Gipsy Castle Lane, Hay-on-Wye, HR3 5PW Pl/AP/17-14686/OUT

Archaeological Field Evaluation

Prepared

for

Mr & Mrs Davies

The Bungalow, Upper Court Farm,
Clifford, Hay-on-Wye, HR3 5ER

By

- BLACK MOUNTAINS ARCHAEOLOGY -
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Front cover: View to the south east of Trench 5.

Summary

Black Mountains Archaeology Ltd/Archaeoleg Mynydd Du Cyf were commissioned by Mr & Mrs Davies of The Bungalow, Upper Court Farm, Clifford, Hay on Wye, HR3 5ER to carry out a geophysical survey and archaeological field evaluation ahead of a proposed residential development of five dwellings and associated access and landscaping to inform on the nature and extent of any archaeological remains on the site (17/14686/OUT).

The present report sets out the results of the archaeological field evaluation in accordance with the agreed Project Design produced to meet the Brief for the work provided by the Brecon Beacons National Park Authority (BBNP).

A geophysical survey was undertaken on the 17th-18th August 2017 (Young 2017; Appendix III) and the results of the survey incorporated into the trenching strategy. The archaeological field evaluation was carried out on the 18th-21st September 2017 and did not identify any features or deposits of archaeological origin in any of the five trenches. The results of the trenching married well with the geophysical interpretation confirming that the natural geology was strongly reflected, as were features of natural origin such as tree-throws, and more modern responses from agricultural activity. There was no evidence of any prehistoric activity in relation to the Gipsy Castle Lane Enclosure and associated cropmarks known from fields to the north of Gipsy Castle Lane. The topsoil and subsoils across all five trenches were fairly uniform and shallow suggesting that this field may never have been ploughed.

The field evaluation was undertaken to the professional standards of the Chartered Institute for Archaeologists Standard and guidance for an archaeological field evaluation*. Published 2014.*

1 Introduction

1.1 Project Background and Proposals

1.1.1 Black Mountains Archaeology Ltd/Archaeoleg Mynydd Du Cyf were commissioned by Mr & Mrs Davies of The Bungalow, Upper Court Farm, Clifford, Hay on Wye, HR3 5ER to carry out a geophysical survey and archaeological field evaluation ahead of a proposed residential development of five dwellings and associated access and landscaping to inform on the nature and extent of any archaeological remains on the site (17/14686/OUT).

1.1.2 A geophysical survey was undertaken on the 17th-18th August 2017 (Young 2017; Appendix III) and the results of the survey incorporated into the trenching strategy. Both magnetic gradiometer and resistivity survey methods were employed and produced good results. No anomalies with certain archaeological origin were identified. However, some anomalies did have the potential to be of archaeological origin but were limited to a few isolated ferrous readings and some linear features. The overall interpretation suggesting that natural geology was strongly reflected, as were features of natural origin such as tree-throws, and more modern responses from agricultural activity. The results of the trenching (see below) married well with the geophysical interpretation.

1.1.3 The present report sets out the results of the archaeological field evaluation in accordance with the agreed Project Design (Lewis 2017) produced to meet the Brief (Thorne 2017) for the work provided by the Brecon Beacons National Park Authority (BBNP).

1.2 Objectives

1.2.1 The definition of an archaeological Field Evaluation as set out by the *Chartered Institute for Archaeologists* (CIfA) is a programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present the field evaluation defines their character, extent, quality and preservation, and enables an assessment of their significance in a local, regional, national or international context as appropriate.

1.2.2 The purpose of field evaluation is to gain information about the archaeological resource within a given area or site (including its presence or absence, character, extent, date, integrity, state of preservation and quality), in order to make an assessment of its merit in the appropriate context, leading to one or more of the following:

- The formulation of a strategy to ensure the recording, preservation or management of the resource.
- The formulation of a strategy to mitigate a threat to the archaeological resource.
- The formulation of a proposal for further archaeological investigation within a programme of research.

1.2.3 (Chartered Institute for Archaeologists Standard and guidance for an archaeological field evaluation Published 2014)

1.3 Legislative Framework

1.3.1 Planning legislation is set out in the *Town and Country Planning Act 1990*. *Planning Policy Wales (PPW 9th Edition)* sets out the land use planning policies of the Welsh Government. Chapter 6 sets out the Welsh Government's policy towards the historic environment. It states *"The historic environment of Wales is made up of individual historic features, archaeological sites, historic buildings and historic parks, gardens, townscapes and landscapes, collectively known as historic assets. The most important of these historic assets have statutory protection through scheduling, listing or designation as a conservation area. Other assets are included in formal registers, which identify them as being of special historic interest. Many others make a positive contribution to local character and sense of place. Some, such as buried archaeological remains, have still to be identified. It is important to protect what is significant about these assets and sustain their distinctiveness. Historic assets should be the subject of recording and investigation when they are affected by proposals that alter or destroy them. Historic assets are a non-renewable resource."* (PPW 2016, 90).

1.3.2 Underpinning PPW are a series of legislative powers and TANs. The *Planning (Wales) Act 2015* sets out a series of legislative changes to deliver reform of the planning system in Wales, to ensure that it is fair, resilient and enables development. The 2015 Act also introduces a mandatory requirement to undertake pre-application consultation for certain types of development. The *Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016* defines in *Schedule 4(l)* the parameters and definitions for the requirement of pre-application consultation by Welsh Ministers, particularly in response to the effect of statutory designated monuments, buildings, and parks and gardens.

1.3.3 Advice on archaeology and buildings in the planning process was contained in Welsh Office Circular 60/96 Planning and the Historic Environment: Archaeology and Welsh Office Circular 1/98 Planning and the Historic Environment, which updated Welsh Office Circular 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas following the Shimizu (U.K.) Ltd. v. Westminster City Council Judgement (February 1997). Detailed advice on Environmental Impact Assessment is contained within Welsh Office Circular 11/99 Environmental Impact Assessment. Following adoption of the TAN 24 Historic Environment on 31st May 2017, Welsh Office Circulars 60/96 Planning and the Historic Environment: Archaeology; 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas; and 1/98 Planning and the Historic Environment have been cancelled.

1.3.4 Any works affecting an ancient monument and its setting are protected through implementation of the *Ancient Monument and Archaeological Areas Act 1979*. In Wales the 1979 Act has been strengthened by *The Historic Environment (Wales) Act 2016.* The 2016 Act makes important improvements for the protection and management of the Welsh historic environment. It also stands at the centre of an integrated package of secondary legislation (Annexes 1-6), new and updated planning policy and advice, and best-practice guidance on a wide range of topics (*TAN 24 Historic Environment*).

1.3.5 Taken together, these will support and promote the careful management of change in the historic environment in accordance with current conservation philosophy and practice.

1.3.6 The *Ancient Monument and Archaeological Areas Act 1979* and *The Historic Environment (Wales) Act 2016* sets out a presumption in favour of preservation *in-situ* concerning sites and monuments of national importance (scheduled/listed), and there exists in the current *Planning Policy Wales (Chapter 6)* a presumption in favour of preservation *in-situ* of all types of heritage assets.

1.4 Location, Topography and Geology

1.4.1 The proposed development is centred on NGR SO (3)22016, (2)41886, just off the south side of Gipsy Castle Lane, Hay-on-Wye (Figure 1). The development area is a rectangular-shaped pasture field with a curving inward eastern hedge bank, which forms the boundary for the adjacent housing estate constructed in 2002. The geology of the proposed development area is superficial deposits of Quaternary alluvial fan deposits of sands and gravels and Devensian till deposits (Diamicton) overlying interbedded siltstone and mudstone of the Raglan Mudstone Formation bedrock (British Geological Survey 2017).

1.4.2 The earlier geophysical survey was undertaken on the 17th-18th August 2017 (Young 2017; Appendix III). The archaeological field evaluation was carried out between the 18th and 21st September 2017. Ground conditions were dry and firm and the weather was predominantly fine sunshine with scattered cloud.

1.5 Archaeological background

1.5.1 The area around Gipsy Castle Lane has a strong prehistoric and Roman presence. Although no sites of these periods are known within the proposed development area, a complex of curvilinear features, probably ditches, was noted in fields to the north of Gipsy Castle Lane in 1965. The Gipsy Castle Lane Enclosure (5833) and associated crop-marks were identified on a 1965 aerial photograph by Cambridge University and clearly shows multiple sets of curving cropmarks (Plate 1). The eastern cropmarks appear to resemble an Iron Age banjo enclosure (farm/settlement) and the western cropmarks a Neolithic henge or causewayed enclosure (ritual).

1.5.2 Roman activity in the wider area is represented by two forts and the conjectural line of the fossilised Kenchester to Brecon Roman Road (11603-RR63), which is aligned to the south of the proposed development area on what is now the B4350 Brecon Road. The road may have provided a link between the locations of the Clifford (4200) and Clyro (SAM RD124) Roman Forts up stream of the development area. The fort at Clifford was identified as a cropmark by aerial reconnaissance in the 1960s, however, little earthwork remains are visible on the ground. The fort is nearly square and is situated on a bend in the River Wye. The fort occupies around 6.5h contained by a set of three defences ditches. No formal investigations have been carried out but the site is considered to be an early campaign base (Burnham and Davies 2010, 237-238).

1.5.3 The successor to Clifford can be found 4km downstream at Clyro. The fort here lies partially under Boatside Farm and the earthworks here were originally recorded by the OS workers in 1832 (1st Edition 1 inch). Originally known as the Gaer, the fort encompasses around 9.5ha in the classic playing card shape. Excavations in the 1960s established two phases of construction, first a 4m wide timber revetted turf rampart and then this was later replaced by a 6m wide rampart, possibly with timber towers. A single 4m wide ditch, rock-cut in places, served both phases although an outlying ditch noted from aerial reconnaissance on the NE side of the fort may indicate an earlier larger fort or marching camp. Dating evidence is limited but suggests a pre-Flavian campaign base (Burnham and Davies 2010, 238-239).

1.5.4 Medieval activity is represented by two sets of ridge and furrow earthworks (CPAT44104 and CPAT44105) noted in the adjacent fields to the south of the proposed development area (CPAT HER). No medieval activity is known from the development area but the site is located close to the town of Hay-on-Wye, which was established certainly by 1100 when a small motte (BR077) was constructed off Swan Bank, possibly by William Revel who was granted Hay-on-Wye by Bernard de Neufmarché, the Norman conqueror of Brycheiniog (1088-95). The nearby St Mary's Church is recorded at the same time as being granted to the Benedictine Priory (Soulsby 1983, 142). Hay Castle (BR076) was built in the late 12th or early 13th century by William de Braose II to replace the small motte. The castle and town had a turbulent history being attacked during the First and Second Barons Wars. King John captured the castle and burnt the town in 1216 to suppress de Braose's rebellion. Llywelyn ab Iorwerth sacked the town and castle in 1231, which led to the first murage grant to build the town wall. The burgages of the town were principally laid out along Belmont Road, Broad Street, Heol y Dŵr and Lion Street (Soulsby 1983, 143). The town at this time the centre of a thriving wool trade. Several centuries of turmoil followed, including attacks by Owain Glyndwr in 1416.

1.5.5 Previous Investigations

1.5.6 An adjacent watching brief (Wainwright 2002) for residential housing recovered little significant archaeological deposits and features save for an undated ditch that was suggested as probably Iron Age and a collection of medieval to Modern ceramics in the topsoil.

2 Methodology

2.1.1 The archaeological field evaluation consisted of the excavation of five trenches, totalling 160 square metres, in accordance with the design Brief provided by BBNP (and agreed trench location plan). The trenches were positioned to target anomalies identified by the geophysical survey (see Figure 1). The plant provided was in the form of a JCB sized back acting excavator with a 1.8m wide grading bucket. The trenches were laid out using a Geomax Zenith 35 Pro GNSS/Glonass (GPS) Receiver and data logger. The survey was conducted to Ordnance Survey National Grid and Datum with a 20mm tolerance.

2.1.2 All trench sections were cleaned by hand and sample sections recorded in detail. No features or deposits of archaeological origin were identified in any of the five trenches. The archaeological recording techniques conformed to the best industry standard; all deposits were recorded using a single continuous context numbering system pro forma. All contexts were recorded with the trench number prefix (e.g. context 03 in Trench 1 = 103) and are summarised in Appendix II. All trenches and sample sections were photographed in digital using a Fujifilm FinePix S4800 super wide (30x) 24-720mm camera at 16mp. In all trenches, natural deposits were encountered and recorded. When no archaeological horizons were encountered during the machine excavation of the trenches then the excavations were taken down to the natural sand/gravels and mudstones. Each section of the trench was inspected and sample sections were hand cleaned and recorded, and the trench measured, before being back-filled. All trenches were backfilled with the excavated material. All trenches were open and monitored by the LPA on the 20th September 2017.

2.1.3 All classes of finds were retained (cleaned and catalogued) and arrangements for final deposition have been agreed, as set out in the requirements of the *Chartered Institute for Archaeologists' Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (2014). No deposits with palaeoenvironmental potential were encountered.

2.1.4 The field evaluation was carried out to the standards of the Chartered Institute for Archaeologists' Standard and Guidance for Archaeological Field Evaluations (2014).

2.1.5 With the permission of the landowner, the site archive will be deposited with Brecknock Museum and art Gallery for permanent curation. An accession number will be generated on submission. A digital copy of the report and archive summary will be supplied to the regional HER, the LPA (BBNP) and the Royal Commission on the Ancient and Historical Monuments of Wales.

3 Results

3.1 Stratigraphical evidence

3.1.1 The archaeological field evaluation consisted of the excavation of five trenches, totalling 160 square metres, in accordance with the design Brief provided by BBNP (and the agreed trench location plan). Trench 2 was extended from 16m to 20m in length to fully capture a probable tree throw identified on the geophysical survey.

3.1.2 The results of each evaluation trench are detailed below and contextual information can be found in Appendix III.

3.1.3 **Trench 1** (Figures 1-2; Plates 2-4)

3.1.4 Level of present ground surface: NW end 93.652mOD, SE end 93.652mOD.

3.1.5 Trench 1 was the most northerly trench, located against the field boundary to Gipsy Castle Lane. The trench was 10m in length and 2m in width and averaged 0.6m in depth. The trench was positioned over several possible linear features and a discrete area of low resistivity. No archaeological deposits or features were identified in the trench. Context 101 (topsoil) contained isolated 19th and 20th ceramics and glass. Two sample sections were recorded (Section 1 and 2) against the southwest facing section, the trench stratigraphy being uniform throughout its length.

3.1.6 Section 1 was 1m in width and 0.48m in depth. The basal layer (103) was a natural glacial outwash deposit of Quaternary sands and gravels. The deposit had frequent occurrences of large worn (<0.5m) cobbles contained in an orange-brown sandy matrix. Overlying this was a mid-brown silty loam subsoil (102) with frequent small (<0.1m) rounded stones. The overlying topsoil (101) was a mid-brown silty loam with isolated small (<0.05m) stones.

3.1.7 Section 2 was 1m in width and 0.67m in depth. The basal layer (106) was equivalent to context 103; natural sands and gravels. The deposit was found to rise steeply towards the north end of the trench from 0.5m to 0.28m in depth. This was overlaid by a mid-brown silty loam subsoil (105) that was less compacted than its equivalent in Section 1 (102) possibly indicating historic root disturbance. The topsoil (104) mirrored Section 1 (101).

3.1.8 **Trench 2** (Figures 1-2; Plates 5-7)

3.1.9 Level of present ground surface: N end 93.766mOD, S end 94.093mOD.

3.1.10 Trench 2 was positioned in the centre of the proposed development over several larger areas of low resistivity and possible linear features. No evidence of any archaeological deposits or features was present in the trench. Topsoil 201 contained 19th and 20th century finds with the exception of a single sherd of Fulham-type Brown Salt Glazed Stoneware (SGS) from the 18th century.

3.1.11 Two sample sections were recorded (Section 1 and 2) against the east facing section, the trench stratigraphy being uniform throughout its length.

3.1.12 Section 1 was 1m in width and 0.72m in depth. The basal layer (203) was a natural glacial outwash deposit of Quaternary sands and gravels. The deposit had frequent occurrences of large worn (<0.5m) cobbles contained in an orange-brown sandy matrix. Overlying this was a mid-brown silty loam subsoil (202) with frequent small (<0.1m) rounded stones. The overlying topsoil (201) was a mid-brown silty loam with heavy bioturbation from tree roots.

3.1.13 Section 2 was 1.5m in width and 0.65m in depth. The basal layer (207) was equivalent to context 203; natural sands and gravels. This was overlaid by an orange-brown silt-loam with frequent small (<0.03m) pebbles (206). The deposit was semi-circular in profile, arching from 0.6m up to 0.4m in depth, and would appear to be a natural ridge derived from glacial outwash. The overlying deposit (205) was equivalent to subsoil 202, a mid-brown silty loam subsoil with frequent small (<0.1m) rounded stones. The topsoil (204) mirrored Section 1 (201).

3.1.14 **Trench 3** (Figure 1 and 3; Plates 8-11)

3.1.15 Level of present ground surface: E end 93.957mOD, W end 94.428mOD.

3.1.16 Trench 3 was located in the centre of the proposed development over a large area of low resistivity and several possible linear features. No evidence of any archaeological deposits or features was present in the trench. Topsoil 301 contained predominantly 19th and 20th century finds with the exception of a single sherd of 18th century Staffordshire Slipware.

3.1.17 Three sample sections were recorded (Sections 1-3) against the north facing section, the trench stratigraphy being uniform throughout its length.

3.1.18 Positioned at the western end of the trench, Section 1 was 2m in width and 0.85m in depth. The basal layer (303) was a natural glacial outwash deposit of Quaternary sands and gravels. The deposit had frequent occurrences of large worn (<0.5m) cobbles contained in an orange-brown sandy matrix. Overlying this was a reddish-brown silty loam subsoil (302) with frequent small (<0.1m) sub-angular stones. The overlying topsoil (301) was a mid-brown silty loam.

3.1.19 Positioned near the centre of the trench, Section 2 was 2.2m in width and 0.53m in depth. The basal layer (306) was equivalent to context 303; natural sands and gravels. This was overlaid by a reddish-brown silt-loam subsoil (305) with frequent small (<0.1m) sub-angular stones. The topsoil (304) mirrored Section 1 (301).

3.1.20 Section 3 was positioned at the eastern end of the trench and was 3m in width and 0.52m in depth. The basal layer (309) was equivalent to context 303; natural sands and gravels. This was overlaid by a reddish-brown silt-loam subsoil (308) with frequent small (<0.1m) sub-angular stones. The topsoil (307) mirrored Section 1 (301).

3.1.21 The greater depth of deposit 302 identified in Section 1 may have contributed to the low resistivity geophysics reading over which the trench was positioned, as opposed to the presence of any archaeological deposits or features.

3.1.22 **Trench 4** (Figure 1 and 3; Plates 12-14)

3.1.23 Level of present ground surface: N end 94.259mOD, S end 94.945OD.

3.1.24 Trench 4 positioned to the SW of the proposed development over a discrete area of low resistivity and an area of magnetic response. The trench was also located over several linear features aligned broadly NE-SW. Trench length measured 20m in width by 2m depth. Average depth 0.5m. No evidence of any archaeological deposits or features. Topsoil 401 contained 19th and 20th century finds.

3.1.25 Two sample sections were recorded (Sections 1-2) against the west facing section, the trench stratigraphy being uniform throughout its length.

3.1.26 Positioned at the northern end of the trench, Section 1 was 2.5m in width and 0.42m in depth. The basal layer (403) was a natural glacial outwash deposit of Quaternary sands and gravels. The deposit had frequent occurrences of large worn (<0.5m) cobbles contained in an orange-brown sandy matrix. Overlying this was a mid-brown silty loam subsoil (402) with frequent small (<0.1m) rounded stones. The overlying topsoil (401) was a mid-brown silty loam.

3.1.27 Positioned at the southern end of the trench, Section 2 was 3.6m in width and 0.68m in depth. The basal layer (407) was equivalent to context 403; natural sands and gravels. The natural geology was overlaid by two successive deposits of silty loam (406) and silty clay loam (405). The topsoil (404) was identical to 401

3.1.28 **Trench 5** (Figures 1 and 3; Plates 15-18)

3.1.29 Level of present ground surface: NW end 94.504mOD, SE end 94.899mOD.

3.1.30 Trench 5 was located to the southeast of the proposed development area over a cluster of low resistivity responses and linear features. The trench measured 13.75m in length, 2m in width with an average depth of 0.75m. No evidence of any archaeological deposits or features. Topsoil 501 contained 18th to 20th century finds.

3.1.31 The west facing section was recorded, the trench stratigraphy being uniform throughout its length. The basal layer (504) was a natural glacial outwash deposit of Quaternary sands and gravels. The deposit had frequent occurrences of large worn (<0.5m) cobbles contained in an orange-brown sandy matrix. Located at the southern end of the trench for 2.1m in length was a light-brown silt loam deposit (503) overlying 504. The deposit (503) was very dry and friable and had the same overall thickness of 502. At 2.1m from the south end of the trench 503 descended at a 45° under the overlying subsoil deposit (502). It would appear likely that deposit 503 is derived from natural glacial outwash. Subsoil 502 was a clean mid-brown silty clay loam with isolated small (<0.1m) rounded stones. The overlying topsoil (501) was a mid-brown silty loam with isolated small stones (<0.05m).

3.2 Finds

3.2.1 The finds recovered during the course of the evaluation were confined to the topsoil in each of the five trenches. The material was processed and catalogued according to fabric type. The assemblage as a whole is dateable to the post-medieval period, specifically the 19th century with some overlap into both the 18th and 20th centuries.

3.2.2 Transfer-printed and plain white earthenwares were the most abundant fabrics, all dating to the 19th and 20th centuries, with bowls, plates and cup forms predominating. The single Fulham-type Brown Salt Glazed Stoneware (SGS) body sherd with incised decoration is datable to the 18th century (201). These types of vessels were dipped in a brown slip then salt glazed to create the mottled and pitted surface. The most common Fulham-type SGS forms are drinking vessels. The Staffordshire Slipware sherd has a reverse slip trailed decoration (301). As the name suggested this type of pottery was being manufactured in the Midlands in the 17th century but by the 18th century the main area of production was the West Country (Laing 2003, 121). Trench 5 produced four fragments of thin frosted glass with a pretty quatrefoil pattern, probably from a domestic internal glass window pane (501). The finds recovered from the topsoil are unremarkable and would appear to be consistent with general night soiling and casual loss over time.

Table 1. Finds catalogue

Context	Material Type	Fabric type	Quantity	Period	Description
101	Pottery	WETP	1	19th century	Single sherd of a decorated bowl.
101	Pottery	WE	8	19th century	Eight sherds of white earthenware, one plate rim.
101	Pottery	SGE	2	19th century	Two base sherds from a salt glaze jar.
101	Glass	-	2	19th/20th century	1x bottle neck, green glass. 1x clear glass, green hue, bottle base.
201	Pottery	SGS	1	17th-18th century	Fulham type Brown Salt Glazed Stoneware body sherd. Incised decoration present.
201	Pottery	RE	1	19th century	Red earthenware with brown internal glaze.
201	Pottery	WETP	2	19th century	Plate rim sherds, pale blue pattern.
301	Pottery	WETP	3	19th century	Blue and brown leaf and flower motif.
301	Pottery	SGE	1	19th century	Base sherd from a salt glaze jar.
301	Pottery	WE	3	19th/20th century	Small fragments of white earthenware, undiagnostic.
301	Pottery	SS	1	18th century	Staffordshire reverse slip trailed decorated body sherd.
401	Pottery	WETP	1	19th century	Blue leaf motif pie crust bowl sherd

Context	Material Type	Fabric type	Quantity	Period	Description
401	Pottery	SGE	3	19th century	Body sherds, jar?
401	Pottery	LCW	1	18th-19th century	Buff coloured sherd, internally glazed.
401	Pottery	WE	13	19th century	Small sherds, one tea cup rim sherd.
401	Pottery	WE	2	19th/20th century	White earthenware bowl base sherd.
401	Glass	-	4	19th/20th century	x4 glass fragments with green hue. Three of the fragments join. Rectangular bottle form with flared corners.
401	Lithic	Slate	2	19th/20th century	Two thin fragments of slate.
501	Pottery	WE	10	19th/20th century	Undiagnostic but both thin cup/saucer and thick plate/bowl sherds present.
501	Pottery	RE	1	18th-19th century	Red earthenware body sherd, internally glazed.
501	Glass	-	6	19th/20th century	x4 fragments of thin frosted glass with quatrefoil pattern. One thin fragment of plain glass and one thick glass bottle neck with a green hue.

Key
Quantity in total number of sherds
U/D: Undiagnostic
SS: Staffordshire Slipware
RW: Red earthenware
LCW: Local Coarseware
NDGT: North Devon Gravel-tempered Ware
SGS: Salt-glazed Stoneware
SGE: Salt-glazed Earthenware
WETP: White Earthenware Transfer Printed
WE: White Earthenware

4 Discussion and Conclusions

4.1.1 The archaeological field evaluation did not identify any features or deposits of archaeological origin in any of the five trenches. The results of the trenching married well with the geophysical interpretation confirming that the natural geology was strongly reflected, as were features of natural origin such as tree-throws, and more modern responses from agricultural activity. The topsoil and subsoils across all five trenches were fairly uniform and shallow suggesting that this field may never have been ploughed. There was no evidence of any prehistoric activity in relation to the Gipsy Castle Lane Enclosure and associated cropmarks known from fields to the north of Gipsy Castle Lane (Plate 1).

4.1.2 The disturbance (105) in the northern end of Trench 1 may have been a tree throw, which would marry well with the geophysical survey, but if true must be of some antiquity due to the compact nature of this and surrounding deposits. No evidence of a tree throw was found in Trench 2 as was suggested by the geophysics. However, the natural glacial outwash deposits (206) noted may be responsible for the geophysical response. The western end of Trench 3 produced a greater depth of subsoil than the rest of the trench and this may be responsible for the low resistivity response from the geophysics. Trench 4 did not produce any features or deposits of significance, natural or otherwise. Trench 5 was very clean and the high resistivity response at the southern end of the trench married well with the position of the silt loam deposit (503) found descending below the subsoil (502) at this point. However, this deposit (503) would appear to have been formed by natural post-glacial depositional processes.

4.1.3 The finds recovered from the topsoil are unremarkable. Only two sherds are worth noting. The first a single Fulham-type Brown Salt Glazed Stoneware (SGS) body sherd with incised decoration of 18th century date from Trench 2 (201). These types of vessels were dipped in a brown slip then salt glazed to create the mottled and pitted surface. The most common Fulham-type SGS forms are drinking vessels. The incised decoration usually the owners or tavern/brewery mark or lettering. The Staffordshire Slipware sherd from Trench 3 has a reverse slip trailed decoration (301). As the name suggested this type of pottery was being manufactured in the Midlands in the 17th century but by the 18th century the main area of production was the West Country because of the growing export trade. Trench 5 produced four fragments of thin frosted glass with a pretty quatrefoil pattern, probably from a domestic internal glass window pane (501). The depositional nature of the finds would appear to be consistent with general night soiling and casual loss over time as opposed to any suggestion of any further buried archaeological deposits or features.

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6 Appendices

6.1 Appendix I Figures

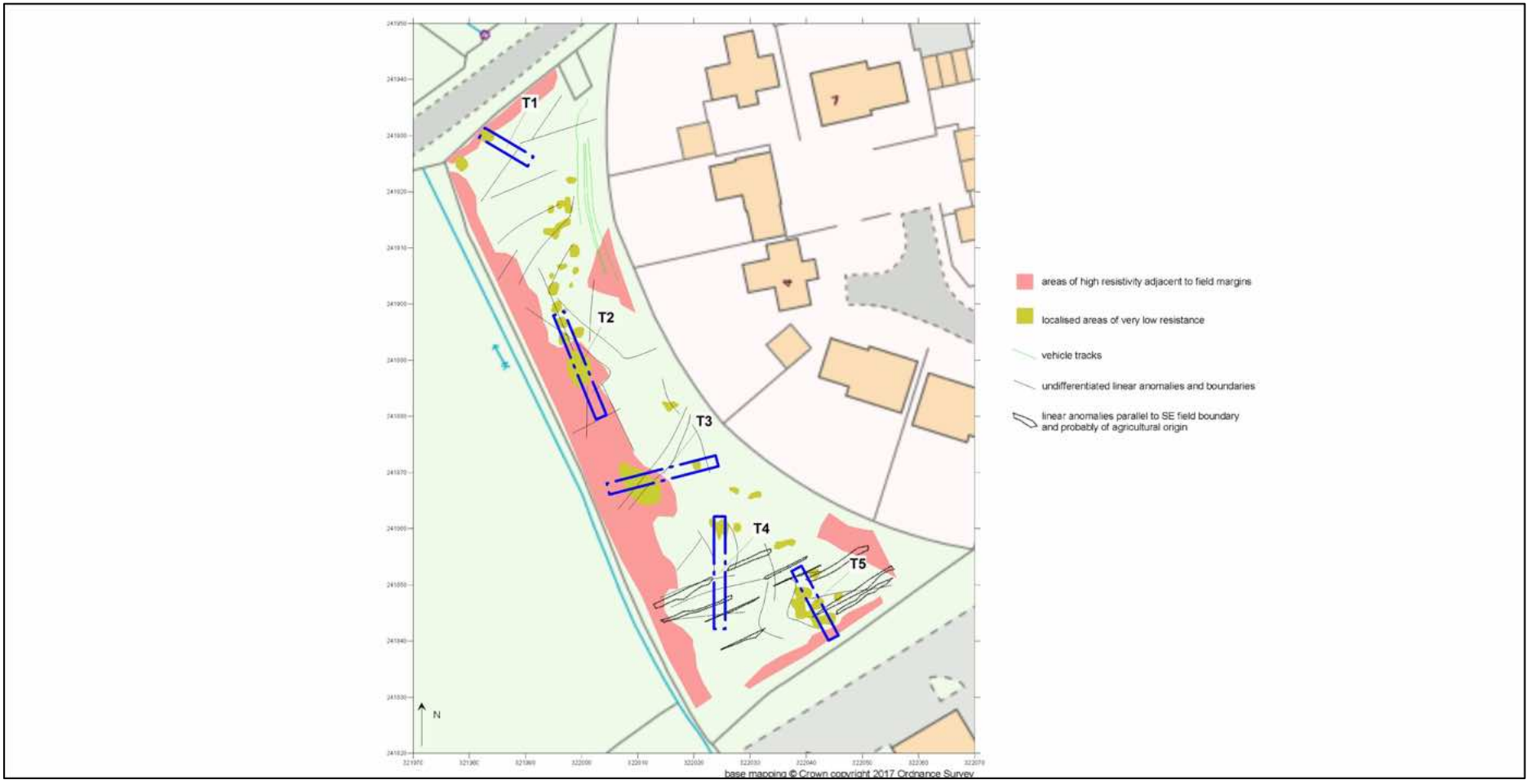

Figure 1. Location of archaeological trenches T1-T5 (blue) overlaid on geophysical survey results. Scale in 10m increments. Land south of Gipsy Castle Lane, Hay-on-Wye, HR3 5PW.

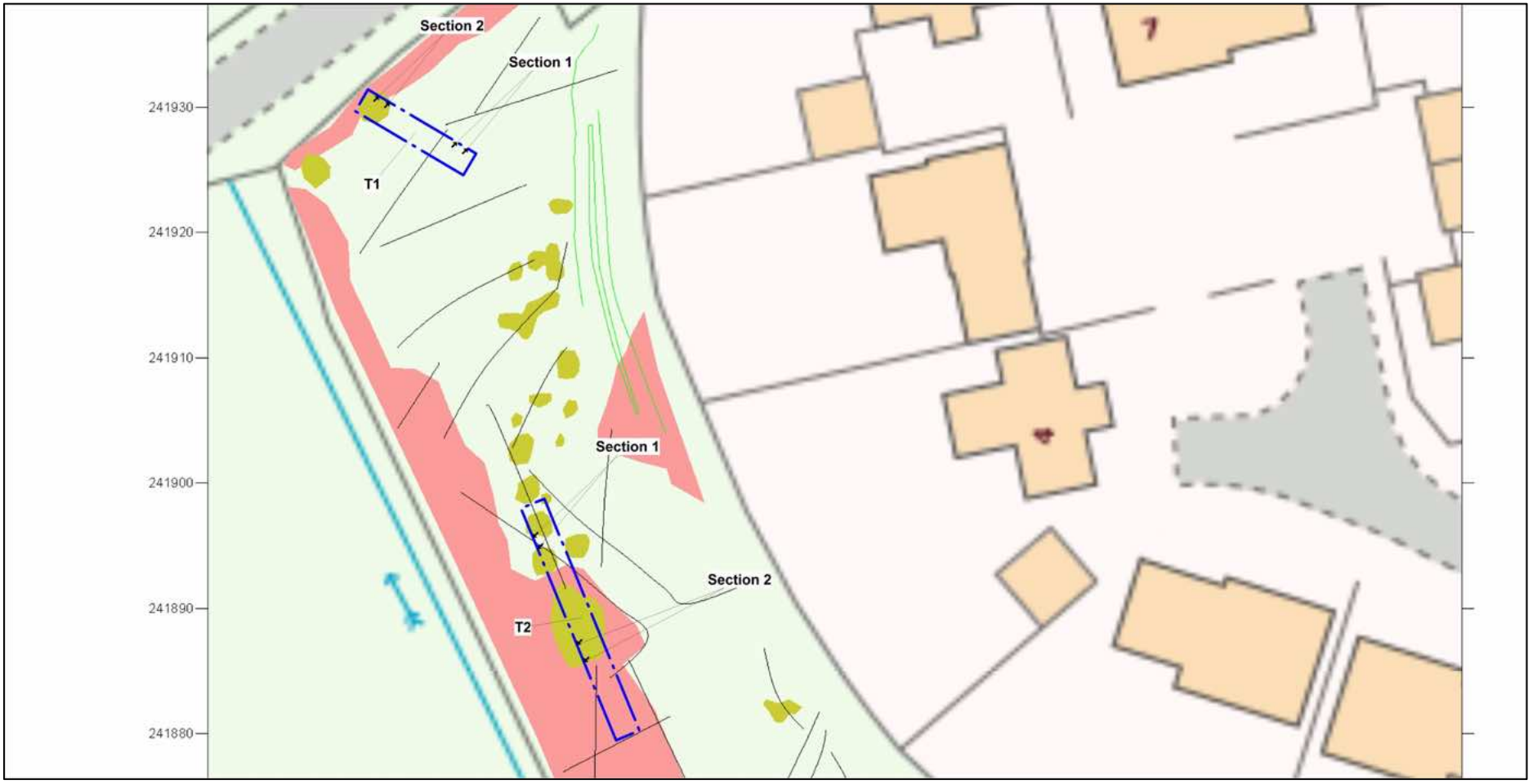

Figure 2. Location of archaeological evaluation trenches T1 and T2 (blue) showing sample section areas. Scale in 10m increments. Land south of Gipsy Castle Lane, Hay-on-Wye, HR3 5PW.

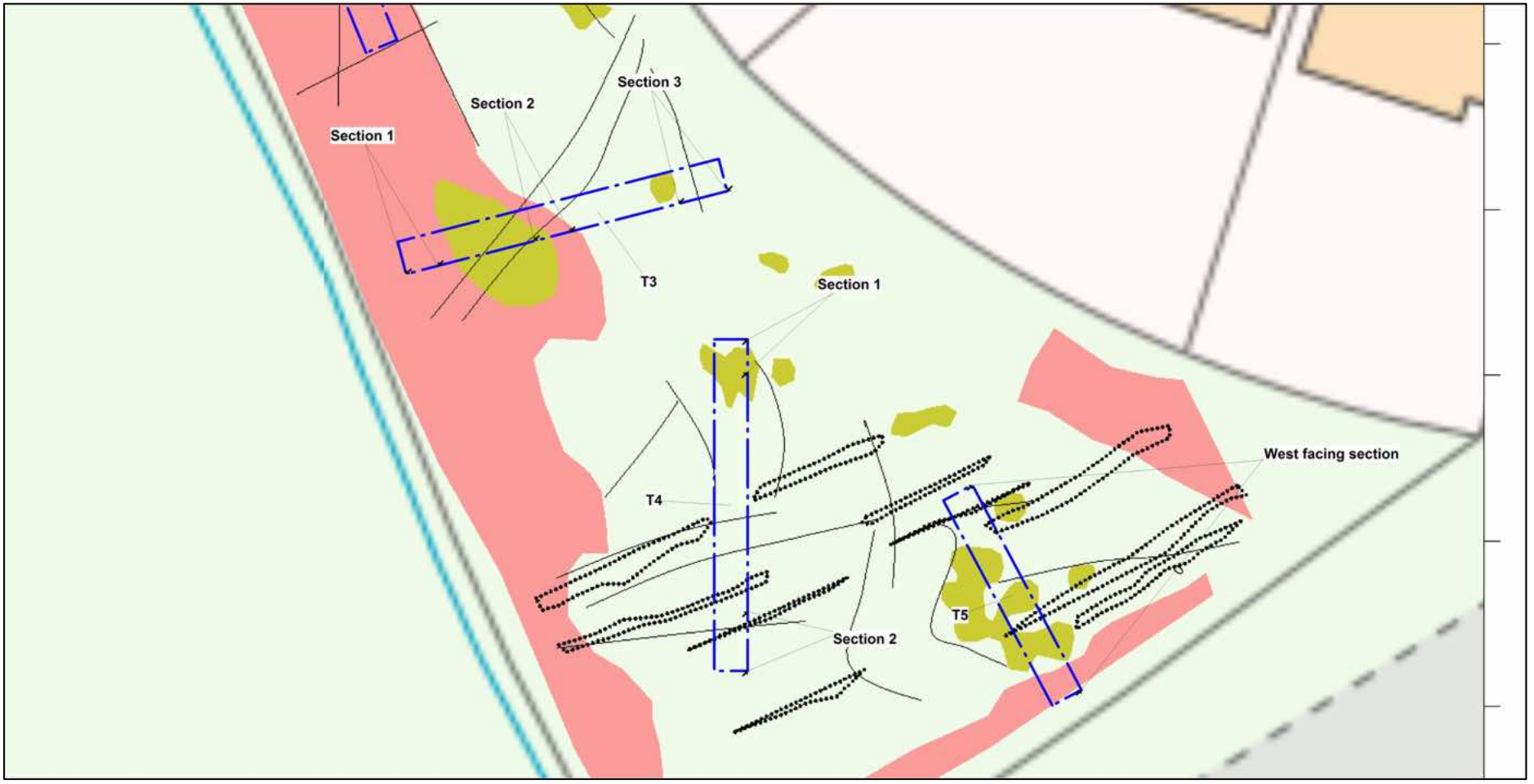

Figure 3. Location of archaeological evaluation trenches T3 to T5 (blue) showing sample section areas. Scale in 10m increments. Land south of Gipsy Castle Lane, Hay-on-Wye, HR3 5PW.

6.2 Appendix I Plates

Plate 1. Gipsy Castle Lane Enclosure (5833) and associated crop-marks identified on a 1965 aerial photograph (Cambridge University). Development area outlined in red.

Plate 2. Trench 1, view N. Scale 1m in 0.5m sections.

Plate 3. Trench 1, view NE of Section 1. Scale 1m in 0.5m sections.

Plate 4. Trench 1, view to NE of Section 2. Scale 1m in 0.5m sections

Plate 5. Trench 2, view to N. Scale 1m in 0.5m sections.

Plate 6. Trench 2, view to W of Section 1. Scale 1m in 0.5m sections.

Plate 7. Trench 2, view to W of Section 2. Scale 1m in 0.5m sections.

Plate 8. Trench 3, view to E. Scale 1m in 0.5m sections.

Plate 9. Trench 3, view to S of Section 1. Scale 1m in 0.5m sections.

Plate 10. Trench 3, view to S of Section 2. Scale 1m in 0.5m sections.

Plate 11. Trench 3, view to S of Section 3. Scale 1m in 0.5m sections.

Plate 12. Trench 4, view to NE. Scale 1m in 0.5m sections.

Plate 13. Trench 4, view to E of Section 1. Scale 1m in 0.5m sections.

Plate 14. Trench 4, view to E of Section 2. Scale 1m in 0.5m sections.

Plate 15. Trench 5, view to S. Scale 1m in 0.5m sections.

Plate 16. Trench 5, view to E of N trench section. Scale 1m in 0.5m sections.

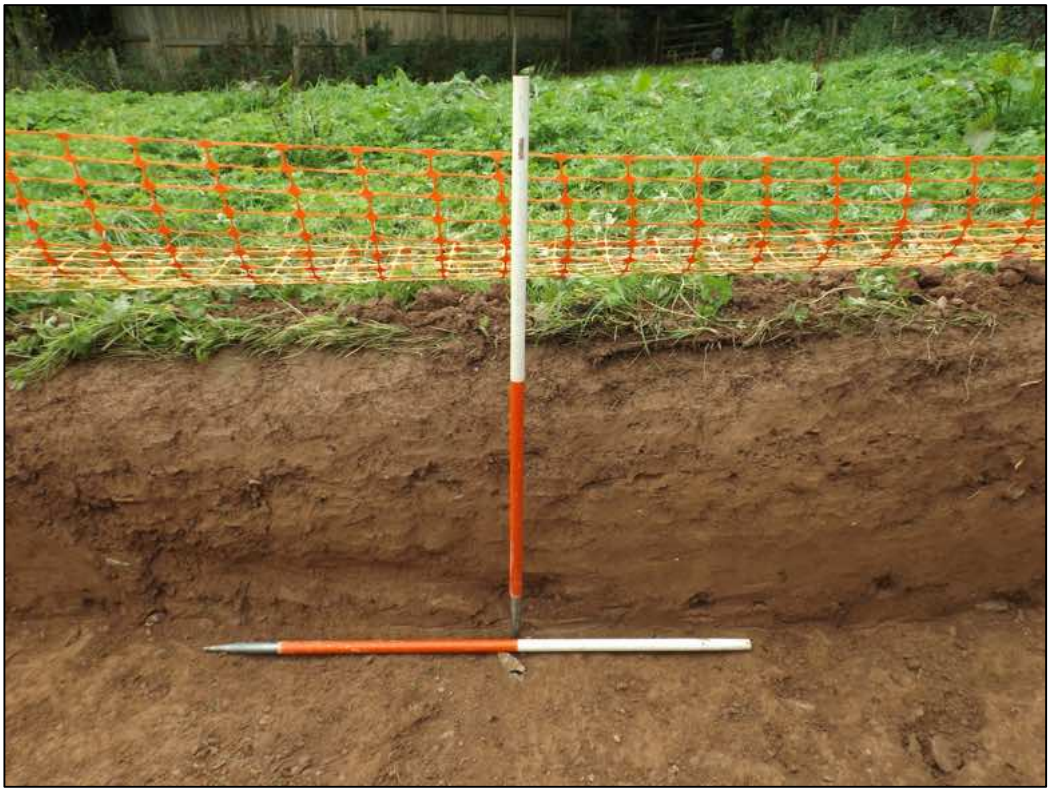

Plate 17. Trench 5, view to E of central trench section. Scale 1m in 0.5m sections.

Plate 18. Trench 5, view to E of S trench section. Scale 1m in 0.5m sections.

6.3 Appendix II Context Inventory

6.3.1 Trench 1

6.3.2 Level of present ground surface: NW end 93.652mOD, SE end 93.652mOD. Trench length 10m, width 2m. Average depth 0.6m. Trench 1 was positioned over several possible linear features and a discrete area of low resistivity. No archaeological deposits or features was present in the trench. Topsoil 101 contained 19th and 20th century finds.

Context	Type	Depth	Description	Period
101	Deposit	0m – 0.16m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 104, overlies 102.	Modern
102	Deposit	0.16m – 0.56m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 105, overlies 103.	Natural
103	Deposit	0.56m – 0.48m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 106.	Natural
104	Deposit	0m – 0.15m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 101, overlies 105.	Natural
105	Deposit	0.15m – 0.28m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 102, overlies 106.	Natural
106	Deposit	0.28m – 0.67m n.b	Natural sandstone gravels. Frequent large worn cobbles contained in an orange brown sandy matrix. Equivalent to 103.	Natural

Trench coordinates (SO): N 321982.790, 241931.390; S 321990.390, 241924.550; E 321991.410, 241926.280; W 321981.790, 241929.650. All depths below present ground surface. n.b = not bottomed

6.3.3 Trench 2

6.3.4 Level of present ground surface: N end 93.766mOD, S end 94.093mOD. Trench length 20m, width 2m. Average depth 0.7m. Trench 2 was positioned in the centre of the proposed development over several larger areas of low resistivity and possible linear features. No evidence of any archaeological deposits or features was present in the trench. Topsoil 201 contained 19th and 20th century finds.

Context	Type	Depth	Description	Period
201	Deposit	0m – 0.22m	Mid-brown silty loam topsoil. Heavy bioturbation (tree roots). Equivalent to 204, overlies 202.	Modern
202	Deposit	0.22m – 0.6m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 205, overlies 203.	Natural
203	Deposit	0.6m - 0.72m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 207.	Natural
204	Deposit	0m – 0.22m	Mid-brown silty loam topsoil. Heavy bioturbation (tree roots). Equivalent to 201, overlies 205.	Natural
205	Deposit	0.22m – 0.4m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 202, overlies 206.	Natural
206	Deposit	0.4m – 0.6m	Orange-brown silt-loam with frequent small (<0.03m) pebbles. Deposit is semi-circular in profile, arching	Natural

Context	Type	Depth	Description	Period
			from 0.6m up to 0.4m in depth. Natural ridge likely derived from glacial outwash.	
207	Deposit	0.6m – 0.65m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 203.	Natural

Trench coordinates (SO): NW 321994.990, 241897.970; NE 321996.850, 241898.740; SE 322004.430, 241880.230; SW 322002.570, 241879.460. All depths below present ground surface. n.b = not bottomed

6.3.5 Trench 3

6.3.6 Level of present ground surface: E end 93.957mOD, W end 94.428mOD. Trench length 20m, width 2m. Average depth 0.5m. Trench 3 was located in the centre of the proposed development over several larger areas of low resistivity and possible linear features. No evidence of any archaeological deposits or features was present in the trench. Topsoil 301 contained 19th and 20th century finds.

Context	Type	Depth	Description	Period
301	Deposit	0m – 0.22m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 304 and 307, overlies 302.	Modern
302	Deposit	0.22m – 0.8m	Reddish brown silty loam subsoil with frequent small (<0.1m) sub-angular stones. Equivalent to 305 and 308, overlies 303.	Natural
303	Deposit	0.8m – 0.85m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 306 and 309.	Natural
304	Deposit	0m – 0.19m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 301 and 307, overlies 305.	Natural
305	Deposit	0.19m – 0.5m	Reddish brown silty loam subsoil with frequent small (<0.1m) sub-angular stones. Equivalent to 302 and 308, overlies 306.	Natural
306	Deposit	0.5m – 0.53m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 303 and 309.	Natural
307	Deposit	0m – 0.22m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 301 and 304, overlies 308.	Natural
308	Deposit	0.22m – 0.5m	Reddish brown silty loam subsoil with frequent small (<0.1m) sub-angular stones. Equivalent to 302 and 305, overlies 309.	Natural
309		0.5m – 0.52m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 303 and 306.	Natural

Trench coordinates (SO): NW 322004.480, 241868.050; SW 322004.990, 241866.100; NE 322023.860, 241873.050; SE 322024.360, 241871.100. All depths below present ground surface. n.b = not bottomed

6.3.7 Trench 4

6.3.8 Level of present ground surface: N end 94.259mOD, S end 94.945OD. Trench 4 was 20m x 2m and was positioned to the SW of the proposed development over a discrete area of low resistivity and an area of magnetic response. The trench was also located over several linear features aligned broadly NE-SW. Trench length 20m, width 2m. Average depth 0.5m. No evidence of any archaeological deposits or features. Topsoil 401 contained 19th and 20th century finds.

Context	Type	Depth	Description	Period
401	Deposit	0m – 0.2m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 404, overlies 402.	Modern
402	Deposit	0.2m – 0.4m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 406, overlies 403.	Natural
403	Deposit	0.4m – 0.42m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 407.	Natural
404	Deposit	0m – 0.1m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Equivalent to 401, overlies 405.	Natural
405	Deposit	0.1m – 0.33m	Mid brown silty clay loam subsoil with isolated small (<0.1m) rounded stones. Overlies 406.	Natural
406	Deposit	0.33m – 0.65m	Mid brown silty loam subsoil with frequent small (<0.1m) rounded stones. Equivalent to 402, overlies 407.	Natural
407	Deposit	0.65 – 0.68m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix. Equivalent to 403.	Natural

Trench coordinates (SO): NW 322023.600, 241862.160; SW 322023.600, 241842.140; NE 322025.610, 241862.160; SE 322025.610, 241842.140. All depths below present ground surface. n.b = not bottomed

6.3.9 Trench 5

6.3.10 Level of present ground surface: NW end 94.504mOD, SE end 94.899mOD. Trench 5 is 13.75m in length, 2m in width with an average depth of 0.75m and is located to the SE of the proposed development area over a cluster of low resistivity responses and linear features. No evidence of any archaeological deposits or features. Topsoil 501 contained 18th to 20th century finds.

Context	Type	Depth	Description	Period
501	Deposit	0m – 0.15m	Mid-brown silty loam topsoil with isolated small (<0.05m) stones. Overlies 502.	Modern
502	Deposit	0.15m – 0.75m	Clean mid brown silty clay loam subsoil with isolated small (<0.1m) rounded stones. Overlies 503.	Natural
503	Deposit	0.15m – 0.75m	Light-brown silt loam deposit, very dry and friable, located at S end of trench. Deposit is the same depth (thickness) as 502. At 2.1m from the S end of the trench 503 descends at a 45° under 502.	Natural
504	Deposit	0.75m n.b	Natural sandstone gravels. Frequent large (<0.5m) worn cobbles contained in an orange brown sandy matrix.	Natural

Trench coordinates (SO): NW 322037.410, 241852.430; SW 322043.990, 241840.060; SE 322045.750, 241840.990; NE 322039.170, 241853.360. All depths below present ground surface. n.b = not bottomed

Acknowledgements and Copyright

6.3.11 The fieldwork was undertaken by Richard Lewis BA MCIfA and Dr Graham Eyre-Morgan MCIfA. The report and illustrations were prepared by Richard Lewis. The author would like to thank Mr and Mrs Davies for their help and support during the project. Thanks also to Alice Thorne (BBNP) for helpful archaeological advice and support.

GeoArch

Report 2017/21

Geophysical Survey of land off Gipsy Castle Lane, Hay-on-Wye, Powys

Dr Tim Young

22nd August 2017

Revised 1st September 2017

Geophysical Survey of land off Gipsy Castle Lane, Hay-on-Wye, Powys

Dr T.P. Young

Abstract

Geophysical surveys by magnetic gradiometry and ground resistivity were conducted across a small field centred on [SO 220419] for development control purposes (Planning Application 17/14686/OUT). The site lies to the SW of the historic core of Hay (approximately 600m SW of St Mary's Church).

The field covered an area of approximately 110m by 20 – 40m. This elongate shape, bounded on all sides by ferrous wire fencing, and the use of the field for horses, all meant that a project design was adopted which employed ground resistivity as the primary tool, rather than magnetic gradiometry that is usually the method of choice for evaluative survey.

The magnetic gradiometer survey showed strong magnetic anomalies associated with the field boundaries extending up to 5m into the field to the SW, SE and NE of the field and up to 7m at the NW. The western side of the field also showed abundant dipolar anomalies indicative of ferrous debris (probably fragments of previous fencing), locally extending a further few metres into the field. The northern part of the field showed a scatter of lesser magnetic anomalies of ferrous origin approximately down the mid-line of the field. The southern part of the field was clearer of ferrous debris, but a small number of larger ferrous magnetic anomalies were observed. There were no observed magnetic anomalies that were likely to be of archaeological significance.

The ground resistivity surveys were conducted with two different mobile probe spacings, providing a high-resolution survey (0.5m x 0.5m measurement grid) for a shallow depth (signal biased towards 0.5m – 0.75m depth) and a lower resolution ((0.5m x 1.0m measurement grid) at a greater depth (biased towards 1.0 – 1.5m depth, although incorporating the influence of shallower depths).

The shallow survey showed numerous strong negative resistivity anomalies, at least some of which showed correlation with patches of more luxuriant plant growth – probably indicating that were, at least in part, controlled by ionicity of the groundwater (i.e. nutrient content), rather than by simple moisture. Two of the larger negative anomalies showed slightly positive anomalies on their margins, and these might possibly be tree-throws. The SW side of field was marked by a broad, but variable zone of higher resistivity probably associated with up-cast from the boundary ditch. The NE and SE margins showed areas probably indicative of disturbance during the creation of the modern boundaries on those sides and in the NE corner the tracks of vehicles accessing the field were imaged. These features were superimposed on a background with much lower-amplitude linear anomalies.

The deeper survey showed similar anomalies to the major features of the shallow survey, including the major negative anomalies possibly interpretable as tree-throws, the marginal zones to the NE and SE and the broad distribution of resistivity across the area.

The broader pattern of resistivity anomalies is probably indicative of the structure of the underlying geology, although an archaeological origin for some individual anomalies cannot be excluded and they present potential targets for evaluative trenching.

Contents

Survey rationale and background

The survey was undertaken as a component of field evaluation for development control purposes (Planning Application 17/14686/OUT), as requested by the BBNPA Archaeologist. The survey was commissioned by Richard Lewis of Black Mountain Archaeology.

The site lies on a s relatively flat area of late Silurian Raglan Mudstone Formation (part of the 'Old Red Sandstone') overlain by thin Devensian till, to the south of the channel of the River Wye, at an elevation of 93 to 95m OD. The site is centred at [SO220419]. The sites to the south of Gypsy Castle Lane, approximately 600m SW of St Mary's Church.

Details of the archaeological context for the site have already been discussed in full in the project's Written Scheme of Investigation (Black Mountains Archaeology 2017), but includes prehistoric and Roman activity in the general vicinity, with particular emphasis on the presence of the Gipsy Castle Lane Enclosure (CPAT 5833) and associated crop-marks identified on a 1965 aerial photograph (Cambridge University). Furthermore, the conjectural line of the fossilised Kenchester to Brecon Roman Road (CPAT 11603) is aligned to the south of the proposed development area on what is now the B4350 Brecon Road. An adjacent watching brief (Wainwright 2002) for residential housing recovered few significant archaeological deposits and features, apart from an undated ditch that was suggested as probably Iron Age and a collection of medieval to Modern ceramics in the topsoil. To the south of the site evidence for ridge-and-furrow agriculture has been recorded from aerial photography (CPAT44104 and CPAT 44105).

The surveys were conducted in August 2017, under damp ground and weather conditions, with intermittent rain.

Surveys was undertaken within the CIfA (2014), English Heritage (2008; now Historic England) and EAC (Schmidt *et al*. 2016) guidelines.

Methods

General

Two techniques were chosen for the survey: magnetic gradiometry and ground resistivity. The field surveyed covered an area of approximately 110m by 20 – 40m. This elongate shape, bounded on all sides by ferrous wire fencing, and the use of the field for horses, all meant that a project design was adopted which employed ground resistivity as the primary tool, rather than magnetic gradiometry that is usually the method of choice for evaluative survey.

Survey layout

Surveys were laid-out using a Trimble survey-grade RTK GPS system (5700 base station and 5800 rover). A temporary base-station was created on open ground close to the entrance to the site (STN1). GPS data were logged by the Trimble 5700 base receiver during the survey layout period, to enable post-processing of locational data, using Trimble Geomatics Office (after conversion of the logged data using the *fixdatweek* utility and the *convert-to-rinex* utility, and the adjustment of the dates in the rinex files of both the logged data and of the five closest OS Net station using the *rinexdates* utility), to a final accuracy of approximately 15mm or better.

The survey was staked out (Figure 1), using the on-the-fly base station location, to design locations using the Trimble 5800 rover. The grid pegs were positioned to within 40mm of the relative design location reported by the GPS.

Since the ground resistivity survey was to be the primary tool for this project an initial survey layout was employed to facilitate this survey (i.e. to make the survey both more efficient and accurate to undertake). In this layout, the axis of the survey grids was approximately parallel to the SW side of the field (Figure 1, red linework). A second layout was employed for the magnetic gradiometry, for which north-south traverses are normally considered best practice – this survey was designed to 'round-number' 20m intervals of National Grid (Figure 1, black linework).

Methodology: magnetic gradiometry

Magnetic gradiometry was undertaken with a Bartington Grad 601 Dual fluxgate gradiometer. Data were collected at 0.125m intervals on traverse 2m apart, giving an effective traverse interval of 1.0m (single density; a data grid of 0.125m x 1.0m). Grids were walked on South to North traverses in either a zig-zag or parallel pattern depending on the most efficient approach for each individual grid. Data were downloaded from the instruments, assembled and cleaned using DW Consulting's '*Terrasurveyor Lite v3*' software. The grids were assembled, the data clipped and the destriping function employed; no data processing or filtering was applied.

The data were then exported from *Terrasurveyor* and interpolated to a 0.125m node-spacing using Golden Software's *Surfer* package to reduce pixilation where required.

Methodology: ground resistivity
The ground resistivity survey was undertaken with a Geoscan RM15 resistivity meter, operating a 'parallel twin electrode' configuration, employing three electrodes with 0.5m probe spacing on a PA5 frame, via an MPX15 multiplexer.

In this configuration, the adjacent mobile electrode pairs had a 0.5m spacing (giving the main component of the response from 0.5-0.7m depth), with 0.5m between centres, to give a 0.5m effective traverse interval. The outer probes therefore had a 1.0m spacing (giving the main component of the response from 1.0-1.5m depth), with a 1.0m traverse interval. Data were collected as a series of three measurements (left 0.5m-, right 0.5m-, 1.0m-spaced). Data were collected with a 0.5m sample interval (i.e. the raw 0.5m-spaced data has 0.5 x 0.5m node spacing and the 1.0m-spaced data has a 0.5 x 1.0m node spacing). Grids were walked on Southeast to Northwest traverses in a zig-zag pattern.

Data were downloaded from the instrument and collated using Geoscan Research's '*Geoplot*' software. The left and right datasets at 0.5m mobile probe spacing were merged into a single composite. Data cleaning was then limited to one passes of the 'despike' function in Geoplot, with radius set to 1 and a threshold of 3 std. dev., using Gaussian statistics. No data processing or filtering was applied.

Data were then exported from Geoplot and imported to Golden Software's 'Surfer'. The data were gridded by kriging to a node-spacing of 0.125m for production of the final, less pixelated, image.

Use of this report
The techniques chosen for the survey, magnetic gradiometry and ground resistivity, were selected for their utility in detecting a wide range of feature types. As with any geophysical technique, it is always possible for archaeological features to be present, but not to be distinguished, or distinguishable, by variation in the physical properties being examined at the time of survey – in this case magnetic susceptibility and water content. Absence of detectable geophysical anomalies cannot be taken as indicative of the absence of archaeological features. All anomalies have been interpreted as far as possible, with contrasting possible interpretations given where appropriate. Geophysical techniques cannot provide an unambiguous evaluation of buried features. Where a higher degree of certainty is required, physical ground-truthing of any geophysical anomalies resolved by the survey will be required.

Results

Magnetic gradiometry
The quality of the magnetic data was moderately good. The standard approach to balancing the data from the pair of instruments, using the 'destripe' function in *Terrasurveyor*, does not work well with grids that impinge on boundaries with strong magnetic anomalies. The likelihood that this would create problems with balancing the data from this particular survey was one of the reasons for ground resistivity survey being adopted as the primary survey tool. Although this concern proved justified, careful clipping of the data limits allowed creation of a moderately good dataset (Figure 2(a)). The second concern about magnetic survey in a field of this shape, was also borne-out, with zones of 4-7m width (see below for more detail) on each side being marked by the magnetic field associated with the fencing, which masks any potential signal from archaeological features in these areas. The third concern in the project design, that small fields on town/village margins, particularly where used intensively such as for the keeping of horses, typically contain much ferrous debris, was less of a problem; ferrous debris of this type is largely constrained to the central-northern part of the field.

Raw magnetic data are presented in Figure 2(a), with the interpolated and georeferenced data shown in Figure 3.

Ground resistivity
The quality of the ground resistivity data was very good. Raw ground resistivity data are illustrated in Figures 2(a) and 2(b), with the interpolated and georeferenced data shown in Figures 4 and 5.

The weather conditions produced slightly damp vegetation and ground surface, which ensured good probe contact and thus little 'noise' in the data.

Interpretation

Magnetic gradiometry
The magnetic gradiometer survey showed strong magnetic anomalies associated with the field boundaries extending up to 5m into the field to the SW, SE and NE of the field and up to 7m at the NW. The western side of the field also showed abundant dipolar anomalies indicative of ferrous debris (probably fragments of previous fencing), locally extending a further few metres into the field.

The northern part of the field showed a scatter of lesser magnetic anomalies of ferrous origin approximately down the mid-line of the field. This pattern of ferrous debris may be associated with the spreading of animal food/bedding or other agricultural activity.

The southern part of the field was mostly clearer of fine ferrous debris, but a small number of larger ferrous magnetic anomalies were observed. These are likely to be discrete ferrous objects. The SW corner of the field showed a slight scatter of low-amplitude anomalies, corresponding to an noticeably lowered surface and to an area of low resistivity (see below). This area might indicate an area either formerly permitting access to the field to the SW, or even perhaps a small pond adjacent to the ditched watercourse.

There were no observed magnetic anomalies that were likely to be of archaeological significance.

Ground resistivity
The interpretation of the ground resistivity survey is illustrated in Figure 6.

The field showed very variable ground resistivity, with both broad and localised variation. This variation in background (probably resulting from geological, topographical and land-use influences) would make

the identification of small-scale anomalies of potential archaeological origin very difficult.

Geological influences may be complex. The BGS mapping of the area shows a patchy cover of Devensian till over a fairly flat rock-head of Silurian bedrock. Bedrock is exposed at short distances to the SW and NW of the site. Material up-cast from the ditch along the SW side of the site was rich in pebbles and cobbles, possibly suggesting the till has suffered some superficial fluvial reworking. The topographically-uneven till surface, combined with the effect superficial stream flow (now represented by the ditched watercourse) may be responsible for much of the observed variation in resistivity.

The ground within the field slopes broadly to the NE, with the ditched watercourse to the west of the field running at a level above that of the ground to the east side of the field. Low resistivity was observed in the lower-lying parts of the fields, together with an area in the SW corner, where according to local anecdotal information, the ditch commonly floods into the field.

The SW side of field was marked by a broad, but variable zone of higher resistivity probably associated with up-cast from the boundary ditch (this and other marginal areas of elevated resistivity shown on Figure 6 in pink tone), although the background topography is also rising in this direction. There is a narrower zone of elevated resistivity close to the NW margin of the field that might also be indicative of the influence of a hedge-bank. The NE and SE margins showed areas probably indicative of disturbance during the creation of the modern boundaries on those sides, and in the NE corner the tracks of vehicles accessing the field were imaged (Figure 6, green lines)

Within the interior of the field, both resistivity data sets show a broad background variation in resistivity with a central, approximately North-South, band of elevated resistivity, separating areas of low resistivity to NW and SE.

Superimposed on this pattern, the 0.5m probe-spaced survey showed numerous strong negative resistivity anomalies arranged in an arcuate distribution across the field (shown in khaki tone on Figure 6). At least some of these anomalies showed a correlation with patches of more luxuriant plant growth – probably indicating that were, at least in part, controlled by ionicity of the groundwater (i.e. nutrient content), rather than by simple moisture. Two of the larger negative anomalies of this general type showed slightly positive anomalies on their margins, and these might possibly be tree-throws. Although it is possible that the arrays of such anomalies might lie over archaeological features, it would appear likely that they correspond to the influences of recent land-use.

Also likely to be of agricultural anomalies are linear anomalies parallel to the SE field boundary seen in the southern part of the field. These are interpreted as of agricultural origin (probably from before the creation of the development tot the NE of the surviving field fragment).

The black lines on Figure 6 indicate the locations of other undifferentiated linear anomalies and edges within the dataset. None of these amounts to an anomaly that is of well defined-form that could be interpreted as being of archaeological origin with any certainty.

The survey undertaken with the 1.0m probe spacings shows similar features, albeit at a lower resolution. The intense localised negative anomalies are less clear, except for the two major examples (centred at [322000,241888] and [322010,241867]) with surrounding resistivity highs, that may be tree throws. The dataset shows some areas with fine featuring at 45 degrees to the traverse direction, but this is interpreted as a moiré pattern produced as artefact during imaging.

The broader pattern of background resistivity distribution is probably indicative of the structure of the underlying geology, modified by the topographical control of groundwater into the lows and nutrient distribution due to recent agricultural practices.

Summary

The survey has demonstrated a very variable resistivity across the site, which makes identification difficult of discrete anomalies that might be of archaeological origin; the ‘diffuse’ variability is likely to have other origins. Although neither the magnetic nor resistivity surveys have produced evidence for anomalies likely to have been generated by archaeological features, testing should be targeted on the observed variation to confirm this interpretation.

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Wainwright, J, 2002, Land off Gipsy Castle Lane, Hay-on Wye, Powys. Marches Archaeology Report 234.

Figure Captions

Figure 1. Grid layout and location of topographic measurements on OS base (base mapping © Crown copyright 2017 Ordnance Survey). Margins show National Grid coordinates in metres.

Figure 2. Raw data
(a) magnetic gradiometer survey – as bitmapped image from *Terrasurveyor*. Greyscale -6nT (black) to +6nT (white).

(b) Ground resistivity data as bitmapped image from *Geoplot* of 0.5m mobile probe spacing, greyscale 25Ω measured resistance (black) to 55Ω (white).

(c) Ground resistivity data as bitmapped image from *Geoplot* of 1.0m mobile probe spacing, greyscale 25Ω measured resistance (black) to 55Ω (white).

Figure 3. Magnetic gradiometry data as interpolated image from *Surfer*. Greyscale -6nT (black) to +6nT (white). (base mapping © Crown copyright 2016 Ordnance Survey; an EDINA supplied service). Margins show National Grid coordinates in metres.

Figure 4. Ground resistivity data as interpolated image from *Surfer*. 0.5m mobile probe spacing, greyscale 27Ω measured resistance (black) to 60Ω (white). (base mapping © Crown copyright 2016 Ordnance Survey; an EDINA supplied service). Margins show National Grid coordinates in metres.

Figure 5. Ground resistivity data as interpolated image from *Surfer*. 1.0m mobile probe spacing, greyscale 20Ω measured resistance (black) to 36Ω (white). (base mapping © Crown copyright 2016 Ordnance Survey; an EDINA supplied service). Margins show National Grid coordinates in metres.

Figure 6. Summary plan of anomalies in resistivity data.
Pink – areas of high resistivity adjacent to field margins
Khaki areas – localised areas of very low resistance.
Black lines – undifferentiated linear anomalies and boundaries.
Green lines – vehicle tracks.
Dotted lines – linear anomalies parallel to SE field boundary and probably of agricultural origin.
(base mapping © Crown copyright 2017 Ordnance Survey). Margins show National Grid coordinates in metres.

Figure 1

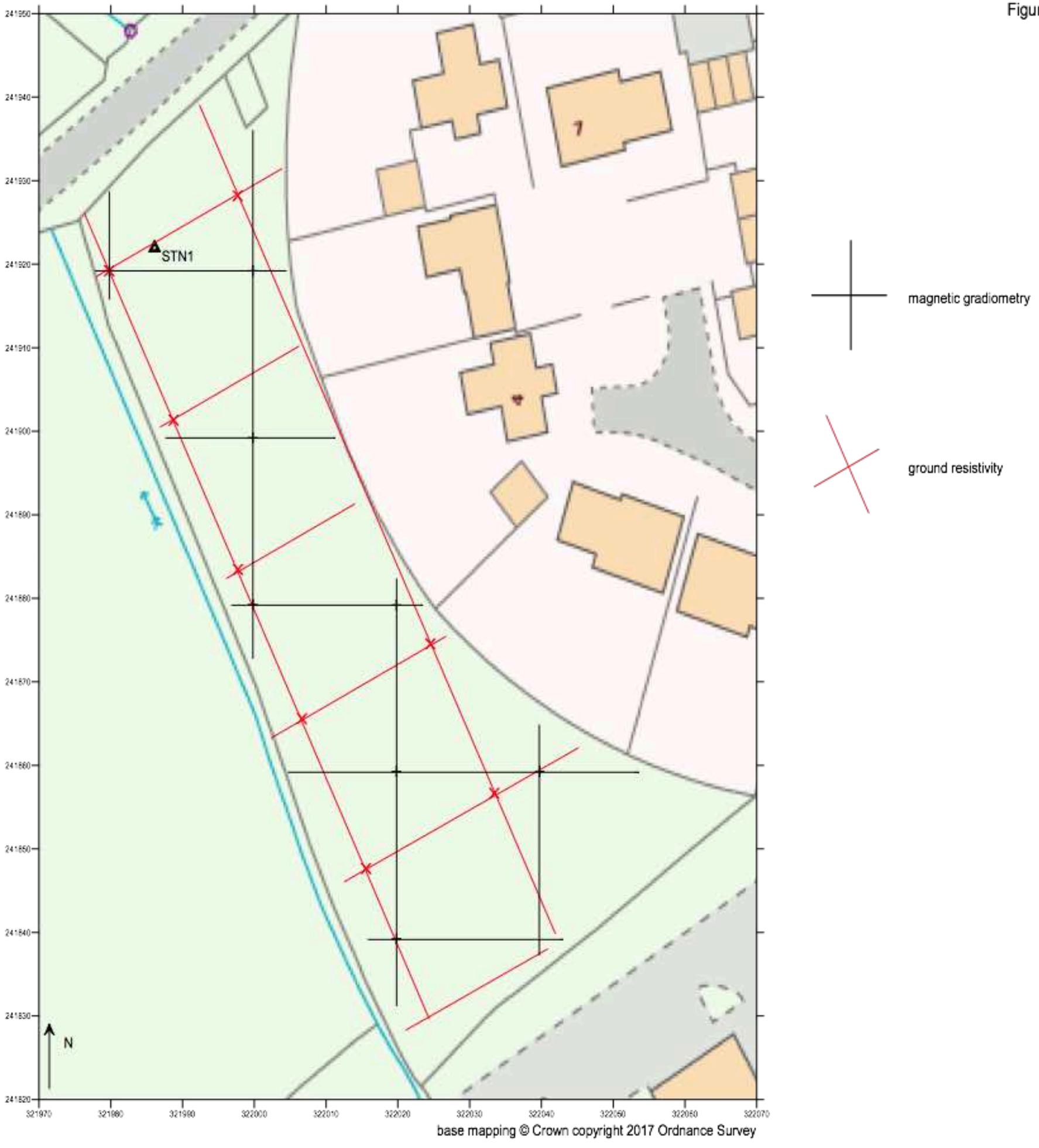
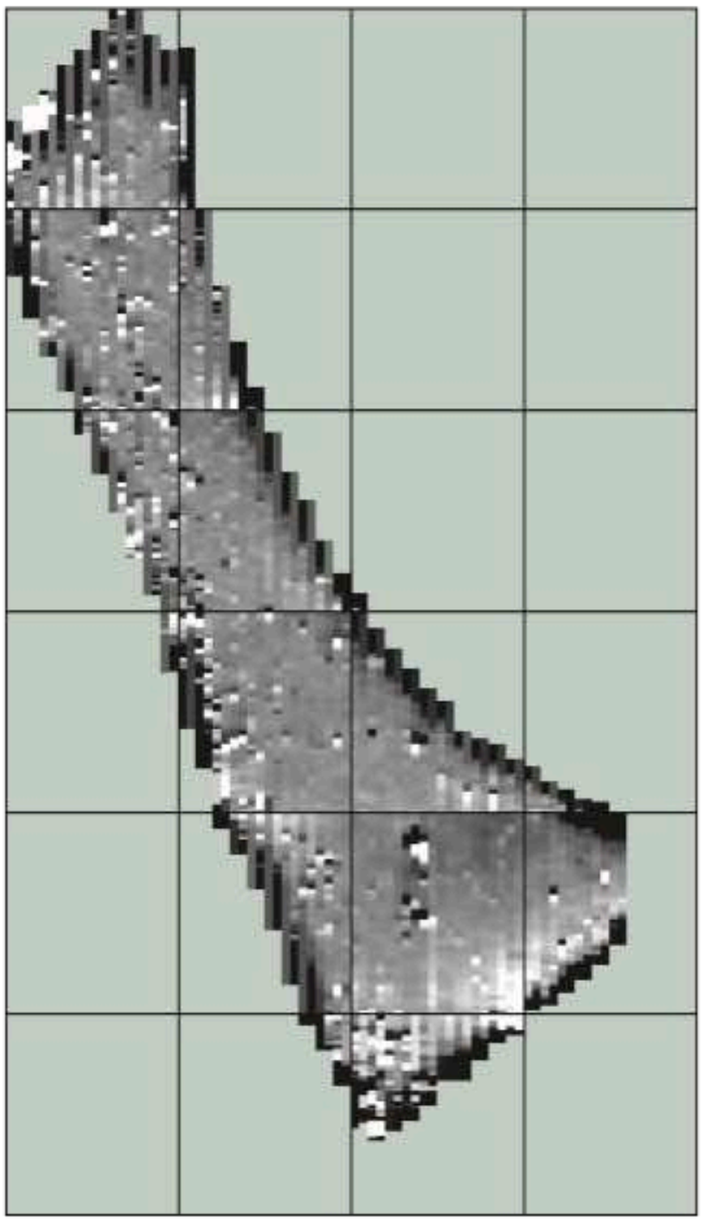


Figure 2

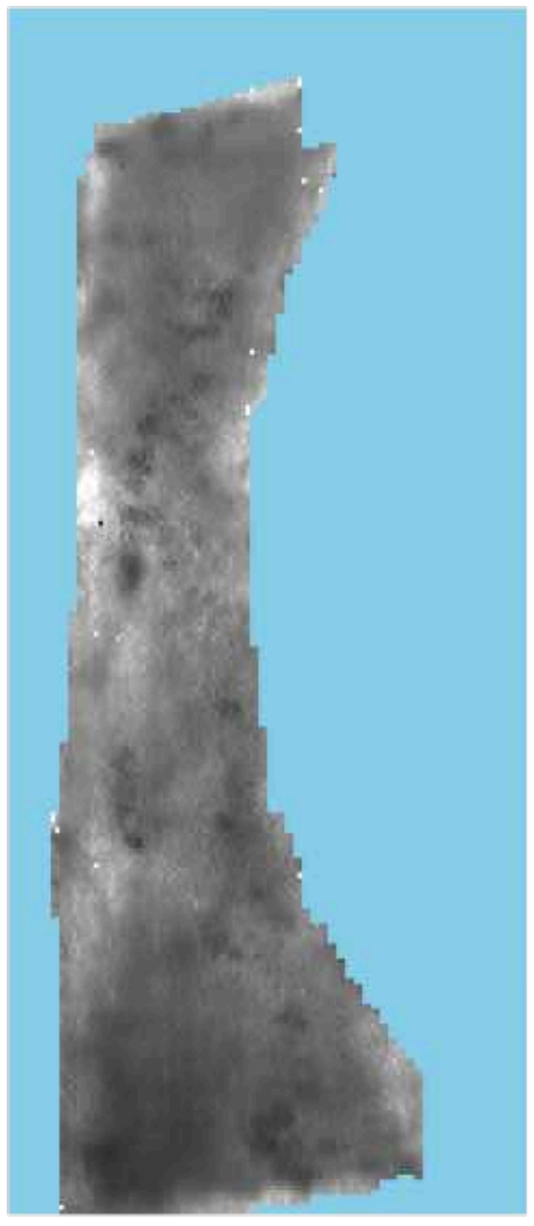
(a)



N

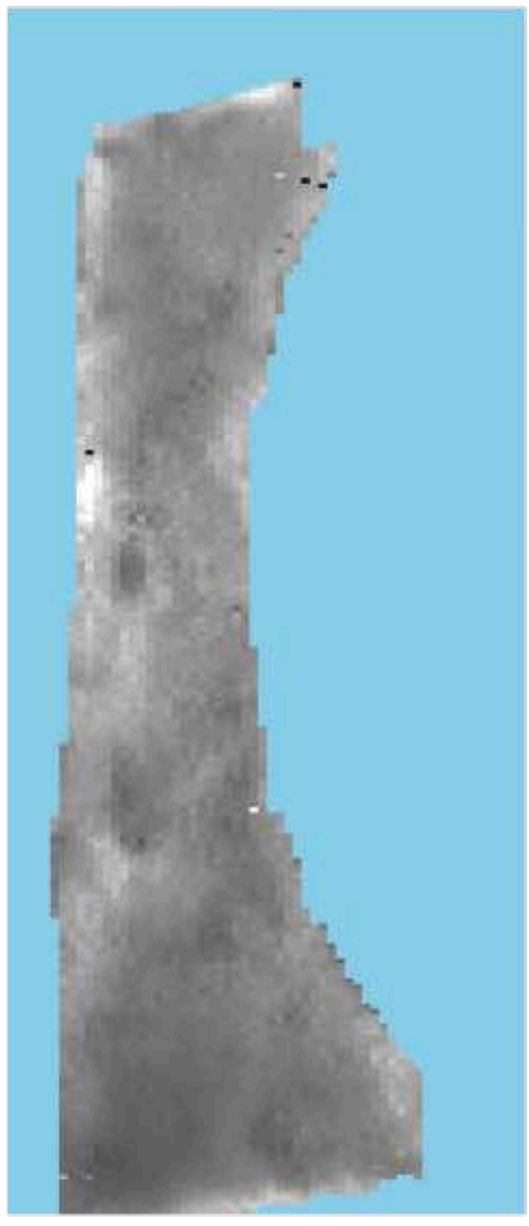
50m

(b)



N

(c)



N

Figure 3

Figure 4

Figure 5

Figure 6

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As part of our desire to improve our quality of service we welcome any feedback you are able to provide.

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