



SUNNICA ENERGY FARM

EN010106

Volume 6

Environmental Statement

6.2 Appendix 7F: Sunnica East and West Sites Geophysical Report

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009



18 November 2021
Version number: 00

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

Sunnica Energy Farm

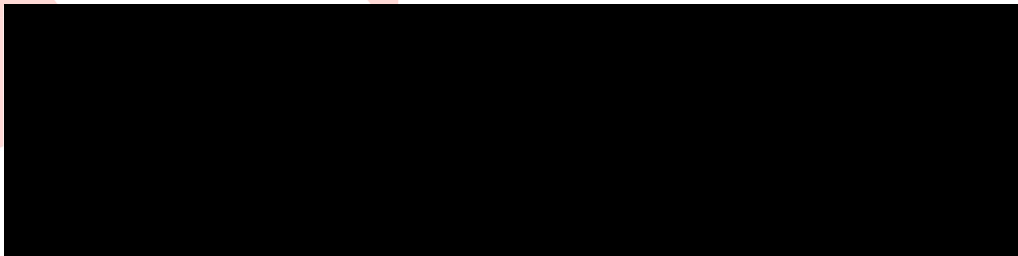
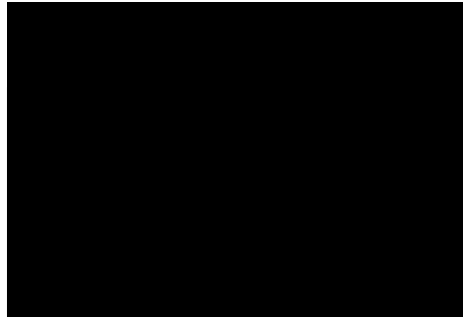
**Environmental Statement
Appendix 7F: Sunnica East and West Sites
Geophysical Survey Report**

Regulation Reference:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	EN010106
Application Document Reference	EN010106/APP/6.2
Author	Magnitude Surveys

Version	Date	Status of Version
Rev 00	18 November 2021	Application Version



magnitude
surveys



Issue Date:

11 November 2020

Abstract

Magnitude Surveys was commissioned to assess the subsurface archaeological potential of a c. 1150ha area of land at the proposed Sunnica Energy Farm which crosses the Suffolk and Cambridgeshire border. A fluxgate gradiometer survey was successfully completed across c. 990ha of the site. Archaeological activity has been identified in the form of at least seven distinct settlement areas covering in total approximately 23ha, multiple potential new barrows, a possible henge, and former field systems which pre-date any recorded on available historic maps. The settlements have suggested dates from later prehistory into the medieval period, and notably include a c. 6ha suspected Romano British productive complex. Dissolution and subsequent infilling of bedrock imperfections has produced a widespread variation in geomorphology, influencing settlement and other anthropogenic activity within the survey area. Anomalies related to the historical agricultural use of the landscape have been detected, including anomalies which correspond with recorded medieval furlong boundaries, ridge and furrow ploughing regimes, more recent historic field boundaries recorded on historic maps, and field drains. The modern use of the landscape has also impacted the data with modern ploughing trends, extant field boundaries and temporary fencing all present within the dataset. Significant ferrous and debris anomalies relate to underground services, an area covered in possible “green waste”, a former section of WW2 airfield, and the former route of the Cambridge and Mildenhall Branch railway.

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1. Introduction

- 1.1. Magnitude Surveys Ltd (MS) was commissioned by Sunnica Ltd to undertake a geophysical survey on a c. 1150ha area of land across both Cambridgeshire and Suffolk. The survey area was located c. 4km northeast of Newmarket (Cambridgeshire) and c. 1.8km south west of Mildenhall (Suffolk).
- 1.2. The geophysical survey comprised hand-pulled, quad-towed, cart-mounted and hand-carried GNSS-positioned fluxgate gradiometer survey.
- 1.3. The survey was conducted in line with the current best practice guidelines produced by Historic England (David et al., 2010), the British Archaeological Association (BAA) and the British Geophysical Society (ClfA, 2014) and the European Archaeological Association (EAA).
- 1.4. It was conducted in line with the Sunnica East (2019 [1]), as well as in line with the Updated Geophysical Survey Guidelines produced by Cambridgeshire County Council (2019), [redacted] and approved by the county archaeologists of Suffolk and Cambridgeshire.
- 1.5. The survey was conducted on 16 March 2020.

2. Quality Assurance

- 2.1. Magnitude Surveys Ltd (MS) is a member of the British Archaeological Association (ClfA), the chartered UK body for archaeologists, and a corporate member of ISAP (International Society of Archaeological Prospection).
- 2.2. The directors of MS are involved in the cutting edge of research and the development of guidance/policy. Specifically, Dr. Chrys Harris is the Vice-Chair of the International Society for Archaeological Prospection (ISAP); Finnegan Pope-Carter is a Fellow of the London Geological Society, as well as a member of GeoSIG (ClfA Geophysics Special Interest Group); Dr. Kayt Armstrong is the Editor of ISAP News, and is the UK Management Committee representative for the COST Action SAGA; Dr. Paul Johnson has been a member of the ISAP Management Committee since 2015, and is currently the nominated representative for the EAA Archaeological Prospection Community to the board of the European Archaeological Association.
- 2.3. All MS managers have relevant degree qualifications to archaeology or geophysics. All MS field and office staff have relevant archaeology or geophysics degrees and/or field experience.

3. Objectives

- 3.1. The objective of this geophysical survey was to assess the subsurface archaeological potential of the survey area.
- 3.2. To assess the presence/ absence of potential archaeological anomalies that might be present.

4. Archaeological Background

- 4.1. The following archaeological background takes into account information taken from a desk-based assessment (DBA) of the site at the Sunnica Energy Farm. Information has been collated from a Heritage gateway search and a previous DBAs produced by AECOM for the Sunnica Energy Farm east (AECOM, 2019 [2]), west (AECOM 2019 [3]) and national grid connection sites (AECOM 2019 [4]). This report looks to assess the archaeological potential for the survey area(s) and a wider 1km study area surrounding both the Sunnica west and east sites (See 1.1).
- 4.2. A flint axe, pottery sherds and bone fragments, possibly dating to the Neolithic have been recovered from the Sunnica east site. Crop marks thought to date to the same time period have been identified in the immediate vicinity of the site to Swales Tumuli.
- 4.3. Evidence of prehistoric settlements is present throughout the study area. An excavation at Foxburrow Plantation, Mildenhall, Suffolk, has revealed a series of stone walls, buildings, hut circle, ring ditch, ditch and pit features. To the north of the northern boundary of the A14 (eastbound), inside the survey area, an excavation conducted prior to the construction of the A14 by the Highways Agency, revealed a series of Bronze Age crannogs, including a large one, which would include the Sunnica Energy Farm site. A further excavation at Dane Hill Farm, Mildenhall, Suffolk, revealed a series of Bronze Age crannogs, including a large one, which would include the Sunnica Energy Farm site.
- 4.4. Two barrows are located to the west of the Sunnica Energy Farm site. The barrows are of the form of worked flints and bronze awl. Contained within and adjacent to the Sunnica west site, immediately north of the A14, are several further scheduled monuments comprised of four bowl barrows, forming part of the Chippenham barrow cemetery; Hilly Plantation bowl barrow and The Rockery bowl barrow. West of the A11, an excavation at Dane Hill Farm uncovered several prehistoric sites of uncertain dates, including a Bronze Age Barrow and evidence of a Medieval Moat.
- 4.5. Numerous different surface scatters have been recovered from c 1100m south of the Sunnica east site with a number of brooch type finds relating to the Roman era among these. Further examples include a scatter of fragments south of Freckenham indicative of hypocaust tile, and a hoard of 600 bronze coins has been recovered in the north western portion of the Sunnica east site.
- 4.6. Medieval activity within the site and wider search area is confined to a number of find spots and stray finds. A Saxon pin and Saxon bronze book fitting were both identified within the eastern portion of the Sunnica site. A Saxon brooch, pin and pottery scatter have been recovered along with metal working related finds and Anglo-Saxon coins within the immediate vicinity of the site. Later medieval activity includes a silver coin scatter and pottery scatter within the eastern portion of the Sunnica Energy Farm.

5. Methodology

5.1. Data Collection

5.1.1. Geophysical prospection comprised the magnetic method as described in the following table.

5.1.2. Table of survey strategies:

Method	Instrument	Traverse Interval	Sample Interval
Magnetic	Bartington Instruments Grad-13 Digital	1m	200Hz reprojected to 0.125m

5.1.3. The magnetic data were collected using a hand-pulled and quad-towed cart system, and hand-held sensors. The positioning system of the equipment are GNSS-positioned.

5.1.3.1. MS' cart and sensors used were Bartington Instruments Grad 13 Digital Three-Axis Gradiometers. Positional referencing was through a multi-

MS' offices. This allowed for data collection, processing and visualisation to be monitored in real-time as fieldwork was ongoing.

5.1.3.3. A navigation system was integrated with the RTK GPS, which was used to guide the surveyor. Data were collected by traversing the survey area along the longest possible lines, ensuring efficient collection and processing.

5.2. Data Processing

5.2.1. Magnetic data were processed in bespoke in-house software produced by MS. Processing steps conform to Historic England's standards for "raw or minimally processed data" (see sect 4.2 in David et al., 2008: 11).

Sensor Calibration – The sensors were calibrated using a bespoke in-house algorithm, which conforms to Olsen et al. (2003).

Zero Median Traverse – The median of each sensor traverse is calculated within a specified range and subtracted from the collected data. This removes striping effects caused by small variations in sensor electronics.

Projection to a Regular Grid – Data collected using RTK GPS positioning requires a uniform grid projection to visualise data. Data are rotated to best fit an orthogonal grid projection and are resampled onto the grid using an inverse distance-weighting algorithm.

Interpolation to Square Pixels – Data are interpolated using a bicubic algorithm to increase the pixel density between sensor traverses. This produces images with square pixels for ease of visualisation.

5.3. Data Visualisation and Interpretation

5.3.1. This report presents the gradient of the sensors' total field data as greyscale images, as well as the total field data from the upper and/or lower sensors. The gradient of the sensors minimises external interferences and reduces the blown-out responses from ferrous and other high contrast material. However, the contrast of weak or ephemeral anomalies can be reduced through the process of calculating the gradient. Consequently, some features can be clearer in the respective gradient or total field datasets. Multiple greyscale images at different plotting ranges have been used for data interpretation. Greyscale images should be viewed alongside the XY trace plots (found in the relevant map book). XY trace plots provide a different form of the geophysical response, aiding in anomaly interpretation.

5.3.2. Geophysical results are presented as greyscale images and XY traces in a layered environment. The data is compared with satellite imagery, historic maps, LiDAR data, and so on. (2019) was consulted as well, to compare the results with recent land usages.

5. [Redacted] OSGB36
[Redacted] (.TIF)
[Redacted] S Open

6. Qualification of Results

6.1. Geophysical results are not a map of the ground and are instead a direct measurement of subsurface properties. Detecting and mapping features requires that said features have properties that can be measured by the chosen technique(s) and that these properties have sufficient contrast with the background to be identifiable. The interpretation of any identified anomalies is inherently subjective. While the scrutiny of the results is undertaken by qualified, experienced individuals and rigorously checked for quality and consistency, it is often not possible to classify all anomaly sources. Where possible an anomaly source will be identified along with the certainty of the interpretation. The only way to improve the interpretation of results is through a process of feedback and discussion with the geophysical reports. MS actively seek feedback on our reports and work in order to constantly improve our knowledge and

6.2. General Statements

6.2.1. Geophysical anomalies are classified into several types across the survey area. Only anomalies that are distinctive or unusual will be discussed individually.

6.2.2. [Redacted] structures. These should be caused

6.2.3. **Ferrous (Spike)** – Discrete ferrous-like, dipolar anomalies are likely to be the result of isolated modern metallic debris on or near the ground surface.

6.2.4. **Ferrous/Debris (Spread)** – A ferrous/debris spread refers to a concentrated deposition of discrete, dipolar ferrous anomalies and other highly magnetic material.

6.2.5. **Natural – Various classes, see below** - Variations in the natural soils and sediments across the survey area reflect different soil and landscape formation processes and are a complex product of parent geology, superficial geology and local soil formation. Though almost the whole survey area is underlain by various chalk types, the resulting background data textures are varied. Changes in superficial overburden, topography and morphology all play a part in shaping the landscape. These specific landscape features influence the shape, form and strength of natural anomalies through transportation, deposition and dissolution processes. Two different main background patterns have been identified at Sunnica, and they appear to relate to the local landforms and resulting flows of water and precipitates across and through the surface. In the interpretation, three classes of Natural anomaly have been used. The characteristics of each are as follows:

6.2.5.1. **Natural (General)** – This class has been used to describe anomalies that typically appear as bands of relatively enhanced response and are usually more visible in the total field data than the gradient. In this landscape, they are interpreted as largely relating to variations in the superficial geology (sands, gravels etc) created at the time of their deposition. The sorting and fining of sediments under fluvial influence creates bands and

pockets of sediments that are relatively magnetically enhanced compared to their immediate surroundings. These bands also have different resistances to erosion, and so commonly influence the local topography as well. Finally, they may appear in conjunction with the two other predominant background patterns where there are bands of superficial material present in areas where the processes that produce the other two patterns are active. There may also be locations where these bands are a result of colluvial hill washing of sediments from further uphill and deposition in the lower parts of the site, and accumulation of the finer textured material in the deeper parts of the soils and sub-soils.

6.2.5.2. **Natural (Dissolution)** – This class has been used to describe a background pattern to the data characterised by strong linear positive anomalies, frequently running with the local slope. In some areas, they can appear to have a striped effect difficult to distinguish from ridge and furrow, whereas in other the effect can look like braided formations, or a geometric pattern. As implied by the class name, these anomalies are interpreted as being the product of finer grained material that is more magnetically enhanced, accumulating in cracks and fissures. These fissures may be within the immediate subsurface or at the surface, such as rills, or they may be at the surface of the bedrock and relate more to faulting patterns within the chalk, or, for example, periglacial cracking (ice wedges). Generally speaking, the straighter and less braided areas correspond with steeper slopes, and so are interpreted as being related to higher flow velocities, whereas the more braided and geometric areas associate with more gentle slopes and are related to lower velocities. Where the velocities slow sufficiently, the pattern shifts to the ‘Natural (Dissolution)’ pattern described above. Where this pattern has been difficult to distinguish from ridge and furrow, the classification has been made on the overall appearance of the pattern and whether or not it ends at a boundary anomaly (or the projected line of one), or where the pattern transitions into another natural type. In the case of the former, ridge and furrow is more likely, and in the case of the latter, then a natural explanation of the anomalies is more likely.

6.2.5.3. **Natural (Infill)** – This class has been used to describe a background pattern to the data characterised by strong linear positive anomalies, frequently running with the local slope. In some areas, they can appear to have a striped effect difficult to distinguish from ridge and furrow, whereas in other the effect can look like braided formations, or a geometric pattern. As implied by the class name, these anomalies are interpreted as being the product of finer grained material that is more magnetically enhanced, accumulating in cracks and fissures. These fissures may be within the immediate subsurface or at the surface, such as rills, or they may be at the surface of the bedrock and relate more to faulting patterns within the chalk, or, for example, periglacial cracking (ice wedges). Generally speaking, the straighter and less braided areas correspond with steeper slopes, and so are interpreted as being related to higher flow velocities, whereas the more braided and geometric areas associate with more gentle slopes and are related to lower velocities. Where the velocities slow sufficiently, the pattern shifts to the ‘Natural (Dissolution)’ pattern described above. Where this pattern has been difficult to distinguish from ridge and furrow, the classification has been made on the overall appearance of the pattern and whether or not it ends at a boundary anomaly (or the projected line of one), or where the pattern transitions into another natural type. In the case of the former, ridge and furrow is more likely, and in the case of the latter, then a natural explanation of the anomalies is more likely.

6.2.6. **Undetermined** – Anomalies are classified as Undetermined when the anomaly origin is ambiguous through the geophysical results and there is no supporting or correlative evidence to warrant a more certain classification. These anomalies are likely to be the

result of geological, pedological or agricultural processes, although an archaeological origin cannot be entirely ruled out. Undetermined anomalies are generally not ferrous in nature.

6.2.7. **Ridge and Furrow** – Ridge and furrow cultivation has a characteristic appearance in magnetic results as alternating bands of enhanced and less enhanced material at regular spacings of 2m up to 20m, though more usually within a 3m to 7m range. The enhanced bands, generally associated with the furrows, of these are all drawn as this can help in the analysis of field patterns and sometimes help to ascribe a relative date to the system.

6.2.8. **Agricultural (Trend)** [REDACTED] seen as weaker more narrowly spaced linear trends. [REDACTED] varies depending on the local soil properties and [REDACTED] cases, a sample of the modern ploughing trend with [REDACTED] as this allows other anomalies of greater interest [REDACTED] seen. At other locations, more of the modern ploughing trend [REDACTED] helpful to the interpretation of the landscape, rather than hindering it. Linear anomalies that follow the shape of the [REDACTED] and [REDACTED]

6. [REDACTED] es both [REDACTED] ward to [REDACTED] tifiable

in the results where old field divisions have been removed to amalgamate fields, but left behind filled ditches and other subsurface remains, such as ferrous/debris material, drains or services. Where anomalies collocate with field boundaries shown on historic maps, these have been classified as 'Agricultural', unless there is a strong reason to suggest otherwise which is discussed in the relevant results section. Other anomalies of similar character that align with mapped boundaries or continue them but where no boundary is shown on the earliest maps are usually also classified as 'Agricultural', unless there is a strong reason to suggest otherwise which is discussed in the relevant results section.

7. Reporting Zone A

7.1. Geographic Background

7.1.1. Zone A is located c. 1.5km southeast from Isleham (Figure A1). Survey was undertaken across six fields covering an area of c. 130ha. The area was predominantly under arable conditions with three areas of cereal stubble and three of young crops. Zone A is bounded by further fields to the north, Lee Brook to the east, Freckenham to the south and Isleham to the west (Figure A1).

7.1.2. Survey considerations:

Survey Area	Ground Conditions	Other
1	Arable field, with a slope that sloped down to the southeast of the area.	Bounded to the north by trees, to the east by a drainage ditch. The field was bounded to the west and southwest. A derelict farm building and an area of hard standing were located just beyond the western corner.
2	[REDACTED]	Bounded to the east by a stream, to the south by a hedge.
3	[REDACTED]	Bounded to the north by a hedge, to the other side of the field by an area of hard standing.
	This slope was interrupted near the northeast boundary by a small ridge that ran approximately north-northwest to south-southeast.	standing were located just beyond the southern corner of the survey area. A second derelict farm building was present on the boundary of survey area at the western corner.
4	Flat, arable field under young crop. Several areas of waterlogged ground and deep tractor ruts were present adjacent to the northern boundary which prevented a small area from being surveyed.	Bounded to the east by Lee Brook and hedgerow, to the south by grass banks and hedgerow, and by a track to the north. The west boundary was demarcated by a change in land use. A residential property and farmyard were located along the northeast boundary with a telegraph line running from the farm across the survey area northeast to southwest. A flow gauging station for the stream was located in the northeast corner of the area. A dirt track cut across the centre of the survey area in a north-south orientation.
5	Flat, arable field under young crop.	Bounded by a grass bank to the north, a hedgerow and stream to the east and a hedge to the west. The field continued to the south.
7	Flat, drilled field, recently sown.	The field continued to the north, bounded by a shallow bank to the east and south, bound to the southwest and west by a bank and trees.

7.1.3. The underlying geology comprises Zig Zag chalk formation across the majority of Zone A with a small inlet of Holywell Nodular Chalk Formation to the northwest of Area 2 and New Pit Chalk Formation (undifferentiated) along the eastern boundaries of Areas 3 and 7. No superficial geology has been recorded in the zone except for along the eastern border. A stretch of peat lies in Area 3 that becomes alluvium to the south, this alluvium band extends into Area 1 (British Geological Survey, 2019).

7.1.4. The soils consist of freely draining lime-rich loamy soils that covers the entirety of the zone, with the exception of a stretch of shallow lime-rich soils over chalk or limestone recorded in the north-northeast of Area 1 and east of Areas 3 and 7 (Soilscapes, 2019).

7.2. Results

7.2.1. Summary

7.2.1.1. Reporting Zone A extends from the village of Isleham, to the west of Lee Brook [REDACTED] background throughout Zone A (Figures A2 & A6) conform with local topographic changes producing clear

[REDACTED] pattern [REDACTED] as been [REDACTED] ogonal [REDACTED] spot is [REDACTED] coins.

Further find spots that record Roman, Early Medieval and Medieval artefacts are located in close proximity (See Section 4). Straight trackways to the north, south, and west extend from a complex of rectilinear anomalies interpreted as a large productive site such as a villa or a farmstead. The trackways, as well as the cellular structure of the archaeological complex, are highly suggestive of an origin in the Roman period. The complex appears to have multiple phases, with linear features truncating or intersecting each other. These linear anomalies share orientation and scale suggesting that the complex could have increased or decreased in size during its existence (Figure A12). Multiple linear anomalies have been identified within the trackways, orientated in the same direction, which could also suggest that the trackways similarly had a multiphase existence (Figure A12 & A16). The presence of a ring ditch within one of the larger rectilinear enclosures in the north suggests a prolonged occupation, with multiple phases of activity predating the Roman period (Figure A12). Outside the main area of activity, c. 140m east, a large circular feature with a 50m diameter has been identified; a circular feature of this size likely relates to a hengiform monument (Figure A24). C. 245m south-west of the main area of activity, another possible and smaller partial ring ditch has been detected. Further south, in Area 4, a further smaller ring ditch has also been detected (Figure A20).

7.2.1.3. In the northeast quadrant of Zone A, numerous linear anomalies have been identified, some of which appear to form a regular, large field system (Figures A8, A36). These probable former fields are located on a downward slope; it is possible

the location of this agricultural activity was chosen based upon the natural drainage of surface water and high groundwater content allowing for an easily accessible water source. Moving south, the linear anomalies become more fragmented with weaker magnetic signals, however, these weak anomalies share a similar orientation with the more defined field systems in the north. Further linear anomalies have been detected overlapping and truncating the fragmented anomalies in multiple orientations, this likely indicates multiphase activity (Figures A8, A28). None of the anomalies classified as “Probable” or “Possible” archaeology correspond with any former field boundaries recorded on available historic maps, or align with them, which suggests the field systems identified predate available maps.

7.2.1.4. In the centre of the Mildenhall Branch railway has been recorded type of magnetic signal along the length of the railway. The removal was more complete in the east, where only debris remains, than to the west, where broad ferrous

[REDACTED]

complex. This effect is likely caused by the plough dragging the enhanced material produced by habitation activity.

7.2.2. Interpretation of Magnetic Results – Specific Anomalies

7.2.2.1. **Probable Archaeology (Large-Scale Roman Complex)** – Within Area 2, a series of rectilinear anomalies, [2a], together form a large-scale complex (Figure A2, A4, A12 & A16). The size of the complex measures 5.6 ha in total and the anomalies generally exhibit a strong, positive magnetic signal indicative of ditches infilled with an enhanced backfill, likely caused by occupation activity which enriches the soils (Figures A2 & A3). Linear anomalies intersect or truncate at perpendicular angles to create orthogonal formations. The complex is organised in a cellular grid formation with the majority of the cells occupying the eastern side of the complex, following a northwest to southeast orientation (Figure A12). Further cellular formations have been identified in the western part of [2a], however these have a weaker magnetic enhancement, which could indicate this area was less intensely used, or existed for a shorter period. The phasing of the complex is difficult to ascertain yet it appears that the structure may have been extended multiple times over its duration. This possible development is visible in the centre of the complex at [2b] where a broad ditch-type anomaly divides the north and southern halves of the complex, possibly indicating this was once an outer boundary (Figures A10 & A12). Further, less expansive additions are visible in the north of the complex at [2c] (Figures A10 & A12) and in the south at [2d] (Figures A14 & A16). The uniform cellular nature of the complex, [2a], is indicative of a Roman period singular large

habitation and production site, such as a villa, with development phases, rather than typical settlement patterns with individual dwellings as might be expected with later prehistoric or post-Roman settlements.

7.2.2.2. **Probable Archaeology (Rectilinear enclosures)** – Two rectangular enclosures adjoin [2a] immediately to the west [2e & 2f] (Figures A4 & A12). The linear anomalies which form these enclosures are very similar to those forming [2a], with continuous positive magnetic signals, yet the magnetic enhancement of these anomalies is slightly weaker (Figure A10). The slight change in magnetic enhancement could be related to a reduction of habitation effect (i.e. that these are further from the focus of settlement activity). Both enclosures [2e & 2f] contain a number of [redacted] share the cellular formation identified within [redacted] enclosures, [2e], measures c. 160 x c. 60m; while [redacted] measures c. 120m; together these form an area covering [redacted] complex (Figure A12). The less compact internal features of these enclosures suggest a different usage, possibly

[redacted] and which [redacted] is of a [redacted] (Figure A11). [redacted] ditch, c. [redacted] essentially

older than the main complex at [2a] or the enclosure at [2e]. However, it seems to have been, respected by the subsequent large-scale occupation which occurred around it. This hints at a continuity of occupation between the iron age and roman periods and underlines the potential for this complex to reflect a Romano-British high- status productive settlement.

7.2.2.4. **Probable Archaeology (Rectilinear enclosures)** - Further west within Area 2, an additional rectangular enclosure [2h] has been detected (Figure A12). This enclosure is separated from [2e] by only 8m, and comprises strongly enhanced outer boundaries to the north, east and west (Figure A10). The western edge of [2e] which runs parallel to the boundary of [2h] shares a similar level of strong enhancement when compared to [2e]'s other boundaries (Figure A10). It is possible the greater level of enhancement of these specific boundaries could indicate the deposition of more enhanced materials into the ditch backfill, perhaps related to burnt or fired material. The enclosure [2h] measures c. 75m in length and an c. 60m in width, however, the southern boundary is unclear. The organisation and size of this enclosure appears to differ from the main complex [2a]; but all three smaller enclosures [2e, 2f & 2h] share orientation with the main complex as well as that of trackway [2j] suggesting likely contemporaneity (Figure A4).

7.2.2.5. **Probable Archaeology (Trackway)** – To the north of [2h], two parallel weakly positive linear anomalies have been identified, [2i] (Figure A12). Similar in magnetic signal to those in the south (see section 7.2.2.6), [2i] is suggestive of

ditches flanking a trackway. The anomalies at [2i] extend to the north and the west, appearing to continue beyond the bounds of the surveyed area. This trackway measures c. 14m in width leading north, and c. 21m in width leading west.

- 7.2.2.6. **Probable Archaeology (Trackway)** – To the immediate south of the large-scale complex [2a] and enclosure [2f], two parallel strong positive linear anomalies have been identified, [2j], leading south from the complex (Figure A4 & A16). These linear anomalies are indicative of the flanking ditches of a trackway, due to the length and continuous nature of the magnetic signal (Figure A14). Measuring 23m in width and c. 240m in length, the probable trackway lies on the same overall orientation as [2i] and extends and intersect with two weakly positive anomalies [2k] which follow a southwest to east alignment. The magnetic signal of this second possible trackway agrees with the magnetic signal of a probable trackway at Area 4, and Area 1 and appears to continue beyond the surveyed area to the west, which could indicate that the

[REDACTED]

made the ground drier and therefore more desirable for habitation. The large-scale enhancement exhibited here [2l] is likely anthropogenic (related to the occupation) rather than natural in origin. This is a common effect on settlement sites with a long duration, or intense occupation, and is a result of the habitation effect, whereby the same anthropogenically enhanced material that concentrates in ditches and pits is pervasive enough in the topsoil in the occupation area that it produces a markedly different background texture.

- 7.2.2.8. **Probable Archaeology (Ring Ditches)** – Only c. 50m south of enclosure [2f], two semi-circular anomalies have been identified [2m], located in the west of Area 2 (Figure A16). Despite the partial nature of these curvilinear anomalies an archaeological origin is considered highly probable, given the similarity of the magnetic signals between these and the archaeological anomalies in close proximity. These curvilinear anomalies fall between two complete ring ditches, [2g] c. 230m north (see section 7.2.2.3), and [4b] a ring ditch of c. 22m diameter in Area 4, c. 400m to the south (Figures A12 & A20).

- 7.2.2.9. **Probable Archaeology (Hengiform Circular Enclosure)** – Also within Area 2, c. 460m east of [2m], a ring ditch on a larger scale than seen elsewhere in the wider landscape has been detected, [2n] (Figure A24). The size of [2n], c. 50m in diameter, is unusually large for a typical late prehistoric ring ditch, which may indicate that this was some form of hengiform monument. None of the later, potentially Roman, features appear to intersect or have any clear relationship with

the possible hengiform monument; the closest trackway, [2k], runs c. 40m to the south (Figure A24). A potential field system with a very weak magnetic signal appears to end c. 25m to the northeast, in Area 1, [1b]. Despite the later archaeological anomalies appearing to respect the boundaries of [2n], an ephemeral curvilinear anomaly has been detected curving through the northern half of the circular feature (Figure A23 & A24). The origin of the curvilinear anomaly is unclear, but an archaeological provenance is considered likely.

7.2.2.10. **Probable/ Possible Archaeology (Field System)** – In the south of Area 2, and east across Area 1 a number of linear anomalies on a north to south alignment have been detected. [REDACTED] anomalies have weak magnetic signals (Figure A22) [REDACTED] possibly enhanced backfill, as might be expected [REDACTED] of a large area of occupation. However, in [REDACTED] alignment of modern ploughing regimes which [REDACTED] archaeological interpretation.

7.2.2.11. **Probable/Possible Archaeology (Field System)** – In the northeast of Zone A, in [REDACTED] anomalies have been identified [REDACTED] northeast alignment [REDACTED] and the [REDACTED] within [REDACTED] e, that

predates available historic maps (hence the “Probable Archaeology” classification) which may have persisted through time. South and west of the former field system numerous further weak linear anomalies on varying orientations have been identified, [3b] (Figures A27 & A28). It is possible that the anomalies at [3b] represent further extensions of former field systems, however, the overlapping nature and various orientations of the anomalies suggest multiphase activity. Set somewhat separate to [3b], c. 90m west of the majority of the anomalies, a linear anomaly with a c. 90 degree return has been identified [3c] (Figure A28). The magnetic signal of [3c] is more enhanced than the surrounding possible field systems and is on a similar level of enhancement to the complex [2a] situated c. 130m to the west in Area 2 (Figure A8 & A6). It is not clear from the magnetic data what the provenance of [3c] is, and whether it is related to the possible former field systems or the large probable Romano-British complex.

7.2.2.12. **Agricultural/ Probable Archaeology (Former Field Boundary)** – In Area 1, in the east of Zone A, a number of linear anomalies have been identified which correspond with former field boundaries recorded on the 2nd edition OS map (Figure A5). One of these anomalies, [1c], has been classified as “Probable Archaeology” as it appears to form the terminus for the trackway [1a] (Figure A24), as well as corresponding with the location of an historic former field boundary (Figure A5). It is possible that anomaly [1c] represents a feature which has been used and re-used, which would explain its relatively enhanced magnetic signature (Figure A23). To the north of [1c] two anomalies, [1d], loosely correspond with

former field boundaries on the 2nd edition OS map (1903 OS map), as does [3d], a rectilinear anomaly in Area 3 (Figures A4 & A5). The magnetic signal of [3d] is weaker than that of [1d] (Figures A24, A28), suggesting that they involve differing deposition processes and/or durations.

7.2.2.13. **Extraction** – In the west of Area 2 and 7, and close to the centre of Area 1, four broad anomalies have been identified [2p, 7b & 1e], interpreted as possible extraction (Figure A12, A20, A24 & A32). On a smaller scale, two anomalies of potential extraction origin have also been identified within the archaeological anomalies of [3b] (Figure A28). The anomalies are located on chalk bedrock and could indicate [redacted] no evidence for extraction on the 2nd Edition OS map and potentially represent older, unmapped [redacted] extraction activity has been identified in [redacted] by [3b] (Figure A28).

7.2.2.14. **Drainage Features** – In Area 2, a series of parallel, weak positive linear anomalies have been identified, [2a] (Figure A20). These linear [redacted] north-south [redacted] Area 2 [redacted] g water

8. Reporting Zone B

8.1. Geographic Background

8.1.1. Zone B is located c. 1.9km southwest of West Row and covers an area of c. 107ha (Figure B1). Survey was undertaken across four fields under arable cultivation. Zone B is bounded by River Lark to the north, Lee Brook to the west, further fields to the east and Beck Road to the south (Figure B1). A total of c. 49.05ha were not able to be surveyed due to heavy furrows, waterlogging, overgrown vegetation and to the presence of pigs.

8.1.2. Survey considerations:

Survey Area	Ground Conditions	Survey Considerations
1	Arable land under cereal crop, with deep furrows down to the north and east. The eastern boundary is a trackway, and a wooden gate was present in the southeast corner. A telegraph pole with	Bounded to the north, east and south by a hedgerow and trees; the field was bounded to the west. A trackway ran along the eastern boundary, and a wooden gate was present in the southeast corner. A telegraph pole with
2	Waterlogged throughout.	overhead cables running on a roughly east to west alignment. Disused electric fencing and iron poles were still present intermittently throughout the survey area. A small area in the southeast of the field was unable to be surveyed due to an active pig paddock and farm equipment being present.
3	Flat, arable field. Heavily furrowed.	Bounded to the north by a trackway and to the west and south by a hedgerow. The field continued to the east. One telegraph pole was present in the centre-west of the survey area, on the same east-west alignment of the telegraph poles located in Area 2. Most of Area 3 was unsurveyable due to the field being cultivated with deep furrows.
4	Flat, arable field. Heavily furrowed.	Bounded on all sides by a grass border and tracks. Telegraph poles border the track to the south orientated east to west. Farm equipment and pig huts created an unsurveyable area, bisecting the field into two parts. A further section to the north of the eastern part of the field was unsurveyable due to farm equipment.

8.1.3. The underlying geology comprises chalk from the West Melbury Chalk formation in the northern fields of the zone, and chalk from the Zig Zag Chalk formation in Areas 1, 2 & 3.

Superficial deposits consist in clay, silt, sand and gravel for the majority of Zone B except for the southern half of Area 1, and the northern half of Area 4 where no superficial deposits are recorded. In the northeast corner of Area 4 a small band of peat is recorded extending into the survey area (British Geological Survey, 2019).

- 8.1.4. Zone B is comprised of three types of soils. Fen peat soils are recorded along the northern end of the zone, while the centre-west of the zone comprises shallow lime-rich soils. Freely draining slightly acid but base-rich soils are recorded over the rest of Zone B (including Areas 1, 2, 3 & 4) (Soilscapes, 2019).

8.2. Results

8.2.1. Summary

- 8.2.1.1. Zone B is located between the Brook and southeast and southwest of the village of [REDACTED]. It is located east of Lee Brook, north of Bec [REDACTED] immediately east. Zone B exhibits a generally quiet magnetic background, probably due to past waterlogging

[REDACTED] fenland drainage, [REDACTED] activation [REDACTED] information [REDACTED] and was [REDACTED] features associated with this activity would achieve detectable magnetic contrasts with the surrounding soils and sediments. This explains the relative absence of archaeological anomalies on the northern limit of this zone, in contrast with others within the wider site. Caution should be exercised however, as it is very difficult to state with certainty whether this non-detection results from an absence of features, or from an absence of contrast within archaeological features in this wet part of the landscape. The central and southern sections of Zone B are situated slightly higher in the landscape, and on a deposit of glacial head material, which may have had conditions more favourable for past occupation. In the southwest of the zone, a group of sinuous curved anomalies have been interpreted as being related to the deposition and transportation of fine-grained alluvial superficial material. The rest of the background patterns are a muted version of the anomaly types described in 6.2.5 above (Figures B2 & B10).

- 8.2.1.2. In the east of Zone B – Area 4, a multiphase complex has been detected, covering 2.4ha, comprising linear and curvilinear anomalies creating orthogonal formations (Figure B16). In the immediate vicinity of this complex, find spots of Roman period pottery sherds and metalwork (MSF7999) are recorded, as well as a Bronze Age chisel (MSF178). Within the wider landscape further find spots that record Bronze Age, Roman, Early Medieval and Medieval artefacts are also in close proximity. This archaeological complex appears to share elements of the cellular formation found within Zone A, which is located c. 1.3km to the southeast (see section 7.2.1.2.). However, the anomalies themselves are more fragmented and the strength of the magnetic signal disperses rapidly from the foci of the occupation area. Whether

this is an effect of wetter ground conditions within Zone B, or an indication of prolonged or intense occupation of this settlement is unclear. The complex appears to have multiple phases, with linear features truncating or intersecting each other. Some of the linear anomalies do not share the orientation of the majority of the complex suggesting the site could have been reused in different periods or significantly modified (Figure B16). A possible trackway has been identified extending north from the complex. Within and around the complex, anomalies have been identified as “Possible Archaeology”: these anomalies likely reflect the impact of ploughing regimes within the area dragging out archaeological fills into the nearby topsoil.

8.2.1.3. In the south of the zone, a circular ring-ditch like anomaly c. 30m in diameter was identified in the middle of the former Cambridge and Mildenhall Bypass. This anomaly likely indicate a ring ditch. This ring ditch represents one of the many ring ditches identified within the zone.

[REDACTED]

signal along the length of the former railway indicates the removal of the trackway was more complete in its western and eastern extent than in the central section, where it appears more strongly ferrous.

8.2.1.5. Agricultural activity is evident in the form of ploughing trends and drains (Figure B4). Modern activity is evident in the form of magnetic disturbance and agricultural trends related to dismantled and extant pig paddocks across the east of Zone B (Figures B4). Magnetic disturbance is also present in the southeast of the zone due to a parked tractor, to the north of the zone due to farm equipment and pig huts and electric fencing as well as at the perimeter of the fields due to fencing.

8.2.1.6. Anomalies classified as “Undetermined” have been identified throughout the zone. The magnetic signals of these undetermined anomalies are generally ephemeral, and may relate to natural or agricultural processes, however, an archaeological origin cannot be entirely ruled out (Figures B4).

8.2.2. Interpretation of Magnetic Results – Specific Anomalies

8.2.2.1. **Archaeological Probable (Complex)** – Within Area 4, a series of rectilinear anomalies, [4a], together form an archaeological complex (Figures B14-16). The size of the complex identified within the survey area measures 2.4ha in total, however it is likely that the complex extends further east, beyond the scope of the survey. The anomalies exhibit a range of strong and weak positive magnetic signals, indicative of ditches infilled with an enhanced backfill, likely caused by occupation activity. The anomalies forming the complex are most enhanced at linear anomaly

[4a], which could indicate the foci of the settlement. [4a] appears to have a central opening, with a ditch terminus suggesting this is “real” rather as a result of later disturbance and truncation. Away from [4a], the general anomaly strength reduces significantly, and anomalies are less continuous which makes assessing the form of the wider settlement more difficult. North of [4a], along the western extent of the complex, there appears to be weak rectilinear anomalies which may indicate a cellular formation like that detected with Zone A. However, the discontinuity of many anomalies prevents confident interpretation, and some of the anomalies within the Zone B complex appear more haphazardly placed, particularly south of [4a]. As the complete form of the settlement is uncertain, this complex may date from the late [redacted] through the rectilinear character suggests a Roman [redacted]

8.2.2.2. **Archaeology** [redacted] the complex within Area 4, two parallel weak [redacted] identified, [4b] (Figures B14-16). These anomalies are similar in magnetic signal to those in the north of the [redacted]

[redacted] ex. The [redacted] however, [redacted] anomalies in [redacted] it could [redacted] circular [redacted]

anomaly [1a] has been identified (Figures B3 & B7). Being cut by the former Cambridge and Mildenhall Branch railway, it is not possible to view the full extent of the anomaly; nevertheless, it appears to be c. 30m in diameter. The anomaly has been interpreted as a probable ring ditch, as it shares characteristics with many similar anomalies detected in the wider environs of the site. [1a] has similar dimensions to the bowl barrows recorded at the A11/ A14 junction to the south (SM 1015246) (Zone F, [12a] and [13a] in Figure F12), and at Chalk Hill to the east (SM 1018097) (Zone D, [8a] and [8b] in Figure D8).

8.2.2.4. **Magnetic Disturbance and Ferrous/Debris (Spread)** – Crossing through the south of Areas 1 and 2 is a broad ferrous anomaly [1b, 2a] running on a northwest to southeast alignment (Figures B2, B3, B6, B7, B10 & B11). This is characterised by ferrous-type anomalies of varying strengths and signal types, all of which fall within a consistent band crossing both survey areas. This linear band is strongly dipolar in the southeast of Area 1 but the magnetic enhancement decreases in the southwest of Area 1 suggesting a reduction in the ferrous content. In Area 2 the band of anomalies comprises a higher concentration of small ferrous anomalies indicating the presence of a spread of debris, as well as large discrete strongly negative anomalies. This anomaly corresponds with the former Cambridge and Mildenhall Branch railway recorded on historic maps (Figure B5). The variety of the magnetic signal within the band of anomalies [1b, 2a] likely reflects the differences in how thoroughly the railway was dismantled along its extent.

9. Reporting Zone C

9.1. Geographic Background

9.1.1. Zone C is located c. 700m to the southwest of Worlington (Figure C1) and covers an area of c. 199ha. Survey was undertaken across 18 fields under arable use and four fields under grassland. Zone C is bounded by B1102 to the north, by fields to the east, by Heath Farm to the south and by further fields and Rectory Farm to the west (Figure C1). It was not possible to survey c. 11.3ha due to the presence of pigs; c. 0.4ha in Areas 5 and 20 could not be surveyed due to waterlogging and overgrown vegetation and a further c. 0.2ha in Area 11 could not be surveyed due to the presence of pig pens.

9.1.2. Survey considerations

Survey Area	Ground Conditions	Other Features
1	Arable field under recently harvested crop with a gentle slope down to the south in the east of the survey area.	Bounded by trees and hedgerow with a pheasant pen in the northeast corner, along with a metal gate.
2	[Redacted]	[Redacted]
3	Arable field under recently harvested crop, with an area of overgrowth and weeds in the north, a sugar beet crop in the centre and a young cereal crop in the south. The area in the north was generally flat, with a gentle slope down to the south in the sugar beet and a gentle slope down to the west in the south.	Bounded by trees and hedgerow to the north, northeast and west, with a barbed wire fence to the east and by trees and hedgerow to the south. A trackway ran along the eastern boundary and across the north of the survey area running northeast to southwest. A mound of earth and a pheasant pen and bird feeders were present in the north, with debris and farming equipment present in the northeast corner. Several pylons and overhead cables were present along the western and southern boundaries, with the cables crossing the southwest corner.
4	Flat, arable field under young rye grass crop with undifferentiated plants	Bounded by hedgerow on all four sides. An overhead power cable ran along the northeast boundary parallel to Elms Road. The overhead wires extended to the southeast boundary over the field.
5	Flat, arable field formerly used for pig pasture but recently ploughed.	Bounded by trees to the north, east and south, a hedgerow to the west, and the field continued to the southeast. There was a large hay pile in the southwest part of the survey area, and stacked metal pig huts in the northeast corner of the survey area.
6	Flat, arable field under seeded grass.	Bounded on three sides (north, east and west) by trees and hedgerow and to the south by a large metal fence. Parallel to the northern boundary

		was a worn dirt track, that ran northeast-southwest.
7	Undulating arable field under wheat stubble.	Bounded by trees and hedgerow on all four sides.
8	Flat, arable field under young rye grass.	Bounded on all sides by trees, banks and hedgerow. An electric fence divided the north and southern halves of the field.
9	Flat, ploughed arable field.	Bounded by a farm track to the north, south and west, and a hedgerow to the east.
10	Flat, ploughed arable field.	Bounded by hedgerow to the southwest and the field continued on all other sides.
11	Flat, ploughed [REDACTED]	erow to the west and south, d to the north and bound by a t. Telegraph lines ran along the western boundary. A 0.2ha t east was overlapped by a pig be surveyed.
12	Flat, arable field of young crop.	Bounded to the northeast by hedgerow, which d to the to the
13	[REDACTED]	row to to the nwest. e area
		from a large reservoir with c. 10m high banks.
14	Undulating arable field, consisting of short stubble.	Bounded on all sides by trees and hedgerow.
15	Flat, arable field under harvested sugar beet.	The field continued to the south and east and was bounded by a farm track to the north and west.
16	Flat, arable field under harvested sugar beet.	The field continued on all sides. A farm track ran along the western boundary.
17	Flat, undifferentiated grassland.	Bounded by a track on all sides and also by a bank and trees along the eastern and southern boundaries. Stacks of hay bales were located in the north-western corner of the field alongside a mound of earth and a water valve.
18	Flat, pasture and grassland used for horse paddocks and chicken runs.	Bounded by a trackway to the south, by a electric fence to the west and east. The field continued to the north. The field was subdivided into paddocks and individual chicken runs by electric fencing. Farm debris and chicken coops were present in the centre-west of the survey area. It was not possible to survey a c. 0.09ha section in the west of the survey area due to the presence of horses.
19	Mixed grassland and arable with a slight slope up to the north.	Bounded on the south, east and west by hedgerow and trees. The field continued to the north. A trackway bisected the survey area roughly north to south. There was one small

		unsurveyable section in the northwest due to the presence of a pile of manure.
20	Flat, arable, scored and ploughed with grassed section along the south-eastern boundary. Plough and scoring ran northeast to southwest across the majority of the survey area. In the southern end of the survey area, the ploughing ran northwest-southeast.	Bounded by trees to the west and south, by trees and wire fencing to the southeast and by a trackway and bank with trees to the north. The field continued to the east. It was not possible to survey three small sections (c. 0.07) in the southeast of the survey area due to waterlogged ground conditions.
21	Undulating grassed area with shallow hollows and mounds throughout.	Bounded to the south, east and west by wire fencing and to the north by trees. The field continued to the north.
22	Flat, pasture grassed area.	Bounded to the south and west by a track, to the east by wire fencing and to the north by trees backing onto housing off Freckenham Road. A trackway runs along the southern boundary c. 0.07. A trackway runs along the northern boundary c. 0.07.
23	Flat, pasture grassed area with a crop in the south.	Bounded to the south and west, by trees and wire fencing. A trackway runs along the northern boundary c. 0.07. The section contained farming equipment, and an area of overgrown vegetation to the west which prevented survey.

9.1.3. The underlying geology comprises chalk of the Holywell nodular formation and New Pit formation (undifferentiated) over the majority of Zone C, however Areas 9,15,17,18,19, 21, 23 and the eastern halves of Areas 20 and 22 in the north and centre of Zone C are also underlain by chalk of the Zig Zag formation. A band of Melbourn rock member chalk separates the Zig Zag and Holywell formations. Superficial geology recorded in Areas 21,22,23,18,6,17,1,5,2,8, in the centre and south of Zone C, and in Areas 18,15, in the western half of Area 19 and northern half of Area 3, consists of river terrace deposits with sand and gravel (British Geological Survey, 2019).

9.1.4. In Areas 14,7,20,17 and in the western portions of Areas 16 and 15, clay, silt, sand and gravel superficial deposits are recorded. Bands of superficial deposits of blown sand are found across the north-eastern edge of Areas 7 and 8. No superficial geology is recorded in the southern portion of Area 3 and in Areas 9,10,16, western portion of Area 20, Area 2, 4 and western portions of Areas 6 and 13 (British Geological Survey, 2019).

9.1.5. Zone C is comprised of three types of soils. In Areas 22,23,18,15 and in northern halves of Areas 3 and 9, freely draining sandy Breckland soils are recorded. The southern halves of Area 3 and 9, the western half of Area 17 and Areas 10,16 and 17 are characterised by freely draining slightly acid but base-rich soils. This same type of soil is recorded in the south and southwest of Zone C, specifically in the western halves of Areas 2 and 6 and in

Areas 4 and 13. The centre and northeast of Zone C, including Areas 21,20,7,14,2,8,5,1,12 and the northernmost part of Area 6, is comprised of freely draining slightly acid sandy soils (Soilscapes, 2019).

9.2. Results

9.2.1. Summary

9.2.1.1. Reporting Zone C is located to the east of Freckenham, southwest of Worthington, and northwest of Red Lodge. Historic mapping of the survey area identifies widespread fenland in the surrounding area (Figures C5, C9, C13). Historically, land use in fenland areas was limited by waterlogging without the implementation of field drainage systems. Settlement or arable cultivation in periods of the past can impact the formation of magnetic anomalies; so even if the fenland was exploited in the past (e.g. as meadows), it is unlikely that features associated with fenland would display multiple magnetic contrasts with the surrounding soils and sediments. This explains the relative absence of

anomalies at this site. The relative absence of anomalies is a result of uncertainty from an interpretation of the data. It has been noted that the anomalies have been marked as “Natural (Dissolution)” (Figures C6, C8; C10, C12). Contours suggest water flow during seasonal flooding of higher fenland to the east of Zone C has influenced the deposition and erosion of a range of surface materials within the southwest of the zone. In this section, both dissolution of the bedrock (Natural (Dissolution)”; Figures C2, C4) and deposition of less permeable material producing irregular shapes (“Natural (Infill)”, Figures C2, C4) have been recorded, in line with the classifications described in section 6.2.5 above.

9.2.1.2. A long, linear anomaly has been detected crossing five of the fields surveyed in the centre and south of Zone C, to the east of Rectory Farm (Figures C4, C8). This feature follows a northeast to southwest alignment for c. 730m, before turning north and continuing for a further c. 650m. The continuous positive magnetic signal of this anomaly is characteristic of a ditch filled with more enhanced sediments, and likely relates to some form of past landscape organisation. No corresponding feature has been recorded on historic maps, and it does not follow the alignment of any former or current field boundaries. The limits of this long, linear feature have not been defined by this survey, and it appears to carry on past the bounds of the zone. Similar linear anomalies have been identified in the western half of Zone E (Figure E4) and in the northeast of Zone F (Figure F16).

9.2.1.3. In the northwest of Zone C extraction pits were identified, along with the infill material from a former pond. The detected anomalies correspond to locations identified on 1882-1885 county series OS maps and the 2nd edition OS mapping (Figures C12, C13).

- 9.2.1.4. Further detected anthropogenic activity is present as modern ploughing trends and some drainage features (Figures C4, C8, C12). Further agricultural activity is evident in the form of tractor tracks around the edges of a number of the fields.
- 9.2.1.5. In addition, three large buried services have been detected in the northern and central parts of Zone C (Figures C4, C8, C12). These produce the broad magnetic halos that may obscure weaker underlying signals, if any are present (Figures C3, C7, C11). A smaller service was detected in the south of the zone, leading to a reservoir visible on satellite imagery. Magnetic disturbance from an extant electric fence has also been detected in the centre-east of Zone C.
- 9.2.1.6. Several undetermined anomalies were detected across Zone C. Though the magnetic signatures are similar to those found in nature, some of them may relate to post-glacial features, a natural origin is considered equally as likely. Linear anomalies categorised as “Undetermined” were detected throughout the zone, the origins of which are uncertain; they may result from deliberate drainage or natural hill wash

9.2.2. Interpretation of Magnetic Results – Specific Anomalies

- 9.2.2.1. A large linear anomaly was detected in the north-west of Zone C (Area 12), extending approximately 1.3km in length and may extend further beyond the bounds of the survey area. Approximately midway along the anomaly (in Area 12), a sharp shift in orientation has been recorded. The southern portion of the anomaly [4a, 6a, 12a] follows a southwest-northeast alignment, whereas its central portion [1a, 8a] shifts to being north-south orientated. Linear positive anomalies of this type are characteristic of ditches with enhanced fills. It has been categorised as “Archaeology Possible” due to the lack of corresponding features recorded on historic maps and current field boundaries. A lack of clear archaeological context in the surrounding areas prevented a confident “Archaeological Probable” classification. However, it is likely that this anomaly represents an early land division of unknown date and may be part of a larger system of landscape management which is not evident by examining Zone C in isolation. Zones E and F contain similar large-scale anomalies interpreted as boundary ditches or land divisions of some sort (see sections 11.2.2.3 and 12.2.2.7).
- 9.2.2.2. **Archaeology Possible (Weak)** – Two weakly positive linear anomalies, [2a], located in the centre-west of Zone C (Area 2) have been identified abutting at an approximate 90-degree angle (Figures C18-C21). Although the shape formed by these anomalies may be indicative of an anthropogenic origin, the diffuse edges of the anomalies is more typical of anomalies of a natural origin instead.
- 9.2.2.3. **Extraction** – In the southwest quadrant of Area 22, extending into the north of Area 9 and northern half of Area 3, concentrations of strongly dipolar anomalies were detected [22a] (Figures C23 & C24). Within Area 22 these anomalies correspond

with the location of gravel pits identified on 2nd edition OS maps (Figure C13), the magnetic signal detected likely relates to imported material used to backfill the extraction pits. The anomalies within Area 3 and Area 9 share very similar magnetic signals to that of [22a] suggesting that the extraction extended further than previously recorded.

9.2.2.4. **Magnetic Disturbance** – A series of discrete negative anomalies [8b] following a northwest to southeast alignment have been identified in Area 8, in the centre-south of Zone C (Figures C14-C17). The alignment extends for c. 200m and each anomaly measures between 2 and 3m in diameter. The magnetic signal of these anomalies is [REDACTED] with an extant electric fence present at the [REDACTED]

9.2.2.5. **Undetermined** – A discrete negative anomaly [20a] has been identified in [REDACTED] (Figures C6-C8). This shows a dipolar magnetic signature [REDACTED] in proximity to broad anomalies natural in origin, [20a] may relate to natural processes as well; however, [REDACTED]ed out.

10. Reporting Zone D

10.1. Geographic Background

10.1.1. Zone D is located c. 1.3km southeast of Worlington (Figure D1) and covers an area of 113.11ha. Survey was undertaken across eight fields, seven of which were under arable cultivation and one was undifferentiated grassland. Zone D is bounded by Golf Links Road to the north, the A11 to the east, and further fields to the south and west (Figure D1). It was not possible to survey c. 0.37ha in Area 4 due to crop cover; c. 0.61 ha in Area 6, as it was being used as an environmental set a side area and contained various ferrous obstacles, and c. 0.41 hectares in Area 7 due to large tractor ruts and multiple mounds of manure.

10.1.2. Survey considered

Survey Area	Ground Conditions	
1	Arable field with maize stubble down towards the southwest.	Bounded on all sides by trees and hedgerow.
2		by trees g the ar beet e field, le.
3		trees.
	down towards the southwest. The north of the area was covered by waist high scrub. The northernmost area was covered in large piles of manure that made sections unsurveyable. A thin strip of non-harvested maize was located along the western boundary of the field, and was also unsurveyable.	The area was bound to the south by wooden fencing which separated the area from Newmarket Road. An extant barrow was located along the eastern boundary. Power lines ran across the area running from the south to the north parallel to the west boundary, and then turning to the east across the centre of the area to the eastern boundary.
4	Two, flat, ploughed fields with potato and maize stubble rests on surface, a few unharvested standing lines of maize were still present in the eastern and north-western edges boundaries and prevented survey. The field was raised along the southeast boundary of the area and sloped down towards the west, centre and north of the field. A concrete track ran north to south along the extent of the area, dividing the larger rectangular field in the east of	Bounded to the north by Golf Link Road, separated by hedgerow. On the west boundary of the field a small area was fenced off by metal fencing. Three boreholes were present near the centre of the field, aligned east-west. The extension of the field to the east was bounded to the south by a metal fence.

	the survey area from the small square field to the west.	
5	Flat, undifferentiated grassland. Close to the perimeter of the north and south edges were deep tractor ruts, which prevented survey in some places.	Bounded on all sides by hedgerow and trees. The western edge borders Newmarket Road.
6	Flat, arable field consisting of young crop.	Bounded to the east by a farm track, and on all other sides by trees and hedgerow. A strip of unharvested maize crop and environmental set-back southern boundary prevented
7	Flat, arable plot south-eastern was unsurveyed due to tractor ruts and multiple	Bounded to the east by hedgerow and trees.
8		Bounded to the east by hedgerow and trees. The western edge borders Newmarket Road and the A11.

10.1.3. The underlying geology comprises chalk of the Holywell Nodular formation (undifferentiated) over the majority of Zone D; however, Area 1 as well as the eastern part of Areas 5 and 7 comprises chalk of the Zig Zag Formation. A narrow band of Melbourn rock member chalk separates the Zig Zag and Holywell formations. No superficial geology is recorded in the majority of Zone D (Areas 4, 7 and 8), with superficial deposits along the edges of the survey area. Superficial deposits of sands and gravels have been identified in the southeast of Zone D in Area 3. Along the north of Zone D in the northern edges of Areas 5 and 6 comprise river terrace deposits: sand and gravel. On the western boundary of Zone D along the southwest corner of Areas 1 and western edge of Area 2 are superficial deposits of clay, silt, sand and gravel (British Geological Survey, 2019).

10.1.4. The soils consist of freely draining lime-rich loamy soils across the majority of Zone D, with freely draining slightly sandy soils in Area 1. (Soilscapes, 2019).

10.2. Results

10.2.1. Summary

10.2.1.1. Reporting Zone D is located immediately west of the A11 and south of the Royal Worlington and Newmarket Golf Club, which is at the south-eastern end of the village of Worlington. Reporting Zone D has a variable magnetic background resulting from natural and anthropogenic processes. Within the most south eastern portion of the survey area within Zone D, a good example of the patterns resulting from water flow in the subsurface been identified (Figures D2 & D6), as outlined in section 6.2.5 above. Freely draining soils have allowed for the percolation [REDACTED] interface, producing further variations in [REDACTED] and further associated patterning.

10.2.1.2. Several mod [REDACTED] this zone; the most obvious of which is evid [REDACTED] of the site and produces a broad magnetic ha [REDACTED] ntations contribute to a noisier background localised to the southwestern part of the zone (Figure D5).

[REDACTED] present [REDACTED]. While [REDACTED] steeply [REDACTED] and the [REDACTED] west of [REDACTED] the recorded Bowl Barrow two further ring ditch anomalies have been detected measuring c. 25m and c. 28m in diameter respectively ([8a] and [8b], Figure D8). These ring ditches may be part of a wider cluster of the bowl barrow monuments, as the scheduled monument listing suggests that the recorded barrow was the only visible survivor of a cluster of four barrows.

10.2.1.4. Two long linear anomalies were detected on a northeast-southwest orientation in Area 1 ([1a] and [1b], Figure D4). As no corresponding feature has been recorded on historic maps, they have been interpreted as having a possible archaeological origin.

10.2.1.5. Two partial inner and outer rings, with a further central anomaly with a strong signature, were identified in Area 7 ([7a], Figure D4). This set of anomalies, which appears to extend beyond the southern boundary of the field, is suggestive of a further ring ditch, possibly with a central feature and an inner ditch.

10.2.2. Interpretation of Magnetic Results – Specific Anomalies

10.2.2.1. **Possible Archaeology (Ditch Surrounding Bronze Age Round Barrow)** - A strong semi-circular anomaly [3a] measuring c. 22m across, was identified towards the south of Area 3 (Figure D12). The anomaly curves around the southern extent of the scheduled monument 'Bowl Barrow on Chalk Hill' (SM 1018097), with the anomaly appearing to continue into the scheduled area. While the monument itself could not be surveyed due to vegetation and the steeply sloping sides, the area immediately surrounding it could be, and the resulting anomaly has been interpreted as a possible ditch associated with the barrow.

10.2.2.2. **Probable Archaeology (Ring Ditches)** – Located towards the northwest and northeast of Area 8 are two circular anomalies with a strong positive magnetic signal characteristic of ring ditches [**8a** and **8b**] (Figure D16). In the northwest of Area 8, [**8a**] has been identified close to the location of a ring ditch of unknown date identified by aerial photos in 1956 date listed on the Suffolk HER (MSF10199); [**8a**] has a diameter of approximately 30m. Both the HER listing and the detected ring ditch have diameters of c. 30m. The HER location is offset by 24m from the detected anomaly but given the date (and thus the implied accuracy) of the HER observation this anomaly almost certainly relates to the same feature. In the northeast corner of Area 8, [**8b**] has a similar diameter, c. 30m, though there is no accompanying HER listing. Two ring ditches identified in the geophysical survey are also associated with bowl barrow monuments, connected by a ditch. One of these is 'Barrow on Chalk Hill' (SM1018097) located in Area 8. The scheduling entry of this monument states that it is 'the most visible survivor of a cluster of four barrows. A further three discrete anomalies [**3b**], located immediately north

[redacted] ss was [redacted] anomaly is [redacted] reference, [redacted] located [redacted] within the ring are two other weak curvilinear anomalies, which appear to be slightly offset from the centre of the ring. The anomalies may be part of another ring ditch; however, the discontinuous nature of the anomalies may suggest another form of monument.

10.2.2.4. **Possible Archaeology** – A linear anomaly with a strong magnetic signal identified running in a northeast-southwest alignment across the southern part of Area 1 [**1a**] (Figure D24). The anomaly appears to be a ditch measuring c. 220m in length. A second linear anomaly with similar characteristics [**1b**] is located immediately to the north with a slightly different orientation and a weaker magnetic signal. [**1b**] is approximately 300m in length. [**1a**] and [**1b**] are along the contours of the slope, rather than up and down it, and are therefore unlikely to be the result of field drains, nor are they aligned with any extant or historically recorded field systems. They have therefore been classified as possible archaeology. A similar but weaker curvilinear anomaly was identified in Area 4 [**4a**] (Figure D32). In Area 1, however, further weak linear anomalies were identified but as these may instead relate to agricultural activity they have been categorised as undetermined anomalies.

10.2.2.5. **Ridge and Furrow** – Several groups of long narrow parallel linear and curvilinear anomalies were identified in the southern half of the survey area in Areas 2, and 8, and across the centre of Area 1 (Figures D4 & D8). These have a spacing of approximately 8 to 10 metres and are therefore consistent with medieval or post-medieval ridge and furrow ploughing regimes.

10.2.2.6. **Agriculture (Strong/Weak)** – A conglomeration of strong magnetic responses lie within an oval shape located in the northwest section of Area 2 [2a] (Figure D28); the oval shape measures 50m in its north-west alignment and 37m west-east. It aligns with a former small unfenced area of deciduous wood and marshland shown on the 2nd edition OS map (Figure D5); these anomalies are therefore likely to be related to ground disturbance and in-filling related to tree removal. A strong curvilinear anomaly is recorded immediately to the south of the oval spread and appears to follow the southern boundary of the wood (as marked on the OS map). The anomaly may represent a former ditched boundary to the wood.

10.2.2.7. **Extraction** – [REDACTED] (and 30m diameter), amorphous discrete positive magnetic anomalies running in line along the north-eastern boundary of Area 2. Similar anomalies are present c. 300m to the north of the boundary, and c. 250m to the south (Figure D9). Figure D9 clearly shows localised chalk extraction around this part of the survey area (Figure D9). A main chalk pit is [REDACTED]

[REDACTED] tip of [REDACTED] radically possible [REDACTED] [REDACTED] have response [REDACTED]

in the centre (as an example, see Figures D8-D10). This type of magnetic signal, with dipolar characteristics, usually suggests a ferrous origin. However, the signal is a-typical, being inverted when compared to a characteristic ferrous anomaly. Another possible origin of dipolar signals is an anomaly comprising burnt or fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been categorised as “Undetermined” because they could represent anthropogenic activity. In addition, weakly positive linear anomalies have been detected (Figures D4, D8) which have also been classified as “Undetermined”. These linear anomalies may relate to natural or agricultural processes; however, an archaeological origin cannot be entirely ruled out.

11. Reporting Zone E

11.1. Geographic Background

11.1.1. Zone E is bisected by the A11 and is located c. 1.3km west of Kennett (Figure E1) and covers an area of 135.59ha. Survey was undertaken across eight fields under arable cultivation. Zone E is bounded by the B1085 to the north, fields to the east, the A14 to the south and La Hogue Road to the west; the A11 bisects the Zone on a north to south alignment (Figure E1).

11.2. Survey considerations:

Survey Area	Ground	Boundaries
1	Arable crop, the north	[REDACTED] a ditch to the north, woodland to the east and the field to the south. The area was separated from the A11 by a hedgerow to the west which separated the area from the A11.
2	[REDACTED]	[REDACTED] with by trees. [REDACTED] the [REDACTED] st was
3	[REDACTED]	[REDACTED] and west
	ploughed in the east, and potato ridges in the west. Slopes were present down to the southeast in the south and east, and down to the northeast in the northeast of the field. An unsurveyable set-aside area was present in the south.	by trees, and to the northwest and west by a track and further arable fields, and a piece of farming equipment was present in the field in the north. Bird feeders were present along the northern boundary, and a wooden structure present in the southeast corner.
4	Arable field, under a young OSR crop. A gentle slope up to the northeast is present in the southwest corner of the survey area. Set aside crops were present on the eastern and south-eastern boundaries.	Bounded to the north, east, south and west by trees and hedgerow, with the field continuing beyond the survey area to the southwest. A metal gate was present on the northern boundary, with bird pens, feeders and The field was crossed northwest to southeast by an overhead power line in the north-eastern corner. A mobile phone mast sat just outside the survey area in the north-western corner. A farm track ran along the northern boundary.
5	Flat, arable field under OSR crop. A small section of abandoned crop ran along the central eastern boundary.	Bounded to the north by trees and hedgerow and to the east and the north by trees. The area was separated from La Hogue Road on the western and southern boundaries by these hedgerows.

6	Arable field under turnip crop that sloped gently down to the southwest.	Bounded to the north by trees and hedgerow, separating the area from Dane Hill Road. Bounded by a ditch to the southwest. The field continued beyond the survey area to the east and south. Power lines ran across the area in both an east-west and north-south orientation.
7	Flat, arable field under young OSR crop that sloped gently down to the south.	Bounded by hedgerow to the south and west which separated the area from Norwich Road and the A14 respectively. Bounded by woodland to the north and [REDACTED] by temporary electric [REDACTED] east.
8	Flat, arable field under young sugar beet crop that sloped gently down to the south.	[REDACTED] trees to the north and south, [REDACTED] by temporary electric fencing to the west [REDACTED] field continuing to the east [REDACTED] survey area.

11.2. [REDACTED] of the [REDACTED] biological [REDACTED] terrace [REDACTED] sloping to [REDACTED] westoft

11.2.2. The soils consist of freely draining, slightly acid sandy soils in the north of the zone (Areas 2, 4 and 6) and freely draining, slightly acid but base-rich soils throughout the rest of the areas (Soilscapes, 2019).

11.3. Results

11.3.1. Summary

11.3.1.1. Reporting Zone E is bisected by the A11 and is located c. 1.3km east of Chippenham and c. 910m west of Kennet. In the northwest corner of Zone E, evidence of archaeological activity has been identified. Although this area is adjacent to an area of fenland (similar to Zone C) and would thus presumably have been wet, or prone to flooding in the past, evidence of possible settlement activity has been identified in the form of a concentration of small enclosures with other associated anomalies. These are located uphill from the former marshy landscape. Further east within the same field, linear ditch-like features have been detected which respect local topography towards the fenland. Features like this are suggestive of attempts to manage seasonal flooding/ wetting, using long drainage ditches, to divert water away from the smaller enclosures, or to separate grazing in the marshes from other agricultural activity (Figure E5).

11.3.1.2. Crossing the northern end of the zone east to west, broad bands of strongly enhanced natural deposits have been identified (Figures E2, E4), as well as in the southern-most area (Figures E10, E12). With limited topographic variation throughout this zone it is likely these anomalies are caused by fine grained

sediments preferentially deposited within imperfections or dissolution features in the surface of the shallow bedrock, as described in section 6.2.5 above. Compared to other parts of the zone, there is a higher density of Neolithic finds in these fields (CHER10230, CHER10229, CHER10261, CHER07919, CHER10228), which also suggests an erosive environment exposing material for detection at the surface.

- 11.3.1.3. Similar to the long linear anomaly identified in Zone C ([4a, 6a, 12a, 1a, 8a], Figures C3, C7), a further positive linear anomaly has been identified in the western half of Zone E (Figure E4). This anomaly runs 218m in a northeast to southwest alignment before turning north and extending a further 216m. Again, this survey has not defined the [REDACTED] to extend beyond the survey extent. In the [REDACTED] alignment is present c. 260m southwest in [REDACTED] (Figure F16). Establishing a clear connection between the [REDACTED] due to the un-surveyed field between the [REDACTED] matches suggests a correlation. Historic maps show no corresponding features for either of the anomalies, so these

[REDACTED] appears to [REDACTED]. These [REDACTED] boundary [REDACTED] to its [REDACTED] 3m was

identified inside or potentially abutting the ditch of the outer enclosure. Within this area, multiple fragmentary linear and curvilinear anomalies are visible, along with discrete positive anomalies which may be pits. The strongly contrasting magnetic background here means that it is difficult to suggest a date for this settlement area, as the anomalies of archaeological interest cannot be clearly distinguished.

- 11.3.1.5. In the eastern and southern areas, two former extraction pits were identified, along with the infill material from a former pond. The detected anomalies correspond to locations identified on 2nd edition OS mapping (Figures E9 & E13).
- 11.3.1.6. Trends relating to modern ploughing have been detected across the zone, with further agricultural activity in the form of drainage features detected in one of the eastern areas (Figure E8).
- 11.3.1.7. In addition to the anomalies of possible archaeological origin, Zone E contains two sections of buried service, which produce broad magnetic halos that obscure any weaker underlying signals. A smaller service was also detected in the north-western edge of the zone. In the southern area of Zone E, a notable wide band of magnetic material was detected running through the centre of the area, oriented north-south (Figure E12). This is most likely related to the spreading of modern green waste material across this section of the field, which suggests at one time this large southern field was further subdivided. Around the edges of a number of

the fields, weak and closely spaced linear trends follow the route of the current boundary; these are indicative of repeated tractor movements.

11.3.2. Interpretation of Magnetic Results – Specific Anomalies

11.3.2.1. **Archaeology Probable (Strong/Weak)** – In the northwest of Area 2, a group of magnetically enhanced linear anomalies covering an area of approximately 1.7ha [2a] have been identified that appear to define a large rectilinear enclosure (Figure E16). This outer enclosure measures c. 150m x 100m, abutting the western perimeter of the survey area, and may well extend beyond it. The southwestern boundary appears to have a second parallel ditch. A group of anomalies sharing similar characteristics is located southwest of this [2a] in Zone F (see section 9.2.2.1). Further anomalies interpreted as ditches and other features have been detected. Interpretation of the internal features is complicated by the geological formations detected which are of a similar or stronger enhancement thus masking the archaeology. The most distinct feature within the larger group of anomalies (Figure E16), this enclosure, is a smaller rectangular feature. Due to their archaeological provenance less certain, hence the “Archaeology Possible” classification.

11.3.2.3. **Archaeology Probable/ Possible (Weak)** – In the eastern end of Area 2, two 200m-long linear anomalies [2c] have been identified (Figure E20). They propagate from the northern and southern boundaries to almost meet in the centre of the field. The linear ditch-type anomalies have been categorised as “Archaeology Probable” because they have not been identified on historic maps and do not respect modern or historic boundaries. It is possible that these anomalies reflect a larger system of landscape management which is not evident by examining Zone E in isolation; Zone C and Zone F contains similar large-scale ditch-like anomalies (see sections 9.2.2.1 and 12.2.2.7 respectively), one of which, in Zone F, is located only c. 260m southwest of the southernmost extent of [2c] and follows a similar alignment. In Area 7, anomalies have been identified on a similar scale to [2c], however these anomalies, [7a], have much weaker magnetic signals and have been classified as “Archaeology Possible” due to the complications posed by the underlying geology (Figure 32). Those in Area 7 extend c. 400m and c. 150m, forming a ‘T’ shape indicative of land division features.

11.3.2.4. **Archaeology Possible (Strong/Weak)** – In the north of Area 6, weak linear and curvilinear anomalies have been identified [6a] (Figure E24). What has been detected does not have a diagnostic shape because proximity to the field boundary and the fragmentary nature of the anomalies has limited interpretation. As such,

these may relate to enclosures of an archaeologically significant date, or they may have more recent agricultural origins.

11.3.2.5. **Ferrous/Debris (Spread)** – In the northern end of Area 1, a concentration of strongly dipolar anomalies was detected at the location of a former pond [1a], identified on 2nd edition OS maps (Figure E9). The dipolar anomalies indicate that the former pond has been backfilled with a mixed material with either a high ferrous content or perhaps using ceramic building materials.

11.3.2.6. **Extraction** – Along the western boundary of Area 1, the west of Area 2 and in the west of Area 7, two further concentrations of strongly dipolar anomalies were detected [1b]. These anomalies correspond with the location of pits on the 2nd edition OS maps, with 7b labelled as a pit. These anomalies are very similar in magnetic signature to those detected at the extraction pits and the backfilled material.

[REDACTED] have been observed in the response in the magnetic signal, the signal anomaly. [REDACTED] for fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been categorised as “Undetermined” because they could represent anthropogenic activity. In addition, weakly positive linear anomalies have been detected (Figures E8, E12) which have also been classified as “Undetermined”. These linear anomalies may relate to natural or agricultural processes; however, an archaeological origin cannot be entirely ruled out.

12. Reporting Zone F

12.1. Geographic Background

12.1.1. Zone F is located c. 0.5km east of Snailwell (Figure F1) and covers an area of 304.1ha. Survey was undertaken across seventeen fields, eight of which were under arable cultivation, with a further three left fallow. Six were pasture or undifferentiated grassland at the time of survey. Zone F is bounded by further fields to the north, La Hogue Road to the east, the A11 and A14 to the south and by a farm track to the west (Figure F1).

12.1.2. Survey considerations:

Survey Area	Ground Conditions	Notes
1	Flat, arable field with cereal crop.	[REDACTED] sides by trees and hedgerow, [REDACTED] breaks for access to other [REDACTED] Overhead electrical lines and [REDACTED] poles ran across the area in a northeast-southwest orientation. A bird scarer [REDACTED] end
2	[REDACTED]	[REDACTED] west by [REDACTED] southwest [REDACTED] es and [REDACTED] area in
3	Arable field under short cereal stubble that sloped gently down to the southwest at the southern end of the area, and gently down to the northeast in the northeast of the area.	Bounded by trees and hedgerow to the north, northeast, southeast and southwest. A change in crop from stubble to plough demarked a field boundary to the south.
4	Flat, arable field with young wheat crop.	Bounded by hedgerow to the north and west, with a farm track forming the eastern boundary. A bird scarer was located in the field close to the north-western boundary.
5	Pasture grassland. A small ridge ran across the centre of the field in a northwest to southeast orientation.	Bounded by metal fencing on all sides.
6	Flat, arable field consisting of fallow stubble.	Bounded on all sides by hedgerow. A track ran along the south-eastern boundary of the area. Powerlines ran inside the hedgerow on the south-eastern boundary. The area was separated from La Hogue Road to the northeast by the hedgerow-lined boundary.
7	Flat, pasture grassland.	Bounded by metal fencing on all sides.
8	Flat, pasture grassland. A slight ridge ran across the field in a northwest-southeast orientation.	Bounded by metal fencing on all sides. A metal trailer and two feeding troughs were located in the north-western end of the field.

9	Pasture grassland with a slight slope down to south corner.	Bounded by metal fencing on all sides. Four large metal feeders were located in the western corner.
10	Flat, pasture grassland.	Bounded by a farm track to the southwest and hedgerow/trees on all other boundaries.
11	Arable field consisting of low, newly seeded cereal crop. The field gently sloped down towards the south. A small square in the southwest corner was unsurveyable due to crop.	Bounded by a hedgerow to the northeast and trees to the west. The area was separated from the A11 by wooden fencing along the southern boundary. A metallic bird scarer was situated along the western boundary. A small weather vane was located along the south boundary.
12	Flat, pasture grassland to the northeast and grazing sheep to the south, a fence line to the west, and a farm track to the area. Two small buildings with large wood stacks overgrown grass and weeds	were located towards the northeast corner of
13	Arable field of harvested potato crop in the northwest and southeast of the field with the central area recently sown. The southwest corner of the field was ploughed northwest to southeast in contrast to the rest of the field. Areas in the centre of the field were unsurveyable due to deep ruts and boggy conditions.	Bounded to the northeast by a track and treeline, to the southeast by a farm track and hedgerow/trees, to the southwest by a hedgerow, a copse and a further field and the northwest by hedgerow/ trees.
14	Arable field that had been freshly sown.	Bounded by hedgerow to the east, hedgerow and fencing to the north, trees and a ditch to the west, and a copse of trees to the south. A short grass track ran along the southern and western boundary, with patches of longer grass along the western track.
15	Arable field of harvested potato crop. The entrance into the field on the western end of the field was unsurveyable due to deep ruts holding water. The north end was unsurveyable for the	Bounded on all sides by hedgerow. The field was crossed on the eastern edge by a telephone line running roughly north to south.

	same reason. Multiple areas of the field were deemed unsurveyable due to deep ruts holding water including a large area towards the southern end of the field.	
18	Flat, arable field under young crop.	The field continued to the northwest where a change in ground cover demarked a field boundary. The remainder of the area was bounded by hedgerow and trees.

12.1.3. The underlying geology within Zone F is complex, with the Nodular Chalk Formation and New Pit Chalk Formation. The geology is complex, with the Nodular Chalk Formation and New Pit Chalk Formation identified in the north and south of the zone. The geology is complex, with the Nodular Chalk Formation and New Pit Chalk Formation identified in the north and south of the zone. The geology is complex, with the Nodular Chalk Formation and New Pit Chalk Formation identified in the north and south of the zone.

12.1.4. The underlying geology within Zone F is complex, with the Nodular Chalk Formation and New Pit Chalk Formation. The geology is complex, with the Nodular Chalk Formation and New Pit Chalk Formation identified in the north and south of the zone. The geology is complex, with the Nodular Chalk Formation and New Pit Chalk Formation identified in the north and south of the zone.

12.2. Results

12.2.1. Summary

12.2.1.1. Reporting Zone F comprises land immediately north of the A11 and A14, and to the east of Snailwell. The results within this zone are relatively complex, due to the presence of anthropogenic activity and various different geologies related to geomorphological processes, which have had impacts on each other. In historic maps of the area, the exploitation of the natural environment is evident from the record of plantations, farms and extraction pits within the immediate vicinity. The former RAF Snailwell was located, in part, in the southern extent of the zone. Concentrated areas of ferrous and debris spread correspond with features associated with RAF Snailwell and demolished farms recorded on historic OS maps. The scheduled Chippenham Barrow Cemetery (MCB8995) extends into the northeast part of the zone as well (Figure F1), with 4 scheduled areas associated with four round barrows within Area 13.

12.2.1.2. Where there is background superficial geology within Zone F, it is comprised predominantly of sand and gravel river terrace deposits, which results in the banded 'Natural- General' anomalies as described in section 6.2.5. In areas without superficial deposits, and particularly towards the southern part of the zone, widespread linear patterns (Figure F6) relate to the local landforms and result from the processes associated with 'Natural – Infill' and 'Natural – Dissolution' patterns described in 6.2.5. Drainage and waterlogging of flatter, low laying areas may have influenced the location of settlement within this zone, with areas of archaeology

apparently preferentially occurring on higher-lying river terrace deposits of sand and gravel, suggesting the freely draining nature of these deposits produced a favourable environment.

12.2.1.3. A series of ditches, large rectangular enclosures, and small rectilinear enclosures were detected abutting the field edge immediately south of Foxburrow Plantation and covering an area of approximately 2.5ha (Figure F5). These features occur in the location of undated enclosures recorded in the HER database interpreted from cropmarks (CHER09027).

12.2.1.4. Some of the northwest-southeast aligned ditches appear to extend through the copse between [redacted] (during the life of RAF Snailwell) into the field to [redacted] (source not found.F4), where further multiple [redacted] identified. This takes the form of a series of [redacted] overlapping features, arranged in two rows either side of [redacted] these enclosures, with associated pits and larger components of a field system cover at least 5ha. A curving band of [redacted] the same [redacted] impact [redacted]

[redacted] in the [redacted] former [redacted] avenue leading to the pleasure grounds associated with Chippennam Hall (Figure F9). These appear to form or are incorporated within a larger wider field system, which continues into the southern part of Zone F (Figure F8) where a drove or trackway is evident.

12.2.1.6. In the northern-most corner of the zone, a further, smaller series of enclosures was detected (Figure F16). These are situated next to an area of background patterning similar to those identified in the southwest end of the zone discussed above (Figure F8). The similarities in size and form suggests another instance of later Prehistoric settlement activity, covering approximately 1ha.

12.2.1.7. The character of the natural background changes moving into the south and south-eastern parts of Zone F where topography has influenced the deposition and transportation of sediment (**Error! Reference source not found.**figure F6). A series of parallel, regularly spaced linear anomalies occur on a similar direction to the flow-based background patterning but are indicative of historic agricultural activity, possibly strip fields or widely spaced ridge and furrow. These occur on a different alignment to a potential irregularly shaped enclosure, which is defined by very narrow ditches within the complex geological formations. At the eastern end of this topographically dependant flow-based patterning is a single isolated ring ditch, c. 19m in diameter (Figures F12 & F52). Due to its isolated nature, a funerary origin, as opposed to a domestic one, is suggested. This possible barrow is located 654m to the southwest of a larger barrow, c. 28m in diameter, which is part of the Chippennam barrow cemetery (DCB237) in the north-eastern part of Zone F

(Figures F12 & F56). In the neighbouring field immediately to the northwest, a second isolated ring ditch (c. 13m in diameter) was identified as being another possible barrow situated c. 879m west of the aforementioned larger barrow within the barrow cemetery (Figures F12 & F44).

12.2.1.8. One of the known barrows associated with the scheduled Chippenham barrow cemetery site was detected as a clear circular anomaly with wider ditches than other ring ditches detected elsewhere in the zone (Figures F1, F55 & F56). No further similar anomalies can be correlated with the relative location of the other scheduled barrows. The circular formations to the northwest of the clearly defined barrow are [REDACTED] transportation and deposition of magnetically [REDACTED]. Further positive anomalies to the north of [REDACTED], forming possible enclosures abutting a track [REDACTED].

12.2.1.9. Two further [REDACTED] approximately 860m to the northwest of the Chippenham barrow cemetery in the northern end of Zone F, on [REDACTED].

[REDACTED] (6). The [REDACTED] which is a [REDACTED] suggests [REDACTED] c. 37m [REDACTED] which [REDACTED] occurs

on a similar alignment to a curvilinear ditch immediately south. This ditch extends northwest to southeast through the centre of the northern part of Zone F, where it appears to link up to two parallel ditches indicative of a trackway within a field system (Figures F16 & F36). The relative phasing of these features is uncertain, particularly for the enclosed c. 37m diameter circular anomaly, which also has closely associated discrete positive anomalies interpreted as probable pits.

12.2.1.10. The wider landscape also includes further long linear anomalies, only a few of which can be associated with mapped former boundaries. To the north of the former RAF Snailwell, a long negative anomaly was detected that extends on a northwest-southeast alignment (Figure F3). This corresponds with the location and orientation of a broad cropmark identified as medieval furlong boundaries (CHER10286).

12.2.1.11. An isolated ditch on a northwest to southeast alignment was detected in the zone to the west, but is hard to discern from the surrounding fluvial geology (Figure 16). It is possible other similar but less extensive features have been detected but due to their similarity to the rill-based anomalies, they might not have been identified in the interpretation. This, and other similar anomalies have been interpreted as large scale land divisions of an uncertain date.

38m by 23 m. The enclosure is not indicative of any particular period therefore it is not possible to infer a date for it, though it relates to the furlong boundary in some way.

12.2.2.3. **Probable/Possible Archaeology (Settlement, Enclosures)** – Located in Area 3 but extending southward into the northeast corner of Area 18 (Figures F28 & F32), are a series of linear and rectilinear anomalies [**3a**, **3b**, **3c**, **3d**, **3e** & **18a**]. A central group of anomalies [**3a**] is aligned broadly northeast-southwest and forms a series of overlapping rectilinear enclosures that vary considerably in size (from c. 8m x 15m to c. 50m x 60m), suggesting multiple phases. Around and within these enclosures are a number of pits, though interpretation of these is complicated by the background patterning, as well as the presence of other anomalies that comprise [**3a**] show a degree of increase in magnetic strength compared to other nearby archaeological anomalies, likely due to the 'enhancement effect' (where long-term occupation causes stronger anthropogenic magnetic enhancement of nearby features).

[REDACTED] linear anomalies of different orientations. Overall, the anomalies are consistent with a period. The anomalies in the northeast corner of Area 3 are defined by a

number of linear ditch-like anomalies are several larger enclosures [**3c**, **3d**, **3e**] (Figures F28 & F32). [**3c**] lies near the western corner of Area 3, measures approximately 50m across, and extends northwest to the survey boundary (Figure F28). It is linked to [**3a**] by a pair of dog-legged linear ditch-like anomalies which run exactly parallel to each other, apparently defining a trackway. On the edge that abuts the trackway, the boundary ditch of [**3c**] forms an in-turned entrance. Two more linear ditch-like anomalies extend southwest from [**3c**] to the field boundary and likely continue beyond it. [**3d**] lies in the southern corner of Area 3 and is comprised of a group of intercutting positive linear ditch-like anomalies that form an enclosure complex that measures approximately 130m by 230m (Figure F28). This enclosure complex lacks visible archaeological anomalies across its centre where the magnetic response is dominated by variations within the superficial geology. [**3d**] encloses a number of magnetically enhanced discrete anomalies; these suggest pit-like features, though given the geological disturbance in this area, a natural origin for these cannot be ruled out. In the northeast corner of Area 3 and extending southeast into Area 18 is a final enclosure group [**3e**, **18a**] which is aligned northwest- southeast (Figure F32). Its south-western boundary appears to respect the alignment of the adjacent boundary of [**3b**].

12.2.2.5. **Possible Archaeology (Ring ditch)** An anomaly [**3f**] within the northernmost cell of [**3b**] is of a similar scale and magnetic strength to the underlying geological anomalies but shows a much greater degree of circularity, suggesting a potential

anthropogenic origin. Given the difficulty of differentiating it from the geological anomalies, it has been classified as 'possible archaeology' (Figure F32).

- 12.2.2.6. **Ferrous/Debris (Spread)** – Running along the northwest and northeast boundaries of Area 3 is a curvilinear band of concentrated small dipolar anomalies [3g] (Figure F32), typically produced by debris containing ferrous or other magnetic material. This band of ferrous debris corresponds with a mapped section of the former airfield of RAF Snailwell and is further confirmed by its clear alignment with aerial photographs of the airfield extent from 1945 (Google Earth 2020). It is likely caused by the remnants of a removed road / taxiway.

South (Figures F38 – F53)

- 12.2.2.7. **Probable/Possible Archaeology** – Across the majority of Zone F (aside from [11b]) a complex of land divisions has been identified. Linear anomalies, interpreted as boundary ditches, have been classified as archaeology where corresponding boundaries have not been identified on historic maps. These anomalies are of varying length and orientation, with some being linear and others curvilinear. The land divisions immediately to the north [11b] (Figure F40), which continue into Area 14 to the northeast [14a] (Figure F44) as well as Area 18 to the west. In the southern part of Area 18, [14a] joins a second linear anomaly to form a trackway [18b] that extends to the survey boundary to the southwest (Figure F48). Together, the multiple orientations, the differences in morphology and the varying anomaly strengths suggest a multi-period palimpsest of land divisions and organisational schemes, pointing to long-term agricultural management of the landscape.

- 12.2.2.8. **Probable Archaeology (Ring Ditch)** – In the southern part of Area 12 there is a positive circular ditch-like anomaly [12a] (Figure F52) similar in size and shape to those recorded elsewhere in the survey (see section 12.2.2.8) and to those recorded as part of the Chippenham Barrow Cemetery c. 250m to the northeast. In the southern part of Area 14 is a smaller ring ditch [14b] (Figure F44). Unlike other examples in Zone F, [14b] presents as a discontinuous anomaly, possibly suggesting a segmented construction.

- 12.2.2.9. **Undetermined (Strong)** - Located mainly in the northeast of Zone F, with only a few in the south, several discrete anomalies have been identified that return a positive magnetic signal, but with a negative response in the centre. This type of magnetic signal, with dipolar characteristics, usually suggests a ferrous origin. However, the signal is atypical, being inverted when compared to a characteristic ferrous anomaly. Another possible origin of dipolar signals is an anomaly comprising burnt or fired material. Due to the unusual response of these anomalies, and the fact that they do appear to cluster to a degree, they have been

categorised as undetermined (Figures 52, 56 & 60) because they could represent anthropogenic activity.

North-East (Figures F34-F37, F54 – F65)

12.2.2.10. **Probable Archaeology (Barrows and Rectilinear Enclosures)** – In the southern end of Area 13, a clear circular anomaly has been identified [**13a**], measuring c. 26m in diameter, and with broader ditches than others identified within Zone F (Figure F56). Unlike the sub-circular geological anomalies in this area, [**13a**] forms a complete ring, and has a consistent width and magnetic strength. The anomaly correlates with the location of one of the barrows associated with the scheduled Chippenham barrow enclosure. To the east of Area 1, two circular ditches [**1a** & **1b**] (Figure F60). These are similar in size to [**13a**] and the Chippenham barrows (located c. 800m to the east). [**1a**] has an apparent entrance, which would suggest this is a ditch. The second circular anomaly [**1b**] is enclosed within a rectilinear enclosure [**1c**] which also contains discrete

[redacted]

enclosure [**1f**] has been identified immediately west of [**1a**], [**1b**] and [**1c**]. It exhibits a very faint positive magnetic signal, mostly visible in the Total Field data (Figures F14, F16, F 58, F60). It measures c. 91m by 40m and appears to have a possible entrance on each of the short sides. The form of this enclosure is not indicative of a particular period; nevertheless, the overlapping of [**1f**] and [**1c**] suggests these are not contemporary.

12.2.2.11. **Probable Archaeology (Linear Features and Trackway)** – In the northern half of Area 1 are a series of weak positive linear anomalies [**1d**] that suggest partial rectilinear ditched enclosures (Figure F36). These are somewhat scattered and comparatively weak, and it is therefore difficult to determine whether they are the result of smaller settlement enclosures that have only been partially preserved or detected, or form part of larger land divisions. Some of these linear features [**1e**] run parallel to each other in a southwest to northeast direction towards the settlement enclosures in Area 15 (see 12.2.2.12); these may form part of a trackway associated with the settlement.

12.2.2.12. **Probable/Possible Archaeology (Enclosures)** – At the northern end of Area 15, a further series of rectilinear enclosures [**15b**] and a smaller circular anomaly [**15c**] were detected (Figure F64). The magnetically enhanced ditch-type anomalies are similar to those identified c. 1.8km to the southwest in Area 3 (Figure F32). A small ring ditch measuring c. 9m in diameter [**15c**] is also similar in size to those identified in Area 7 ([**7a**], see section 12.2.2.1, Figure F20) c. 1.8km to the southwest, as well as being located in close proximity to small rectilinear enclosures. This also

suggests a possible domestic origin for these features, with characteristics typical of late prehistoric settlement activity. A number of enhanced discrete, positive anomalies interpreted as pits are present in close association with these enclosures [15d] (Figure F64). As is the case elsewhere within the Zone, interpretation of these is complicated by nearby geological and pedological formations (Figure F62). One band [15d] of these discrete anomalies extends northwards towards the survey boundary; these are particularly enhanced and could represent archaeological pits, geological dissolution hollows containing magnetically enhanced material from the nearby settlement, or chalk extraction pits of the sort recorded elsewhere within the Zone. Extending eastwards from one of the ditch-like anomalies that make up [15b] is a narrow linear feature [15e]. These are more clearly similar to the features recorded elsewhere in the Zone, showing the same alignment as some of the more prominent features, suggesting that the latter may have made use of the same alignment.

12.2.2.13. **Undetermined** - Anomalies [15j] and [15k] which exhibit a very strong positive magnetic signature. Due to their location within the Zone, they are likely to be related to the features recorded elsewhere. They are not clearly defined and their exact nature is uncertain.

13. Reporting Zone G

13.1. Geographic Background

13.1.1. Zone G is located c. 1.1km northwest of Snailwell from (NGR: TL 63909 68757) and covers an area of 60.5ha (Figure G1). Survey was undertaken across seven fields, five of which were pasture or undifferentiated grassland, and two were arable at the time of survey. Zone G is bounded by the River Snail to the west, Fordham Road to the south, farm tracks to the east and a small wooded area bordering further fields to the north (Figure G1). It was not possible to survey a c. 2.1ha area due to overgrown vegetation in Areas 5 and 6, waterlogging in Areas 1, 3 and 7, and to the presence of young trees in Areas 3 and 4.

13.1.2. Survey considerations

Survey Area	Ground Conditions	Boundaries and Features
1	Flat, pasture grassland.	Bounded by hedgerow and trees to the north, with a boggy ditch forming the western boundary. A tree and metal trough were noted.
2	[REDACTED]	[REDACTED]
3	Flat, undifferentiated grassland with occasional waterlogged ground.	Bounded by hedgerow and occasional ditches to the south, east and west. The area was bound by trees to the north. The hedgerow to the west separated the area from the River Snail. There was a machinery along the western boundary. There were several areas of waterlogged ground that were deemed unsurveyable.
4	Flat, undifferentiated grassland.	Bounded by a ditch to the southeast and south, trees to the west, with the field continuing to the north. An area of c. 1ha along the western boundary was not surveyed due to the presence of young trees.
5	Generally flat, pasture grassland. Several ridges were noted in the area likely natural gullies.	Bounded by wire fencing and trees to the east, west and north. The area was bounded by widely spaced trees to the south.
6	Undulating arable field, under a young wheat crop.	Bounded by hedgerow to the northeast and east, a farm track to the south and west, with the field continuing to the northwest.
7	Flat, arable ploughed field. The plough was occasionally cross cutting, making the survey surface especially bumpy.	Bounded by hedgerow and trees to the east and west, areas of high scrub to the north and south and the field continued to the northwest.

13.1.3. The underlying geology comprises chalk of the zig zag formation over the majority of Zone G; however, Area 7 to the east of the zone also comprises chalk of the Holywell nodular formation and new pit chalk formation (undifferentiated). A narrow band of Melbourn rock member chalk separates the zig zag and Holywell formations. Superficial geology recorded in Areas 1, 2, 3, 5 and the south of 6 comprise alluvium: clay, silt, sand and gravel. In the northwest of Area 4, and the northern tip of Area 6 peat deposits are recorded. No superficial geology is recorded within Area 7 (British Geological Survey, 2019).

13.1.4. The soils consist shallow lime-rich soils over chalk or limestone over the majority of Zone G, with freely drained soils across Area G7. Fen peat soils are located in the north of Area G4, and the northern edges of Areas G6 and G3 (S

13.2. Results

13.2.1. Summary

[REDACTED] to the
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is no discernible change in the natural background in the magnetic results. However, the survey results have identified a greater density of drains in this part of the zone which suggests waterlogging of this area has been managed to allow for agricultural utilisation, which can be seen in the ridge and furrow and agricultural ploughing trends in this area.

13.2.1.2. A change in the bedrock layer is noted between the eastern and western portions of the survey area, producing a distinctive interface towards the eastern portion of this zone (Figure G2). Typically, the Holywell Nodular Chalk formation (present in the east) is subject to erosional/ depositional processes as a result of it being a relatively thin layer within a much larger chalk formation, making it more susceptible to various erosional/ dissolution processes, especially in areas of shallow overburden. Low lying areas of flat ground may be subject to percolation and stagnation of nutrient/ acid rich precipitates creating large scale dissolution formations such as 'dissolution sinkholes', as described in section 6.2.5 above (Figure G2).

13.2.1.3. On a very slight rise in the centre of Zone G, a complex area of multi-phase late prehistoric to roman period activity was identified, covering approximately 5ha. While numerous intersecting and overlapping features suggests many different phases of activity in this area, the groups of features roughly follow broad orientations: a sub east to west alignment in the centre of the zone and a north to south alignment in the eastern and southern parts of the zone (Figure G4). Given the fen characteristics of the zone immediately north of this complex, it is possible

that these features extend into the fen area, but, thanks to waterlogging inhibiting the magnetic enhancement of the sediments, the features may not have sufficient contrast for detection.

13.2.1.4. The east-west aligned activity towards the centre part of the Zone G is characterised by a concentrated core of settlement activity, which is defined by very strong discrete and linear anomalies, interpreted as pits and ditches. Weaker linear anomalies extending to the north, south, and east define an associated field system or less intensively used features (Figure G20). When considered together, smaller cellular rectilinear enclosures, track/droeways, clusters of strong discrete anomalies, and [REDACTED] together suggest a multi-phase prehistoric/medieval archaeological site. Archaeological evaluations of this area identified [REDACTED] Early Iron Age to Roman in date (MCB20063) [REDACTED] [REDACTED] have also been found in (CHER 07435, CHER [REDACTED] this location.

13.2.1.5. One of the most coherent enclosures in this group is defined by a D-shaped [REDACTED] (Figure G20). [REDACTED] suggests [REDACTED] the very [REDACTED] group is [REDACTED] Figure [REDACTED] less intensive habitation activity in this area.

13.2.1.6. The archaeological activity on the north-south alignment is situated more towards the eastern and southern parts of Zone G (Figures G16) and covers c. 1ha. There is no clear link between the multi-phase prehistoric settlement described above and this group of anomalies, and the size and scale of the enclosure features within this north-south group are slightly smaller. Running along the field edge, is a series of enhanced disjointed anomalies, which if considered holistically is evocative of a series of small enclosures. The morphology of the enclosures is suggestive of medieval croft and tofts, though the more difficult to interpret results make dating less clear. While this interpretation may be supported by the apparent continuation of these anomalies into the field to the west, due to the fragmented nature of these anomalies, it is hard to define specific components. These anomalies appear to be situated around a long ditch-like anomaly that extends into the north-eastern part of the zone. Two different trackways appear to lead into the location of this anomaly cluster. The wider trackway on an east to west orientation appears to be incorporated into one of the possible enclosures, which complicates the phasing of the surrounding features.

13.2.1.7. A service has been identified running approximately east to west across the south of Zone G (Figure G11). The strong overwhelming magnetic response will obscure any weaker underlying signals within the resulting halo.

13.2.2. Interpretation of Magnetic Results – Specific Anomalies

13.2.2.1. **Probable Archaeology (Trackway)** – Running along and through the northern and eastern boundaries of Area 7 on an approximately northeast-southwest orientation, a linear anomaly of both strong and weak positive magnetic signal has been identified [7a] (Figures G23, G24). This linear anomaly is indicative of a ditch lining a possible former track due to the length and continuous nature of the magnetic signal (Figure G7). The anomalies forming both sections of the track run along a similar route to an unfenced boundary, visible on the 2nd Edition OS Maps (Figure G5), suggesting this track has been in continuous usage with minor alterations along its length. The trackway sits on higher lying land to the north. The course of the trackway is particularly well defined in the north, where it bends to the east. To the east are a series of rectilinear enclosures (Figure G16) that likely represent occupation activity along the trackway.

13.2.2.2. **Probable Archaeology (Trackway)** – In its southern extent, along the eastern boundary of Area 7, a linear anomaly of both strong and weak positive magnetic signal has been identified [7a]. This trackway [7a] sits on a clear line of higher ground, with a break of slope immediately to the west of it. The trackway as a whole is interpreted as evidence of a long-lived droveway down to the wetter landscape to the south, perhaps for grazing in water meadows associated with the River Snail.

13.2.2.3. **Probable Archaeology (Enclosures)** – Immediately to the east of the track [7a] in Area 7, a series of linear and rectilinear anomalies have been identified [7b] (Figure G16). These appear to form a series of enclosures on a roughly north-south alignment but are very fragmentary, possibly due to the ploughing regimes that can be seen across Area 7. Due to the fragmentary nature of these features, it is hard to identify the exact extent of each enclosure, although they appear smaller than the enclosures further west in Area 6. These enclosures [7b] appear more sub-rectangular in the centre, but toward the north, south and east they become less well defined, with some pit-like anomalies present to the southeast of these enclosures. Further linear, ditch-like anomalies in the vicinity of these enclosures may be related but are too fragmentary to be confident of their origin, so have been classified as possible archaeology. The size and shape of the enclosures, along with their close association with a trackway, are similar to examples of medieval croft and tofts, although an earlier prehistoric origin cannot be ruled out due to the fragmentary appearance of the features and other potentially prehistoric activity identified in the field to the west.

13.2.2.4. **Probable Archaeology (Track)** – Running eastwards, perpendicular to [7a] is a set of three parallel positive linear anomalies [7d] (Figure G16), spaced between c. 2m

and c. 4m apart. The parallel and linear nature of these anomalies are characteristic of the flanking ditches of a trackway feature, which appears to be connected to the enclosures [7b]. The presence of three ditch-like linear anomalies, rather than two, suggests that the trackway may have originally been narrower, or has shifted location over time. Both of these possibilities indicate multiple phases of use.

13.2.2.5. **Probable Archaeology (Curvilinear Feature)** – Immediately to the east of [1a & 5a] is a strong, curvilinear, ditch-type anomaly [7c] (Figure G12). It appears to curve towards [1a & 5a], though the magnetic disturbance caused by an underground service crossing the survey area here has limited interpretation. This anomaly may be geological [REDACTED] of strong geological variations. However, the [REDACTED] in line with other geological variations in [REDACTED] Area 5 (with different background patterning) is [REDACTED] disturbance. To the immediate south of [7c], a ditch [REDACTED] has been recorded. It is characteristic of a pit-like feature and appears to lie within the area enclosed by [7c].

13.2.2.6. [REDACTED] Area 6, is a [REDACTED] phases of [REDACTED] features [REDACTED] roughly [REDACTED] s. The [REDACTED] towards the [REDACTED] limits of the detected archaeology (Figure 4).

13.2.2.7. **Probable Archaeology (Settlement, Enclosures)** – In the western part of Area 6 are several large enclosures [6b, 6c & 6d] (Figure G20). These enclosures have a similar shape, in particular [6b & 6c], which have a distinct 'D' shape. These measure between c. 45m to c. 80m in length and between c. 42m to c. 70m in width. The magnetic signal is stronger in the north of [6b] than in the anomalies surrounding it, indicating an intense level of usage and/ or possible prolonged period of habitation in this enclosure as opposed to the surrounding areas. While it is not possible to be certain that these enclosures [6b & 6c] are contemporary they do share a similar alignment. There appears to be multiple different phases of activity within this area however, as these sub-rectangular enclosures are intersected by several of the rectilinear enclosures surrounding them.

13.2.2.8. **Probable Archaeology (Rectilinear Enclosures)** – North, south and east of anomalies [6b, 6c & 6d] are a series of rectilinear enclosures running on a broadly east-west alignment [6e & 6f] (Figure G20). At [6e] regularly shaped rectangular enclosures overlap with the D-shaped [6c], suggesting complex multiphase settlement in the area. Of the rectilinear enclosures, those with the strongest magnetic signal are focused in the south, around the track [6a], indicating the probable foci of the settlement. Away from this trackway on the outer reaches of the settlement area [6f], enclosures continue to be detected with weaker magnetic signals, suggesting less intense usage in the east and north. Weak enclosures and linear features [3a], extend northwards into Area 3 (Figure G20) and southwards

into Area 5 (Figure G16). These northern enclosures have less evidence of internal activity and may be indicative of field systems and stock enclosures rather than a continuation of the settlement area. The abrupt end of the area of anomalies to the north suggests that activity continued into this area in some form, but that the wetter soils here have prohibited the formation of enhanced fills in the resulting features.

13.2.2.9. **Probable Archaeology (Sub-circular Enclosures)** – In the south of Area 6 three sub-circular anomalies with varying degrees of fragmentation have been identified, [6g] (Figure G20), measuring between c. 13m and 17m in diameter. The curved form of the anomalies is indicative of historic activity, potentially older than the recorded activity in the area (see Figure G).

13.2.2.10. **Archaeological Features** – The archaeological anomalies identified in Area 6 are associated with a change in the background magnetic pattern and are likely related to the occupation activity within the settlement features in the centre of the area. The

geology of the area is likely to be a combination of this geology and the habitation effect that is producing the altered magnetic background indicated by the 'archaeological zone' classification.

13.2.2.11. **Extraction** – In the southeast corner of Area 6, a broad anomaly showing as a distinctly different texture has been identified [6j] and interpreted as possible extraction (Figure G20). Due to this anomaly showing sharp edges and being located northeast of a band of alluvial material (see section 13.1.3, Figure G4), [6j] could indicate a sand pit or similar. No evidence for extraction is visible on the 2nd Edition OS Maps (Figure G5), but [6j] could potentially represent older, unmapped extraction activity.

13.2.2.12. **Agricultural (Former Field Boundary)** – Across Areas 3 and 6, a strong and weak linear anomaly has been identified running north to south and east to west [3b & 6i] (Figures G4 & G20). It is probable that this is one continuous feature, although [6i] appears to have a stronger and more continuous signal than [3b], perhaps indicating that it has been reused or infilled at some point with more magnetic material. [3b] and [6i] correlate with historic field boundaries visible in the 2nd Edition OS Mapping (Figure G5).

13.2.2.13. **Drainage Features** – Across Area 4, a series of linear trends can be seen running in various orientations [4a] (Figure G24). These are probably related to field drains placed to drain the fenland that can be seen on the 2nd Edition OS Mapping (Figure

G5). Ploughing regimes can be seen over the top of the drainage, indicating a prolonged period of agricultural land use.

14. Reporting Zone H (Cable Route)

14.1. Geographic Background

14.1.1. Zone H is located c. 0.9km northeast of Snailwell (Figure H1) and covers an area of c. 11.5ha. Survey was undertaken across three fields under arable cultivation. Zone H is bounded by fields and woodland to the north, east and west (Figure H1). The three fields continued to the south, and Chippenham road runs through the zone separating Area 2 from Area 3.

14.1.2. Survey considerations

Survey Area	Ground	Boundaries
1	Arable stubble. Slight topographic	newly planted trees to the northwest, hedgerow to the north and south, crossed west to
2	stubble. Gently sloping up towards southeast.	to the north, east and southeast. The field continued to the south and southwest.
3	Pasture field, gently sloping up towards southeast.	Bounded by wire fencing to the north, east and southeast. The field continued to the south and southwest.

14.1.3. The underlying geology in all areas comprises chalk from the Holywell Nodular chalk formation and from the New Pit chalk formation (British Geological Survey, 2019). A small portion in the centre of Area 1 comprises chalk from the Zig Zag chalk formation. No superficial deposits are recorded for this area.

14.1.4. The soils consist of freely draining slightly acid but base-rich soils across the majority of the zone, with the exception of a small central section of Area 1 which comprises shallow lime-rich soils (Soilscapes, 2019).

14.2. Results

14.2.1. Summary

14.2.1.1. Reporting Zone H is located southwest of Chippenham and northeast of Snailwell (Figure H1). Zone H exhibits a generally quiet magnetic background, with background variations related to topographic changes which have caused different natural processes to occur. Widespread dissolution, as described in section 6.2.5 above characterises the lowest lying sections of Zone H, in its northern and central areas (Figures H4, H8). Infilling processes are recorded in the south of zone H but

also partly overlapping the dissolution anomalies in the north of the zone (Figures H4, H8, H12).

14.2.1.2. Across Zone H, groups of linear positive anomalies have been identified, in some cases with associated discrete positive anomalies (Figures H3, H4, H12) and interpreted as ditches and pits respectively. The linear ditches follow different orientations and partly intersect each other. No corresponding features have been recorded on historic maps; for this reason, they have been interpreted as having a possible archaeological origin. The limits of the survey area, being long and narrow, preclude a clear and more confident identification of these anomalies. The westernmost [REDACTED] on satellite imagery (Google Satellite, 20[REDACTED]) shows a much larger cropmark possibly suggestive of [REDACTED]

14.2.1.3. Weak positive [REDACTED] alignment of discrete anomalies correspond [REDACTED] in the centre-north of Zone H (Figures H4, H8). This appears to have been in use for a long period of time as it is [REDACTED]

[REDACTED] evident [REDACTED] in the [REDACTED] sections [REDACTED] stand out more due their stronger signal.

14.2.1.5. Agricultural activity is evident in the form of ploughing trends and tractor tracks present throughout the zone (Figure H4). A large buried service has been detected in the centre-south of Zone H. This has produced a broad magnetic halo that may obscure weaker underlying signals, if any are present. Magnetic disturbance is also present at the perimeter of the fields due to fencing.

14.2.2. Interpretation of Magnetic Results – Specific Anomalies

14.2.2.1. **Possible Archaeology (Strong/Weak)** – In the south of Area 2 and in the north of Area 3, a set of intersecting linear and discrete anomalies [2a], [2b] and [3a] has been identified (Figures H10-H13). The positive linear anomalies, interpreted as possible enclosure ditches, are variably strong and weak in magnetic signal and run on different orientations. They are concentrated in the southern end of Area 2, with one of them extending southwards into Area 3. The linear anomalies appear as though they may extend beyond the survey boundaries. One of these linear anomalies is also visible as cropmark on satellite imagery (Google Satellite, 2018), where it appears to be part of a larger cropmark possibly suggestive of a sub-rectangular enclosure. Several strong discrete anomalies identified have been interpreted as possible pits [2b]. In the north of Area 2, further weakly positive linear anomalies have been detected [2c], running parallel to each other and on a north-south alignment (Figures H10-H13). These could be interpreted as trackways however, the limited context which this survey area provides has prevented a

confident interpretation. This group of anomalies lies within a rich archaeological landscape as visible in Zones G and F, respectively to the west and east of Zone H.

- 14.2.2.2. **Agriculture (Strong/Weak)** – In the centre of Area 1, weak positive linear anomalies and an alignment of discrete anomalies [**1a**] has been identified (Figures H6-H9). These are parallel to each other and run on a northeast to southwest orientation. They correspond with an extant trackway which has been used over a long period of time, also visible on 2nd edition OS mapping.



15. Overall Discussion and Conclusions

15.1. A fluxgate gradiometer survey was successfully undertaken across the majority of the site, with c. 990ha surveyed out of the total c. 1150ha area. Areas which could not be surveyed include 49.05ha of land in Zone B, which could not be surveyed due to poor ground conditions and the presence of pigs, pig pens & pig shelters. A further 11.3ha of land in Zone C could not be surveyed due to the presence of pigs, pig pens & pig shelters. Access had not yet been granted along 113ha of land on the cable route or in the 10ha required for HV connections. This leaves a total of 173ha not accessible at the time of writing.

15.2. The survey methodology has generally responded well to the environment and reveals different phases of archaeological activity across the site. To the scale of the Sunnica site the solar PV areas were divided into a total of eight zones for the section of cable route surveyed. The survey identified several anomalies with some archaeological potential, which are considered to be of probable archaeological provenance. Within the solar PV areas there is no clear link between the archaeology detected within the different zones, but some of the features identified include pits, ditches, postholes, and arrows, and other features.

15.3. The survey has identified several potential settlement areas present in Zone F, Zone G, and Zone H. These are likely to be of other archaeological origin and are not included in the list of other assets listed in the local HER. For example:

15.3.1. In Zone F, northeast of Snailwell, at least three potential settlement areas have been identified. One in the west of the zone (Areas 7 and 9) covers an area of c. 2.5ha and is located directly south of a recorded Iron Age settlement. Cropmark enclosures of unknown date have been recorded over the surveyed area. An Iron Age coin was also located to the south of the settlement area. A much larger occupation area, covering c. 5ha, has been identified to the southwest, in Area 3; it is unclear whether the two settlements are connected as they follow different orientations despite their close proximity. Also, in Zone F, c. 1.7km northeast of these settlements in Area 15, a small cluster of anomalies, covering c. 1ha, has been identified close to a Roman findspot. It is not clear whether these anomalies are a definitive settlement, due to difficulties interpreting less consistently detected anomalies, however it is considered likely.

15.3.2. In the west of Zone E to the southeast of Low Park Farm, just c. 310m north of the small 1ha potential settlement in Zone F, a further cluster of anomalies, here contained within an enclosure, have been identified. A findspot of Roman pottery and Bronze Age worked flint is recorded within the enclosure. Again, these more ephemeral anomalies do not allow for potential dating on the basis of morphology.

15.3.3. In Zone G, northwest of Snailwell, cropmarks have been recorded in the location of anomalies interpreted as settlement activity, as have findspots of Bronze Age, Iron Age and Roman origin. The nature of anomalies detected through the geophysical survey suggest a settlement in Zone G covering an area of c. 6ha. The settlement contains

anomalies of rectilinear form, D-shaped enclosures and ring ditches which is indicative of multiphase activity, late-prehistoric to Roman in date.

15.3.4. In Zone A, southeast of the village of Isleham, the survey has identified a large complex of rectilinear anomalies, covering 5.6ha, forming a comprehensive habitation and production site with multiple development phases. The cellular orthogonal form of much of this archaeological complex is indicative of a Roman-period provenance. Within the complex itself a findspot of Roman Pottery and post medieval coins is recorded. Other assets in the vicinity of the complex include multiple Bronze Age, Iron Age and further Roman findspots, and medieval findspots to the south, close to the village of Freckenham. Elements of the complex are also identified dating from later prehistory, with a ring ditch being identified on the outer enclosures.

15.3.5. In Zone B, directly adjacent to the Zone A complex, a complex of rectilinear and curvilinear anomalies was identified c. 0.3km northeast of the Roman settlement within the Zone B complex, including pottery sherds and metalwork finds is recorded in the field adjacent to the Zone B complex. Other assets in the Zone B complex, including a ring ditch, are also identified to the south of the Zone B complex, and are associated with late-prehistoric date, and the Roman period.

15.4. Two scheduled monuments were listed within the Sunnica site. One in the south, within Zone F, has been partially detected by the geophysical survey. This scheduled monument (SM 1015246) comprises four bowl barrows, only one of which has been detected, and the position of the detected ring ditch is shifted by c. 16m compared to the scheduling. It should be noted that two of these recorded bowl barrows were located on the edges of survey areas and if a similar offset exists, they may have fallen beyond the scope of the investigation. In the north, within Zone D, a single bowl barrow (SM 1018097) is scheduled. While the monument itself could not be surveyed due to poor ground conditions, anomalies of possible archaeological origin were detected around its perimeter.

15.5. Similar anomalies, potentially indicative of further previously unrecorded barrows have been detected across the site, resulting in up to 15 new examples. Four partial or complete ring ditches have been identified in the northwest, within Zone A. All of these are relatively close to the occupation area, with one falling within it. An additional ring ditch in Zone A measures c. 50m in diameter which is suggestive of a more substantial feature, possibly a hengiform monument (Area 2). One potential barrow has been identified in the north, within Zone B; this appears to have been cut by a modern service. Two fully complete ring ditches have been identified in isolated positions in the northeast, within Zone D. In the south of the Sunnica site, in Zone F, a further two ring ditches have been detected associated with settlement areas, and four more detected in more isolated positions. However, one of the more isolated ring ditches in Zone F (Area 1) has been fully enclosed within a rectilinear enclosure. To the southwest, in Zone G, two partial ring ditches have been detected on the outer edge of the settlement.

- 15.6. Further anomalies of probable and possible archaeological origin have been identified in the form of long linear anomalies, often with no clear association with the settlement or funerary activity across the site. These anomalies occur most frequently in the western zones of the Sunnica site and span the north and southern sections, in Zones C, D, E and F. These linear anomalies have been categorised as land divisions which predate available historic maps. In Zone F, Area 15, one of these anomalies corresponds with a cropmark which has been interpreted in the HER as a medieval furlong boundary. The projected route of this anomaly would lead to Zone E, Area 2, where another of the long linear anomalies has been identified within the dataset. Whether each of these linear anomalies, across all four zones, could be interpreted as furlong boundaries is uncertain, however, the association in Zone F does lend support to these being land divisions.
- 15.7. The natural background geology is a large scale, varied geological and sedimentological process. The topography and the resulting geomorphology have on the site, chalk bedrock covering the survey area has been widely impacted by variations in precipitate dissolution and infilling of be [redacted] direction [redacted] infilled [redacted] categorised [redacted] ns and [redacted] of these [redacted] fe [redacted]
- 15.8. The historic and modern agricultural utilisation of the landscape is evident across the Sunnica site. Numerous ridge and furrow ploughing regimes have been detected, focused mainly in the southwest in Zones F, G and H, and a small number in the northeast in Zone D. Modern ploughing is prevalent across the site, as are anomalies associated with tractor movement along field edges. Field drains have been identified across six of the reporting zones, usually accompanying depressions in the landscape, or associated with wetter local environments such as former fenland. In addition, evidence of former field boundaries has been detected across the north of the Sunnica site in Zones A, C and D as well as in Zone G in the southwest.
- 15.9. In general, the survey areas have been only minimally impacted by the presence of modern activity, this being mostly restricted to broad ferrous anomalies at the perimeters of fields, related to field boundaries, or where temporary fencing had been in place. However, underground services have been detected across six zones, with the exceptions being those in the north of the Sunnica site (Zones A and B). One field in the southeast, Zone E, has a section of c. 11ha covered in a high concentration of small ferrous anomalies likely caused by the spread of “green waste” for agricultural purposes. Other significant ferrous and debris anomalies identified include part of a former WW2 airfield in the southeast of the site (Zone F), and sections of the former Cambridge and Mildenhall Branch railway in the north, crossing Zones A and B.

16. Archiving

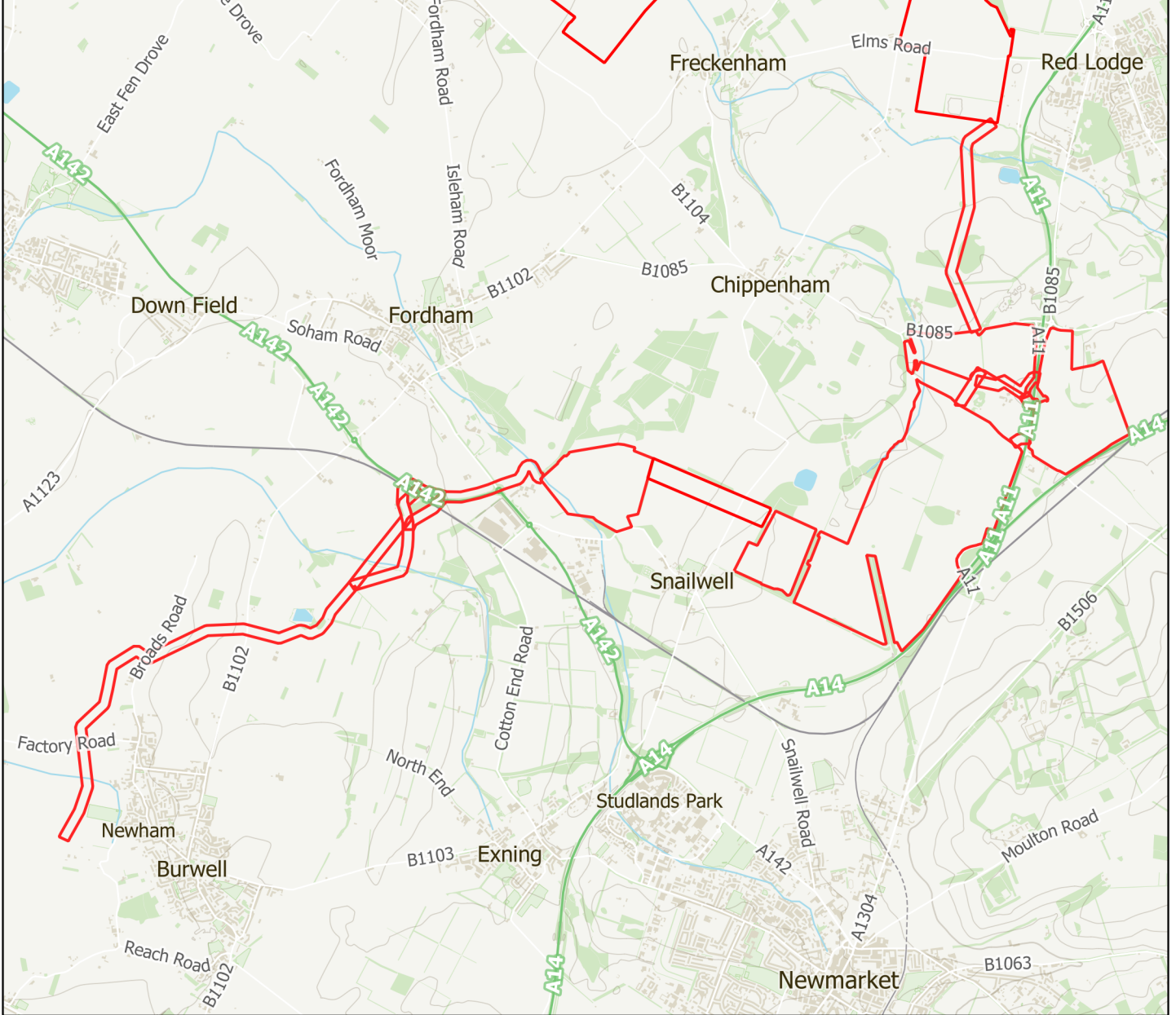
- 16.1. MS maintains an in-house digital archive, which is based on Schmidt and Ernenwein (2013). This stores the collected measurements, minimally processed data, georeferenced and un-georeferenced images, XY traces and a copy of the final report. A copy of this archive will be included in a disk with the final printed report.
- 16.2. MS contributes reports to the ADS Grey Literature Library upon permission from the client, subject to the any dictated time embargoes.
- 16.3. A hard and digital copy of the geophysical survey report will be supplied to the CHER and SCCAS an OASIS form will be filled in and submitted to the client for their permission from the client.

17. Copyright

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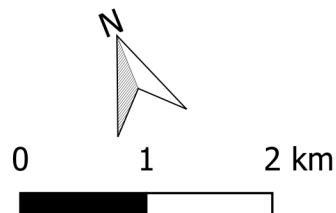
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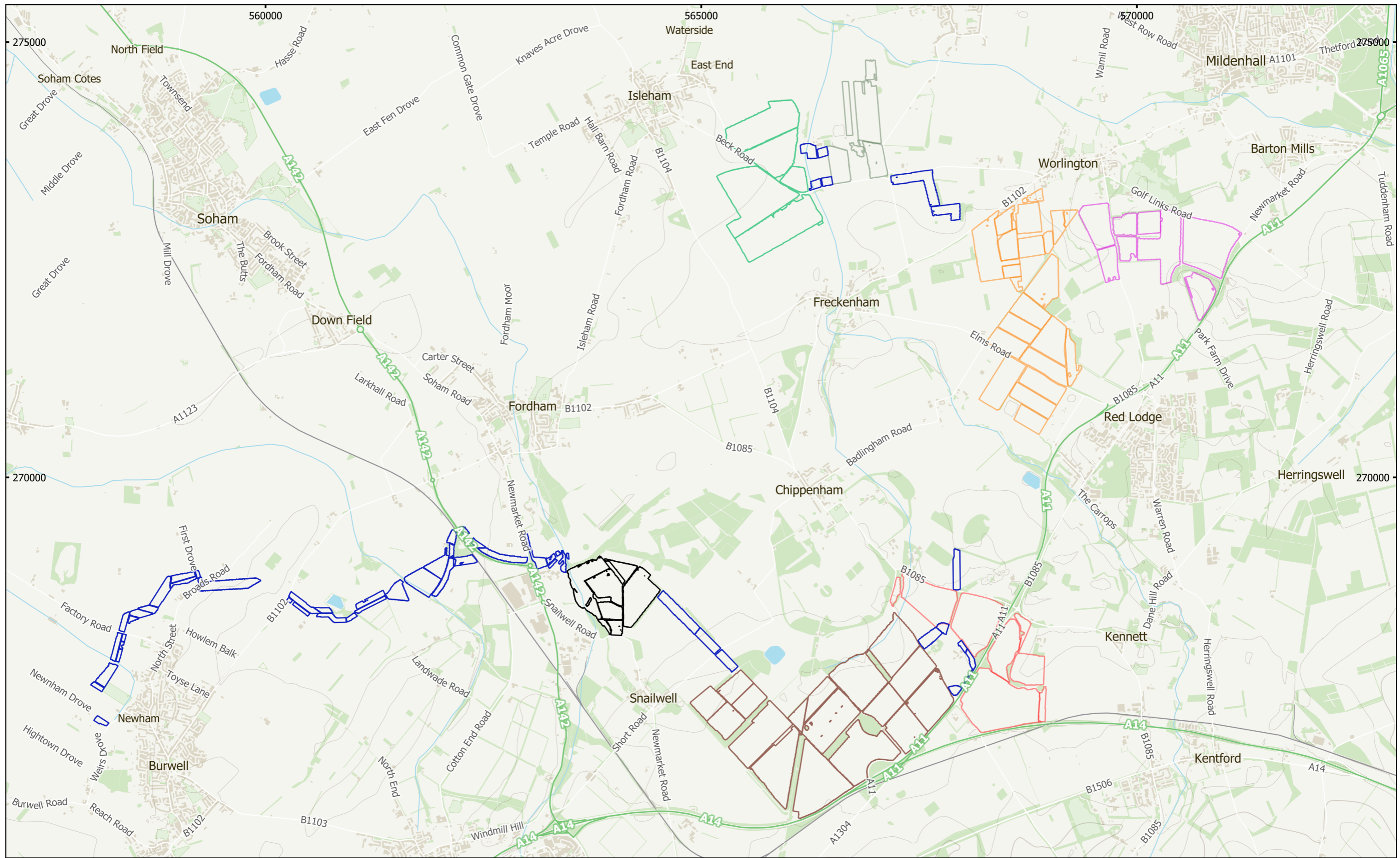


MSTL551 - Sunnica Energy Farm
 Figure 1 - Site Location
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 Site Boundary

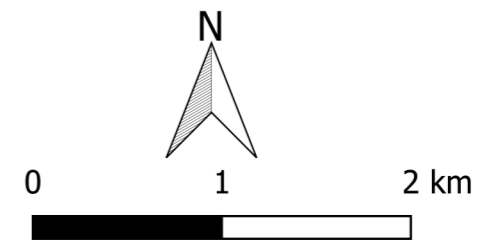


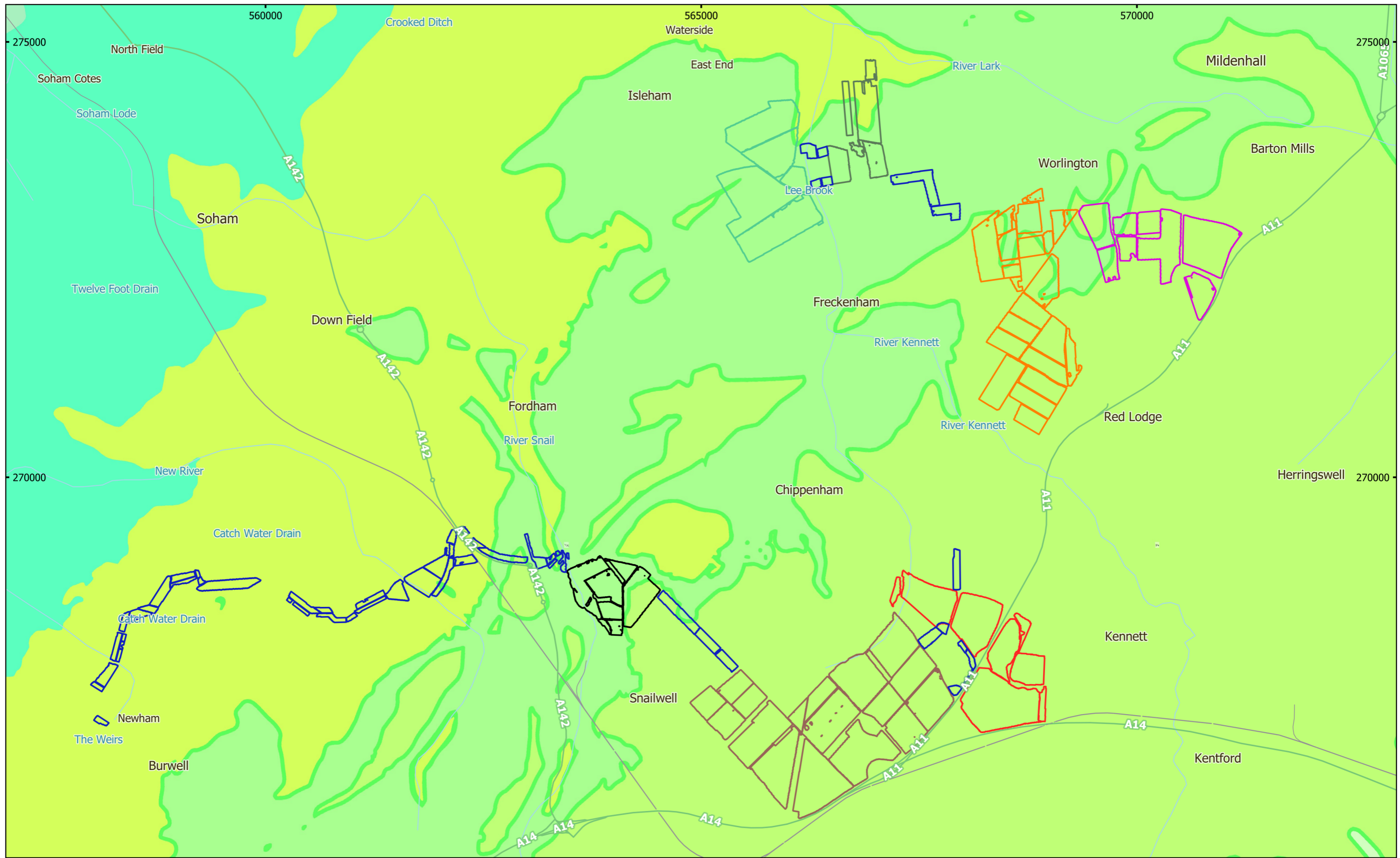
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MSTL551 - Sunnica Energy Farm
 Figure 2 - Location of Survey Areas (Survey Extent)
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- | | |
|---|--|
|  Zone A |  Zone E |
|  Zone B |  Zone F |
|  Zone C |  Zone G |
|  Zone D |  Zone H |

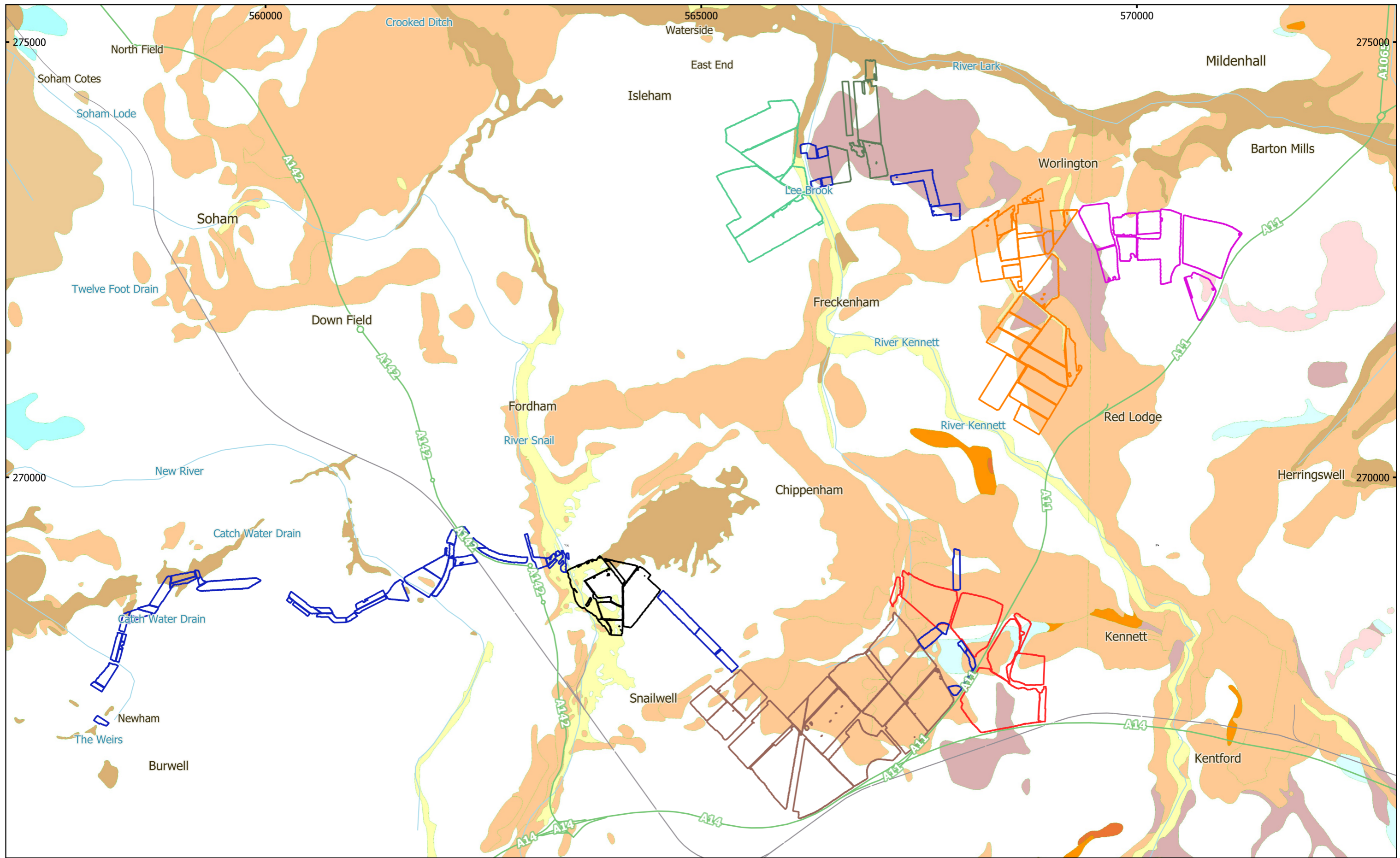




MSTL551 - Sunnica Energy Farm
 Figure 3 - Geological Map of Site (Bedrock)
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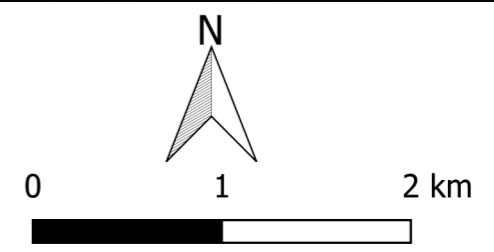
Zone A	Zone E	Gault Formation - Mudstone
Zone B	Zone F	Holywell Nodular Chalk Formation & New Pit Chalk Formation - Chalk
Zone C	Zone G	Lewes Nodular, Seaford, Newhaven & Culver Chalk Formations (Undifferentiated) - Chalk
Zone D	Zone H	West Melbury Marly Chalk Formation - Chalk
		Zig Zag Chalk Formation - Chalk

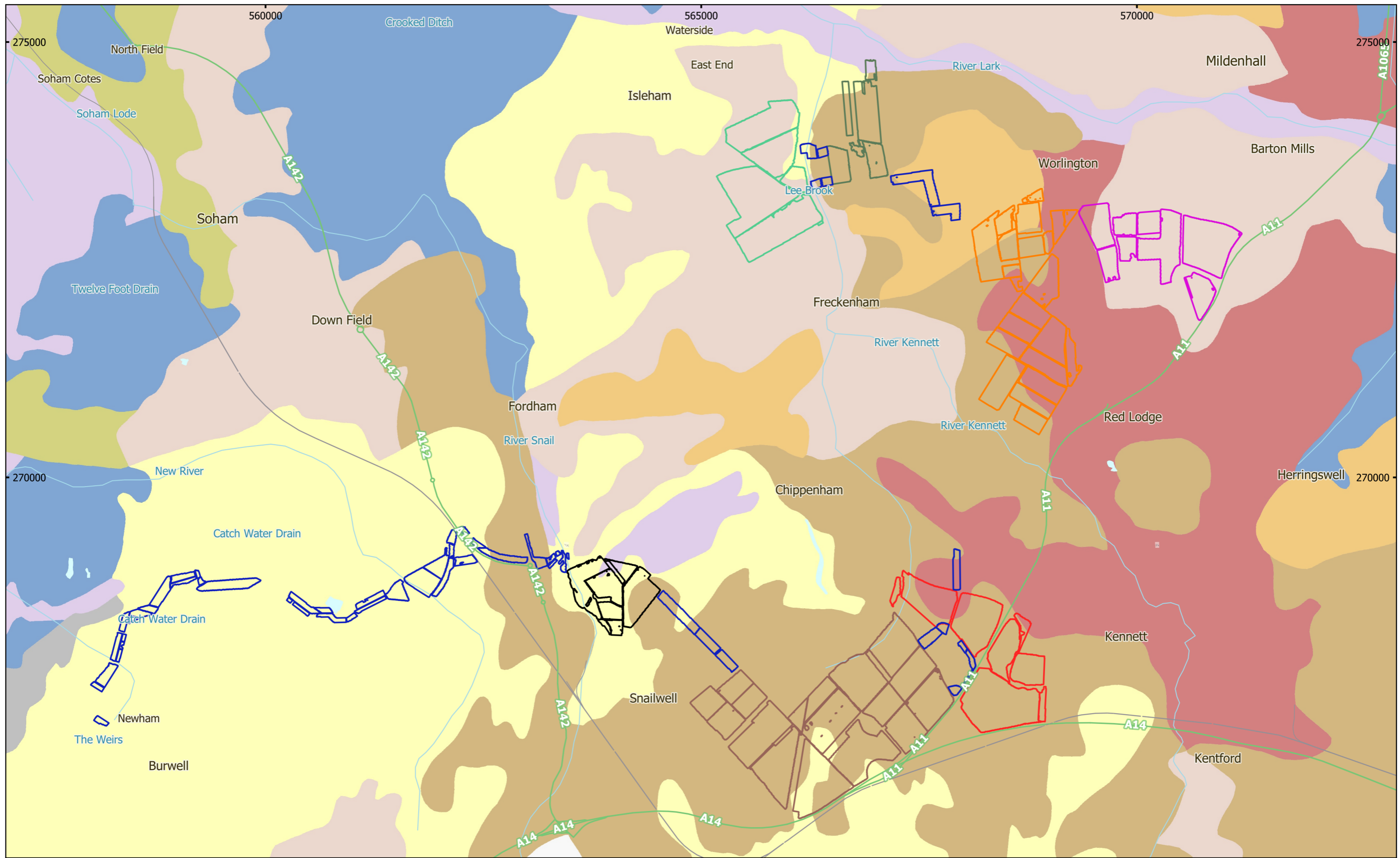
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MSTL551 - Sunnica Energy Farm
 Figure 4 - Geological Map of Site (Superficials)
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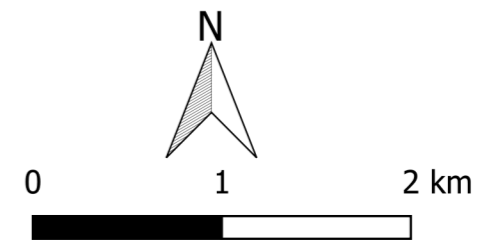
Zone A	Zone E	Alluvium - Clay, Silt, Sand and Gravel
Zone B	Zone F	Croxtan Sand and Gravel Member - Sand and Gravel
Zone C	Zone G	Head - Clay, Silt, Sand and Gravel
Zone D	Zone H	Lowestoft Formation - Clay and Silt
		Lowestoft Formation - Diamicton
		Peat - Peat
		River Terrace Deposits - Sand and Gravel
		None recorded

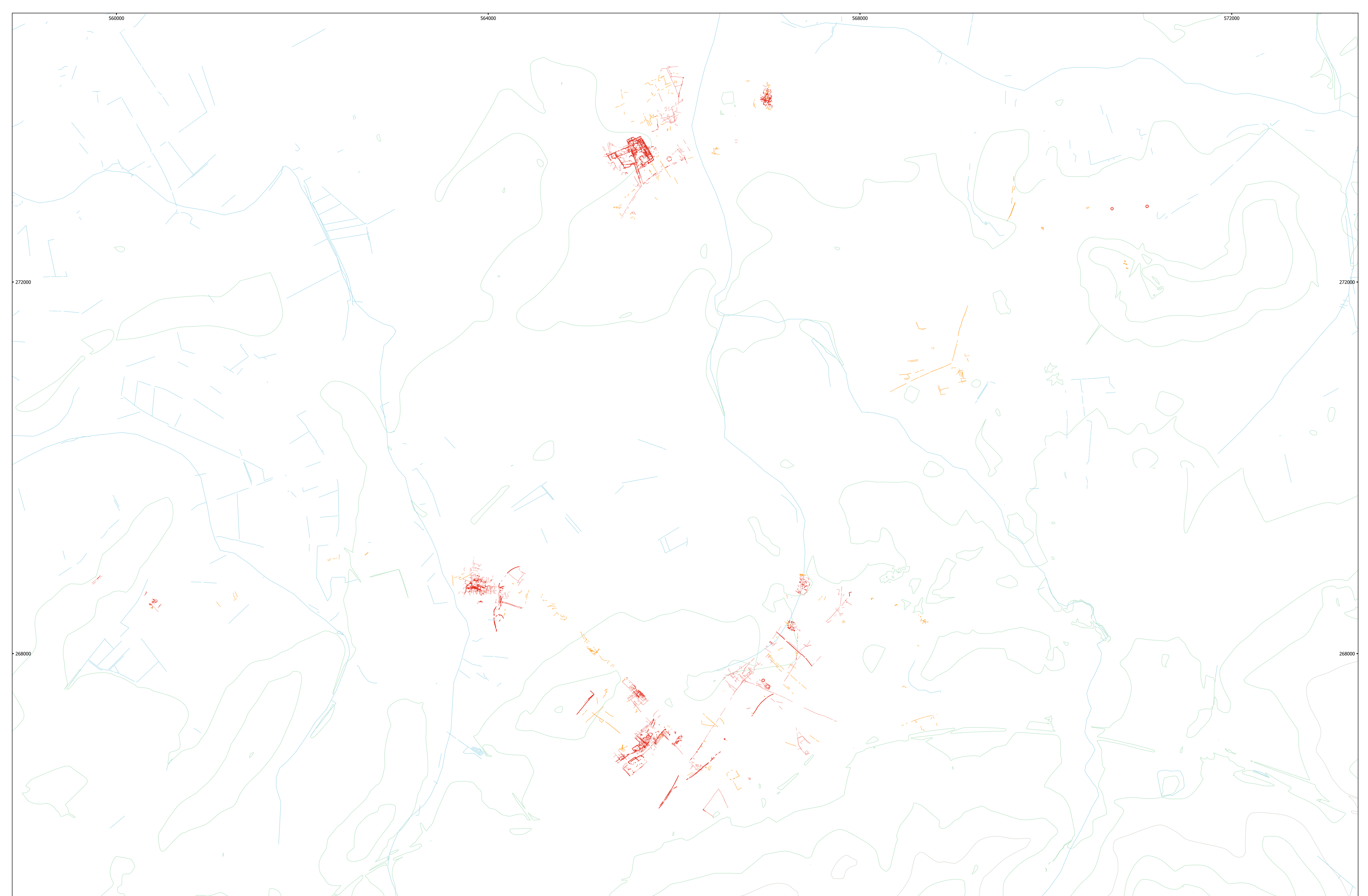




MSTL551 - Sunnica Energy Farm
 Figure 5 - Geological Map of Site (Soils)
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Zone A	Zone E	Fen peat soils
Zone B	Zone F	Freely draining lime-rich loamy soils
Zone C	Zone G	Freely draining sandy Breckland soils
Zone D	Zone H	Freely draining slightly acid but base-rich soils
		Freely draining slightly acid sandy soils
		Loamy and sandy soils with naturally high groundwater and a peaty surface
		Shallow lime-rich soils over chalk or limestone





MSTL551 - Sunnica Energy Farm
 Figure 6 - Overview of Detected Archaeology
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- Archaeology Probable (Strong)
- Archaeology Probable (Weak)
- Archaeology Possible (Strong)
- Archaeology Possible (Weak)

- Waterways
- Contours

