GASCOW FARM, PRIORY ROAD, ULVERSTON, CUMBRIA

Archaeological Desk-Based Assessment and Geophysical Survey

Client: Rowland Homes Limited

NGR: 329231 476461 (centre)

May 2016

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Summary

As part of pre-planning consultation for a proposed residential development on land at Gascow Farm, Priory Road, Ulverston, Cumbria, Greenlane Archaeology was commissioned to carry out a desk-based assessment and geophysical survey of the site. This is intended to identify whether there are any known archaeological remains within the site and what the potential is for as yet unknown archaeological remains to be present. The project was carried out in November 2015. The desk-based assessment, including a site visit, was undertaken by Greenlane Archaeology and the geophysical survey was carried out by Phase Site Investigations, working as sub-contractors on behalf of Greenlane Archaeology.

The site comprises an area of 11.6 hectares on the south edge of the town of Ulverston, a short distance to the north-west of Conishead Priory. It is in an area of known archaeological potential, with possible prehistoric burial mounds nearby and the line of a road or track, of possible Roman origin, running through it. The history of the site is dominated by that of Conishead Priory, which was founded as a hospital and developed into a priory during the 12th century. The site was part of the Conishead Priory estate and available maps show that the area comprised fields and woodland from at least 1822.

The archaeological potential of seven sites which may be affected within the proposed development area is assessed. The significance of several of these sites is not known because the period to which they belong is uncertain. Of particular interest are a north-west/south-east aligned linear earthwork (**Site 4**) to the east side of the site at the north end, which probably relates to a relict field boundary first marked in 1843 and seemingly still present in 1933 but which may also mark the route of a former road of possible Roman origin and a possible prehistoric mound (**Site 7**), which is still present as an earthwork.

There has been relatively little disturbance to the area apart from the route of a known aqua duct which has been tracked by ground radar. The only potential obstruction to any further archaeological work is the presence of overhead telephone wires at the north end of the site to the north side of Gascow Farm.

The geophysical survey revealed large numbers of isolated anomalies and other linear trends, some of which may indicate the presence of features of archaeological interest, as well as large areas of disturbance resulting from quarrying as well as confirming the known line of an aqua duct. Of particular interest were grouped anomalies and regular linear trends in Fields 3 and 4, which may be significant, although it was notable that the two earthwork structures known within the study area, **Site 4** and **Site 7**, were not revealed particularly well by the geophysical survey.

In view of the evidence from the wider area, there is some potential for archaeological remains, particularly of late prehistoric and possibly Roman date, to be present at the site.

Acknowledgements

Greenlane Archaeology would like to thank Rowland Homes Limited for commissioning the project, in particular Jon Gould. Additional thanks are due to Mark Brennand, Manager - Countryside Management at Cumbria County Council, for his comments and for help with accessing the HER, and the staff of the Cumbria Archive Centre in Barrow (CAC(B)) for help with accessing their archives. Special thanks are also due to the current landowner, Andrew Crayston, for his assistance on site.

The project was managed by Dan Elsworth, who also carried out the desk-based assessment and site visit, and wrote the report with Tom Mace, who produced the illustrations. The geophysical survey was carried out and the associated report produced by Phase Site Investigations, and special thanks are due to them given the difficulties encountered on site. The final report was edited by Jo Dawson.

1. Introduction

1.1 Circumstances of the Project

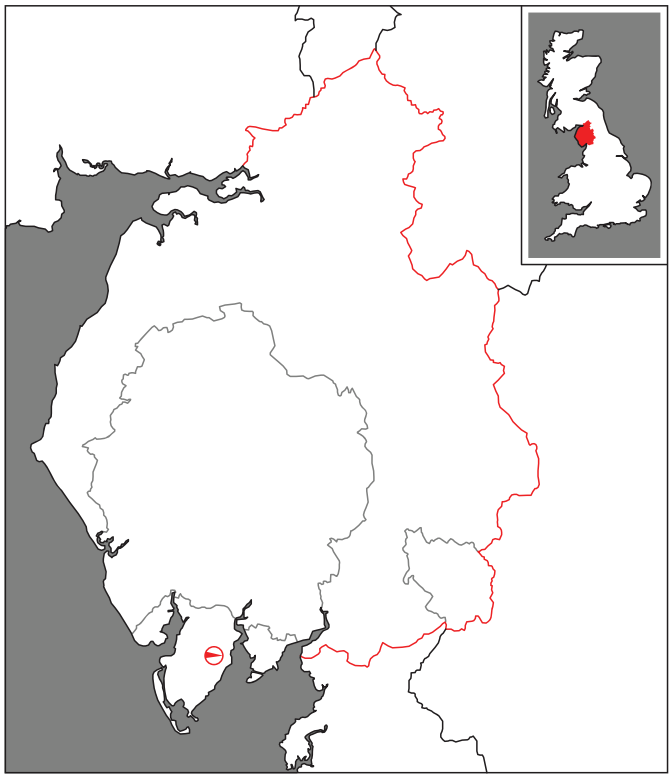
1.1.1 As part of pre-planning consultation for a proposed residential development on land at Gascow Farm, Priory Road, Ulverston, Cumbria (NGR 329231 476461 (centre)) Greenlane Archaeology was commissioned to carry out an archaeological desk-based assessment and geophysical survey, as required by the Development Brief issued for the site (SLDC 2015). This was intended to establish at an early stage whether the area was likely to have any known sites of archaeological interest within it or whether there was any potential for as yet unknown sites to be present. In response to the Development Brief issued for the site (SLDC 2015) Greenlane Archaeology produced a project design. Following its acceptance by Rowland Homes Limited (hereafter 'the client') the work was carried out by Greenlane Archaeology in November 2015.

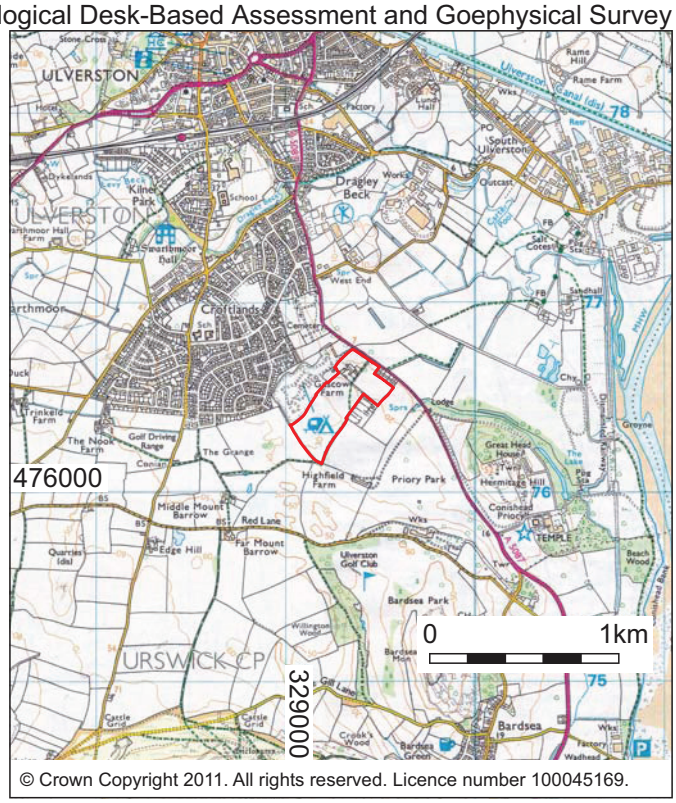
1.1.2 The proposed development site comprises an area of 11.6 hectares and is on the south edge of the town of Ulverston, a short distance to the north-west of Conishead Priory. It is in an area of known archaeological potential, with possible prehistoric burial mounds nearby and the line of a road of possible Roman origin running through it (Elsworth 2007).

1.2 Location, Geology, and Topography

1.2.1 The site is located on the west coast of the Furness Peninsula, approximately 1.8km south of the centre of Ulverston, Cumbria, between approximately 8m and 35m above sea level (Figure 1). The undulating landscape to the west comprises a mix of rough pasture, limestone walls, narrow lanes and widespread semi-natural deciduous woodland (Countryside Commission 1998, 70).

1.2.2 The site is on the boundary between an area of Namurian millstone grit to the south-west and Carboniferous limestone to the north-east (Moseley 1978, plate 1), which is typically overlain by glacial deposits of boulder clay (Countryside Commission 1998, 72).





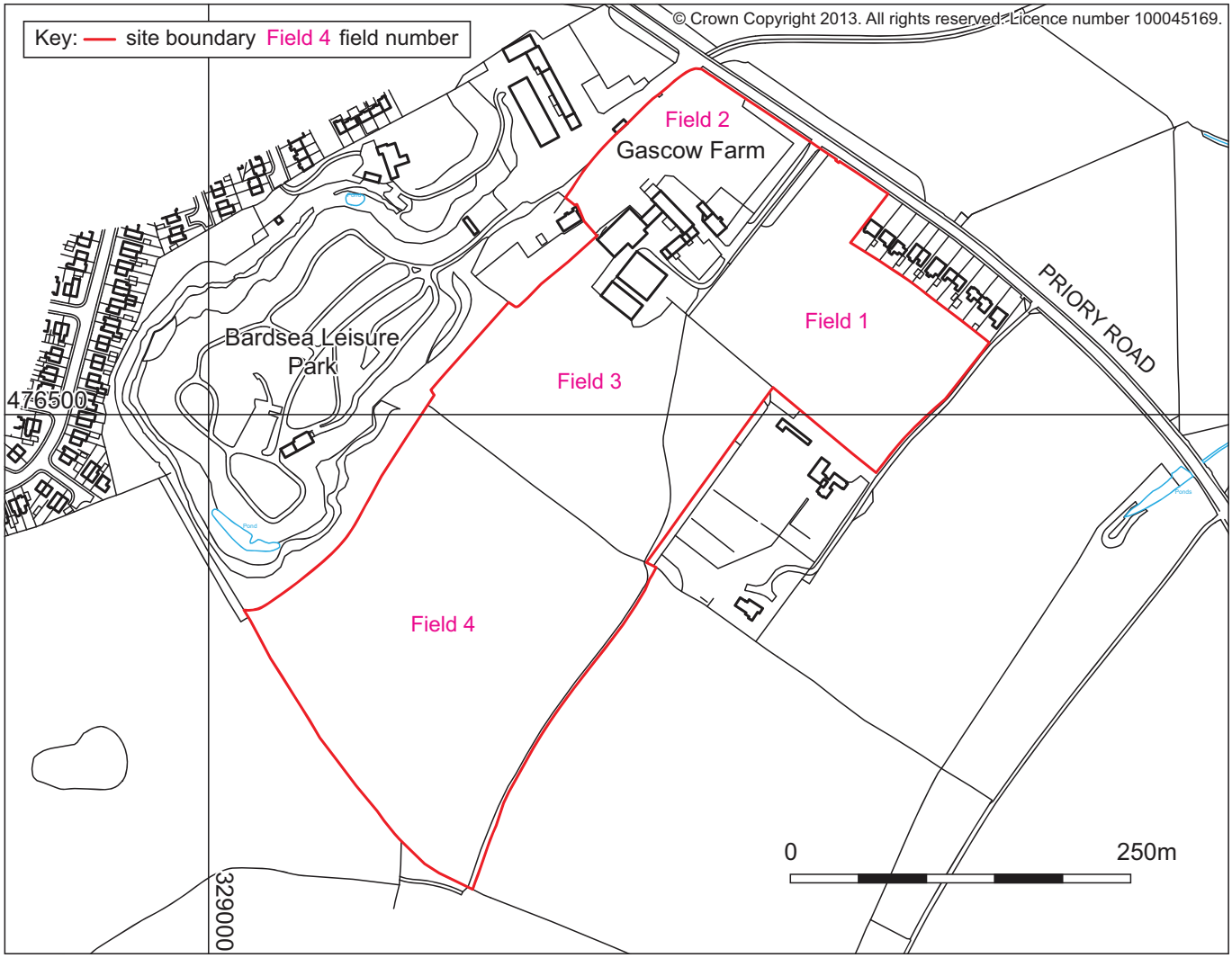


Figure 1: Site location

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2. Methodology

2.1 Desk-Based Assessment

2.1.1 A desk-based assessment was carried out in accordance with the guidelines of the Chartered Institute for Archaeologists (CIfA 2014). This principally comprised an examination of early maps of the site and published secondary sources. A number of sources of information were used during the desk-based assessment:

- ***Cumbria Historic Environment Record (HER)***: this is a list of all the known sites of archaeological interest within the county, which is maintained by Cumbria County Council and is the primary source of information for an investigation of this kind. All of the known sites of archaeological interest within c500m of the edge of the proposed development area were examined; each identified site comes with a grid reference, description and source and any additional information which was referenced was also examined as necessary. In addition, unpublished reports of archaeological investigations in the vicinity of the site were examined;
- ***Cumbria Archive Centre, Barrow-in-Furness (CAC(B))***: this was visited principally in order to examine early maps and plans of the site, but other documentary sources and published records were also consulted in order to gather information about the historical development of the site and its environs, and also information about the archaeology of its immediate environs;
- ***Greenlane Archaeology library***: additional secondary sources and unpublished reports were examined to provide information for the site background. In particular, information was taken from a previous report for Conishead Priory compiled by Greenlane Archaeology (2009a), which utilised information from a number of other sources, notably the Cumbria Archive Centre in Kendal (CAC(K) and the Lancashire Record Office (LRO) in Preston.

2.2 Site Visit

2.2.1 A brief site visit was carried out, primarily with the intension of identifying any areas that might prove constraining to any subsequent archaeological work and whether the site had been affected by any modern activity that might have impacted upon archaeological remains. In addition, the presence of any features, finds, or deposits of possible archaeological interest was noted. Brief written notes were made during the site visit and areas of interest noted on a plan of the site. Colour digital photographs showing the general arrangement of the site and any features of interest were also taken.

2.3 Geophysical Survey

2.3.1 Full details of the methodology used during the geophysical survey are presented in *Appendix 3*. A detailed magnetic survey was carried out using a multi-sensor array cart (MACS) comprising eight Foerster 4.032 Ferex CON 650 gradiometers with sensors at a separation of 0.5m, so data was collected on profiles spaced at 0.5m intervals.

2.4 Archive

2.4.1 A comprehensive archive of the project has been produced in accordance with the project design, and current CIfA and English Heritage guidelines (Brown 2007; English Heritage 1991). The paper and digital archive and a copy of this report will be deposited in the Cumbria Archive Centre in Barrow-in-Furness following the completion of the project. A copy of this report will be provided for the client, a digital copy for the client's agent, and a copy will be retained by Greenlane Archaeology. In addition, at a suitable time a digital copy will be provided for the Historic Environment Record at Cumbria County Council, and a record of the project will be made on the OASIS scheme.

3. Results

3.1 Introduction

3.1.1 A total of 16 sites of archaeological interest were identified within the study area during the desk-based assessment and site visit (Figure 2; summarised in Table 1 below) ranging from prehistoric to post-medieval in date. Six of these sites were newly identified during the desk-based assessment and site visit (**Sites 1** to **6**). **Site 7** relates to a site recorded on the HER but has been more accurately located as a result of the desk-based work and a survey provided by the client. The remainder of the sites (**Sites 9** to **16**) were already recorded on the HER although the locations and extent of some have now been more accurately recorded (specifically **Sites 7, 12** and **15**). The extent of ridge and furrow as part of the relict field system to the east (**Site 13**) has also been marked on the basis of aerial photographs of the area. **Sites 1** to **7** are located within the proposed development area, however, the two find spots (**Sites 8** and **16**) are not accurately located so their significance to the study area is uncertain. In addition, there are other sites recorded in the HER comprising single objects found nearby that could have been within the study area but as their exact location is unknown they are not included in the gazetteer. Sites included in the gazetteer that relate to periods of the study area's history are individually mentioned in the site history (see *Section 4* below). Several of the earthworks in the area (**Site 3**, **4**, **7**, **13**, **14** and **15**) are of unknown date and **Site 11** may in fact record a natural feature.

Site No.	Type	Period	Site No.	Type	Period
1	Small brick-built structure	Post-medieval	**9**	Mineral railway	Post-medieval
2	Earthworks, possible quarry	Post-medieval	**10**	Quarry	Post-medieval
3	Lynchet or terrace	Unknown	**11**	Mound	Natural feature?
4	Linear earthworks denoting line of road, area of quarrying, and probable field boundaries	Roman? / Post-medieval	**12**	Mound	Post-medieval
5	Terrace and platform	Post-medieval	**13**	Relict field system	Roman? to post-medieval
6	Slight hollow way, possible footpath	Post-medieval	**14**	Lynchet / mound	Roman?
7	Possible barrow	Unknown	**15**	Possible barrow	Prehistoric?
8	Hammerstone	Prehistoric	**16**	Miscellaneous finds	Unknown / prehistoric?

Table 1: Summary of the gazetteer sites identified within the study area

3.2 Desk-Based Assessment

3.2.1 The results of the desk-based assessment have been used to produce two separate elements. Firstly all sites of archaeological interest recorded within the study area were compiled into a gazetteer (*Appendix 1*). The gazetteer is used to assess the general type of historic landscape that makes up the study area, contribute to the compilation of the general history of the site (see *Section 4*) and, more importantly, identify sites that are likely to be affected by the proposed development. The significance of each of these sites and the degree to which they are likely to be affected is considered in *Section 5* and from this recommendations for further work are produced.

3.2.2 The second purpose of the desk-based assessment is to produce a background history of the site. This is intended to cover all periods, in part to provide information that can be used to assess the potential of the site (particularly for the presence of remains that are otherwise not recorded in the study area), but more importantly to present the documented details of any sites that are known (see *Section 4*).

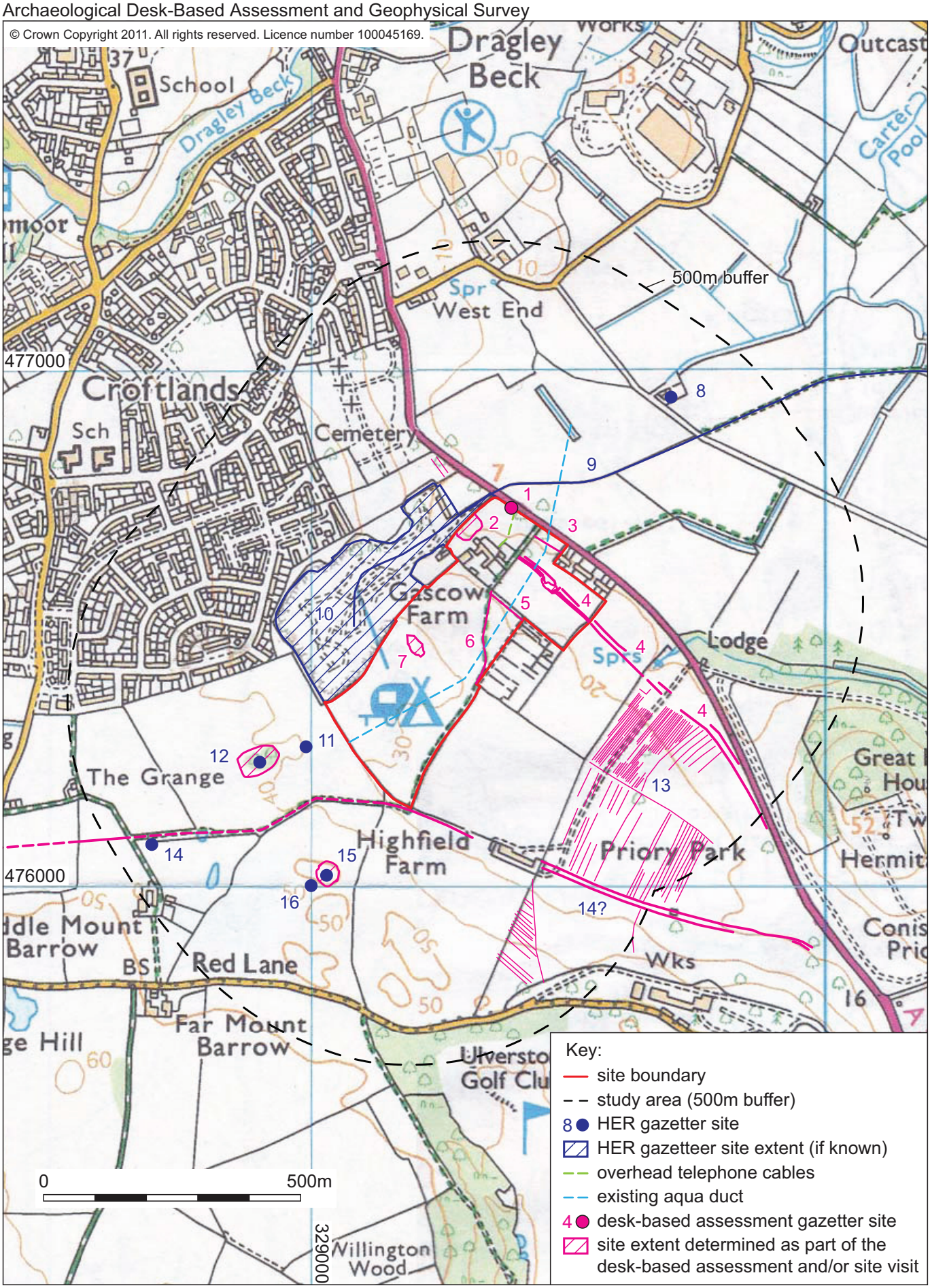

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Figure 2: Gazetteer sites

3.3 Map and Image Regression

3.3.1 ***Introduction***: early maps of the area tend to be relatively lacking in detail and are certainly not specific enough to be useful in understanding the development of the site. The earliest useful maps are therefore from the early 19th century onwards.

3.3.2 ***Smith's map of 1822***: this map (Plate 1) was drawn by William Smith in 1822 to show the ranges of limestone rocks around Conishead Priory (OUMNH 462-smith/Box 16/Folder 1/1 1822). William Smith was a pioneer of geology in the 19th century and created the first geological map of England (Winchester 2002). Bankrupt in 1819 he fled north where he offered his services to landowners who might benefit from him surveying their land with the discovery of profitable mineral seams (*op cit*, 269). The most significant element that this map shows is that the position of the road leading to Conishead Priory was on a different alignment at this time, being slightly south-west of its current location. The road as shown on this map seems to relate to that now evident as earthworks in the field (**Site 4**), although these are marked by the line of a field boundary on later maps and the line of a road corresponding to **Site 14** is also shown. It has been suggested that these roads are Roman in origin (Elsworth 2007), although, if so, that corresponding to **Site 4** was clearly still in use when Smith carried out his survey before being moved to its current location shortly afterwards (see Elsworth 2010). In addition, a feature is shown to the south side of the southern field boundary, which clearly corresponds to **Site 7**, and a single building is shown at the location of what is now Gascow Farm, although this is on the edge of the mapped area. The farm is apparently accessed by the road or track which leads to it from the south-east.

3.3.3 ***Jonathan Binns' map of 1843***: this map (CAC(B) BDHJ/Plan 24 1843) shows Gascow Farm in more detail and also names the nearby fields (Plate 2). The fields are named possibly 'Slack Yard' to the north-east, 'Bull Copy' south of that, 'Barn Field' across the central section, and 'Cookson Close' to the south. The north end of the area is wooded to the east, this area is called 'Hagg', and a large pond is shown north of the farm buildings to the west. The road to the south-east (**Site 4**) is no longer shown, although its line is marked by a field boundary and the adjoining area has been further subdivided, although the other road (**Site 14**) is still present. The mound (**Site 7**) near the boundary between Fields 3 and 4 is not shown but the farm, named 'Gaskew', is shown in more detail.

Plate 1 (left): Re-drawn extract from Smith's map of 1822 (OUMNH 462-smith/Box 16/Folder 1/1 1822)

Plate 2 (right): Extract from Jonathan Binns' map of 1843 (CAC(B) BDHJ/Plan 24 1843)

3.3.4 ***Jonathan Binns' Map of 1846***: this is the second map (CAC(B) BDHJ/Plan 20 1846) by Binns of the Conishead estate. It shows essentially the same information as the earlier plan, although the mound (**Site 7**) near the central field boundary is shown once again (Plate 3; cf. Plate 2). By contrast, it is noticeable that the large mound covered in the trees in the field to the south-west of the proposed development area (**Site 12**) and a number of field boundaries running up to it seem to have either been created since the previous map was produced or for some reason surveyed for the first time at this date.

3.3.5 ***Ordnance Survey map 1850:*** the farm is called Gascow on this map (Plate 4), which shows similar detail to Binns' earlier maps. Various paths are shown leading across the fields to the farm from the south. The mound in the adjoining field (**Site 12**) is now named 'Gray Barrow Plantation'.

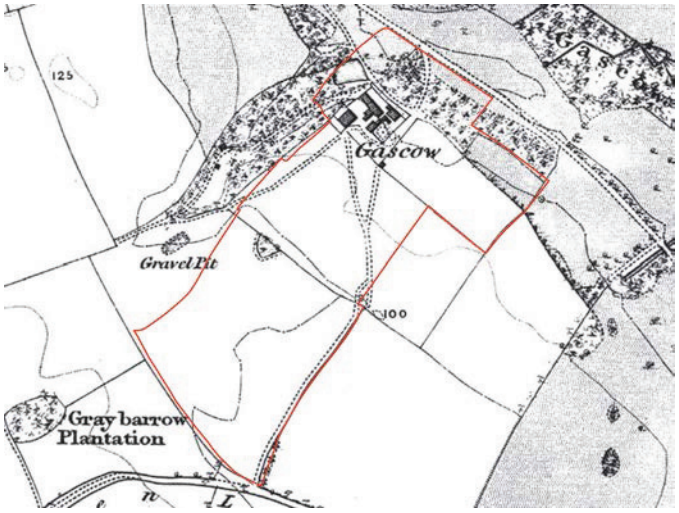

Plate 3 (left): Extract from Jonathan Binns' map of 1846 (CAC(B) BDHJ/Plan 20 1846)

Plate 4 (right): Extract from the Ordnance Survey map of 1850

3.3.6 ***Estate plan of c1865***: the exact date of this map is not known but appears to be extremely similar to Binns's map of 1846 and an estate plan of 1866 (Plate 5; cf. Plate 3 and Plate 6). It shows essentially the same information as Binns' survey, although the field called 'Bull Copy' is called 'Ball Copy' and what appears to have been called 'Slack Yard' is now marked as 'Stack Yard'.

3.3.7 ***Estate plan of 1866***: this plan (Plate 6) shows the area around the farm (again called Gaskew) in some detail (CAC(B) BDX 53/10/2 1866). The field names are the same as those shown on Binns' earlier maps, although 'Slack Yard' appears to be called 'Stack Yard' as on the estate plan from *c*1865. The mound (**Site 7**) is not shown and a new track cuts across the south field.

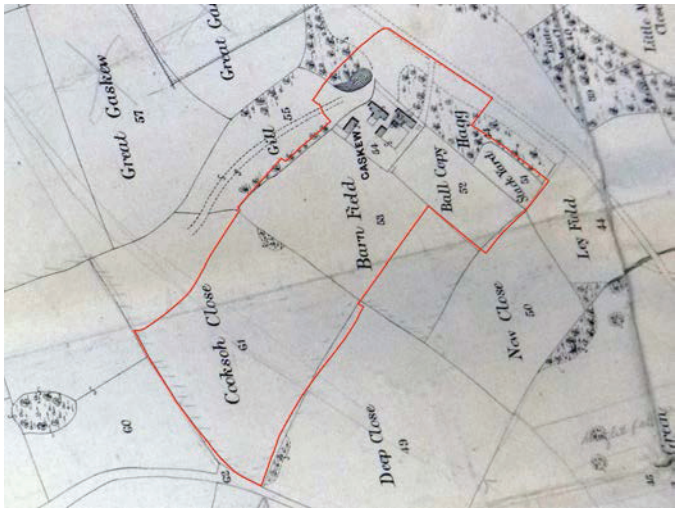

Plate 5 (left): Extract from the estate plan of c1865 (CAC(B) BDX 86/110 *c*1865)

Plate 6 (right): Extract from the estate plan of 1866 (CAC(B) BDX 53/10/2 1866)

3.3.8 ***Plan of land for sale, 1879***: this map (CAC(B) BDKF/30/19 1879) highlights the land of the Conishead Priory estate offered for sale by Henry Askew (Plate 7). The gravel hole and quarry (**Site 10**) to the north-west of the site are shown but the speculative division of the estate and creation of new

roads as shown here does not appear to have taken place. The pond to the north of the farm is not shown.

3.3.9 ***Plan of proposed deviation of footpath, 1879***: this plan was clearly produced in connection with the proposals to build houses in the area (see also *Section 3.3.8* above) and shows a proposed diversion of the footpath at a right angle from the proposed new road that would have run through the centre of the site but was clearly never built (Plate 8). The plan field boundaries are unchanged from those shown on earlier available maps (CAC(B) BSUDU_BIPLAN_371 1879, Plate 8). An existing footpath (approximately corresponding to **Site 6**) and a proposed diversion to the footpath (approximately corresponding to **Site 5**) are marked, as is the mound (**Site 7**), but the proposed road was never followed through.

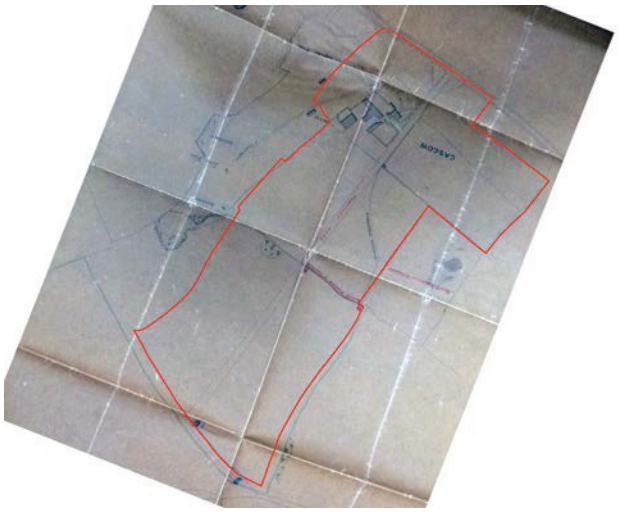

Plate 7 (left): Extract from the map of land for sale of Conishead Priory estate, 1879 (CAC(B) BDKF/30/19 1879)

Plate 8 (right): Extract from plan of proposed footpath diversion, 1879 (CAC(B) BSUDU/BIPLAN/371 1879)

3.3.10 ***Plan of the Sand Hall estate, c1890***: this map (Plate 9) shows the area to be purchased in connection with enlarging the adjoining Gascow quarry, and provides essentially the same information as the earlier maps, although the footpaths and mound (**Site 7**) are not shown (CAC(B) BDX/86/06 *c*1890).

3.3.11 ***Ordnance Survey Map, 1891:*** this map (Plate 10) shows that little has changed within the site boundary. The fields to the north have been extended to the roadside and minor changes have been made to the field boundaries at this end and Gascow Quarry (**Site 10**) has increased in size to the north-west of the area. A nursery is shown just to the east of the site.

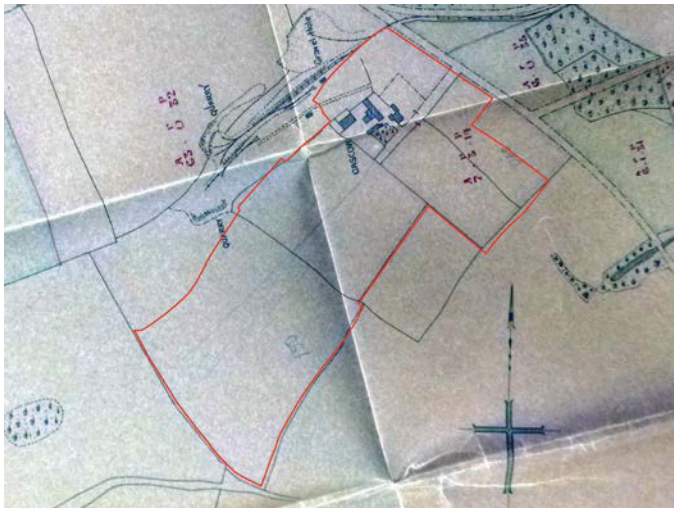

Plate 9 (left): Extract from the plan of the Sandhall Etstae, *c*1890 (CAC(B) BDX/86/106 *c*1890)

Plate 10 (right): Extract from the Ordnance Survey map of 1891

3.3.12 ***Ordnance Survey Map, 1913***: the map is largely unchanged from the 1891 edition although Gascow Quarry (**Site 10**) has again increased in size (Plate 11; cf. Plate 10). A pond is again possibly marked to the north of the farm.

3.3.13 ***Ordnance Survey Map, 1933****:* this map shows much the same information as the earlier Ordnance Survey map, although the pond shown on the 1913 edition is no longer marked (Plate 12; cf. Plate 11). The area to the east of the site at the north end has started to see some development. In addition a small area of quarrying is shown immediately to the east of Gascow Farm (part of **Site 4**).

Plate 11 (left): Extract from the Ordnance Survey map of 1913

Plate 12 (right): Extract from the Ordnance Survey map of 1933

3.3.14 ***Aerial photograph, 1966***: the mounds (**Site 7** and **12**) and possible tracks and earthworks (**Sites 5** and **6**) are clearly visible in this aerial photograph (Plate 13). The quarrying site and possible relict field boundary or road (**Site 4**) is also visible. The line of this earthwork continues into neighbouring fields to the south-east and the extent of ridge and furrow (**Site 13**) in the neighbouring fields is also fairly clear (see Figure 2). It is also apparent that there is very regular, and therefore probably post-medieval, ridge and furrow orientated north-west/south-east across Field 3.

Plate 13: Aerial photograph, 1966 (Ordnance Survey 1966)

3.4 Site Visit

3.4.1 ***Site Arrangement and Character***:

3.4.2 ***Constraints***: there were few constraints to any further archaeological work across most of the site, however, an existing aqua duct, which is known to run across the site and has been traced with ground radar by SurveyEng Ltd, will undoubtedly have impacted upon any below ground remains.

3.5 Geophysical Survey

3.5.1 The full geophysical report is presented in *Appendix 3*. In summary though, each of the four fields produced markedly different results:

- **Field 1**: the central part of the site is dominated by an area of magnetic disturbance that corresponds with the quarrying activity known to have taken place here in the early 20th century. The field is also cut on its north-west side by a dipolar linear anomaly that clearly corresponds with the aqua duct known to be present in this area. Otherwise there are two possible linear trends that run oblique to the faint traces of ridge and furrow. The road or trackway recorded in this field is not obviously visible in the geophysical data, which would indicate that it is not constructed from a material with a variable magnetic signal (such as compacted gravel), although the traces of recent agricultural activity in this area have the same orientation and so may have masked the track and it has evidently been considerably disturbed by the later quarrying;
- **Field 2**: while there were a number of isolated responses across the field, many of which are likely to be modern or geological in origin, the results are dominated by a large area of magnetic disturbance that is probably caused by activity associated with the nearby quarry and former pond. However, there were a small number of other trends and anomalies that are of uncertain origin and may be of archaeological interest;
- **Field 3**: this contains a large number of isolated responses, the majority of which are not likely to be of archaeological interest, as well as a strong response clearly showing ridge and furrow across the field, corresponding with what is visible in the aerial photograph of 1966, and the line of the aqua duct also present in Field 1 running along the south-eastern edge as a large dipolar

anomaly. In addition there are two negative linear anomalies, presumably caused by compacted non-magnetic material, at least some of which correspond to known trackways. There are also several clusters of isolated positive responses, some of which may be of archaeological origin although the majority are likely to have been caused by natural features. Most significant is a large grouping of positive linear and curvi-linear anomalies that appear to form an oval-shaped feature, possibly with internal structures. While this appears to be of archaeological interest it is notable that the response for the ridge and furrow is much weaker in this area (although it is evidently present here in the aerial photograph of 1966), perhaps suggesting that this oval feature post-dates the ridge and furrow, although this would make it very modern and there is no evidence for any recent disturbance on the surface;

- **Field 4**: this field too has a number of isolated responses, most of which are likely to be natural in origin, as well as the aqua duct visible as a linear dipolar anomaly running through the middle. However, a number of broad linear trends are also present, some of which could be natural, but several of which appear to form regular patterns suggesting they might be of archaeological interest. The positive isolated responses are also more numerous and clustered in certain parts of the field, particularly the southern half, and while many are likely to be natural in origin, the grouping in some areas appears significant and might suggest they are of archaeological interest. In addition, it is worth noting that the supposed burial mound positioned against the north-east boundary of the field did not show any obvious magnetic response, which seems to indicate that it does not contain any extensive infilled features or other material of interest.

3.6 Conclusion

3.6.1 The map regression shows that the proposed development site comprised fields and woodland from at least 1822, but that it was all within the Conishead Priory estate. Elements of Gascow Farm are shown from this date onwards and are shown in more detail on subsequent maps. A track to the farm from the south-east shown on the map of 1822 is not shown on later maps and the mound (**Site 7**) near the southern boundary is marked, albeit sporadically, from 1822 onwards. The field names persist, with minor differences, from at least 1846 to 1866 and minor alterations were made to field boundaries within the area after this time. The quarry (**Site 10**) to the north-west grew considerably after 1866.

3.6.2 The site visit revealed that the mound (**Site 7**) is still present as an earthwork. A second north-west/south-east aligned linear earthwork (**Site 4**) to the east side of the site at the north end probably relates to a former road line recorded in 1822 and possibly of Roman origin, which was preserved as a field boundary into the 19th and early 20th century, although it was disturbed by quarrying by at least 1933. The site visit also revealed that there has been relatively little disturbance to the majority of area, although it is clear that the ground has been subject to improvement, although the route of a known aqua duct will also have caused some damage to any archaeological deposits that might be present along its route, primarily **Site 4**. The only potential obstruction to any further archaeological work is the presence of overhead telephone wires at the north end of the site to the north side of Gascow Farm.

3.6.3 The geophysical survey revealed a number of anomalies that are of potential archaeological interest. This was particularly the case in Fields 3 and 4, while Field 2 showed large amounts of disturbance probably due to the nearby quarry. Field 1 showed a smaller number of features of interest, although there was again some modern disturbance caused by quarrying, although curiously the line of the track or road shown on early maps and aerial photographs (**Site 4** was not particularly clear and no features of interest were found in association with the possible burial mound (**Site 7**). In addition, the aqua duct known to run across the site was very clear in three of the four fields.

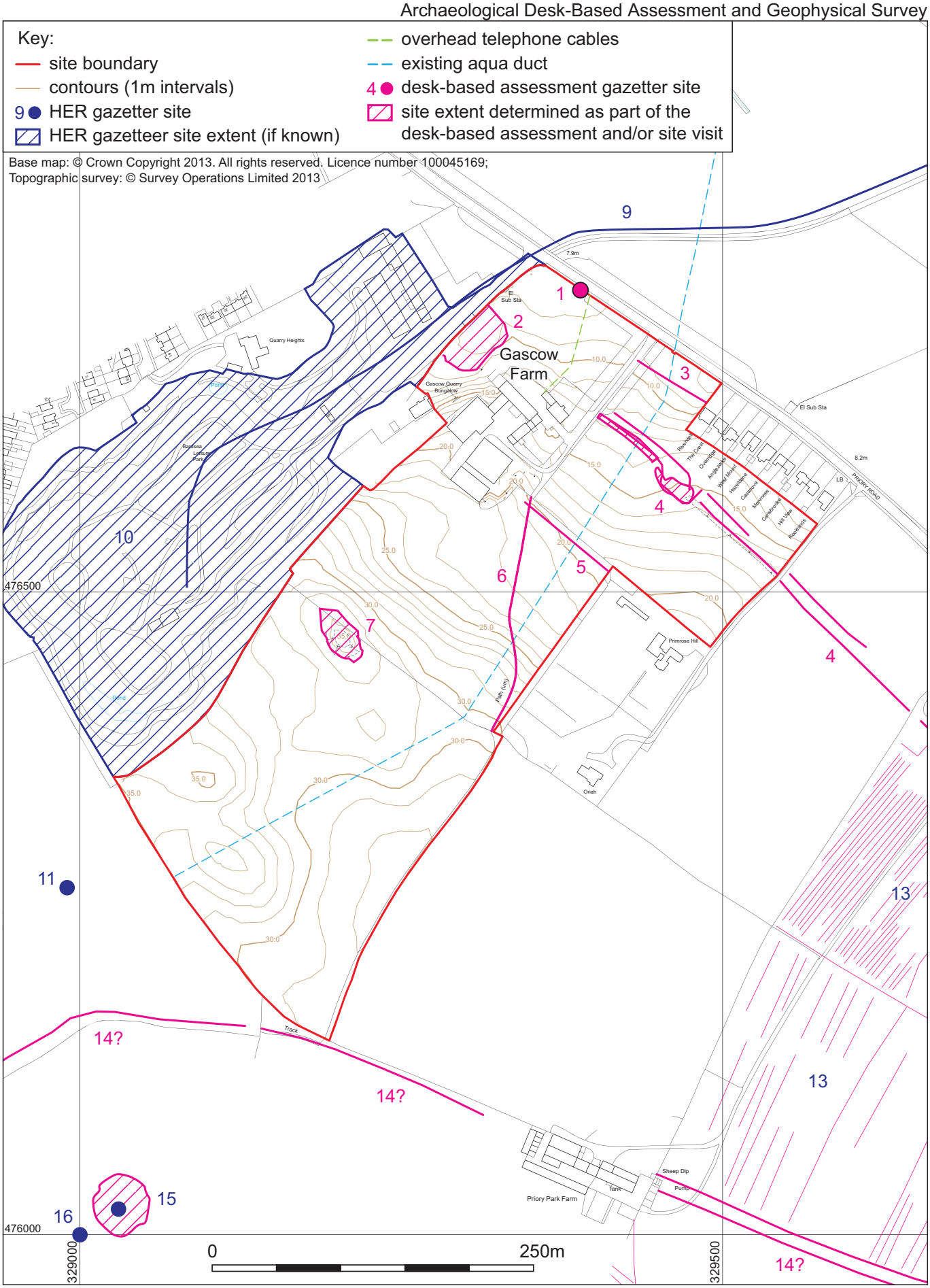

Figure 3: Topgraphic survey and detail of gazetteer sites within site boundary

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4. Site History

4.1 Introduction

4.1.1 The landscape around Conishead Priory has evidence for human activity dating back at least 6000 years, and there is palaeoenvironmental evidence from potentially even earlier periods. However, the earliest phases of activity around the priory are largely identified through very insubstantial information, typically stray finds and conjectured arguments based on later sources. Gascow Farm formed part of the Conishead Priory estate and so is closely liked to its history. There is considerably more evidence relating to the later periods because of the connections with the medieval priory and the mansion that was subsequent built on the site, but even then there is some uncertainty about the meaning and validity of some of the available sources.

4.2 Prehistory

4.2.1 Evidence for early prehistoric remains are not widespread in the region, although of the few remains of the immediately post-glacial (Late Upper Palaeolithic) period that have been discovered in the North West, a considerable number have come from the limestone caves around Morecambe Bay (Young 2002, 21). Evidence for people living in the local area is more prevalent in the following Mesolithic period, although this tends to be restricted to scatters of flint artefacts (*op cit*, 24), and little in the way of more obvious settlement activity. During the following Neolithic period more tangible, structural remains such as stone circles, enclosures and burial mounds do start to appear, but these are relatively rare. The typical find of this period is the stone axe, an example of which is recorded within the study area (**Site 16**). A prehistoric hammerstone, perhaps also belonging to this period was also found nearby (**Site 8**). A polished stone axe (HER 2395) was also found 'near Conishead Priory' before 1893 about 6ft below the ground surface (Harrison 1896, 9; Gaythorpe 1909, 210). The HER described it as being '*of grey fine-grained stone, the ends chipped only, the two faces polished in facets lengthwise, the sides quite sharp, surface covered with a brown deposit. Length 14 ½ inches*'. There is also evidence in aerial photographs of ancient tidal creeks in the vicinity of Conishead that demonstrate the form of the ancient landscape (Clare 2000, 6). Although not directly dateable in some cases, these are likely, based on other evidence, to belong to the late Mesolithic or Neolithic (*ibid*; Plate 14).

Plate 14: Fossilised tidal creek near Conishead Priory revealed in an aerial photograph (Bewley 1984)

4.2.2 During the following period, the Bronze Age, the large monuments of the previous period become increasingly common and are supplemented by complex field systems; the presence of prehistoric sites of various types at Birkrigg, Urswick and Stainton to the west is very notable. Excavations in the early 20th century at the double stone circle on Birkrigg Common revealed material attributable to various stages of the Bronze Age (Gelderd and Dobson 1912; Committee of the North Lonsdale Field Club

1922) and at Urswick Stone Walls an engraved fragment of bronze thought to date from the Iron Age was discovered (Dobson 1907). Investigations at an enclosed homestead known as Stone Close at Stainton revealed finds including roughed out and polished stone axes, a bronze palstave and socketed axe, and both saddle and rotary querns, suggesting occupation from the Neolithic to Iron Age periods (Dobson 1912). During the Iron Age enclosures of this type are generally thought to be more common, even if many are likely to have earlier origins. There are several examples of the type-site of the period, the hillfort, in the local area (Elsworth 2014) although only one of these had been subject to any modern excavation, Skelmore Heads near Urswick, (Powell *et al* 1963); although this revealed evidence suggesting continuous occupation from the Neolithic period (Powell 1972). Other features that can be positively dated to the Iron Age period are very rare (Hodgson and Brennand 2006, 51).

4.2.3 Within the study area a number of burial mounds are recorded in the vicinity of Gascow, typically close to Mountbarrow Farm, the name of which is indicative of such features as is the name of one of the fields, 'Grey Barrows', as shown on early estate maps (this field contains one of these possible mounds (**Site 12**, see also **Site 11**)). The early sources describing these mounds are somewhat confusing, generally because of the lack of detailed locations, but various accounts suggest that up to three burial mounds existed in the area into the 19th century, although at least one was already in the process of being removed by 1805 (West 1805, 9; Barber 1869, 29; Ferguson and Cowper 1893, 113; Hawkridge and Stables 1896, 16; see **Sites 7**, **11**, **12**, and **15**).

4.3 Roman to Early Medieval

4.3.1 Activity in Furness during the Roman period has generally been thought to be confined to a few stray coins, although 18th century accounts suggest that more substantial remains existed (Elsworth 2007). A recent re-assessment of the evidence has suggested that these have some foundation, and that military structures might exist including a fort at Dalton and perhaps even activity in Ulverston, but this has yet to be proven (*ibid*). An ancient road, known as the Streetgate and probably one of two roads mentioned in the foundation charter of Conishead Priory, running west from the shore towards Conishead Priory, was excavated in the 1920s and is considered to be Roman (*ibid)*. The road from Gascow Farm to Conishead Priory shown on William Smith's plan of 1822 (OUMNH 462-smith/Box 16/Folder 1/1 1822) possibly records the position of the 'Roman' road, still in use at this time, and earthworks in the field (**Site 4**) may be related to it; these earthworks also correspond to the line of a field boundary on later maps, but they could still mark the position of the old road. A second road running approximately east/west to the south of the proposed development area (**Site 14**) may also be Roman in origin and be the other one mentioned in the foundation charter for Conishead (Elsworth 2007), but this too is unproven. The HER records that a silver coin of Augustus Caesar was found in a field near Conishead Priory *c*1800 (HER 2396, NGR. 330000 46000), but its exact find spot location is unknown (Evans 1842, 119). On one side was a very protuberant and perfect head surrounded by the words 'Caesar Augustus', and on the other a female sitting in a chair with right hand extended and holding a small ball or globe with left hand placed on her side and inscribed 'Salus' or 'Salve' underneath. This has subsequently been identified as Denarius of Augustus dated to the 1st century AD (Shotter 1989, 41). A second HER entry for a silver coin find at the same point (HER 4905) duplicates much of this information and so probably refers to the same find. An account was given in the *Lancaster Gazette* and also the *Carlisle Journal* (17th May 1806): '*A silver coin of very ancient date, was lately found in the neighbourhood of Ulverstone, and is now in the possession of Mr J Wilson, watchmaker in that town. The head is perfect and round it, in Roman letters; 'CAESAR AVGVSTVS'. On the reverse is a female figure, in light drapery, sitting on a chair, with a ball or globe in the right hand, and her left resting on her side; and underneath the figure, the four Roman; 'S A L V', all in high preservation*'.

4.3.2 There is little evidence of activity in the vicinity of Conishead following the collapse of Roman administration in the early 5th century, although a 16th century grant naming lands associated with the priory includes an '*Eglysfylde*', the first element of which is likely to be derived from the Latin *ecclesia*, which is often assumed to indicate the location of an early Christian site (Elsworth 2013). The name Conishead, originally *Conyngsheved*, which can be found in ancient documents (see for example Atkinson 1887, 420), derives from the old Norse words *konungr*; king, and *heofud*; headland (Ekwall 1960, 120) and therefore meaning '*headland belonging to the king*'. The element 'king' suggests

someone of significance was associated with the area from an early date, which is further suggested by the name Harlsyde, the original name for Chapel Island, derived from the Norse for 'Earl's seat'.

4.4 Medieval

4.4.1 The proximity of the site to Conishead Priory means that its history is inevitably dominated by that of Conishead Priory. Despite the possible evidence for earlier activity on the site (see *Section 3.3.1* above) there is a distinct lack of detailed information about the origins of the medieval priory at Conishead. It is known to have been founded as a hospital and subsequently developed into a priory during the reign of Henry II (1154-1189). It is thought to have been established by Gamel de Pennington, perhaps as early as 1167 as a hospital run by the Augustinian order (Barnes 1968, 30); William de Lancaster II (1170-1184), baron of Kendal, also claimed to be the founder however (Farrer and Brownbill 1908, 140). It may have developed out of an earlier hospital dedicated to St John of Jerusalem founded some time earlier by William de Lancaster I and said to be in Bardsea (Wiseman 1987, 95; citing Curwen 1906, 176-177). That the site at Conishead was established as a hospital and had a particular connection to those suffering from leprosy is known from an early date (West 1774, 186) and it seems logical that the original hospital developed into the later priory (Wiseman 1987, 95). Gamel, who also gave the church of Orton in Westmorland to Conishead (Cherry and Cherry 2004, 264) and the vill of Poulton in Lonsdale and whose manor of Pennington adjoined the estate on which the hospital was built is described as its founder in several late medieval documents (Farrer and Brownbill 1908, 140). It was raised to the status of a priory soon after it was established, most likely by 1180-1181, but certainly by 1184 (Farrer 1902, 357). The charter, issued by William de Lancaster II, granted to Conishead:

'*the church of Ulverston, with its chapels and appurtenances; with forty acres of land in Ulverston, adjoining to the lands of the said brethren; with a salt-work betwixt Conishead and Ulverston pule, and turf in the turbary, sufficient for the use of the said house and salt-work; and pasture and dead wood behind Plumpton, and necessary materials for their said house out of his woods in Furness, common of pasture, and all easements belonging to Ulverston, with pannage for their hogs, thro' all his woods in Furness*' (West 1774, 186).

4.4.2 Additional grants were also made at this time (*op cit*, 187), with a more substantial second grant made shortly after, again by William de Lancaster II, including 20 acres of land in Ulverston, land for a forge and bloomery, an iron mine at Plumpton, wood at Blawith for making charcoal, and fishing rights on the River Crake (*op cit*, 188-189). This demonstrates that they had an extensive landholding, including not only industrial sites but also important fishing grounds; it is also recorded as obtaining salt from near Haverigg (Cranstone 2006, 102; he does not give the original source although this would seem to be confirmed in notes made by WB Kendall cited by Kipling (1961, 61)). Of particular relevance was the grant of Gascow in 1275, which seems to have formed the core grange for Conishead Priory (Newman 2014, 154-155). The extent of lands and properties granted to Conishead Priory outside of the Ulverston area has now been examined in some detail (*op cit*, 155), but most are not particularly relevant to the study area. Closer to it, however, they were granted the right to make a ditch 12ft wide from their well at Trinkeld to provide water for the priory (Farrer and Brownbill 1914, 355), and the spring that erupts from the ground, apparently by means of an artificially created adit, just outside the south-east boundary of the proposed development site, is probably the point where this reappears after passing into a natural underground channel somewhere near Mountbarrow Road (Fell 1929, 22). Its artificial course to the west of this point may have been identified during a recent geophysical survey (Wardell Armstrong Archaeology 2015), the channel apparently having been moved to the side of the field some time immediately prior to 1929 (Fell 1929, 22).

4.4.3 There is evidence of dispute between Furness Abbey and Conishead Priory but an amicable settlement was reached in 1208. Both sides agreed to drop their claims and it was further agreed that the Priory should not exceed more than thirteen canons. Also, acquisition of land by the Priory must be confined to the Ulverston fief and not exceed a third of this area; in addition there was an annual 50s pension to be paid to the Abbey (Barnes 1968, 30). However, some of the endowments brought the Priory into conflict with the monks of Furness Abbey and early records show almost continuous rivalry

between the two religious houses. The disputes were finally settled in 1338 when Edward III bestowed a royal charter on Conishead, thus confirming all the grants (Anon 1895, 122).

4.4.4 In 1326 the Abbot of Furness Abbey petitioned Edward II for the appointment of a coroner in Furness due to the number of people drowning while crossing the Leven to reach Lancaster, ironically in some cases while trying to reach the coroners court there (Hindle 1984, 130). It may be at this time that a guide was first appointed, although the first record is not until the 1530s (*ibid*). These guides were known as carters, possibly because the first was known by that name, or they were carters who would have the necessary knowledge to cross the sands (*ibid*). The route across the sands remained in common use until the coastal railway was completed in 1857 (*op cit*, 131).

4.4.5 In 1536 Conishead Priory, along with Cartmel, was surrendered to the King. At this time the Priory had seven canons and 41 servants as well as an ex-prior with a pension and a canon at Orton (Barnes 1968, 44). In 1537 it was seized by the crown under the Act of Suppression. Despite strong opposition from the local people, the canons were evicted, the building dismantled and the lead, bells and timber sold for £333 6s and 3d. Of the bells, two are believed to have gone to the church at Aldingham, one to Colton, and one to Urswick (Anon 1962, 339). Some of the stone was carried to Ulverston and used to restore the tower of St Mary's Parish Church which had been destroyed in a gale (Fell 1899, 102). The remainder would almost certainly have been used to build the first house on the site.

4.5 Post-Medieval

4.5.1 After the transfer of Conishead Priory to the King (Henry VIII) it was incorporated in the Duchy of Lancaster; and in the latter part of his reign it was leased to Thomas Stanley, the second Lord Monteagle. In 1547, the first year of the reign of Edward VI, Conishead was granted to Sir William Paget who then sold it to John Machell a year later (Farrer and Brownbill 1914, 352n). In 1554 Conishead was sold to William Sandys (Philp 1880, 6), the details of which are recorded in the *Final Concords for Lancashire*:

> *'Between William Sandes, plaintiff, and John Machell and Joan his wife of the manor of Conyshede, otherwise Conyngshede, with the appurtenances, and of 10 messuages, 6 cottages, 4 tofts, 10 gardens, 8 orchards, 2 dovecotes, a water-mill, 200 acres. of land, 100 acres. of meadow, 200 acres. of pasture, 40 acres. of wood and underwood, 100 acres. of moor, 100 acres. of moss, 100 acres. of turbary, 100 acres. of furze and heath, and 4s. of rent in Conyshede [Conishead], otherwise Conyngshede*' (Farrer 1910, 106).

4.5.2 William Sandys was killed during a dispute in 1559, and his son Francis died without issue in 1583 leaving two married half-sisters, Margaret Dodding and Barbara Philipson, as heirs. Margaret's grandson George Dodding, a zealous Roundhead, later bought out the Philipsons; his son Miles died in 1683 leaving two daughters (Farrer and Brownbill 1914, 352). One died childless, so the estate passed through her sister Sarah, wife of John Braddyll of Portfield, to their son Dodding Braddyll, Whig MP for Lancaster 1715-22. Dodding's son Thomas Braddyll in turn died unmarried in 1776, leaving Conishead to Wilson Gale (1756-1818) who took the name and arms of Braddyll. Wilson Gale-Braddyll was Groom of the Bedchamber to King George III and Colonel of the 3rd Royal Lancashire (Philp 1880, 8); later he was a member of parliament for Lancaster 1780-84 and Carlisle 1791-96 as a Whig. Wilson's maternal grandfather was Christopher Wilson who owned Bardsea Hall, the neighbouring estate. On the Bardsea estate to the south west of Conishead there is the Braddyll Memorial; constructed *c*1770 inscribed with his grandparents names (Cross 2002). After his death in 1818 his son, Thomas Richmond Gale Braddyll inherited Conishead (Farrer and Brownbill 1914, 353). In 1847 he was declared bankrupt due to disastrous speculation in Durham coal mines and by order of the Chancery Court the estate was sold off (Ashburner 1988). In 1848 on 17th of October Conishead Priory and 424 acres of land was put up for auction at the Bull Inn, Preston. This included gardens, parkland, a Swiss fishery cottage, ornamental summer house, folly and ice-house. Also for sale were the deer park and three freehold farms adjoining the estate, including Gaskow Farm and Sand Hall Farm. On October 20th 1848, at the Braddyll's Arms in Bardsea, Lane House Farm with 80 acres of farmland adjoining the Priory was also put up for auction (Anon 1848). It would appear that the estate initially struggled to sell as it was offered for sale again with

1,100 acres of land in August 1850 in London (Anon 1850). Included in the sale was Gascow Farm, Sandhall Farm, Lane House Farm, the deer park and enclosures of land around Bardsea. Separate lots of the contents of the Priory were also sold off including furniture, suits of armour, glass and porcelain, and linen. Also sold were the contents of the library and the wine cellar (*ibid*). The Priory and estate was finally bought by Henry Askew of Minard Castle, Inverary (Ashburner 1988). As well as a place of residence, which he apparently shared with Henry Schneider (Casson 1900, 33), the iron mining entrepreneur who was heavily involved in the growth and development of Barrow-in-Furness (Barnes 1968, 95), it seems Askew was using the Priory as collateral to raise money as he re-mortgaged the property at least five times between 1859 and 1874 (LRO DDX 75/56 1859; LRO DDX 75/60 *c*1860; LRO DDX 75/58 1867; LRO DDX 75/59 1867; LRO DDX 75/63 1874) before finally putting the house and estate up for sale in 1874.

4.5.3 In 1874 the estate was bought by a local solicitor, John Poole of the firm Wood and Poole of Ulverston (CAC(B) BDKF/145/25 1874). Poole sold much of the estate's land for building purposes and the largest purchaser was William Gradwell, a developer from Barrow-in-Furness (*ibid*; see Trescatheric 1985 for information about William Gradwell). Gradwell was given permission by Poole to build a railway from the quarry across the highway to other parts of the estate (*ibid*) and there were clearly plans to develop some elements of the estate for housing during this period (see Plate 7 and Plate 8), including the area immediately adjoining Gascow Farm (BDX/86/107 nd). In 1878 the Priory and surrounding park (around 150 acres) was sold to a Scottish syndicate who converted it to a spa hotel (Anon *c*1929; Ashburner mistakenly gives the date as 1887 (Ashburner 1988)). It is apparent that the Gascow Farm development was never completed, the land associated with it being largely used in conjunction with the large limestone quarry that grew considerably during the late 19th and early 20th (BDX/86/106 c1890; **Site 9** and **Site 10**). In 1925 the estate was bought by Dr John Wishart and the Rev Dr JC Gibson who in conjunction with friends formed the Conishead Co Ltd '*with the view to making it an ideal holiday resort*' (CAC(K) WDX 427/2 1928). Only four years later Dr Wishart put the Priory and estate up for sale and it was bought by the Durham Miners Welfare Committee in 1929 for £35,000 (Ashburner 1988).

4.5.4 During World War II the Priory served as an emergency hospital for air-raid victims although in the event it was not used as such but was instead use for wounded servicemen, approximately 8,000 of whom were treated there (Ashburner 1988). It is said to have been the largest military hospital in the North West (Manjushri Kadampa Meditation Centre *c*2004, 7). After the war the Priory reverted back to the Welfare Committee who, at the end of their tenure, put it up for sale in 1970 (Ashburner 1988). By this time the Priory and estate consisted of 226 acres and nine other houses and in 1971 it was to be auctioned off in 13 lots, although this sale was postponed due to boundary issues (Anon 1971). Finally, in 1972, the estate was sold; the park was split into two and both parts were sold, one part with the old Staff House to a Mr R Fisher (Ashburner 1988). The other part with the Priory was sold to a Mr Jones of Wigan who intended to use the house and park as a hotel and caravan park. Unable to get planning permission, Mr Jones put the house and estate back on the market. The Priory buildings remained empty until 1976 when it was bought by the Manjushri Kadampa Buddhist community who have done much to preserve its structure (Anon *c*1976).

4.5.5 Sites of known post-medieval origin recorded within the study area include two possible earthworks (**Sites 5** and **6**) which match the line of paths marked on modern mapping of the site (Figure 1), further earthworks (**Site 2**), a quarry (**Site 10**), the former mineral railway (**Site 9**) and a mound of probably post-medieval origin (**Site 12**). **Site 4** also marks a relict field boundary and quarry of post-medieval date.

4.6 Previous Archaeological Work

4.6.1 No archaeological work has previously been undertaken in the study area. Limited excavation was carried out at Conishead Priory between 1925 and 1929, which revealed some remains from the priory buildings and the line of supposed Roman road through the grounds, although these were interpreted as being of later date in the published account (Kelly 1930; see also Elsworth 2007 for further discussion). In addition, those elements of the Conishead Priory estate now belonging to the Buddhist

Priory were examined via to desk-based assessment and walkover survey in 2009 (Greenlane Archaeology 2009a; 2009b).

5. Discussion

5.1 Introduction

5.1.1 The discussion of the results of the desk-based assessment, site visit and geophysical survey is intended to determine the archaeological significance and potential of any known remains (above or below ground) and the potential for any as yet unidentified remains being present. The system used to judge the significance of the remains identified within the development area, or those thought to have the potential to be present within the development area, is based on the criteria used to define Scheduled Monuments (DoE 1990, Annex 4; *Appendix 2*). Of the 16 sites identified within the study area during the desk-based assessment, including the site visit, **Sites 1** to **7** are situated within the proposed development area (although the exact location of **Site 16** is uncertain) and may therefore be affected by subsequent groundworks. In addition, several anomalies of potential archaeological origin were also identified within the proposed development area during the geophysical survey and are also likely to be affected.

5.2 Significance

5.2.1 **Sites 1** to **7** lie within the proposed development area and may be affected by the works. **Site 1** is a small brick built structure of post-medieval date, **Site 2** marks earthworks or a possible quarry of post-medieval date, **Site 3** is a lynchet or terrace of unknown date, **Site 4** represents the line of a road, possibly of Roman origin, that also forms a relict field boundary and has been cut by quarrying of post-medieval date; **Site 5** is a terrace and platform of post-medieval date, **Site 6** is a possible footpath and slight hollow way of post-medieval date, and **Site 7** is a possible barrow; if so it would be of prehistoric date, although it is uncertain if this does indeed represent a barrow and the lack of evidence from the site visit and geophysical survey would perhaps suggest that it is not. No other previously known sites of archaeological interest are recorded within the proposed development area, however, several isolated and linear anomalies of potentially archaeological interest were revealed during the geophysical survey in particular in Fields 3 and 4 (*Appendix 3*), some of which have the potential to be of some significance.

5.2.2 The level of significance of the features within the proposed development area is categorised, according to each criterion, as high, medium, or low, and an average of this has been used to produce an overall level of significance for each site (see Table 2 below: H=high, M=medium, L=low). As can be seen in Table 3 all of these features are considered to be of low or medium significance.

Site	***1***	***2***	***3***	***4***	***5***	***6***	***7***
Period	L	L	-	M	L	L	M
Rarity	L	L	L	L/M	L	L	M?
Documentation	L	L	L	L	L	L	L
Group value	L	L	L	M	L	L	M?
Survival/condition	L	L	L	M	L	L	M?
Fragility/Vulnerability	L	L	M	M	M	M	M
Diversity	L	L	L	L	L	L	M
Potential	L	L	L	L	L	L	L
Significance	L	L	L	L/M	L	L	M/L

Table 2: Significance by site

5.3 Potential for Unknown Archaeological Remains

5.3.1 The details of those archaeological remains present within the proposed development area are presented in the results of the desk-based assessment (*Section 3*; Figure 2; *Appendix 1*) and the importance of these sites is discussed above (*Section 5.2*). The potential for as yet unidentified archaeological remains to be present, however, is based on the known occurrence of such remains elsewhere in the study area and local environs (see *Section 4*). Where there are no remains known

within the study area the potential is based on the known occurrence within the wider local area. The degree of potential is examined by period and the results are presented in Table 3 below; in each case the level of potential is expressed as low, medium, or high:

Period	Present in study area?	Potential
Late Upper Palaeolithic	N	L
Mesolithic	N	L
Neolithic	Y	L
Bronze Age	Y	M
Iron Age	N	L
Roman	Y	L/M
Early Medieval	N	L
Medieval	N	M
Post-medieval	Y	M

Table 3: Degree of potential for unknown archaeological remains by period

5.3.2 In consideration of Table 3 it is worth noting that the possibility of finding Mesolithic remains is considered low as none are recorded in the study area although in the local area they are relatively common. Sites of Bronze Age date are generally relatively rare, and only stray finds and unconfirmed burial mounds of Bronze Age date are present within the study area so there is some potential for other remains of this period to be present, while, by contrast, the Neolithic period is only represented by stray finds within and near the study area so further remains are unlikely as they are still relatively rare. The Roman origin of the track or road (**Site 4**) is uncertain but it could be Roman and if so confirmation of this would be regionally very significant, and there are other stray finds of Roman date from the local area. Remains of early medieval date are extremely rare in the region and so, while there is certainly evidence for potentially significant activity in the area around Conishead Priory in this period, finding physical archaeological evidence for it is very unlikely. By contrast, although there are no known sites of medieval origin within the proposed development area, the site formed part of the Conishead Priory estate, which is of medieval origin as is Gascow itself and so further remains of this date are certainly possible.

5.4 Disturbance

5.4.1 The area appears to have seen relatively little disturbance apart from an existing below ground aqua duct, which has been tracked by ground radar and the geophysical survey, and the evidence of post-medieval activity relating to quarrying at **Sites 2** and **4**, as demonstrated by the presence of made ground in areas associated with these sites found in during the excavation of test pits (E3P 2016). Anecdotal evidence suggests that the former pond area located at **Site 2** was filled with ash (*ibid*). Other made ground was also encountered. In addition a test pit excavated on the south-west side of Field 1 also encountered made ground containing ceramic material (described as porcelain tile) in the uppermost deposit (*ibid*), which suggests that some relatively recent tipping of material has taken place here too. It also appears, albeit based on anecdotal evidence, that at least some livestock has been buried in mound comprising **Site 7** and that this has also been subject to other excavation (see *Appendix 1*). While this suggests that **Site 7** is likely to have been somewhat disturbed this was not particularly apparent during the site visit or in the results of the geophysical survey.

5.5 Impact

5.5.1 Proposed plans for the development of the site received during the production of this report indicate no intended changes to the field immediately north of Gascow Farm, which suggests that **Sites 1** and **2** will not be affected by the proposed development. While **Site 3** will be largely avoided it would be affected by a proposed dwelling in this location, and **Sites 4**, **5** and **6** would be are likely to subsequently be severely impacted on or destroyed by development, primarily the construction of dwellings and associated infrastructure. It is likely that any such building would substantially impact on any archaeological remains that might be present, although it is worth noting that parts of each of these sites will already have been impacted upon by the installation of the existing aqua duct. They current proposals would apparently leave **Site 7** largely unaffected.

5.5.2 In addition, the anomalies shown in the geophysical survey, particularly the ones in Fields 3 and 4 (labelled H-K in the figures in *Appendix 3*), are likely to be impacted upon by any proposed development.

5.5.3 The current proposals also do not indicate any changes to the current farm buildings at Gascow Farm, some of which, those closest to the Farm House, are of historic interest in their own right. Should they be subject to any later conversion to residential use this would potentially impact upon the historic fabric.

6. Bibliography

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Appendix 1: Site Gazetteer

Site Number: **1**
NGR: 329389 476735
HER No: –
Sources: site visit
Designation: none
Description: a pair of brick pillars supporting a stone flag roof, *c*1.5m^2 by 1.5m tall. The bricks are machine made and red and built against the field boundary. Inside it is lower than ground level, with pipes, and the south side is concrete edged. It was full of water and mud at the time of the site visit.

Plate 15 (left): Brick structure (Site 1) viewed from the south

Plate 16 (right): Detail of the inside of the brick structure (Site 1)

Period: post-medieval

Site Number: **2**
NGR: 329307 476698
HER No: –
Sources: site visit
Designation: none
Description: earthworks, *c*10m by 20m and up to 2m tall, probably the result of quarrying, although it is approximately in the position of a pond shown on early maps of the site (see Plate 2 to Plate 6), cutting into the slope on the east side and forming a platform on top (Plate 17), *c*15m long by 10m wide, with a lower bank to south-west, *c*0.6m tall by 2m wide (Plate 18 and Plate 20).


Plate 17 (left): Platform on the south-east side of Site 2, viewed from the south-west

Plate 18 (right): Earthworks forming Site 2, viewed from the south-east


Plate 19 (left): Bank on the north-east side Site 2, viewed from the south-east

Plate 20 (right): Earthworks forming Site 2, viewed from the north-west

Period: post-medieval

Site Number: **3**
NGR: 329461 476664
HER No: –
Sources: site visit
Designation: none
Description: east/west lynchet or terrace across the end of the field, *c*1-1.5m tall, although it is less obvious in the centre (Plate 21 and Plate 22); possibly part of a more general area of terracing.


Plate 21 (left): Earthworks (Site 3), viewed from the south-west

Plate 22 (right): Earthworks (Site 3), viewed from the west

Period: unknown

Site Number: **4**
NGR: 329473 476575
HER No: –
Sources: OUMNH 462-smith/Box 16/Folder 1/1 1822; Elsworth 2007; Ordnance Survey 1933; 1966; site visit
Designation: none
Description: line of a road shown on Smith's plan of 1822 (Plate 1), perhaps of Roman origin (Elsworth 2007). The Ordnance Survey map of 1933 (Plate 12) shows a small area of quarrying cutting into the north-west side. It is shown as an area of very obvious earthworks in an aerial photograph from 1966 (Plate 13), forming part of a much longer linear feature extending into the fields to the south-east. The site visit revealed a number of earthworks, including a long terrace, *c*20m wide, running north-west/south-east across the field defined by a very pronounced bank along its south-west side up to 1m tall (Plate 23). At the south-east end another bank cuts across the terrace, against the wall (Plate 24), and there is a further low bank running parallel to the main one downhill to the north-east. The terrace is less obvious to the north-west but it appears to run to the field gate. Near the centre is a more irregular area, clearly the result of the quarrying shown on the Ordnance Survey map of 1933 (Plate 25). It incorporates a broken gatepost (as a scratching post?) (Plate 26) at the north-west end and a blocked gate in the wall to the south of the gate at the end of the earthwork with one gatepost missing (Plate 27).

Plate 23 (left): Earthworks forming (Site 4) at the south-east end, viewed from the north-east

Plate 24 (right): Earthworks forming (Site 4) at the –south-east end, viewed from the north-east

Plate 25: Area of quarrying within Site 4, viewed from the north-west

Plate 26 (left): Broken gate post (Site 4), viewed from the west

Plate 27 (right): Blocked gate (Site 4), viewed from the south-east

Period: Roman? to post-medieval

Site Number: **5**
NGR: 329379 476543
HER No: –
Sources: site visit; Ordnance Survey 2011
Designation: none
Description: a slight terrace cut into the hillside and a corresponding platform, *c*3m wide by 0.5m deep (Plate 28). It matches a track or footpath shown on modern mapping but is evidently not now used. It peters out to the south-east but the remains of an iron kissing gate are present in the boundary at the south-east end (Plate 29).

Plate 28 (left): Terrace/track (Site 5), viewed from the north-west

Plate 29 (right): Kissing gate (Site 5) viewed from the north-west

Period: post-medieval

Site Number: **6**
NGR: 329336 476483
HER No: –
Sources: site visit; Ordnance Survey 2011
Designation: none
Description: a slight hollow way, aligned north/south, on the line of the footpath, *c*2m wide by 1m tall (Plate 30); it lines up with disused timber gate and clearly corresponds with the line of the footpath shown on the present and earlier mapping.

Plate 30: Hollow way (Site 6), viewed from the north-west

Period: post-medieval

Site Number: **7**
NGR: 329200 476460
HER No: 2364(C); probably the same as 11066
Sources: HER; site visit; OUMNH 462-smith/Box 16/Folder 1/1 1822
Designation: none
Description: a possible round barrow, recorded in a number of sources and confused by the various antiquarian and later accounts given of the area, which record at least three possible burial mounds (see also Sites **11**, **12** and **15**). This particular mound is first depicted on Smith's plan of 1822 (OUMNH 462-smith/Box 16/Folder 1/1 1822; Plate 1) and is shown on subsequent plans of the area.
According to Tom Clare the farmer (at that time) had buried a horse and dog in this mound and his children had dug a central pit 0.9m deep. An inspection of the section of this revealed a layer of cobblestones with some soil 0.3m deep overlying yellow clay with small stones.
During the site visit it was observed to be a large oval mound, *c*20m long by 15m wide and 3m tall, orientated east/west, with good views to the Lakes to north. Large amounts of water-worn stone are evident in the top and some are loose on the surface. The faces of three large blocks form a north/south line on its east side. It is eroded on the south-east side and the north side where it is crossed by a fence on its east edge; a small piece of soft reddish orange pottery was recovered from the eroded section on the south-east side, although it is not easy to date. Its approximate extent has been determined by mapping provided by the client.
Note: the site is located further to the south than it is shown on the HER due to rounding of the grid reference; the HER only provides grid reference SD 292 765 for site HER 11066. The actual position of the mound closely correlates with the coordinates given for Site C, which forms part of HER 2364 (**Site 15** below). From the description for HER 2364, Site C (SD 2920 7646) is 'a large circular mound with a tailed ramp to the north being industrial from the adjacent quarry'.

Plate 31 (left): Plate 32 (left): Mound (Site 7), viewed from the east

Plate 33 (right): Mound (Site 7), viewed from the south

Plate 34 (left): Mound (Site 7), viewed from the south-east

Plate 35 (left): Mound (Site 7), viewed from the west

Plate 36 (right): Stone eroding from the fabric of the mound (Site 7), viewed from the west

Plate 37 (left): Stone on the top of the mound (Site 7), viewed from the west

Plate 38 (right): Stone edging on the east side of the mound (Site 7), viewed from the east

Plate 39 (left): Stone edging on the east side of the mound (Site 7), viewed from the south

Plate 40 (right): Eroded section of the mound (Site 7), viewed from the south-west

Period: prehistoric?

Site Number: **8**
NGR: 329700 476950
HER No: 2222
Sources: HER; Dobson 1923, 20-21
Designation: none
Description: a hammerstone found prior to 1923 at Gascow in the field opposite Oxenholme. It has been formed from an elongated pebble of greenstone *c*2¼ inch diameter and 8 inches circumference. Its original length cannot be determined. In its present state it is 3 inches long and 2¾ inches on the cross axis and weighs 11½ ounces. Present whereabouts unknown. The NGR given in the HER places it at Oxenholme Cottages, even though the description given above suggests it might actually have been found within the proposed development area, in which case it would most likely have been in the north corner.
Period: prehistoric

Site Number: **9**
NGR: 329100 476580
HER No: 18284
Sources: HER; Ordnance Survey 1891
Designation: none
Description: Gascow Quarry Mineral Railway, Ulverston; site of a mineral railway from Gascow Quarry (HER 18283; **Site 10**), no longer marked by the Ordnance Survey. The line took goods to Ainslie Pier (HER 41381), connecting with the Ulverston Wireworks Mineral Railway (HER 16003) and others, to the

north of Sand Hall. The line of the railway can still be traced on the east side of the road. It postdates the 1867 edition of the Ordnance Survey map.
Period: post-medieval

Site Number: **10**
NGR: 329030 476480
HER No: 18283
Sources: HER; Ordnance Survey 1850; Ordnance Survey 1891
Designation: none
Description: site of Gascow Quarry; this quarry is on the site of a gravel pit on the 1850 Ordnance Survey map. Goods were transported to Ainslie Pier via a mineral railway (HER 18284; **Site 9**).
Period: post-medieval

Site Number: **11**
NGR: 328990 476270
HER No: 2364(B)
Sources: HER
Designation: none
Description: the description for HER 2364 (**Site 15**) states that there are similar low mounds of varying size and shape in adjoining pasture fields to the north and south-east. This site, corresponding to Site B of HER 2364 (SD 2899 7627) is described as a large circular glacial mound. This is probably the same as Site **12** just with an incorrect grid reference.
Period: natural?

Site Number: **12**
NGR: 328890 476250
HER No: 2364(A)
Sources: HER; CAC(B) BDHJ/Plan 24 1843; CAC(B) BDHJ/Plan 20 1846
Designation: none
Description: from the description for HER 2364 (**Site 15**), there are similar low mounds of varying size and shape in adjoining pasture fields to the north and south-east. Although the HER records this site, Site A (at SD 2890 7624), as a large elongated mound orientated north-east/south west, blending with the ground contours and seemingly entirely natural, it seems likely that it is in fact of post-medieval date as it is first depicted on Binns' survey of 1846 (CAC(B) BDHJ/Plan 20 1846) but not his survey of 1843 (CAC(B) BDHJ/Plan 24 1843). It was either created since the 1843 map was produced or, for some reason, it was surveyed for the first time in 1846.
Period: post-medieval

Site Number: **13**
NGR: 329600 476200
HER No: 11158
Sources: HER; Ordnance Survey 1966; Elsworth 2007
Designation: none
Description: Priory Park Field System, Ulverston: old field boundaries and ridge and furrow are visible on an aerial photo. The fields have been improved, the remains of field boundaries are still evident, but the ridge and furrow is fairly faint. A very clear aerial photograph from 1966 (Ordnance Survey 1966;

Plate 13) shows these features in some detail and they were transcribed in a published account of possible Roman remains in the area (Elsworth 2007).
Period: Roman?, medieval and post-medieval

Site Number: **14**
NGR: 328690 476080
HER No: part of 2364
Sources: HER; Elsworth 2007
Designation: none
Description: at SD 2869 7608, recorded as part of HER 2364, there is a lynchet and rise which Tom Clare suggested could be the remains of a ploughed out mound, perhaps one of the various supposed burial mounds recorded in the area. However, this lynchet is perhaps part of earthworks forming the line of a road or perhaps Roman origin (Elsworth 2007; Site **14**).
Period: Unknown/Roman?

Site Number: **15**
NGR: 329030 476020
HER No: 2364
Sources: HER; Collingwood 1933, 172-3; West 1805
Designation: none
Description: a possible round barrow, recorded in a number of sources and confused by the various antiquarian and later accounts given of the area, which record at least three possible burial mounds (see also **Sites 11**, **12**, and **15**). West and others describe a tumulus/mound/barrow 'much defaced by improvement of the ground' a small distance east of Mountbarrow House, although it has also been described as a pillow mound (Collingwood 1933, 172-3), or even a natural feature. West (1805, 9) describes a tumulus at Mountbarrow: 'at a small distance to the east of Mountbarrow House appears a tumulus, but much defaced by the improvement of the ground it stands on'. The six-inch Ordnance Survey map (Plate 4) marks a barrow of considerable dimensions two fields east of Far Mountbarrow House [now Middle Mount Barrow]; yet on visiting the site, Clare was unable to detect any traces of the a mound, artificial or otherwise.
Period: prehistoric?

Site Number: **16**
NGR: 329000 476000
HER No: 2243
Sources: HER; Anon 1923, 1
Designation: none
Description: miscellaneous finds from Gascow found during draining operations prior to 1923 (Anon 1923, 1); a pile of oak over 7ft long, squared, with a mortice hole near the top and remains of a wooden peg; a large jet ring; a round piece of opaque white glass; a drill of indurated shale; iron objects; a piece or red sandstone used for sharpening pointed implements; and part of an indurated shale celt refashioned as a polishing stone. The sharpening stone is approximately two inches long, ½ to ¾ inch wide and is now in the Dock Museum Barrow (Accession. No. 5166). The whereabouts of the other finds are unknown. The exact location of these discoveries is uncertain from the available description, but the most likely area is perhaps the north end of the site where there was originally a pond (approximately corresponding to **Site 2**).
Period: unknown/prehistoric?

Appendix 2: Significance Criteria

After DoE 1990, Annex 4: '*Secretary of State's Criteria for Scheduling Ancient Monuments*'

i) *Period*: all types of monuments that characterise a category or period should be considered for preservation;

ii) *Rarity*: there are some monument categories which in certain periods are so scarce that all surviving examples which retain some archaeological potential should be preserved. In general, however, a selection must be made which portrays the typical and commonplace as well as the rare. This process should take account of all aspects of the distribution of a particular class of monument, both in a national and regional context;

iii) *Documentation*: the significance of a monument may be enhanced by the existence of record of previous investigation or, in the case of more recent monuments, by the supporting evidence of contemporary written records;

iv) *Group Value*: the value of a single monument (such as a field system) may be greatly enhanced by its association with related contemporary monuments (such as a settlement and cemetery) or with monuments of different periods. In some cases, it is preferable to protect the complete group of monuments, including associated and adjacent land, rather than to protect isolated monuments within the group;

v) *Survival/Condition*: the survival of a monument's archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features;

vi) *Fragility/Vulnerability*: highly important archaeological evidence from some field monuments can be destroyed by a single ploughing or unsympathetic treatment; vulnerable monuments of this nature would particularly benefit from the statutory protection which scheduling confers. There are also existing standing structures of particular form or complexity whose value can again be severely reduced by neglect or careless treatment and which are similarly well suited by scheduled monument protection, even if these structures are already listed historic buildings;

vii) *Diversity*: some monuments may be selected for scheduling because they possess a combination of high quality features, others because of a single important attribute;

viii) *Potential*: on occasion, the nature of the evidence cannot be specified precisely but it may still be possible to document reasons anticipating its existence and importance and so to demonstrate the justification for scheduling. This is usually confined to sites rather than upstanding monuments.

Appendix 3: Geophysical Survey Results

Gascow Farm, Priory Road, Ulverston Cumbria

Archaeological geophysical survey

Project No. ARC/1699/607

December 2015

Gascow Farm, Priory Road, Ulverston
Cumbria

Archaeological geophysical survey

Project No. ARC/1699/607

Report prepared by		Report checked by	
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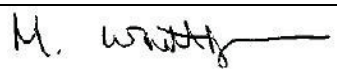
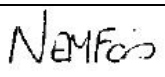
Signature		Signature	
Date	22/12/15	Date	22/12/15

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1. SUMMARY

Phase Site Investigations Ltd was commissioned to carry out a magnetic gradient survey at a site at Gascow Farm, Priory Road, Ulverston, Cumbria. The aim of the survey was to help establish the presence / absence, extent, character, relationships and date (as far as circumstances and the inherent limitations of the technique permits) of archaeological features within the survey area.

The survey was undertaken using the Phase Site Investigations Ltd multi-sensor array cart system (MACS). The MACS comprises 8 Foerster 4.032 Ferex CON 650 gradiometers with a control unit and data logger. The MACS data was collected on profiles spaced 0.5 m apart with readings taken at between 0.1 and 0.15 m intervals.

The magnetic data for the site is complex as there are a variety of strong anomalies which have different origins and are associated with multiple phases of activity (much of which is relatively modern). This makes a reliable interpretation of the data quite difficult and means that a number of anomaly types have had to be categorised as of uncertain or unknown origin.

There is evidence for extensive modern activity, including an infilled quarry, in the north and east of the site. In the centre of the site there are suggestions of an oval / sub-rectangular feature but this may post-date ridge and furrow, responses from which are located around the feature, but not clearly within it. There are several broad, diffuse linear trends in the south of the site which, whilst often are associated with natural features / variations, possibly form regular patterns and so could be anthropogenic in origin, although it is possible that the patterns are coincidental and the responses are from natural features / variations.

It is clear that the majority of the anomalies identified by this survey relate to modern material / objects, agricultural activity and geological / pedological variations. However, there are a large number of anomalies whose cause cannot be determined with certainty and some of which could potentially be associated with archaeological features / activity.

The high resolution of the survey (0.5 m by approximately 0.15 m), high data quality and the fact that soils appear to have a reasonably high magnetic susceptibility (as evidenced by the presence of anomalies relating to ridge and furrow, agricultural activity and natural features / variations) suggest that if significant linear / curvi-linear archaeological features or activity were present that they would have produced anomalies of sufficient strength to allow them to be identified by the survey; assuming that any such responses were not masked by stronger responses from modern activity.

2. INTRODUCTION

2.1 Overview

Phase Site Investigations Ltd was commissioned by Greenlane Archaeology Ltd to carry out an archaeological geophysical survey at a site at Gascow Farm, Priory Road, Ulverston, Cumbria utilising magnetic gradiometers.

The aim of the survey was to help establish the presence / absence, extent, character, relationships and date (as far as circumstances and the inherent limitations of the technique permits) of archaeological features within the survey area.

The location of the site is shown in drawing ARC_1699_607_01.

2.2 Site description

The site is situated off Priory Road, on the southern edge of Ulverston (centred at NGR SD 293 765).

The site was approximately 12.6 ha and encompassed four pasture fields and farm buildings with an access road and areas of hardstanding ground. Each field has been given a number as shown in drawing ARC_1699_607_02 and are described in more detail in Section 4.

The geology of the site consists mainly of the calcarenite Park Limestone Formation except for the western edge of the site where the calcarenite Dalton Formation present. The site is overlain by glacial till (British Geological Survey, 2015).

2.3 Archaeological background

A desk-based assessment (DBA) is currently being compiled by Greenlane Archaeology (in prep.) but it is understood that there are possible burial mounds, of presumably bronze age date, in the vicinity of the site and one possibly within it. A road / trackway crosses the site, which linked Conishead Priory to the south-east with Ulverston and the site was formerly part of the Conishead Priory estate.

2.4 Scope of work

The survey area was specified by the client based on a proposed development boundary.

Due to the presence of dense vegetation and trees around the field boundaries, metallic fences and surface features, farm buildings and an access road the area accessible / suitable for survey was reduced to approximately 10.5 ha, the extent of which is shown in drawing ARC_1699_607_02.

Very heavy rain and equipment issues meant that the survey had to be undertaken in several visits. No other problems were encountered during the survey which was carried out on days between 16 November and 09 December 2015.

3. SURVEY METHODOLOGY

3.1 Magnetic survey

The survey was undertaken using a Phase Site Investigations Ltd multi-sensor array cart system (MACS).

The MACS comprised 8 Foerster 4.032 Ferex CON 650 gradiometers with a control unit and data logger. The Foerster gradiometers do not require balancing as each sensor is automatically 'zeroed' using the control unit software.

The MACS utilises an RTK GNSS system which means that survey grids do not have to be established. Instead an area is surveyed over a series of continuous profiles and the position of each data point is recorded using an RTK GNSS system. The sensors have a separation of 0.5 m which means that data was collected on profiles spaced at 0.5 m apart. The MACS was towed by an all terrain vehicle (ATV) operating at a speed no greater than 10 km/h. The sample interval was set to 0.1 m along each profile. The sampling rate was set to 100 Hz (100 readings per second) but readings were 'stacked' to provide average values at a given point which improves data quality and reduces 'noise'.

Data is collected on zig-zag profiles along the full length or width of a field, although fields can be sub-divided if they are particularly large. Marker canes are set-out along field boundaries at set intervals and these are used to align the profiles. The survey profiles are usually offset from field boundaries, buildings and other metallic features by several metres to reduce the detrimental effect that these surface magnetic features have on the data. The location of the MACS data is converted direct to Ordnance Survey co-ordinates using the UK OSTN 02 projection. As the survey is referenced direct to Ordnance Survey National Grid co-ordinates temporary survey stations are not established.

3.2 Data processing and presentation

The MACS data was stored direct to a laptop using in-house software which automatically corrects for instrument drift and calculates a mean value for each profile. A positional value is assigned to each data point based on the sensor number and recorded GNSS co-ordinates. The data is gridded using in-house software and parameters are set based on the sensor spacing and mean values. No additional processing is required. The gridded data is then displayed in Surfer 9 (Golden Software) and image files of the data are created.

The data was exported as raster images (PNG files) and are presented in greyscale format with accompanying interpretations at a scale of 1:1500. All greyscale plots were clipped at -2 nT to 3 nT. Greyscale plots have been 'smoothed' using a visual interpolation but the data itself has not been interpolated.

The data has been displayed relative to a digital topographic survey base plan provided by the client as drawing *'RH TS03a - Priory Road Ulverston - Aqua Duct outfall Routes by SurvEng.dwg.dwg'*. The base plan was in the Ordnance Survey National Grid co-ordinate system and as the survey data was referenced directly to National Grid co-ordinates the data could be simply superimposed onto the base plan in the correct position. The data has been displayed for the entire site with the contour information from the topographic in drawing ARC_1699_607_02 displayed.

X-Y trace plots were examined for all of the data and overlain onto the greyscale plot to assist in the interpretation, primarily to help identify dipolar responses that will probably be associated with surface / near-surface iron objects. However, X-Y trace plots have not been presented here as they do not show any additional anomalies that are not visible in the greyscale data. A digital drawing showing the X-Y trace plot overlain on the greyscale plot is provided in the digital archive.

All isolated responses have been assessed using a combination of greyscale and X-Y trace plots. Only the stronger or larger responses positive responses and positive anomalies located in proximity to probable or possible features have been shown on the interpretation. There are a large number of 'iron spike', isolated dipolar anomalies present in the data. In the vast majority of cases this type of anomaly are caused by modern magnetic surface / near-surface material. There are a very large number of isolated dipolar responses in Fields 1 and 2 and so for the sake of clarity these have not been shown. Isolated dipolar responses have been shown in Fields 3 and 4 as although the majority of these will also be modern in origin there are other features in these fields and there is a slight chance that some of the isolated responses could be associated with these.

Anomalies associated with agricultural regimes are present in the data but each individual anomaly has not been shown on the interpretation. Instead the general orientation of the regime is indicated.

The data was examined over several different ranges during the interpretation to ensure that the maximum information possible was obtained from the data.

The anomalies have been categorised based on the type of response that they exhibit and an interpretation as to the cause(s) or possible cause(s) of each anomaly type is also provided.

A general discussion of the anomalies is provided for the entire site and then the results are discussed on a field by field basis. A discussion of the general categories of anomaly which have been identified by the survey is provided in Appendix 1.5.

The geophysical interpretation drawing must be used in conjunction with the relevant results section and appendices of this report.

4. RESULTS

4.1 General

The data quality across the survey area is very good allowing the data to be viewed at a narrow range of readings to better identify weak anomalies. Although the data quality is high the data set is complex as there are a variety of strong anomalies which have different origins and are associated with multiple phases of activity (much of which is relatively modern). This makes a reliable interpretation of the data quite difficult and means that a number of anomaly types have to be categorised as of uncertain or unknown origin.

One factor that does stand out is that the soils appear to have a high magnetic susceptibility, as evidenced by the strong agricultural and natural responses and the fact that compacted ground associated with trackways produces negative anomalies. This apparent high magnetic susceptibility suggests that if significant infilled archaeological features are present that they would also produce measureable magnetic responses.

4.2 Field 1

Basic topography: Relatively level. Slope downwards to the north in the northern part of the field.

Field description: Pasture. Firm underfoot. Bounded by walls to the west, north-east and south-west, and by metal fencing with some overhanging trees on the remaining boundaries.

Interpretation drawing(s): ARC_1699_607_04

Summary of anomalies: Numerous isolated responses, the majority of which are probably modern or geological in origin.

Areas of magnetic disturbance associated with relatively modern features / material.

A linear dipolar anomaly associated with a modern sub-surface pipe / culvert and a second possible modern utility feature.

Very strong responses associated with strongly magnetic modern features / material.

Linear responses associated with a relatively modern ploughing regime.

Trends of uncertain origin.

Positive linear responses of uncertain origin.

Further discussion / additional information:

A large area of magnetic disturbance (**Anomaly B**) corresponds with an infilled early 20th century quarry.

The linear dipolar anomaly in the north of the field (**Anomaly C**) is caused by a modern sub-surface pipe / drain. A second linear dipolar response in the east of the field may be caused by a utility feature, such as a pipe or drain.

There is a suggestion of a diffuse, linear trend which runs oblique to the agricultural regime (**Anomaly D**). The origin of this response is not certain but it could potentially be caused by an infilled feature.

There is a fragmented positive linear anomaly and associated trends in the west of the field (**Anomalies E**) and there are several other adjacent weak trends with a similar alignment. The cause of these responses is not certain. The presence of several adjacent responses with similar alignments could suggest that they are caused by the remnants of an older agricultural regime but it is also possible that Anomalies E could be associated with an infilled feature.

A road / trackway is visible on air photographs and is shown in the DBA. This is not obviously visible in the data which would suggest that the trackway is not formed from variable magnetic material (such as compacted gravel). The track has a similar alignment to the relatively recent agricultural regime and it is possible that this may mask responses from an underlying feature but it is thought that if there were any significant infilled features (such as ditches adjacent to the track) that these would have produced responses that could be identified by the survey.

There are a large number of positive isolated responses in this field. Given the sigfncaint modern activity it is probable that the majority of these responses are also caused by modern material / activity.

4.3 Field 2

Basic topography: Relatively level. Gradual slope downwards to the west.

Field description: Pasture. Firm underfoot. Bounded by fencing, hedges and trees.

Interpretation drawing(s): ARC_1699_607_04

Summary of anomalies: Numerous isolated responses, the majority of which are probably modern or geological in origin.

Areas of magnetic disturbance associated with relatively modern features / material.

Trends of uncertain origin.

Positive linear and curvi-linear anomalies of unknown or uncertain origin.

Further discussion / additional information:

The extensive and strong magnetic disturbance in this field indicates the presence of significant amounts of modern material / made ground. It cannot be determined if this material overlies or cuts into potential sub-surface features.

There are several positive linear responses and weaker / more diffuse trends within and adjacent to the magnetic disturbance (**Anomalies A**). These could indicate the presence of the remains of an infilled feature(s) although they could also be associated with the modern material / disturbance.

4.4 Field 3

Basic topography: Relatively level. Gradual slope downwards from the south.

Field description: Pasture. Firm underfoot. Bounded by farm buildings and farm equipment to the north, a wall to the north-east and by fencing with some overhanging trees on the remaining boundaries.

Interpretation drawing(s): ARC_1699_607_06

Summary of anomalies: Numerous isolated responses, the majority of which are probably modern or geological in origin.

A linear dipolar anomaly associated with a modern sub-surface pipe / culvert.

An area of magnetic disturbance associated with relatively modern features / material.

Very strong responses associated with strongly magnetic modern features / material.

Negative responses probably associated with relatively modern features, such as trackways or drains.

Positive linear responses probably associated with ridge and furrow.

Positive linear / curvi-linear anomalies and associated trends which may indicate the presence of an oval / sub-rectangular feature.

Several other linear / curvi-linear positive responses and trends of uncertain origin.

Further discussion / additional information:

The linear dipolar anomaly (**Anomaly C**) is caused by a modern sub-surface pipe / drain.

There are a number of negative responses within this field. This type of response is not usually of archaeological significance unless the geology is igneous or a structural feature is made up of non-magnetic material. In this instance it is thought that some of the responses are caused by compacted ground associated with trackways (**Anomalies F**). The remaining responses (**Anomalies G**) are visible on an air photo shown in the DBA and are suggestive of negative features / depressions. The negative magnetic response does not indicate that they are caused by infilled features and it is possible that they are related to service or drainage features but their exact origin cannot be determined.

The relatively close spacing of the ridge and furrow responses and the very straight nature may suggest that these are relatively late in date.

There a large number of positive isolated responses within this field, some of which are relatively large. The majority of these larger responses (**Anomalies H)** are suggestive of natural features / variations and the majority of the remaining responses are also probably caused by natural features / variations. However, it is possible that some of these isolated responses, particularly those in proximity to other anomalies / features could have a different origin.

In the centre of the field there is a grouping of positive linear / curvi-linear anomalies and weaker trends that appear to form an oval / sub-rectangular shape (**Anomaly I**). There are

positive responses within Anomaly I that could indicate the presence of internal features but this cannot be determined with certainty. The origin of Anomaly I is not certain. The responses are suggestive of infilled features and as such could indicate an archaeological origin. However, it is worth noting that the ridge and furrow responses appear to be much weaker or not present within Anomaly I which could indicate that the feature / activity causing Anomaly I post-dates the ridge and furrow. Some of the isolated dipolar responses in the vicinity of this anomaly could potentially be caused by related features / activity but it is probable that the majority of them are related to modern material.

There are a number of other positive responses and trends which are not aligned with the agricultural regime. The cause of these responses is not certain. Many of them could be caused by other agricultural features, others could be natural but it is possible that some of the responses could be caused by infilled features, although there is not form any obvious patterns or relationships that would indicate an archaeological origin.

4.5 Field 4

Basic topography: Relatively level with some undulations. An earth mound was present adjacent to the northern boundary and two areas of higher ground were present in the southern part of the field. General gradual slope downwards to the south-east.

Field description: Pasture. The field boundaries were a mix of fencing, walls and overhanging trees.

Interpretation drawing(s): ARC_1699_607_06

Summary of anomalies: Numerous isolated responses, the majority of which are probably modern or geological in origin.

A linear dipolar anomaly associated with a modern sub-surface pipe / culvert.

Very strong responses associated with strongly magnetic modern features / material.

Linear responses associated with a relatively modern ploughing regime.

A number of trends of uncertain origin.

Positive isolated responses are present which may be caused by natural features / variations but there are several possible groupings of responses which may suggest that some if these anomalies are anthropogenic in origin.

Positive linear / curvi-linear anomalies and associated trends which may indicate the presence of sub-surface features but these could potentially be caused by natural features / variations.

Further discussion / additional information:

There are a number of broad, diffuse trends in the data. This type of anomaly is usually caused by natural features or variations but in this instance some of the broad trends appear to form regular patterns (**Anomalies J**). This could be coincidental or it could indicate that some of the trends are anthropogenic in origin. The more regular responses, broadly speaking, appear to relate to the edges of areas of higher ground. There are numerous other trends within this field, which do not appear to be related to agricultural activity but the cause of these responses cannot be determined with any certainty.

There are numerous positive isolated responses and it is likely that the majority of these are related to natural features / variations but there are suggestions that some of these responses form groupings (**Anomalies K**), which could indicate an anthropogenic origin. However it is also possible that these groups of responses are coincidental and that all of the isolated responses are natural in origin.

It is worth noting that the mound in the north of the field, which is thought to be a possible burial mound, does not exhibit any obvious magnetic responses. This would seem to suggest that there are no extensive infilled features associated with the mound.

5. DISCUSSION AND CONCLUSIONS

The magnetic data for the site is complex as there are a variety of strong anomalies which have different origins and are associated with multiple phases of activity (much of which is relatively modern). This makes a reliable interpretation of the data quite difficult and means that a number of anomaly types have had to be categorised as of uncertain or unknown origin.

There is evidence for extensive modern activity, including an infilled quarry, in the north and east of the site. In the centre of the site there are suggestions of an oval / sub-rectangular feature but this may post-date ridge and furrow, responses from which are located around the feature, but not clearly within it. There are several broad, diffuse linear trends in the south of the site which, whilst often are associated with natural features / variations, possibly form regular patterns and so could be anthropogenic in origin, although it is possible that the patterns are coincidental and the responses are from natural features / variations.

It is clear that the majority of the anomalies identified by this survey relate to modern material / objects, agricultural activity and geological / pedological variations. However, there are a large number of anomalies whose cause cannot be determined with certainty and some of which could potentially be associated with archaeological features / activity.

There are several areas where very strong responses or magnetic disturbance from modern features dominate the surrounding data. It should be recognised that the strength of the strong responses could mask anomalies from other sub-surface features in the area.

The high resolution of the survey (0.5 m by approximately 0.15 m), high data quality and the fact that soils appear to have a reasonably high magnetic susceptibility (as evidenced by the presence of anomalies relating to ridge and furrow, agricultural activity and natural features / variations) suggest that if significant linear / curvi-linear archaeological features or activity were present that they would have produced anomalies of sufficient strength to allow them to be identified by the survey; assuming that any such responses were not masked by stronger responses from modern activity.

It should be noted that a geophysical survey does not directly locate sub-surface features - it identifies variations or anomalies in the background response caused by features. The interpretation of geophysical anomalies is often subjective and it is rarely possible to identify the cause of all such anomalies. Not all features will produce a measurable anomaly and the effectiveness of a geophysical survey is also dependant on the site-specific conditions. The main factors that may limit whether a feature can be detected are the composition of a feature, its depth and size and the surrounding material. It is not possible to guarantee that a geophysical survey will identify all sub-surface features. Confirmation on the identification of anomalies and the presence or absence of sub-surface features can only be achieved by intrusive investigation.

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APPENDIX 1

Magnetic survey: technical information

1.1 Theoretical background

1.1.1 Magnetic instruments measure the value of the Earth's magnetic field; the units of which are nanoTeslas (nT). The presence of surface and sub-surface features can cause variations or anomalies in this magnetic field. The strength of the anomaly is dependent on the magnetic properties of a feature and the material that surrounds it. The two magnetic properties that are of most interest are magnetic susceptibility and thermoremnant magnetism.

1.1.2 Magnetic susceptibility indicates the amount of ferrous (iron) minerals that are present. These can be redistributed or changed (enhanced) by human activity. If enhanced material subsequently fills in features such as pits or ditches then these can produce localised increases in magnetic responses (anomalies) which can be detected by a magnetic gradiometer even when the features are buried under additional soil cover.

1.1.3 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 topsoils, subsoils 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. Less magnetic material such as masonry or plastic service pipes which intrude into the topsoil may give a negative magnetic response relative to the background level. The strength of magnetic responses that a feature will produce will depend on the background magnetic susceptibility, how rapidly the feature has been infilled, the level and type of human activity in the area and the size and depth of a feature. Not all infilled features can be detected and natural variations can also produce localised positive and negative anomalies.

1.1.4 Thermoremnant magnetism indicates the amount of magnetism inherent in an object as a result of heating. Material that has been heated to a high temperature (fired), such as brick, can acquire strong magnetic properties and so although they may not appear to have a high iron content they can produce strong magnetic anomalies

1.1.5 The magnetic survey method is highly sensitive to interference from surface and near-surface magnetic 'contaminants'. Surface features such as metallic fencing, reinforced concrete, buildings or walls all have very strong magnetic signatures that can dominate readings collected adjacent to them. Identification of anomalies caused by sub-surface features is therefore more difficult, or even impossible, in the vicinity of surface magnetic features. The presence of made ground also has a detrimental effect on the magnetic data quality as this usually contains magnetic material in the form of metallic scrap and brick. Identification of features beneath made ground is still possible if the target feature is reasonably large and has a strong magnetic response but smaller features or magnetically weak features are unlikely to be identified.

1.1.6 The interpretation of magnetic anomalies is often subjective and it is rarely possible to identify the cause of all magnetic anomalies. Not all features will produce a measurable magnetic response and the effectiveness of a magnetic survey is also dependant on the site-specific conditions. The main factors that may limit whether a feature can be detected are the

composition of a feature, its depth and size and the surrounding material. It is not possible to guarantee that a magnetic survey will identify all sub-surface features.

1.1.7 Most high resolution, near surface magnetic surveys utilise a magnetic gradiometer. A gradiometer is a hand-held instrument that consists of two magnetic sensors, one positioned directly above the other, which allows measurement of the magnetic gradient component of the magnetic field. A gradiometer configuration eliminates the need for applying corrections due to natural variations in the overall field strength that occur during the course of a day but it only measures relative variations in the local magnetic field and so comparison of absolute values between sites is not possible.

1.1.8 Features that are commonly located using magnetic surveys include archaeological ditches and pits, buried structures or foundations, mineshafts, unexploded ordnance, metallic pipes and cables, buried piles and pile caps. The technique can also be used for geological mapping; particularly the location of igneous intrusions.

1.2 Instrumentation

1.2.1 A multi-sensor array cart system (MACS) utilising 8 Foerster 4.032 Ferex CON 650 gradiometers, spaced at 0.5 m intervals, with a control unit and data logger was used for the magnetic survey.

1.3 Survey methodology

1.3.1 The MACS utilises an RTK GNSS system which means that survey grids do not have to be established. Instead an area is surveyed over a series of continuous profiles and the position of each data point is recorded using an RTK GNSS system. The sensors have a separation of 0.5 m which means that data was collected on profiles spaced at 0.5 m apart. Readings were taken at between 0.1 m and 0.15 m intervals.

1.3.2 Data is collected on zig-zag profiles along the full length or width of a field, although fields can be sub-divided if they are particularly large. Marker canes are set-out along field boundaries at set intervals and these are used to align the profiles. The survey profiles are usually offset from field boundaries, buildings and other metallic features by several metres to reduce the detrimental effect that these surface magnetic features have on the data. The location of the MACS data is converted direct to Ordnance Survey co-ordinates using the UK OSTN 02 projection. As the data is related direct to Ordnance Survey National Grid co-ordinates temporary survey stations are not established.

1.3.3 The Foerster gradiometers have a resolution of 0.2 nT but the stability of the cart system significantly reduces noise caused by instrument tilt and movement when compared with a traditional hand-held gradiometer system and the increased data intervals provide a higher resolution data set. The sensors have a range of ± 10,000nT and readings are taken at 0.1 nT resolution.

1.4 Data processing and presentation

1.4.1 The MACS data is stored direct to a laptop using in-house software which automatically corrects for instrument drift and calculates a mean value for each profile. A positional value is assigned to each data point based on the sensor number and recorded GNSS co-ordinates. The data is gridded using in-house software and parameters are set based on the sensor spacing and mean values. No additional processing is required. The gridded data is then displayed in Surfer 9 (Golden Software) and image files of the data are created.

1.4.2 The data was exported as raster images (PNG files), and are presented in greyscale format at 1:1500.

1.4.3 The data has been displayed relative to a digital base plan provided by the client as drawing *'RH TS03a - Priory Road Ulverston - Aqua Duct outfall Routes by SurvEng.dwg'*. The base plan was in the National Grid co-ordinate system and as the survey grids were set-out directly to National Grid co-ordinates the data could be simply superimposed onto the base plan in the correct position.

1.5 Interpretation

1.5.1 The anomalies have been categorised based on the type of response that they have and an interpretation as to the cause(s) or possible cause(s) of each anomaly type is also provided. The following anomaly types may be present within the data:

Dipolar responses

Dipolar responses are those that have a sharp variation between strongly positive and negative components. In the majority of cases dipolar responses are usually caused by modern ferrous features / objects, although fired material (such as brick), some ferrous or industrial archaeological features and strongly magnetic gravel could also produce dipolar responses.

There are numerous **isolated dipolar responses** (iron spikes) across the survey area that are indicative of ferrous or fired material on or near to the surface. The isolated responses are often caused by small objects, such as spent shotgun cartridges, iron nails and horseshoes or pieces of modern brick or pot. Archaeological artefacts can also produce this type of response but unless there is strong supporting evidence to the contrary they are assumed not to be of archaeological significance. The majority of the dipolar responses at this site are believed to be non-archaeological in origin and so responses of this type have only been shown where they are proximity to probable or possible sub-surface features. The majority of the dipolar responses that are shown are also probably modern in origin but there is a slightly increased possibility that some of them could be associated with the adjacent features.

Areas containing strong or numerous dipolar responses (**magnetic disturbance)** are usually caused by concentrations of ferrous or fired material and are often found adjacent to field boundaries where such material tends to accumulate. Above ground metallic or strongly magnetic features, such as fences, gates, pylons and buildings can also produce very strong dipolar responses. If an area of magnetic disturbance is located away from existing field boundaries then it could indicate a former field boundary, several large isolated objects in close proximity, an area where modern material has been tipped or an infilled cut feature, such as a quarry pit. Areas of dipolar response can occasionally be caused by features / material associated with archaeological industrial activity but they are usually caused by modern activity. Responses in areas of magnetic disturbance can sometimes be so strong that archaeological features located beneath them may not be detected.

Linear anomalies that contain dipolar responses (categorised as **dipolar linear**) are usually caused by modern pipes or cables.

Very strong responses from modern features can dominate the data for a significant distance beyond the feature. The extent of these areas is usually shown as a **limit of very**

strong response. It should be noted that this effect extends beyond the feature and so the limit of the response does not correspond to the actual size or location of the feature within it. It should be recognised that other sub-surface features located within these areas may not be detected.

Negative linear anomalies

Negative linear anomalies occur when a feature has lower magnetic readings than the surrounding material. It can often be associated with ploughing regimes or plastic / concrete pipes.

They can indicate the presence of a feature that cuts into magnetic soils or bedrock and which is infilled with less magnetic material and in certain geologies can be associated with archaeological features.

On this site it is believed that the responses are associated with trackways or with non-magnetic relatively modern features.

Linear / curvi-linear anomalies (probable agricultural)

In many geological / pedological conditions agricultural features / regimes can produce magnetic anomalies due to the accumulation / alignment of magnetic topsoil. In most cases these are exhibited as a series of **broadly parallel positive linear** anomalies. The majority of these responses are associated with modern ploughing regimes but in some instances, where the responses are broader and more widely spaced, they can indicate the presence of the remnants of ridge and furrow.

Field drain systems can also produce linear anomalies, usually where the drains are made from fired ceramic or infilled with magnetic gravels.

Where a series of parallel anomalies are present then the approximate orientation of the anomalies are shown on the interpretation drawing to indicate the direction of the agricultural regime but for the sake of clarity individual anomalies have not been shown.

Individual anomalies may be shown if the response is not part of a regime.

Linear / curvi-linear trends

An anomaly is categorised as a **trend** if it is not certain that the response is associated with an extant sub-surface feature. Trends are usually weak, irregular, diffuse or discontinuous and it is usually not certain what their cause is, if they represent significant sub-surface features or even if they are associated with definite features.

It is possible that some of the trends are associated with geological / pedological variations. Others may be produced by artificial constructs within the data, either caused by processing or in some instances by intersecting anomalies (usually different agricultural regimes) that give the appearance of curving or regular shapes. Many trends are a product of weak, naturally occurring responses that happen to form a regular pattern but which are not associated with a sub-surface feature.

In some instances former features that have been severely truncated can still produce broad, diffuse or weak responses even if the underlying feature has been removed. This is due to the presence of magnetic soils associated with the former feature still being present along its route. In other instances the magnetic properties of the soils filling a feature may vary and so the magnetic signature of the feature can change, even if the sub-surface

feature itself remains uniform. If a response from a feature becomes significantly weak or diffuse then part of the anomaly may be shown as a trend as it is uncertain if the feature is still present or has been severely truncated or removed.

Isolated positive or enhanced responses

Isolated positive or enhanced responses can occur if the magnetism of a feature, area or material has been enhanced or if a feature is naturally more magnetic than the surrounding material. It is often difficult to determine which of these factors causes any given responses and so the origin of this type of anomaly can be difficult to determine. They can have a variety of causes including geological variations, infilled archaeological features, areas of burning (including hearths), industrial archaeological features, such as kilns, or deeper buried ferrous material and modern fired material.

The large number of isolated responses and lack of an obvious pattern to their distribution suggests that these the majority anomalies are probably associated with geological / pedological variations. Only the larger or stronger areas of positive response have been shown on the interpretation.

Positive or enhanced linear / curvi-linear anomalies

Positive magnetic anomalies indicate an increase in magnetism and if the resulting anomaly is linear or curvi-linear then this can indicate the presence of a man-made feature. **Positive or enhanced linear / curvi-linear** anomalies can be associated with agricultural activity, drainage features but they can also be caused by ditches that are infilled with magnetically enhanced material and as such can indicate the presence of archaeological features. Some natural infilled features can also produce positive anomalies.

1.5.2 Several different ranges of data were used in the interpretation to ensure that the maximum information possible is obtained from the data.

1.5.3 X-Y trace plots were examined for all of the data and overlain onto the greyscale plot to assist in the interpretation, primarily to help identify dipolar responses that will probably be associated with surface / near-surface iron objects. X-Y trace plots have not been used in the report as they do not show any additional anomies that are not visible in the greyscale data. A digital drawing showing the X-Y trace plot overlain on the greyscale plot has been provided in the digital archive.

1.5.4 All isolated responses have been assessed using a combination of greyscale and X-Y trace plots.

1.5.5 Anomalies associated with agricultural regimes are present in the data. The general orientation of these regimes has been shown on the interpretation but, for the sake of clarity, each individual anomaly has not been shown.

1.5.6 The greyscale plots and the accompanying interpretations of the anomalies identified in the magnetic data are presented as 2D AutoCAD drawings. The interpretation is made based on the type, size, strength and morphology of the anomalies, coupled with the available information on the site conditions. Each type of anomaly is displayed in separate, easily identifiable layers annotated as appropriate.

1.6 Limitations of magnetic surveys

1.6.1 The magnetic survey method requires the operator to walk over the site at a constant walking pace whilst holding the instrument. The presence of an uneven ground surface, dense, high or mature vegetation or surface obstructions may mean that some areas cannot be surveyed.

1.6.2 The depth at which features can be detected will vary depending on their composition, size, the surrounding material and the type of magnetometer used for the survey. In good conditions large, magnetic targets, such as buried drums or tanks can be located at depths of more than 4 m. Smaller targets, such as buried foundations or archaeological features can be located at depths of between 1 m and 2 m.

1.6.3 A magnetic survey is highly sensitive to interference from surface and near-surface magnetic 'contaminants'. Surface features such as metallic fencing, reinforced concrete, buildings or walls all have very strong magnetic signatures that can dominate readings collected adjacent to them. Identification of anomalies caused by sub-surface features is therefore more difficult or even not possible in the vicinity of surface and near-surface magnetic features.

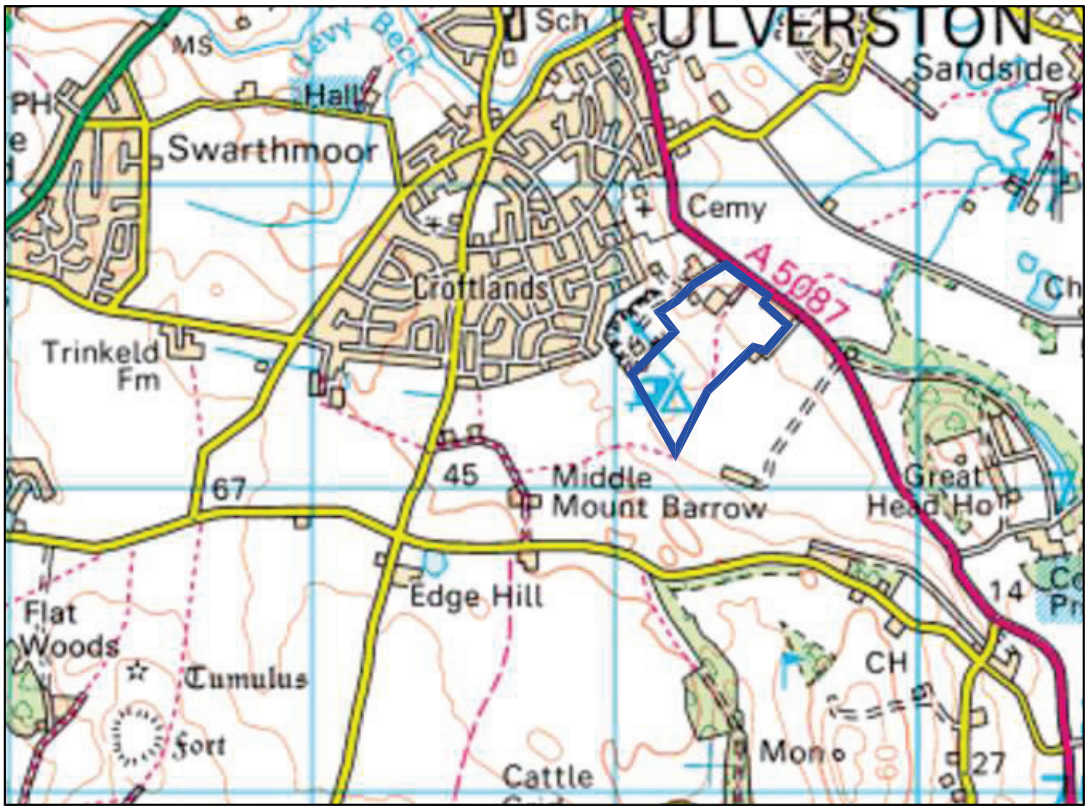
1.6.4 The presence of made ground also has a detrimental effect on the magnetic data quality as this usually contains magnetic material in the form of metallic scrap and brick. Identification of features beneath made ground is still possible if the target feature is reasonably large and has a strong magnetic response but smaller features or magnetically weak features are unlikely to be identified.

1.6.5 It should be noted that anomalies that are interpreted as modern in origin may 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.

1.6.6 A magnetic survey does not directly locate sub-surface features - it identifies variations or anomalies in the local magnetic field caused by features. It can be possible to interpret the cause of anomalies based on the size, shape and strength of response but it should be recognised that a magnetic survey produces a plan of magnetic variations and not a plan of all sub-surface features. Interpretation of the anomalies is often subjective and it is rarely possible to identify the cause of all magnetic anomalies. Geological or pedological (soil) variations or features can produce responses similar to those caused by man-made (anthropogenic) features.

1.6.7 Anomalies identified by a magnetic survey are located in plan. It is not usually possible to obtain reliable depth information on the features that cause the anomalies.

1.6.8 Not all features will produce a measurable magnetic response and the effectiveness of a magnetic survey is also dependant on the site-specific conditions. It is not possible to guarantee that a magnetic survey will identify all sub-surface features. A magnetic survey is often most-effective at identifying sub-surface features when used in conjunction with other complementary geophysical techniques.



SITE LOCATION

SCALE

0m 500m 1000m

NOTE

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PHASE SITE INVESTIGATIONS

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Scale [A4 Sheet]	Drawing	Status
AS SHOWN	ARC_1699_607_01	FINAL

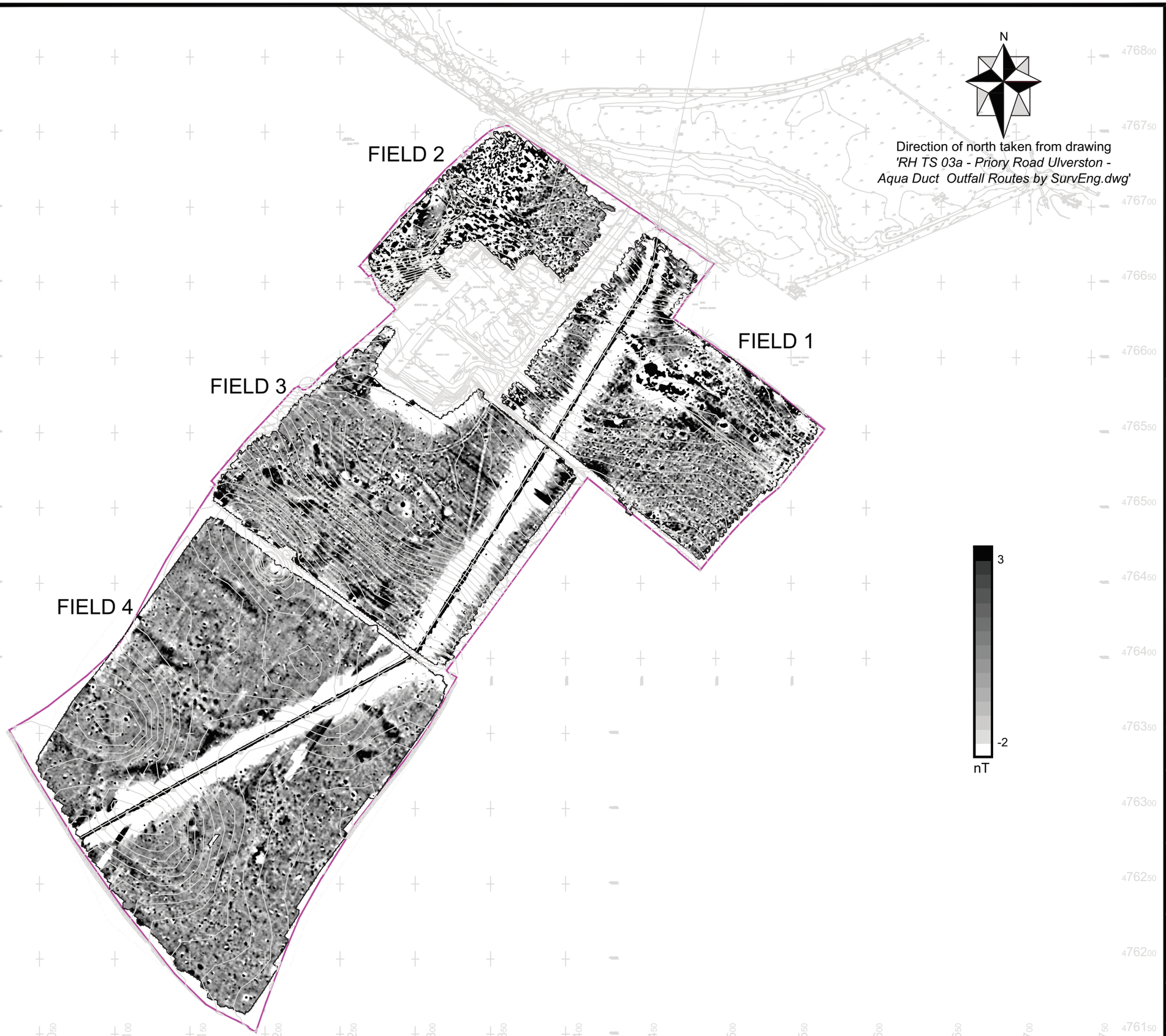
Client: GREENLANE ARCHAEOLOGY LTD ULVERSTON

Site: GASCOW FARM, PRIORY ROAD ULVERSTON, CUMBRIA

Title: SITE LOCATION MAP

Job No: ARC_1699_607

		Drawn	CW
Chk.	NF	Date	20/11/2015



NOTES

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ALWAYS EXERCISE CAUTION WHEN EXCAVATING

KEY

SITE BOUNDARY

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Scale [A3 Sheet]	Drawing	Status
1:2500	ARC_1699_607_02	FINAL

Client
GREENLANE ARCHAEOLOGY LTD
ULVERSTON, CUMBRIA

Site
GASCOW FARM, PRIORY ROAD
ULVERSTON, CUMBRIA

Title
LOCATION OF SITE SHOWING
MAGNETIC GRADIENT DATA

Job No
ARC_1699_607

Surveyed	SV, RP	Drawn	RP, MW
Chk.	NF	Date	09/12/2015

NOTES

1. THIS DRAWING MUST BE USED IN CONJUNCTION WITH THE ACCOMPANYING REPORT (ARC_1699_607_RPT.DOC) WHICH PROVIDES DETAILS OF THE TECHNIQUES EMPLOYED, THEIR INHERENT LIMITATIONS AND ANY SITE SPECIFIC ISSUES.
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ALWAYS EXERCISE CAUTION WHEN EXCAVATING

N

Direction of north taken from drawing *'RH TS 03a - Priory Road Ulverston - Aqua Duct Outfall Routes by SurvEng.dwg'*

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Scale [A3 Sheet]	Drawing	Status
1:1500	ARC_1699_607_03	FINAL

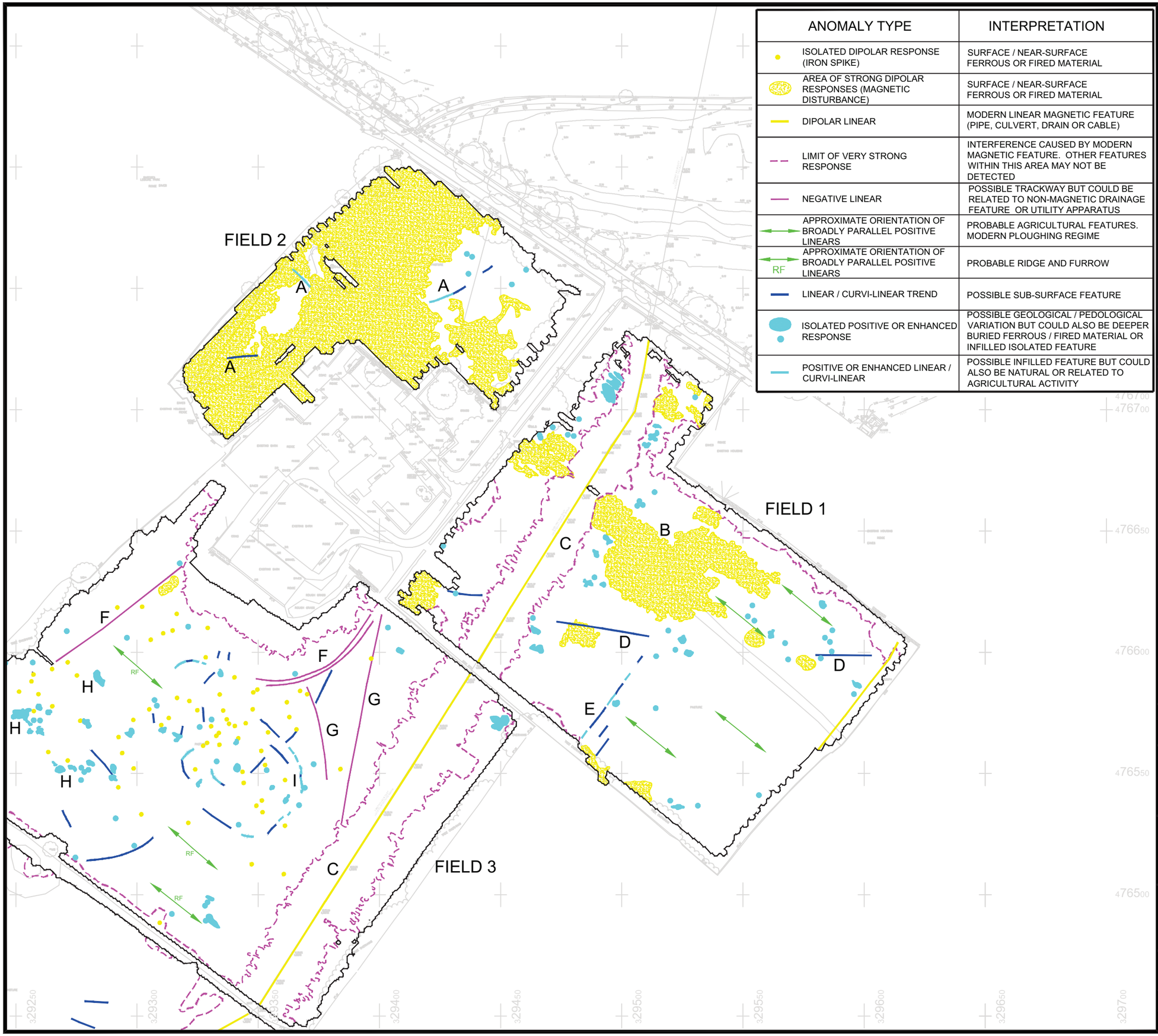
Client: GREENLANE ARCHAEOLOGY LTD ULVERSTON, CUMBRIA

Site: GASCOW FARM, PRIORY ROAD ULVERSTON, CUMBRIA

Title: GREYSCALE PLOTS OF MAGNETIC GRADIENT DATA: FIELDS 1 AND 2 AND PART OF FIELD 3

Job No: ARC_1699_607

Surveyed	SV, RP	Drawn	RP, MW
Chk.	NF	Date	09/12/2015



ANOMALY TYPE	INTERPRETATION
ISOLATED DIPOLAR RESPONSE (IRON SPIKE)	SURFACE / NEAR-SURFACE FERROUS OR FIRED MATERIAL
AREA OF STRONG DIPOLAR RESPONSES (MAGNETIC DISTURBANCE)	SURFACE / NEAR-SURFACE FERROUS OR FIRED MATERIAL
DIPOLAR LINEAR	MODERN LINEAR MAGNETIC FEATURE (PIPE, CULVERT, DRAIN OR CABLE)
LIMIT OF VERY STRONG RESPONSE	INTERFERENCE CAUSED BY MODERN MAGNETIC FEATURE. OTHER FEATURES WITHIN THIS AREA MAY NOT BE DETECTED
NEGATIVE LINEAR	POSSIBLE TRACKWAY BUT COULD BE RELATED TO NON-MAGNETIC DRAINAGE FEATURE OR UTILITY APPARATUS
APPROXIMATE ORIENTATION OF BROADLY PARALLEL POSITIVE LINEARS	PROBABLE AGRICULTURAL FEATURES. MODERN PLOUGHING REGIME
RF APPROXIMATE ORIENTATION OF BROADLY PARALLEL POSITIVE LINEARS	PROBABLE RIDGE AND FURROW
LINEAR / CURVI-LINEAR TREND	POSSIBLE SUB-SURFACE FEATURE
ISOLATED POSITIVE OR ENHANCED RESPONSE	POSSIBLE GEOLOGICAL / PEDOLOGICAL VARIATION BUT COULD ALSO BE DEEPER BURIED FERROUS / FIRED MATERIAL OR INFILLED ISOLATED FEATURE
POSITIVE OR ENHANCED LINEAR / CURVI-LINEAR	POSSIBLE INFILLED FEATURE BUT COULD ALSO BE NATURAL OR RELATED TO AGRICULTURAL ACTIVITY

NOTES

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ALWAYS EXERCISE CAUTION WHEN EXCAVATING

N

Direction of north taken from drawing *'RH TS 03a - Priory Road Ulverston - Aqua Duct Outfall Routes by SurvEng.dwg'*

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Scale [A3 Sheet]	Drawing	Status
1:1500	ARC_1699_607_04	FINAL

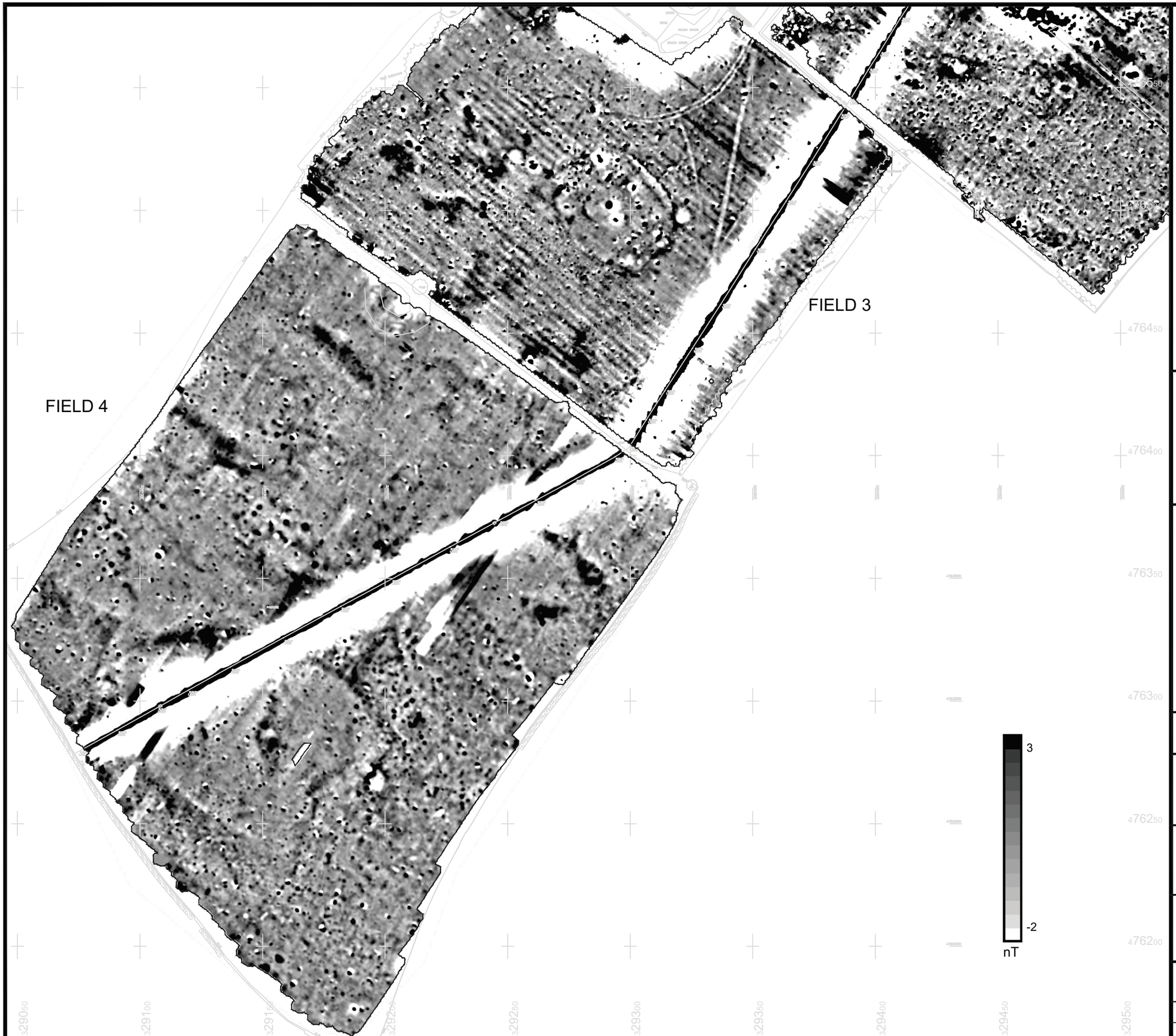
Client
GREENLANE ARCHAEOLOGY LTD
ULVERSTON, CUMBRIA

Site
GASCOW FARM, PRIORY ROAD
ULVERSTON, CUMBRIA

Title
INTERPRETATION OF MAGNETIC GRADIENT DATA: FIELDS 1 AND 2 AND PART OF FIELD 3

Job No
ARC_1699_607

Surveyed	SV, RP	Drawn	RP, MW
Chk.	NF	Date	09/12/2015



NOTES

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ALWAYS EXERCISE CAUTION WHEN EXCAVATING

N

Direction of north taken from drawing *'RH TS 03a - Priory Road Ulverston - Aqua Duct Outfall Routes by SurvEng.dwg'*

PHASE SITE INVESTIGATIONS

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Scale [A3 Sheet]	Drawing	Status
1:1500	ARC_1699_607_05	FINAL

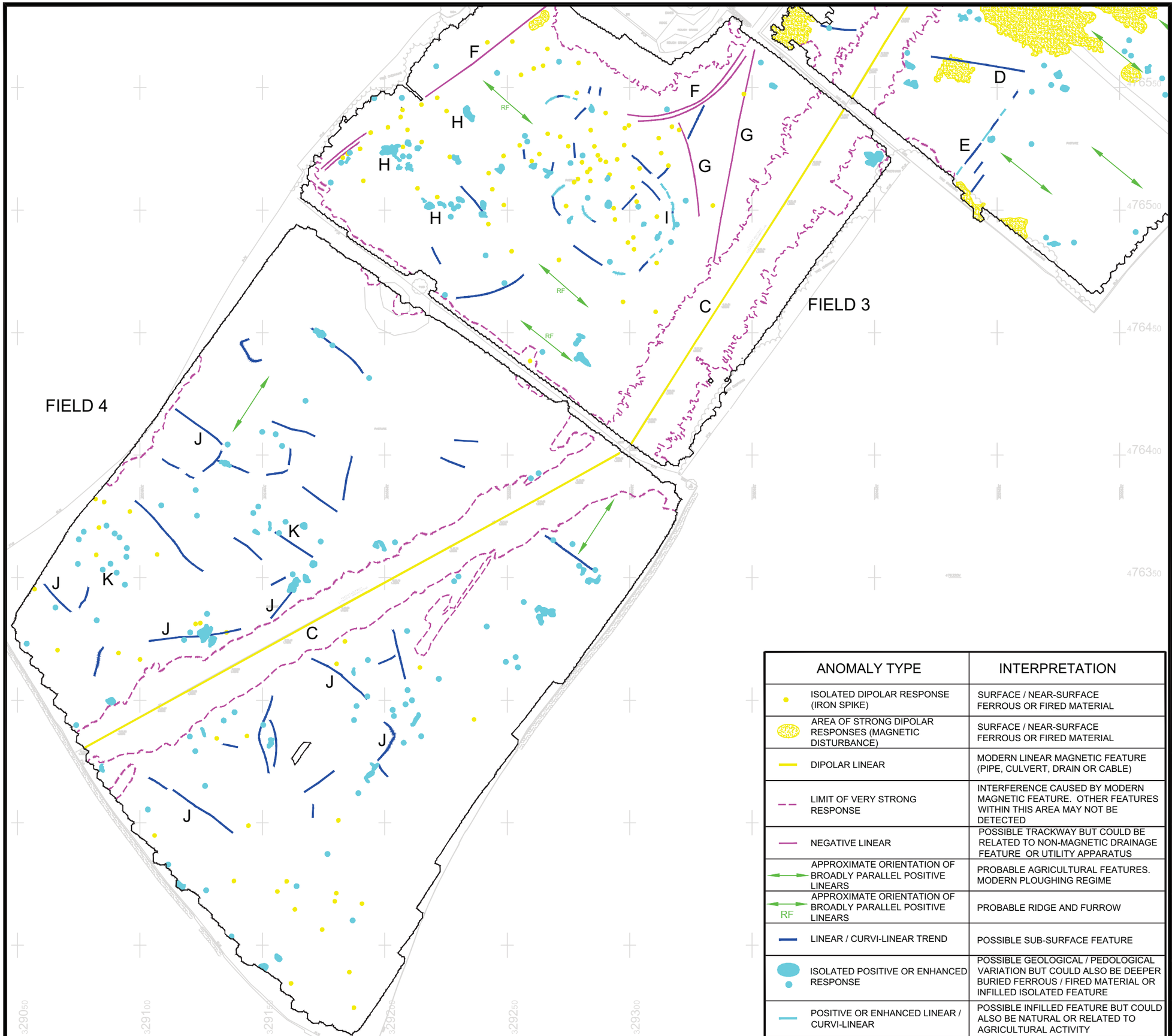
Client
GREENLANE ARCHAEOLOGY LTD
ULVERSTON, CUMBRIA

Site
GASCOW FARM, PRIORY ROAD
ULVERSTON, CUMBRIA

Title
GREYSCALE PLOTS OF MAGNETIC GRADIENT DATA: FIELDS 3 AND 4

Job No
ARC_1699_607

Surveyed	SV, RP	Drawn	RP, MW
Chk.	NF	Date	09/12/2015



NOTES

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ALWAYS EXERCISE CAUTION WHEN EXCAVATING

N

Direction of north taken from drawing *'RH TS 03a - Priory Road Ulverston - Aqua Duct Outfall Routes by SurvEng.dwg'*

ANOMALY TYPE	INTERPRETATION
ISOLATED DIPOLAR RESPONSE (IRON SPIKE)	SURFACE / NEAR-SURFACE FERROUS OR FIRED MATERIAL
AREA OF STRONG DIPOLAR RESPONSES (MAGNETIC DISTURBANCE)	SURFACE / NEAR-SURFACE FERROUS OR FIRED MATERIAL
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RF APPROXIMATE ORIENTATION OF BROADLY PARALLEL POSITIVE LINEARS	PROBABLE RIDGE AND FURROW
LINEAR / CURVI-LINEAR TREND	POSSIBLE SUB-SURFACE FEATURE
ISOLATED POSITIVE OR ENHANCED RESPONSE	POSSIBLE GEOLOGICAL / PEDOLOGICAL VARIATION BUT COULD ALSO BE DEEPER BURIED FERROUS / FIRED MATERIAL OR INFILLED ISOLATED FEATURE
POSITIVE OR ENHANCED LINEAR / CURVI-LINEAR	POSSIBLE INFILLED FEATURE BUT COULD ALSO BE NATURAL OR RELATED TO AGRICULTURAL ACTIVITY

PHASE SITE INVESTIGATIONS

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Scale [A3 Sheet]	Drawing	Status
1:1500	ARC_1699_607_06	FINAL

Client: GREENLANE ARCHAEOLOGY LTD ULVERSTON, CUMBRIA

Site: GASCOW FARM, PRIORY ROAD ULVERSTON, CUMBRIA

Title: INTERPRETATION OF MAGNETIC GRADIENT DATA: FIELDS 3 AND 4

Job No: ARC_1699_607

Surveyed	SV, RP	Drawn	RP, MW
Chk.	NF	Date	09/12/2015