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LAND NORTH OF NAPTON ROAD, STOCKTON, WARWICKSHIRE

GEOPHYSICAL SURVEY REPORT

June 2016

DATE ISSUED: June 2016
JOB NUMBER: CP11773
REPORT NUMBER: 0002 (Version 0.1)
GRID REFERENCE: SO 4395 6398
OASIS REFERENCE: Wardella2-254615

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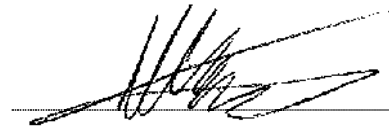
LAND NORTH OF NAPTON ROAD, STOCKTON, WARWICKSHIRE

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SUMMARY

In June 2016 Wardell Armstrong Archaeology (WAA) undertook a geophysical survey of land at Napton Road, Stockton, Warwickshire. The survey was undertaken Taylor Wimpey (West Midlands), to provide information in relation to a proposed residential development at the site.

Previous geophysical survey on land to the south of Napton Road has identified possible medieval rectilinear plot boundaries. Subsequent trial trench evaluation revealed a series of linear boundaries and pits, with dating evidence indicating activity in the 12th and 13th centuries. Prehistoric and Roman remains are also known from the surrounding area.

The objective of the geophysical survey was therefore to determine the presence/absence, nature and extent of potential archaeological features within the study area, and the presence/absence of any known modern features within the survey area, which may affect the results.

Geomagnetic survey was undertaken over the northern portion of the study area, which comprised uncultivated land at the time of the survey. A number of geophysical anomalies were detected at the site, all of which are believed to be modern in origin. These include at least one service pipe, and other ferrous debris. No definite archaeological remains were detected by the geophysical survey.

1 INTRODUCTION

1.1 Circumstances of the Project (Figure 1)

- 1.1.1 Between the 8th and 9th June 2016 Wardell Armstrong Archaeology (WAA) undertook a geophysical survey of land at Napton Road, Stockton, Warwickshire. The survey was undertaken Taylor Wimpey (West Midlands), to provide information in relation to a proposed residential development at the site, for which outline planning permission has been granted (Reference No. 14/03205/OUT). This is in line with government advice as set out in Section 12 of the National Planning Policy Framework (NPPF 2012).
- 1.1.2 The proposed development area comprises c.1.58ha of land to the north of Napton Road, on the northeast side of Stockton in Warwickshire (Figure 1). The proposed development area is located within a field of rough pasture to the southeast of George Street and northwest of Station Road and Stockton Football Club.
- 1.1.3 Previous geophysical survey on land to the south of Napton Road identified possible medieval rectilinear plot boundaries (Mola 2014). Subsequent trial trench evaluation revealed a series of linear boundaries and pits, with dating evidence indicating activity in the 12th and 13th centuries (Allen Archaeology 2014). Prehistoric and Roman remains are also known from the surrounding area.
- 1.1.4 As a result a geophysical survey of the site was commissioned, in order to help determine the archaeological potential of the site. The objective of the geophysical survey was to determine the presence/absence, nature and extent of potential archaeological features within the study area, and the presence/absence of any known modern features within the survey area, which may affect the results.
- 1.1.5 This report outlines the results of the geophysical survey undertaken, and includes an interpretation of the geophysical survey results, in light of the historical and archaeological background of the site.

2 METHODOLOGY

2.1 Written Scheme of Investigation

2.1.1 A Written Scheme of Investigation (WSI) for the geophysical survey was produced by Wardell Armstrong Archaeology, in accordance with the *Generic Archaeological Geophysical Survey Guidelines*, provided by the Archaeological Information and Advice, Warwickshire County Council (Warwickshire County Council 2013). The WSI was adhered to in full, the survey work being consistent with Historic England guidelines (English Heritage 2008), and undertaken in accordance with the standard and guidance of the Chartered Institute for Archaeologists (CIfA 2014).

2.2 Geophysical Surveys

2.2.1 **Technique Selection:** geomagnetic survey was selected as the most appropriate technique, given the non-igneous environment, and the expected presence of cut archaeological features at depths of no more than 1.5m. This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features.

2.2.2 Previous geomagnetic survey to the south of Napton Road has shown magnetic susceptibility exists at the site, and a series of linear anomalies were detected (Mola 2014), which were confirmed by trial trench evaluation (Allen Archaeology 2014).

2.2.3 **Field Methods:** the geophysical study area comprised c.1.58ha of former agricultural land. However, at the time of the survey only the northern part of the site was suitable for geophysical survey, the remainder of the site being overgrown with vegetation. A 30m grid was established across the available area and tied-in to known Ordnance Survey points using a Trimble M3 Total Station (Figure 2).

2.2.4 Geomagnetic measurements were determined using a Bartington Grad601-2 dual gradiometer system, with twin sensors set 1m apart. It was expected that significant archaeological features at a depth of up to 1.5m would be detected using this arrangement. The survey was undertaken using a zig-zag traverse scheme, with data being logged in 30m grid units. A sample interval of 0.25m was used, with a traverse interval of 1m, providing 3600 sample measurements per grid unit, with measurements being recorded at the centre of each grid cell. The data were downloaded on site into a laptop computer for processing and storage.

- 2.2.5 **Data Processing:** geophysical survey data were processed using Terra Surveyor software, which was used to produce 'grey-scale' images of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.
- 2.2.6 Raw data were processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:
- *Despike:* to locate and suppress random iron spikes in the gradiometer data (despike was performed on all survey grids using a window of 11x3 and threshold of 2.0).
 - *Destripe:* to reduce the effect of striping in the gradiometer data, sometimes caused by misalignment of the twin sensors (zero mean traverse was performed on all survey grids using a threshold of 2 standard deviations).
 - *Clip:* to clip data to specified maximum and minimum values, in order to limit large noise spikes in the geophysical data (clipped from -3nT to 3nT).
 - *Interpolate:* to match the resolution of the sample intervals in the x and y directions (doubled in the y direction).
- 2.2.7 **Interpretation:** two types of geophysical anomaly were detected in the gradiometer data:
- *positive magnetic:* regions of anomalously high or positive magnetic data, which may be associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches.
 - *dipolar magnetic:* regions of paired positive and negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, or fired structures, such as kilns or hearths.
- 2.2.8 **Presentation:** the grey-scale images were combined with site survey data and Ordnance Survey data to produce the geophysical survey figures. A colour-coded geophysical interpretation diagram is provided, showing the locations and extent of positive and dipolar magnetic anomalies. An archaeological interpretation diagram is also provided, which is based on the interpretation of the geophysical survey results in light of the archaeological and historical context of the site.

2.3 **Archive**

- 2.3.1 The data archive for the geophysical survey has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2013). This archive is held at the company offices at Carlisle, Cumbria. The archive comprises a compressed (zipped) file folder, containing the geophysics data, documentation (metadata), and other project material (report and field notes).
- 2.3.2 One copy of the final report will be deposited with the County Historic Environment Record, where viewing will be available on request. The project is registered with the Online Access to the Index of archaeological investigations (OASIS). The OASIS reference for the project is: wardella2-254615.

3 BACKGROUND

3.1 Site Conditions and Geological Context

3.1.1 **Location:** the survey area comprised a single narrow field bounded by Napton Road to the south, modern houses and gardens to the northwest, the Stockton Football Club grounds to the southeast, with further agricultural land to the north and east. The site is centred at Ordnance Survey grid reference SP 4395 6398. The site covers c.1.58ha of land in total, which comprised rough uncultivated ground at the time of the survey.

3.1.2 **Geology and Soils:** The underlying geology at the site comprises mudstone, known as Charmouth Mudstone Formation. This sedimentary bedrock was formed approximately 183 to 197 million years ago in the Jurassic Period (BGS 2001). No superficial deposits are recorded.

3.1.3 **Topography and Hydrology:** The land is relatively level and appears to be well-drained, with a slight rise in elevations to the north.

3.1.4 **Current land use and Vegetation:** The site comprised overgrown scrub land at the time of the survey, which had been cleared over the northern part of the site, with some tree stumps present.

3.1.5 **Historic land use:** Late 19th century mapping depicts the proposed development area as part of a larger rectangular field on the north side of Stockton. Properties were subsequently constructed along George Street on the west side of the site from the early 20th century onwards.

3.1.6 In the late 20th century the southern part of the proposed development area was utilised for allotment gardens and this may have resulted in widespread disturbance across the site.

3.2 Previous Archaeological Work

3.2.1 Previous geophysical survey on land to the south of Napton Road identified possible medieval rectilinear plot boundaries (Mola 2014). Subsequent trial trench evaluation revealed a series of linear boundaries and pits, with dating evidence indicating activity in the 12th and 13th centuries (Allen Archaeology 2014). Prehistoric and Roman remains are also known from the surrounding area.

4 THE GEOPHYSICAL SURVEYS

4.1 Introduction (Figure 2)

4.1.1 Geomagnetic survey was undertaken over the northern part of the study area. The southern part of the site was too overgrown with vegetation at the time of the survey to be included in the geophysical survey.

4.1.2 The survey area was bounded by field boundaries consisting of mature hedges and fences, with some Heras fencing present to the north. These fences produced strong dipolar magnetic disturbance around the periphery of the survey area.

4.1.3 An iron drain cover was located at the centre of the survey area and was excluded from the geophysical survey. However, this also produced strong dipolar magnetic anomalies in the gradiometer data.

4.2 Geophysical survey (Figures 3-6)

4.2.1 Small discrete dipolar magnetic anomalies were detected across the whole of the study area. These are almost certainly caused by fired/ferrous litter in the topsoil, which is typical for modern land. Some larger dipolar magnetic anomalies were also detected, which are believed to be due to larger ferrous objects in the topsoil. These anomalies are indicated on the geophysical interpretation drawings, but not referred to again in the subsequent interpretations.

4.2.2 A linear positive magnetic anomaly was detected crossing the south side of the survey area, aligned southwest to northeast, which aligned with the manhole cover. This is almost certainly due to the presence of a service pipe, which is believed to be a drain. A number of dipolar magnetic anomalies were also detected on the same alignment suggesting this continued across the field to the northeast.

4.2.3 A further possible linear positive magnetic anomaly was detected crossing the southeast corner of the survey area, aligned approximately northeast to southwest. This may represent another drain, but this is uncertain.

4.3 Discussion

4.3.1 Overall the site appeared to be relatively disturbed by modern activity with at least one major service crossing the site, and modern debris present in the topsoil.

4.3.2 No potential archaeological features were detected by the geophysical survey.

5 **CONCLUSIONS**

4.4 **Conclusions**

- 4.4.1 Geomagnetic survey has been conducted on land north of Napton Road, Stockton, in Warwickshire, to provide information in relation to a proposed residential development at the site.
- 4.4.2 A number of geophysical anomalies were detected at the site, all of which are believed to be modern in origin. These include at least one service pipe and associated drain cover.
- 4.4.3 No definite archaeological remains were detected by the geophysical survey.

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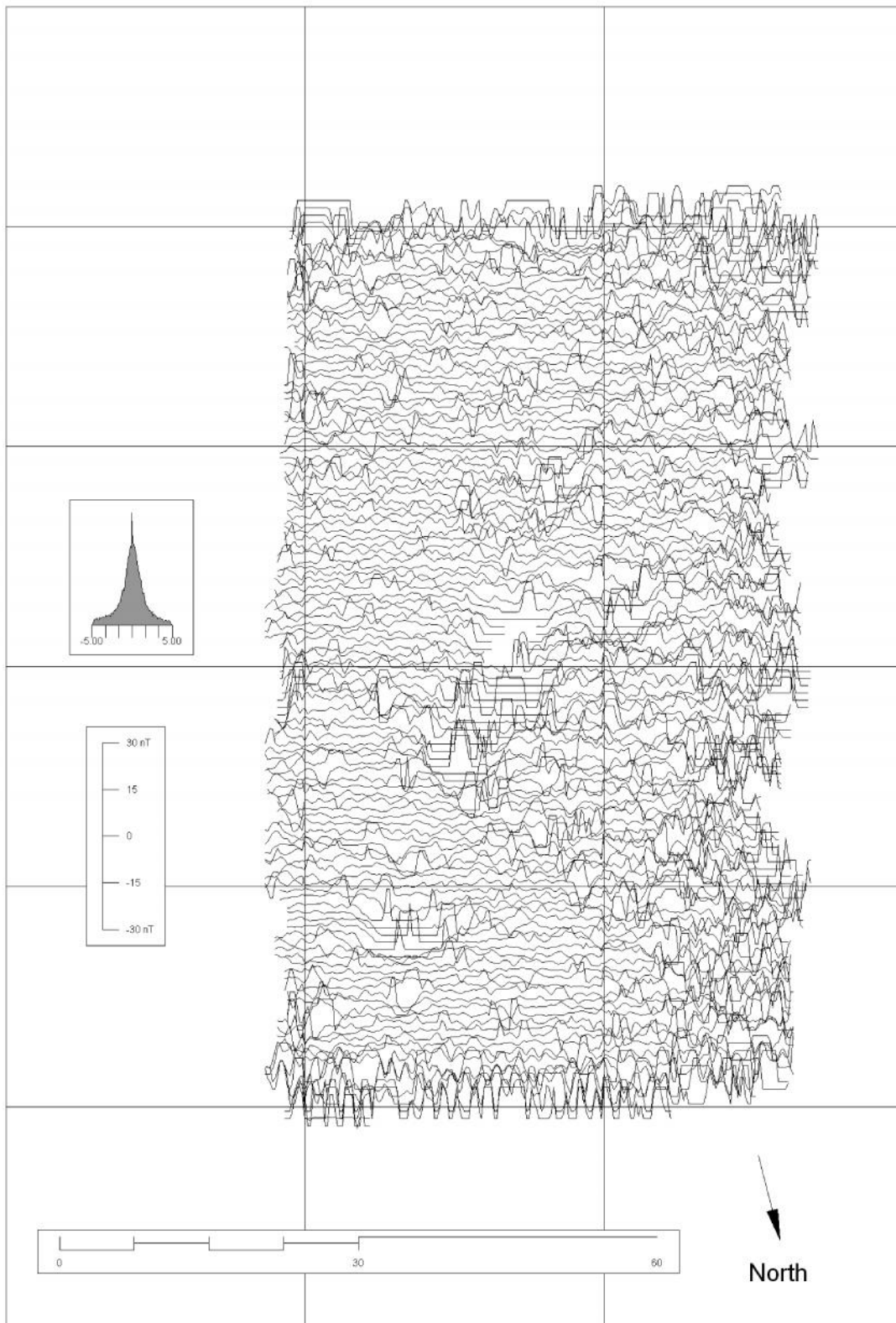
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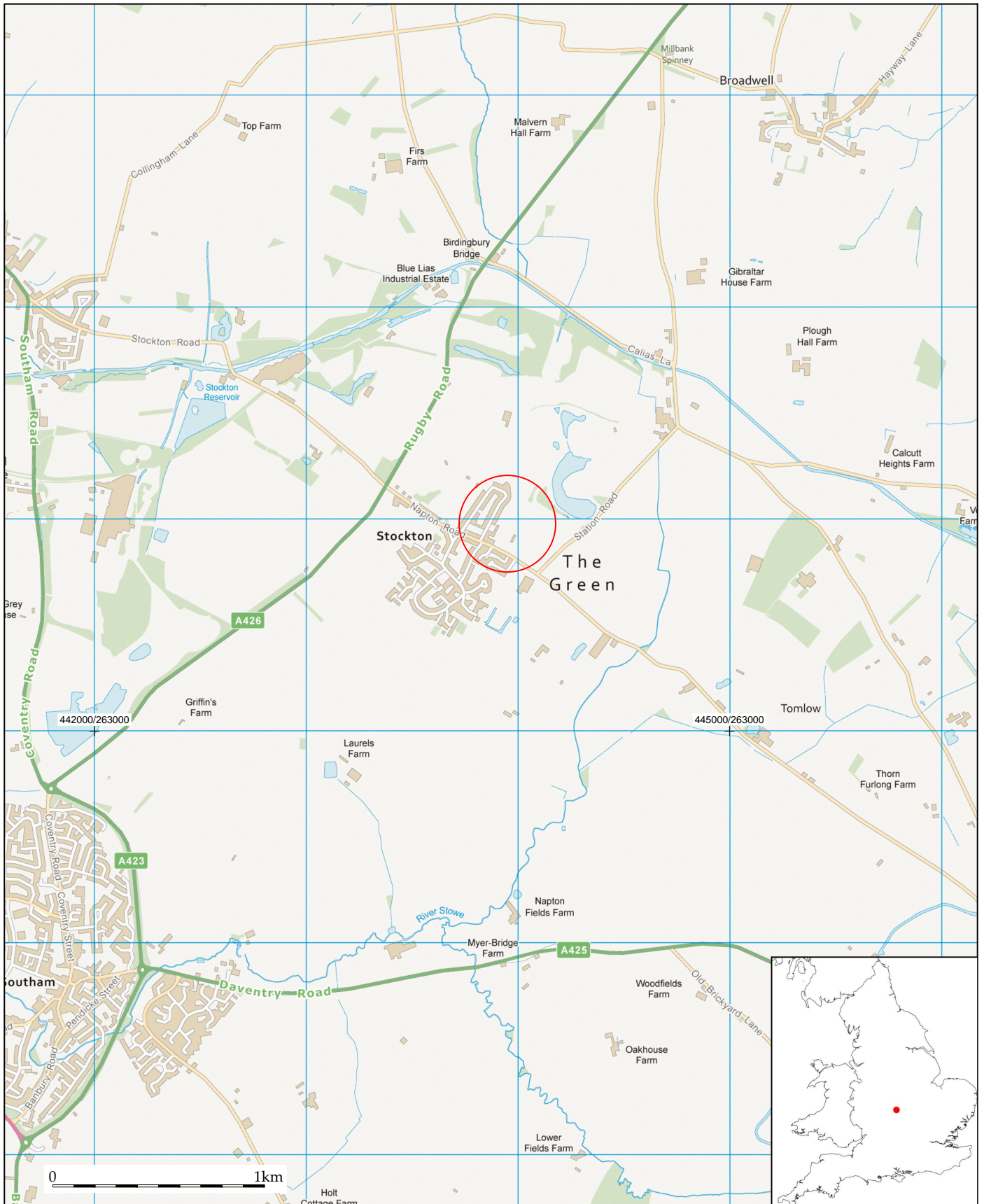
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APPENDIX 1 – TRACE PLOT



APPENDIX 2 - FIGURES






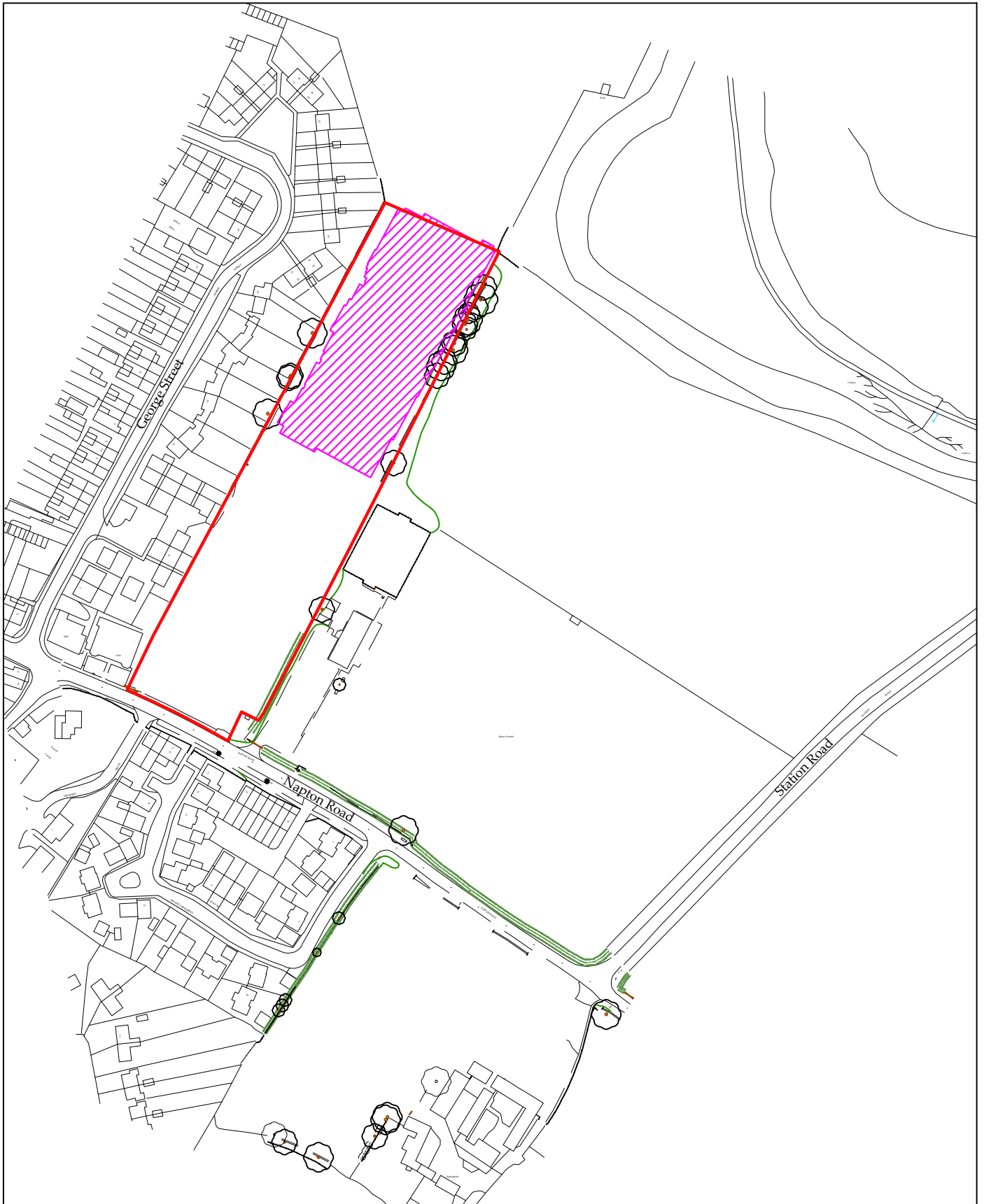
 <p>Wardell Armstrong Archaeology 2016</p>	<p>PROJECT: Land north of Napton Road, Stockton, Warwickshire</p> <p>SCALE: 1:25,000 at A4</p> <p>REPORT No: CP11773</p> <p>CLIENT: Taylor Wimpey (West Midlands)</p> <p>DRAWN BY: HP</p> <p>CHECKED BY: HP</p> <p>DATE: June 2016</p>	<p>KEY:</p> <p> Site location</p>	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 1: Site location.







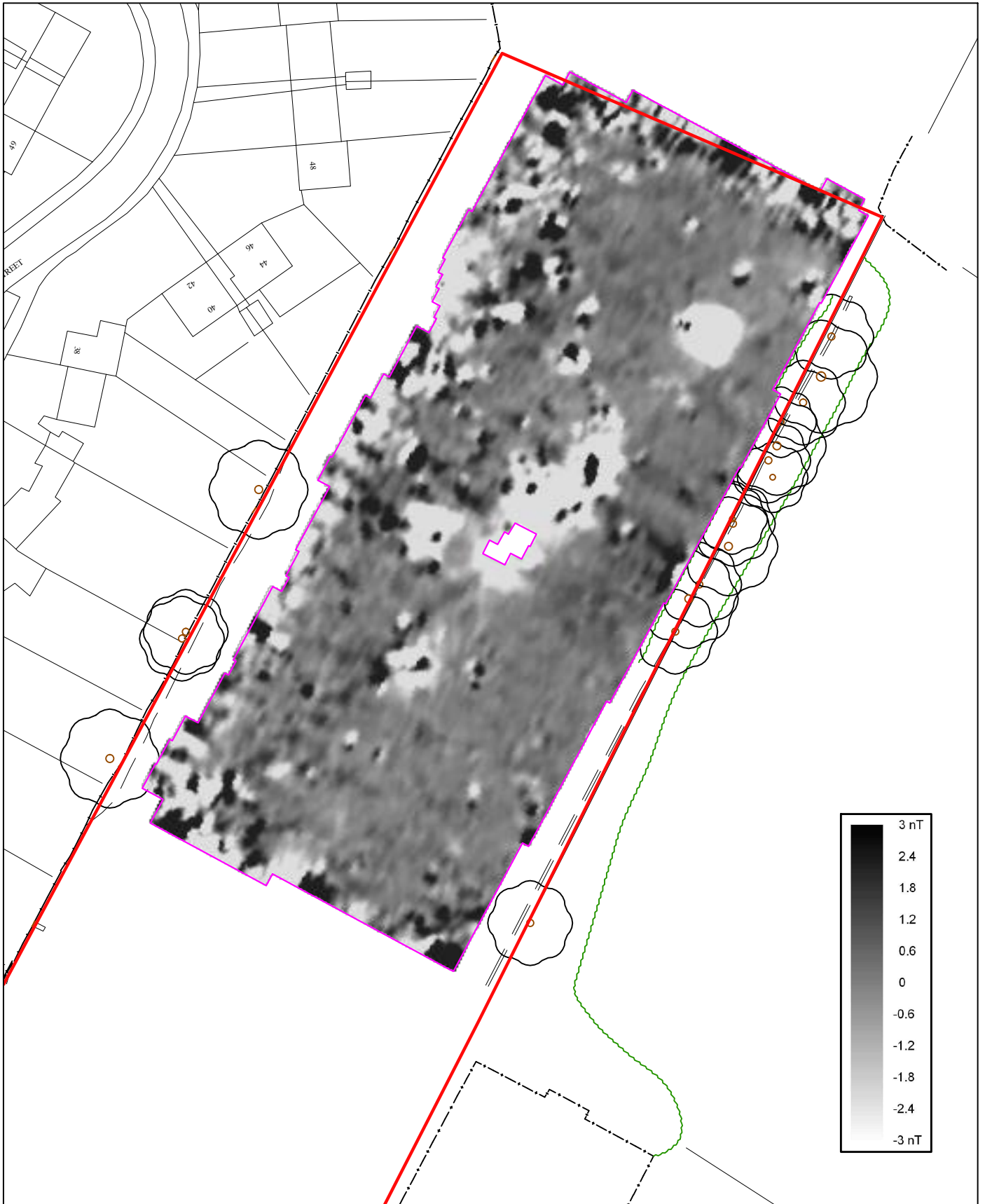
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Figure 2: Location of the geophysical survey area.







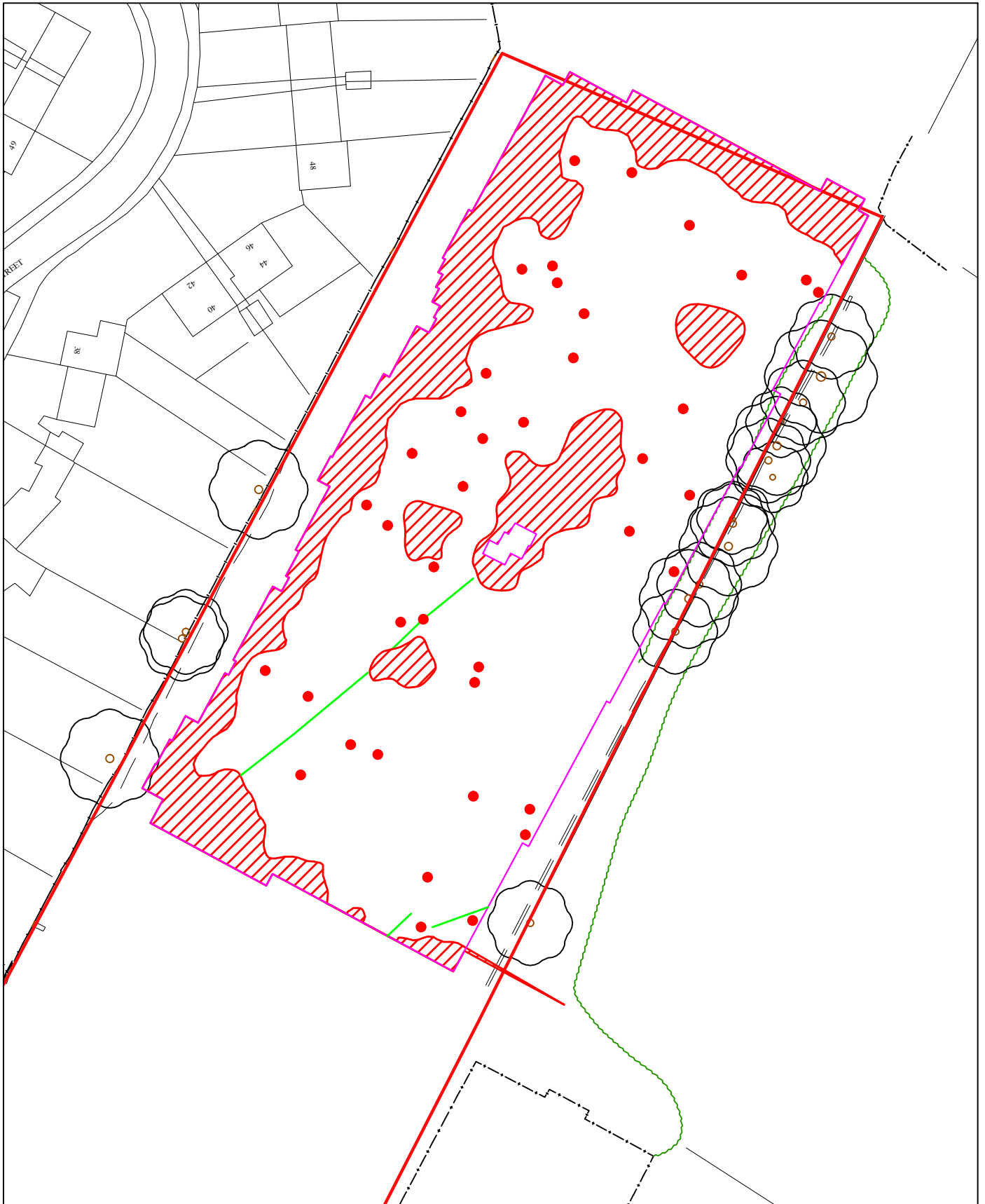
 <p>Wardell Armstrong Archaeology 2016</p>	<p>PROJECT: Land north of Napton Road, Stockton, Warwickshire</p> <p>SCALE: 1:750 at A4</p> <p>REPORT No: CP11773</p> <p>CLIENT: Taylor Wimpey (West Midlands)</p> <p>DRAWN BY: MDR</p> <p>CHECKED BY: AB</p> <p>DATE: June 2016</p>	<p>KEY:</p> <ul style="list-style-type: none">  Outline of proposed development  Geophysical survey area outline 	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 3: Geophysical survey.









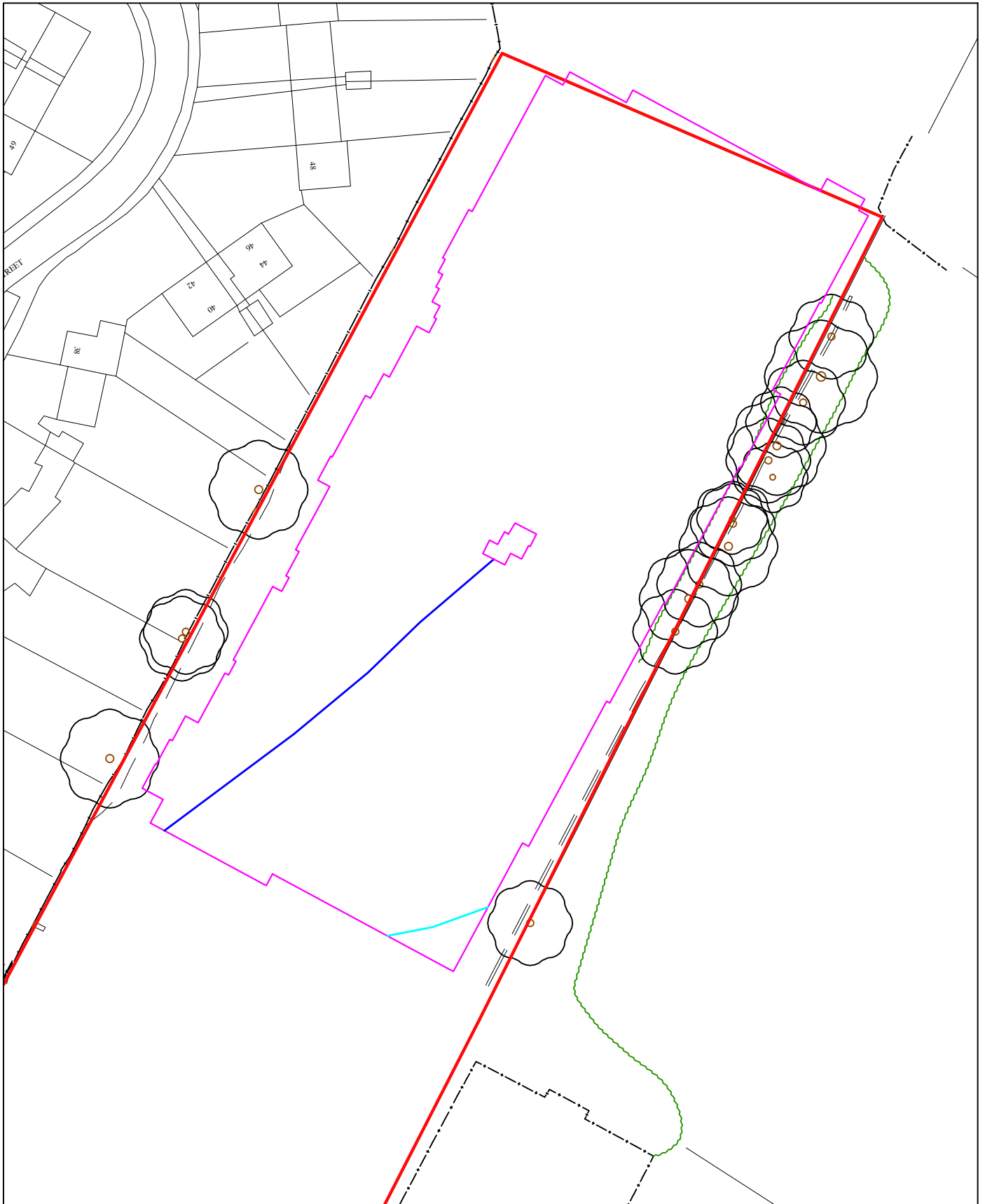
 <p>Wardell Armstrong Archaeology 2016</p>	<p>PROJECT: Land north of Napton Road, Stockton, Warwickshire</p> <p>SCALE: 1:750 at A4</p> <p>REPORT No: CP11773</p> <p>CLIENT: Taylor Wimpey (West Midlands)</p> <p>DRAWN BY: MDR</p> <p>CHECKED BY: AB</p> <p>DATE: June 2016</p>	<p>KEY:</p> <ul style="list-style-type: none">  Outline of proposed development  Geophysical survey area outline  Dipolar magnetic anomaly  Positive magnetic anomaly 	 <p>Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 4: Geophysical interpretation.



	<p>PROJECT: Land north of Napton Road, Stockton, Warwickshire</p> <p>SCALE: 1:750 at A4</p> <p>REPORT No: CP11773</p> <p>CLIENT: Taylor Wimpey (West Midlands)</p> <p>DRAWN BY: MDR</p> <p>CHECKED BY: AB</p> <p>DATE: June 2016</p>	<p>KEY:</p> <ul style="list-style-type: none"> Outline of proposed development Geophysical survey area outline Service pipe Possible drain 	<p style="font-size: small; text-align: center;">Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright. All rights reserved. Licence number 100019512</p>
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Figure 5: Archaeological interpretation.

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