THE HULLEYS, CLOUGHTON, NORTH YORKSHIRE

ARCHAEOLOGICAL SURVEY

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**ARCHAEOLOGICAL SURVEY, THE HULLEYS,
CLOUGHTON, NORTH YORKSHIRE**

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EXECUTIVE SUMMARY

In March 2012, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by the North York Moors National Park Authority (NYMNPA) on behalf of the Staintondale and Ravenscar Local History Group (S&RLHG) to undertake a programme of non-intrusive archaeological survey at The Hulleys, Cloughton, North Yorkshire (NGR TA 0030 9625 centred). The work was required to record recently identified elements of a much wider local archaeological and historical landscape, to build on and augment the current work of the S&RLHG. The recording was funded by the NYMNPA as part of their current LEADER initiative.

Two areas of measured earthwork survey were undertaken of sites previously identified by the S&RLHG, as well as a total of 4.25ha of geophysical magnetometer survey spread over four discrete areas. All the survey work was carried out in April 2012.

It is clear that the features recorded by the current survey form a small part of a complex multi-period archaeological and historical landscape, which is likely to have developed over thousands of years and in many different phases; some features would almost certainly have been re-used in different periods for different purposes. Some of the earthworks at The Hulleys were previously recorded by Robert Knox in early 19th century and mapped in 1885, while additional features were surveyed by the Ordnance Survey in 1848-49.

The main area of earthwork survey recorded a well-defined sub-rectangular enclosure occupying a localised plateau of higher ground in Survey Area 1, once forming part of a larger enclosure extending east and also possibly south. It was also possibly linked to what appeared to be an angled trackway which extended to the east. A sub-oval feature in the north-east corner of the sub-rectangular enclosure may represent a former hut circle although its location appears to be close to a 'great tumulus' noted by Knox. The date and function of the earthworks is unclear without further research, although it is possible that the site represents a medieval farmstead or stock enclosure which lies on top of the remains of a prehistoric complex. There are further structures to the south-east and downslope from the sub-rectangular enclosure, but they respect the alignment of the natural topography and are less well constructed, perhaps suggesting they are of a different date or function. Some way to the north, the earthwork survey recorded the disturbed and denuded remains of a potential prehistoric ring cairn (Survey Area B).

Despite considerable archaeological potential, little of significance was recorded by the geophysical surveys. Within Survey Area 1, one curvilinear anomaly correlates with one of the stone banks recorded by the earthwork survey, although other straight negative linear anomalies suggest modern agricultural drains. Little evidence for the features as depicted by Knox and the early Ordnance Survey maps was noted, which implies that almost all remains have been ploughed out. Elsewhere within the other three geophysical survey areas, most of the discrete areas of magnetic enhancement are almost certainly geological in origin.

1 INTRODUCTION

Reasons and Circumstances for the Project

1.1 In March 2012, Ed Dennison Archaeological Services Ltd (EDAS) were commissioned by the North York Moors National Park Authority (NYMNPA) on behalf of the Staintondale and Ravenscar Local History Group (S&RLHG) to undertake a programme of non-intrusive archaeological survey at The Hulleys, Cloughton, North Yorkshire (NGR TA 0030 9625 centred).

1.2 The work was required to record recently identified elements of a much wider local archaeological and historical landscape, to build on and augment the current work of the S&RLHG. The scope of the work was defined by an EDAS methods statement (see Appendix 3), which was produced following discussions with both the NYMNPA and the S&RLHG. The project was funded by the NYMNPA as part of their current LEADER (Liaison Entre Actions de Développement de l'Économie Rurale) initiative, which is part of the Rural Development Programme for England (RDPE), administered by the Department for the Environment, Food and Rural Affairs (DEFRA).

Site Location

1.3 The Hulleys lies c.2km to the north-north-west of Cloughton village, which itself is c.5km north-west of Scarborough, North Yorkshire (see figure 1). The farmstead known as 'The Hulleys' lies on the west side of the unclassified Cloughton to Staintondale road, within a number of fields on the east side of Cloughton Plantations. A total of four areas were subject to a combination of earthwork and geophysical surveys in April 2012 (see figure 2).

Objectives of the Project

1.4 The objectives of the project were two-fold:

- to gather additional archaeological information on the prehistoric landscape around The Hulleys, to expand and enhance existing survey data and knowledge;

- to provide an accurate record of parts of the landscape around The Hulleys, leading to a better understanding and appreciation of the area.

Survey Methodologies

1.5 As noted above, the scope of the archaeological project was defined by an EDAS methods statement (see Appendix 3).

Desk-top Assessment

1.6 A limited amount of collation of the existing historical and archaeological information on the survey areas and their surroundings was undertaken, in order to begin to place the new survey work into context. The majority of this information was supplied through liaison with the S&RLHG.

Topographical Earthwork Survey

1.7 Two areas of divorced topographical measured earthwork survey were undertaken as part of the project, in Areas A and B. These surveys comprised detailed analytical Level 3 archaeological surveys as defined by English Heritage (2007, 23-29), and they recorded the position and form of all features considered to be of archaeological and/or historic interest.

1.8 The southernmost area, forming part of Survey Area A, was represented by a discrete area of earthworks, wall remnants, surface stones and other features, measuring c.90m long by 36m wide. The divorced survey was carried out at a scale of 1:200 using EDM total station equipment, in accordance with recent guidelines (English Heritage 2011). Sufficient information was gathered to allow the survey area to be readily located through the use of surviving structures, fences, walls and other topographical features. The survey recorded the ground level position of all earthworks, structures, wall remnants and revetments, individual significant stones, fences, hedges and other boundary features, and any other features considered to be of archaeological or historic interest. Control points were observed through trigonometric intersection from survey stations on a traverse around and through the survey area, and the survey was integrated into the Ordnance Survey national grid using a Trimble 5800 VRS differential GPS. On completion of the EDM survey, the field data was plotted and re-checked in the field in a separate operation, with any amendments or additions being surveyed by hand measurement.

1.9 A divorced Level 3 survey was also undertaken of a potential ring cairn forming part of Survey Area B, using traditional tape and offset techniques, again following guidance produced by English Heritage (2002). The earthworks were recorded by measuring distances along and from taped baselines, set out along compass bearings or between other prominent features, e.g. junctions or angles of field walls, boundaries, trees etc. The earthworks were drawn in the field at a scale of 1:100.

1.10 The two resulting field surveys are presented as interpretative hachure plans using conventions analogous to those established by English Heritage (1999; 2007, 31-35). Smaller scale plans, at 1:10,000 and 1:2,500 scale, have been used to put the survey areas into context.

1.11 Detailed field descriptions were prepared, including a summary description and preliminary interpretation of the extant remains (e.g. dimensions, plan, form, function, date, sequence of development), locational information, mention of relevant documentary, cartographic or other evidence, and management details such as an assessment of current condition and threats. Each identified feature or component within the two survey areas was also photographically recorded using a digital camera with 10 megapixel resolution. English Heritage photographic guidelines were followed (English Heritage 2007, 14) and each photograph was normally provided with a scale. More general digital photographs were also taken showing the landscape context of the area and of specific features. All photographs have been clearly numbered and labelled with the subject, orientation, date taken and photographer's name, and cross referenced to digital files etc.

Geophysical Survey

1.12 Four areas of magnetometer survey totalling 4.25ha were undertaken by specialist sub-contractors, Archaeological Services WYAS. Within Survey Area A, the geophysical survey covered 2.7ha partly within and around the area of earthwork survey. Within Survey Area B, the geophysical survey covered 1ha to the west of but not including the earthwork survey area. Area C comprised a sample strip positioned midway between The Hulleys farm and Area A; the sample strip measured 200m in length by 80m in width. During the fieldwork, an additional area (Area D) was surveyed to the east of The Hulleys farm, in a field where fieldwalking had previously been undertaken by the S&RLHG.

1.13 The geophysical survey areas were set out using a Trimble 5800 VRS differential GPS, with the Ordnance Survey national grid superimposed onto digital mapping. Temporary reference objects (e.g. small survey pins on fence posts) were established and left in place following completion of the fieldwork for accurate subsequent georeferencing. Bartington Grad601 instruments were used to take readings at 0.25m intervals on zigzag traverses 1m apart within the various survey grids. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. The full unedited geophysical survey report (Webb 2012) is presented as Appendix 2, while the results have been fully integrated into the text below.

Survey Report and Archive

1.14 This EDAS archive survey report details the results from all the areas surveyed by the project. It assembles and summarises the available evidence for the survey areas and the investigations in an ordered form, synthesises the data, comments on the quality and reliability of the evidence, and how it might need to be supplemented by further work. The various appendices include photographic registers and catalogues, an unedited copy of the geophysical survey report, and the EDAS methods statement. A draft of the report was submitted to the S&RLHG and NYMNPA for comment prior to the delivery of the final version.

1.15 The full archive, comprising paper, magnetic and plastic media, relating to the project has been ordered and indexed according to the standards set by English Heritage and the National Archaeological Record (EDAS site code WMA 11). It was deposited with the NYMNPA's Historic Environment Record at Helmsley, North Yorkshire, on completion of the project.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

Introduction

2.1 The landscape elements recorded as part of the current survey work form part of a rich and complex archaeological and historical landscape which survives in the area to the north of Cloughton. This has been the subject of investigation since at least the early 19th century, and more recently by local archaeologist Vaughan Wastling and latterly by the Staintondale and Ravenscar Local History Group (S&RLHG). The results of the latter's work have been published as a series of papers by Alan Walker (Walker 2009; Walker 2010; Walker, Carr & Smith 2011) and the following text draws heavily on these accounts.

Geology and topography

2.2 Although the name 'The Hulleys' is used on modern maps to refer to a single farmstead, it was formerly applied to a larger local area. The Ordnance Survey 1854 6" to 1 mile map not only marks the farm as 'The Hulleys', but also the surrounding fields to the south between Morfar Dale and the Cloughton to Staintondale road. A third area shown as 'Hulleys' is located to the north of the farm, at the north-east end of a sub-oval plateau of high ground. The Hulleys was set within the township of Cloughton in the mid 19th century, within the larger parish of Scalby.

2.3 The underlying solid geology of the area comprises Moor Grit Sandstones of the Scalby Formation, part of the Ravenscar Group, and there is also considerable evidence of glacial action. Most notably, a large overflow channel runs south through Caywood Plantation, to the immediate east of the survey area and significant quantities of erratics are evident within the adjacent ploughsoil, although it is still considered by some that The Hulleys plateau was not glaciated during the most recent period of Devensian glaciation (Walker 2009, 8; Walker 2010, 34).

2.4 Locally, the highest part of the landscape is the aforementioned plateau to the north-east of the farm, which is set at over 150m AOD. From here, the land surface slopes gently down from north-west to south-east, past the farm and down through enclosed pasture fields; to the east and west, the land surface slopes steeply into the wooded valleys through Caywood Plantation and Morfor Dale respectively to below 130m AOD. Within the main part of the survey area, the land surface continues to slope downwards to c.110m AOD, when it reaches the north edge of the wooded Stone Dale. Within this woodland, the land slopes steeply into the valley forming Stone Dale.

Previous Accounts

2.5 An early and very valuable account of the archaeological landscape at The Hulleys was given by Robert Knox in the mid 19th century (Knox 1855), based on observations that he had made dating back to the early 19th century. Knox produced a map, and gave upper and lower case letter identifiers to the features that he described (plate 14, 1855) (see figure 3); these same identifiers are used in the following text.

2.6 At the north end of Knox's map, feature 'a' was described as a sepulchural tumulus or house, a full 20 yards across at its base, which had had hundreds of cart loads of stone led away from it since c.1800. In May 1818, Knox and colleagues explored amongst the base stones that remained of this feature, and found an urn,

crushed to pieces, mixed with a black greasy substance, and unburnt bones (Knox 1855, 162-163). An 'Old Foss Way' (feature 'c') led across the Hulleys from the south-east towards tumulus 'a' (Knox 1855, 161), while to the west, a spur of Morfor Dale had a ridge (feature 'p') running parallel to its southern side, described as being formed of large stones and the greatest one on the Hulleys plain (Knox 1855, 162). West of this feature, another 'Old Foss Way' (feature 't') crossed Morfor Dale. A 'Raised Way' (feature 's'), described by Knox as a flat raised road between two ditches, possibly a Roman road or even an old rampart, ran approximately north-south across a moor (planted in c.1800), in the direction of another 'Old Foss Way' (feature 'r'). Knox appears to have used the term 'foss way' to denote a hollow way (Knox 1855, 162).

2.7 The majority of the remains depicted by Knox were located between Morfor Dale (now the Holm Slack valley) and what he marked as a 'Field Road', which is now represented by the existing public footpath running almost north-south through the Hulleys area. This 'Field Road' (feature 'h') had a long scarp running parallel to but some distance away from its western side, particularly along the southern part which represented the east side of Morfar Dale. Knox speculated that this might be either a raised road or an 'enclosing agger' to protect one side of a settlement (Knox 1855, 161-162). To the east, there was another house or tumulus (feature 'b'), slightly smaller than feature 'a', demolished in early 19th century and found to contain a funereal urn. Some of the kerbstones that marked its circular margin were still visible in 1818 (Knox 1855, 163). To the west, there were two further 'houes' (features 'o' and 'n'), by which Knox appears to have meant smaller mounds or cairn-like features (Knox 1855, 163).

2.8 To the south of these features, the nature of the remains described by Knox changed markedly. In the base of Morfor Dale itself was a 'Druid Circle'. This was described as being 21 feet in diameter and formed by seven stone pillars scarcely a yard in height; an accompanying depiction may suggest that four of the orthostats remained upright, whereas the other three may have been recumbent, or at least longer and shorter. Knox stated that the circle had been noted to him in 1819 by John Wharton of Scarborough, and that he himself had seen it earlier but had always assumed that it was the remains of a sheep or cattle fold. Several years later, another observer thought that there was another larger, and nearly contiguous, circle next to the smaller one, but Knox poured scorn on this suggestion. At some point after c.1820, the circle was dug into by 'antiquarian amateurs', who discovered within fragments of unglazed urns and bricks slightly baked, some of which were similar in shape to a large vertebrae, in addition to a flat 'altar stone' (Knox 1855, 159-160, 163).

2.9 To the east of the circle, in the main area of the Hulleys between Morfor Dale and the field road, Knox depicts a regularly laid-out system of conjoined enclosures ('M'), describing them as a cluster of 15 low earthern mounds crossing each other forming square areas or paddocks, set nearly to the cardinal points, and with a large cluster of beehive-like stone huts to the north, although these are not marked by a letter on the plan (Knox 1855, 162). The enclosures have a general slight north-east/south-west alignment, and had a rectangular central area (the 'M' on Knox's plan) with an enclosed trackway leading into it from the south, which eventually angled south-west towards another enclosure (see below). The central area was surrounded by regular square or rectangular enclosures to the north, south and west; there may have been an element of symmetry to those to the west, with longer rectangles to the north and south ends. There were further enclosures to the east, on a similar orientation, but slightly larger. Of these, the northernmost

contained another 'houe' (feature 'm') (Knox 1855, 163) and the southernmost one a 'druid stone' (feature 'k'), about three feet in height (Knox 1855, 162).

2.10 As already noted, the enclosed trackway leaving the central enclosure of complex 'M' eventually angled south-west towards another enclosure (feature 'f'), of contrasting irregular plan form, and described by Knox as comprising strong ridges made of stone (Knox 1855, 161). To the immediate south of this, there was another 'druid stone' (feature 'e'), similar to feature 'k' noted above. The southern part of Knox's plan is dominated by a square enclosure (K') and this was clearly the feature that most excited Knox, as he referred to it as a 'citadel'. Each side was stated to comprise loose stones, the remains being generally about two feet high. Its north and south sides measure c.34 yards in length and the east and west sides c.32 yards in length. An avenue of between 12 to 14 feet in width between two ridges of loose piled-up stones led from the south-west angle of the square in a southerly direction, extending for c.60 yards. In the interior of the square, there was a small central 'houe' or tumulus (feature 'g'), together with four pits, likened by some others to ancient British houses. The tumulus, apparently about 10 feet across, was opened by Knox in 1818, and found to contain a stone laid flat over ashes, charcoal and burnt bones. Nearly adjoining this there was another stone, again covering ashes and charcoal (Knox 1855, 163-165). The avenue had features set at right angles to both sides ('i' and 'j'); that to the west ('j') was described as an earth mound (Knox 1855, 161). That to the east ('i') ran in the general direction of what Knox saw as 'another great tumulus' ('d'), apparently with a convex plan (a domed profile?) (Knox 1855, 163).

2.11 In addition to the above, Knox proposed that the large stone circle on Cloughton Moor had once been related to the Hulleys remains, or formed part of the same landscape, and that many 'rude querns' had been discovered amongst the ruins at the Hulleys, although no specific locations are given (Knox 1855, 159 & 168). The remains were apparently much disturbed between c.1820 and 1840, both by amateur excavations and agricultural activity (Knox 1855, 161). The oldest inhabitants of Cloughton, when questioned by Knox, stated that the ruins on the Hulleys had once been more extensive, and that small round heaps of stones were also very numerous, but that these had been cleared away. When cleared, each contained two to three cart loads of stone and underneath was always found a rough flagstone floor. Knox opened one of these up (although it is not clear if these were the same as the large cluster of beehive-like stone huts said to be the north of enclosures ('M')) and said that a floor was exposed. He interpreted the structures to be primitive huts, on average six to eight feet in diameter and probably once standing up to six feet high (Knox 1855, 166).

2.12 The Ordnance Survey 1854 1st edition 6" to 1 mile map (sheet 62) (see figure 4) forms an interesting comparison with Knox's near contemporary plan, and is discussed in more detail below. Since the mid 19th century, the area of 'Hulleys' (as it is named in 1854) has attracted sporadic attention from archaeologists and historians, although as the remains were progressively destroyed, many relied on Knox's interpretations and prehistoric dating without questioning them. However, more recently, a programme of structured investigation has been undertaken, first by local archaeologist Vaughan Wastling between 1997 and 1999, and subsequently by the S&RLHG. Again, the results of these are discussed in more detail below.

Prehistoric and Romano-British periods

2.13 Fieldwalking undertaken by Wastling in the late 1990s, and more recently by the S&RLHG in 2008, recovered a substantial amount of flint artefacts, clearly demonstrating that widespread flint working was being undertaken in the Hulleys area. Wastling recorded a total of 268 tools, 50 reduced cores and at least 20 flakes for each tool. The S&RLHG recorded 30 lithic items that were considered worthy of note, including manufactured tools, waste flakes and reduced cores. Of the lithics that were recovered, apart from one possible Mesolithic microlith and three possible leaf arrowheads of Neolithic/early Bronze Age date, all remaining artefacts could be attributed to the Bronze Age or even the Iron Age. The 2008 fieldwalking area of the S&RLHG was concentrated in a field to the east of the farm and immediately to the west of Caywood Plantation. This area included the site of a large round barrow examined by Knox (the feature 'a' referred to above) in the early 19th century. Despite its poor condition, it was found to contain funerary remains, and Walker (2009, 9) suggests that this and other nearby barrows are most likely to have been of early Bronze Age date (Walker 2009, 9 & 12-14).

2.14 No evidence for the aforementioned barrow was found during the 2008 fieldwork, although a weathered but broken cup-marked stone in a field wall adjacent to the study area could feasibly have been removed from an open air location and placed in an early Bronze Age burial context. However, Walker (2009, 13) has proposed three theories as to how the flints recovered during the fieldwork may have been deposited, and how they may have related to a barrow. Firstly, that the cores were reduced and the resultant tools were lost during periods of subsequent agriculture in the early Bronze Age, prior to soils being worked out and before the construction of the barrow. Secondly, that the flints were produced and deposited during the period of barrow construction, either as votive deposits or as result of ritual activity focused on the barrow. Thirdly, that the flints represent a later sequence when stresses to population resulted in the re-introduction of agriculture to long since abandoned but revitalised marginal areas (Walker 2009, 13-14).

2.15 Walker (2009, 13-14) further acknowledges that elsewhere, the presence of flint work has been noted in the quarry ditches of Bronze Age barrows and although some may be votive deposits, the majority probably represents later activity focused on these monuments, suggesting that the working and deposition of flint may have more than just utilitarian significance. This suggestion is supported by recent excavations undertaken by Blaise Vyner on Brow Moor, above Ravenscar, which focused on a number of small cairns (Alan Walker, *pers. comm.*). Until recently, these would have been routinely considered to comprise clearance cairns, but there is scant evidence for prehistoric agriculture in the immediate area; the apparent linear distribution of the Brow Moor cairns has also been noted by other commentators. The 2008 excavations demonstrated little or no structure to the cairns and produced a paucity of finds, other than a surprisingly high quantity of worked flint. The presence of the flint is noteworthy as when the area was recorded following an extensive wildfire in 2003, relatively few lithic surface finds were recorded. One might therefore infer that, whatever the purpose of the cairns, it seems that for some reason it was appropriate to deposit flints within them. The deliberate deposition of lithics within Neolithic ritual contexts has been previously acknowledged, although the Brow Moor cairns are more likely to be Bronze Age in date.

2.16 In addition to the lithic evidence described above, in the mid 19th century Knox made reference to prehistoric remains which, based on their morphology and the items of material culture found within them, clearly included a number of Bronze

Age barrows. A 'druidical circle' recorded by Knox in Morfor Dale was excavated by Rimington in the late 1950s, when it was interpreted as a hut circle of Iron Age or Romano-British date (Rimington 1958). The feature, resembling a circle or setting of stones, rather than a stone circle, was unfortunately accidentally destroyed by forestry workers in 2001, although the stones have subsequently been re-erected in an approximate fashion (Walker 2009, 9). A possible substantial ring cairn, apparently unmentioned by Knox, lies to the north-east of the farm, and forms the one of the subjects of this report (Area B) (Walker 2009, 13).

2.17 During his fieldwork carried out between 1997 and 1999, Wastling identified Roman pottery and glass in the Hulleys area. The suggestion has also been tentatively made that the Hulleys could be a possible location for a Roman signal station, due to the intervisibility between the high ground here and the known signal stations at Scarborough Castle and Ravenscar (Walker, Carr & Smith 2011, 33).

The Medieval Period

2.18 As has already been noted, as part of the work he published in the mid 19th century, Knox described a number of features that he interpreted as prehistoric, including an enclosure which he referred as 'The Citadel' and a cluster of 'beehive-like stone huts'. When Elgee visited the Hulleys in 1927, he followed Knox's interpretation, referring to the 'Celtic fields' in the area (Walker 2009, 9). Walker (2009, 14-15) draws attention to work elsewhere which has highlighted the similarity between such fields and medieval sub-rectangular closes and suggests the enclosure, the field system and the 'stone huts' may all be contemporary with one another, possibly relating to medieval agriculture rather than prehistoric activity. Furthermore, the 'avenue' leading south off the 'Citadel' enclosure seems to head directly towards two adjacent holloways situated in adjacent woodland, with the spur marked by Knox (feature 'j') possibly acting as a funnel to bring stock into the enclosure (Walker 2009, 15).

2.19 Walker further suggests that the 'stone huts' were not huts but cairns associated with land clearance within the field system (Walker 2009, 14-15). Knox's measurements produced an internal diameter of 6-8 feet for the features after deducting the width of the perimeter wall, which would hardly leave any useable space inside. Furthermore, their morphology is not like typical roundhouses, and Knox also noted the rough flagged floors of the features. Trial pitting undertaken to the north of the farm by Wastling in the late 1990s produced a feature resembling such a rough flagged floor, but following excavation, it was subsequently reconsidered as natural underlying geology (Walker 2009, 14-15). Wastling's trial pit was re-opened and extended in 2009, so that the feature could be re-examined. This process resulted in the exposure of a roughly semi-circular surface c.2m long by 1.5m wide that was initially, on specialist geological advice, positively differentiated from bedrock. Further excavation in 2010 discovered a narrow layer of mixed clay and soil between the surface and the natural bedrock. There were no associated finds, and so the surface remained undated (Walker 2010, 33-35; Walker, Carr & Smith 2011, 31).

The Post-Medieval Period

2.20 The Ordnance Survey 1854 6" to 1 mile map forms an interesting comparison with Knox's near contemporary plan, albeit partly based on observations he had made 20 years before (see figure 5). The most striking difference is how much less is shown by the Ordnance Survey than by Knox; with the exception of the 'Druid

Circle' in Morfor Dale, Knox's 'Citadel' ('K') and the field road (the existing public footpath), everything else had disappeared. This absence of common reference points sometimes makes it difficult to accurately locate some of the more ephemeral features shown by Knox within the more detailed mapping of the Ordnance Survey.

2.21 The only features marked to the immediate north of the farm are 'Tumuli', at the south-west end of the sub-oval plateau area here. One is shown as a raised circular feature directly to the east of the lettering, but it is difficult to see any others. To the south of the farm, Knox's 'druid circle' appears as 'Druidical Circle (Supposed)'. The only apparent remnant of Knox's group of very regular conjoined enclosures ('M') is a broad curvilinear bank (almost a semi-circle) on the southern side of a field boundary. This bears little resemblance to what Knox shows, but it is noticeable that some of the field boundaries in this area appear to be on broadly the same alignment as Knox's conjoined enclosures. Further south again, and Knox's 'citadel' ('K'), the 'avenue' running south from it, spurs 'i' and 'j' and ridges 'f' are all recognisably portrayed by the Ordnance Survey, but not in exactly the same way as in 1855. For example, the ridges ('f') form a small enclosure, essentially the east end of that shown by Knox, with an additional bank running north. The 'avenue' has another enclosure running parallel to the west side, coming to a bow or shallow arched shape at its southern end beyond 'j'. Knox's mound ('i') continues east to form part of a larger enclosure, not shown by Knox, in the south-east corner of the field, perhaps with an enclosed trackway on its west side; these latter features appear truncated, and must surely have continued into the woodland to the south.

3 SURVEY RESULTS

Introduction

3.1 The following chapter provides a detailed account of the earthwork, structural and other remains recorded within each of the two survey areas, based on the field records and written observations made on site. Relevant information from the geophysical survey is also included. Reference should be made to the plans and plates, and the photographic record which appears as Appendix 1; colour digital photographs are referenced in the following text in bold type and square brackets, the numbers before the stroke representing the film number and the number after indicating the frame e.g. [**1**/**32**].

3.2 On both earthwork survey drawings, a number of conventions have been adopted. The position of larger *in situ* stones are shown, and have been blacked in. Banks containing a high proportion of stone rubble have been stippled, while possible *ex situ* stones are cross hatched. Other surface stones, including natural outcrops, have been left blank.

Survey Area A: The Enclosure and Associated Features

Location and Topography

3.3 The enclosure and associated features are located in the south-eastern corner of the improved pasture field immediately above the steep north slope of Stone Dale, south of Hulleys Farm and adjacent to the public footpath traversing the area [**1**/**187**] (see figure 2). Overall, the survey area had maximum dimensions of c.300m east-west by c.150m north-south. The majority of the area is now permanent pasture, which has been frequently ploughed in the past (meaning there are few obvious earthworks surviving), although there is a patch of unimproved rough ground containing earthworks at the southern end (see plate 1).

3.4 The main body of the earthworks recorded within the survey area was not shown by Knox (1855) although he may have depicted parts of them as isolated features (see figure 3). The overall form is however shown by the Ordnance Survey in 1854 (see figure 4); the relationship of the recorded earthworks to historic maps is discussed in more detail as part of the description given below.

Earthwork Survey and Description (see figure 6)

3.5 The area covered by the earthwork survey had maximum dimensions of c.90m east-west by 36m north-south. The westernmost part is relatively level, but it then slopes away to the south-east in a series of shallow terraces, presumably reflecting the underlying sandstone geology. The sandstone outcrops across the eastern half of the survey area, and there are surface scatters of very large angular stones. Parts of the survey area have small but dense drifts of gorse bushes growing on them, but these are not thought to obscure any significant details. The southern boundary of the survey area was to be formed by a drystone wall [**1**/**183**]; however, it was extended slightly into the area of coniferous plantation beyond in order to record fragmentary earthworks that may be associated with those to the north.

3.6 The western part of this area is occupied by a sub-rectangular enclosure ('1' on figure 6), which itself occupies a small plateau of high ground, the land surface sloping away to the east and south-east (see plate 2). The enclosure is aligned north-west/south-east, measuring c.32m long by 20m wide [**1**/**163**]. Its boundaries

are characterised by the high proportion of stone rubble within the enclosing banks. Along the north side, the bank is on average 2.0m wide and stands up to 0.7m high. The north-facing scarp is steeper than the south face, and in several places is revetted by large angular stones, although these do not appear to form a wall face proper [**1**/**160**]. At its west end, the north bank returns to the south through an approximate right angle to form the west side of the enclosure. This west bank is less prominent than the north bank, standing up to 0.5m high, but still containing a high proportion of stone rubble [**1**/**164**]. As it moves south, it becomes more spread and fragmentary; towards the southern end within the survey area, the bank returns sharply to the east, but this almost certainly results from later disturbance, rather than marking an early access point [**1**/**165**]. It is possible that the line of the western bank may be continued into the plantation beyond the drystone wall by a slight depression (a clearance?) through outcropping sandstone, which can be followed for 4m to 5m before it meets the steep north slope of Stone Dale.

3.7 Knox does not appear to show the west or north banks of the enclosure in 1855 (enclosure 'K' seems too far north), although his bank ('J') was very likely continuous with the north side (see figure 3). However, the north and west sides of the enclosure are clearly visible on the 1854 Ordnance Survey map, when they were depicted as two sides of a larger enclosure extending to the east (see figure 4). In 1854, there was what appeared to be an enclosed trackway with an angular plan form to the immediate west of the enclosure. This has now been ploughed out, but its former width may be represented by a very faint west-facing scarp set on a parallel alignment to the enclosure's west bank, c.7m to the south-west. The angled enclosed 'trackway' is faintly visible on the greyscale geophysical survey plot of this area, as are some of the banks further west marked by the Ordnance Survey; a geological origin was preferred for these features, but, given the map evidence, an archaeological origin was not discounted (Webb 2012, 3; see Appendix 2). To the north of the north bank, there may be a very slight depression running parallel to it, with a slightly raised area extending for 4m to 5m beyond this.

3.8 The southern side of the enclosure ('1' on figure 6) is less regular and less well defined than the north and west sides. Adjacent to the south-west corner, there appears to be a section of low bank containing stone rubble that forms an approximate T-shape in plan. To the immediate east of this, there are two sub-rectangular piles of stone rubble, standing up to 1m in height, that may overlie sub-rectangular structures at their base. These structures appear to be c.3m long by 2m wide, and may be linked by a narrow line of stone towards their north ends, but this is not certain [**1**/**166** and **1**/**167**] (see plate 5). There is a gap to the north of these possible structures, perhaps marking an early access point, and then the southern boundary bank of the enclosure resumes. It becomes more prominent as it moves east, and again contains a high proportion of stone rubble, with several larger semi-upright stones on the southern edge which may have acted as revetting or supports [**1**/**168**]. The bank widens, then narrows and finally returns sharply to the north to form the east side of the enclosure. This is perhaps the best defined side of all, but it does not appear on the 1854 Ordnance Survey map. The bank is 1.5m wide, steeply scarped to both sides and standing up to 0.5m high [**1**/**169**] (see plate 3). It contains a very high proportion of stone rubble, and towards the north end of the east scarp, there are at least three roughly squared stones which resemble a laid base course [**1**/**171** and **1**/**172**]. The bank ends quite abruptly, and there is a 2.50m wide gap before it recommences, although to the north of the gap it is very denuded.

3.9 The interior of the enclosure is largely empty. The western half comprises a broad curvilinear raised area, preserving fragmentary traces of low banks with a high rubble content that might once have formed sub-divisions, but are not convincing as such. The main feature is the remnant of a sub-circular structure at the internal north-east corner ('2' on figure 6). This is not depicted by the Ordnance Survey, but it is in approximately the same position as what Knox (1855, 163) referred to as 'another great tumulus' (feature 'd'), apparently with a convex form. The use of the term 'convex' might be taken to mean that the feature was a mound with a domed profile, but it could also be that Knox was trying to infer that it had a curved shape or plan form; if the latter, then it is possible that he was referring to the same feature, although it no longer resembles a 'tumulus'. The feature is oval in plan, and defined by banks containing a high proportion of stone rubble [**1**/**159** and **1**/**161**] (see plate 4). Externally, it measures c.9m east-west by 7m north-south. In some parts, the banks might be thought to overlie those defining the sides of the enclosure, but this is probably the result of the feature once standing higher and then collapsing; the north bank of the enclosure widens considerably to either side of the feature, and it seems more likely that they are contemporary. The interior of the feature is slightly depressed, with a maximum depth of 1m to the north side. There may be an entrance on the south side, defined by two upright large stones with a c.0.60m wide gap between them [**1**/**162**].

3.10 The enclosure's north bank continues north-east beyond the sub-circular feature ('2' on figure 6) for a further c.10m as a well-defined earthwork, gradually narrowing to a point and then terminating [**1**/**185**]. On the 1854 Ordnance Survey map, it continued east almost as far as the trackway running along the eastern edge of the field, before returning to the south for a short distance. This eastward continuation has now been ploughed out, although its approximate line is marked by a spread south-west facing scarp standing up to 1m in height [**1**/**173**]. There is at least one linear pile of stone rubble at the base of this scarp [**1**/**175**], but this is almost certainly a recent feature and not associated with the bank shown in 1854. The eastward continuation of the bank showed up clearly on the geophysical survey of this area, although it was interpreted as an infilled ditch, rather than a ploughed out bank (Webb 2012, 3) (see figure 7).

3.11 As has been noted above, within the former boundaries of the enclosure shown in 1854, the eastern end comprises a small plateau, with the ground surface within the rest of the enclosed area stepping down from north-west to south-east in a series of shallow natural terraces reflecting outcropping sandstone [**1**/**174**]. There are two possible structures or groups of structures on these terraces, and it may be significant that the general alignment of these respects the alignment of the natural terraces, whereas that of the enclosure described above runs counter to them.

3.12 The first structure may be a slightly raised sub-square platform, measuring c.10m along either side [**1**/**176**] ('3' on figure 6). There is a large flat stone at the south-west corner, while the south side is defined by a steep south-east facing scarp which contains a high proportion of stone rubble [**1**/**177** and **1**/**178**]. The platform retains some evidence for internal sub-division, and it is possible that the western half is formed by a sub-rectangular platform raised slightly above the level of the main feature. The second structure ('4' on figure 6), or group of structures, lies close to the drystone boundary wall on the south side of the survey area. There may be as many as four conjoined structures here, some formed by slight sub-oval depressions perhaps partly defined by large stones, with others resembling small sub-rectangular quarries [**1**/**179** to **1**/**182**] (see plate 6). An oval cairn or dump of stone rubble, 0.80m high, stands on their south side [**1**/**184**].

3.13 At the east end of the survey area, Knox's 'Field Road' marked on his 1855 plan and the 1854 Ordnance Survey track survives as a very steep sided linear depression up to 1.60m in depth, followed by the existing public footpath. Knox showed a bank running parallel to the west side of the track. This has now been ploughed out, but it may have been recorded by the geophysical survey as a linear anomaly (Webb 2012, 3) parallel to the footpath. However, the bank may still survive to the south of the drystone wall, where there is a 0.6m high and 4.0m wide linear mound on approximately the same orientation.

3.14 The enclosure shown on the 1854 Ordnance Survey map appears to be truncated by the line of the drystone field wall, and must once have continued to the south. It is possible that a bulbous mound containing a high proportion of stone rubble and standing up to 1m high may represent a remnant of the enclosure's southern side. It may continue south-west for a short distance as a stoney, south-east facing scarp, and there is a large amount of surface stone to the north; at least one of the larger stones looks as if it has been placed on edge. A 2m wide break or gap to the immediate east of the bulbous mound is aligned on a hollow way rising up the slope to the south.

Geophysical Survey Results (see figure 7)

3.15 The geophysical survey area covered c.2.7ha. Numerous magnetic anomalies were identified in this area, giving the data a 'speckled' appearance. It is difficult to give a confident interpretation for many of them. The majority of the discrete areas of magnetic enhancement are almost certainly geological in origin being due to variation in the bedrock or the stony nature of the soils; as noted above, many large boulders can be seen on the surface of the area of unimproved rough grazing which was subject to the earthwork survey.

3.16 There seems to be only a vague correlation between the features recorded on the early Ordnance Survey mapping and some of the identified anomalies (areas of magnetic enhancement), but nothing that precisely matches the features as drawn or that could be specifically attributed to human activity. Although a geological origin for these anomalies is preferred, an archaeological origin for some of them cannot, at present, be discounted.

3.17 Nevertheless, there is one curvilinear anomaly, 'A', which does clearly correlate with one of the stone banks recorded by the earthwork survey and which is shown on the early mapping. The actual anomaly is considered likely to represent an infilled ditch. Immediately to the east of 'A' is a second linear anomaly, 'B'. This also correlates with a feature shown on the first edition mapping, in this case what looks like a trackway. Elsewhere, negative linear trend anomalies have been identified. The straightness of these anomalies suggests a modern agricultural origin, perhaps field drains.

Survey Area B: the Potential Ring Cairn

Location and Topography

3.18 Survey Area B lies to the north and north-east of The Hulleys farmstead (see figure 2). Once again, the area of geophysical survey (of c.1ha) lay within a field of improved pasture, which had been ploughed almost flat in the past. The area of earthwork survey, comprising a potential ring cairn, is located to the south-east of here, on the edge of an area of largely coniferous plantation set on the north side of the access track to The Hulleys farm [**1**/**144**].

Earthwork Survey and Description (see figure 8)

3.19 The earthwork was not noted by Knox (1855) and it is not shown on the 1854 Ordnance Survey 6" map (see figures 3 and 4). The earthwork is not quite positioned on the plateau of highest ground to the north-east of the farm, and therefore does not have any long distance views to the north, as these are obscured by the gently rising land surface. To the west, prior to the plantation being established, there were probably views across Morfor Dale to the rigg on the west side, but no further. However, to the east, there is a clear view across the North Sea as far as the horizon, and to the south, very extensive views across the Scarborough headland as far south as Flamborough Head [**1**/**189** and **1**/**190**].

3.20 The earthwork was in a poor condition at the time of the survey, having apparently been subject to considerable disturbance in the past. It has a broadly sub-circular plan, with a maximum external diameter of c.24m [**1**/**156** and **1**/**158**], although there are few places where the external 'circuit' survives in anything other than fragmentary form. It is described below in a clockwise direction, starting on the north side.

3.21 At due north, the earthwork is completely absent; a regular north-east facing scarp here is set at a right angle to an old post and wire fence, representing either a former return of the fence or a vehicle trackway across the earthwork. On the east side of this gap, a spread bank gradually broadens as it runs south-east, meeting one of the best preserved parts of the external circuit. The earthwork here is formed by a low (0.30m high) spread bank, with a maximum width of 2.40m [**1**/**149**]. The east or outer scarp of the bank is both narrower and steeper than the west or inner scarp. This bank contains a high proportion of stone rubble, and at the north end there are several larger angular stones, up to 0.50m across, which appear to remain *in situ* [**1**/**150**] (see plate 7). The bank is placed on top of, and set back c.1.30m back from, a steep curvilinear east-facing scarp standing up to 0.60m in height [**1**/**146**]. Although at a glance, this might be mistaken for the edge of the earthwork, it was actually created by the ploughing down of the ground surface in the adjacent area of pasture. At the southern end of this part of the earthwork, there is a single deciduous tree standing on or near it, and also what appears to be an infilled sub-rectangular depression, measuring c.3m long by c.1.3m wide [**1**/**148**]. This depression is placed at a right angle to the earthwork and also the scarp created by ploughing - although it could have been created by vehicle use, its form and position suggest that it may be a former archaeological excavation trench.

3.22 To the south of this possible infilled excavation, the earthwork and the ploughing scarp begin to diverge. The earthwork curves to the south-west and becomes more spread, increasing in width to over 3m but becoming correspondingly lower; it also appears to contain a lower rubble content [**1**/**147**]. However, the outer scarp remains relatively steeper and narrower than the inner scarp, and there is at least one large stone which may be *in situ*, in addition to a possible *ex situ* example. There is another gap, 5.50m wide, in the circuit when due south is reached. This gap is placed roughly opposite that described above at due north, and so may mark the other side of a vehicle track across the earthwork; the bank appears to have been eroded and pushed outwards to the south.

3.23 To the west of this gap, the bank once again becomes more prominent, and reaches its maximum surviving dimensions. It again has a high stone rubble content, standing up to 0.50m in height, and a maximum 3.50m wide [**1**/**152** and **1**/**155**] (see plate 8). The bank is flat-topped, and in contrast to the eastern

surviving part of the circuit, the inner scarp is steeper and narrower than the outer scarp. The earthwork then curves around to the west at its northern end, away from a broadly circular plan form, but then returns to the north. Here it becomes more spread, lower and apparently contains a lower proportion of stone rubble. There is then a narrow gap, across which the inner scarp may continue. Immediately to the north-west of the gap is the only surviving part of the earthwork that preserves any clear evidence for built structure, as opposed to heaped or gathered rubble. There are three large angular stones in a line, set within a spread earth bank that may form the remnants of an edge or kerb [**1**/**151**]. To the north-east of these stones, the line of the circuit appears to be continued by a very shallow curvilinear depression, c.1m wide. As the depression curves around towards the aforementioned post and wire fence on the north side of the earthwork, a very spread bank becomes visible running parallel to the inner side. This appears to have a bulbous terminal just beyond where the depression meets the fence.

3.24 The interior of the earthwork is generally uneven, and difficult to interpret. Some of the changes in level are clearly due to root action of the trees within the coniferous plantation or, as already noted, potential former vehicle erosion. A north-east/south-west profile constructed across the earthwork shows that the surface of the interior is generally relatively level, and raised by c.0.50m above the ground surface of the plantation to the west of the earthwork. Nevertheless, there does appear to be a more generally raised area to the south-west of centre of the interior, associated with a surface spread of small angular stones. This has a very shallow curvilinear depression running along its eastern side, and the eastern scarp of the depression appears to mark the eastern limit of the spread of small stones.

Geophysical Survey Results (see figure 9)

3.25 An area to the north-west of the earthwork survey was selected for geophysical survey, as it was centred on the location of a man-made stone surface first identified by Wastling in 1999 and further excavated a decade later (Walker 2009).

3.26 Relative to Area A, the magnetic background in Area B is much more 'quiet', with very little variance in the readings resulting in a much more uniform grey tone to the data plot. However, there is a band along the eastern side of the area where the magnetic background is noticeably more variable. This boundary is not considered to be archaeologically significant, and again probably reflects underlying variation in the soils and geology.

3.27 The position of the test pit/excavation undertaken in 2009 is located as a discrete ferrous anomaly ('iron spike') in the survey data, presumably caused by the deposition of a ferrous item in the backfill. Overall, however, no anomalies of archaeological potential were identified in the survey area.

Survey Area C

Location and Topography

3.28 Survey Area C lies to the south and south-east of The Hulleys farmstead (see figure 2), within an area of improved pasture, which had been ploughed almost flat in the past.

Geophysical Survey Results (see figure 10)

3.29 Area C comprised a linear strip, 30m wide by c.150m long, which was located to cover an area where significantly enhanced magnetic susceptibility readings had been recorded in the past, predominantly in the eastern half of the strip. It had been considered that these elevated readings may have been caused by human activity in the vicinity. It should be noted that the exact location of these readings was not recorded.

3.30 As in Area B, there is a split between the magnetically quiet western third of the survey area and the much more variable magnetic background to the east. Whether there is any direct correlation between the enhanced magnetic susceptibility readings and the variation in the data is not clear as there are no anomalies, other than a ferrous pipe that bisects the area aligned north-south, that appear to be anything other than geological in nature. It should be noted that some of the enhanced magnetic susceptibility readings are likely to have been due to taking readings either over, or in the immediate vicinity of, the ferrous pipe.

Survey Area D

Location and Topography

3.31 Survey Area D lies to the east of The Hulleys farmstead (see figure 2), within an area of improved pasture, which had been ploughed almost flat in the past. The survey area is located just to the south of a tumulus marked by Knox and the Ordnance Survey 1st edition map (see figure 5).

Geophysical Survey Results (see figure 10)

3.32 This small block, measuring 50m by 50m, was added following discussion with Alan Walker in lieu of the reduced area surveyed in Area C. Linear trends can be seen in the data aligned north-west/south-east, parallel with the field boundary immediately to the west. These anomalies are likely to be agricultural in origin caused by ploughing when the grassland was improved.

4 DISCUSSION AND CONCLUSIONS

4.1 It is clear that the features recorded as part of the current survey work at the Hulleys form a small part of a complex multi-period archaeological and historical landscape, one which is likely to have developed over thousands of years and in many different phases. Some features would almost certainly have been re-used in different periods for different purposes. It is sometimes difficult, and indeed might be considered erroneous, without further research and investigation to place the features recorded by the current survey work within anything other than a broad chronological framework (e.g. medieval, pre-18th century and post-18th century), and it should be stressed that the assignment of a particular feature to one of these periods is based on a combination of available documentary sources, the form and relationship to other features, and professional judgement. A more widespread consideration of the Hulleys within its landscape setting would in particular need to include the wider prehistoric remains in the vicinity of Cloughton and Ravenscar, but such a consideration lies beyond the scope of this report - this work is being done by the S&RLHS.

4.2 As would be expected, the local topography and landform is likely to have been of fundamental importance to the development of the local historical and archaeological landscape, in particular the presence of an area measuring c.500m east-west by c.900m north-south, running from the plateau to the north of the potential ring cairn (Area B) as far south as the earthworks (Area A) on the edge of Stone Dale. This area is bounded by Morfor Dale to the west and the glacial overflow channel running through Caywood Plantation to the east, and approximates to the area marked as 'Hulleys' on the Ordnance Survey 1854 6" map (see figure 4). At Risby, in East Yorkshire, glacial spillways or meltwater overflow channels also enclosed a well-defined physical unit, which formed the core of the township and medieval manor, and might arguably have served to define a territorial unit with its origins in the Romano-British or possibly later prehistoric periods (Dennison & Richardson forthcoming).

4.3 Closer to the Hulleys, in 1989 and 1993, Spratt proposed, based on the distribution of surviving Bronze Age round barrows and cairnfields, that the Jurassic sandstone area of the North York Moors had been divided into a number of Bronze Age territories or 'estates'. Each estate comprised a cairnfield, a stretch of grazing land on the hills, meadows in the dale and access to water supplies. The influence of these estates may have been extremely long-lasting, as they are very similar to medieval townships which had similar requirements for their mixed farms (Spratt 1989; Spratt 1993, 92-141). Although such evidence is currently lacking for the Hulleys, the possible presence and influence of early landscape boundaries which only became legally formalised during much later periods should not be dismissed.

4.4 With the exception of the possible Mesolithic microlith and three possible leaf arrowheads of Neolithic/early Bronze Age date recovered during fieldwalking, the earliest evidence for human activity at the Hulleys is the presence of a number of circular barrows, noted by Knox, most likely to be of Early Bronze Age date (Walker 2009, 9 & 12-14). Knox noted three features which he interpreted as large tumuli or houses (features 'a', 'b' and 'd') (see figure 3). All three have since been destroyed above ground, although it is possible that feature 'd' corresponds with a surviving feature within Survey Area A, and was not actually a barrow (see below). If, for the moment, feature 'd' is discounted, then features 'a' and 'b' are placed on the eastern half of the area described above, above the 135m contour. However, they do not occupy prominent visual positions as is often the case (such as the probable Middle Bronze Age cairns at Beamsley Beacon near Ilkley (Luke &

Richardson 2010)), nor do they appear to be followed by a later parish or township boundary, as proposed by Spratt. Nevertheless, they would both have had far-reaching views to the east, out to sea, and to the south, along the coast as far as Flamborough Head. They are also located away from the potential associated areas of field systems and settlement noted during the mid 19th century.

4.5 The possible association of these barrows with the potential ring cairn in Survey Area B, and some of the other features noted by Knox, is also of significance. The potential ring cairn is placed just to the south of the plateau of highest ground within the Hulleys, and may once have had other monuments in close spatial association, as 'Tumuli' are marked to the immediate west on the 1854 Ordnance Survey map (see figure 4). This area also has limited views to the north and west, but very extensive views to the east and south. The earthwork is now in poor condition, but in its original form it apparently had a broadly sub-circular plan, with a maximum external diameter of c.24m, and was defined by a low spread bank averaging 2.50m in width, containing a high proportion of sandstone rubble that was possibly edged by larger stones in sections. There is no clear evidence for contemporary interior features. Only a limited number of ring cairn sites on the North York Moors have been excavated, but of those that have, several contained internal cremation burials and were probably Early Bronze Age in date (Manby, King & Vyner 2003, 89).

4.6 The potential ring cairn at the Hulleys also falls within the upper range of sizes noted for other ring cairns on the North York Moors (Spratt 1993, 102-103). However, elsewhere in England, on Dartmoor for example, surveyed examples of Early Bronze Age ring cairns were generally only half the size of the Hulleys example. Interestingly however, some preserved evidence for a stone kerb on one or both sides of the bank, and the banks often had openings, which may have functioned as entrances (Newman 2011, 46-47). It may therefore be that the breaks or gaps in the banks of the Hulleys example that have been ascribed to vehicle damage in the earthwork description above are at least in part actually earlier, or perhaps even contemporary, features.

4.7 Another notable characteristic of the Dartmoor ring cairns was that they seldom occurred in isolation, and were usually either paired with other cairns of different forms or were part of a group (Newman 2011, 47). Again, this is reminiscent of the setting at the Hulleys, with possible contemporary barrows or cairns to the west (the 'tumuli' recorded by the Ordnance Survey) and to the south (the barrows recorded by Knox). In relation to this possible grouping of monuments, the 'beehive-like stone huts' and numerous small round heaps of stone referred to by Knox might also be included, if they were interpreted as the remains of a cairnfield. However, their elevation might be considered somewhat low for this interpretation; Fleming (1971, 20-24) noted that within north-east Yorkshire, cairnfields occur normally at elevations of between about 183m to 305m AOD. However, most slopes (almost always dry) on which the cairns occurred faced south, south-west, or south-east, and there was sometimes an association between cairnfields and ring cairns, noted elsewhere such as in the Derbyshire Peak District. Fleming's conclusions were broadly followed by Spratt and Simmons (1976, 201-204), who also noted an occasional association of cairnfields with ring cairns. The latter relationship was recorded in some detail by the excavation and survey work at Danby Rigg, although it was noted that an assumed Bronze Age date for the cairnfield by association with the ring cairns was speculative (Harding & Ostoja-Zagorski 1994, 16-97).

4.8 To summarise, there is therefore some evidence to suggest that the more elevated parts of the Hulleys once contained a grouping of at least two circular barrows and one ring cairn of possible Early Bronze Age date, while around and to the south of these there may have been smaller cairns of prehistoric but not necessarily contemporary date.

4.9 Perhaps the most puzzling aspect of the Hulleys' landscape is whether any of the enclosures recorded by Knox and the Ordnance Survey in the mid 19th century have a contemporary spatial relationship with the those features described above, a matter not helped by the discrepancies between what the two mid 19th century sources recorded. Earthwork field systems are amongst the most complex surviving historical and archaeological landscapes in Yorkshire, and ongoing fieldwork is demonstrating this complexity. One might see, as Elgee did in the late 1920s, some similarities between what was recorded at the Hulleys in the mid 19th century and the so-called 'Celtic fields' surviving at High Close in Grassington, upper Wharfedale, for example, the relationship between enclosed trackways and adjacent enclosures. Such field systems were traditionally assigned an Iron Age/Romano-British date, but this is now generally considered too recent (Manby, King & Vyner 2003, 103) and also a great oversimplification (Martlew 2011, 60-72). Elsewhere in upper Wharfedale, contrasts are drawn between medieval townships where earlier co-axial field systems were perpetuated and those where contour strip lynchets were laid out afresh (Moorhouse 2003, 311-319). Walker (2009, 14-15) rightly draws attention to work elsewhere which has highlighted the similarity between 'Celtic' fields and medieval sub-rectangular closes, and suggests that the enclosures, the field system and the 'stone huts' recorded by Knox at the Hulleys may all be contemporary with one another, possibly relating to medieval agriculture rather than prehistoric activity.

4.10 What, then, can be said about the various enclosures at the Hulleys? In summary, the small surviving earthwork portion forming part of Survey Area A comprises a sub-rectangular enclosure ('1' on figure 6) occupying a localised plateau of higher ground, and once forming part of a larger enclosure extending east, and possibly also south into what is now a plantation on the north edge of Stone Dale. It was also possibly linked to what appeared to be an angled trackway which extended to the east. The sub-rectangular enclosure was defined by banks containing a high proportion of stone rubble, and these were laid out counter to the adjacent terracing reflecting the underlying outcropping sandstone. In the mid 19th century, Knox differentiated between banks that were 'earthern mounds' and those which contained much stone, and this difference must surely be of some significance, perhaps indicating different functions or construction at different periods. The sub-oval feature in the north-east corner of the sub-rectangular enclosure ('2' on figure 6) could be a former hut circle with an entrance on the south side, although its location appears to be close to the 'great tumulus' (feature 'd') noted by Knox. If this is so, it is difficult to see how Knox could describe what remains in the field as such, perhaps suggesting that material has been removed since the mid 19th century or that Knox was simply mistaken. There are further structures to the south-east and downslope from the sub-rectangular enclosure but they respect the alignment of the natural terracing, rather than running across it. They are also far less robustly constructed than the sub-rectangular enclosure, again perhaps denoting that they either performed a different function or that they are of a different period.

4.11 Turning to the enclosures shown by Knox (see figure 3), their most significant characteristic may be their similarity. Although Knox placed great emphasis on the square enclosure ('K') and the 'avenue' that lead to it, the central part of his group

of enclosures ('M') is actually of a similar form i.e. a straight, narrow, long enclosure running towards a larger enclosure placed to the east side of the north end. Furthermore, the banks (features 'i' and 'j') running off the 'avenue' at right angles are very similar to those running off the long enclosure within 'M'; could enclosure 'K' and the avenue once have been surrounded by similar enclosures?

4.12 This leads to further questions. Were they two complexes with a similar layout, existing at the same time, or did one supersede the other, perhaps explaining why one was better preserved in the 19th century? If they did exist contemporaneously, then did they form sub-divisions of a single unit under a single overarching control, or separate units (performing different functions) under a single overarching control, or even loose groupings of separate units that developed independently? The latter seems unlikely, given the possible similarities of plan form and the proximity of one to the other, and if the former, who or what performed the overarching control?

4.13 To return to Walker's suggestion that these features relate to medieval agriculture, one possible origin could be the core of a medieval sheep or cattle complex, belonging to a secular or ecclesiastical landlord, and perhaps linked by some of the trackways noted by Knox to grazing enclosures. One would have expected such a complex to have left some trace in the documentary record, and further research might uncover references to it. It is known that Staintondale was an important estate held by the Knights Hospitallers and centred on Bell Hill during the medieval period, and Bridlington Priory did hold a vaccary (cattle farm) centred on Crowden Farm to the north of the Hulleys in the 12th and 13th centuries (Harrison 2000). However, no other ecclesiastical holding is noted at Cloughton, although the site could easily have been established by farmers creating new enclosed holdings from the forest tract known as Fulwood which included the Hulleys area, as they were doing immediately to the east at Cloughton Thwaites and Cloughton Newlands in the 13th century (Harrison 2000, 313). The presence of such a medieval complex could explain why there are no clearly identifiable prehistoric remains in the southern half of the Hulleys area, as these were removed during the medieval period. This process has been noted elsewhere within the North York Moors, for example at Scotland Farm near Hawnby, where a cairnfield had been partly cleared to allow a large complex of buildings to be erected, quite possibly a previously unrecognised bercary (sheep farm) belonging to Byland Abbey (Dennison & Richardson 2011).

4.14 Despite their name, such complexes were often designed to accommodate a variety of different animals with different needs, and again this could be an explanation for the differing forms of the boundaries recorded by Knox. Finally, examples of re-used or partly cannibalised prehistoric enclosures incorporated into bercary complexes are known from Wharfedale (Moorhouse 2003, 339), Gloucestershire (Dyer 1995, 147), and possibly also on Iron Howe, above the aforementioned Scotland Farm (Dennison & Richardson 2011). The imposition of a medieval stock complex onto, and partly re-using, the remains of a prehistoric landscape at the Hulleys, but leaving the more elevated elements such as the barrow and ring cairn undisturbed, is perhaps the best hypothesis that can be offered at present.

4.15 Disappointingly, despite considerable archaeological potential, little of significance was recorded by the geophysical surveys. Within Survey Area 1, one curvilinear anomaly correlates with one of the stone banks recorded by the earthwork survey, although other straight negative linear anomalies suggest modern agricultural drains. Little evidence for the features as depicted in the mid 19th century by Knox

and the Ordnance Survey was noted, which implies that almost all remains have been ploughed out. Elsewhere within the other three geophysical survey areas, most of the discrete areas of magnetic enhancement are considered to be almost certainly geological in origin.

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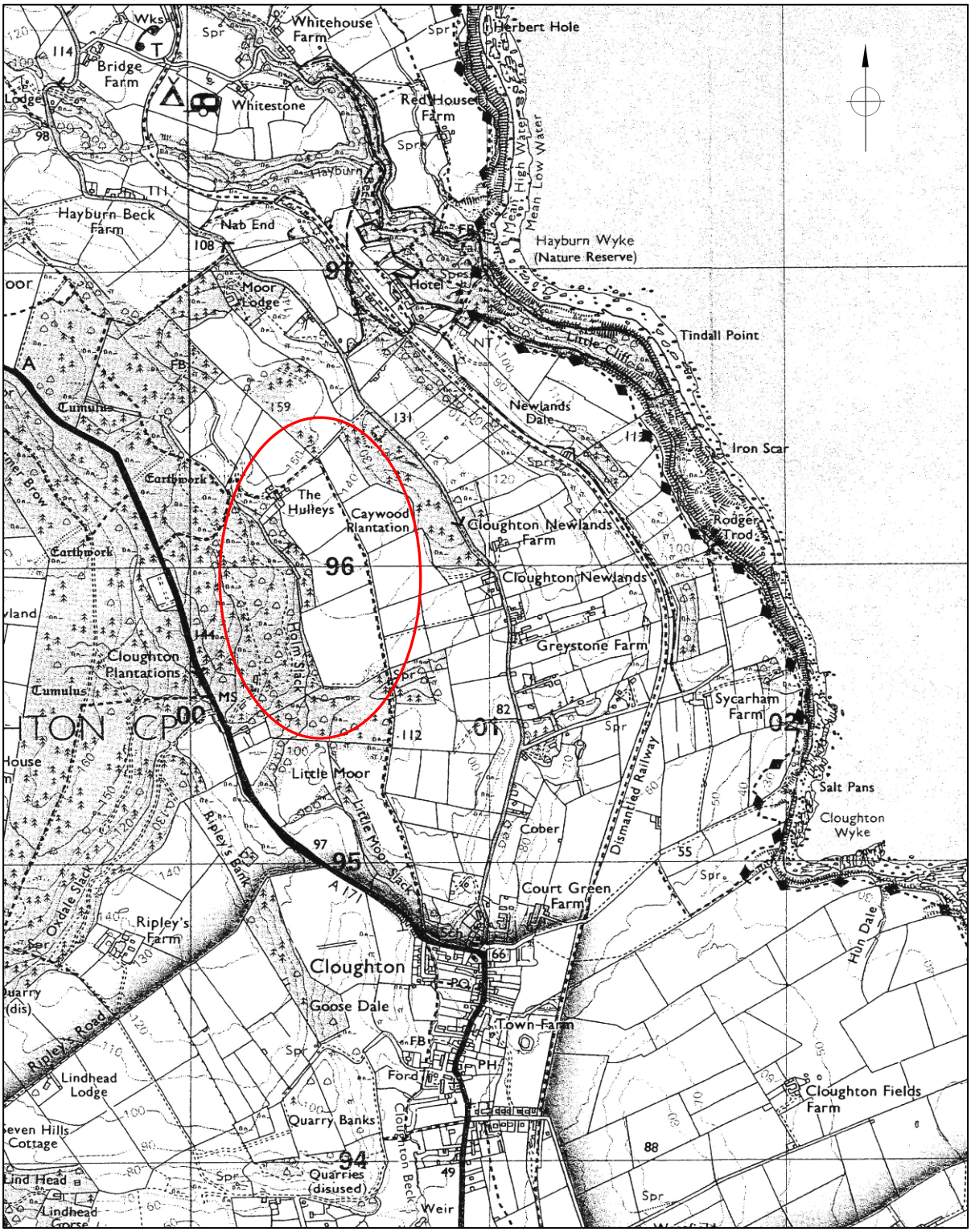
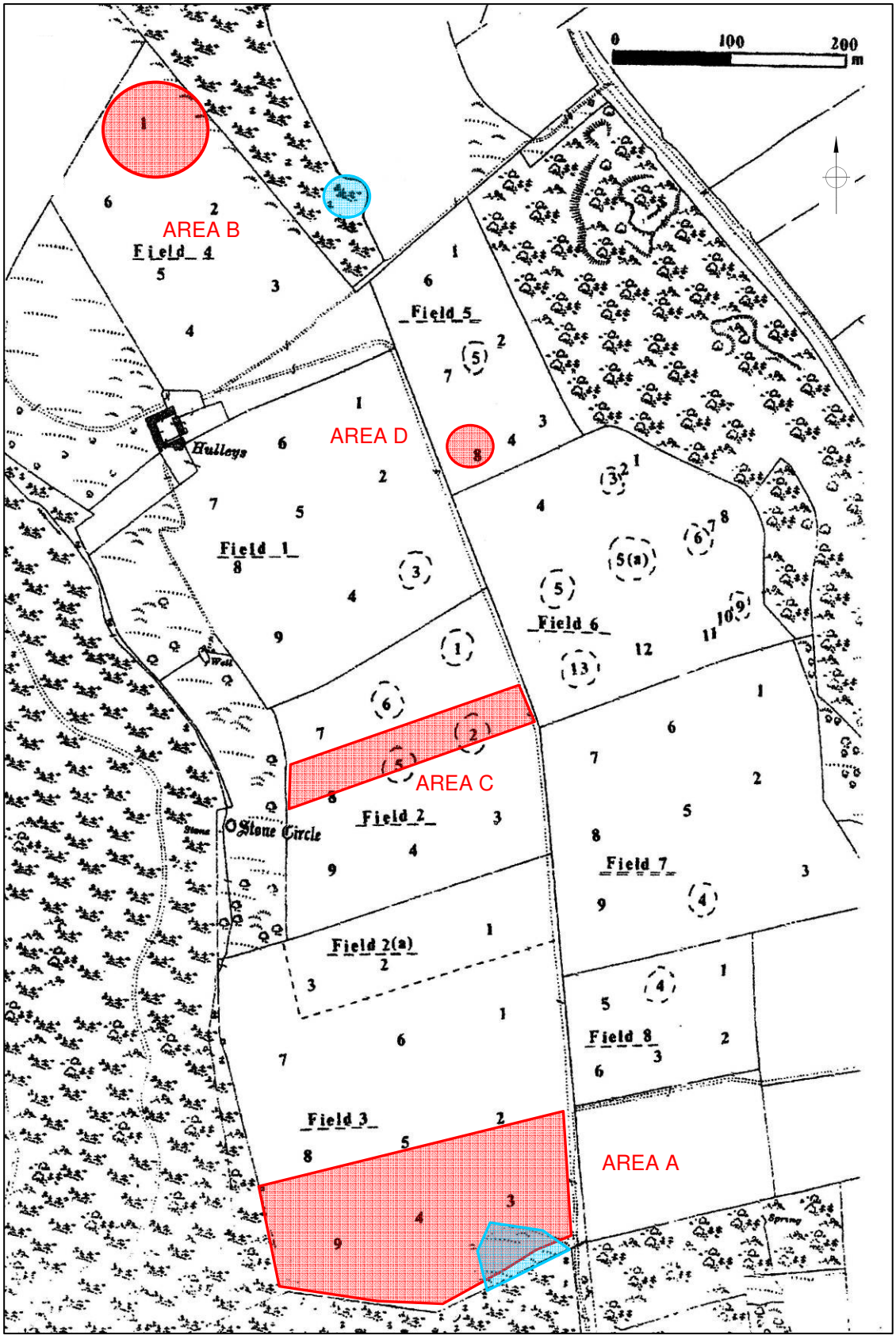
6 ACKNOWLEDGEMENTS

6.1 The archaeological survey work at The Hulleys was commissioned by the North York Moors National Park Authority (NYMNPA) on behalf of the Staintondale and Ravenscar Local History Group (S&RLHG). The project was funded by the NYMNPA as part of their current LEADER initiative, which is part of the Rural Development Programme for England (RDPE), administered by the Department for the Environment, Food and Rural Affairs (DEFRA). Thanks are due to Alan Walker (S&RLHG), Claire Shields (NYMNPA) and Messrs John and James Ulliott, and Mr and Mrs D Nuham (farmers) for their help in organising and carrying out the survey.

6.2 The topographical earthwork survey was undertaken by Shaun Richardson and Benchmark Surveys of Leeds, assisted by Richard Lamb. The geophysical survey was undertaken by Archaeological Services WYAS of Morley, Leeds. Shaun Richardson also produced the site archive and a draft report. Comments on the draft report were kindly received from Alan Walker (S&RLHG) and Graham Lee (NYMNPA). The final report was produced and edited by Ed Dennison of EDAS, with whom the responsibility for any errors remains.



PROJECT	THE HULLEYS, CLOUGHTON
TITLE	GENERAL LOCATION
SCALE: NTS	DATE: SEPT 2012
EDAS	FIGURE: 1

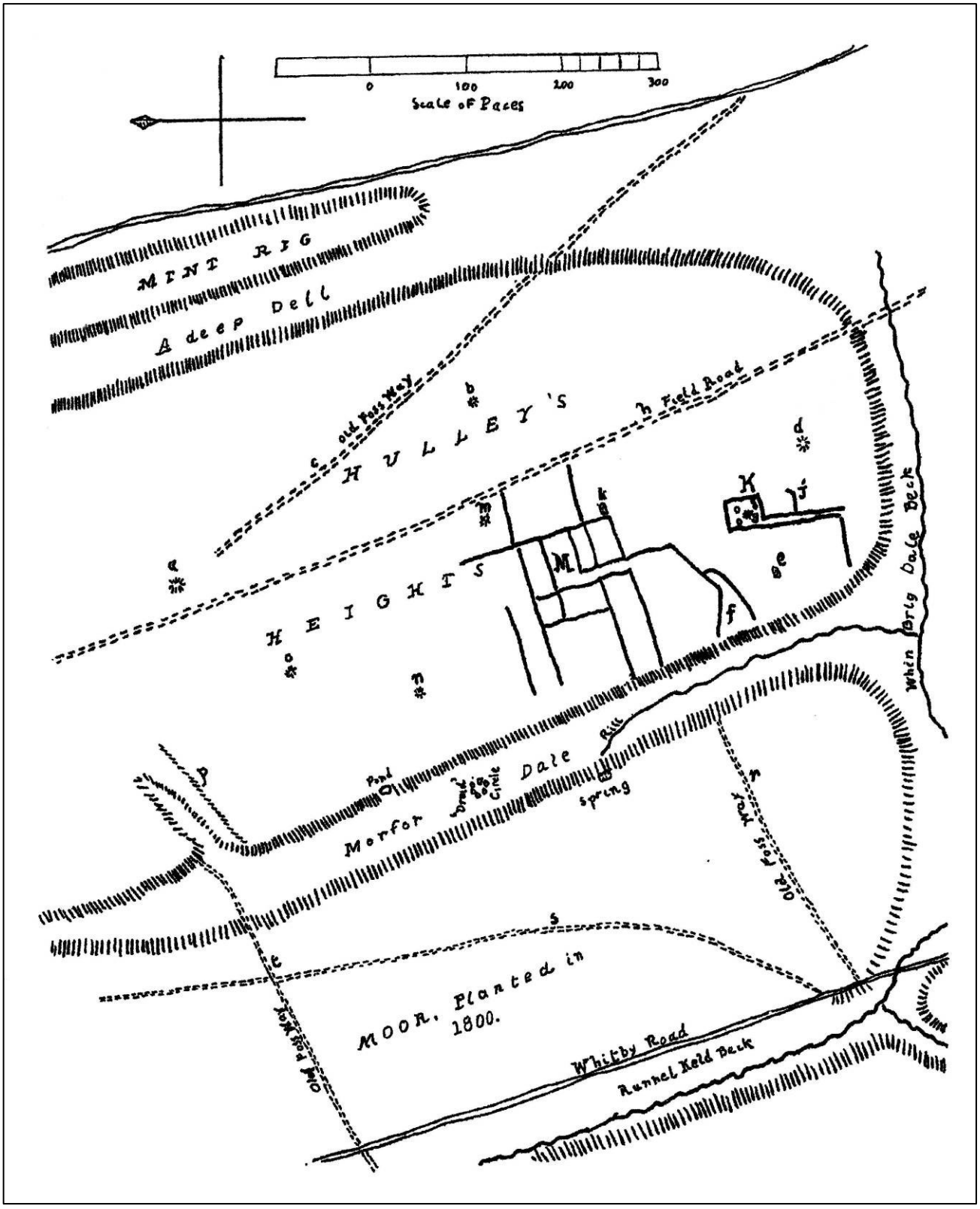


Blue: areas of earthwork survey.
Red: areas of geophysical survey.

Numbers represent previous S&RLHR magnetic susceptibility readings over 100.

Base plan provided by S&RLHR.

PROJECT: THE HULLEYS, CLOUGHTON	
TITLE: AREAS OF SURVEY	
SCALE: AS SHOWN	DATE: SEPT 2012
EDAS	FIGURE: 2



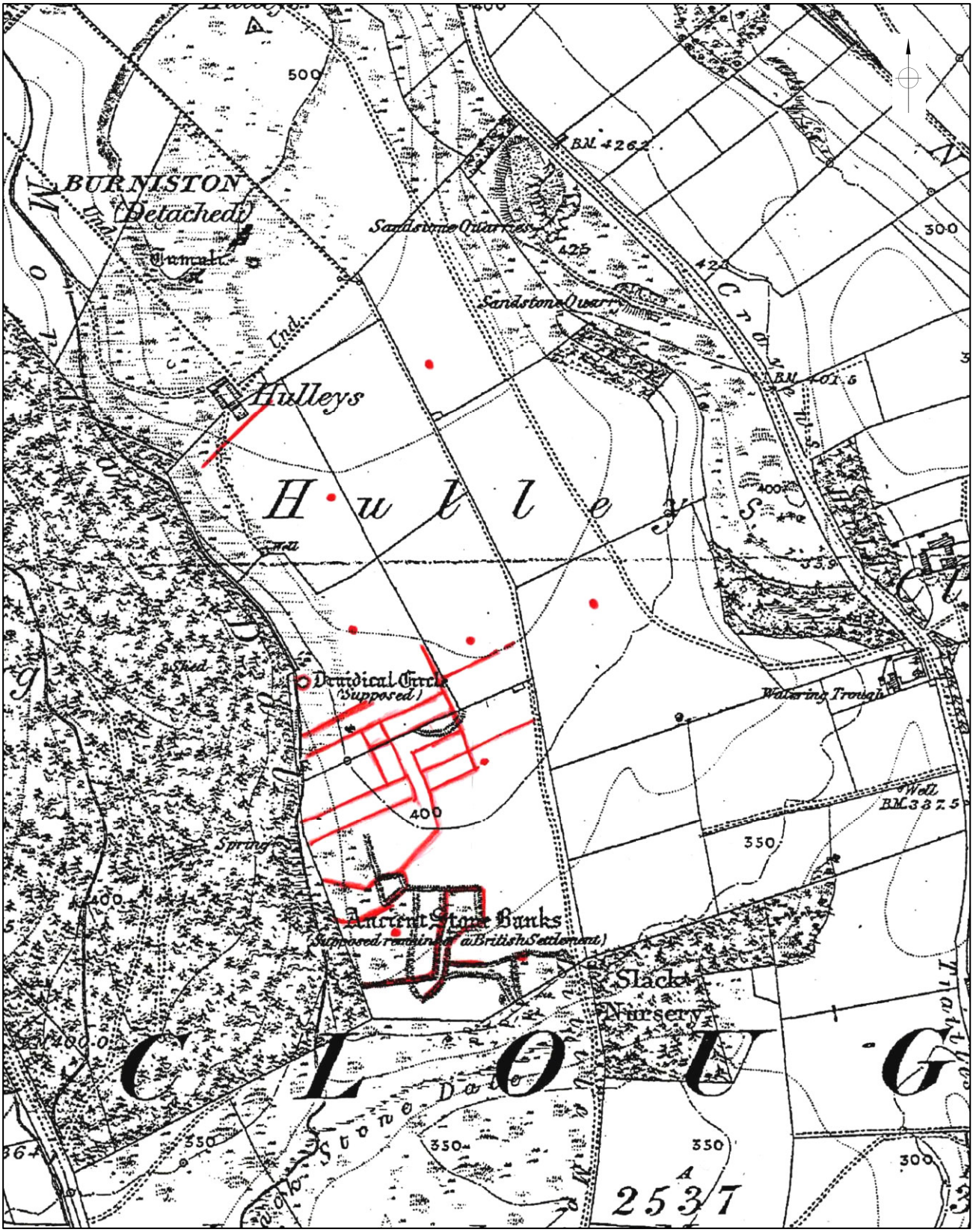
Source: Knox, R 1855 *Descriptions Geological, Topographical and Antiquarian in Eastern Yorkshire, Between the Rivers Humber and Tees,* plate 14.

Note: north pointing towards the left.

PROJECT	
THE HULLEYS, CLOUGHTON	
TITLE	
KNOX'S PLAN OF 1855	
SCALE	DATE
NTS	SEPT 2012
EDAS	FIGURE 3

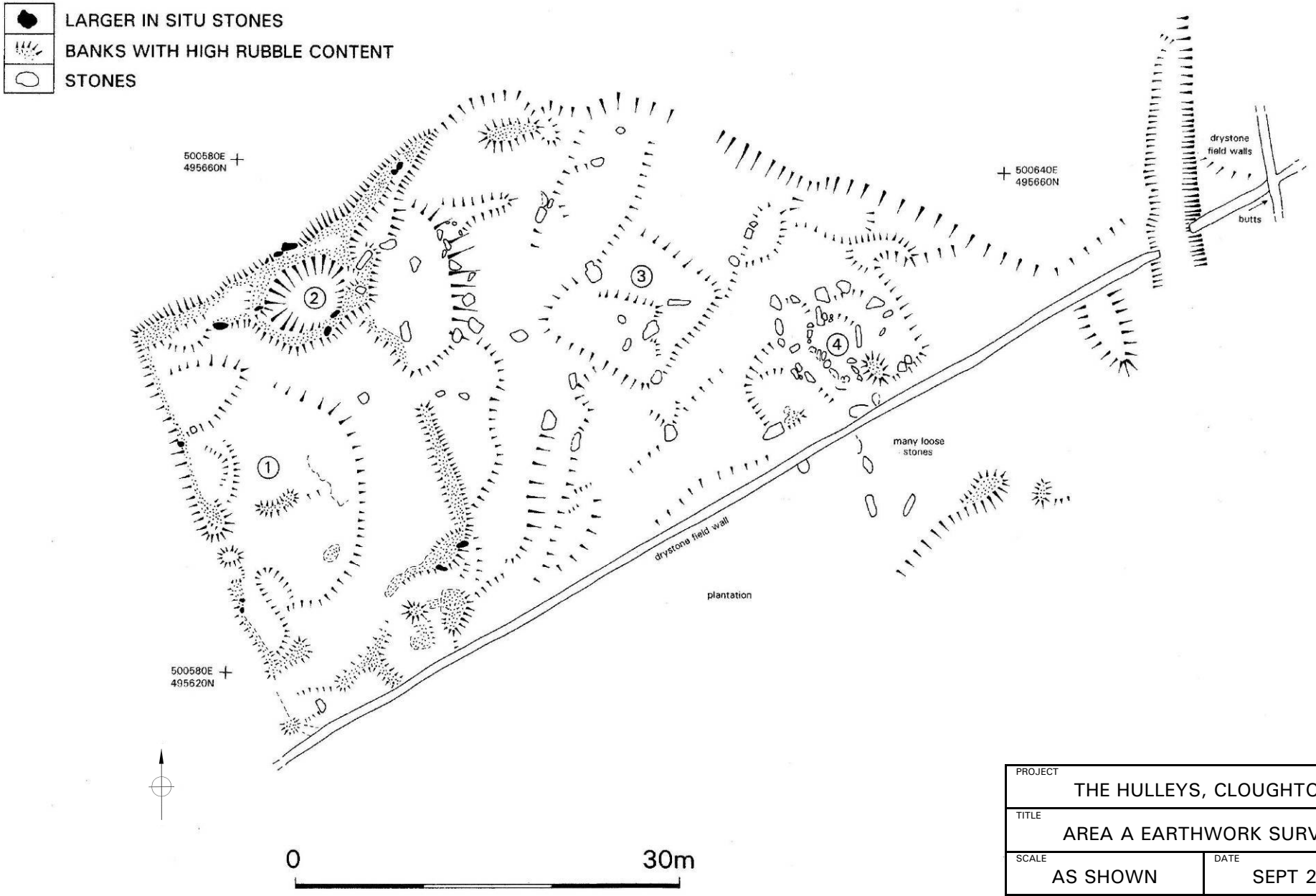
Source: Ordnance Survey 1854 6" map (sheet 62) surveyed 1848-49.

PROJECT: THE HULLEYS, CLOUGHTON	
TITLE: ORDNANCE SURVEY 1854 MAP	
SCALE: NTS	DATE: SEPT 2012
EDAS	FIGURE: 4



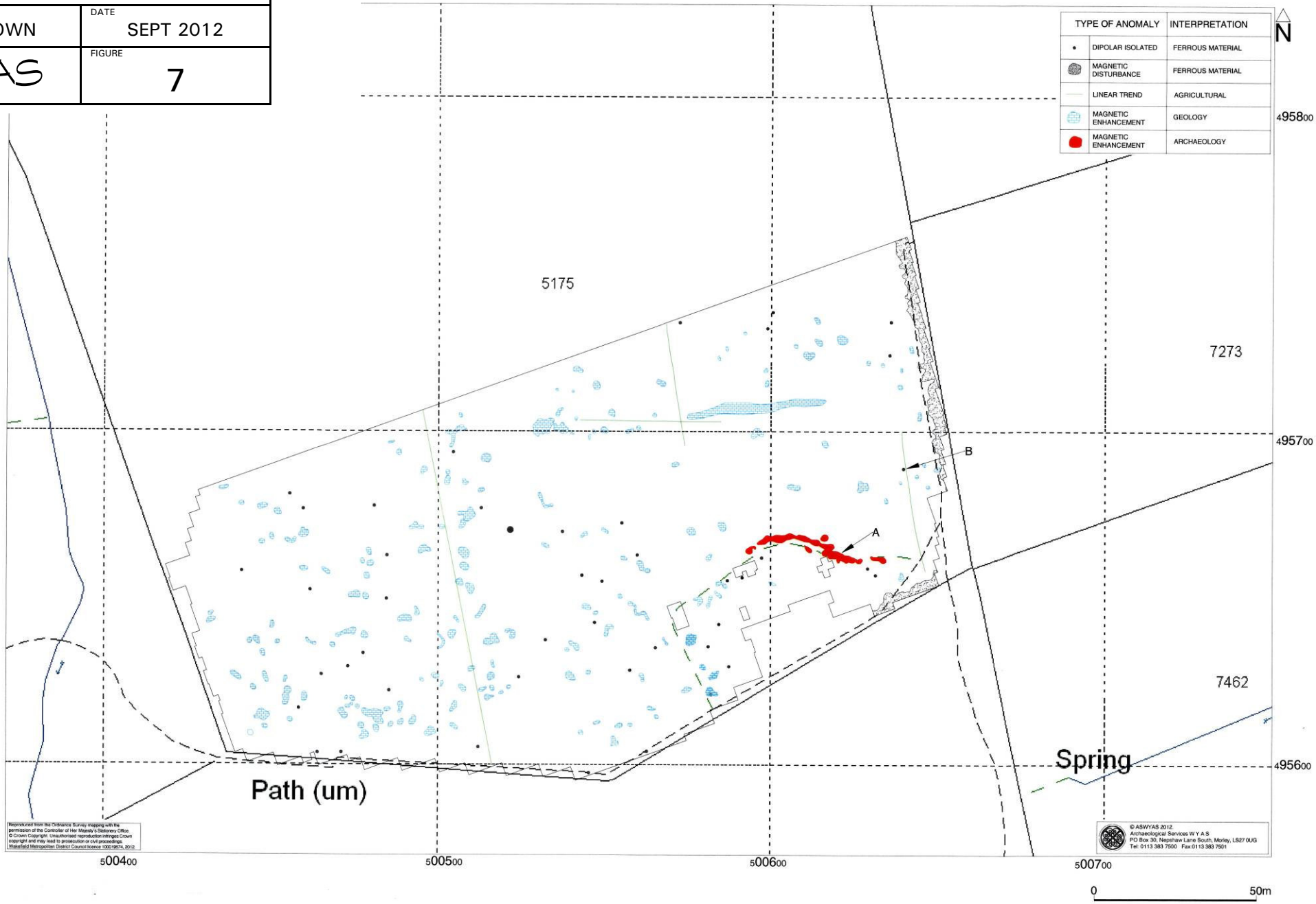
Sources:
Knox, R 1855 *Descriptions Geological, Topographical and Antiquarian in Eastern Yorkshire, Between the Rivers Humber and Tees,* plate 14.
Ordnance Survey 1854 6" map (sheet 62) surveyed 1848-49.

PROJECT: THE HULLEYS, CLOUGHTON	
TITLE: COMBINED KNOX AND OS 1854 MAPS	
SCALE: NTS	DATE: SEPT 2012
EDAS	FIGURE: 5

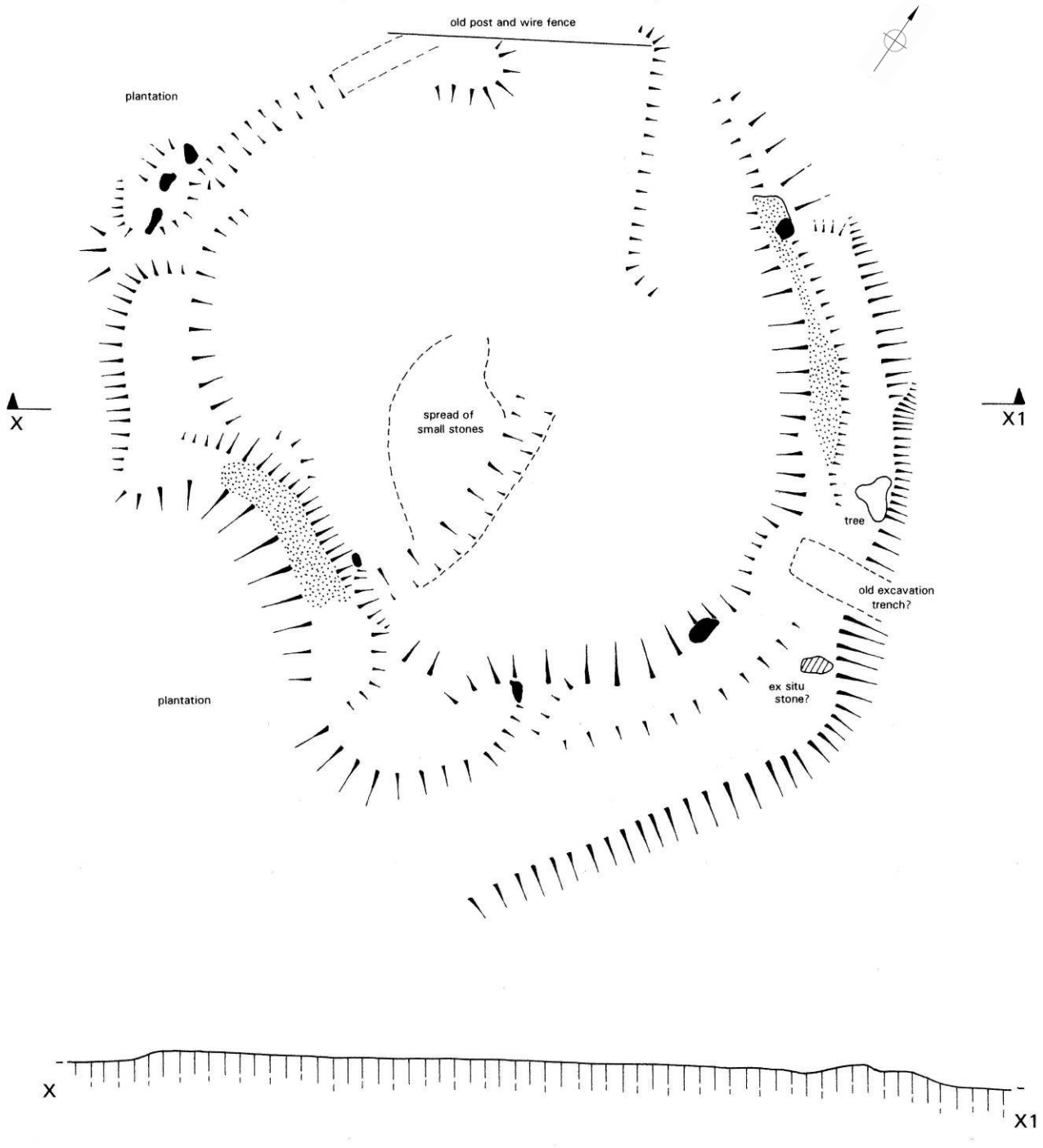


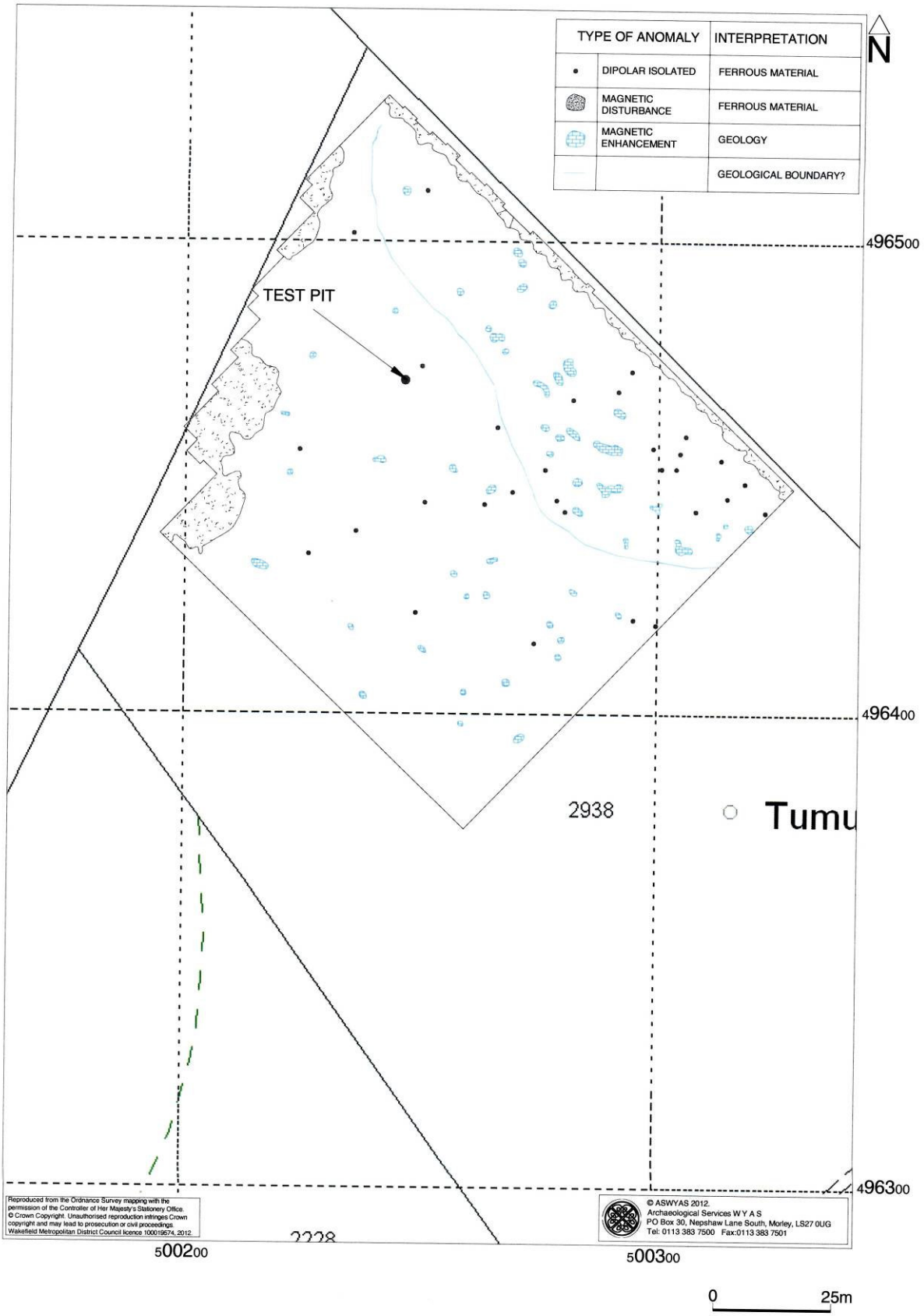
PROJECT: THE HULLEYS, CLOUGHTON	
TITLE: AREA A EARTHWORK SURVEY	
SCALE: AS SHOWN	DATE: SEPT 2012
EDAS	FIGURE: 6

PROJECT	THE HULLEYS, CLOUGHTON
TITLE	AREA A GEOPHYSICAL SURVEY
SCALE: AS SHOWN	DATE: SEPT 2012
EDAS	FIGURE: 7

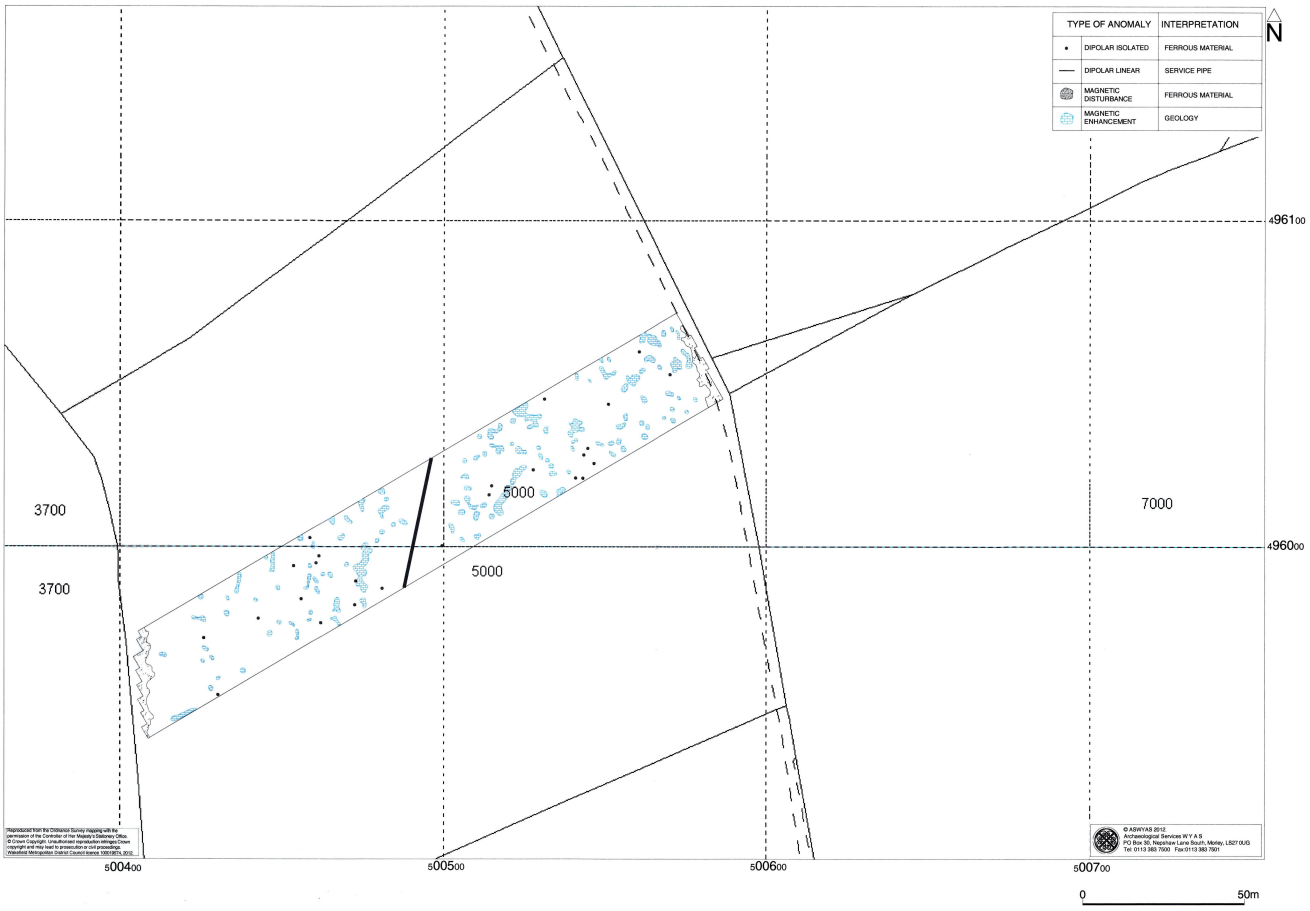


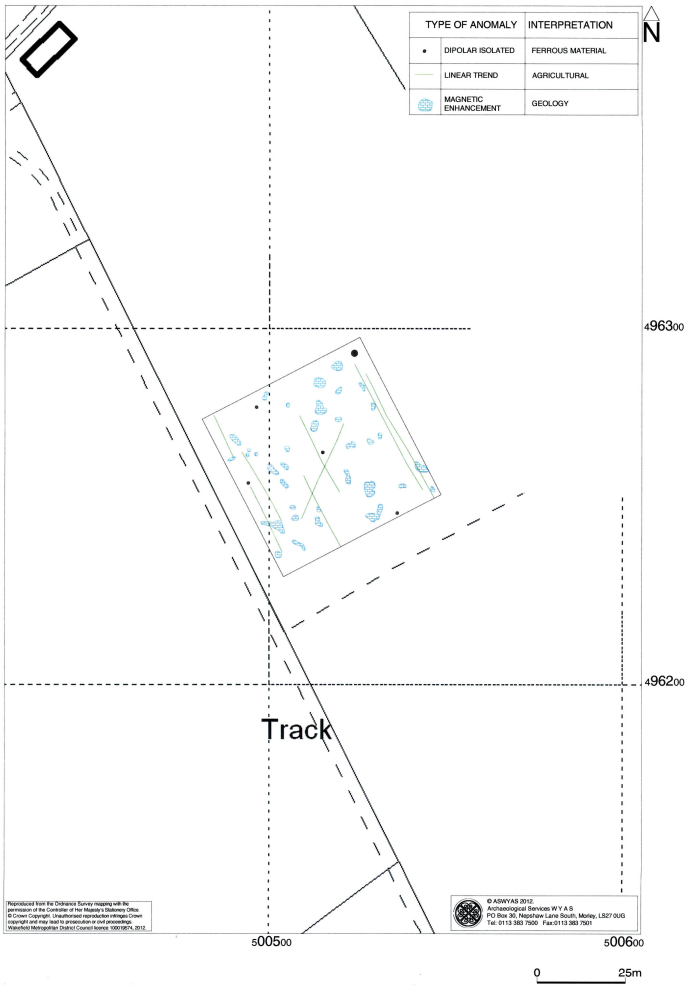
PROJECT	
THE HULLEYS, CLOUGHTON	
TITLE	
AREA B EARTHWORK SURVEY	
SCALE	DATE
AS SHOWN	SEPT 2012
EDAS	FIGURE 8





PROJECT: THE HULLEYS, CLOUGHTON	
TITLE: AREA B GEOPHYSICAL SURVEY	
SCALE: AS SHOWN	DATE: SEPT 2012
EDAS	FIGURE: 9





PROJECT	THE HULLEYS, CLOUGHTON
TITLE	AREAS C AND D GEOPHYSICAL SURVEY
SCALE: AS SHOWN	DATE: SEPT 2012
EDAS	FIGURE: 10

Plate 1: General view of Survey Area A, looking SW (photo 1/187).

Plate 2: Earthwork survey Area A - view across enclosure (1), looking SE (photo 1/163).

Plate 3: Earthwork survey Area A - east bank of enclosure (1), looking N (photo 1/169).

Plate 4: Earthwork survey Area A - sub-circular structure (2), looking N (photo 1/161).

Plate 5: Earthwork survey Area A - possible structure on south side of enclosure (1), looking SW (photo 1/166).

Plate 6: Earthwork survey Area A - possible structures or quarries (4), looking NE (photo 1/181).

Plate 7: Earthwork survey Area B - bank forming north-east side of potential ring cairn, looking SE (photo 1/150).

Plate 8: Earthwork survey Area B - bank forming south-west side of potential ring cairn, looking SW (photo 1/155).

APPENDIX 1
PHOTOGRAPHIC RECORD

PHOTOGRAPHIC CATALOGUE

Film 1: Colour digital photographs taken 30th April 2012

Film	Frame	Subject	Scale
1	144	Area B earthwork survey area, looking NW	-
1	146	Area B earthwork, south-east part, looking N	1m
1	147	Area B earthwork, east part, looking N	1m
1	148	Area B earthwork, possible excavation trench, looking SE	1m
1	149	Area B earthwork, north-east part, looking N	1m
1	150	Area B earthwork, north-east part, looking SE	1m
1	151	Area B earthwork, possible edging / kerb, W part, looking N	1m
1	152	Area B earthwork, south-west part, looking SE	1m
1	155	Area B earthwork, south-west part, looking SW	1m
1	156	Area B earthwork, looking SW along profile line	2 x 1m
1	158	Area B earthwork, looking SW along profile line	2 x 1m
1	159	Area A earthwork, feature 2, looking SW	1m
1	160	Area A earthwork, north bank of enclosure 1, looking SE	1m
1	161	Area A earthwork, feature 2, looking N	1m
1	162	Area A earthwork, feature 2, possible entrance, looking NW	1m
1	163	Area A earthwork, enclosure 1, looking SE	1m
1	164	Area A earthwork, west bank of enclosure 1, looking NE	1m
1	165	Area A earthwork, west bank of enclosure 1, looking NE	1m
1	166	Area A earthwork, possible structure on south bank of enclosure 1, looking SW	1m
1	167	Area A earthwork, possible structure on south bank of enclosure 1, looking SW	1m
1	168	Area A earthwork, east bank of enclosure 1, looking N	1m
1	169	Area A earthwork, east bank of enclosure 1, looking N	1m
1	171	Area A earthwork, east bank of enclosure 1, looking SW	1m
1	172	Area A earthwork, east bank of enclosure 1, looking SW	1m
1	173	Area A earthwork, north limit of east part, looking SE	1m
1	174	Area A earthwork, east part, looking SE	-
1	175	Area A earthwork, pile of stone adjacent to north limit of east part, looking NE	1m
1	176	Area A earthwork, possible platform 3, looking NW	1m
1	177	Area A earthwork, south side of possible platform 3, looking NE	1m
1	178	Area A earthwork, south side of possible platform 3, looking SW	1m
1	179	Area A earthwork, possible structures / quarries (4), looking NE	1m
1	180	Area A earthwork, possible structures / quarries (4), looking NE	1m
1	181	Area A earthwork, possible structures / quarries (4), looking NE	1m
1	182	Area A earthwork, possible structures / quarries (4), looking N	1m
1	183	Area A earthwork, east part, typical section drystone wall, looking S	1m
1	184	Area A earthwork, possible cairn adjacent to structures / quarries (4), looking S	1m
1	185	Area A earthwork, east end of north bank of enclosure 1, looking NE	1m
1	187	Area A survey area, general view, looking SW	-
1	189	Area B survey area, view to SE, looking SE	-
1	190	Area B survey area, view to SE, looking SE	-


1-144.JPG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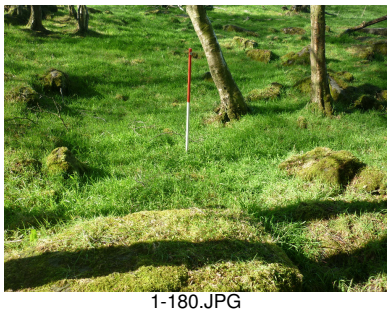
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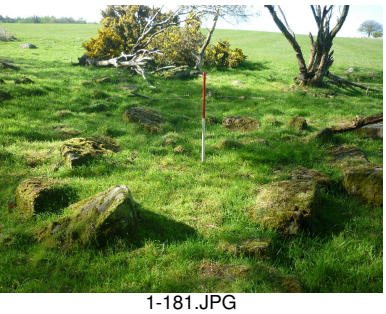
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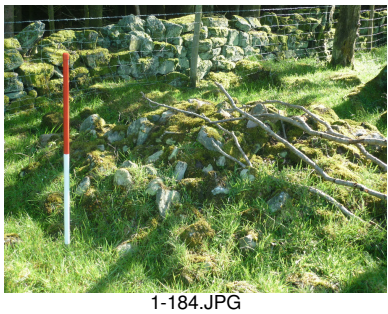
1-183.JPG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APPENDIX 2
ASWYAS GEOPHYSICAL SURVEY REPORT

ARCHAEOLOGICAL SERVICES WYAS

The Hulleys
Cloughton
North Yorkshire

Geophysical Survey

Report no. 2361

July 2012

Client: Ed Dennison Archaeological Services Ltd

The Hulleys
Cloughton
North Yorkshire

Geophysical Survey

Summary

A magnetometer survey covering approximately 4.25 hectares was carried out at four locations to the north, south and east of The Hulleys, near Cloughton, on behalf of the Staintondale and Ravenscar Local History Society, in order to determine the presence/absence of any archaeological features in an area of possible prehistoric activity. The data is dominated by anomalies caused by variations in the soils and geology. However, in the southernmost survey area a curvilinear anomaly corresponds with the location of a stone bank, shown on the first edition Ordnance Survey mapping, which may be of prehistoric origin.

ARCHAEOLOGICAL
SERVICES
WYAS

Report Information

Client:	Ed Dennison Archaeological Services Ltd
Address:	18 Springdale Way, Beverley, East Yorkshire, HU17 8NU
Report Type:	Geophysical Survey
Location:	The Hulleys, Cloughton
County:	North Yorkshire
Grid Reference:	TA 0030 9625
Period(s) of activity represented:	?
Report Number:	2361
Project Number:	3892
Site Code:	THC12
Planning Application No.:	n/a
Museum Accession No.:	n/a
Date of fieldwork:	April 2012
Date of report:	May 2012
Project Management:	Sam Harrison BSc MSc AIfA
Fieldwork:	David Harrison BA MSc
	Christopher Sykes BA MSc
Report:	Alistair Webb BA MIfA
Illustrations:	David Harrison
Photography:	Christopher Sykes
Research:	n/a

Authorisation for distribution: ----------

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Email: admin@aswyas.com

Contents

List of Figures

1 Introduction

Archaeological Services WYAS (ASWYAS) was commissioned by Ed Dennison of Ed Dennison Archaeological Services Ltd (EDAS), on behalf of the Staintondale and Ravenscar Local History Society (SRLHS), to undertake a geophysical (magnetometer) survey at four locations to the north, south and east of The Hulleys, near Cloughton (see Fig. 1). The survey was undertaken to support and augment an archaeological earthwork survey, and in order to further investigate an area of possible prehistoric activity. The combined survey area was 4.25 hectares.

Site location, topography and land-use

The Hulleys is situated approximately 1.75km north-west of the village of Cloughton in the North York Moors National Park, and is centred at TA 0030 9625 (see Fig. 2). The survey covered four discrete areas to the north, south and east of the farm from Area B in the north at TA 0025 9645 to Area A in the south at TA 0055 9565.

The land sloped down from the north-west (Area B) at about 140m above Ordnance Datum (aOD) to about 100m aOD at the southern end of the site in Area A. All four areas were under improved permanent pasture although there was a relict patch of gorse and birch with outcropping boulders and earthworks along the south-eastern edge of Area A, indicating what the land would have been like prior to improvement.

Soils and geology

The solid geology of the area consists of Moor Grit Sandstone of the Scalby Formation (BGS 2012). There are no recorded superficial deposits. The soils are classified in the Rivington 1 association being described as well drained coarse loams over sandstone (SSEW 1983).

2 Archaeological and Historical Background

The site is of archaeological interest due to the number of archaeological features shown on a map produced by the cartographer Robert Knox. After the publication of the map in 1818 many of the features were investigated but not recorded. Soon after many of these features were damaged or destroyed as more land was brought into agricultural production following the introduction of the Corn Laws. Nevertheless, by the time of the first edition Ordnance Survey mapping a series of earthworks described as ‘ancient stone banks’ are marked at the southern end of the site in Area A (see Fig. 15). The presumption was that these features are of probable prehistoric date.

However, recently the interpretations of some of these features on the Knox plan and the early mapping has been questioned (Muir 2001 and Walker 2009). The latter postulated that the ‘beehive-like huts’ as described by Knox may be nothing more than clearance cairns. Following the apparent identification of a an area of crude paving in a test pit (Wastling

2000) members of the SRLHG undertook a more extensive programme of test pitting and excavation (2009) which identified an undated paved surface 'constructed over natural bedrock sometime before 1849' in the area around Wastling's original pit.

3 Aims, Methodology and Presentation

The general aims of the geophysical survey were to establish and clarify the potential for surviving archaeological remains at three pre-determined locations (Areas A, B and C) in order to help in the overall interpretation of the site. A fourth area (D) was added later at the request of the SRLHG.

Specifically the survey sought to provide information about the nature and possible interpretations of any anomalies identified during the survey and thereby determine the likely extent, presence or absence of any buried archaeological remains within the selected areas.

These aims were to be achieved by undertaking a magnetometer survey at the four locations, an area of 4.25 hectares.

The survey area was set-out with a Trimble 5800 VRS differential GPS to the national grid. The grid was then superimposed onto digital mapping provided by EDAS. Temporary reference objects (small survey pins on fence posts) were established and left in place following completion of the fieldwork for accurate geo-referencing. The locations of the temporary reference objects are shown on Figure 3 and their Ordnance Survey co-ordinates tabulated in Appendix 3.

Magnetometer survey

Bartington Grad601 instruments were used to take readings at 0.25m intervals on zigzag traverses 1m apart within 30m by 30m grids so that 3600 readings were recorded in each grid. These readings were stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software was used to process and present the data. Further details are given in Appendix 1.

Reporting

A general site location plan, incorporating the 1:50000 Ordnance Survey mapping is shown in Figure 1. The site location and survey areas are shown on Figure 2 at a scale of 1:2500.

The processed magnetometer greyscale data, the 'raw' XY trace plot data and magnetometer interpretation graphics are presented at a scale of 1:1000 in Figures 3 to 14 inclusive. The data and the first edition mapping for Area A are reproduced as Figure 15, also at 1:1000.

Further technical information on the equipment used, data processing and survey methodologies are given in Appendix 1 and Appendix 2. Appendix 3 describes the composition and location of the site archive.

The survey methodology, report and any recommendations comply with the Methodology and with guidelines outlined by English Heritage (David *et al* 2008) and by the Institute for Archaeologists (IfA 2010). All figures reproduced from Ordnance Survey mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The figures in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of Archaeological Services staff.

4 Results and Discussion

Area A

This block was positioned over an area of presumed prehistoric enclosure and field division.

Numerous anomalies have been identified in this block, which covered approximately 2.7 hectares, giving the data a 'speckled' appearance. It is difficult to give a confident interpretation for many of them. The majority of the discrete areas of magnetic enhancement are almost certainly geological in origin being due to variation in the bedrock or the stony nature of the soils – many large boulders can still be seen on the surface in the area of unimproved rough grazing to the south-east of this area. Nevertheless, a complex of 'ancient stone banks' is recorded on the first edition mapping (see Fig. 15) in this part of the site. There seems to be a vague correlation between the features recorded on the early mapping and some of the identified anomalies (areas of magnetic enhancement) but nothing that precisely matches the features as drawn or that could be specifically attributed to human activity. Although a geological origin for these anomalies is preferred an archaeological origin for some of them cannot be discounted given the mapping evidence.

However, there is one curvilinear anomaly, **A**, which does clearly correlate with one of the stone banks shown on the early mapping. A rubble-filled earthwork still survives here (recorded by the topographic survey), although the geophysical anomaly is considered likely to be due to an infilled ditch which is no longer visible.

Immediately to the east of **A** is a second linear anomaly, **B**. This too correlates with a feature on the first edition mapping, in this case what looks like a trackway.

Elsewhere negative linear trend anomalies have been identified. The straightness of these anomalies suggests a modern agricultural origin, perhaps field drains.

Area B

This area was selected for survey as it was centred on the location of a man-made stone surface first identified by Wastling in 1999 and further excavated a decade later (Walker 2009).

Relative to Area A the magnetic background in Area B is much more 'quiet' with very little variance in the readings resulting in a much more uniform grey tone to the data plot. However, there is a band along the eastern side of the area where the magnetic background is noticeably more variable (see Fig. 8). This boundary is not considered to be archaeologically significant and again probably reflects underlying variation in the soils and geology.

The position of the test pit/excavation undertaken in 2009 where the stone surface was revealed is located as a discrete ferrous anomaly ('iron spike') presumably caused by the deposition of a ferrous item in the backfill left to enable easy recognition of the spot should further investigation be carried out in the future.

No anomalies of archaeological potential have been identified in this area.

Area C

Area C comprised a linear strip, 30m wide and approximately 150m in length, which was located to cover an area where significantly enhanced magnetic susceptibility readings had been recorded - the eastern half of the strip. It had been considered that these elevated readings may have been caused by human activity in the vicinity. It should be noted that the exact location of these readings was not recorded.

As in Area B there is a split between the magnetically quiet western third of the survey area and the much more variable magnetic background to the east. Whether there is any direct correlation between the enhanced magnetic susceptibility readings and the variation in the data is not clear as there are no anomalies, other than a ferrous pipe that bisects the area aligned north/south, that appear to be anything other than geological in nature. It should be noted that some of the enhanced magnetic susceptibility readings are likely to have been due to taking readings either over, or in the immediate vicinity of, the ferrous pipe.

Area D

This small block, 50m by 50m, was added following discussion with Alan Walker in lieu of the reduced area surveyed in Area C.

Linear trends can be seen in the data aligned north-west/south-east, parallel with the field boundary immediately to the west. These anomalies are likely to be agricultural in origin caused by ploughing when the grassland was improved.

5 Conclusions

The geophysical survey has not identified any features of obvious archaeological potential with the exception of a probable ditch in Area A which correlates with an earthen bank shown on early mapping. Elsewhere numerous anomalies have been identified but all are considered likely to be due to geological or pedological variation.

Although the sedimentary solid geology is generally conducive to magnetometer survey it is only infilled cut features (such as ditches or pits) or areas where the magnetic susceptibility has been enhanced by burning (such as hearths or kilns) that are likely to result in a magnetic contrast sufficient to allow them these features to present as magnetic anomalies. It would be impossible to locate features by magnetometry, such as the stone surface identified in Area B, where the target feature is comprised of the same material as the geological substrate.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

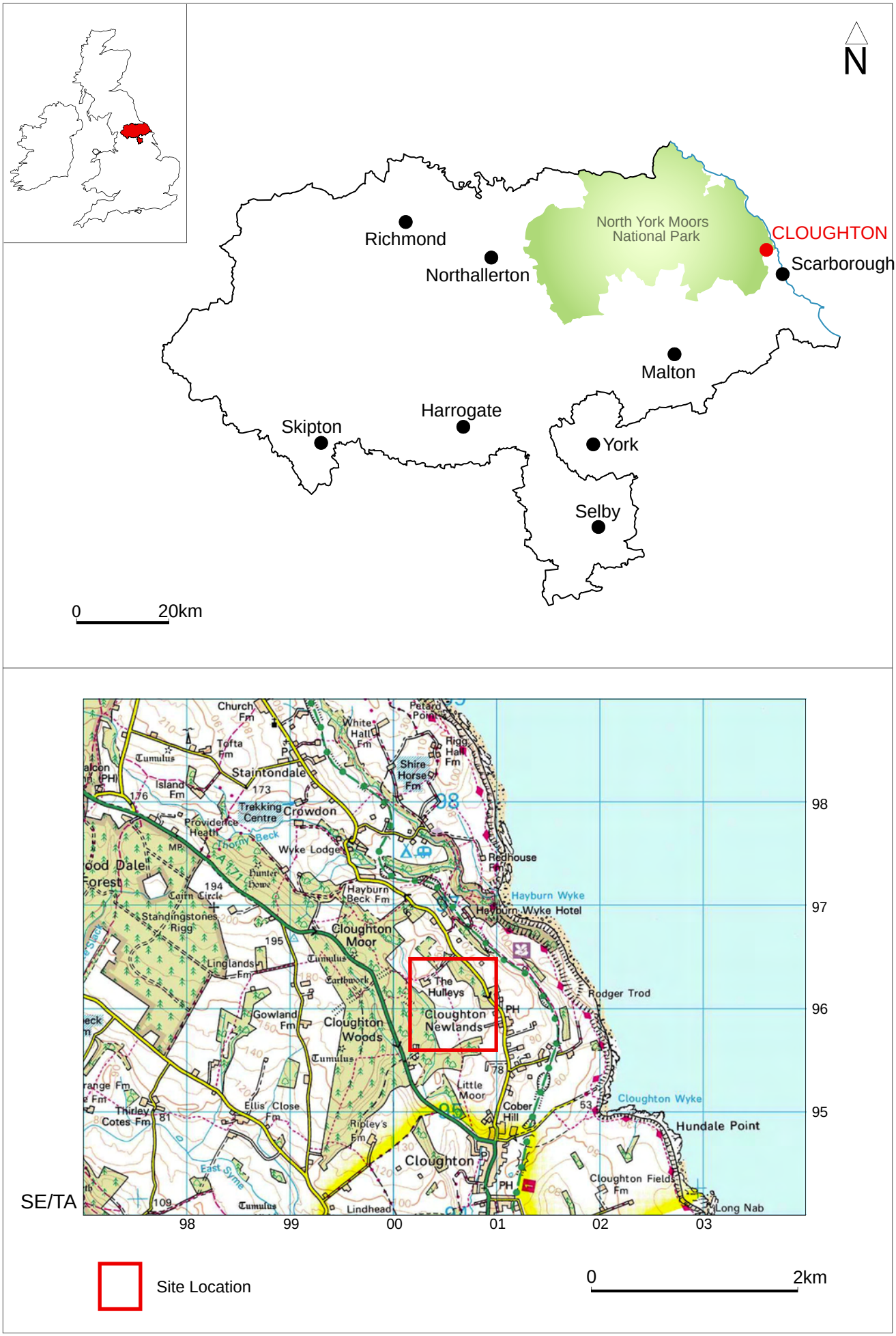

Fig. 1. Site location

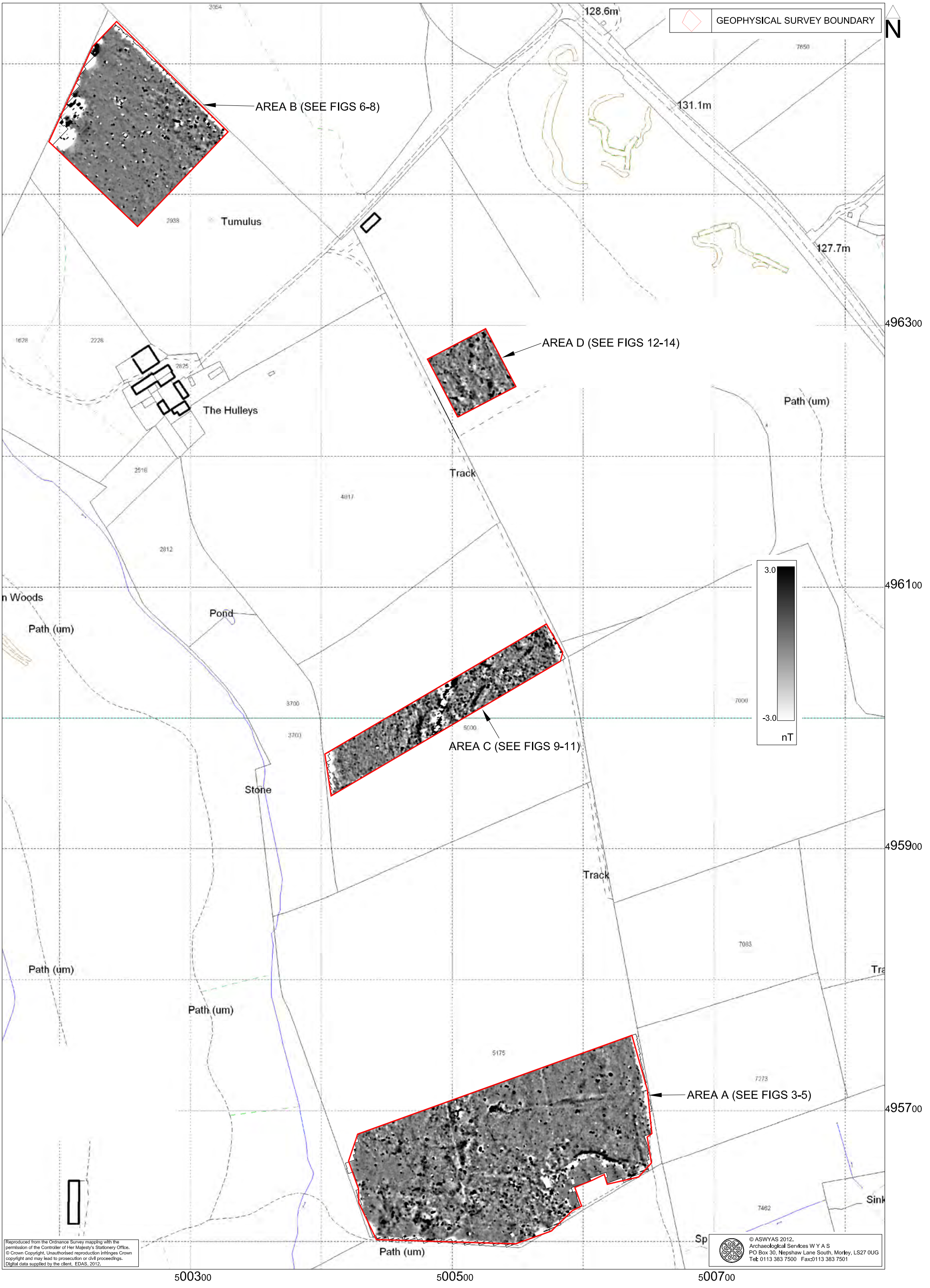

Fig. 2. Site location showing greyscale magnetometer data (1:2500 @ A3)

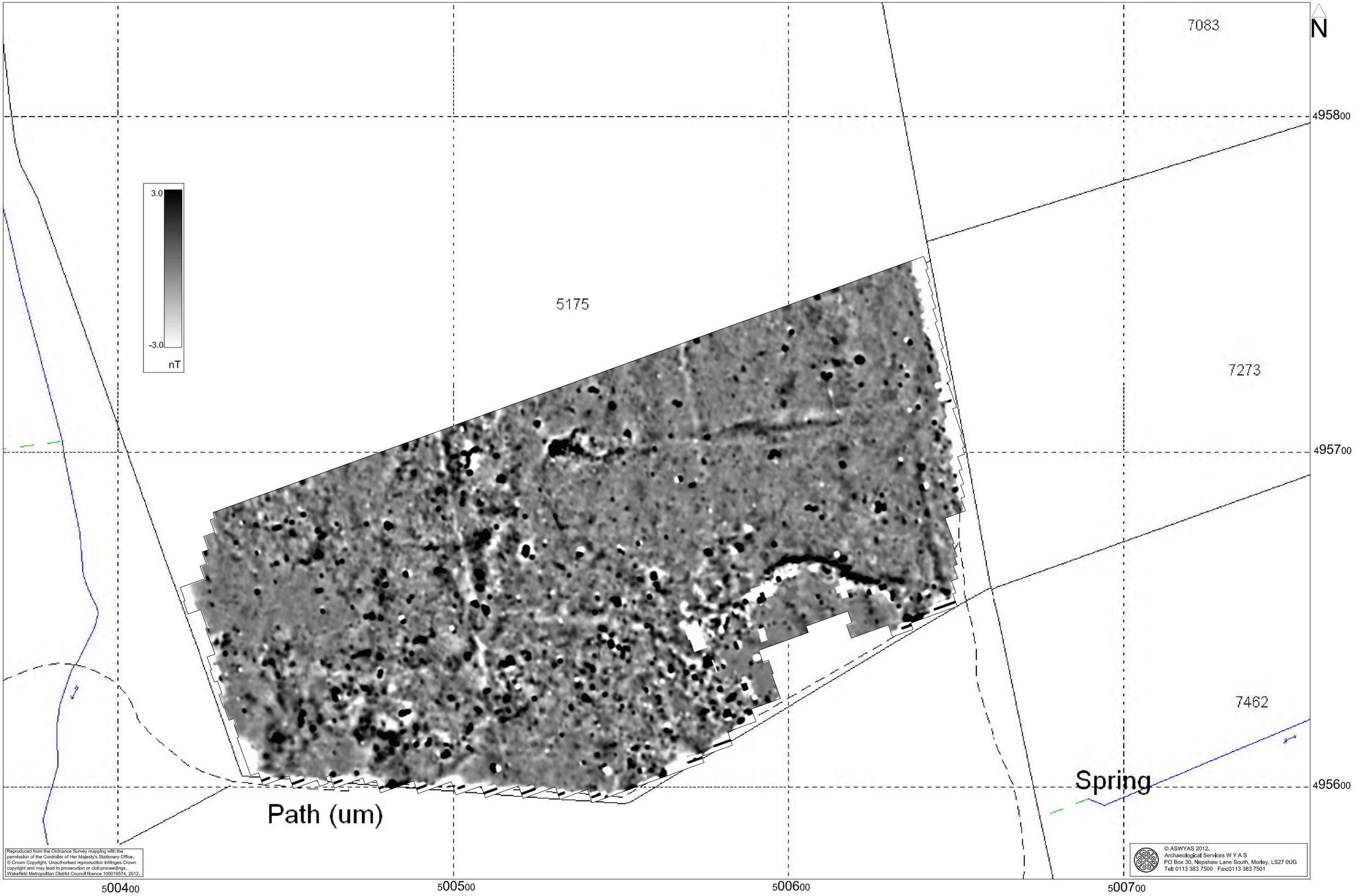

Fig. 3. Processed greyscale magnetometer data; Area A (1:1000 @ A3)

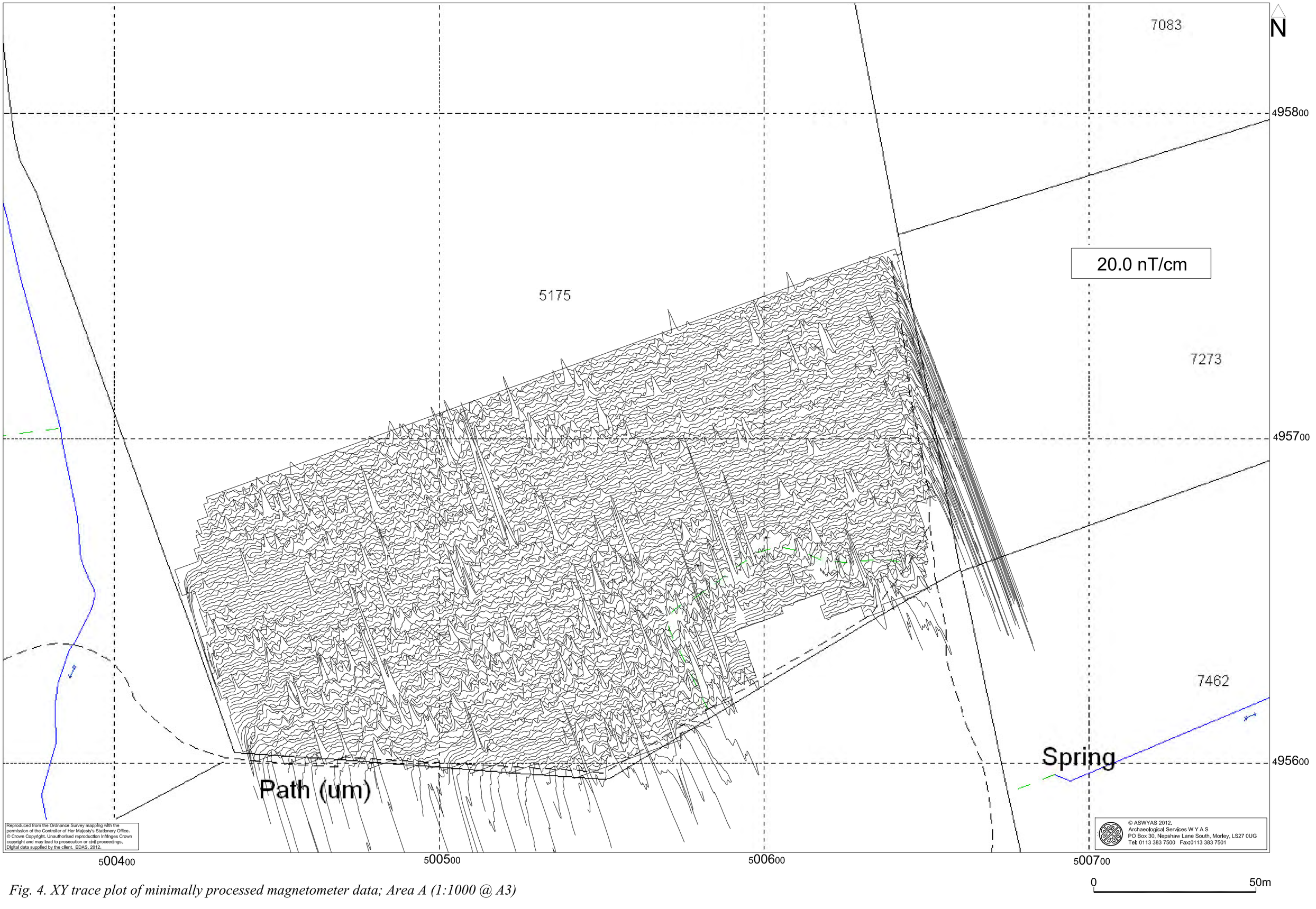

Fig. 4. XY trace plot of minimally processed magnetometer data; Area A (1:1000 @ A3)

TYPE OF ANOMALY		INTERPRETATION
●	DIPOLAR ISOLATED	FERROUS MATERIAL
	MAGNETIC DISTURBANCE	FERROUS MATERIAL
	LINEAR TREND	AGRICULTURAL
	MAGNETIC ENHANCEMENT	GEOLOGY
	MAGNETIC ENHANCEMENT	ARCHAEOLOGY

N

5175

7273

7462

A

B

Path (um)

Spring

4958 00

4957 00

4956 00

5004 00

5005 00

5006 00

5007 00

0 50m

Archaeological Services W Y A S
PO Box 30, Nepshaw Lane South, Morley, LS27 0UG
Tel: 0113 383 7500 Fax:0113 383 7501

Fig. 5. Interpretation of magnetometer data; Area A (1:1000 @ A3)

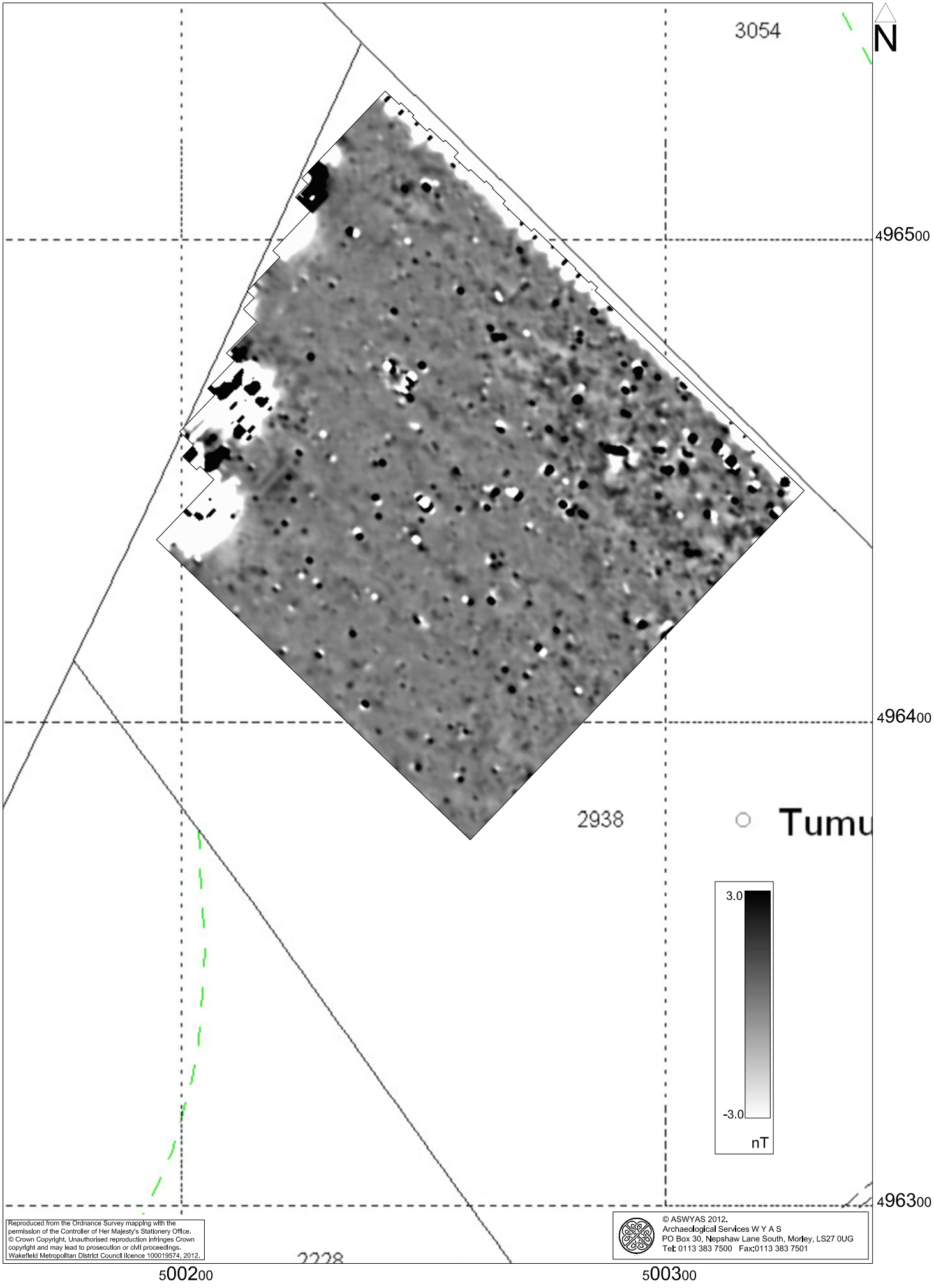

Fig. 6. Processed greyscale magnetometer data; Area B (1:1000 @ A4)

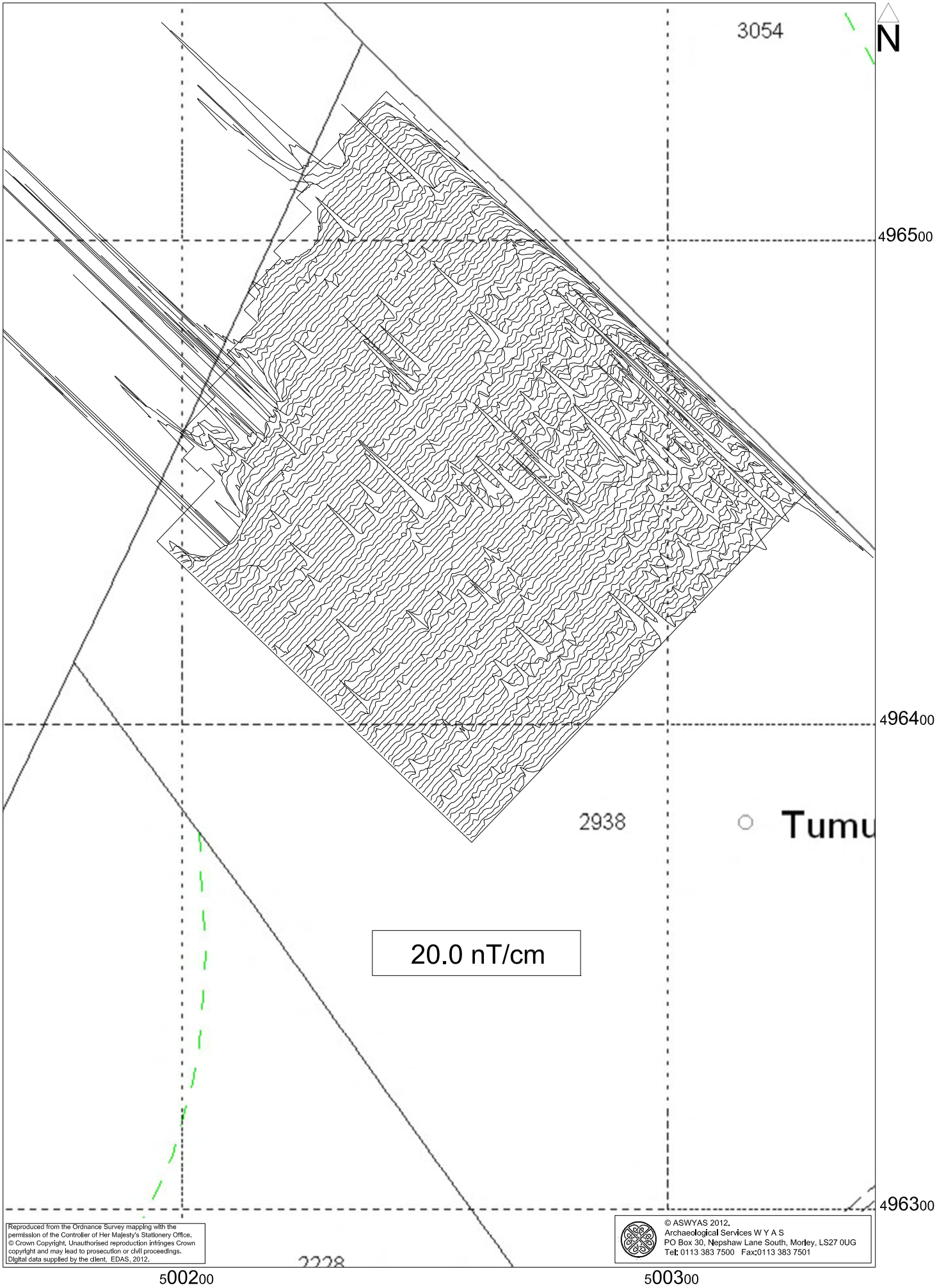

Fig. 7. XY trace plot of minimally processed magnetometer data; Area B (1:1000 @ A4)

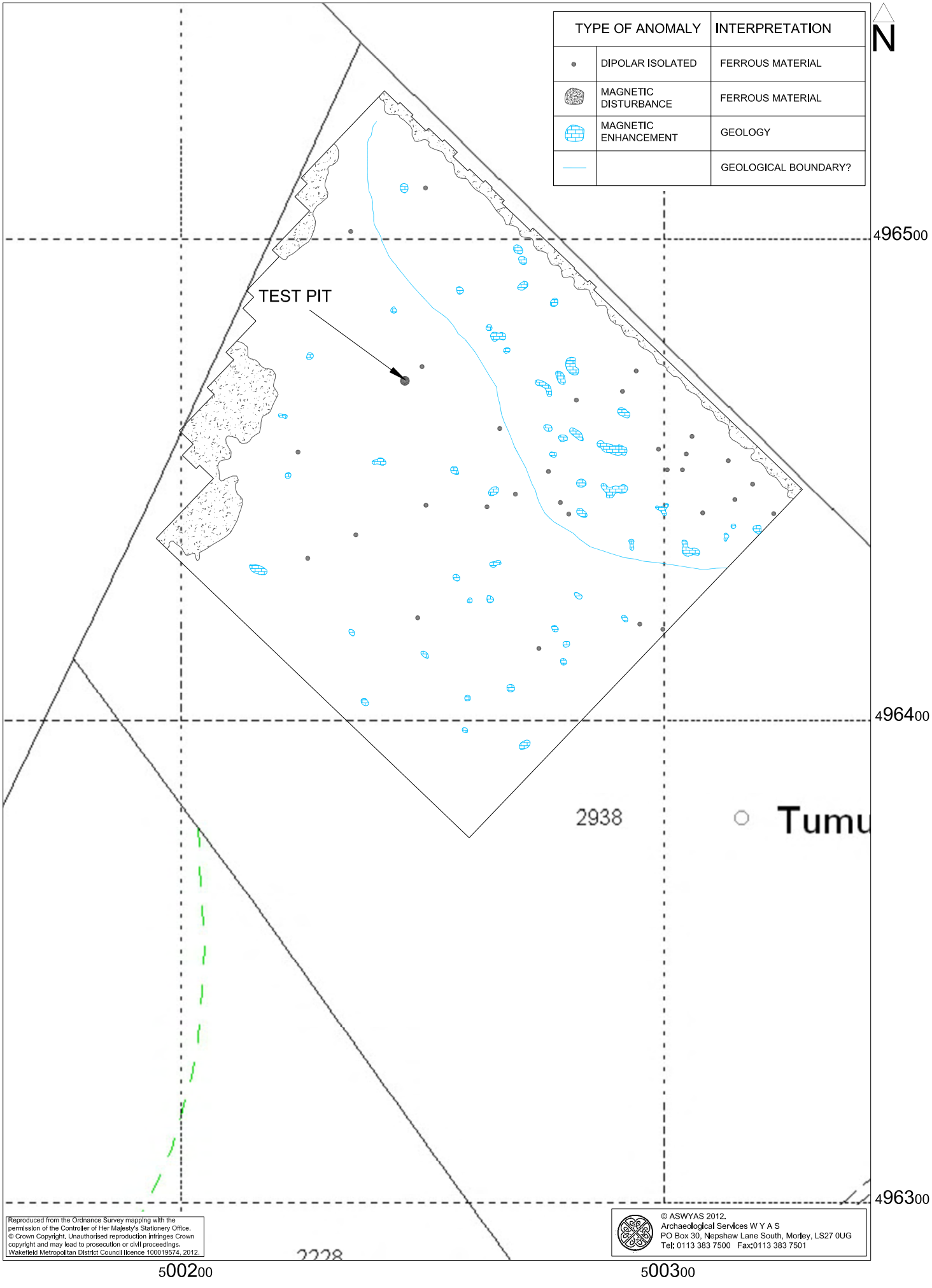

Fig. 8. Interpretation of magnetometer data; Area B (1:1000 @ A4)

N

4961 00

4960 00

3700

3700

5000

7000

3.0

-3.0

nT

0 50m

5004 00

5005 00

5006 00

5007 00

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Fig. 9. Processed greyscale magnetometer data; Area C (1:1000 @ A3)

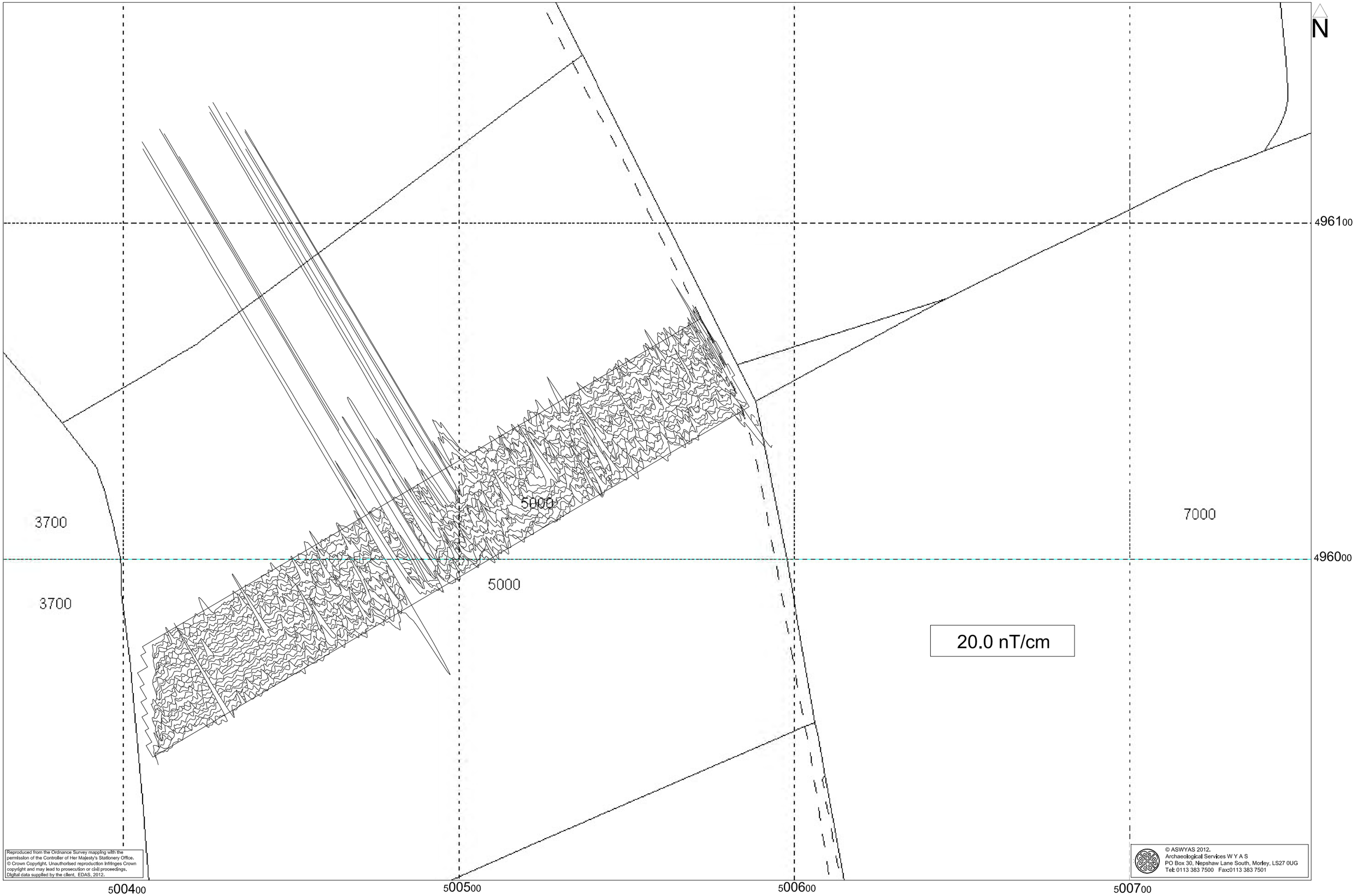

Fig. 10. XY trace plot of minimally processed magnetometer data; Area C (1:1000 @ A3)

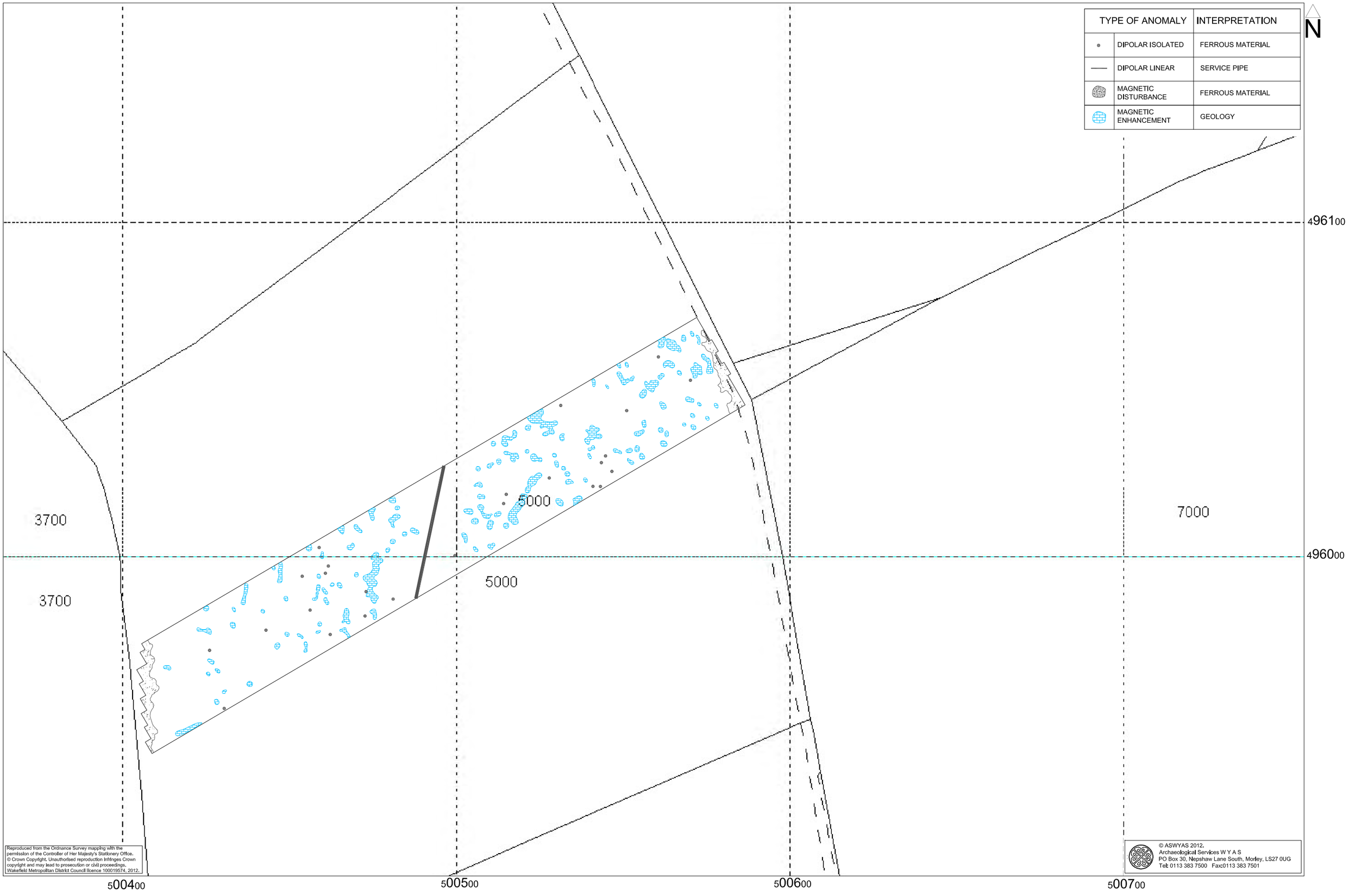

Fig. 11. Interpretation of magnetometer data; Area C (1:1000 @ A3)

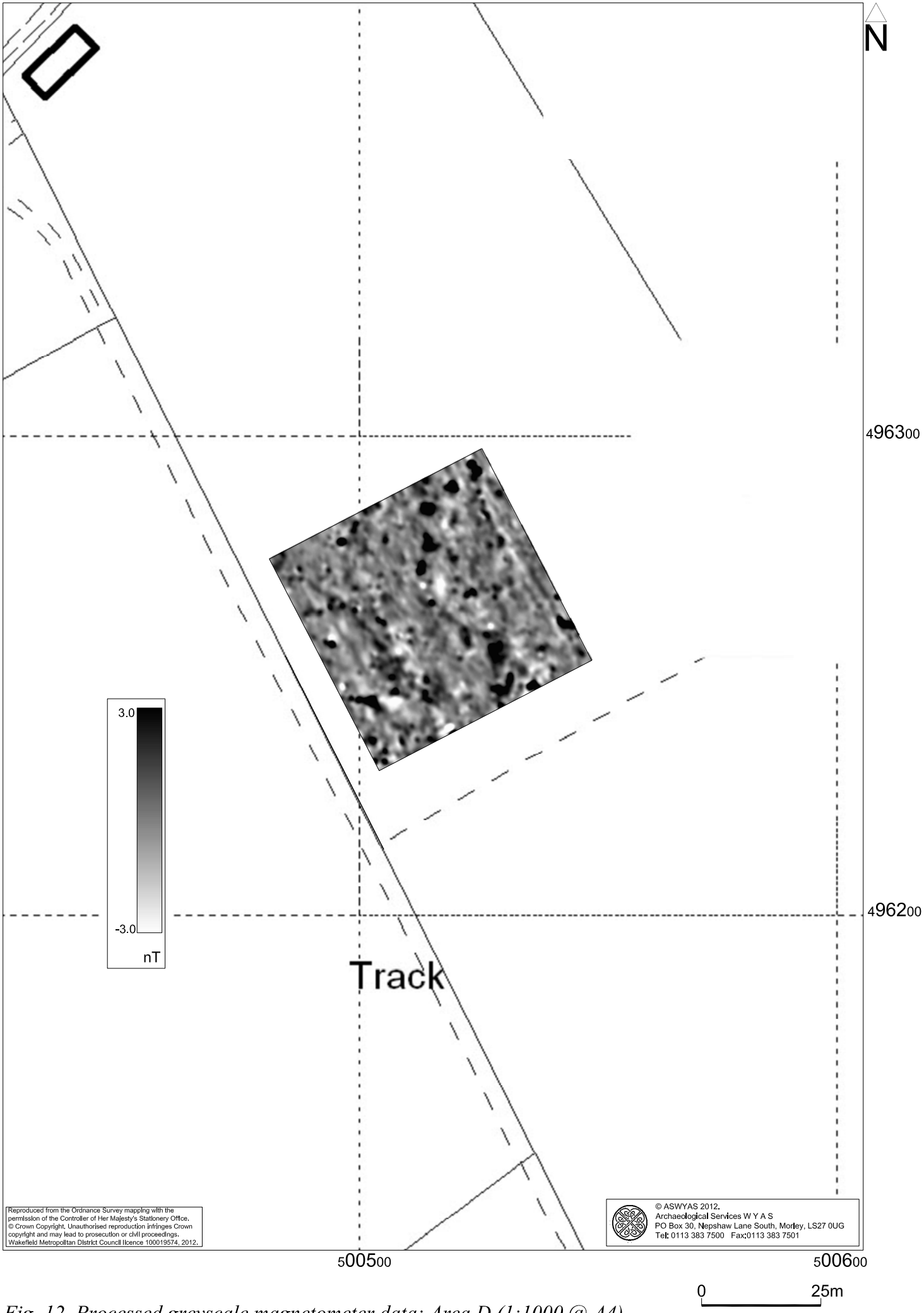

Fig. 12. Processed greyscale magnetometer data; Area D (1:1000 @ A4)

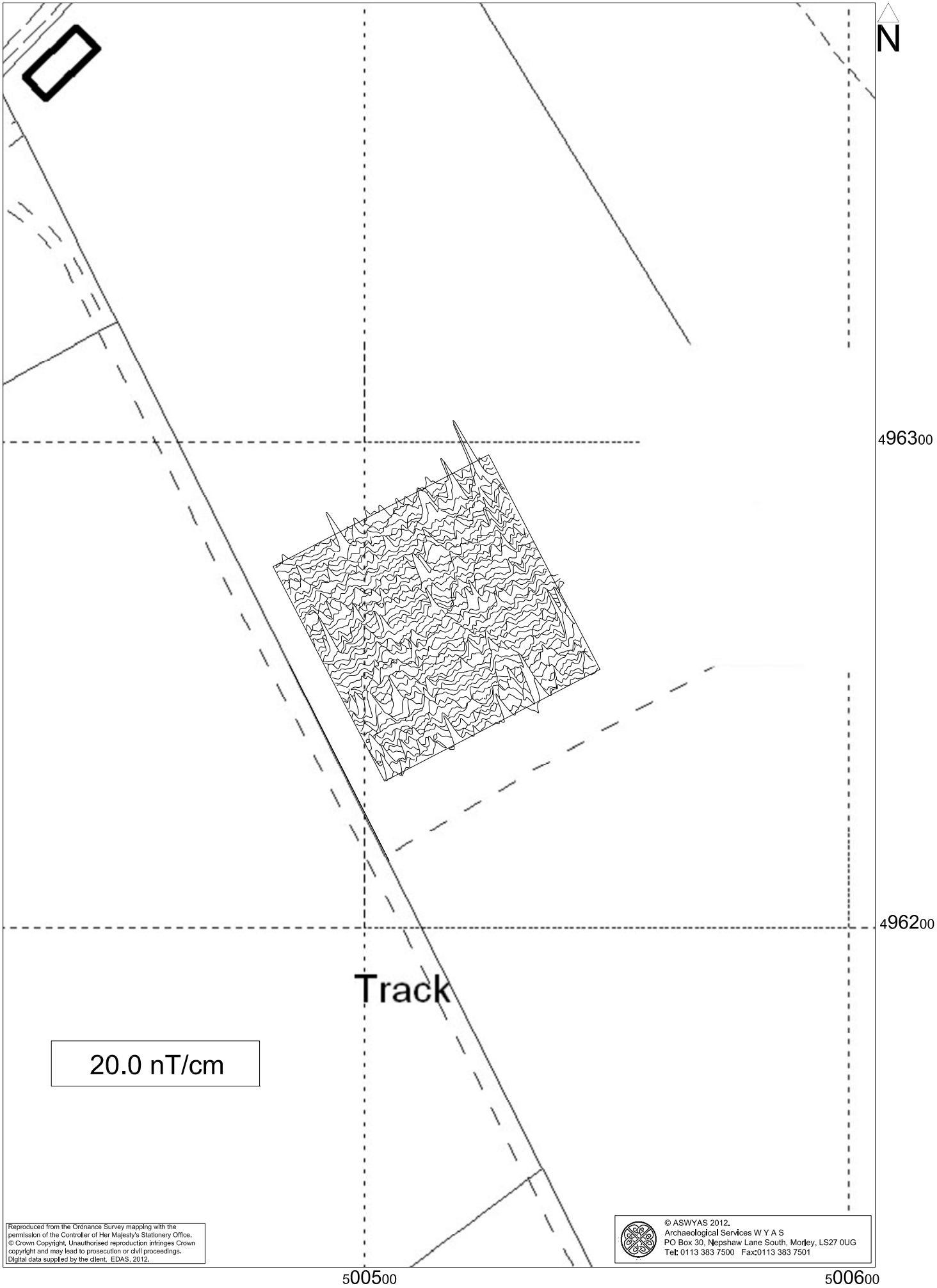

Fig. 13. XY trace plot of minimally processed magnetometer data; Area D (1:1000 @ A4)

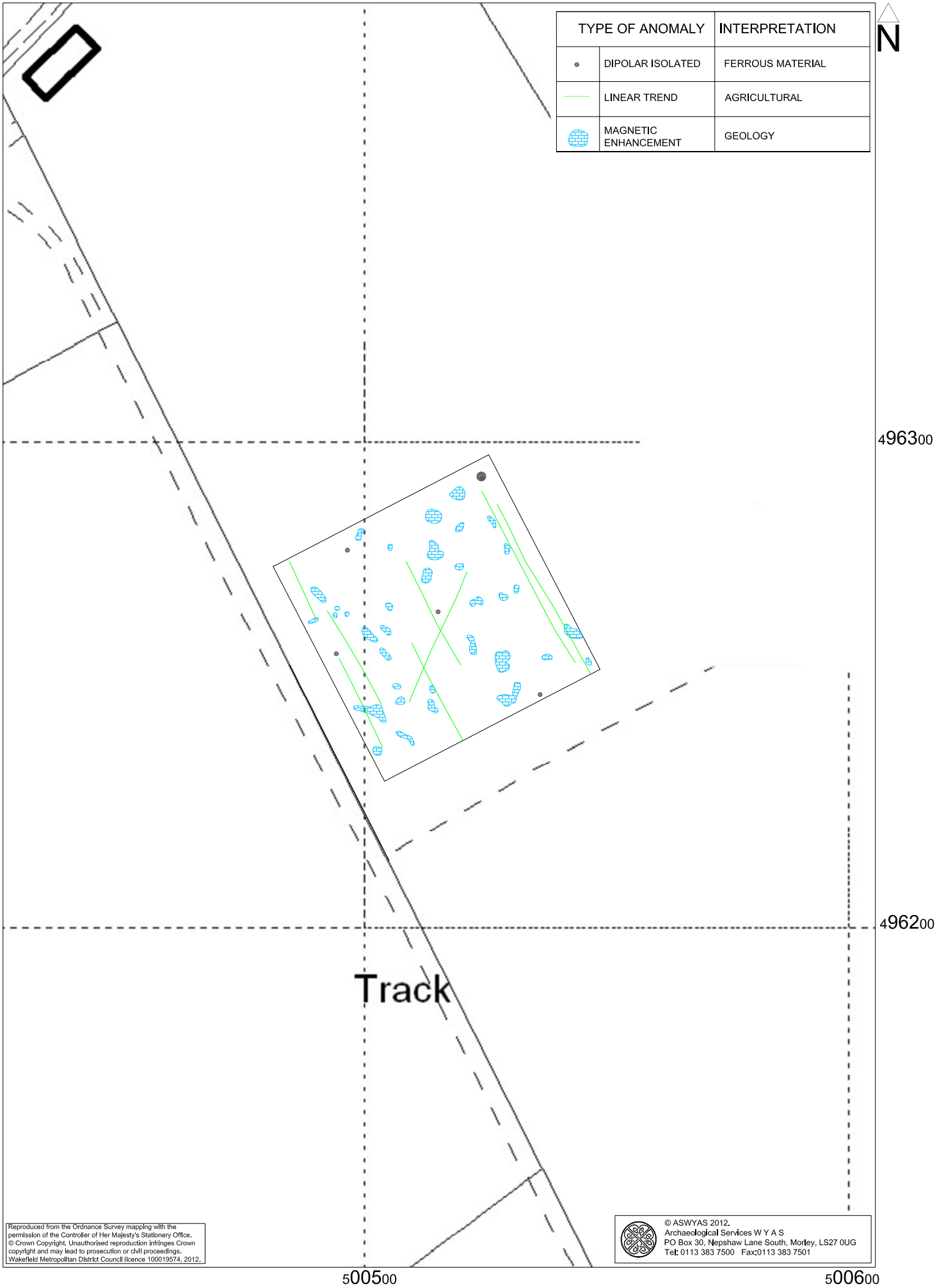

Fig. 14. Interpretation of magnetometer data; Area D (1:1000 @ A4)

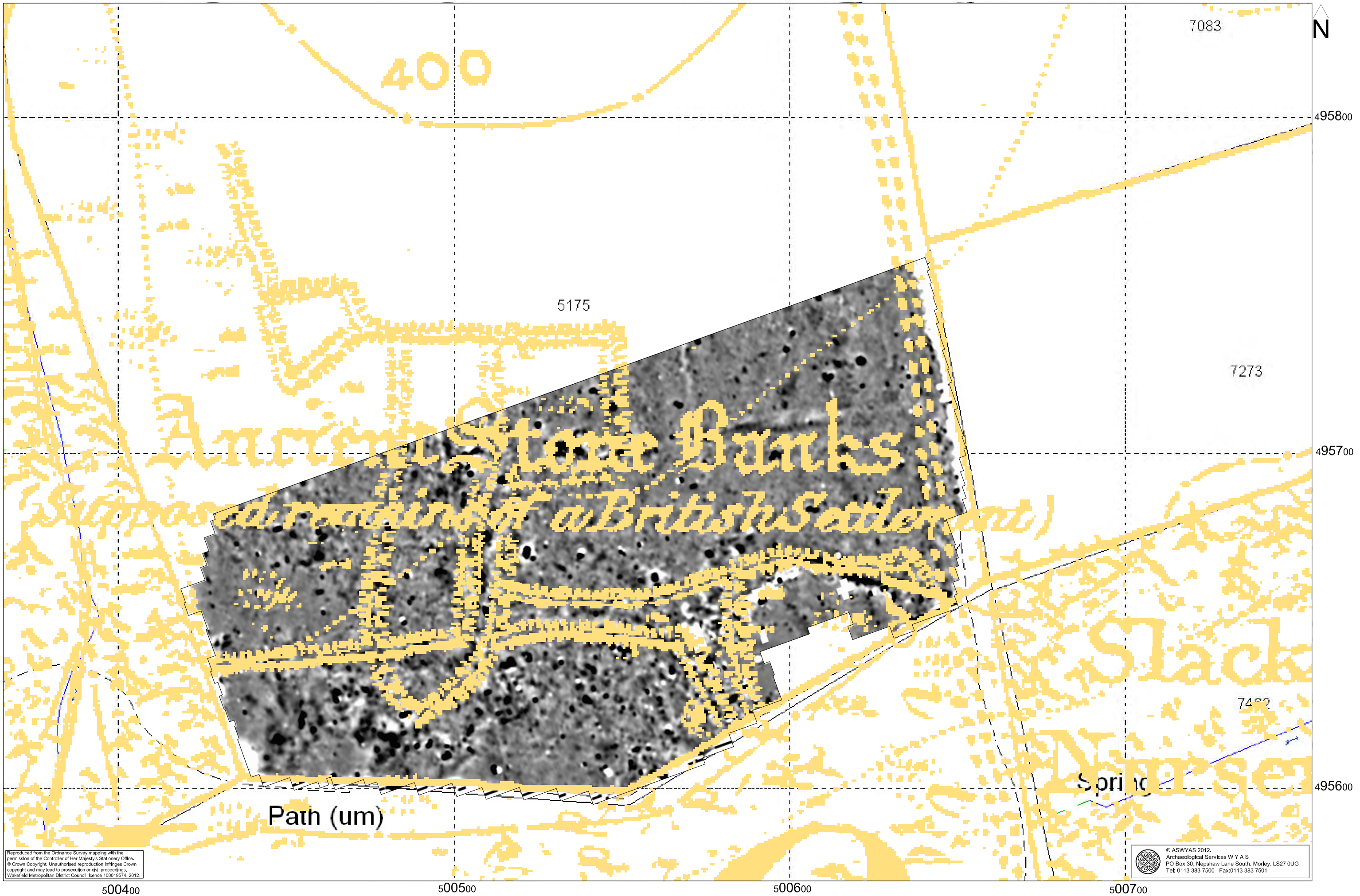

Fig. 15. Area A showing magnetometer data and first edition mapping (1:1000 @ A3)

Appendix 1: Magnetic survey - technical information

Magnetic Susceptibility and Soil Magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haemetite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoil's, subsoil's and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. The magnetic susceptibility of a soil can also be enhanced by the application of heat and the fermentation and bacterial effects associated with rubbish decomposition. The area of enhancement is usually quite large, mainly due to the tendency of discard areas to extend beyond the limit of the occupation site itself, and spreading by the plough. An advantage of magnetic susceptibility over magnetometry is that a certain amount of occupational activity will cause the same proportional change in susceptibility, however weakly magnetic is the soil, and so does not depend on the magnetic contrast between the topsoil and deeper layers. Susceptibility survey is therefore able to detect areas of occupation even in the absence of cut features. On the other hand susceptibility survey is more vulnerable to the masking effects of layers of colluvium and alluvium as the technique, using the Bartington system, can generally only measure variation in the first 0.15m of plough-soil.

Types of Magnetic Anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended. It should be noted that anomalies interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains); natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

Methodology: Gradiometer Survey

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***magnetic scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey.

The disadvantages of magnetic scanning are that features that produce weak anomalies (less than 2nT) are unlikely to stand out from the magnetic background and so will be difficult to detect. The coarse sampling interval means that discrete features or linear features that are parallel or broadly oblique to the direction of traverse may not be detected. If linear features are suspected in a site then the traverse direction should be perpendicular (or as close as is possible within the physical constraints of the site) to the orientation of the suspected features. The possible drawbacks mentioned above mean that a 'negative' scanning result should be validated by sample detailed magnetic survey (see below).

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.25m intervals, on zigzag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation. Detailed survey allows the visualisation of weaker anomalies that may not have been detected by magnetic scanning.

During this survey a Bartington Grad601 magnetic gradiometer was used taking readings on the 0.1nT range, at 0.25m intervals on zigzag traverses 1m apart within 20m by 20m square grids. The instrument was checked for electronic and mechanical drift at a common point and calibrated as necessary. The drift from zero was not logged.

Data Processing and Presentation

The detailed gradiometer data has been presented in this report in XY trace and greyscale formats. In the former format the data shown is 'raw' with no processing other than grid biasing having been done. The data in the greyscale images has been interpolated and selectively filtered to remove the effects of drift in instrument calibration and other artificial data constructs and to maximise the clarity and interpretability of the archaeological anomalies.

An XY plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a ‘stacked’ plot. A hidden line algorithm has been employed to block out lines behind major ‘spikes’ and the data has been clipped. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the ‘shape’ of individual anomalies can be discerned and potentially archaeological anomalies differentiated from ‘iron spikes’. Geoplot 3 software was used to create the XY trace plots. The same program was used to produce the greyscale images. All greyscale plots are displayed using a linear incremental scale.

Appendix 2: Survey location information

The survey grid was laid out using a Trimble VRS differential Global Positioning System (Trimble 5800 model). The internal accuracy of the survey grid relative to these markers is better than 0.05m. The survey grids were then super-imposed onto a base map to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas.

Archaeological Services WYAS cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party or for the removal of any of the survey reference points.

Appendix 3: Geophysical archive

The geophysical archive comprises:-

- an archive disk containing compressed (WinZip 8) files of the raw data, report text (Microsoft Word 2000), and graphics files (Adobe Illustrator CS2 and AutoCAD 2007) files.
- a full copy of the report

At present the archive is held by Archaeological Services WYAS although it is anticipated that it may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (i.e. available for consultation in the appropriate Sites and Monument Record Office).

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APPENDIX 3
EDAS METHODS STATEMENT

ARCHAEOLOGICAL SURVEY, THE HULLEYS, CLOUGHTON, NORTH YORKSHIRE

EDAS METHODS STATEMENT

Introduction

A programme of archaeological survey, comprising topographical earthwork survey and geophysical magnetometer survey, is required of several areas at The Hulleys, Cloughton, North Yorkshire (NGR NZ 0030 9625 centred), to record recently identified archaeological sites.

Three separate areas are required for survey (see attached figure). Area 1 lies to the south of The Hulleys farm, on the east side of Holm Slack and on the northern edge of a plantation. An area of uncultivated ground covering c.50sqm contains the well preserved earthworks of at least one prehistoric hut circle and associated enclosure, and there may be other similar features within an area of scattered stones, vague earthworks and protruding bedrock. This part of the field, together with an adjacent area to the north, represents the site of prehistoric settlement and field system first identified and mapped by Robert Knox in the 1850s, which he called the 'Citadel', and has been the subject of recent research, firstly by local archaeologist Vaughan Wastling and latterly by the Staintondale and Ravenscar Local History Group (SRLHG) (Walker 2010).

Area B lies to the north of the farm, either side of an area of woodland. The main survey area lies to the west of the wood, and covers 1ha centred on a test pit previously excavated by Wastling and then the SRLHG. This revealed an area of crude paving interpreted as a floor surface (Walker 2011). A further well preserved earthwork, most likely representing a ring cairn c.20m in diameter, lies just to the south-west on the east edge of the wood; this site is marked as a 'tumulus' on the historic Ordnance Survey mapping.

Area C lies in an improved area of pasture between Areas A and B, to the south of the farm. Test pitting was also undertaken here by Wastling and the SRLHG, with generally negative results (Walker 2010). However, subsequent fieldwalking by the SRLHG has recovered a wide range of prehistoric artefacts, including arrowheads, stone axes and glass beads and bangles.

Objectives

The objectives of the project are:

- to gather additional archaeological information on the prehistoric landscape around The Hulleys, to expand and enhance existing survey data and knowledge;

- to provide an accurate record of parts of the prehistoric landscape around The Hulleys, leading to a better understanding and appreciation of the area.

Methodology

Desk-top Assessment

A short amount of time will be taken in collating existing archaeological information on the survey areas and their surroundings, to place the new survey work into context. It is expected that this will include significant liaison with the SRLHG - it is assumed that the SRLHG will have all the necessary background material for the project, including historic aerial photographs.

Topographical Earthwork Survey

The c.50sqm area of earthworks at Area A will be subject to a detailed Level 3 archaeological survey (as defined by English Heritage (2007, 23-29), to record the position and form of all features considered to be of archaeological and/or historic interest.

This divorced survey would be carried out at a scale of 1:200 using EDM total station equipment, in accordance to recent guidelines (English Heritage 2011). Sufficient information would be gathered to allow the survey area to be readily located through the use of surviving structures, fences, walls and other topographical features. The survey would record the ground level position of all earthworks, structures, wall remnants and revetments, individual significant stones, fences, hedges and other boundary features, and any other features considered to be of archaeological or historic interest. The survey would also record the position of any individual trees within the site, together with an indication of their canopies, as well as areas of differential vegetation and areas of damage/erosion.

The site survey would be integrated into the Ordnance Survey national grid by resection to points of known co-ordinates. If possible, heights AOD would be obtained by reference to the nearest OS benchmark/spot height, and contours plotted across the site. Control points would be observed through trigonometric intersection from survey stations on a traverse around and through the site. The maximum error in the closure of the traverse would be less than +/- 25mm. The locations, descriptions and values of the Bench Marks and control points would be started in the final survey data.

On completion of the EDM survey, the field data would be plotted and re-checked on site in a separate operation. Any amendments or additions would be surveyed by hand measurement.

A divorced measured survey would also be undertaken of the potential ring cairn in Area B, using traditional tape and offset techniques, again following guidance produced by English Heritage (2002). The earthworks will be recorded by measuring distances along and from taped baselines, set out along compass bearings or between other prominent features, e.g. field walls, forest drives, boundaries, trees etc. The earthworks will be drawn in the field at a scale of 1:200.

The two resulting site surveys would be produced at a scale of 1:200 and presented as interpretative hachure plans using conventions analogous to those used by English Heritage (1999; 2007, 31-35). It should be noted that the final product arising from the site surveys would be a hand-drawn hachure plan, and not AutoCad (or equivalent) electronic data. Smaller scale plans, at 1:10,000 and 1:2,500 scale, would be used to put the survey area into context (OS map bases to be provided by NYMNPA).

Detailed site descriptions would be prepared, to include a summary description and preliminary interpretation of the extant remains (e.g. dimensions, plan, form, function, date, sequence of development), locational information, mention of relevant documentary, cartographic or other evidence, and management details such as an assessment of current condition and threats.

Each identified site or component within the two survey areas would also be photographically recorded using a digital camera with 10 mega pixel resolution. English Heritage photographic guidelines would be followed (English Heritage 2007, 14) and each photograph would normally be provided with a scale. More general digital photographs would also be taken showing the landscape context of the area and of specific sites. All photographs would be clearly numbered and labelled with the subject, orientation, date taken and photographer's name, and would be cross referenced to digital files etc.

Geophysical Survey

A magnetometer survey will be undertaken in Area A, comprising 2.7ha around and to the north of the earthwork site. In addition, an area of 1ha will be surveyed in Area B, and a sample strip measuring 200m long by 80m wide (0.8m) in Area C. The survey areas will be set out with a Trimble 5800 VRS differential GPS to the national grid, with the grid then superimposed onto digital mapping. Temporary reference objects (e.g. small survey pins on fence posts) may be established and left in place following completion of the fieldwork for accurate subsequent geo-referencing. Bartington Grad601 instruments will be used to take readings at 0.25m intervals on zigzag traverses 1m apart within the various survey grids. These readings will be stored in the memory of the instrument and later downloaded to computer for processing and interpretation. Geoplot 3 (Geoscan Research) software will be used to process and present the data. A separate geophysical survey report will be produced by the specialist sub-contractors, Archaeological Services WYAS.

Survey Report

A single EDAS archive survey report will be produced, covering all three survey areas. This will assemble and summarise the available evidence for the sites and the investigations in an ordered form, synthesise the data, and comment on the quality and reliability of the evidence. It will include a contents list, acknowledgments, executive summary, details of the survey methodology and procedures, an account of the results of the investigations, preliminary conclusions, recommendations for any further appropriate and/or interpretation work, and a bibliography. Appendices will include a copy of this methods statement and details of any departures from it, and an unedited geophysical survey report. The EDAS survey report will also contain plans and photographs as appropriate; the former will be drawn to English Heritage standards using traditional hachure techniques and will be reduced to A3 / A4 size.

A draft report will be submitted to the SRLHG for comment prior to the delivery of the final report. Three copies of the final survey report would then be provided to the SRLHG, including an electronic version in pdf format. Copyright of all survey material and the report will pass to the SRLHG on payment of final invoices. It is expected that the SRLHG will present copies of the final survey report to the NYMNPA and other interested parties.

Included in this element of the work is an allowance for EDAS to complete the appropriate OASIS record forms and a short publication of the results in an appropriate journal, as necessary.

Resources and Programming

The project would be overseen by EDAS, who are on the NYMNPA list of archaeological contractors, and who are also registered as an archaeological organisation with the Institute for Archaeologists.

The project would be undertaken by Shaun Richardson of EDAS, in conjunction with Benchmark Land Surveys. Shaun Richardson has considerable expertise in non-intrusive earthwork survey, as well as recording prehistoric remains. Ed Dennison of EDAS would have overall control of the project and would be responsible for the final report production.

It is envisaged that, subject to the necessary access being secured and appropriate funding, the site survey work will be undertaken in late March/April 2012 (subject to suitable weather conditions). It is proposed to have all the initial site survey completed by the end of May 2012, with the final report produced by the end of July 2012.

Health and Safety, and Insurance

EDAS would comply with the Health and Safety at Work Act of 1974 while undertaking the project. A full copy of their Health and Safety Policy is available on request.

The site is privately-owned, and EDAS would indemnify the landowner(s) in respect of their legal liability for physical injury to persons or damage to property arising on site in connection with the survey, to the extent of EDAS's Public Liability Insurance Cover (£5,000,000).

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Ed Dennison, EDAS
February 2012