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ENVIRONMENTAL SERVICES



**LAND AT CLEATOR MILLS  
CLEATOR  
CUMBRIA**

**GEOPHYSICAL SURVEY  
REPORT**

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**NORTH ASSOCIATES**  
**LAND AT CLEATOR MILLS**  
**CLEATOR**  
**CUMBRIA**

**GEOPHYSICAL SURVEY  
REPORT**

**PREPARED BY:**

Martin Railton

Senior Project Manager



**APPROVED BY:**

Frank Giecco

Technical Director



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## SUMMARY

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In December 2013 Wardell Armstrong Archaeology undertook a geophysical survey of land at Cleator Mills, Cleator in Cumbria at the request of North Associates. The work was undertaken to inform a proposed planning application for a residential development.

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

Geomagnetic survey covering c.4ha of land was conducted to the northwest of Cleator, between the main A5086 and the River Ehen. The surveys detected significant modern disturbance, particularly to the north of the site, associated with modern service pipes and drainage.

The only potential archaeological features detected by the survey were the remains of ridge and furrow cultivation on the west side of the site, and possible soil-filled features to the west, interpreted as a possible palaeochannel.

Given the results of the geophysical survey no further survey work is recommended.

## ACKNOWLEDGEMENTS

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Wardell Armstrong Archaeology would like to thank Andy Ross of North Associates, for commissioning the project, and for all assistance throughout the project.

The geophysical surveys were undertaken by Kevin Mounsey and Kevin Horsely. The project was managed by Martin Railton BA (Hons) MA MIfA, Project Manager for WAA, who also wrote and illustrated the report. The report was edited by Frank Giocco, WAA Technical Director.

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# 1 INTRODUCTION

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## 1.1 CIRCUMSTANCES OF THE PROJECT (FIGURE 1)

- 1.1.1 Between 2<sup>nd</sup> and 3<sup>rd</sup> December 2013 Wardell Armstrong Archaeology undertook a geophysical survey of land at Cleator Mills, Cleator in Cumbria at the request of North Associates. The work was undertaken to inform a proposed planning application for a residential development. This is in line with government advice as set out in Section 12 of the National Planning Policy Framework (NPPF 2012).
- 1.1.2 The proposed development area comprised an area of land to the northwest of Cleator, between the main A5086 and the River Ehen, measuring c.6.7ha in total. It was bounded by the A5068 to the north, modern housing to the west, with former factories and the River Ehen to the east and south (Figure 1). Of this an area of 4ha was suitable for geophysical survey. The site is centred on Ordnance Survey grid reference NGR NY 0205 1381.
- 1.1.3 A desk-based assessment has been undertaken for the proposed development, which has identified that a Roman road is believed to run between Egremont and Cockermouth to the north of the proposed development site, although the exact alignment is unclear. Documentary sources have also indicated that an iron forge formerly existed in close proximity to the Cleator Mills site dating to the 17th century; this was seemingly removed when the earliest phase of the flax mill was constructed in c.1800. The earliest phase of the Cleator Mills site dates to c.1800 and the 1825 Enclosure Map clearly shows the buildings and mill race that was in existence at that date. The proposed development could potentially have an impact on these early 19th century remains, although later redevelopment may have removed such evidence (Wooler 2013).
- 1.1.4 The objective of the geophysical surveys was to determine the presence/absence, nature and extent of potential archaeological features within the survey area, and the presence/absence of any known modern features within the survey area, which may affect the results. The results of the project were to be used to inform the need for further archaeological work, or mitigation measures, should potential significant archaeological remains be identified during the project.
- 1.1.5 This report outlines the results of the geophysical surveys undertaken, and includes an interpretation of the geophysical survey results, in light of the archaeological and historical background of the site, with recommendations for further work where necessary.

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## 2 METHODOLOGY

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### 2.1 STANDARDS

2.1.1 The work was consistent with English Heritage guidelines (English Heritage 2007 and 2008), and in accordance with the standard and guidance of the Institute for Archaeologists (IfA 2011).

### 2.2 GEOPHYSICAL SURVEYS

2.2.1 **Technique Selection:** geomagnetic survey was selected as the most appropriate technique, given the non-igneous environment, and the expected presence of cut archaeological features at depths of no more than 1.5m. This technique involves the use of hand-held gradiometers, which measure variations in the vertical component of the earth's magnetic field. These variations can be due to the presence of sub-surface archaeological features. Data were recorded by the instruments and downloaded into a laptop computer for initial data processing in the field using specialist software.

2.2.2 **Field Methods:** the geophysical study comprised an area of pasture to the northeast of the former factory, measuring c.4ha. A 30m grid was established across this area, and tied-in to known Ordnance Survey points using a Trimble 3605DR Geodimeter total station with datalogger.

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

2.2.4 **Data Processing:** geophysical survey data were processed using ArchaeoSurveyor II software, which was used to produce 'grey-scale' images of the raw data. Positive magnetic anomalies are displayed as dark grey, and negative magnetic anomalies are displayed as light grey. A palette bar shows the relationship between the grey shades and geomagnetic values in nT.

2.2.5 Raw data were processed in order to further define and highlight the archaeological features detected. The following basic data processing functions were used:

*Despike:* to locate and suppress random iron spikes in the gradiometer data.

*Clip:* to clip data to specified maximum and minimum values, in order to limit large noise spikes in the geophysical data.



*Destagger:* to reduce the effect of staggered gradiometer data, sometimes caused by difficult working conditions, topography, or operator error.

2.2.6 **Interpretation:** three types of geophysical anomaly were detected in the gradiometer data:

*positive magnetic:* regions of anomalously high or positive magnetic data, which may be associated with the presence of high magnetic susceptibility soil-filled features, such as pits or ditches.

*negative magnetic:* regions of anomalously low or negative magnetic data, which may be associated with features of low magnetic susceptibility, such as stone-built features, geological features, land-drains or sub-surface voids.

*dipolar magnetic:* regions of paired positive and negative magnetic anomalies, which typically reflect ferrous or fired materials, including fired/ferrous debris in the topsoil, modern services, metallic structures, or fired structures, such as kilns or hearths.

2.2.7 **Presentation:** the grey-scale image was combined with site survey data and Ordnance Survey data to produce the geophysical survey figures. A colour-coded geophysical interpretation diagram is provided, showing the locations and extent of positive, negative and dipolar, geomagnetic anomalies.

2.2.8 An archaeological interpretation diagram is also provided, which is based on the interpretation of the geophysical survey results, in light of the archaeological and historical background of the site.

2.2.9 A trace plots of the unprocessed geophysical data is included in Appendix 1.

## 2.3 ARCHIVE

2.3.1 The data archive for the geophysical survey has been created in accordance with the recommendations of the Archaeology Data Service (ADS 2013). This archive is currently held at the company offices at Carlisle, Cumbria.

2.3.2 One copy of the final report will be deposited with the County Historic Environment Record, where viewing will be available on request. The project is also registered with the Online Access to the Index of archaeological investigationS (OASIS), where a digital copy of the report will be made available.

2.3.3 The OASIS reference for this project is **wardella2-166355**.

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## 3 BACKGROUND

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### 3.1 LOCATION AND GEOLOGICAL CONTEXT

- 3.1.1 The village of Cleator is situated in West Cumbria, approximately 3km to the north of Egremont, and 1km to the south of Cleator Moor. The village straddles the A5086 which runs from Egremont to Cockermouth. The River Ehen flows to the east side of the village (Figure 1).
- 3.1.2 The proposed development site is located to the north-east of the village, between the main A5086 and the River Ehen. Present vehicular access is by a road from Brookside to the north of the site, with additional access possible from the south-west along Mill Street (Figure 2).
- 3.1.3 The Countryside Commission places the village of Cleator in a landscape character area known as the 'West Cumbria Coastal Plain', which is a narrow belt of country between the coast and the high fells of the Lake District. North of St Bees Head, the area coincides with the outcrop of the Coal Measures, Hensingham Group and Chief Limestone Groups, all of Carboniferous age. These rocks are overlain in the Whitehaven area by small outliers of Permo-Triassic ('New Red Sandstone') sedimentary rocks. Glaciation by ice has affected the whole area leaving a widespread mantle of boulder clay (till) with, in places, sand and gravel (Countryside Commission 1998, 27).

### 3.2 HISTORICAL CONTEXT

- 3.2.1 **Introduction:** a desk-based assessment of the site has been undertaken (Wooler 2013), a summary of which is included below. This historical background is compiled mostly from secondary sources, and is intended only as a brief summary of historical developments specific to the study area. References to the Cumbria Historic Environment Record (HER) are included where known.
- 3.2.2 **Prehistoric (up to c. AD43):** at present the HER entries for the 1km search radius centred on the proposed development site at Cleator Mills do not include any which relate to the prehistoric period, although this does not necessarily indicate that there was no land use or settlement in the area.
- 3.2.3 On the east side of the River Ehen there is some evidence for prehistoric activity, in the form of burial mounds. To the south-east of Cleator, near the summit of Dent, is the place name 'Long Barrow' which may indicate the site of a burial mound, and Caesar Cain noted that the place name 'borrans' means a cairn, or heap of stones, with examples known at Black How, immediately opposite Cleator Mills, although he noted that these could equally have been clearance cairns from the surrounding fields (Caine 1916, 361).
- 3.2.4 **Roman (c. AD43-c.410):** although not presently recorded in the HER, there is reference to a Roman road from Egremont to Cockermouth heading through the parish of Cleator. Writing in 1860, Whellan noted that the Roman road at

Cleator 'entered at the boundary stone on the road to Frizington, and pursues a south-westerly direction past the Catholic Church and then is probably merged into the high road through Cleator village. The larger stones composing it have nearly all disappeared, but traces of it are very distinct' (Whellan 1860, 374).

- 3.2.5 *Early Medieval (c.AD410-1066)*: there is presently no evidence for settlement or land use in the area around Cleator relating to this period, and no entries in the HER within the 1km search radius identify any potential early medieval sites. This is, however, not unusual for Cumbria. Evidence for this period is generally derived from place names and the presence of early medieval stone sculpture surviving at church sites, possibly indicating an earlier religious establishment prior the medieval period. St Leonard's Church has medieval (12th century) fabric within the chancel, and a 12th century round-headed window survives in the north wall. However, there is presently no evidence for earlier stone sculpture at that site.
- 3.2.6 The place name Cleator is believed to derive from Old Norse words, and means 'shieling by the rock cliffs'. Old Norse was the language spoken in Cumbria in the latter part of the early medieval period, and it is therefore possible that a settlement of some form, possibly only a few shielings, existed in the vicinity, although there is currently no archaeological evidence for this (Wooler 2013).
- 3.2.7 *Medieval (c.AD1066-1540)*: there is some evidence for a settlement of some form at Cleator from the 12th century. A manor of Cleator is referred to in 1315 when it was recorded: 'In the year of our lord 1315 Robert Bruce besieged Carlisle. At this time James Douglas did much damage at Egremont and despoiled the church of St Bega and burned the prior of St Bega's manors of Cleator and Stainburne' (Caine 1915, 25). It is unclear, however, what was meant by the 'manor' and whether it referred to a settlement or an individual property.
- 3.2.8 St Leonard's Church at Cleator contains within its stonework, 12th century (Norman) fabric, and during restoration work in 1900-03 a Norman window and doorway, as well as traces of wall painting, were revealed by J H Martindale (Hyde and Pevsner 2010, 277). It is unclear where the settlement which was served by St Leonard's Church was; presumably it was located in close proximity, possibly straggling the main road (the modern A5086). Several medieval cross slab fragments survive in the church, one is dated to the late 11th to mid 12th century, and another dates to the late 12th or early 13th century (Ryder 2005, 75).
- 3.2.9 Apart from St Leonard's Church (HER No. 4448), the HER entries within the 1km search radius refer to the original and present location of the 'Fawn Cross'. There was a farmhouse called Fawn Cross, located on the road from Cleator Gate which heads northwards to the north side of Cleator Moor (HER No. 1209), which collapsed in the late 19th century due to subsistence. A possible medieval boundary cross head was recovered from this site, and is now at Cleator Parish Church (HER No. 1205).
- 3.2.10 *Post-medieval to Modern (AD1540-present)*: the earliest readily-available source to describe the parish of Cleator was Thomas Denton's late 17th century

perambulation. In this source, Cleator is simply described as being located 'a mile higher north from Egremont, as Keekle beck falls into the River End [Ehen], [where there] stands the town and parish of Cleator'. The only other reference of interest is made to colliery at Wedacre [Weddicar] (Winchester 2003, 97), with no mention of any industrial activity at Cleator itself, although there may have been small-scale concerns such as water mills.

- 3.2.11 Despite Denton's lack of reference to industrial activity in Cleator, it has been suggested that smelting was being undertaken in the parish in the late 17th century. Of particular relevance is the indication that an iron furnace site was situated 'not far from the forecourt of the flax mill, on the north side of the entrance lane, where slag can be found' (Davies-Shiel and Marshall 1969, 234). As the 'flax mill' forms part of the present proposed development site, this is therefore of relevance as it indicates that an iron furnace/smelting site lay in close proximity, possibly even within the site boundary. A 17th century 'bloomsmithy' site is also recorded to the south-west of the proposed development site, in close proximity to the River Ehen, believed to have been operating between approximately 1670 and 1688 (HER No. 17731).
- 3.2.12 At the end of the 18th century, observations were made regarding the extraction of iron ore in the parish. Hutchinson noted in 1794: 'At a place called Crowgarth, is the most singular mine of iron ore supposed to be in Great Britain. It lies in the earth at the depth of twelve fathoms, and the thickness of the band of ore, which is hard solid metal, is between 24 and 25ft. It was never known to be much wrought till the years 1784 and 1785, when it was more generally opened; and so great was the demand for it at Carron foundry in Scotland, and others, that in 1790 and 1791, the annual exportation was 20,000 tons and upwards' (Hutchinson 1794-97, 30). At this date there does not appear to be any reference to a flax mill at Cleator, although two iron forges existed, one at Wath and the other at Cleator, 'both plating forges and each employs about 12 hands in making spades, shovels etc' (ibid, 29).
- 3.2.13 Hodkinson and Donald's Map of Cumberland, which was produced in 1774, appears to show the locations of three water mills along the River Ehen in close proximity to Cleator, all represented as a circular feature. One is shown at Wath, possibly the iron forge noted by Hutchinson, and two are shown at Cleator, one again possibly the forge referred to above, and the second possibly a corn mill (?Low Mill, Site 20 on Figure 3). The settlement of Cleator is shown with a small vignette of the church and a prominent building, possibly the 'Old Hall' (annotated with the name Jn Gate Esq.), with properties represented either side of the road, but not seemingly a large village at this date. No water mill or building is shown in the location of Cleator Mills on this map; although it was produced at a small scale and does not necessarily provide an accurate depiction of all buildings which existed at this date.
- 3.2.14 The earliest phase of industrial activity at the Cleator Mills site, which relates to textile manufacture, was the construction of Henry Birley's flax mill in 1800 (Marshall 1978, 163). Caesar Caine noted that the mill was erected 'on the site of

the old iron ore furnaces' (Caine 1916, 369). The Enclosure Map for Cleator, dated 1825, clearly shows buildings within the proposed development site in the form of a linear range orientated roughly east to west, with small structures to its south side, and a mill race leading in from a bend in the river to the north, and exiting the mill building to the south. Entrance to the mill appears to have been along the line of what is Mill Lane, leading in from the settlement of Cleator which was clearly located to the south-west, with the church and hall present on the west side of the road. Extensive buildings are shown to the west side of the proposed development site; these represent The Flosh (now the Ennerdale Country House Hotel, HER No. 41841) which was also owned by Birley & Co at this date. Apart from the mill buildings and mill race, the remainder of the proposed development site is shown as fields at this date.

- 3.2.15 The combined effects of the spade forge, flax mill and iron and coal mining caused the population of the parish of Cleator to increase from 363 in 1801, to 571 in 1811 and then to 818 by 1821; the last increase was more than double the average rate for rural districts of Cumberland calculated for the same decade (Marshall 1978, 163). Writing in 1829 Parson and White noted that Cleator parish contained 'a few good houses, and about 80 cottages chiefly inhabited by the workmen employed at the two large iron forges and the flax mill, or at the iron works in the adjacent parish of Egremont'. Iron, coal and lime had been worked in Cleator parish prior to this date, 'but the mines have been some time discontinued', with Crowgarth mine being described as 'exhausted'. The flax mill that existed at the Cleator Mill site was listed as being operated by 'Henry Birley & Co., flax and tow spinners, thread, twine, sail cloth etc, manufacturers'. This source clearly illustrated the importance water mills played in the economy of the parish, along with agriculture. As well as the flax mill, three corn millers were listed (Low House, Low Wath and an un-named site, and two forges, Abraham Little at High Wath and Little and Lindow at Cleator Forge and Mill (Parson and White 1829, 198).
- 3.2.16 The flax mill ceased to function by the end of the 1830s, and remained derelict until 1837-38 when Thomas Ainsworth became proprietor, as well as the new owner of The Flosh (Marshall 1978, 163; Caine 1916, 369). In 1847 the flax mill was employing 300 people, and was fitted with 850 spindles, powered by water wheels 'equal to the power of 90 horses' (Mannix and Whellan 1847, 319). Thomas Ainsworth also had an impact on iron mining in the area around Cleator, which had previously been described as 'some time discontinued' by causing the two earliest smelting furnaces of the Whitehaven Haematite Iron Company to be erected on the western side of the Moor in 1842, the first modern-type smelting site to be set into use in the north-west (Marshall 1978, 164).
- 3.2.17 Cleator and Cleator Moor developed rapidly in the 19th century with the mines, furnaces and railway network. The population progressed from 363 in 1801 to 1779 in 1851, doubling to 3995 in 1861. Cleator village, although already expanding, was upstaged in the 1860s by the planned town of Cleator Moor

located one mile to the north, with its municipal square dating to the 1880s (Hyde and Pevsner 2010, 277).

- 3.2.18 The flax mill on the Cleator Mills site was erected in the mid-19th century by Thomas Ainsworth, on the site of the earlier buildings (Davies-Shiel and Marshall 1969, 234), although Caesar Caine, when writing in 1916, noted that 'the original mill is still in existence..it consists of a central tower with two wings. It stands within the more modern buildings and is characterised by a mural sun-dial and the date 1800' (Caine 1916, 369). Whellan noted that a new flax spinning mill was opened in February 1859, and was capable of receiving 30,000 spindles (Whellan 1860, 373), although it is unclear from this source if this was added to earlier buildings or constructed on the site of them. Power up until 1857 came from a water-wheel, with a superior wheel to the original 1800 example being added in 1840, designed by Sir William Fairbairn of Manchester. In 1857, a beam engine was introduced, which was also designed by Fairbairn. About 1870 two Crossland engines were installed, not to replace the beam engine but to supplement it (Caine 1916, 378).
- 3.2.19 The First Edition Ordnance Survey map of c.1863 shows the extent of the buildings within the proposed development site, occupying much of the southern end, with the mill race still present heading towards the mill from the north. Access to the site was from Mill Street, rather than from Brookside as it is now, and several terraced houses and a 'British School' are shown to the south of the mill buildings (Figure 6). A comparison of the buildings shown on this map, and the modern structures on the site, indicates that those that are still standing were not seemingly shown on the First Edition map, although it is possible that fabric from earlier structures could have been utilised within the extant buildings.
- 3.2.20 The Second Edition Ordnance Survey map of 1899 shows that there had been substantial additions (and possibly rebuilding) made since the 1860s, with possibly some of the buildings that still stand shown for the first time on this map. At this date, therefore, the southern end of the proposed development site was covered in various buildings associated with 'Cleator Mills (flax)' including a School and the mill race. The northern end of the site was still fields at this date, and this map appears to show that in 1899 the main road to the north did not follow the same alignment as it does now.
- 3.2.21 The Third Edition Ordnance Survey map of 1925 appears to show the buildings at Cleator Mills as the same as they were in 1900 with the exception of the addition of a few small structures and some boundary walls or fences. At this date the mill race was still open, and access to the site was still provided from Mill Street, rather than from Brookside.
- 3.2.22 Modern maps show the survival of a number of field boundaries at the site, first shown on the 1<sup>st</sup> Edition Ordnance Survey map of c.1863. A number of houses have since been constructed to the west of the site, along with associated services and infrastructure.

### **3.3 PREVIOUS ARCHAEOLOGICAL WORK**

- 3.3.1 There have been two previous schemes of archaeological work undertaken within 1km of the site:
- 3.3.2 The Mission, Wath Brow, Cleator Moor: an historic building survey was undertaken by Jan Walker in 2011 of a Mission Church at Wath Brow prior to conversion to residential use. The chapel was noted to have been constructed in 1881 to replace a Wesleyan Chapel 'situated elsewhere in Cleator Moor' (HER Report Ref: 4/11/2413).
- 3.3.3 South Egremont Pipeline, Cumbria: an archaeological desk-based assessment and walkover survey was undertaken by Wardell Armstrong Archaeology in 2012 in advance of a proposed new pipeline, part of which passed through the 1km search area to the east and south of the proposed development site. In the vicinity of Cleator, the report highlighted the potential impact of the scheme on St Leonard's Church (McIntyre 2012).

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## 4 THE GEOPHYSICAL SURVEYS

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### 4.1 INTRODUCTION (FIGURE 2)

4.1.1 The geophysical surveys were undertaken between 2<sup>nd</sup> and 4<sup>th</sup> December 2013. Geomagnetic survey was undertaken over all of the available agricultural land on the northwest side of the study area (Figure 2). This area was bounded by field boundaries incorporated post and wire fences. These fences produced strong dipolar magnetic anomalies around the periphery of the survey areas.

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

### 4.2 GEOPHYSICAL SURVEY (FIGURES 3-5)

4.2.1 Two strong linear dipolar magnetic anomalies were detected on the north side of the proposed development area, aligned northeast to southwest, and northwest to southeast. These were due to the presence of modern service pipes. A number of manhole covers and concrete structures were also present on the north side of the survey area, which also produced very strong dipolar magnetic anomalies.

4.2.2 The survey area was crossed by a number of post and wire fences, aligned north to south and northwest to southeast, some of which followed historic field boundaries. These produced further linear dipolar magnetic anomalies in the gradiometer data. A number of trees were present along these boundaries, which were excluded from the geophysical survey.

4.2.3 A series of weak linear negative magnetic anomalies were detected on the north side of the survey area, aligned northeast to southwest and northwest to southeast, which are interpreted as probable land drains. A linear dipolar magnetic anomaly was detected on the northwest side of the survey area, which is also almost certainly a land drain or service pipe. Two alignments of small dipolar magnetic anomalies were also detected on the southwest side of the survey area, which are likely to be further land drains.

4.2.4 A parallel series of positive linear magnetic anomalies were detected on the east side of the survey area, aligned northeast to southwest, which are interpreted as the remains of ridge and furrow cultivation. These were spaced on average c.5m apart and are likely to represent the remains of medieval or post-medieval cultivation practices.

4.2.5 Very irregular positive magnetic anomalies were detected on the east side of the survey area, which are interpreted as possible soil-filled features, although the nature of these is uncertain. They may possibly represent a palaeochannel.



#### **4.4 DISCUSSION**

- 4.4.1 Overall the results of the geophysical survey indicate significant modern disturbance, particularly to the north of the site, associated with modern service pipes and drainage. Post and wire fences have also created significant anomalies, both within, around the periphery of the survey area.
- 4.4.2 Evidence for ridge and furrow cultivation of possible medieval or later date has been detected over the eastern half of the site. However, no other definite archaeological features have been detected by the survey.

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## 5 CONCLUSIONS

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### 5.1 CONCLUSIONS

- 5.1.1 Geomagnetic surveys covering *c.*4ha of pasture land have been conducted to the northwest of Cleator, at the location of a proposed new residential development.
- 5.1.2 Modern features were detected over the majority of the survey area, comprising services, manhole covers, land drains and post and wire field boundary fences. It is possible that the strong anomalies created by these features, may have masked potential archaeological features in these areas.
- 5.1.3 The only potential archaeological features detected by the survey were the remains of ridge and furrow cultivation on the west side of the site, and possible soil-filled features to the west, interpreted as a possible palaeochannel.
- 5.1.4 No evidence has been revealed for features associated with the Roman road, which is believed to run to the north of the site, or for a possible 17th century iron forge, which may have formerly existed in close proximity to the Cleator Mills.

### 5.2 RECOMMENDATIONS

- 5.2.1 Given the results of the geophysical surveys no further survey work is recommended.

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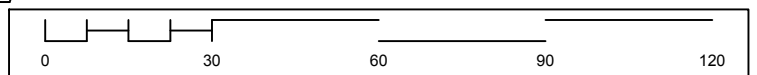
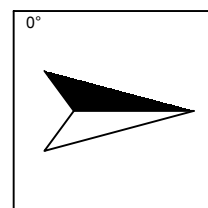
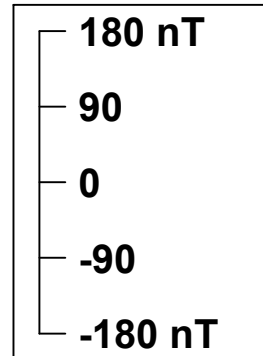
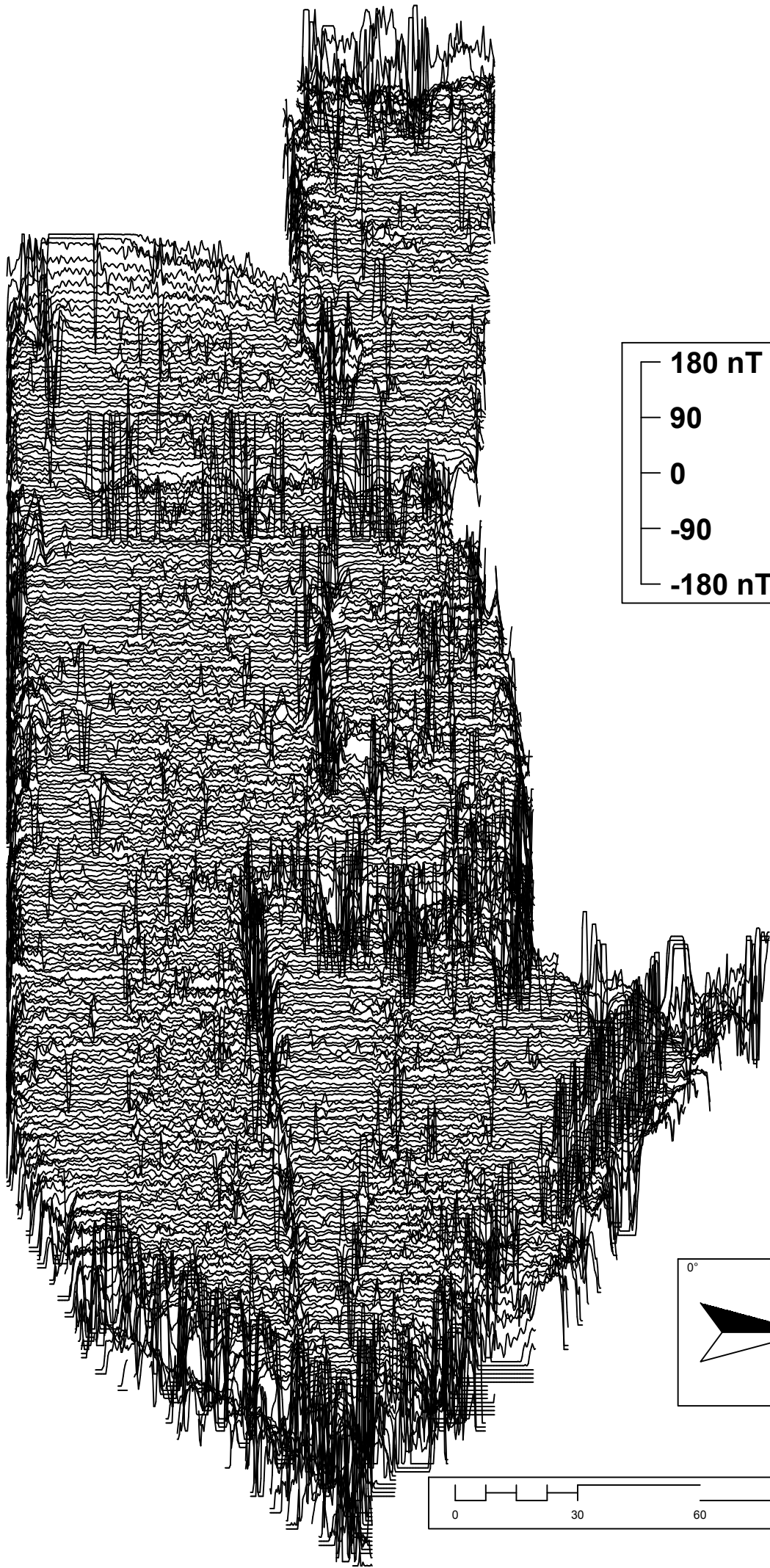
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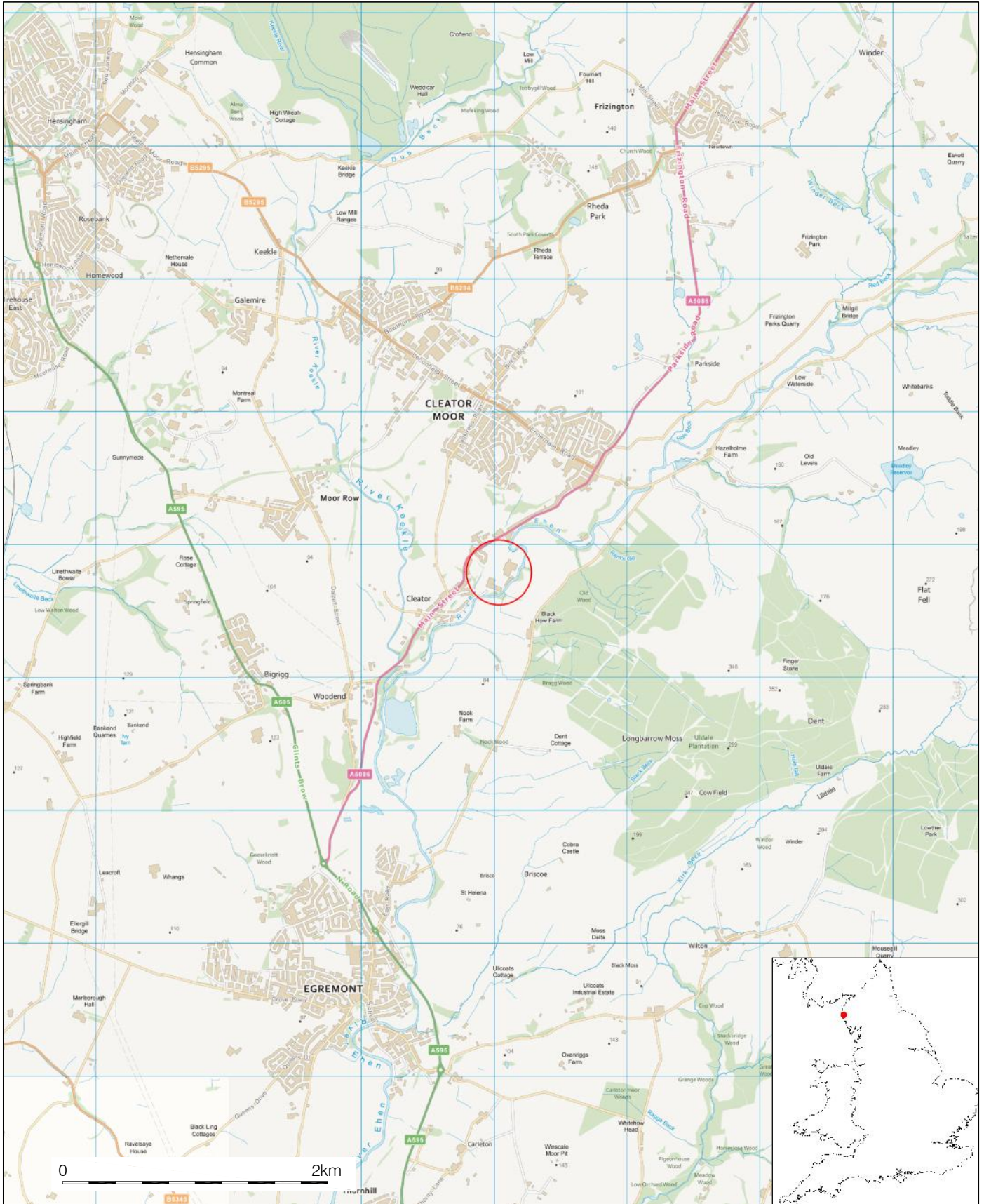
## APPENDIX 1: RAW DATA

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## APPENDIX 2: FIGURES

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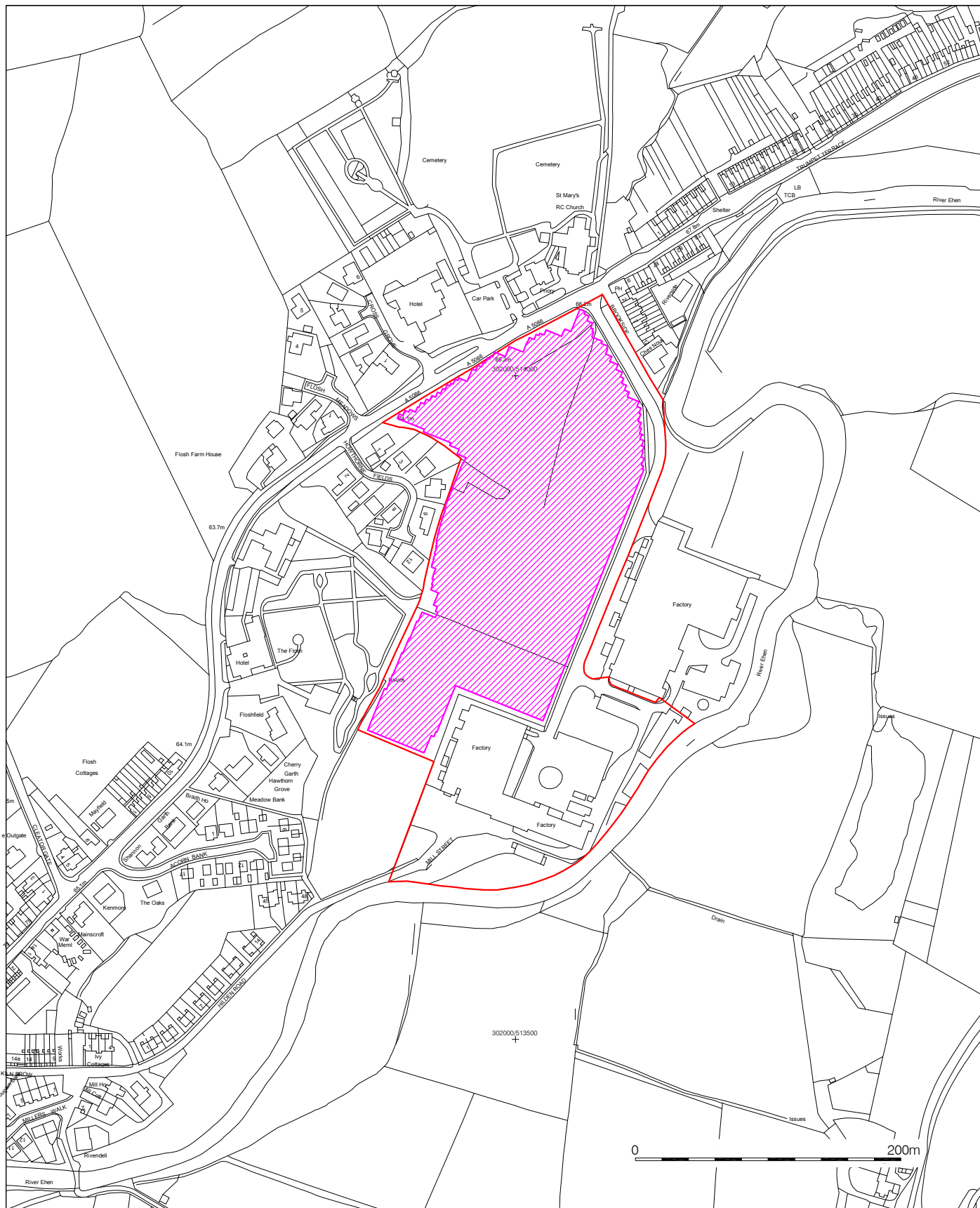
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Figure 1: Site location.









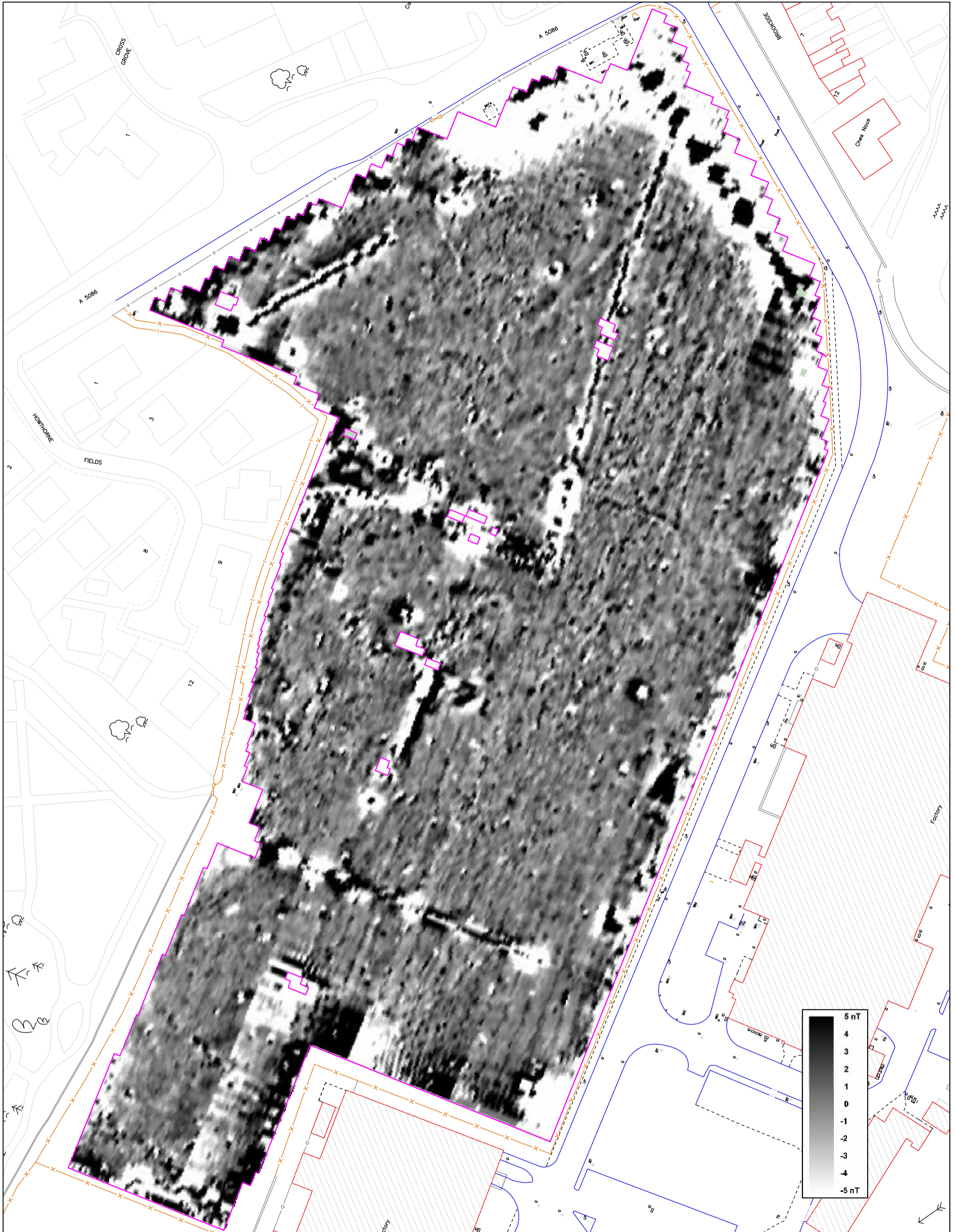

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

Figure 2: Location of the geophysical survey area





  
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 SCALE: 1:1000 at A3  
 REPORT No: CP10770  
 CLIENT: North Associates  
 DRAWN BY: MDR  
 DATE: December 2013  
 FIGURE: 3

KEY:  
 Outline of proposed development area  
 Outline of geophysical survey area


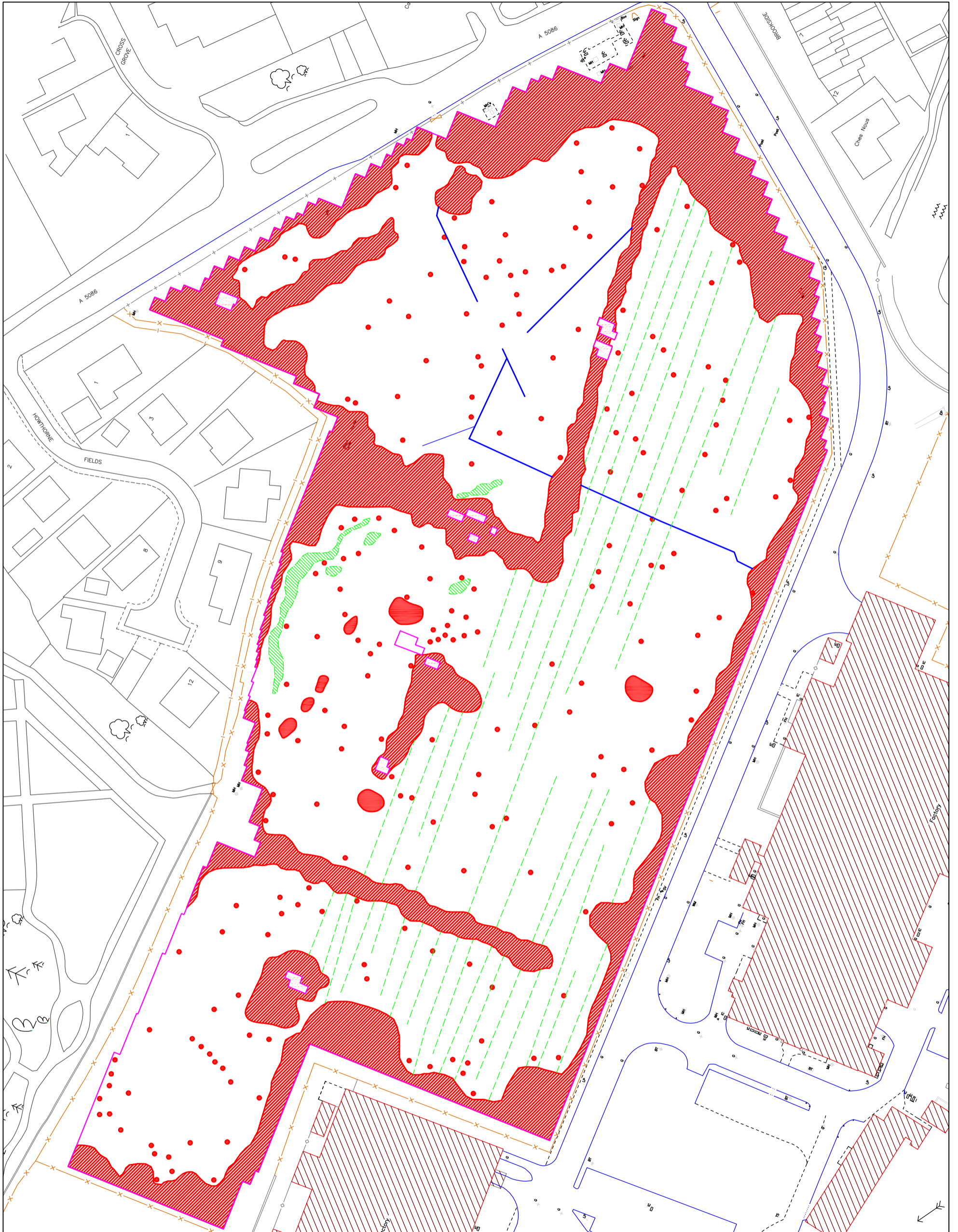
  
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Figure 3: Geophysical survey










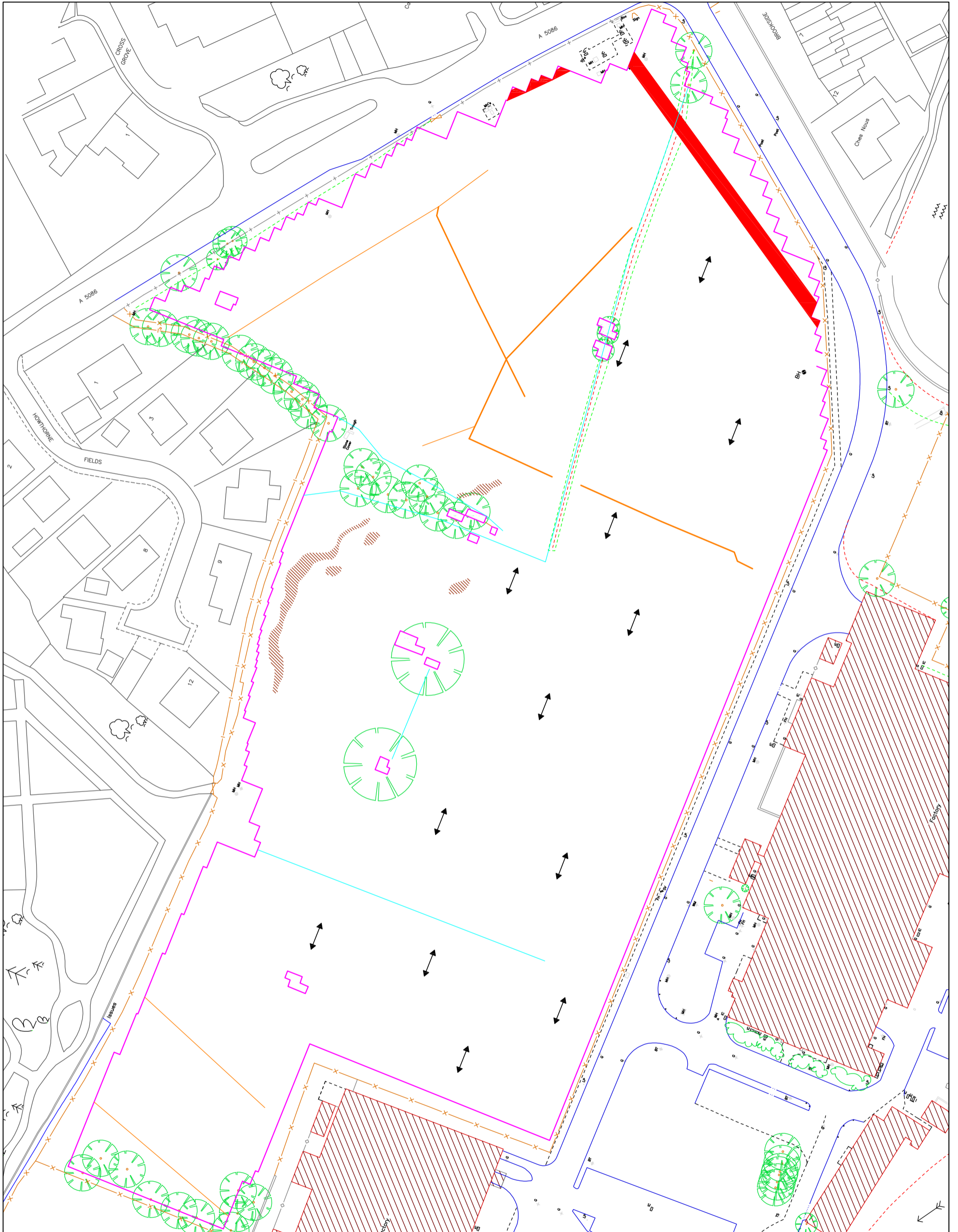

 <p>Wardell Armstrong Archaeology 2013</p>	<p>PROJECT: Land at Cleator Mills, Cleator, Cumbria</p> <p>SCALE: 1:1000 at A3</p> <p>REPORT No: CP10770</p> <p>CLIENT: North Associates</p> <p>DRAWN BY: MDR</p> <p>DATE: December 2013</p> <p>FIGURE: 4</p>	<p>KEY:</p> <ul style="list-style-type: none"> <li> Outline of proposed development area</li> <li> Outline of geophysical survey area</li> <li> Dipolar magnetic anomaly</li> <li> Positive magnetic anomaly</li> <li> Negative magnetic anomaly</li> </ul>	 <div style="border: 1px solid black; padding: 2px; font-size: 8px;">       Reproduced by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationary Office. © Crown copyright. All rights reserved. Licence number 100019512.     </div>
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Figure 4: Geophysical interpretation













  
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 Archaeology  
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 SCALE: 1:1000 at A3  
 REPORT No: CP10770  
 CLIENT: North Associates  
 DRAWN BY: MDR  
 DATE: December 2013  
 FIGURE: 5

**KEY:**

-  Outline of proposed development area
-  Outline of geophysical survey area
-  Probable land drain
-  Fences/field boundaries
-  Direction of ridge and furrow
-  Service pipes
-  Possible soil-filled features



  
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Figure 5: Archaeological interpretation

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Wardell Armstrong Archaeology:

CUMBRIA  
Cocklakes Yard  
Carlisle  
Cumbria  
CA4 0BQ  
Tel: +44 (0)1228 564820

STOKE-ON-TRENT  
+44 (0)845 111 7777

CARDIFF  
+44 (0)29 2072 9191

EDINBURGH  
+44 (0)131 555 3311

GREATER MANCHESTER  
+44 (0)1942 260101

LONDON  
+44 (0)20 7287 2872

NEWCASTLE UPON TYNE  
+44 (0)191 232 0943

SHEFFIELD  
+44 (0)114 245 6244

TRURO  
+44 (0)1872 560738

WEST BROMWICH  
+44 (0)121 580 0909

International offices:

ALMATY  
+7-727-3341310

MOSCOW  
+7 (495) 980-07-67