Surface Mining and Reclamation Facility, Cutacre, Wigan,
Greater Manchester

Archaeological Investigation

Oxford Archaeology North

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UK Coal Mining Ltd

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CONTENTS

SUMMARY

A planning application and Environmental Statement was submitted by UK Coal Mining Ltd to develop a surface mining and tip reclamation facility (Application No. APP/N4205/A/97/289386). The development area is sited to the north-west of Atherton and to the south-east of Kearsley (NGR centred SD 6980 0404), and is divided between the three metropolitan boroughs of Salford, Bolton and Wigan. Planning consent has been granted with a condition to undertake an archaeological investigation prior to development in order that a suitable mitigation strategy can be implemented regarding any archaeological remains. A desk-based assessment of the development area had previously been undertaken by the University of Manchester Archaeology Unit (UMAU 1996) during the planning application process, which showed the development area to have a high archaeological potential. RPS, acting as consultants for UK Coal Mining Ltd, compiled a Written Scheme of Investigation (WSI; RPS 2005) for the archaeological investigation in consultation with the Assistant County Archaeologist of the Greater Manchester Archaeology Unit (GMAU). This incorporated the information from this earlier study (*ibid*) and detailed the required programme of evaluation work, to include a mining study, geophysical survey and trial trenching. Oxford Archaeology North (OA North) was commissioned to commence this second phase of work in December 2005.

In total, 14 areas of archaeological significance, identified in the desk-based assessment (UMAU 1996), were evaluated during the programme of works; Sites **5**, **35**, **36**, **37**, **42**, **45**, **50**, **51**, **70**, **75**, **76**, **77**, **78** and **87**. A fifteenth area, The Wash (Site **88**), was also earmarked for evaluation but was not accessible during trial trenching due to the presence of dense scrub and woodland, and had been shown from research for the purposes of the mining study to have been subsequently destroyed to make way for Wharton Hall Colliery.

The geophysical survey was undertaken by Archaeological Surveys, and involved a magnetometer survey of Sites **42** (Cinder Hill), **45** (Coal Pit Meadow), **50** (Kiln Meadow), and areas of mining activity at Sites **75**, **76**, **77** and **78**, which were also near Kiln Field Meadow and Further Kiln Meadow. The resultant information aided the positioning of trial trenches. Many of the magnetic anomalies were identified as agricultural features, land drains or modern features. An area of magnetic debris was identified to the north of Cinder Hill, evaluated by Trench 42a, linear features at Site **75**, evaluated by Trench 75a, and potentially brick or tile debris at Site **76**, evaluated by Trench 76/77a. A large geophysical anomaly at Coal Pit Meadow was to be evaluated by Trench 45a. However, a large depression in the ground suggested this was highly likely to be a coal pit and the trench was not excavated due to health and safety reasons. A second coal pit was also visible in the geophysical results at Site **76**, also identified during the mining study, and Trench 76b was not, therefore, excavated for the same reasons.

During the trial trenches significant archaeological deposits were located at The Ashes Farm (Site **35**), evidence of iron working at Cinder Hill (Site **42**), coal pits at Site **76** and **77**, and structural remains with other features associated with the sixteenth/seventeenth century and later phases of Wharton Hall (Site **70**). Although this last site is speculated to be the location of a medieval moated manor, little evidence of this was found, but this possibility was not dismissed by these investigations, and further work is needed.

Further archaeological work was also recommended at the post-medieval Ashes Farm (Site **35**), and around deposits of slag from a bloomery furnace at Cinder Hill (Site **42**). An archaeological watching brief has also been recommended for the sites of post-medieval structures at Sites **5** (Rosemary Lane), Site **51** (Old Graces), and Site **87** (The Hursts), due to the fact that absolutely no evidence of these anticipated structures were located during the trial trenching. It was speculated, at least in the case of Site **51** that the location of these structures, as indicated on the 1850 Ordnance Survey map, may be in doubt, and that investigations in the surrounding areas may be more productive. A watching brief is also recommended in the area of old coal workings at Sites **76** and **77**, although it is not recommended that any excavation of the coal pits themselves be undertaken for health and safety reasons.

The results of the mining study showed that Bank House Colliery (Site **61**) comprised four coal pits and one building, buried beneath Cutacre Tip (Site **53**); the site was operating in the mid nineteenth century. Wharton Hall Colliery (Site **89**) was the latest and most modern colliery included in the study, demolished in 1969, and the remains are now buried below a smaller colliery waste tip and scrub vegetation. Much of the works of Wharton Colliery (Site **114**), later known as Charlton Colliery, are located to the north of the development area. The earliest coal pit is labelled as Wharton Colliery on the 1850 (OS) map within the development area and to the south of the main workings, but activity by the 1860s was concentrated at the more northerly location; a lease map from this later period making no mention of this earlier coal pit. Watching briefs in the area of each of these sites, the mid nineteenth workings at Bank House Colliery and original pit at Wharton Colliery, is also recommended to identify and record any structures of features associated with this early industry.

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The excavations were undertaken by Andy Bates, with assistance from Christina Clarke, Giles MacFarland, Pippa Howarth, Pascal Eloy and Alistair Vannan. The report was compiled by Andy Bates and the drawings were undertaken by Marie Rowland and Christina Clarke. The project was managed by Emily Mercer, who also edited the report, together with Alan Lupton.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Following the submission of a planning application and Environmental Statement by UK Coal Mining Ltd to develop a surface mining and tip reclamation facility (Application No. APP/N4205/A/97/289386) to the north-west of Atherton (Fig 1), a condition of the planning consent required an archaeological investigation be undertaken prior to development in order that a suitable mitigation strategy can be adopted. A desk-based assessment of the development area had previously been undertaken by the University of Manchester Archaeology Unit (UMAU 1996) during the planning application process, which showed the development area to have a high archaeological potential. RPS, acting as consultants for UK Coal Mining Ltd, compiled a Written Scheme of Investigation (WSI; RPS 2005) for the archaeological investigation in consultation with the Assistant County Archaeologist of the Greater Manchester Archaeology Unit (GMAU). This incorporated the information from this earlier study (*ibid*) and detailed the required programme of evaluation work, to include a mining study, geophysical survey and trial trenching. Oxford Archaeology North (OA North) was requested to submit proposals (*Appendix 1*) to carry out the programme of work accordingly, and once approved was commissioned to commence work in December 2005.

1.1.2 In total, 14 areas across the development area were evaluated during the programme of works. These were sites of archaeological potential or significance identified in the desk-based assessment (UMAU 1996), their site number relating to that assigned in the assessment gazetteer; Sites **5**, **35**, **36**, **37**, **42**, **45**, **50**, **51**, **70**, **75**, **76**, **77**, **78** and **87**. Descriptions of these sites are provided in *Appendix 2*. A fifteenth area, The Wash (Site **88**), was also earmarked for evaluation but was not accessible during trial trenching due to dense scrub and woodland, and had been shown from the mining study to have been subsequently destroyed to make way for Wharton Hall Colliery (*Section 3.3*).

1.1.3 This report sets out the results of the evaluation. The concluding chapter includes a discussion of the results, assesses the archaeological value of each site, the impact of the development on the identified archaeological remains and recommendations for any further work.

1.2 SITE LOCATION AND GEOLOGY

1.2.1 The site is located within the three metropolitan boroughs of Bolton, Salford and Wigan. It is positioned to the north-west of Atherton and to the south-east of Kearsley (NGR centred SD 6980 0404; Fig 1). The A6 runs immediately to the north of the site, and the M61 is to the north of the A6. The site is bounded to the south by a section of the railway between Walkden and Atherton and to the west by residential properties of Over Hulton. The land is mainly used for agricultural purposes at present, although a large portion of the southern and

eastern area is covered by a large dirt-tipping site, with material transported from Brackley, Mosley Common and Sandhole collieries (Hayes 2004, 163).

1.2.2 The site is situated on the southern part of the Lancashire Coal Fields, which date to the Westphalian period (310-300 million years ago) of the Upper Carboniferous. Underlying the coal measures is Millstone Grit, also of the Upper Carboniferous, formed in the Numurian period (327-310 million years ago (Edwards and Trotter 1954)).

2. METHODOLOGY

2.1 PROJECT DESIGN

2.1.1 The archaeological evaluation was conducted in adherence with a project design compiled by OA North (*Appendix 1*), in accordance with the Written Scheme of Investigation (WSI) prepared by RPS (2005). The work was consistent with the relevant standards and procedures of the Institute of Field Archaeologists, and generally accepted best practice.

2.2 HISTORICAL MINING RESEARCH

2.2.1 Research on the historical development of mining activity within the outlined development area was undertaken to provide additional information to that within the previous desk-based assessment (UMAU 1996). This would aid in evaluating the landscape and any mining remains to be considered during the preparation of a suitable mitigation strategy.

2.2.2 Three collieries, situated within the development area, were subject to research; Bank House Colliery, Wharton, or Charlton Colliery, as it was also known, and Wharton Hall Colliery. Several sources were consulted, in particular early maps of the area, as well as primary and secondary sources.

2.2.3 ***Sites and Monuments Record (SMR):*** this is a database of all archaeological sites recorded in the entire county. Information concerning these sites in the SMR was provided in the desk-based assessment (UMAU 1996).

2.2.4 ***County Record Offices (CRO), Preston, Manchester and Wigan:*** both primary and secondary sources were examined at the County Record Offices. These included historic maps of the area and papers of the Bridgewater Trust and of the Bagot Family. Other primary documents and secondary sources covering various aspects of local history and coal mining were also consulted.

2.2.5 ***Manchester Central Library and Wigan History Shop:*** a number of secondary sources were consulted concerning historical coal mining, as well as primary sources such as the List of Mines in the UK.

2.2.6 ***Oxford Archaeology North:*** OA North has an extensive archive of secondary sources relevant to the study area, as well as numerous unpublished client reports on work carried out both as OA North and in its former guise of Lancaster University Archaeological Unit (LUAU). These were consulted where necessary.

2.2.7 ***Glyn Atkinson:*** is a local industrial historian of the area, and author of *The Canal Dukes Collieries* (1998). He has an extensive knowledge and archive of coal mining within the area, and was consulted during the course of the project.

2.3 GEOPHYSICAL SURVEY

2.3.1 Geophysical survey was the first phase of the field evaluation work to be undertaken. In accordance with the WSI (RPS 2005), a detailed magnetometer survey was earmarked for twelve of the gazetteer sites (see Table 1, below and Figs 2-8). However, four sites (Sites **5**, **36**, **37** and **51** (Figs 3, 4 and 7)) could not be surveyed due to overgrown or waterlogged conditions at the time of the fieldwork. The work was carried out by Archaeological Surveys, using a Bartington Grad601-2 gradiometer, which measures the magnetic gradient between two fluxgate sensors mounted vertically 1m apart. In addition, two sets of sensors are mounted on a single frame 1m apart horizontally. This instrument is extremely sensitive and is able to measure magnetic variation to 0.1 nanoTesla (nT). The readings were saved to an integral data logger for subsequent analysis and presentation.

Site No.	Survey area and configuration
42	Checkerboard of six 30m grids, covering an area 180m x 60m
45	Checkerboard of six 30m grids, covering an area 120m x 90m
50a	30m x 30m
50b	30m x 30m
75	50m x 50m
76	50m x 50m
77	50m x 50m
78	90m x 60m

Table 1: Details of the gazetteer sites or areas targeted with magnetic survey

2.3.2 The survey areas were divided into 30m by 30m grids, as per the WSI (RPS 2005). Within this, data was collected at 0.25m centres along traverses 1m apart, which is very effective at locating archaeological features and, hence, is the recommended methodology for archaeological prospection (English Heritage 1995).

2.3.3 The survey grids were located using a CSI Wireless dGPS and set out using a Topcon GTS212 total station. The locations of the survey grids were provided on digital base mapping supplied by UK Coal Mining Ltd.

2.3.4 The data was processed using specialist software known as ArcheoSurveyor for the purposes of analysis. The software enables greyscale and trace plots to be produced for presentation and display. The processing details and results are provided in the report produced by Archaeological Surveys (2005) (*Appendix 6*). The results were used to inform the configuration and positioning of the trial trenches, and will be discussed in this context in *Section 4*.

2.4 TRIAL TRENCHING

2.4.1 Fourteen areas of archaeological significance or potential were targeted with trial trenching in line with the WSI (RPS 2005), and in conjunction with the results of the geophysical survey that provided additional information on archaeological potential. The positions of the trenches were agreed in consultation with RPS, acting on behalf of the client, and the Assistant County Archaeologist. These included Sites **5**, **35**, **36**, **37**, **42**, **45**, **50**, **51**, **70**, **75**, **76, 77**, **78** and **87**. This equated to a total of 33 trenches being excavated, as individually detailed in *Appendix 3*.

2.4.2 Trenches were excavated using a JCB mechanical excavator fitted with a 1.6m wide toothless ditching bucket, under the supervision of an OA North archaeologist. In addition, a tracked 13 tonne excavator was employed over Site **70** to remove the extensive overlying debris. This was originally thought to relate to the demolished Hall but was shown to be the result of illegal flytipping, and consisted of concrete rubble and general domestic waste. Each trench was excavated in a stratigraphical manner down to either the first archaeological deposits or natural glacial till, with all spoil scanned for artefacts. Any further excavation was completed manually.

2.4.3 The recording comprised a full description and preliminary classification of the deposits and materials revealed on OA North *pro-forma* sheets. A plan was produced showing the location of each trench, with representative sections being drawn at a scale of 1:10 or 1:20. A photographic record, using monochrome, colour slide and digital formats, was maintained. The latter was required by RPS and GMAU for monitoring purposes.

2.4.4 The position of the trenches was located with a total station that respected the Ordnance Survey grid. This was incorporated with digital map data in a CAD system to create the location maps.

2.4.5 All finds recovered were bagged and recorded by context number; all significant finds were retained and have been processed and temporarily stored according to standard practice (following the Institute of Field Archaeologists guidelines).

2.5 ARCHIVE

2.5.1 A full professional archive has been compiled in accordance with the project design (*Appendix 1*), and in accordance with current IFA, English Heritage (English Heritage 1991) and UKIC guidelines. The paper and digital archive will be deposited in the Greater Manchester Archaeology Unit in Manchester. The material archive will be deposited with Salford Museum and Art Gallery.

3. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

3.1 INTRODUCTION

3.1.1 The historical and archaeological background to the area was compiled by UMAU (1996) for the purposes of the Environmental Statement submitted with the planning application. It is not intended to reproduce the full background, and therefore a précis will provide a context to the results and the gazetteer sites.

3.1.2 As part of the evaluation, additional, and updated, information regarding the development of the historical mining activity has also been provided at the end of this section.

3.2 HISTORICAL AND ARCHAEOLOGICAL CONTEXT

3.2.1 ***Prehistoric Period:*** there was no evidence for prehistoric activity identified within the study area or in the immediate vicinity. However, this is typical for the North West in general as the evidence for early activity is often sporadic and based on chance finds. This may be largely due to the local geology, as the poorly drained and heavy boulder clays were not conducive to early farming techniques and there is growing regional evidence for prehistoric settlement concentrating on sand and gravel beds adjacent to rivers and mosslands (*op cit*, 3).

3.2.2 ***Roman Period:*** the main evidence for Roman activity in the area is the line of the modern A6, immediately to the north of the site, which is believed to follow the Roman road that branched from the Manchester to Wigan road, possibly at Chorlton Fold near Worsley, and led to Blackrod from where it may have joined the Wigan to Lancaster road. This is suggested by the place names such as Stanney Street in Walkden, and Street Gate in Little Hulton that was uncovered during railway construction and was found to be 'only ten feet wide and paved'. In 1930 a piece of grey Roman pottery was dug up within the garden of the vicarage of Peel Church, Little Hulton, which lies adjacent to the Roman road, and was identified as the neck and shoulder and one handle of a large two-handled narrow-necked vessel of 1st century AD 'military' ware (Mullineux 1964, 10-11).

3.2.3 ***Medieval Period:*** the outlined development area is divided between parts of three early townships, which are reflected in modern borough divisions. The southern part of the site lies in the township of Tyldesley cum Shakerley, now in the urban district of Wigan; the north-western part of the site is situated in the township of Middle Hulton, now in Bolton; two small areas along the north-eastern fringe, one around Wharton Hall, another near Ellenbrook Brick Works, are in the township of Little Hulton, now in Salford (*ibid*).

3.2.4 The place names of Tyldesley and Shakerley are of Anglo-Saxon origin, although they do not appear to have been documented before the early thirteenth century. Their common element *-ley* is derived from *leah*, meaning

'woodland', or 'clearing in a wood'; this last sense often refers to a clearing used for arable or pastoral farming, and by an extension of this meaning the term may also be used for 'open land' or 'meadow land' (Mills 1976, 43).

3.2.5 Tyldesley is first mentioned in the early thirteenth century, as a manor held by Hugh son of Henry de Tyldesley under the barony of Warrington (Farrer and Brownbill 1907, 439). In 1301, a later Henry de Tyldesley divided the manor and lands between his sons. This division effectively created two manors within the township. One was held by Henry's eldest son Hugh and his descendants. The other, 'reputed' manor, lay in the north part of the township and was held by Henry's younger son Adam (*op cit*, 440-1).

3.2.6 The hamlet and manor of Shakerley lay in the north-west part of the township of Tyldesley, and in *c* 1200 Hugh de Tyldesley gave them to Cockersand Abbey. These were held by the de Shakerleys, residing at Shakerley Hall (*op cit*, 444); the present Shakerley Old Hall lies immediately to the south-west of the development area (*ibid*). The history of the Shakerley family provides early evidence for the exploitation of the local coal measures as early as 1429 (*ibid*).

3.2.7 Little Hulton, Middle Hulton and the township of Over Hulton to the west appear to have originally comprised a single post-conquest manor of Hulton, and is first documented in *c* 1200 as Hilton. Its Old English derivation may indicate an earlier Anglo-Saxon settlement. The first element *hyll* (hill) clearly refers to the local topography; the second element *tun* has a wide range of meanings - 'an enclosed piece of ground', 'a building with its enclosed piece of ground, a farmstead', 'a hamlet or village', 'a manor or estate' (Mills 1976, 48). This original manor was subdivided by the sixteenth century when the distinguishing prefixes Nether (later Little), Middle and Over are first documented (*ibid*).

3.2.8 The township of Little Hulton included three subordinate manors, of which Peel Hall and Kenyon Peel Hall lay to the north-east of the development area. Peel Hall lay in an area known as the Wich that was acquired in the thirteenth century by a branch of the de Hulton family, the lords of Over Hulton. By the late fourteenth century the estate was held by the de Tyldesleys. In 1546 the estate of William Tyldesley included the 'Peel of Hulton or Wicheres Hall' and a water mill (Farrer and Brownbill 1911, 30-1). The present Peel Hall was built in 1840 and replaced an early seventeenth century moated house with gables and cross-wings. Kenyon Peel Hall was acquired in *c* 1600 by Alexander Rigby and later passed to the Kenyon family (*ibid*).

3.2.9 The third subordinate manor within Little Hulton was Wharton Hall that lies on the east side of the development area (Site **70**). A William de Waverton or Warton is mentioned in 1292 (*op cit*, 390 n 115a), and a Gilbert de Warton was witness to an early Worsley charter. In *c* 1310 William son of John of Warton gave lands to John son of William de Warton, and in 1356 John de Warton claimed a messuage and land in Wharton against Hugh de Rylands (*op cit*, 30 n 60). In the 1420s or 1430s Denis Warton is recorded as a tenant of Geoffrey de Worsley, giving in rent a pair of gloves (*op cit* 379 n 33) and he may be the same Denis de Warton mentioned in 1444 as a Hulton yeoman.

By the early seventeenth century the manor had passed into possession of the Assheton family of Great Lever. The inquisition post mortem of Ralph Assheton, who died in 1616, records among his estates and possessions 'the manor, lordship or capital messuage called Warton Hall', held of Dorothy Legh and her second husband Sir Peter Legh, again for a fee of a pair of gloves (Rylands 1887, 289).

3.2.10 Wharton Hall was demolished in the 1960s but is known to have been a two storey timber-framed building consisting of a central range with cross-wings (Plate 12). Its general plan and construction are typical of a house of the lesser gentry of the sixteenth and seventeenth centuries. The site is of particular interest given the likelihood that this building stood on the same site as a medieval hall of the de Wartons, and is, therefore, one of the sites to be evaluated with trial trenching (see *Section 4*).

3.2.11 Another site within the Lomax Brow area with a possible medieval predecessor is the farm of Hulton Heys (SD 6969 0415). Included within the documentary evidence for the manor of Hulton are two grants of an enclosed parcel of land named Hulton Hey made in 1467 and 1484 by William de Massy and Geoffrey de Massy respectively. The 1484 grant gave the leases the right to build and marl on the ground, while de Massy undertook to maintain hedges and ditches (Farrer and Brownbill 1907, 30 n 58). The grant provides early evidence for an important local industrial activity, the extraction of local marl or clay.

3.2.12 ***Post-medieval and Industrial Periods:*** in Tyldesley, several farms can be traced back to the sixteenth or seventeenth centuries through documentary sources. Oliver Fold to the south of the development area (SD 6978 0373) may have been tenanted as early as 1597 and is thought to relate to the original occupants, as with many of the farm sites. Hursts (Site **87**) may have been the home of Geoffrey Hurst of Shakerley who in the 1550s was imprisoned as a Protestant under Queen Mary (Farrer and Brownbill 1907, 444). This farm site is no longer in existence, and is one of the sites to be targeted with trenching (see *Section 4*). However, the picture of land ownership and tenancy is fullest in the township of Middle Hulton. By the early eighteenth century this was divided between two major landowners, the Duke of Bridgewater, then lord of Worsley and Middle Hulton, and Mr Bagot, whose family had acquired its share through a marriage alliance in the late seventeenth century. The evidence from both Tyldesley and Middle Hulton would indicate that the pattern of farmstead distribution within the area was largely established by the late seventeenth century.

3.2.13 The predominant form of these farms, as indicated by the *c* 1800 surveys of the Bridgewater and Bagot estates, is that of a house with a detached barn, which is suggestive of a local economy based largely on arable farming. Other local or small-scale industries are likely to have also taken place, such as the use of local clay used in brick manufacture, probably carried out on an *ad hoc* basis to meet immediate local needs. This is illustrated by numerous ponds in the area, although some of these may have been marl pits dug for spreading clay on the fields. Brick kiln sites are suggested by the names Brick Kiln Field, Kiln Meadow and Kiln Field (Sites **50** and **78**), and Brick Hill

Field (Site **56**). In order to investigate this further, Sites **50** and **78** were targeted during the evaluation (see *Section 4*).

3.2.14 There is evidence of other cottage industries that may have supplemented some tenants' income from farming on a regular basis. Principal among these was probably textile manufacture. In 1606 the inventory of Thomas Hurst of Shakerley included linen towe and yarn 40s 4d, and a small pair of looms with heald and other implements at 24s'. In 1597 the will of John Marsh of Oliver Fold includes flax, also indicating linen weaving (Lunn 1953). In 1791 the will of William Eckersley of Israels included reference to looms. The field name Bleach Croft at Ashes Farm (Site **37**) indicates a location where locally produced cloth was bleached. Tan Pit Croft, the name of an adjoining field attached to the same farm (Site **36**), points to the involvement of the tenant in yet another occupation, the tanning of leather. Another interesting field name is Cinder Hill (Site **42**), associated with Leadbeaters Farm; this probably refers to 'land on which cinders or slag are spread or heaped' (Field 1972, 45) and may indicate iron smelting. Further evaluation of these sites would hopefully provide additional information on the small-scale industries (*Section 4*).

3.3 HISTORICAL MINING ACTIVITY

3.3.1 Coal was mined within the environs of the development area from at least the fifteenth century (Atkinson 1998, 4); documentary evidence from the second half of the sixteenth century often refers to disputes over the possession of mining rights (UMAU 1996, 7). For example, in 1556 a coal pit was the centre of a dispute between Elizabeth Hulton, the widow of the former lord of Over Hulton, and Adam her son and heir (Farrer and Brownbill 1911, 28 n 41). The economic value of coal mining in late sixteenth century Little Hulton is demonstrated by the fact that landowners reserved the right to dig coal within leased tenements (Crofton 1889, 42-3). The involvement of local landowners in the industry is also illustrated in 1639 by the will of Dorothy Legh, which included a grant to 'the workemen in or at the coalepitts and cannel pitts in Middle Hulton everyone tenne shillings a peece' (Piccope 1861, 209-10).

3.3.2 Of particular relevance to the outlined development area are the eighteenth century leases granted by the Bagot Family in Middle Hulton (UMAU 1996, 8). The value of coal under their land led them to reserve any rights relating to mining in land leased as tenements. This included the digging for coal, cutting down of timber, the right of way for the transportation of coal, the erection of any buildings required for mining, and right to dam up or re-route waterways (*ibid*). Other areas within the study area no doubt saw similar mining activity. On land owned by the Bridgewater Trust, 'Coal Pit Meadow' is named in the tenement of Leadbeaters in the survey of 1722 (Site **45**). In the mid nineteenth century the maps of Tyldesley locate a number of 'Old Coal Pits', demonstrating that mining activity was, by then, long established in the area. However, it was evident that there were three main collieries within the development area; Bank House, Wharton (or Charlton), and Wharton Hall Collieries. These will be discussed in turn below.

3.3.3 ***Bank House Colliery (Site 61):*** no records directly associated with Bank House Colliery are known to exist in any of the sources consulted. However, it was positioned on the land of the Trustees of the Duke of Bridgewater and would have been subject to agreements between these and the tenant. The Colliery is first identified on the 1850 Ordnance Survey (OS) first edition 6" map of the area (Plate 1), whereas on the earlier 1844 tithe map and schedule of Middle Hulton (DRM 1/59) the area is recorded as pasture. The tenant was Francis Charlton who leased it as part of his workings along the Trencherbone seam, which he continued to work from Wharton Colliery after the abandonment of Bank House. This information is known from an indirect reference to Bank House Colliery from a map accompanying the lease of land owned by the Trustees of the Bagot estate to Francis Charlton, dated 1867 (Plate 2). Here, the colliery is marked as "Old Pit, M^{s} Charlton, Bank House Colliery"; the lease is actually pertaining to what was initially called the Wharton and later the Charlton Colliery (E3/108). It is likely that the term 'old pit' refers to Bank House having been abandoned by this time, in favour of Wharton Colliery, as it is also absent from the 1867 list of mines (http://freepages.genealogy.rootsweb.com/~cmhrc/lomindex.htm), and any remains of the colliery are absent from the 1891 OS map (Plate 3). The only feature still in existence associated with it is part of the lane that led to the colliery known as "Back Lane" (Fig 2).

3.3.4 The fact that it was named as a colliery, as opposed to a coal pit, suggests it was substantial and had a windlass and engine rather than just ladder access (Glyn Atkinson pers comm). There is only one building marked on the 1850 OS map (Plate 1) and the 1867 map (E3/108, Plate 2), which is adjacent to what is marked on a sketch map of mines in Hayes (2004, 189) as pit No. 2. This is unlikely to have housed an engine and boiler, as there is no reservoir marked on the map to suggest the presence of a steam-powered engine. Therefore, it may have formed the offices and mess of the colliery. The lack of any evidence of steam power at the site would suggest that a horse gin was in use.

3.3.5 Four coal pits were associated with Bank House Colliery, most likely joined together to enable the flow of air to avoid the build up of methane and carbon dioxide (Atkinson 1998, 6). These can be seen on the 1850 OS map (Plate 1) and the 1911-12 map (Plate 9) attached to the List of Abandoned Mines (A/MIN/1). The coal pit to the north, pit No. 1 in Hayes (2004, 189), is labelled "M^{s} Earls Old Pit", Site **60** (Fig 2), on the lease map of 1867 (Plate 2).

3.3.6 The 1909 OS map of the area (Plate 4) shows a line from the north branch of the Collieries' Railway (Site **59**) out to the former site of Bank House Colliery that had not been seen on previous mapping. The purpose was for the deposition of spoil, and as the spoil heap continued to expand so did the railway lines, so that by the 1928 OS map (Plate 5) it is of a considerable size. This was the beginning of the Cutacre Clough tip, which now covers the whole area of this colliery, leaving no visible remains on the present day ground surface (Plate 10). However, remains of structures and pits may well survive beneath the tip.

3.3.7 ***Wharton or Charlton Colliery (Site 114):*** as with Bank House Colliery, Wharton Colliery is first identified on the 1850 OS map of the area (Plate 1), and it can also be observed on the map accompanying the lease of land owned by the Trustees of the Bagot estate to Francis Charlton, dated 1867 (Plate 2). Unfortunately, the exact location of the workings is not clear from either of these maps. No colliery is recorded on the earlier 1844 tithe map of the area (DRN 1/59), and any workings, therefore, must post-date it. Similarly, there were limited primary sources available pertaining to "Wharton Colliery. This was in part due to the renaming of the Colliery. The 1891 OS Second Edition map (Plate 3) does not show Wharton Colliery, but does show a Charlton Colliery to the north.

3.3.8 However, Hayes (2004, 189) marks the site of Charlton Colliery as "Wharton Colliery" and "Charlton Pits", positioned *c* 150m to the north of the Wharton Colliery label in the 1850 map. At the same time Hayes (*ibid*) also positions a single coal pit at this earlier 1850 Wharton Colliery position. It would seem that collectively Wharton Colliery and Charlton Colliery refer to the same workings covering a number of pits, and that the name was altered towards the end of the nineteenth century, possibly to make a clearer distinction with the Wharton Hall Colliery when it was established at this time (Site **89**; Plates 6 and 7). Hayes (*ibid*) records four coal pits, as well as two shafts, at the site, with the pits dating from the earlier phase of workings.

3.3.9 Leases associated with the Trencherbone Mine, as worked from the Wharton Colliery, show that in 1867 the colliery was leased to Francis Charlton (E3/108, Plate 2). However, it would appear to be under two owners, the Trustees of the Bagot Family and the Earl of Ellesmere. The initial lease for Wharton Colliery with the Bagot family dates from fourteenth of June 1867, which states the rent to be £50 per annum (E3/108). A second lease was made up in 1869, with an increased rent of £200 per annum, for an increased period of 42 years (E3/28). However, the start of the tenancy period of the first lease is dated to 25th of December 1865, for a period of 21 years, but it is known that mining activity at Wharton Colliery existed from at least 1850. Either earlier leases no longer exist, or the original lease formalised an outstanding verbal agreement. As well as working both the Bank House and later Wharton Colliery, Francis Charlton was also recorded as an agent for the Trustees of the Bridgewater Estate in an Indenture between the Bridgewater Trustees and the Earl of Ellesmere to surrender a road for the Trustees use, dated 1871 (NCBw 19/11).

3.3.10 The Colliery eventually became the property of the Bridgewater Trustees in 1880, purchased by the Trust as part of the Wharton Hall Estate, and linked to the Colliery Railway (Hayes 2004, 86). By 1899, an account of Charlton's property shows the Trencherbone Mine was recorded as valueless (NCBw 19/11), and pencil notes on the accounts of the mines in 1870 suggest the mine was struggling to produce enough to cover the rents payable for coal from under Bagot's land. By 1901, Francis Charlton is absent as a coal owner in Kelly's Directory, and he may have ceased activity in the area in the late 1870s before handing it over to the Bridgewater Trustees. The Trust worked

the Cannel seam, located at a deeper level to the Trencherbone Seam, from these works until the colliery was abandoned in 1898 (Atkinson 1998, 60).

3.3.11 The 1891 and 1909 OS maps (Plates 3 and 4) reflect the changes and abandonment of the site between these dates. On the 1891 OS Second Edition map (Plate 3) two shafts are marked, with a reservoir to the south of the site. The buildings to the north of the reservoir are likely to have been used to wash the coal before it was sorted by size using a screen. The reservoir would also have supplied the steam engines with water, although no chimney is marked to indicate the presence of the engine or boiler house. Therefore, the steam engine could have been located in the main complex, used to power the headgear, as well as other processing machinery. Tippers positioned across the railway are also visible, used for loading the coal for transporting via the Colliery Railway, and two spoil heaps are shown.

3.3.12 Work at the colliery had ceased by the time of the 1909 OS map (Plate 4), although it shows basically the same layout exists. By this time, however, it is noticeable that no tippers are marked over the railway and the site is labelled as "old shafts". The spoil heaps have increased in size and encompass the reservoir. The Lists of Mines of 1911 (PF 338.2.M2) recorded Charlton No's 1 and 2 as the property of the Bridgewater Trustees as part of the Wharton Hall Colliery, despite not being worked at this time. However, they were removed by the time of the publication of the 1916 lists. The 1928 OS map of the area (Plate 5) shows the fate of the colliery as it is entirely covered in spoil, transported to the site via the Colliery Railway, and the sidings have been removed together with the buildings.

3.3.13 ***Wharton Hall Colliery (Site 89):*** the Wharton Hall Colliery was initially opened by The Wharton Hall Colliery Company in 1873, formed three years earlier by Gwillym and Gerald Potter and others (Hayes 2004, 86). The Bridgwater Trustees subsequently bought it in 1879 or 1880 at the same time as Charlton Colliery (*ibid*). A lease was also obtained for the use of mining lands, with rights to build the associated railway, tramway, building and huts, by the Trustees of the Duke of Bridgewater for the land owned by the Bagot Family Estate Trustees in 1879 (E2/172). The result was the Trustees of the Duke of Bridgewater now controlled all the colliery activity within the study area.

3.3.14 The site of Wharton Hall Colliery was built over The Wash (Site **88**; UMAU 1996), a farmstead identified on early mapping. The Colliery was connected to the London and North Western Railway Little Hulton Mineral Branch by a triangular junction at Greenheys sidings to the north of the development area. However, it was not linked with the Bridgewater Collieries Railway network of track, later the Central Railways of the Manchester Coalfields, until 1907-8. A connection was also made to the Pendleton-Hindley line of the Lancashire and Yorkshire Railway, located immediately to the south of the colliery, in 1888 (Hayes 2004, 86).

3.3.15 During 1888-9 new staging had been constructed with a galvanised roof, together with a series of vibrating screens for sorting the coal, sorting belts from which the shale would be picked off, movable chutes and tub tipplers

(*op cit* 87). The machinery was powered by a newly installed 7" x 12" twin horizontal engine (*ibid*). These would have been located in the larger buildings marked on the 1891 and 1909 OS map, on which some of then aforementioned sorting belts can also be seen (Plates 6 and 7). A number of air compressors were installed at the site during the 1880s and 1890s, although these could have served several purposes, with an up-to-date Walker 2500cfm compressor installed in 1912 (*ibid*).

3.3.16 Three shafts were located at Wharton Hall, Nos 1, 2 and 3. The first two are visible on the 1891 and 1909 OS maps, and the position of No 3 pit is marked on the 1928 OS map (Plates 6-8). No 1 and No 3 pits attained depths of 312 yards and 461 yards respectively, but No 2 pit was deepened in 1903 to 551 yards to reach the Arley mine (*ibid*). The fine lattice head gear (Plate 11) , demolished in 1964, probably dates from this time (*ibid*). Winding engines, all of the twin cylinder type, were installed above each pit or shaft. The engine above No 2 pit possibly replaced an earlier one (*ibid*), as the disposition of the head gear and the engine house suggest that the new engine house had been built behind a pre-existing one (*ibid*). Three chimneys are marked on the 1909 OS map of the site (Plate 7), of which two were also marked on the earlier 1891 edition (Plate 6). The chimney in the centre of the site, at least, is likely to be adjacent to a combined engine and boiler house to the west. Gas was also known to have been produced at the site from at least 1911 (PF338.2.M2). However, a list of equipment held at the colliery *c* 1900 makes no mention of a gas retort. Therefore, it is likely to have been installed in the later buildings, associated with the third chimney, all located on the northern side of the colliery, as marked on the 1909 OS map.

3.3.17 Coal seams continued to be worked from Wharton Hall, including the Trencherbone seam, considered to be the best coal of the Lancashire Coal Fields, until the 23rd of December 1927 (PF 338.2.M2, 188). After this time, only eight and then five people are recorded as working at the mines. Activities were recorded as "pumping only" until the closure of Brackley Colliery, located to the north of the study area, in May 1964 (Atkinson 1998, 64-65). Water was pumped from the Wharton Hall mines to keep those under Brackley Colliery dry (*ibid*). Pit No 1 was abandoned altogether during this period, the shaft being bricked up at the surface (Hayes 2004, 87). Only three boilers were retained to provide steam for the three remaining winding engines, as well as the Walker 2500cfm compressor (*ibid*).

3.3.18 In 1933-34 the whole of the Wharton Hall operation was converted to electricity, which negated the purpose for a railway from Greenheys that had been supplying fuel for the boilers. The track was therefore removed, with only the triangular section at Greenheys, located to the south-west of Charlton Colliery (Site **114**), remaining to allow access to the Cutacre Tip (*ibid*, 87 and 163). The pumping operation had been carried out at No 2 shaft, and the main winding engine was converted to electricity. The Walker 2500cfm compressor was therefore removed, and the boiler plant demolished, with one of the boilers removed to another site. Winding above No 3 shaft also ceased, with access maintained for inspection using hoppit and tackle. A twin horizontal winding engine was retained, presumably over No 2 shaft, but used

only occasionally and powered by a newly installed Vertical Cochran Boiler; although later, even this plant was scrapped and any access was made using the portable winding engine from the Mines Rescue Station at Boothstown. Wharton Hall Colliery were finally abandoned in 1964, when all pumping operations ceased and the building demolished and the area of the works subsequently used for tipping (*ibid*).

3.3.19 ***Cutacre Clough Tip:*** Cutacre Clough forms a large dirt-tipping site of considerable size, with material transported from Brackley, Mosley Common and Sandhole collieries (*op cit*, 163). However, it can be seen that waste material was deposited on a smaller scale in the area of Cutacre Clough since the late nineteenth century, in the areas surrounding, and over Bank House Colliery (Plates 4 and 5). The triangular junction at Greenheys had been retained to allow access to the tip, and for turning colliery locomotives, after the line to Wharton Hall colliery had been removed (*ibid*). However, the system of disposal was eventually highly mechanised with a Rotaside wagon tipper feeding conveyor belts transporting the waste to the disposal points in the tip (*ibid*). Tipping activities ceased when the Ashton Field-Brackley Colliery line of the Colliery Railway closed in 1968, preventing access to the site (*ibid*).

4. EVALUATION RESULTS

4.1 INTRODUCTION

4.1.1 In total, 14 sites were evaluated with trial trenching, of which seven were also surveyed with magnetometry (*Section 2*). The results of the geophysical survey (Archaeological Surveys 2005) are provide in *Appendix 6*. Detailed descriptions and measurements of deposits for each trial trench are given in *Appendix 3*, with a list of contexts provided in *Appendix 4* and a finds catalogue in *Appendix 5*. An overview of the results from each site is provided, in turn, below, with a description of any archaeologically significant deposits. The position of the survey areas and trenches discussed below are plotted in a general plan of the outlined development site in Figure 2. More detailed plans for each evaluation area, with reference to OS co-ordinates, are provided in Figures 3-10.

4.2 SITE 5, STRUCTURE OFF ROSEMARY LANE

4.2.1 ***Geophysical Survey:*** Figure 3 shows an area measuring 30m x 30m intended for geophysical survey to evaluate the presence of a "messuage with garden and two crofts" marked in some form on historical maps from 1786 to 1849 (UMAU 1996, 9). However, at the time of the site work the conditions were too wet, and the survey was abandoned.

4.2.2 ***Trial Trenches 5a, 5b and 5c:*** three trenches were positioned to achieve the most coverage of the evaluation area, given the loss of information that would have been provided by the geophysical survey. Trench 5c was originally sited closer to the boundary but was moved westwards to maintain a safe working distance from a service located at the eastern end of Trench 5a.

4.2.3 Only Trench 5a produced an archaeologically significant feature, ditch ***72*** which measured a minimum of 2m wide and 0.78m deep. It contained three deposits; a primary fill, ***74***, a secondary fill ***73***, and the final deposit, ***71***. These comprised a mix of topsoil and clay till, where the feature had been backfilled. The ditch was identified as a field boundary ditch, running parallel with the current field boundary, and was truncated on its eastern edge by the aforementioned modern service. A wet area could be discerned on the ground, prior to excavation, which correlated with the position of this feature. The finds retrieved were unstratified (topsoil), and included pottery sherds from the late eighteenth to the twentieth centuries.

4.2.4 It is surprising that no deposits associated with the buildings identified on the historic maps were located. Without repeating the map regression analysis (*ibid*) to verify the exact location, it can only be assumed that little to no archaeological deposits remain of these structures.

4.3 SITE 35, ASHES FARM SETTLEMENT

4.3.1 ***Trenches 35a, 35b, 35c:*** three trenches were excavated over the location of Ashes Farm, which dated from at least 1684 (Figs 2 and 4), and was demolished in the mid twentieth century (*op cit*, 12). At the time of the evaluation, the site was overgrown, although there were traces of concrete flooring apparent and some minor upstanding remains. Trenches 35a (Fig 11, Plate 13) and 35b (Fig 12, Plate 14) contained various foundations, surfaces and a cellar associated with the farm.

4.3.2 Within Trench 35a a red brick floor, ***28***, and three red brick footings, ***29***, ***37*** and ***38***, were recorded at the southern end of the trench. A fourth red brick footing, ***36***, seen at the eastern edge of the trench, was orientated approximately north/south. At the northern end of ***36*** was a sandstone beam, ***54***; possibly formerly a lintel of an earlier structure. This footing ran beyond the northern and eastern extents of the trench. The floor ***28*** consisted of machine-made bricks, and the four footings were hand-made brick. The floor surface may, therefore, be of a later phase in the structure A large linear, ***30***, was only partially located within the trench, and contained a single backfilled deposit, ***31***. Stones in its base suggest it was for drainage, possibly containing a stone culvert beyond the extents of the trench, but it had subsequently had a ceramic pipe field drain inserted into the backfill.

4.3.1 Feature ***33*** was a twentieth century posthole, with the base of the post still present. After the removal of the brick floor ***28***, a small pit, ***52***, 0.52m in diameter and 0.14m, deep was located, it was backfilled with a mix of clay till and topsoil. Its purpose remains unresolved, and no finds were recovered, but stratigraphically it predates the removed floor.

4.3.2 Within Trench 35b a sandstone foundation, ***46***, supported the exterior south-eastern corner of a wall visible on the OS First Edition (1850) map of the area (Fig 12). Within the interior of the building a second interior sandstone foundation, ***58***, surrounds the vaulted ceiling and entrance to a red brick cellar, ***63*** (Fig 12; Plate 14). The backfill of the construction cut for this cellar, deposit ***62***, contained late seventeenth to eighteenth century ceramics and hand-made red brick fragments, probably of the same period. The cellar has been backfilled with twentieth century brick rubble, ***61***. A red brick footing, ***57***, is a later addition to this structure, butting up to foundation ***58***, made from nineteenth century hand-made bricks.

4.3.3 Trench 35c contained a single drain associated with the final mid twentieth century phase of the farm. From the odour, it clearly contained contaminated water, and was not excavated.

4.4 SITE 36, TAN PIT CROFT

4.4.1 ***Geophysical Survey:*** it was originally intended that an area measuring 30m by 90m (Fig 4) would be surveyed to determine whether any sub-surface remains exist relating to activities associated with the field name of 'Tan Pitt Croft' in the holding of Ashes Farm, on the *c* 1800 Bridgewater Estate Plan

(*ibid*). However, the presence of highly magnetic modern debris and surface obstructions, such as fences, prevented any survey.

4.4.2 ***Trenches 36a, 36b, 36c:*** as the area could not be surveyed with magnetometry, three trenches were positioned to sample the outlined area for Site **36**, whilst avoiding services (Fig 4) and topographic features. Once on site, Trench 36b was further moved to maintain a safe working distance from overhead cables. However, only Trenches 35a and 35b produced features of potentially archaeological significance.

4.4.3 Trench 36a contained a single north-east/south-west linear, ***23***, truncated by later ceramic field drains, measuring 0.72m wide and 0.07m deep. Although root action had clearly affected the sides and base of the feature, it was considered to be of anthropogenic origin. Possible interpretations include the base of an earlier field boundary ditch, or perhaps more likely, a horticultural or agricultural trench.

4.4.4 Trench 36b contained three features. Feature ***7*** represents an area of root action, but appeared to be cut in plan by gully ***5***. However, the fills are almost identical, and it was suggested that gully ***5*** is a continuation of root action ***7***, but with some variation in its deposits. Pit ***14*** was initially excavated as a feature, but it is quite likely that this represents a small variation in the glacial till. No tanning pits or associated activities were located as suggested by the field name, or any waste products associated with the tanning industry.

4.5 SITE 37, BLEACH CROFT

4.5.1 ***Geophysical Survey:*** an area measuring 30m x 30m was outlined for survey over an area marked as "Bleach Croft" in the holding of Ashes Farm (Fig 4), on the *c* 1800 Bridgewater Estate Plan (*ibid*). However, the presence of field boundaries, overhead cables and the underground services inhibited survey.

4.5.2 ***Trench 37a:*** initially two trenches were intended for this area, given that the survey could not be undertaken. However, Trench 37b could not be excavated due to the steep drop in ground level down to the stream, and it could not be moved due to the presence of the overhead power cables. Therefore, only one trench was excavated, Trench 37a, which contained potentially two features, possible linear ***19*** and an irregular shaped pit ***21***. However, the fills vary only slightly and it was thought they represent a single irregular feature of an undetermined origin.

4.6 SITE 42, CINDER HILL

4.6.1 ***Geophysical Survey:*** six grids measuring 30m x 30m were surveyed in a checkerboard arrangement over a field marked as 'Cinder Hill' in the Bridgewater Survey of 1722 (*op cit*, 13). A number of parallel linear anomalies were observed in the results that are likely to be associated with former agricultural activity and land drains that run parallel to the fields eastern boundary or perpendicular to it (Fig 5).

4.6.2 Nevertheless, in the centre of the survey area are several fragmented positive linears and a possible curvilinear anomaly. Their fragmented form inhibited interpretation in terms of their origin, but they were believed to be the response to magnetically enhanced material within cut features, and may have been of archaeological potential. These features were targeted with Trench 42c (Fig 5). To the south of these features is a pair of positive linear anomalies, again thought to be cut features, but being parallel to the adjacent field boundary and with the ploughing trend it is suggestive of an agricultural origin. However, a discrete cut feature interpreted as a possible pit is located close by. Trench 42b was positioned to determine more accurately the nature of these features (Fig 5).

4.6.3 Of particular interest was an area of magnetic debris situated at the northern end of the area. This was interpreted as a possible spread of thermoremnant material, such as brick or clinker, and was, therefore, targeted with Trench 42a (Fig 5).

4.6.4 ***Trenches 42a, 42b and 42c:*** two of the three trenches produced archaeological features or deposits, Trenches 42a and 42c. Trench 42a was foreshortened at its western end to maintain the required distance between the excavation and the watercourse to the west.

4.6.5 Trench 42a was excavated in an L-shape (Fig 13), in order to locate the cause of the thermoremnant material seen in the magnetic survey. Significant quantities of slag, including tap slag debris, were revealed within the soil horizon, particularly at the northern end of the north/south orientated section of the trench, and at the western of the east/west orientated section of the trench, down the slope to the stream. It would seem that this material was being tipped down the slope towards the stream, and indicates the presence of iron working in the vicinity.

4.6.6 The terminus of a linear feature ,***87***, was located at the southern end of the north/south section of the trench (Fig 13). It measured 0.9m wide and 0.4m deep, filled with sediment originating from the surrounding eroding topsoil. The purpose of the feature was unresolved, but within the soil horizon directly above the feature a single sherd of mid twelfth to mid fourteenth century pottery was recovered. Unfortunately, it was unstratified and may have been introduced to the site from elsewhere. Three areas of root action were present in the trench, one of which was pit ***81*** filled with slag-rich topsoil.

4.6.7 Trench 42c contained one pit or posthole feature, ***83***, and a possible linear, ***91***. Feature ***83*** measured *c* 0.4m in diameter and 0.07m deep, and was filled with a single deposit containing charcoal. Feature ***91*** was located in the south-eastern corner of the trench and measured 0.5m deep, filled with essentially redeposited clay till. It appeared to be a variation in the glacial till, as opposed to any archaeological significant feature, and is likely to relate to the anomaly seen in the magnetic survey.

4.6.8 In Trench 42b, no features of archaeological significance were revealed. The linear features identified by the magnetic survey were confirmed during the

evaluation to be field drains, with the more distinct and stronger linear anomaly to the east, running parallel with the eastern boundary representing two phases of ceramic drain.

4.7 SITE 45, COAL PIT MEADOW

4.7.1 ***Geophysical Survey:*** six 30m x 30m grids were surveyed in a checkerboard arrangement (Fig 6) in a field marked as 'Coal Pit Meadow' in the Bridgewater Survey of 1722 (*op cit*, 13), in an attempt to investigate the potential for evidence of industrial activity relating to the fieldname. The survey results showed a very low magnitude positive area anomaly in the north-west corner, which corresponded with a visible depression in the field. The response was thought to relate to increased soil depth or enhanced magnetic properties of subsoil or infill material. The cause of the depression was not known at this juncture, and was earmarked for investigation with a trial trench (45a).

4.7.2 In the south-east corner of the survey two discrete positive anomalies were observed, with a moderate strength response and interpreted as possible cut features. Their origin could not be ascertained from the survey and, therefore, these would be subject to investigation through Trench 45b. Similarly, two negative linear anomalies could not be characterised from the survey results alone and would be investigated with Trenches 45c and 45d (Fig 6). Trench 45e was positioned to investigate further two discrete anomalies possibly relating to pits.

4.7.3 ***Trenches 45b, 45c, 45d and 45e:*** initially, five trenches were proposed for Site 45. Trench 45a, however, was not excavated as a large circular depression in the ground at this location was highly suggestive of the presence of a coal pit, as seen elsewhere during evaluations. Given the fieldname, it was considered hazardous to proceed with any excavation. Within the remaining trenches, geophysical anomalies corresponded with numerous field drains revealed in the excavations. No evidence of the anomalies from the survey was seen in Trench 45e, although a field drain was present in this position and it is possible that the anomalies pertain to objects/deposits within it. No deposits of an archaeological significance were located.

4.8 SITE 50, KILN MEADOW

4.8.1 ***Geophysical Survey:*** two 30m x 30m grids were surveyed (areas 50a and 50b (Fig 7) in a field marked as 'Kiln Meadow' on the *c* 1800 Bagot Estate map (*op cit*, 14), to investigate any activity associated with the site of a kiln. In survey area 50a anomalies suggestive of land drains and an area of magnetic disturbance associated with the known nearby gas pipeline were observed.

4.8.2 In area 50b, there were several positive linear and area anomalies, and negative linear anomalies. The relatively steep slope may indicate that these anomalies are associated with former water channels. However, the origin of

these anomalies required determination and were targeted with Trenches 50a and 50b.

4.8.3 ***Trenches 50a and 50b:*** two north/south orientated field drains were located in Trench 50a, one at either end of the trench, although neither corresponded with the geophysical anomalies seen across the centre of the trench. A linear depression was visible running across the field on a north-east/south-west orientation, which also crossed Trench 50a. No feature was found during the evaluation below this depression and it may indicate a natural water channel in this field, or perhaps a deliberate attempt at drainage within the soil horizon. The anomalies may represent a pedological variation within the soil horizon associated with this activity.

4.8.4 The north-east/south-west geophysical anomaly targeted with Trench 50b was identified as a modern, and current, main drain from Hulton Heys Farm. The nature of such a small sample for geophysical survey inhibits more precise interpretation or understanding of the anomalies presented, and it is likely that a larger coverage would enable such natural pedological or geological variations to be observed more easily.

4.9 SITE 51, OLD GRACES

4.9.1 ***Geophysical Survey:*** an area of 60m x 60m (Fig 7) was positioned over Site 51 to investigate the location of a farmstead referred to in seventeenth century documentation as 'Old Graces', and identified at this location on nineteenth, and possibly eighteenth, century historic maps (*ibid*). However, the survey was abandoned due to the position of the site across numerous topographic obstructions, including a trackway, three barbed-wire fences and a small stream with adjacent bramble growth. In addition, there were exceptionally high levels of magnetic disturbance from nearby steel pipelines and a pylon.

4.9.2 ***Trench 51a, 51b and 51c:*** three trenches were positioned to adequately sample the area whilst avoiding above and below ground obstructions. Trench 51a was moved again on site as it was over the current trackway of Leadbeaters Farm, and Trench 51b was moved to maintain a safe working distance from overhead power cables.

4.9.3 All of the trenches contained deposits of clay containing small but varying quantities of post-medieval pottery and red brick fragments, deposits ***107***, ***108***, and ***109*** in Trench 51a, ***115*** and ***116*** in Trench 51b, and ***112*** in Trench 51c (Plate 15). These layers essentially comprised one phase of clay dumping over the area, which is thickest near the current trackway to the south of the trenches, where deposits ***107***, ***108*** and ***109*** collectively measured 0.3m thick. In the vicinity of Trenches 51b and 51c these deposits measured only *c* 0.1m thick.

4.9.4 The layers of redeposited clay till are possibly associated with construction of the current track or, alternatively, represent very limited quantities of demolition debris mixed with glacial till. It was surprising to see that these deposits have no buried soil horizon beneath, as they directly overly the

glacial till. A sondage was excavated into the till at the southern end of Trench 51a to confirm its identification. No foundations or features suggestive of a farmstead was located, but it should be noted that the site lies on a steep gradient down to a stream to the north, which seems an unlikely location for buildings without either levelling up or cutting into the slope. It is, therefore, suggested that Old Graces may have been located to the south of the trackway, on a level area much more suitable for construction, unless the area has been heavily truncated and substantially altered following disuse of the farm.

4.10 SITE 70, WHARTON HALL

4.10.1 ***Trenches 70a, 70b, 70c, 70d, 70e and 70f:*** six trenches were excavated on the site of Wharton Hall (Fig 8), positioned in accordance with the structures depicted on the OS First Edition map of 1850 (RPS 2005, 13). The Hall was built in the sixteenth or seventeenth century, and demolished in the 1960s, although it is believed to have a medieval predecessor, and speculated to be the site of a moated medieval manor house of the de Warton family, who are documented from at least the fourteenth century (UMAU 1996, 15). The position of the remains of the moat may possibly be indicated by the presence of the two ponds (Fig 8). The Hall comprised a two-storey timber-framed building, refaced in red brick, with a central range aligned approximately north/south, and end cross-wings (*op cit*). A photograph of the structure taken in *c* 1930 (Plate 12) shows most of the front and northern elevation of the Hall, taken from Wharton Hall Lane. Within this image, the original timber-framed structure is easily discernible, a jetty visible in the southern cross-wing, and with the roof of the northern cross-wing raised and extended to the north.

4.10.2 The excavation of Trenches 70b to 70e produced a variety of archaeological features, predominantly post-medieval in date with Trench 70a containing predominantly twentieth century features. Historic mapping shows an L-shaped structure at the location of Trench 70a, dating back to *c* 1850 (OS 1850). However, revealed within Trench 70a was a floor of twentieth century construction (Fig 14), with modern red brick sumps leading into ceramic drains. These features are evidence of the remains of what is likely to have been a twentieth century shippon, known from information provided by local residents (Fig 14). Stratigraphically, the earlier levelling deposits for this floor, ***398***, contained twentieth century brick. It is thought that the area was heavily truncated in the construction, or modification, of a building formed in order to create a modern shippon, with the drainage system built prior to the levelling layers.

4.10.3 Trench 70b was located over the southern cross-wing of the hall (Fig 15; Plate 12). Within the trench was a flagstone floor (Plates 16 and 17), located in three areas recorded as ***210***, ***224***, and ***234***, although this would have extended across the entire floor of the building (Fig 15). Sandstone foundation, ***196***, was located at the western end of the trench and corresponds to a boundary wall visible on the OS 1850 map of the area, as well as later maps, and with a wall also present in this position on the 1930 photograph

(Fig 15; Plate 12 and 18). The western terminus of this foundation marks the south-western corner of the structure. Foundation ***197*** marks what is considered to be the original eastern wall of the southern cross-wing (Fig 15). It also corresponds to the position of a north/south aligned wall marked on the 1891 OS map of the hall, forming a base upon which a sill-beam may have been located. Footing ***233***, to the east of ***197***, comprised a red-brick construction, probably relating to an extension or outshut to the original structure and possibly dating to when the building was refaced in red brick (Fig 15).

4.10.4 No sill-beam was located at the anticipated front of the building, aligned parallel to ***197*** and adjacent to the western terminus of foundation ***196***. The reason for this probably lies in the drop of the original ground surface, as indicated by the drop in the glacial till, ***402***, which is in the order of 0.7m between the eastern and western ends of Trench 70b. The flagstone floor at the eastern end of this cross-wing would have rested directly above the glacial till. Flags at the western end of the structure overly two levelling deposits, ***211*** and ***212***, which raise the ground level by 0.5m, and extends beyond the limits of the building. Therefore, above layer ***211*** a stone plinth would have supported the sill-beam of the timber-framed construction, but this has been lost to subsequent activity.

4.10.5 Truncating these levelling deposits, linear ***422*** contained a line of three larger stones (Fig 15). These were not faced, and only provided a roughly level surface between them. It is possible that the fill of ***422***, ***213***, may constitute a variation or a disturbance of the levelling deposits ***211*** and ***212***, suggested by a single sherd of nineteenth century pottery found within it. Within the lower levelling deposit ***212***, and within ***422***, a number of cobbles worn flat on one surface were revealed, indicating the presence of an earlier disturbed cobbled surface. It is unclear whether these originate from a surface relating to a medieval building or an earlier floor of the later post-medieval structure. The line of three larger stones and the cobbles within ***213*** appear as though an attempt was made to form a line of hard standing, and possibly represents stone used to maintain a level floor in this area. Deposit ***213*** contained pottery dated to the nineteenth or twentieth centuries. It could be speculated that the flagstone floor within this building, being present in the eastern extension to the southern cross-wing, was also laid throughout the rest of the building at the time of the construction of this extension, but this could not be proven in the current excavations.

4.10.6 Other features in Trench 70b include drain ***228*** in the eastern half of the trench (Fig 15). This is located within the original post-medieval structure, prior to the red brick extension, and consisted of sandstone sides and base, but slightly modified with red brick. Adjacent to the drain, feature ***226*** comprised a posthole, with the post still present, containing twentieth century ceramics. Feature ***217*** in the western half of the trench comprised a small undated pit, filled with redeposited topsoil, and measuring 0.1m deep (Fig 15). Although there was no evidence of a post pipe, its interpretation as a posthole is feasible.

4.10.7 Trench 70c was located in an area of no known buildings, although local knowledge stated that the dairy was once positioned here (Fig 16; Plates 19 and 20). Ditch ***331*** appears to be the south-western corner of an enclosure, its fill a single deposit of sediment derived from surrounding eroding topsoil (Plate 20). Comparing the First Edition OS (1850) map to the Second Edition OS (1891) map it would appear the southern field boundary has been straightened, and this ditch possibly correlates with the original boundary ditch of the hall. Cutting the fill of this ditch this were two postholes ***321*** and ***325***, both of which also truncated a third posthole ***323***. These postholes possibly represent three phases of reinstating the same structure, most likely a fence. Pit ***329*** within the middle of the trench measured 0.95m x 0.4m x 0.1m and was infilled with humic deposits. There was no evidence or finds to suggest its function and, therefore, its interpretation remains unresolved but it may have possibly related to a garden feature, i.e. for a plant or shrub, or possible root action. Features ***340*** and ***342*** at the north-eastern end of the trench comprise two pits of unknown purpose, the former being fairly irregular in shape (Fig 16). Linear ***348*** truncates much of the northern half of the trench and comprised a twentieth century feature, with a large cable located at its base.

4.10.8 Within the south-eastern half of Trench 70d an east/west orientated red brick foundation was located (Fig 17; Plate 21). A building is visible in this location on the First Edition OS map (1850) showing the Hall. There is no clear evidence from this that the structure was originally timber-framed. The line of sandstone, ***292***, to the south of the red brick footing, ***293***, overlies the backfill of the construction cut of the red brick foundation and must therefore post-date it. Within the interior of this structure, features ***300*** and ***303*** comprise two postholes with identifiable post pipes and packing material (Fig 17) but their origin or function is unknown and it could not be ascertained whether they relate to the structure. Also within the interior of this structure, linear ***302*** represents a deposit of slag and clinker used as bedding material at the base of a shallower red brick foundation, most of the brick now removed.

4.10.9 To the north of foundation ***293*** a drainage gully, ***308***, truncated by the field drains and a service (Fig 17), was filled with a crushed slag and clinker; it was considered fairly recent in date although no dating material was recovered.

4.10.10 In the centre and at the north-western and of the trench, features ***336*** and ***410*** comprise two large postholes, the post still present in ***410***. Only ***336*** was fully excavated and was seen to contain nineteenth to twentieth century pottery, glass and brick fragments. At its base was a large sandstone post pad. A third such feature ***241*** was also located in Trench 70e (Fig 18), which was also excavated and shown to be identical in form, and are considered part of the same structure; most likely a twentieth century pole barn.

4.10.11 At the southern end of Trench 70e, was a well ***291*** (Fig 18; Plate 22), with only 50% being visible within the eastern edge of the trench. The upper fill of this structure, ***290***, contained a post-medieval clay tobacco pipe stem. Some of the stone inclusions in the upper fill are thought to have derived from an upper upstanding part of the structure surrounding the well.

4.10.12 Five postholes, ***202***, ***206***, ***219***, ***285*** and ***287*** were located in Trench 70e (Fig 18), but there were no associated finds. In the case of ***202*** and ***206***, the latter appears to be a replacement of the former. Creamware pottery, suggesting a late eighteenth century *terminus post quem*, was recovered from ***202***, and early eighteenth to nineteenth century ceramics from ***206***. Features ***271***, ***243***, ***283*** and ***297*** comprise areas where root action has effected the glacial till ***227***. The area of bioturbation recorded as feature ***243*** is noteworthy as it contained one sherd of thirteenth or fourteenth century pottery, as well as a fragment of a sherd of possible late Roman or eighteenth century pottery (see *Section 4.15*). Pit ***199*** in the north-western corner of Trench 70e contained a single sherd of late seventeenth to early eighteenth century pottery (Fig 18). Feature ***295*** at the south-western end of the trench represents a twentieth century linear or pit.

4.10.13 Trench 70f was positioned to the south of the site of the Hall, and contained three field drains. No deposits of any archaeological significance were observed during the evaluation.

4.11 SITE 75, EARLY MINING EVIDENCE

4.11.1 ***Geophysical Survey:*** a single square block of 50m x 50m (Fig 9) was surveyed to examine any activity associated with mining, as identified within the desk-based assessment (*ibid*). Four linear anomalies (three positively magnetic and one negative) were seen in the survey results running along the southern edge of the survey area. The character of these anomalies suggests an anthropogenic origin although their function could not ascertained. On the eastern side of the survey area three parallel linear anomalies were interpreted as ceramic land drains.

4.11.2 ***Trench 75a:*** Trench 75a (Fig 2 and 19) was located across the four, roughly east/west orientated, geophysical anomalies. The most northerly anomaly was identified as a field drain. The adjacent anomaly was located over these two following inter-cutting features. The first comprised a wide field boundary ditch, ***137***, measuring 4.70m wide and 0.60m deep (Plate 23). It contained three fills, deposits ***141***, ***142*** and ***143***, all of which originated from sediment eroded from surrounding topsoils. This is a field boundary ditch, which can be seen marked on the 1850 OS map of the area. Cutting the northern edge of this ditch, a backfilled linear, ***136***, with abundant stone at its base comprised a drainage ditch still active today. At its base wood was located along the length of the feature, either incidental inclusions or placed deliberately as bundles, known as a bush drain (Harvey 1980, 71).

4.11.3 Two further linear features, ***133*** and ***135***, account for the southern two geophysical anomalies (Fig 22). They comprise two shallow gullies ***c*** 0.90m wide and ***c*** 0.10m deep, both with abundant stone inclusions within their fills. They are interpreted as the bases of drainage ditches to the south of the aforementioned field boundary.

4.12 SITES 76 AND 77, EARLY MINING EVIDENCE

4.12.1 ***Geophysical Survey:*** two areas were surveyed over Sites **76** and **77** (Fig 2) in blocks of 50m x 50m (Fig 9), to locate any evidence of early mining activity. In the centre of Site **77** a discrete positive anomaly was seen (Fig 9), which correlated with a coal pit extrapolated from nineteenth century mapping and was, therefore, excluded from further evaluation. Three positive linear anomalies and a possible curvilinear/rectilinear anomaly were seen in the survey results for Site **76**. From the magnetic response they are thought to possibly relate to former brick structures. Consequently, they have been incorporated within the northern end of Trench 76/77a for further investigation.

4.12.2 The southern end of Trench 76/77a has incorporated an area of magnetic debris interpreted as being a response to thermoremnant material, such as brick. Within the magnetic debris are two positive linear anomalies and a curvilinear anomaly, which may suggest the remains of brick structures.

4.12.3 A series of positive linear anomalies extend across the site and suggest the presence of land drains, and a strong linear anomaly across the northern part of the survey area is a response to a pipeline or service, as seen marked on the base map.

4.12.4 ***Trench 76/77a:*** within the single trench excavated across the two areas, a coal pit ***151*** was located at the northern end (Fig 20; Plate 24). The upper fill of this feature, ***165***, comprised redeposited clay till as backfill. Within this deposit were areas of crushed coal, ***148*** and ***150***, as inclusions within ***165***. A lower fill of clay, ***166***, comprised material deposited in waterlogged conditions containing wood and other plant remains. Three stakes, ***167***, were located in this deposit, in the limited area of the coal pit that was excavated (Plate 25). Their use was undetermined, but they may be contemporary with the coal pit marked on the 1850 OS map of the area. What was thought to be the edge of a second coal pit, not marked on this map, was located along the south-eastern edge of the trench, pit ***184***. Excavation of this produced evidence of deliberate backfilling, and below this sediment originated from surrounding eroding topsoil. This feature was considered comparable enough to coal pit ***151*** for it to be considered also a likely coal pit, and further excavation ceased due to the health and safety implications. The backfilled coal pit, ***184***, may be associated with the geophysical anomalies seen as magnetic debris.

4.12.5 A number of features were seen to post-date the in-filling of the coal pits. Three sub-square postholes, ***172***, ***174*** and ***180***, in the southern half of the trench were all orientated in the same direction with similar characteristics in form (Fig 20). Two linear features, ***160*** and ***189***, at opposing ends of the trench and orientated in north/south and east/west direction, were seen to truncate coal pits ***151*** and ***184*** respectively,. They are also both filled with re-deposited clay till and topsoil. The purpose of these features was not entirely clear, drainage being one possibility. A sub-square pit and associated gully, ***190***, at the southern end of the trench was backfilled with topsoil and nineteenth and twentieth century building material. The feature forms a large

sump, fed by a gully that extends to the east of the limit of excavation. Drainage ditch ***170*** near the centre of the trench (Fig 20) comprised an east/west orientated gully, 0.68m wide and 0.37m deep, backfilled with a clayey-gravel, ***169***, but no finds were recovered from this feature to date it.

4.13 SITE 78, EARLY MINING EVIDENCE

4.13.1 ***Geophysical Survey:*** an area measuring 90m x 60m was surveyed (Fig 9), again to locate any evidence of early mining activity in the vicinity and in the area of two adjoining fields entitled Near Kiln Field and Lower Kiln Field on an 1847 plan of the Township of Tyldesdale cum Shakerley (*op cit*, 16). In the west of the survey area, several positive linear thought to relate to cut features of archaeological potential were targeted with Trench 78a, together with a curvilinear anomaly of unknown origin. The remaining anomalies appeared to be the result of agricultural activity or land drains.

4.13.2 ***Trench 78a:*** the north-east/south-west orientated linear anomaly seen in the magnetic survey results can be identified as one of the two field drains located within the trench. Parallel linear geophysical anomalies cutting across the trench did not match any significant archaeological features, although two ploughmarks were orientated in this direction. The curvilinear anomaly may be of a similar origin, located over one of the two observed plough marks, as no other significant correlating features were observed.

4.14 SITE 87, HURSTS

4.14.1 ***Trenches 87a, 87b and 87c:*** three trenches were located over the position of the 'Hursts' (Fig 10), a structure located on mid nineteenth century mapping of the area, and possibly the home of Geoffrey Hurst, imprisoned for Protestantism in the 1550s (*op cit*, 17). Archaeological features were located in Trenches 87b and 87c. Trench 87b contained a series of three inter-cutting pits, ***355***, ***356*** and ***416*** (Fig 21; Plate 26). Feature ***355*** and ***356*** are similar in form, with ***356*** truncating ***355***, and both were backfilled with clayey-sand. Finds from ***355*** date this feature to the nineteenth century. Pit ***416*** was a twentieth century intrusion truncating both of these features.

4.14.2 Trench 87c contained a series of large inter-cutting pits; ***363*** (Plate 27), ***365***, ***374***, ***377***, ***379***, and ***387***. These were mainly sub-circular in shape although some of these were only identified as separate features in section (Fig 22). They all continue beyond the eastern limit of the excavation, with only ***374*** just extending beyond the western extant of the trench. All of these show some evidence of being backfilled at some point, with the exception of ***379*** which contained a single deposit of sediment eroded from the surrounding topsoil. Deposits ***376*** of pit ***377,*** and possibly ***373*** of pit ***374***, appear to have accumulated in waterlogged conditions. Pottery from these features suggests a nineteenth century date for their excavation. The larger pits, up to *c* 4m wide, may be clay extraction pits for brick-making, possibly associated with the activities of Wharton Hall Colliery. An alternative interpretation is that they are marl pits, known in the area (RPS 2005 and UMAU 1996).

4.14.3 It is surprising that no evidence of the 'Hursts' buildings were revealed, although Trench 87c was largely truncated by later extracting activity. It can only be assumed that there is little or nothing remaining of this structure and its associated features as a result.

4.15 FINDS

4.15.1 In total, 352 fragments of artefacts and ecofacts were recovered during the excavations. By far, the majority (259 fragments; 73.5%) were fragments of ceramic vessels, the remainder comprising ceramic building materials (mainly brick), with very small amounts of clay tobacco pipe, glass vessels, industrial debris, copper alloy and iron.

Trench	CBM	Ceramic vessel	Glass vessel	Industrial debris	Iron	Other	Totals
5a		6				1	*7*
5b		13					*13*
35a	4	1					*5*
35b	7	20	2			1	*30*
35c		9					*9*
36c		2					*2*
37a		3					*3*
42a		15		2			*17*
45d		4					*4*
50a		4					*4*
50b		2					*2*
51a	10	5					*15*
51b	5	6					*11*
70b	9	15		1			*25*
70c		35	13				*48*
70d	4	10	2		1		*17*
70e	6	44			1	6	*56*
75a	1	11				1	*13*
76/77a	6	19	1			3	*29*
78a		8					*8*
87b	2	1					*3*
87c	4	26					*30*
unstrat	3						3
Totals	*61*	*259*	*18*	*3*	*2*	*12*	*355*

Table 2: distribution of finds between individual trenches

4.15.2 Much of the pottery (119 fragments; 46%) was recovered unstratified: in Trenches 36c, 37a, 42a, 45d, 50a, 50b, 75a, 76/77a, and 78a unstratified material comprised 100% of the assemblage. At Site **5** (Trenches a and b) 79% of the pottery was unstratified, whilst at Site **70** (Trenches b, c, and e) it was 21%. Such a high rate of unstratified material has reduced the potential of the finds to provide accurate dating for sites investigated, but the material can still be used to assess general trends of activity in the area as a whole and on a site-by-site basis.

4.15.3 ***General trends***: the overwhelming majority of the ceramic vessels were of late eighteenth century or later date. There were, however, four fragments of abraded medieval pottery, two unstratified from Trenches 42a and 70e, and two more from root disturbance ***243*** (Trench 70e). Small fragments of (probably) locally made medieval pottery are not easy to identify and thus date with confidence, but their gritty nature and pinkish-orange oxidised fabrics point to a mid twelfth to mid fourteenth century date range, as does the rim-form of the unstratified fragment from Trench 42a, probably from a cooking jar.

4.15.4 A fifth fragment (also from Trench 70e root disturbance ***243***) presents a problem; a small part of a tightly hooked rim in a slightly sandy cream fabric with occasional black flecks, and what appears to be a purplish colour-coat. It seems to point to it being a Nene Valley product of the third to fourth centuries AD. It is, however, relatively fresh and unabraded, and the rim-form unusual, and it is not impossible that it is, in fact, a fragment of waster from a much later vessel, perhaps an unglazed fragment of a later eighteenth century hook-rimmed blackware vessel. It was only one of three fragments of pottery from ***243***, the other two being medieval (above), and there is nothing else in the assemblage from Trench 70e to suggest a Roman presence, although a very small fragment of what appears to be amphora came from Trench 70c in the same area (levelling deposit ***212***).

4.15.5 A small group of 14 sherds are suggestive of activity from the late seventeenth-early eighteenth century. Again, however, this must be treated with caution, as most (10) are small fragments of early post-medieval blackwares, thin-walled, hard-fired, with a purplish fabric typical of the period, but there are no diagnostic rims or bases to confirm this dating (unstratified in Trench 70b, ***198*** and ***203*** in Trench 70e, and fill ***381*** of pit ***363*** in Trench 87c). A small fragment of Staffordshire slip-decorated hollowware was from Trench 70e, fill ***279*** of linear feature ***283***, and can be more confidently assigned to the period, as can two fragments of a magnesium-speckled flask from fill ***185*** of coal pit ***184*** (Trench 76/77a), and a fine brown stoneware base found unstratified in Trench 70b.

4.15.6 A few sherds (five) probably date from the mid-late eighteenth century; white salt-glaze stoneware tablewares from Trench 35c, subsoil ***43***, and unstratified from Trench 36c, point to a moderately well-to-do domestic milieu, although the large black impurity on the plate rim from subsoil ***43*** might hint at it being a waster, sold off cheaply. The bases of two tankards were found unstratified in Trench 76/77a; one Agate ware, the other in a fine brown stoneware.

4.15.7 The rapid ceramic changes of the late eighteenth and early nineteenth centuries are well-represented, with Creamware, Pearlware, and White-glazed earthenwares all present in increasing quantities. Most of the recognisable vessels are plates and dishes, typically with blue feathered and scalloped edges. Although under-glaze transfer printing was introduced in the late eighteenth century, it is probably the case that all the decorated white earthenwares recovered are later, dating generally from the later nineteenth and twentieth centuries, as are the few fragments of poor quality porcelains and bone chinas. Alongside these tablewares, there is a relatively limited range of black-glazed redwares and yellowwares, industrial slipwares, and late brown and grey slipwares typical of the nineteenth and early twentieth century kitchen. Unstratified fragments from Site 70 and Trench 78a make it clear that deposition continued at a lower level well into the twentieth century.

4.15.8 A small group of nineteenth to twentieth century glass was recovered; 19 fragments in the main unstratified within Trench 70c (13 fragments) and Trench 35b (two fragments). This material was domestic in nature, including beer and mineral water bottles from Cornbrook's Brewery, Hulme, Manchester, a colourless 'Grill Sauce' bottle from CWS, and a brown Virol jar. Fragments of opaque turquoise and opaque white glass are more decorative in nature, and could derive from oil lamp shades. Two small fragments of eighteenth century dark olive green wine bottle-type glass were also recovered from Trenches 35b and c (subsoil ***43*** and foundation ***59***), pointing to some probably later eighteenth century domestic activity in the vicinity of that trench.

4.15.9 ***Other finds:*** only five fragments of clay tobacco pipe were recovered, from Trench 76/77a, deposit ***181***, and Trench 70e, deposit ***290***, and unstratified in Trench 5a. All were featureless stem fragments and thus cannot thus be dated with any precision. A single iron nail, of no great antiquity, came from Trench 70d, ***334***, and a small copper alloy collar was recovered unstratified from Trench 75a. A single small fragment of animal bone was collected, unstratified from Site 35, and six other small fragments from Site 70e (***294***).

4.15.10 In all, 62 fragments of ceramic building material were recovered, the majority being hand-made brick in two distinctive fabrics, one coarse with a dense cream/white fleck, the other extremely coarse with large inclusions up to *c* 30 mm, and, on one occasion, including part of a broken whetstone. Both appear as relatively thick bricks, and evidence on occasion suggests the inclusion of chopped straw to the clay. One brick (Trench 35a) has numerous grain impressions on one surface (identified as oats (*Avena*) by D Druce). The 'rough and ready' nature of these bricks corresponds with the known local small-scale production to supplement farm income. Later bricks from the site are machine-made.

4.15.11 Finally, a few fragments of industrial debris were noted from Trenches 42a and 70d. These are typical 'ropy' tapping slag from post-medieval iron-production.

4.15.12 ***Trench-specific comments:*** below are details for notable trenches in terms of their dating from finds recovered and other pertinent comments.

- ***Trench 5a***: the pottery and glass recovered is consistently late, with nothing earlier than the last quarter of the eighteenth century. Apart from a small fragment of clay tobacco pipe, all the finds from this site are domestic table and kitchen wares.

- ***Trench 5b:*** all the finds were unstratified. The group is consistently late, with nothing earlier than the last quarter of the eighteenth century; again all are domestic table and kitchen wares.

- ***Trench 35a:*** the finds recovered were predominantly bricks due to the presence of the brick floor; a modern machine-made example from ***28*** (the brick floor), and hand-made (and probably earlier) fragments from ***29***, ***36***, and ***38***, all walls. A single fragment of a creamware dish, from the brick floor ***28***, is probably late eighteenth or early nineteenth century in date.

- ***Trench 35b:*** this was one of the more productive trenches regarding finds. Pottery (20 fragments from foundations ***48*** and ***59***) is almost exclusively black-glazed redwares, pointing to a late seventeenth to eighteenth century date, and a fragment of olive green glass wine bottle from ***59*** points to the same date range. Hand-made bricks from backfill ***62*** are probably of about the same date, whilst machine-made bricks from cellar backfill ***61*** are almost certainly twentieth century in date. A single fragment of twentieth century bottle glass and a single animal bone were recovered unstratified.

- ***Trench 35c:*** the finds were all derived from subsoil ***43***. Pottery points to late eighteenth to early nineteenth century activity, with a range of tablewares, the earliest piece being a mid-late eighteenth century white salt-glazed stoneware plate with moulded rim. Again, there was a single fragment of olive green glass wine bottle.

- ***Trench 36c:*** both fragments of pottery from this trench were unstratified. Again, both point to a mid/late eighteenth century to early nineteenth century date.

- ***Trench 37a:*** a single spalled fragment of creamware was recovered, pointing to the a late eighteenth century to early nineteenth century date.

- ***Trench 42a:*** all 17 fragments of pottery were unstratified. A range of domestic fabrics again points to a late eighteenth to nineteenth century date, probably inclining towards the nineteenth century. Fragments of ropy tapping slag clearly derive from (contemporary?) iron production, although as they are also unstratified, it is quite possible that they were introduced to the site, rather than signalling local iron production.

- ***Trench 45d:*** the few fragments of pottery from this trench point to probably nineteenth century activity in the locality.

- ***Trench 50a:*** in all, four fragments of pottery were recovered, all unstratified. As is much the case across the development site, they point to a late eighteenth to nineteenth century date range.

- ***Trench 50b:*** the two unstratified fragments of pottery from the trench are

probably of eighteenth century date.

- ***Trench 51a:*** pottery was recovered in small quantities from ***109***, and topsoil ***110***, brick from redeposited till ***117***, and salt-glazed drain from ***109***. The pottery points to nineteenth century activity, and it is possible that the black-glazed redware base from ***109*** was a waster, perhaps hinting at dumping, if not production, in the wider vicinity.

- ***Trench 51b:*** pottery from topsoils ***105*** and ***113*** indicate a (probably) earlier nineteenth century date for activity in the area. Building material from subsoil ***114*** cannot be dated.

- ***Trench 70b:*** this trench was amongst the more productive. Levelling deposit ***212*** was unusual in producing what has been tentatively identified as a very small fragment of Roman amphora. It must, however, be borne in mind that the deposit is quite likely to represent imported material; the only other find from this context being a small fragment of tapping slag. Most of the material from linear ***213*** is handmade brick, in a coarse fabric with a distinctive dense white fleck; a single fragment of pottery suggests a nineteenth century date. Similar brick also came from posthole ***281*** (fill ***280***), where again, pottery suggests a nineteenth century date. On the whole, unstratified pottery from this site confirms activity during a period from the late eighteenth century onwards, but fragments of earlier blackwares, agate ware, and a fine brown stoneware tankard base, indicate earlier deposition, perhaps spanning the late seventeenth to mid-eighteenth centuries.

- ***Trench 70c:*** all the stratified material comes from the same deposit (fill ***349*** of modern service trench ***348***). All point to nineteenth century activity, and all reflect domestic activity, being for the most part kitchen storage vessels. The unstratified material, both pottery and vessel glass, points to a later nineteenth century date at the earliest.

- ***Trench 70d:*** all finds from this site derive from stratified contexts. Bricks from foundation ***293*** are modern machine-made examples, one apparently coated with bitumen. A thick coarse brick from fill ***316*** of construction cut ***302*** is possibly earlier. A fourth fragment, from posthole ***336*** (fill ***334***) could well be earlier, perhaps eighteenth century, having a similar dense white fleck to material from Trench 70b. However, glass and pottery from the same fill are later, the glass pointing to a late nineteenth to early twentieth century date, and a large iron nail remains undated. Domestic pottery from pit ***377*** (fill ***375***) is perhaps earlier, white salt-glazed stoneware and a creamware plate with blue-painted rim perhaps indicating a late eighteenth to early nineteenth century date. Pottery from pit ***363*** (fill ***382***) was of similar or slightly later date.

- ***Trench 70e***: this site produced the largest assemblage of finds, with, perhaps the widest date range; the majority were stratified. Blackware from pit ***199*** (fill ***198***) is probably of late seventeenth to early eighteenth century date. Small undiagnostic fragments of creamware from posthole ***202*** (fills ***200*** and ***201***) can only suggest a late eighteenth century *terminus post-*

quem. Pit ***206*** (fills ***203*** and ***204*** and ***216***) produced a limited range of kitchen wares; the earliest possible was early eighteenth century, although the group as a whole would seem to be of broadly nineteenth century date. Brick from pit ***219*** (fill ***218***) remains undated. The fill (***294***) of pit ***295*** produced hand-made brick, a hand-forged iron nail and a small amount of animal bone, none of which are closely dateable.

The fill (***220***) of root disturbance ***221*** produced a single fragment of post-medieval hand-made brick, whilst that of root disturbance ***243*** produced two small and abraded fragments of medieval pottery in the Northern gritty tradition, and thus dated to the mid twelfth to mid fourteenth century, and a somewhat enigmatic rim fragment which could be as early as the third-fourth century AD. A single fragment of a Staffordshire slip-decorated dish came from ***279*** (=***284***), fill of linear feature ***283***, and can be dated to the late seventeenth to mid-eighteenth century. Well ***289*** produced a single fragment of clay tobacco pipe.

Apart from the presence of a third medieval sherd, the range of pottery from topsoil ***276*** represents the period from the late seventeenth century to the present day, and again indicates general domestic activity.

- ***Trench 75a:*** only a single fragment of post-medieval hand-made brick was recovered from a securely stratified deposit (***142***) a fill of ditch ***137***. The remainder, a range of late eighteenth to nineteenth century kitchen and table wares, was unstratified.

- ***Trench 76/77a:*** the majority of the finds from this trench are from pit ***181***. Pottery and glass point to a nineteenth or early twentieth century date for the fill. Pit ***160*** (fill ***161***) produced more of the distinctive white/cream flecked brick, and two fragments of tapping slag. A single fragment of the neck of a small magnesium-flecked bottle or flagon, from possible coal pit ***184*** (fill ***185***) could offer a date for its backfill in the later seventeenth or early eighteenth century. Unstratified material again suggests a late eighteenth century or later date for activity in the immediate area.

- ***Trench 78a:*** all finds from this trench were unstratified. Considered together, they suggest later nineteenth to possibly mid-twentieth century activity.

- ***Trench 87b:*** a single fragment of pottery from fill ***357*** of pit ***355*** is probably of nineteenth century date, and two fragments of hand-made brick in an extremely coarse fabric (inclusions up to 30 mm long) came from pit ***356*** (fill ***358***).

- ***Trench 87c:*** the majority of finds are from pit ***365***, again there is nothing earlier than the late eighteenth century, and the general impression is that all is of nineteenth century date. Fragments of hand-made brick were recovered from fill ***369*** (pit ***368***) and fill ***375*** (pit ***378***), the former seemingly deliberately knife-cut to an unusual shape (now mainly lost).

4.15.13 ***Discussion:*** it is difficult to comment on the two small and equivocal fragments thought possibly to be of Roman date, as both derive from contexts

where they could well have been imported dumping material, and could thus have little relevance to the development of the site in question. In general, it would seem that the very limited amount of abraded medieval pottery hints at some early activity at Site **70**, although the amount and present condition might suggest that it reached the site in material dumped in a tree-throw, or in midden waste spread as manure.

4.15.14 The main focus of activity at all of the sites lies in the late eighteenth to nineteenth century, when relatively substantial amounts of domestic pottery and smaller amounts of glass were being deposited. The fragments are all of reasonable size and relatively unabraded, suggesting that they have not moved far from their original place of deposition. It must, however, be noted that a few of the smaller Creamware sherds are frost-spalled, perhaps suggesting that some of the material reached the site through an agricultural vector. None of the finds from any of the sites across the development area, however, warrant further analysis.

4.16 ENVIRONMENTAL SAMPLES

4.16.1 ***Introduction:*** three bulk environmental samples were taken in total. Two samples were from pit ***83***, and one from ditch ***87***. They were all taken from secure contexts for the assessment of charred and waterlogged plant remains. The different feature types are shown in Table 3. It was hoped that the samples would inform about the economy and environment on and around the site during its period of use.

Feature	**Number of samples**
Pit ***83***	2
Ditch ***87***	1

Table 3: Number of samples from each feature type

4.16.2 ***Quantification:*** three bulk samples were taken and processed for the assessment of charred and waterlogged plant remains. Two samples were processed for this assessment. The sample from fill ***83***, in pit ***84***, was 2 litres in volume, and that from fill ***88*** of ditch ***87*** was 32 litres in volume.

4.16.3 ***Method:*** the samples were hand-floated and the flots were collected on 250 micron mesh and air dried. The flots were scanned with a Leica MZ6 stereo microscope and the plant material was recorded and provisionally identified. The data are shown on Table 4 below. Botanical nomenclature follows Stace (1991). Plant remains were scored on a scale of abundance of 1-5, where 1 is rare (less than 5 items) and 5 is abundant (more than 100 items). The components of the matrix were also noted.

4.16.4 ***Assessment of the plant remains:*** the results of the assessment are shown in Table 4. Both samples contained charcoal in abundant quantities. The sample from the ditch fill, ***88***, contained charcoal which was mostly <4mm. The sample from the pit fill had abundant quantities of charcoal >4mm.

4.16.5 Plant material was absent from the ditch sample and only a few *Juncus* (rushes) seeds were found in the pit sample.

4.16.6 ***Potential of the plant remains:*** there is no potential for the further analysis of the samples for plant remains. However, the charcoal present would provide material for radiocarbon dating if necessary.

Sample No	**Ctxt**		**Sample vol (l)**	**Flot description**	**Modern organic contamination**	**Plant remains**	**Potential**
1	***84***	Pit	2	125 ml. Charcoal <4mm (5) >4mm (5), Coal (1),	Modern roots (3), Earthworm egg cases (1)	CPR (1) Juncus	None
3	***88***	Ditch	32	300 ml. Charcoal <4mm (5) >4mm (2), Coal (2), Clinker (2),	Modern roots (5), Earthworm egg cases (1)		None

Table 4: Assessment of charred and waterlogged plant remains.
Plant remains scored on a scale of 1-5 (where 1 is rare (1-5 items) and 5 is abundant (more than 100 items)). CPR= Charred plant material.

5. DISCUSSION

5.1 CONCLUSIONS

5.1.1 No features of archaeological significance were located at Sites **5**, **36**, **37**, **50**, **51**, or **78**. For Sites **36**, **37**, **50** and **78** this may be due to the fact that the evaluation was targeting fieldnames. A relatively small portion of each field was evaluated, suggesting that there may be evidence elsewhere, or it is possible that any remains would be relatively ephemeral, such as at Site **37**, when the name may refer to the laying out of the bleached cloth for instance. At Sites **5** and **51** evidence of previous farmsteads was expected. However, no evidence relating to any domestic activity of any nature was even recovered. At this stage of the investigation, there are two possible explanations; either that the evaluation areas were positioned in the wrong place, or that the remains have been completely truncated by more recent activity. This is likely to have occurred at Site **87** where a dwelling known as The Hursts was sited. Evidence of this would seem to have been removed entirely by the later extraction pits.

5.1.2 Of relatively low archaeological significance were the field boundary ditch and drainage features at Site **75**. Nevertheless, significant archaeological remains of the sites targeted by trial trenching were found at Sites **35**, **42**, **70,** and **76** and **77**, all of a post-medieval date. These included substantial remains consisting of foundations, floor surfaces and a still intact vaulted cellar belonging to the farmstead 'The Ashes' (Site **35**). In the field known as 'Cinder Hill' deposits of slag were found, correlating with the magnetic anomaly in the geophysical survey (Site **42**). At Sites **76** and **77** two coal pits were identified, together with other features post-dating the infilling of the coal pits. It is speculated that the presence of the infilled coal pits resulted in highly waterlogged ground after the return of the land to agricultural use, and the identified linear features, as well as the sump, are seen as attempts to drain the area.

5.1.3 Extensive archaeological remains of the sixteenth or seventeenth century Wharton Hall were located in trenches at Site **70**, including the floor, foundations and levelling deposit for the Hall itself. It is clear that remains of this structure, as well as a later red brick and other nineteenth and twentieth century buildings, survive *in situ* below ground level. Other earlier features include a well backfilled in the later post-medieval period, although its inception date at present is undetermined, and a possible plot boundary ditch. No substantial evidence of a medieval predecessor was found during the trenching, although there was the remains of an earlier cobbled surface revealed of an unknown date, and a very small number of unstratified sherds of possible medieval date were recovered. Extensive levelling deposits were revealed, with areas of truncation on the eastern side below the flagged floor, and disturbance from later post-medieval or twentieth century structures on the western side. This may be one explanation as to the lack of any remaining evidence for the medieval Hall, which is supported by the majority of the finds dating to the eighteenth to twentieth centuries.

5.1.4 The research on the development of the historical mining activity within the study area showed Bank House Colliery and Wharton, or Charlton, Colliery dated to the mid nineteenth century. Both sites were buried beneath spoil tips of coal waste when the mining activity had ceased and the mines abandoned. Consequently, removal of the spoil has the potential to reveal remains of the pits and other associated workings. Wharton Hall Colliery, at the southern end of the site, dates to the later nineteenth and early twentieth century, and was abandoned and demolished in the 1960s. As with the fates of Bank House and Wharton/Charlton Collieries, Wharton Hall Colliery was also buried beneath colliery waste and has now been succeeded by scrub vegetation and birch woodland.

5.2 IMPACT AND RECOMMENDATIONS

5.2.1 The development of the area will have significant impact on the archaeological remains described, either through mining, construction of infrastructure or landscaping. As such, it is recommended that further archaeological work be undertaken.

5.2.2 ***Site 35:*** it is recommended that the remains of Ashes Farm be exposed in their entirety to allow the layout and structure of the farmstead to be recorded and located in plan, with a suitable written and photographic record. This will allow the full remains to be understood. The cellar should be investigated by clearing what debris can be safely removed from the doorway. If the structure is deemed unsound then any further recording of the cellar must be completed from this position, including a total station and photographic survey. On present information from the evaluation, it is not proposed that any excavation beyond that detailed above be undertaken, unless evidence of structures or features predating the identified post-medieval Ashes Farm is subsequently revealed, in which case the programme of archaeological work would need to be reviewed to allow for further archaeological excavation.

5.2.3 ***Site 42:*** the deposits of slag identified at Cinder Hill indicate the presence of a bloomery furnace in the vicinity, although this activity is as yet undated. The presence of one sherd of thirteenth century pottery is suggestive, although not conclusive, of an early date for the furnace, as it may have been imported with the slag deposits. The position of such a furnace within the evaluation area would have been seen as a very strong magnetic anomaly in the geophysical survey. Therefore, it may lie outside of the survey area. However, it is recommended that the entire area of the geophysical anomaly at Site **42** identified by Archaeological Surveys (2005) be opened, with the removal of all the topsoil followed by the excavation of any archaeological features, structures or layers should they be present.

5.2.4 ***Site 70:*** the entire area, including beyond the speculated position of a moat, of the Wharton Hall site should be excavated prior to any development. The objectives of the excavation should include the recording of the post-medieval hall and associated buildings and features, the further understanding of the development of this site, and to confirm and record the presence of the possible medieval structures and features. The location or absence of the

speculated moat would confirm or dismiss the presence of a medieval moated manor at the site, even if the entire platform of the site has been truncated by later activity.

5.2.5 During the evaluation phase, security at this site proved highly problematic mainly due to numerous thefts and vandalism, as well as threats to staff welfare despite Police monitoring. This impacted on the progression of fieldwork and on site recording. Consequently, any further work at the site would require the imposition of various security measures by the client, ensuring that it is securely fenced with permanent on-site security personnel to provide safe working conditions for archaeological staff, and to protect the site overnight during excavation.

5.2.6 ***Sites 76 and 77:*** although evidence of mining activity was located at Sites **76** and **77** in the form of two coal pits, an archaeological excavation is not considered safe due to the dangers of collapse within the coal pit itself. Other features are thought to post-date this mining activity. However, an archaeological watching brief is recommended at the site to locate the outline of any coal pits. This would also allow for the identification and recording of any further archaeological features within the constraints of the watching brief, or the instigation of an archaeological excavation should significant structures or features be identified associated with this early industry.

5.2.7 ***Other watching brief areas:*** no clear evidence of the farmsteads at Sites **5**, **51** and **87** were located. However, location of buildings from historic maps can be problematic. It was also noted that the topography at Site **51** was considered unsuitable for such buildings, due to the gradient of the slope down to the stream, and it is suggested that the site may be located to the south of the adjacent trackway. It is therefore recommended that a watching brief should be maintained in the surrounding environs of these sites to identify any structures that may be located beyond the evaluation areas. Watching briefs are also recommended to cover the mid nineteenth century workings at Bank House Colliery (Site **61**), Wharton Colliery (Site **114**) and Wharton Hall Colliery (Site **89**). These should primarily aim to locate and record any features or structures associated with these collieries, as well as locating the extent of coal pits. It is not recommended that any archaeological excavation work should take place in vicinity the coal pits due to the dangers of collapse.

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6.2 PRIMARY SOURCES

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7. ILLUSTRATIONS

7.1 FIGURES

7.2 PLATES

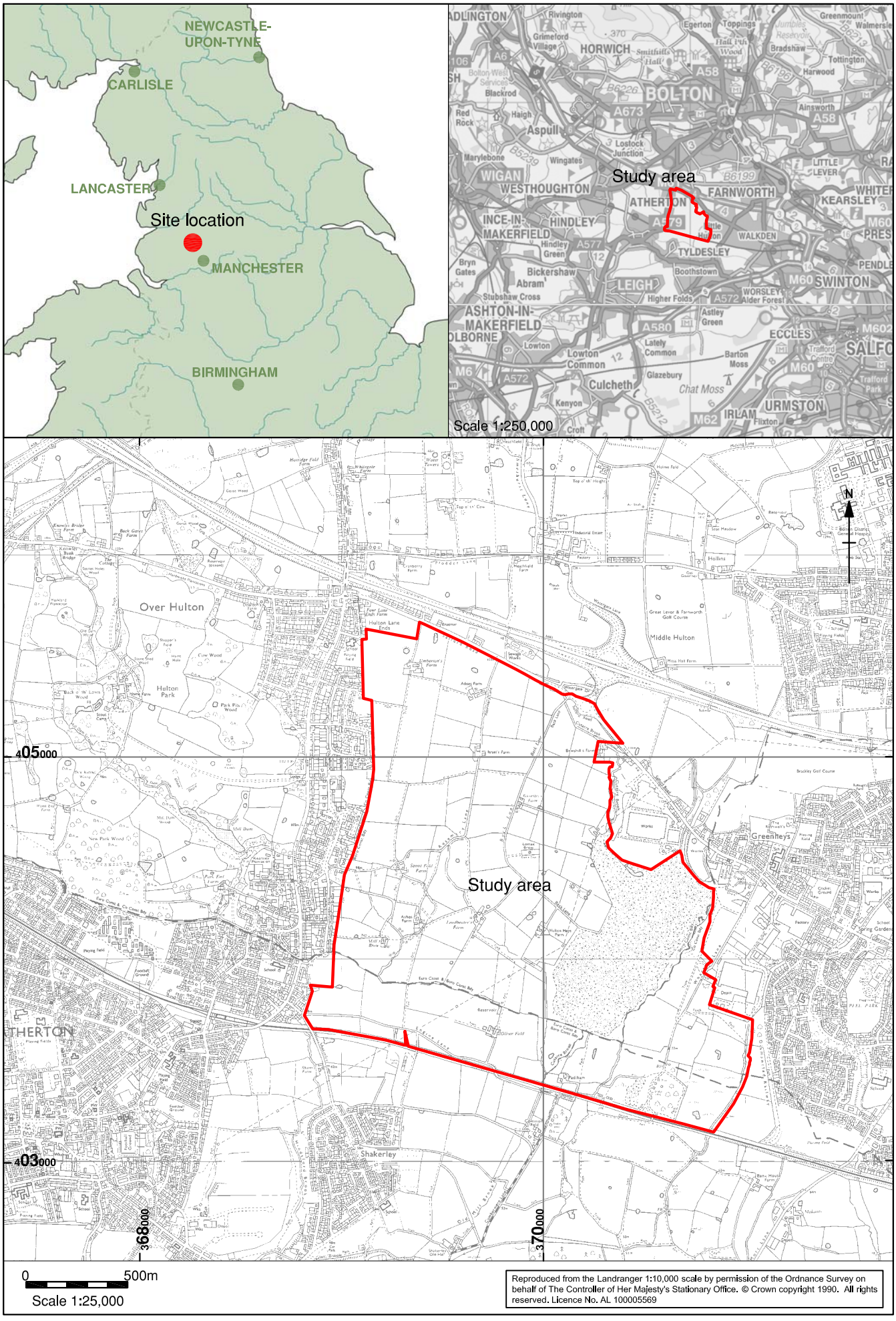


Figure 1: Site Location

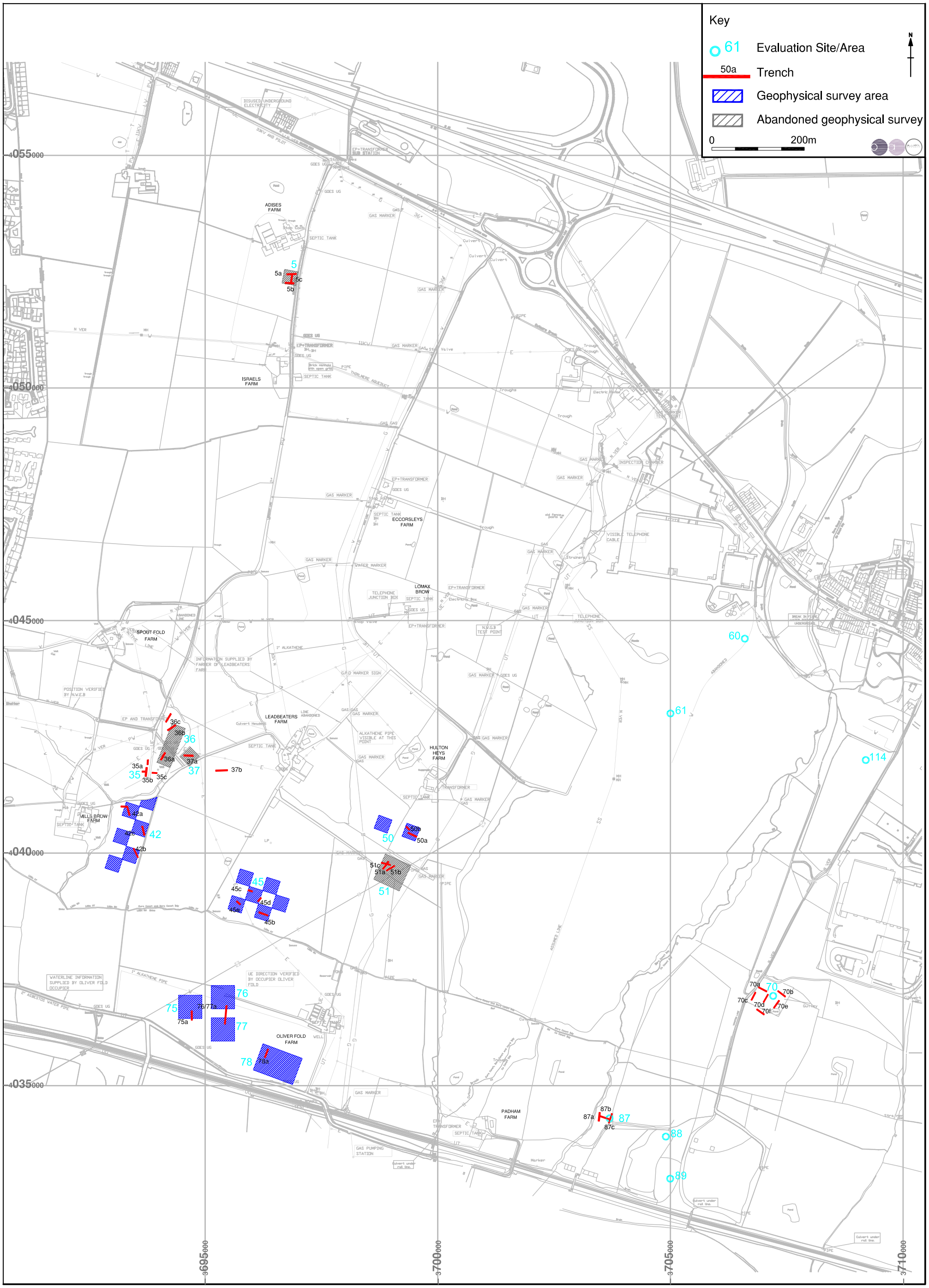


Figure 2: Plan showing gazetter sites (UMAU 1996) and areas evaluated with geophysical survey and trial trenching

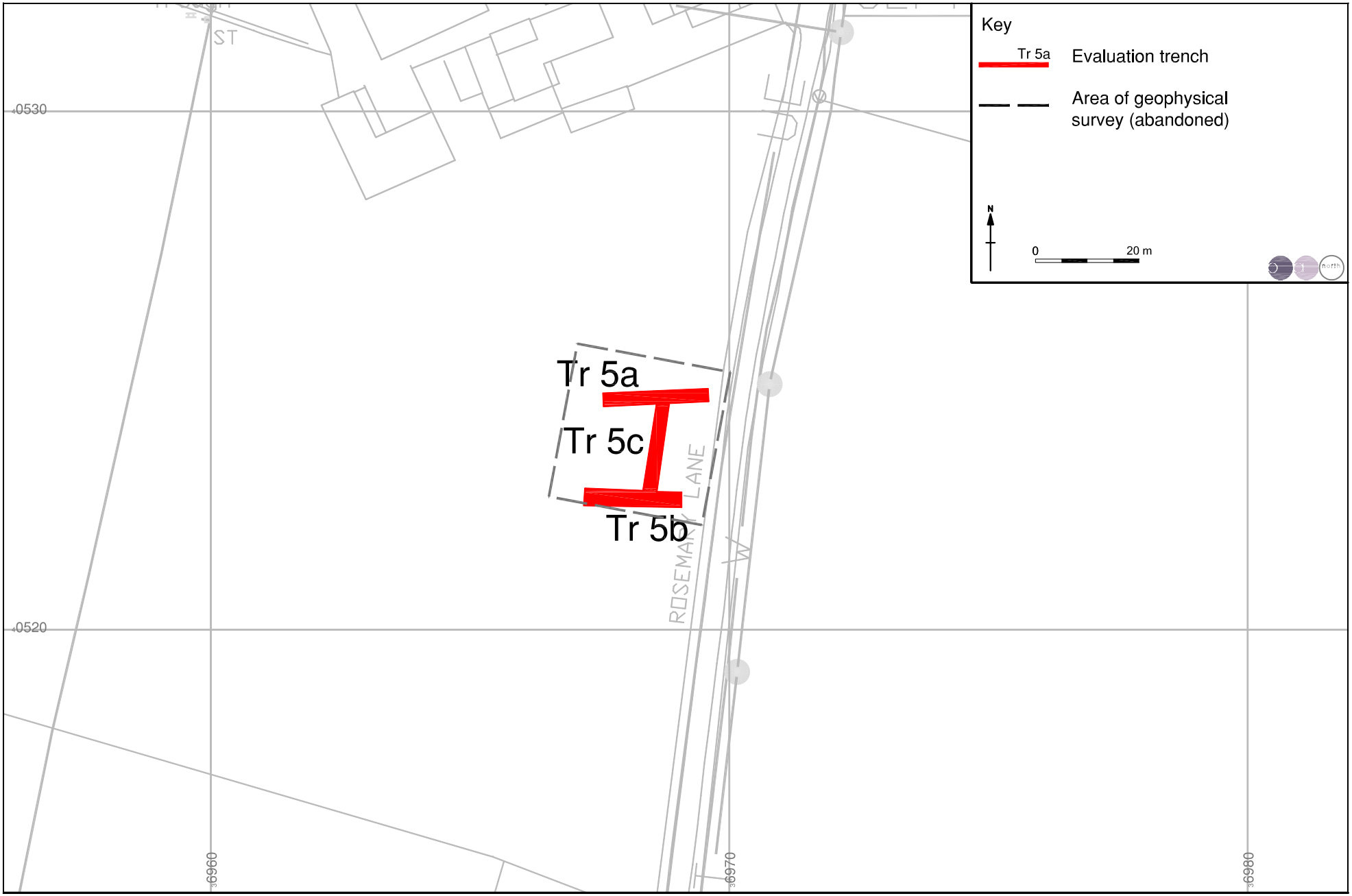


Figure 3: Plan showing position of trial trenches for Site 5

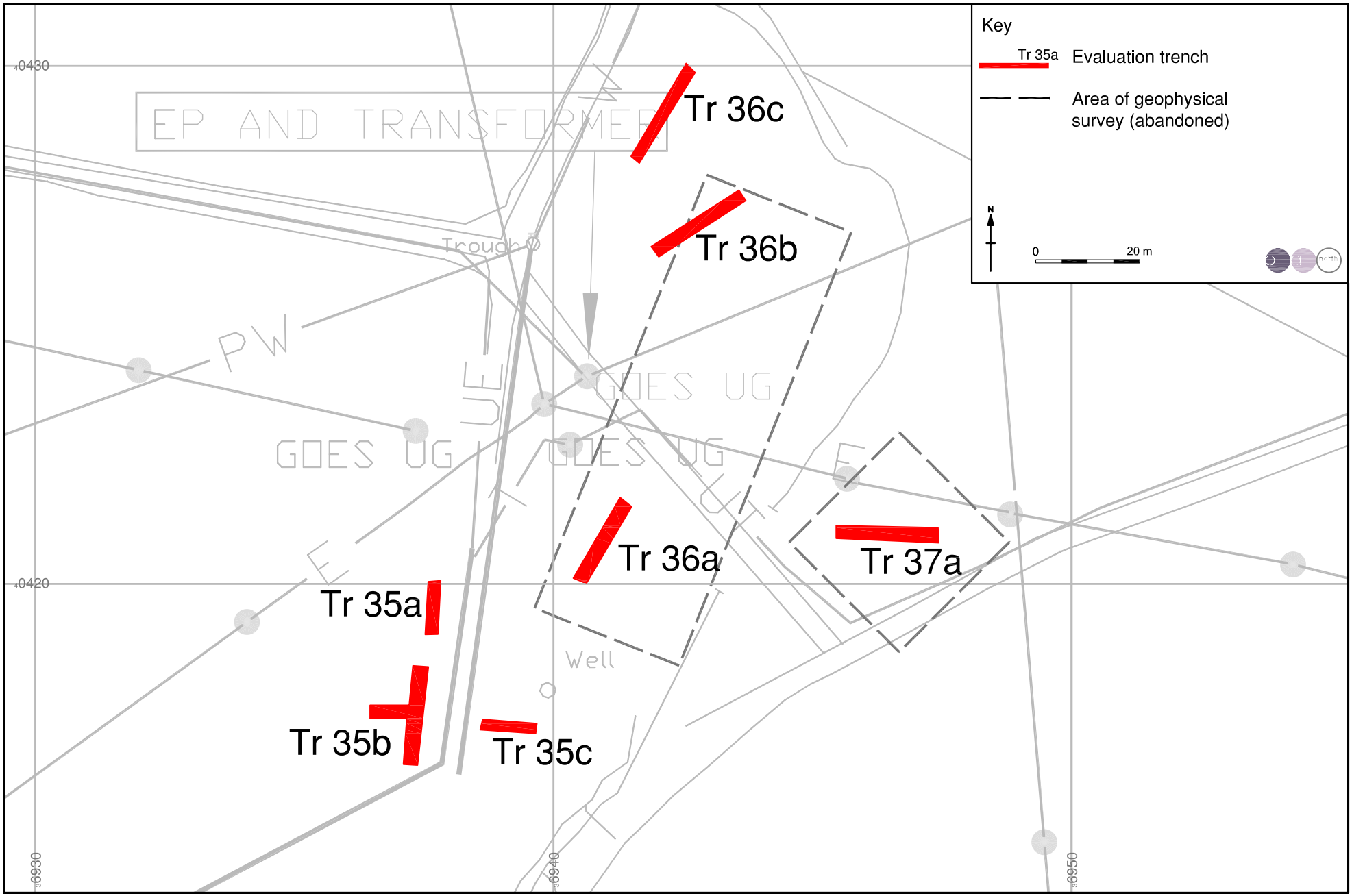


Figure 4: Plan showing position of trial trenches for Sites 35, 36 and 37

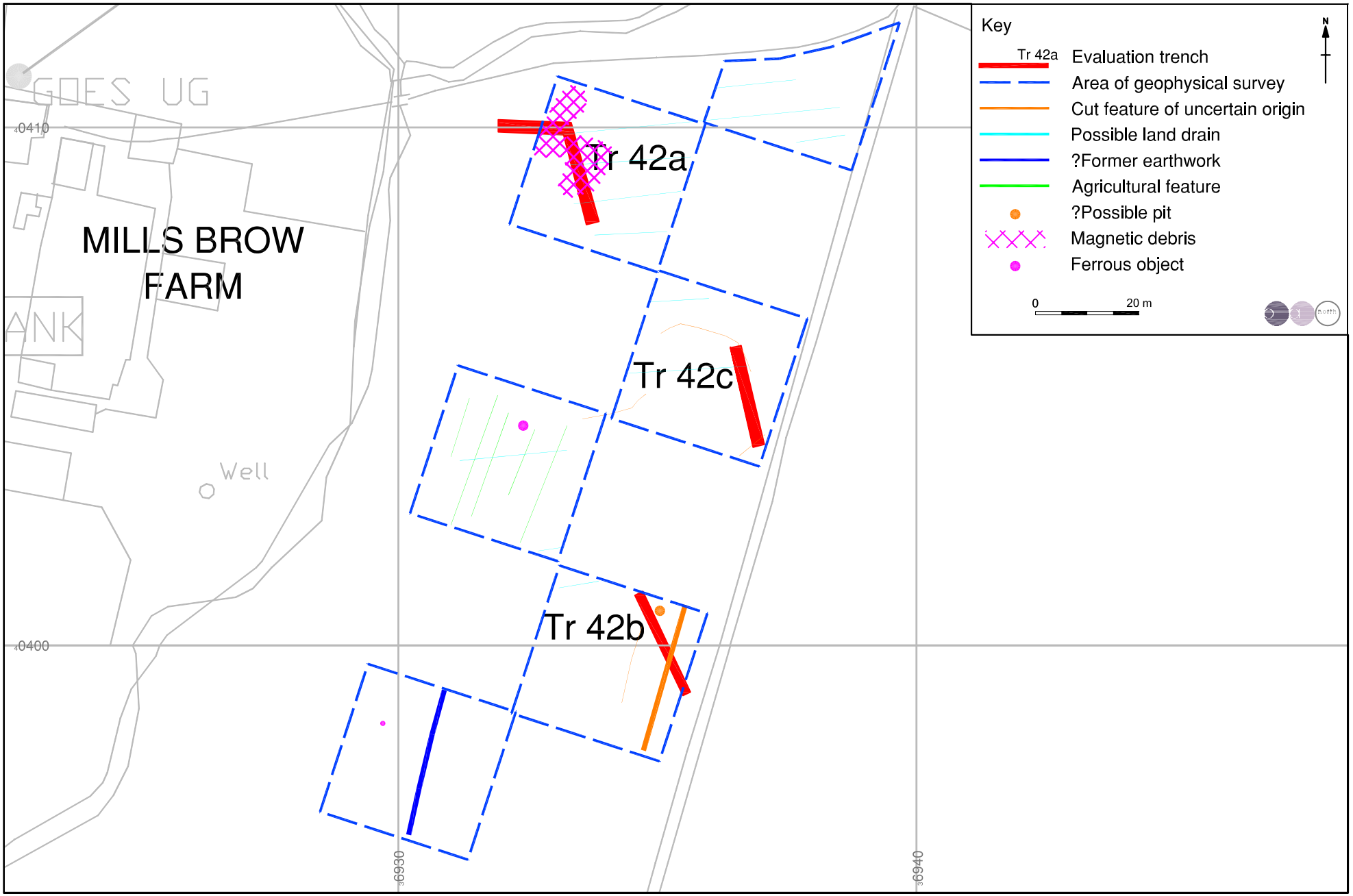


Figure 5: Plan showing position of trial trenches in relation to geophysical anomalies for Site 42

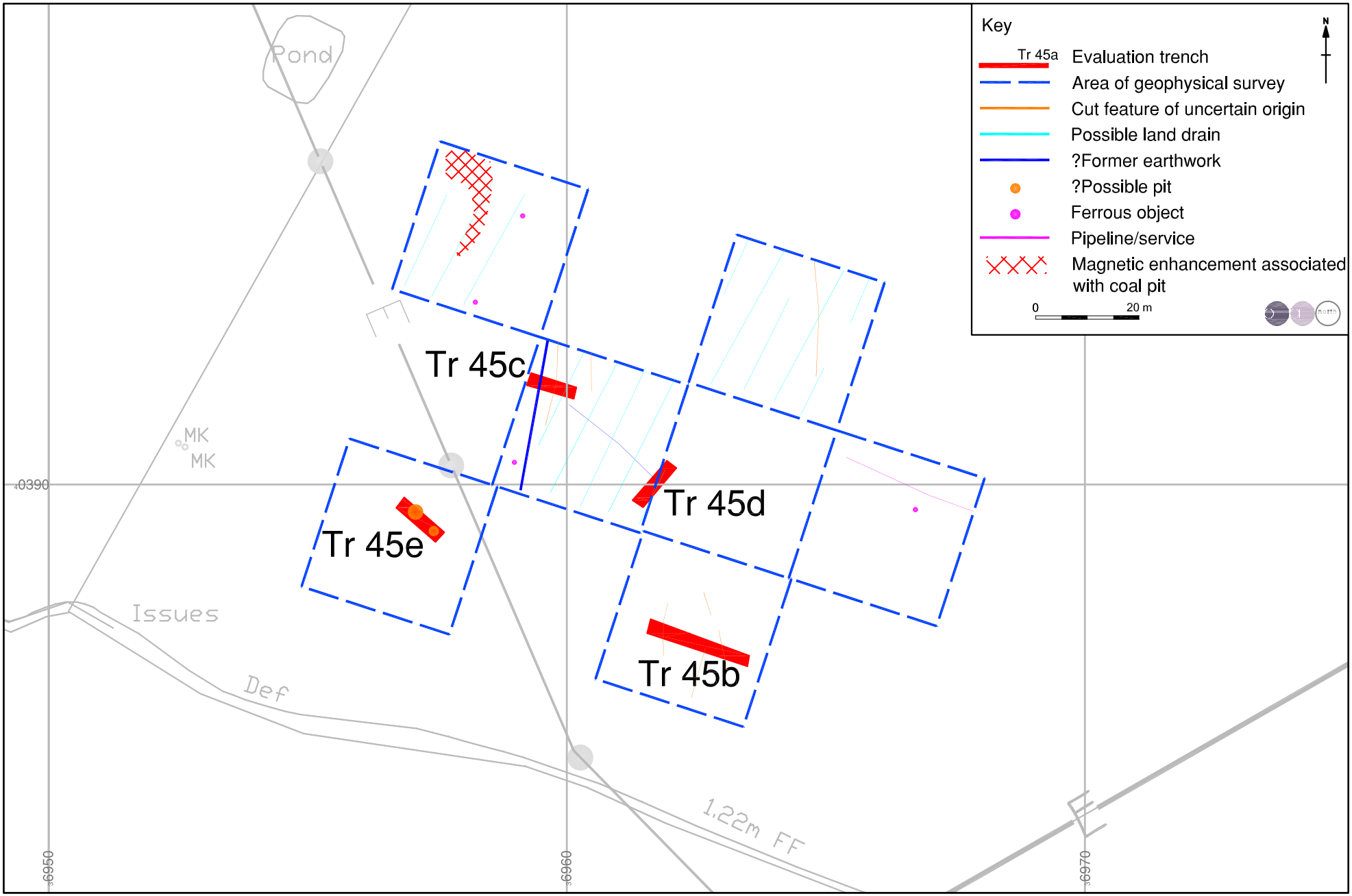


Figure 6: Plan showing position of trial trenches in relation to geophysical anomalies for Site 45

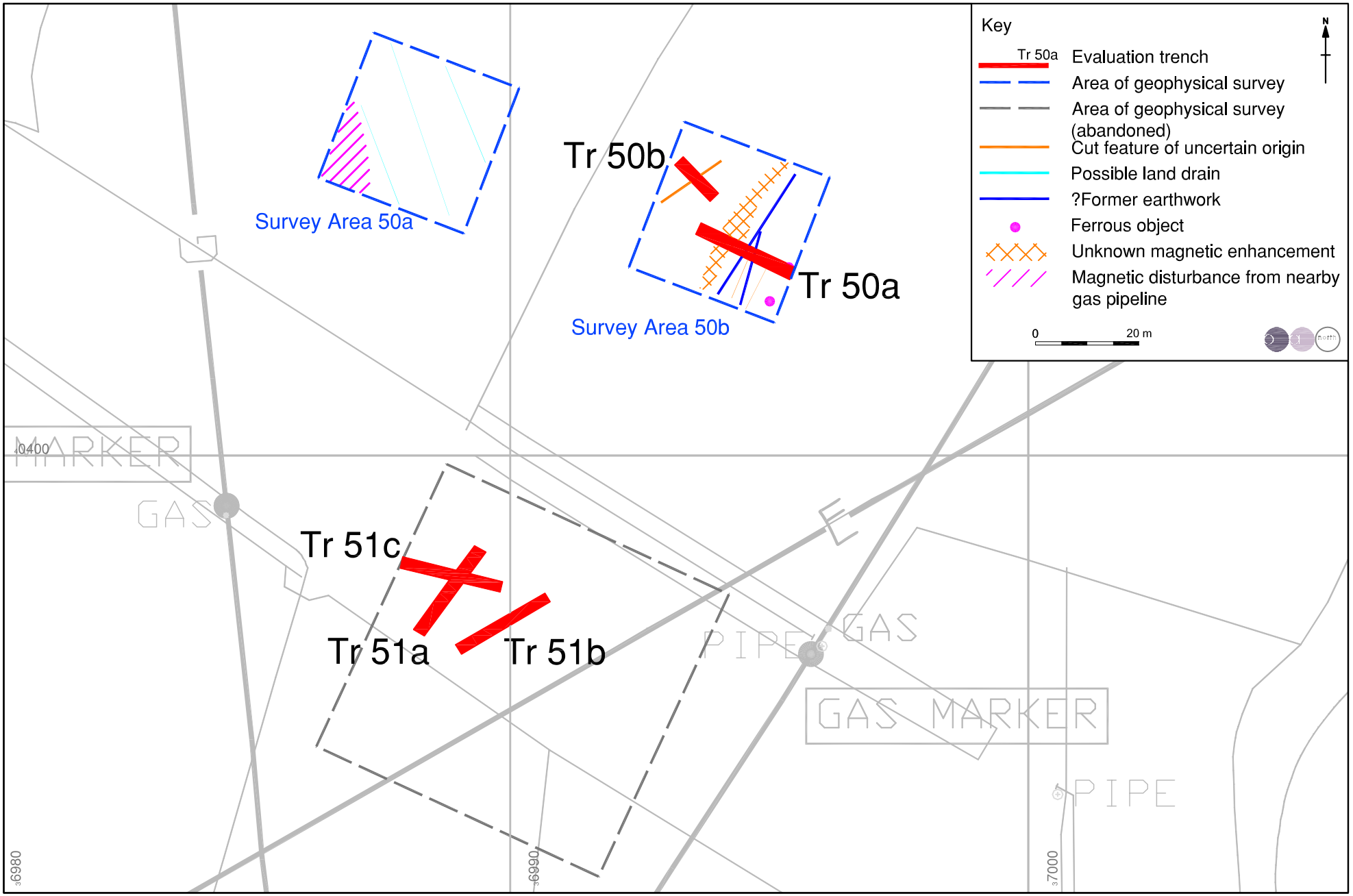


Figure 7: Plan showing position of trial trenches for Site 51 and in relation to geophysical anomalies for Site 50

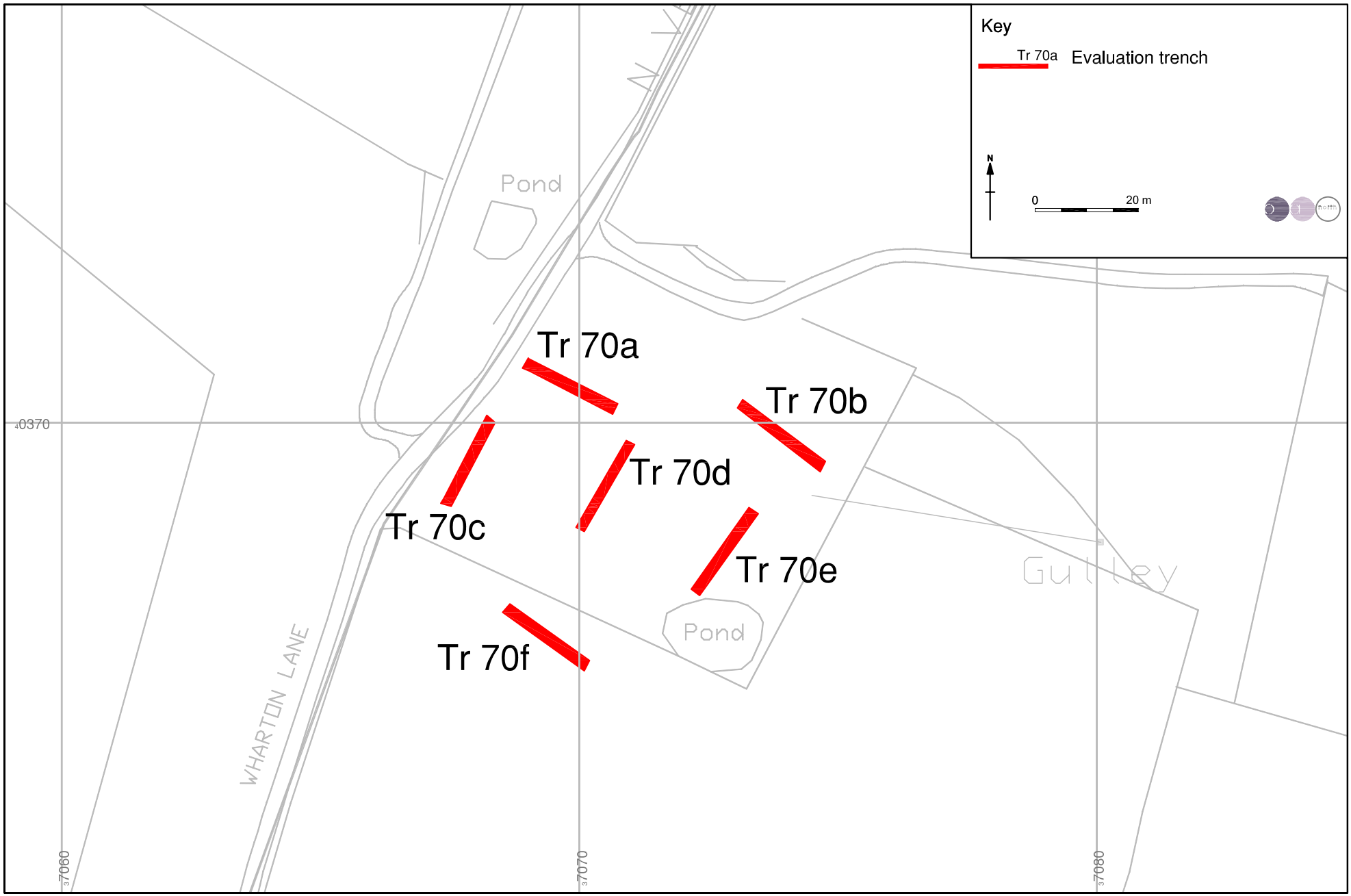


Figure 8: Plan showing position of trial trenches for Site 70

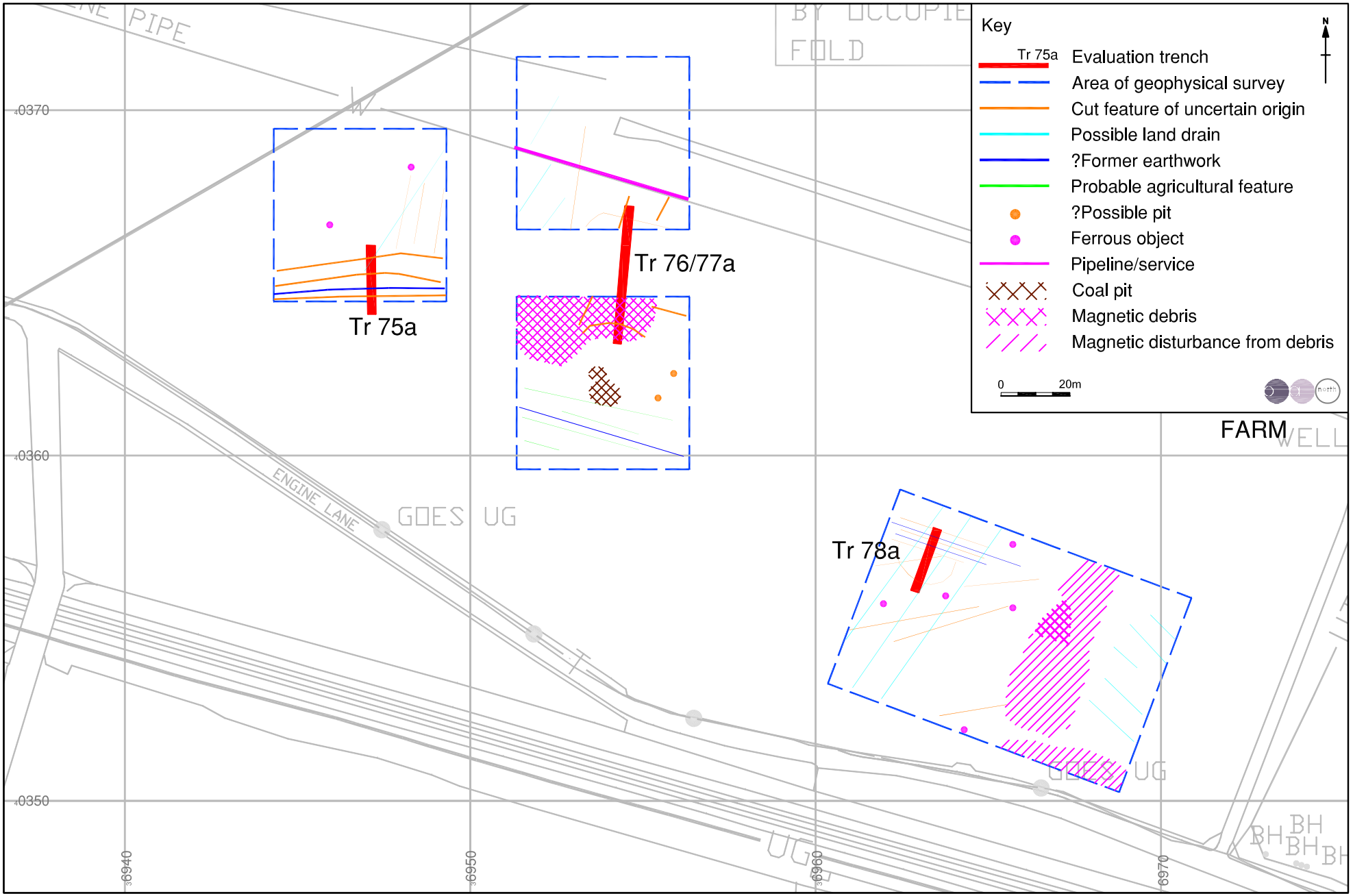


Figure 9: Plan showing position of trial trenches in relation to geophysical anomalies for Sites 75-78

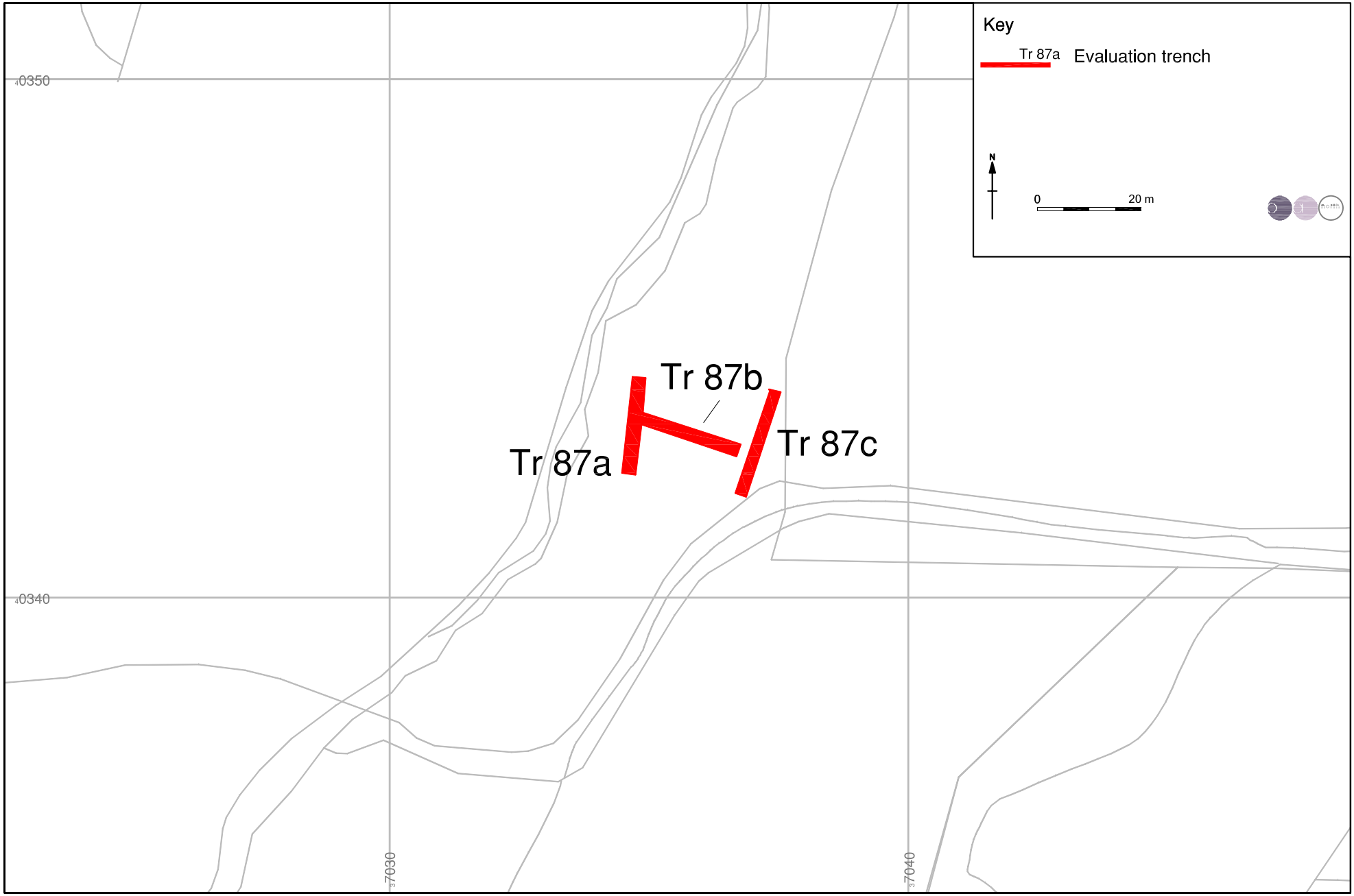


Figure 10: Plan showing position of trial trenches for Site 87

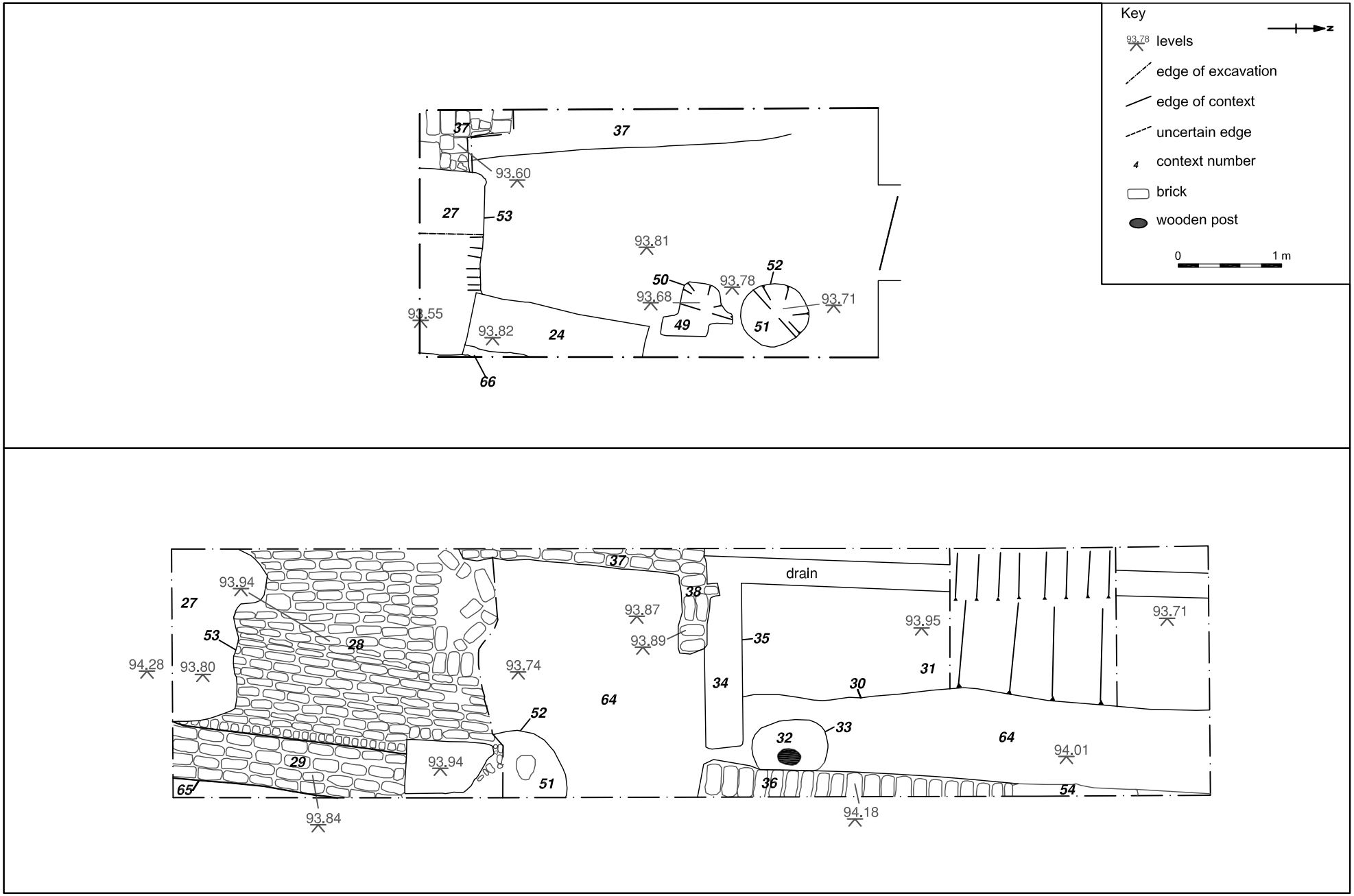


Figure 11: Plan of Trench 35a, showing the features below the brick floor, ***28*** (top)

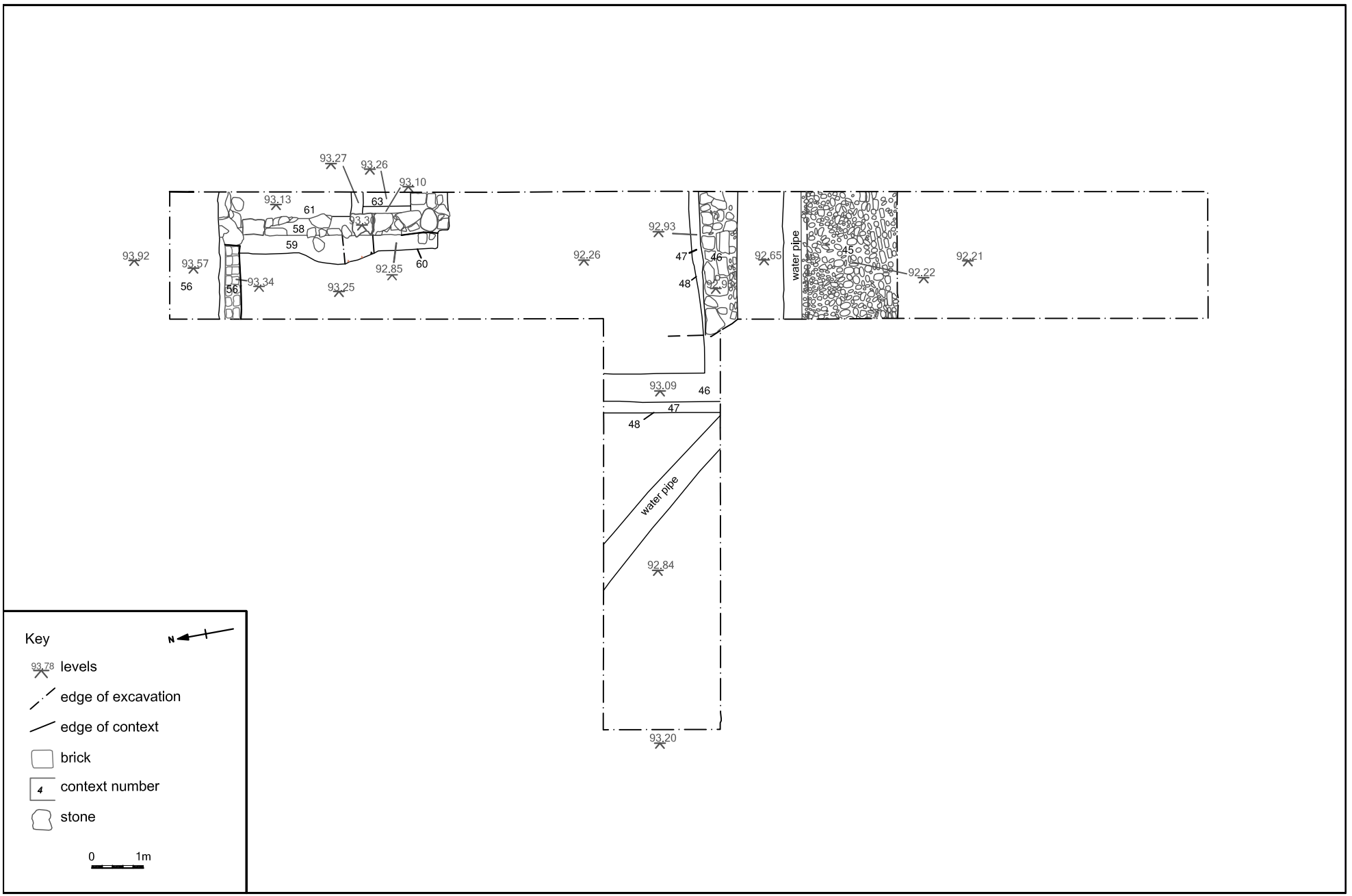


Figure 12: Plan of Trench 35b

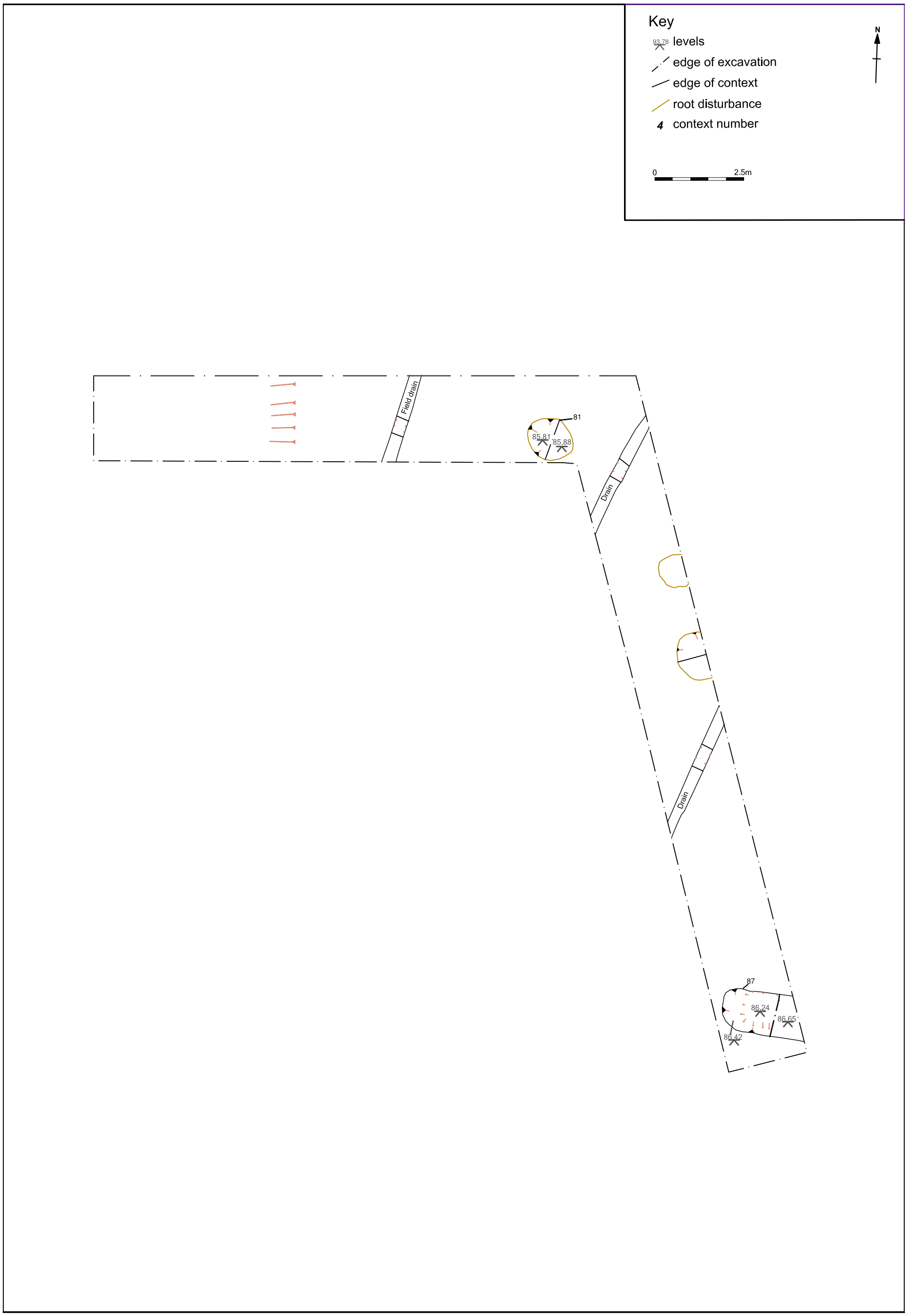


Figure 13: Trench Plan of 42a

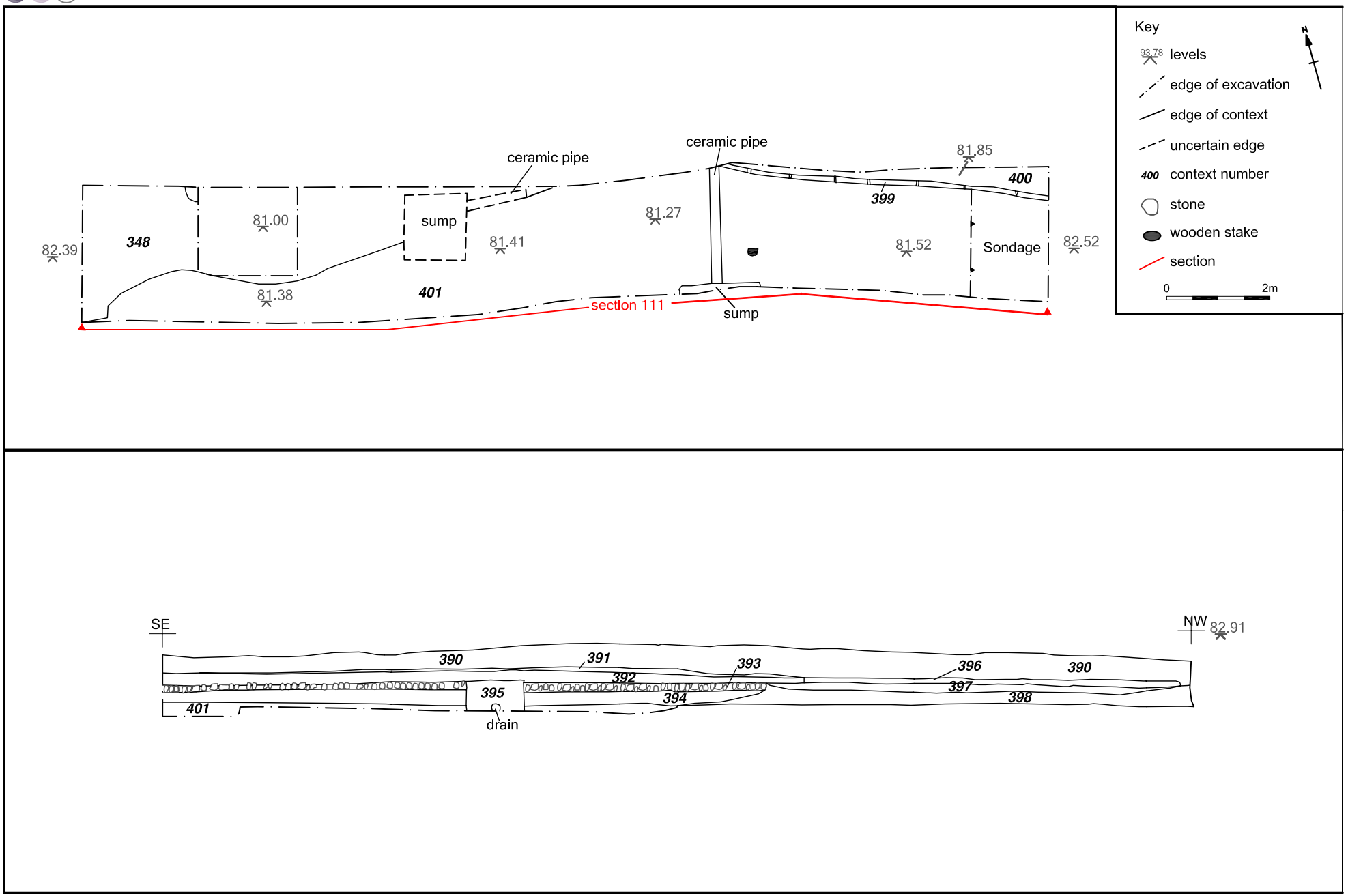


Figure 14: Plan of Trench 70a and detail of section 111

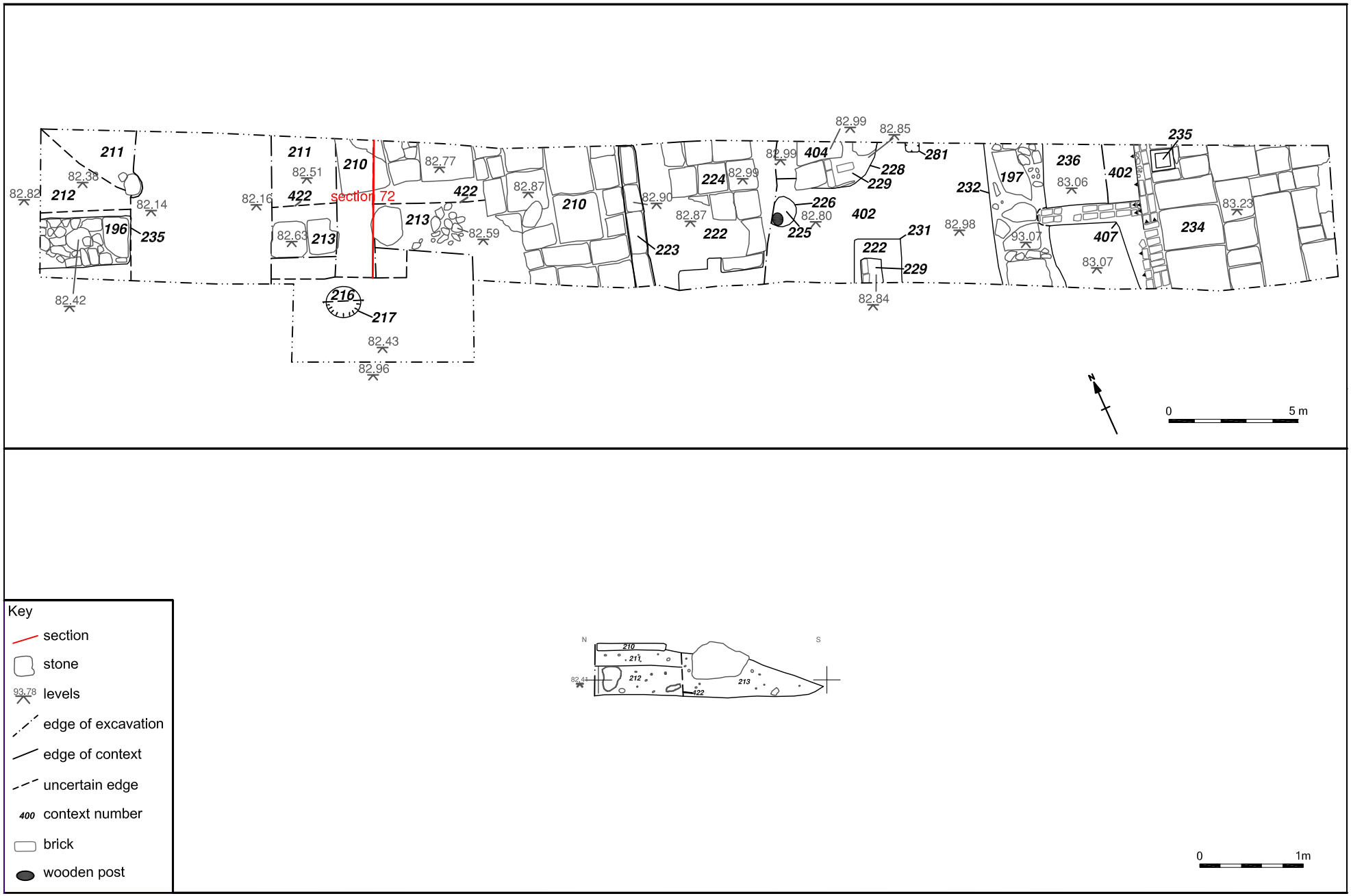


Figure 15: Plan of Trench 70b and detail of section 72

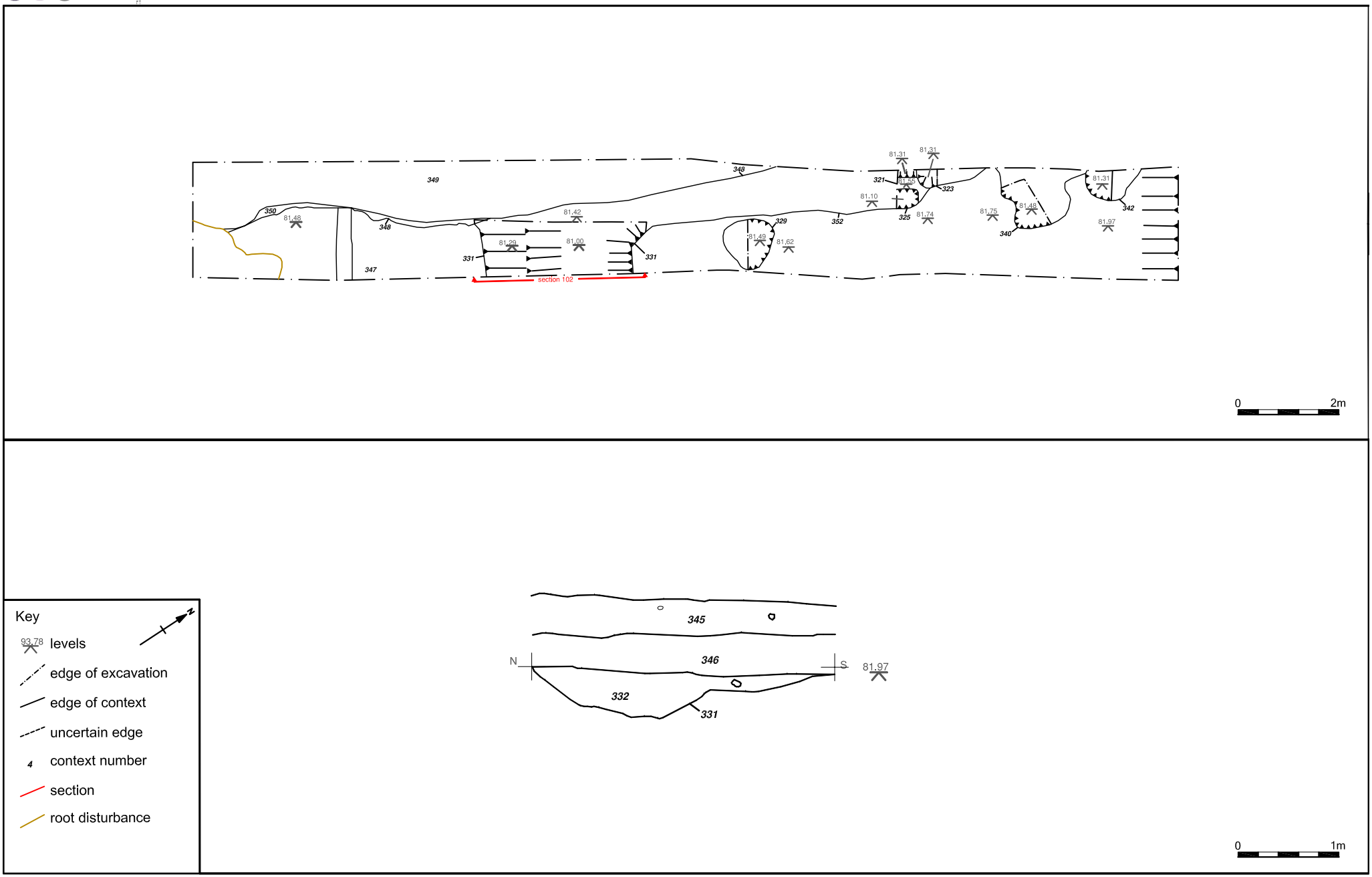


Figure 16: Plan of Trench 70c and detail of section 102

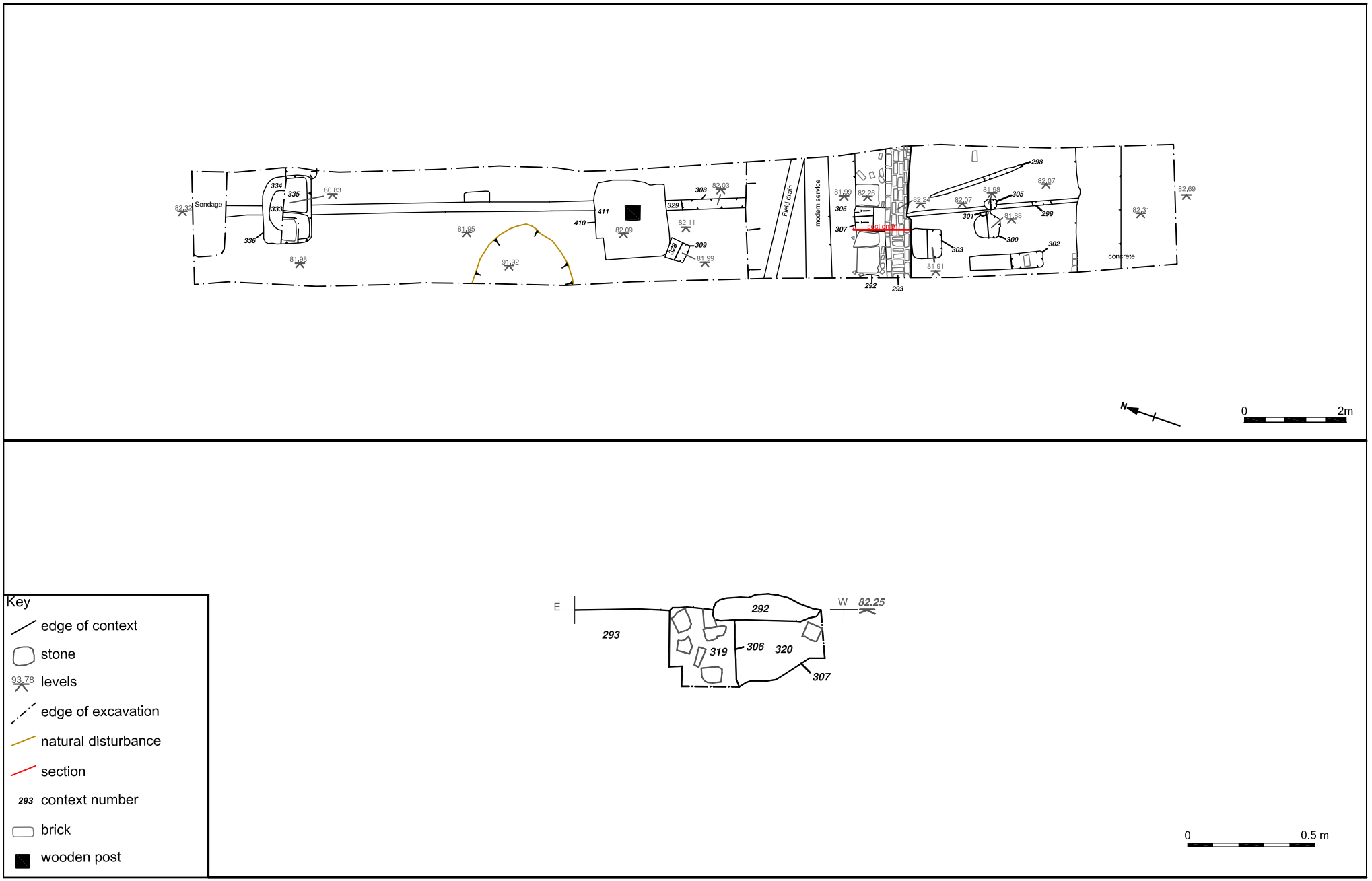
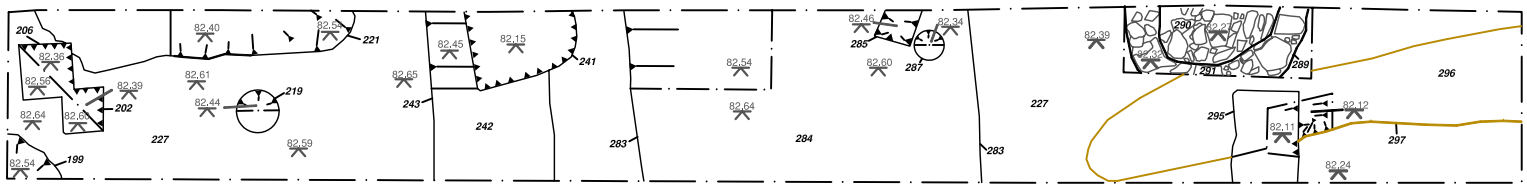


Figure 17: Plan of Trench 70d and detail of section 91



Key

93.78 levels

edge of excavation

edge of context

truncated

4 context number

natural disturbance

stone

N

0 2m

Figure 18: Plan of Trench 70e

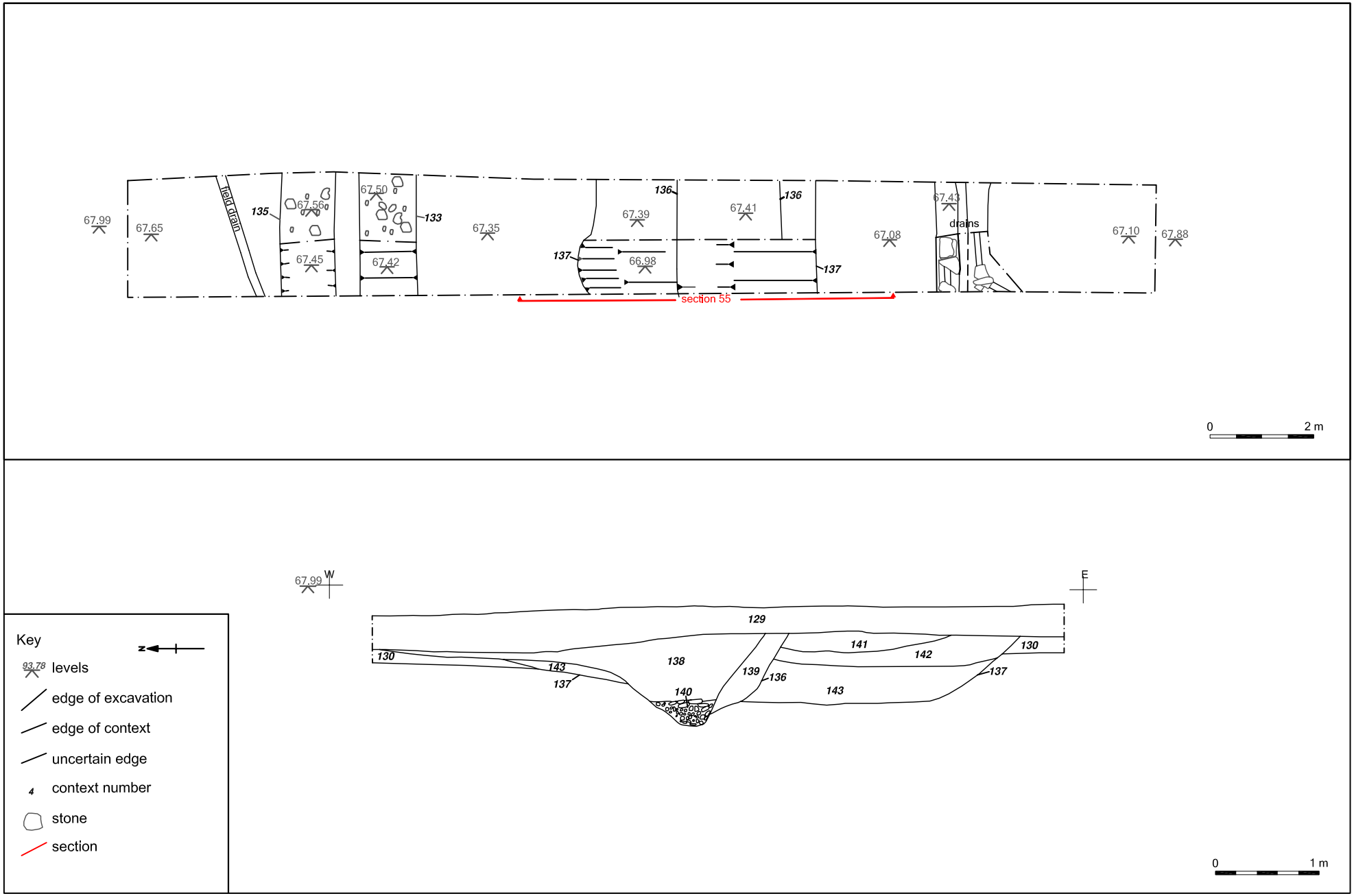


Figure 19: Plan of Trench 75a and detail of section 55

Key

93.78 levels

edge of excavation

edge of context

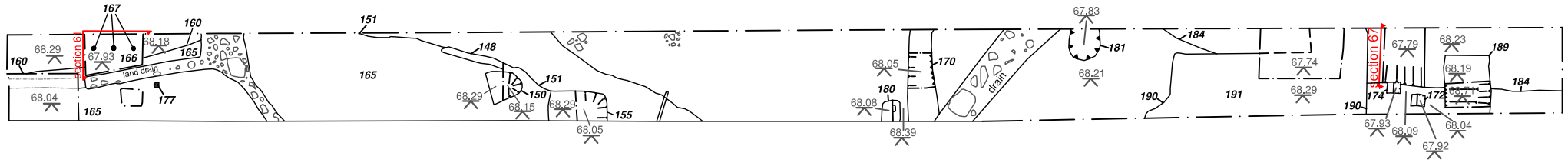
uncertain edge

184 context number

stone

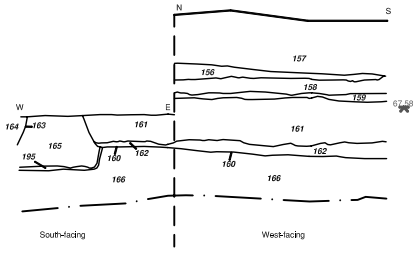
wooden post/stake

section

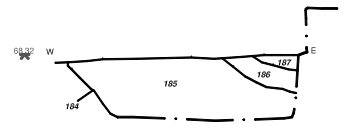


N

0 2 m



0 1m



0 1m

Figure 20: Plan of Trench 76-77a and detail of sections 61 and 67

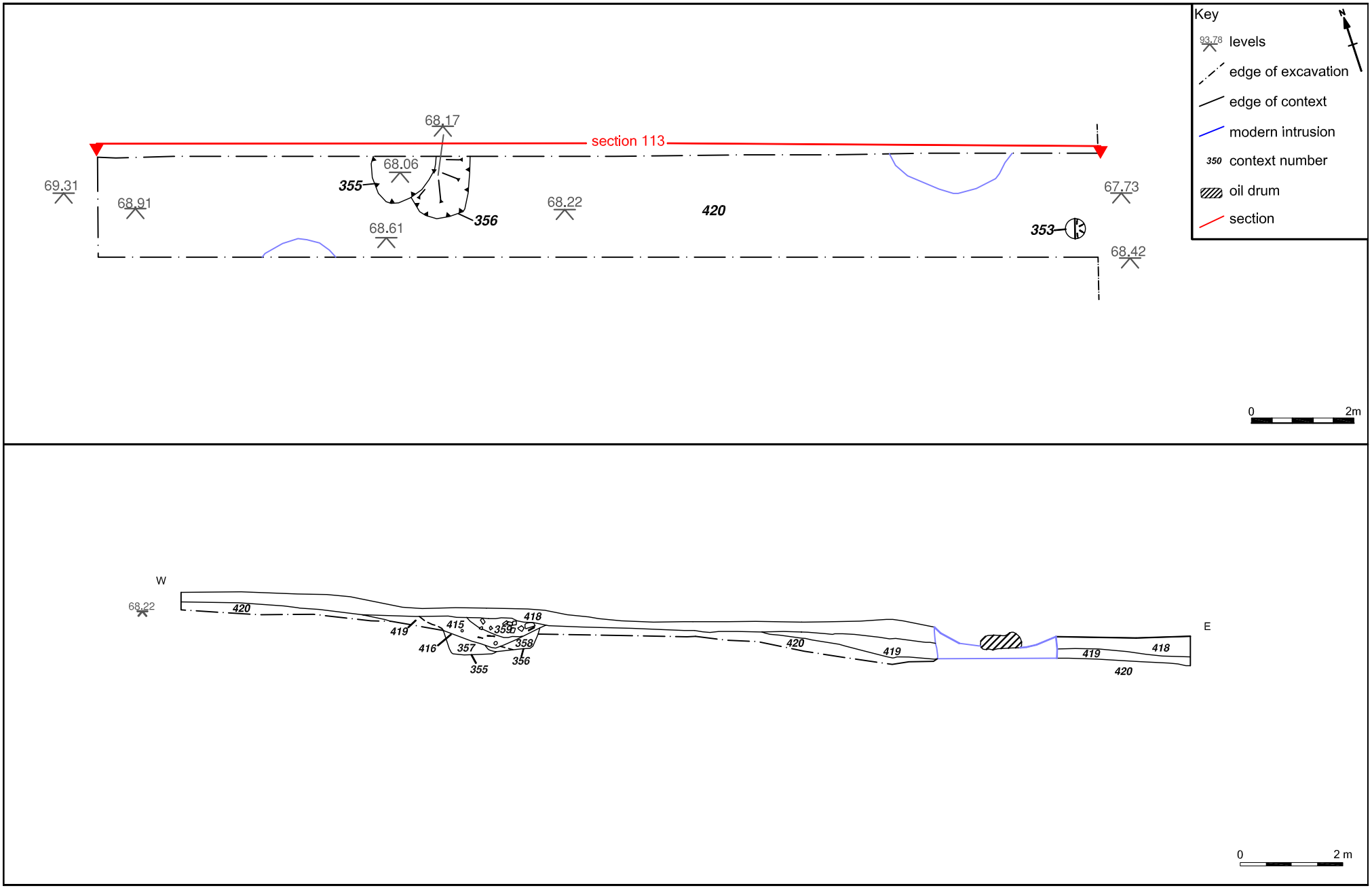


Figure 21: Plan of Trench 87b and detail of section 113

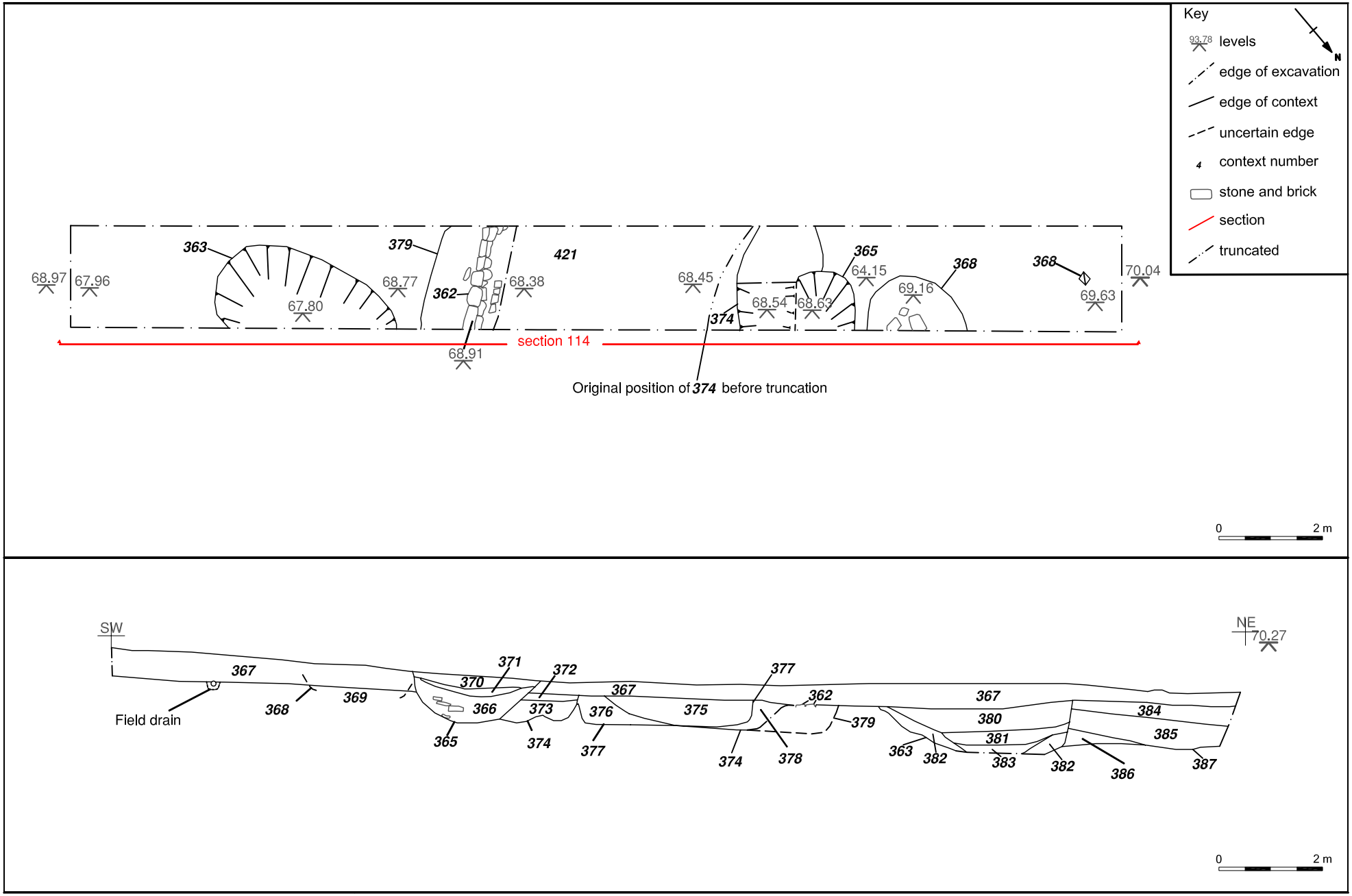


Figure 22: Plan of Trench 87C and detail of section 114

Plate 1:Extract from the 1850 First Edition Ordnance Survey map, 6", showing Bank House and Wharton Collieries

Plate 2: Map from the 1867 lease documents showing Bank House Colliery (E3/108)

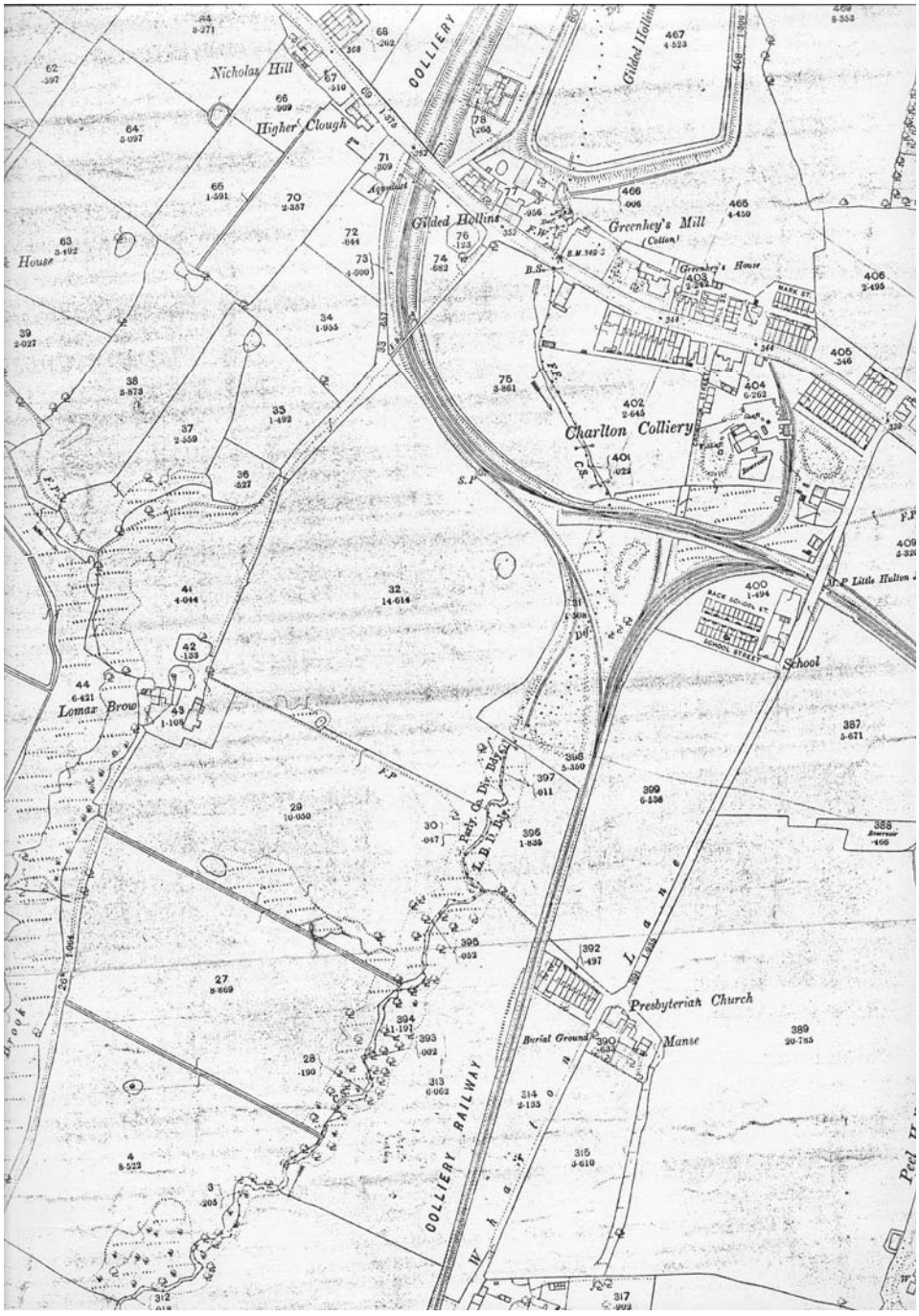


Plate 3:Extract from the 1891 Ordnance Survey map, 1:25", showing the former location of Bank House Colliery and Charlton Colliery

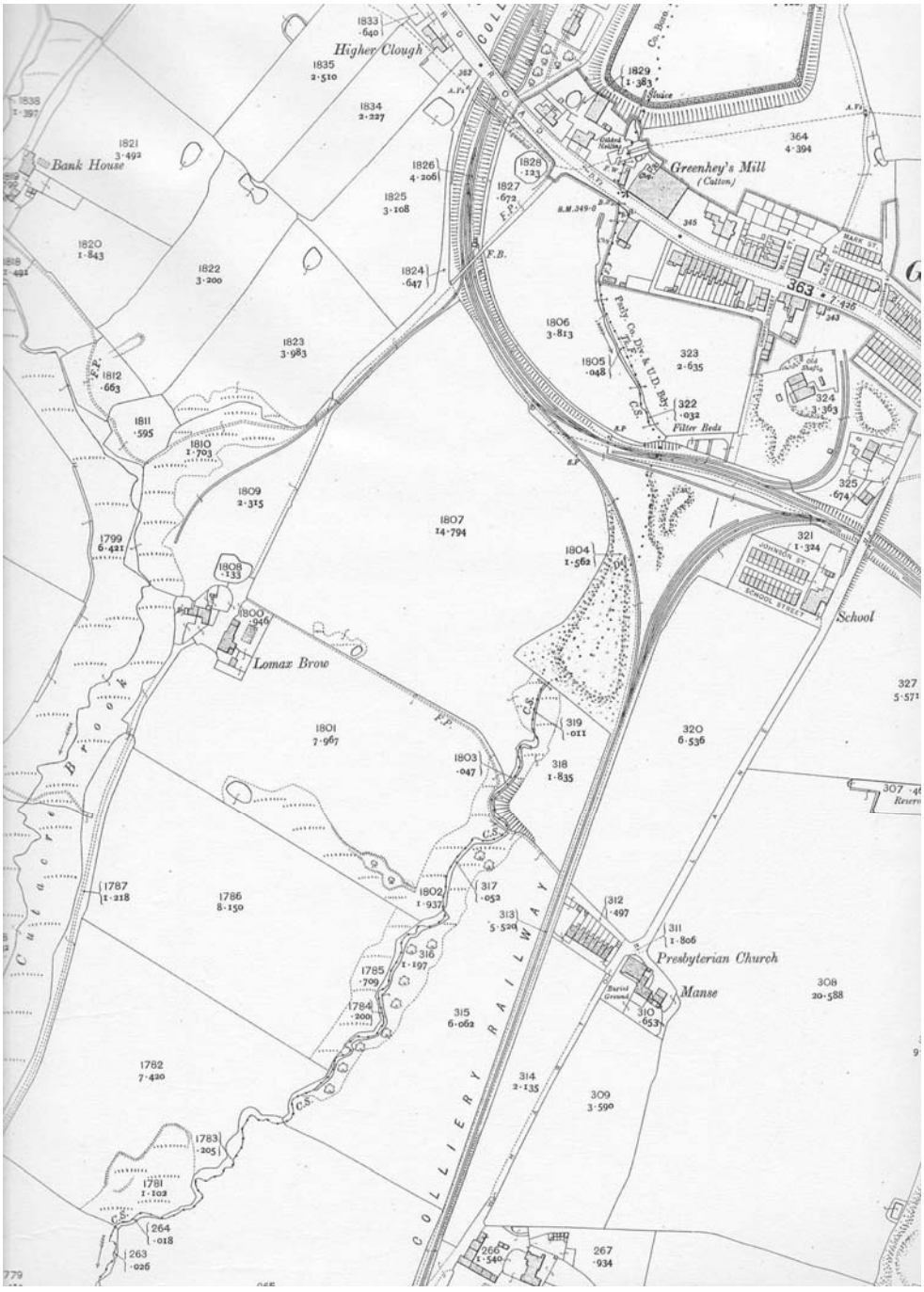


Plate 4: Extract from the 1909 Ordnance Survey map, 1:25", showing the former location of Bank House and Charlton Collieries

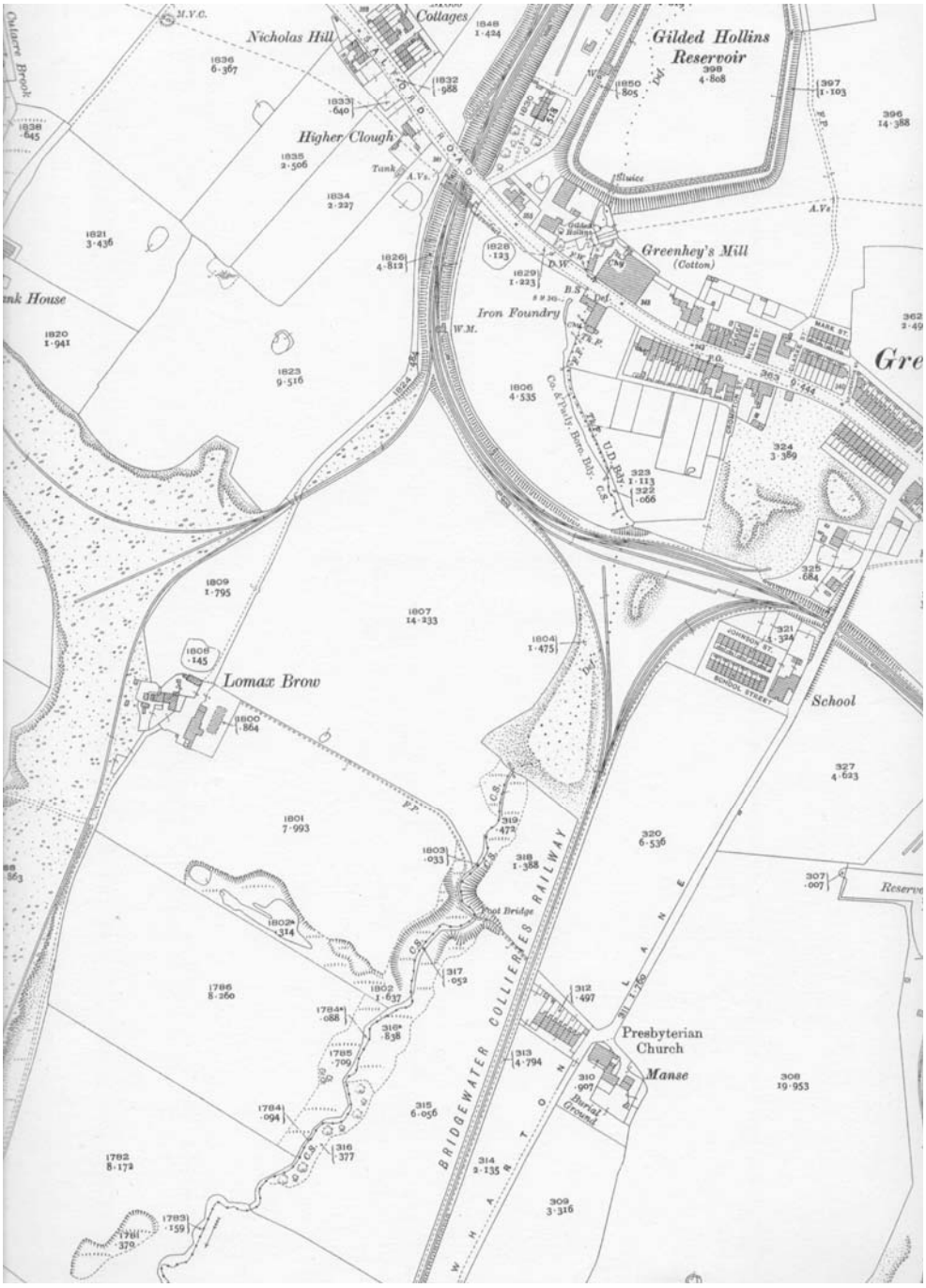


Plate 5: Extract from the 1928 Ordnance Survey map, 1:25", showing the former location of Bank House and Charlton Collieries

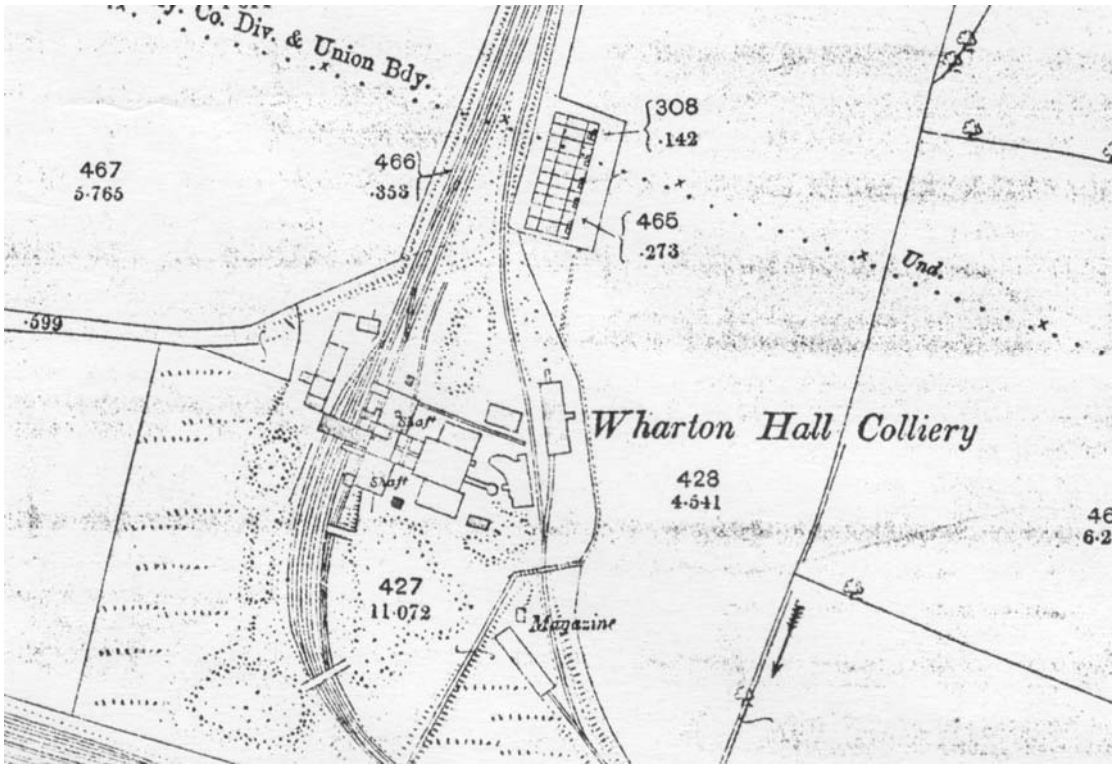


Plate 6: Extract from the 1891 Ordnance Survey map, 1:25", showing Wharton Hall Colliery

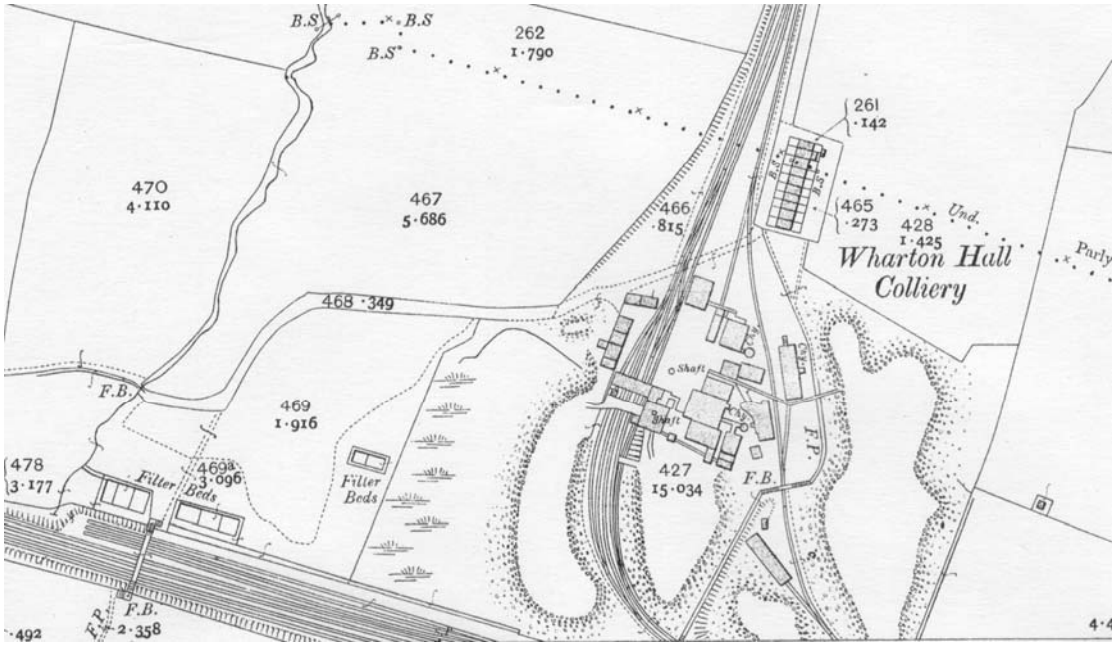


Plate 7: Extract from the 1909 Ordnance Survey map, 1:25", showing Wharton Hall Colliery

Plate 8: Extract from the 1928 Ordnance Survey map, 1:25”, showing Wharton Hall Colliery

Plate 9: Extract of the List of Abandoned Mines 1911-12 (A/MIN/1)

Plate 10: Approximate location of Bank House Colliery in the present day, facing north-west

Plate 11: Wharton Hall Colliery, April 1951, from the south-west with the Pendleton-Hindley line of the Lancashire and Yorkshire Railway in the bottom right (1270/20)

Plate 12: Wharton Hall; timber-framed building showing two cross-wings and central range *c* 1939

Plate 13: Trench 35a, facing north, showing the brick floor, ***28***

Plate 14: General view of Trench 35b, facing south

Plate 15: Northern end of Trench 51b, showing redeposited clay layers ***108*** and ***109***

Plate 16: General view of Trench 70b, facing north-west

Plate 17: General view of Trench 70b, facing south-east

Plate 18: Trench 70b, facing north-west, showing foundation ***196***

Plate 19: General view of Trench 70c, facing south-west

Plate 20: Trench 70c, ditch ***331***, facing south-east

Plate 21: Trench 70d, facing west, showing sandstone feature ***292*** and foundation ***293***

Plate 22: Trench 70e, showing well ***291***

Plate 23: West-facing section of Trench 75a, showing ditches ***136*** and ***137***

Plate 24: Trench 76/77a, facing north, showing coal pit ***151***

Plate 25: Trench 76/77a, facing east, showing stakes ***167*** in coal pit ***151***

Plate 26: Trench 87b, facing south, showing pits ***355***, ***356*** and ***416***

Plate 27: Trench 87c, facing east, showing pit ***363***

APPENDIX 1: PROJECT DESIGN

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.2.3 UK Coal Mining Ltd (hereafter the 'client') has requested that Oxford Archaeology North (OA North) provide proposals for an archaeological investigation at land proposed for the development of a surface mining and reclamation facility (Application No. APP/N4205/A/97/289386). The site is to the north-west of the town of Atherton and to the south-east of Kearsley (NGR centred SD 6980 0404). The A6 and M61 run immediately to the north of the site. The work is in response to a planning condition requesting the implementation of a programme of archaeological work. This will take the form of field evaluation and survey in the first instance, targeting sites identified during an assessment undertaken by University of Manchester Archaeological Unit (1996). A magnetometer survey will locate possible and actual sites, and the test pitting or trenches will test the efficacy of the magnetometer survey.

1.2.4 The land is mainly used for agricultural purposes at present, although a large portion of the southern and eastern area is covered by spoil and former workings associated with the former Wharton Hall Colliery. It is positioned within an area of archaeological potential, as highlighted by a number of mainly post-medieval sites/findspots, revealed during an archaeological assessment produced by the University of Manchester Archaeological Unit (UMAU) in 1996 for the Environmental Statement.

1.2.5 This project design has been prepared in accordance with a detailed Written Scheme of Investigation (WSI) prepared by RPS (2005). In order to avoid unnecessary repetition, this project design should be read in conjunction with the WSI.

1.2 OXFORD ARCHAEOLOGY (OA) QUALITY ASSURANCE

1.2.1 OA is a Registered Archaeological Organisation with the **Institute of Field Archaeologists (no 17)**. OA is not at present ISO certified but operates an internal QA system governed by standards and guidelines outlined by English Heritage and the Institute of Field Archaeologists.

1.2.2 ***Standards:*** it is OA's stated policy to adhere to current professional standards set by IFA, English Heritage, Association of Local Government Archaeological Officers, Museums Organisations. OA helps the profession to develop and establish standards by serving on national working parties (eg recently on archives), and conforms with current legislation and national and local policy standards for archaeology health and safety and other relevant matters.

1.2.3 OA has established technical manuals, procedures and policies which control its work covering field recording, finds retention and discard, finds storage and handling, environmental sampling and processing, archiving and post-excavation. These have been developed to conform with best professional practice.

1.2.4 ***Staff:*** OA ensures that its staff are fairly recruited, fairly employed, and properly qualified for their work whether by formal qualification or by established and verifiable experience. OA have established terms and conditions of employment and a system of staff representation to ensure regular consultation on employment matters.

1.2.5 OA ensures that staff remain committed and enhance their abilities using annual staff appraisals, supporting formal and informal training and educational courses.

1.2.6 ***Procurement of services and materials:*** OA procures subcontracted work on the basis of value for money, considering quality, track record and service, as well as cost. OA regularly reviews quality of subcontracted work and uses tendering procedures for major sub-contracts.

1.2.7 Procurement of materials is on the basis of quality and availability, as well as cost, especially in respect of long-term storage of archives (OA adheres to archive quality photographic materials and processes, archive quality boxes etc).

1.2.8 ***Working Practices:*** management procedures ensure that all work conducted within the Company and all end product reports to clients are monitored and evaluated whilst they are in progress, during compilation, and after completion.

1.2.9 ***Data Acquisition and Security:*** for fieldwork projects OA always removes records and finds from site every day, and ensures equipment is secured.

1.2.10 ***Experience:*** OA North has considerable experience of sites of all periods, having undertaken a great number of small and large scale projects throughout Northern England during the past 24 years. Evaluations, assessments, watching briefs and excavations have taken place within the planning process, to fulfil the requirements of clients and planning authorities, to very rigorous timetables.

1.3 KEY STAGES IN QA PROCEDURES

1.3.1 The following procedures cover technical aspects of OA's work:

- critical review of previous work;
- analysis of how archaeological issues are dealt with in the brief, including consideration of uncertainty and risk, and consideration of whether different approach would be more cost-effective;
- development of method statements (Project Designs/Written Schemes of Investigations);
- detailed consideration and documentation of logistical aspects, including H + S procedures, plant logistics, staff logistics;
- compilation of Briefing Document for site director/supervisor to include all relevant background data and information, procedures, technical specifications and logistics;
- execution of field work guided by technical Manual, incorporating unique site codes and numbering systems;
- recording systems on *pro formas* cross-referenced and identified to individuals dealing with descriptions, finds, samples, drawings, photographs;
- finds system designed to track where objects are, and to establish museum destination and legal ownership of finds;
- PX Assessment procedures to establish exactly how much work needs to be done to achieve academic objectives within budget;
- no automatic writing of interminable PX reports: tasks and methods focussed on aims and objectives;
- constant review and monitoring to ensure objectives are being met, with the flexibility to reassign priorities in light of important discoveries;
- monitoring of progress of PX projects by members of staff not directly involved, as well as project manager.

2. AIMS AND OBJECTIVES

2.1 AIMS

2.1.1 A number of aims have been provided by the WSI (RPS 2005), which are local and specific to the site. These will be considered during the evaluation. The outcomes of these aims and the assessment of material artefacts and ecofacts will enable a detailed research agenda to proposed for further work of for post-excavation analysis.

2.2 OBJECTIVES

2.3 The following programme has been designed to identify and evaluate the nature, survival and extent of any archaeological deposits or features within the proposed development area, as part of Stage 1 of the archaeological investigation. The resultant information will enable an appropriate mitigation strategy to be proposed for Stage 2 of the investigation. The fieldwork will be carried out in line with current IFA guidelines and in line with the IFA Code of Conduct. The geophysical survey will be compliant with English Heritage Guidelines (1995).

2.4 ***Geophysical Survey:*** a detailed magnetometer survey will be carried out by Archaeological Surveys on behalf of OA North, to locate and determine the extent and form of any

archaeological remains of the sites identified during the UMAU assessment (1996). The results will inform intrusive evaluation.

2.5 ***Archaeological Trial Trenching and Test Pitting:*** a series of trenches or test pits should determine the quality, extent, nature, survival and significance of any archaeological deposits. The positions of these will be based on the results of the geophysical survey.

2.6 ***Mining study:*** a study of records of mining will assess the sites of Bank House, Wharton and Wharton Hall Collieries, and a summary report will be included in the final Stage 1 report (see 2.6 below).

2.7 ***Interim reports:*** interim results from the magnetometer survey will inform the intrusive evaluation stage. Following the evaluation, interim results will inform further fieldwork decisions.

2.8 ***Report and Archive:*** a full report incorporating all elements will be issued following completion of Stage 1, and a site archive will be produced to English Heritage guidelines (MAP 2 (1991)).

3 METHOD STATEMENT

3.1 HEALTH AND SAFETY

3.1.1 ***Risk assessment:*** OA North provides a Health and Safety Statement for all projects and maintains a Unit Safety policy. All site procedures are in accordance with the guidance set out in the Health and Safety Manual compiled by the Standing Conference of Archaeological Unit Managers (1997). OA North will liase with the client to ensure all health and safety regulations are met. A detailed risk assessment will be completed in advance of any on-site works, with continuous monitoring and updating during the fieldwork. This can be supplied to all interested parties on request.

3.1.2 All project staff will be CSCS qualified. Archaeological contractors have not yet been recognised for the receipt of CSCS cards. However, proof of qualification can be provided.

3.1.3 ***Services:*** full regard will, of course, be given to all constraints (services etc) during the evaluation trenching as well as to all Health and Safety considerations. As a matter of course the Unit uses a Cable Avoidance Tool (CAT) prior to any excavation to test for services. However, this is not infallible and **it is assumed that the client will provide any available information regarding services within the defined area** North prior to the work commencing on site.

3.1.4 ***Contamination:*** any contamination issues must also be made known to OA North in order that adequate PPE can be supplied prior to commencement. Should any presently unknown contamination be discovered during excavation, it may be necessary to halt the works and reassess the risk assessment. Any specialist safety requirements may be costed as a variation.

3.1.5 ***Fencing requirements:*** the trenches will be protected with barrier tape whilst open. However, if the client deems this as not suitable, OA North must be informed prior to commencement of site works. Unless significant archaeological deposits are uncovered, it is intended to backfill the trenches immediately as soon as they have been opened and archaeologically recorded.

3.2 GEOPHYSICAL SURVEY

3.2.1 ***Magnetometry:*** an effective geophysical survey technique in the location of archaeological remains is magnetometry, which will easily locate 'positively magnetic' material such as iron-based features and objects, or those subjected to firing such as kilns, hearths, and even the buried remains of brick walls. Therefore, this technique is suitable in the detection of features associated with industrial activity. This technique can also be widely used to locate the more subtle magnetic features associated with settlement and funerary remains, such as boundary or enclosure ditches and pits or postholes, which have been gradually infilled with more humic material. The breakdown of organic matter through microbiotic activity leads to the humic material becoming rich in magnetic iron oxides when compared with the subsoil, allowing the features to be identified. Conversely, earthwork or embankment remains can also be identified with magnetometry as a 'negative' feature due to the action in creating the earthwork of upturning the relatively low magnetic subsoil on to the more magnetic topsoil. In this way, magnetometry is a very efficient technique and is recommended in the first instance by the English Heritage Guidelines (1995) for such investigations.

3.2.2 However, non-magnetic stone structures or megaliths cannot be easily identified with magnetometry. Therefore, stone buildings may be difficult to interpret without the use of the complementary techniques such as electrical resistivity. Furthermore, it should also be noted that boulder clay has notoriously low magnetic properties, and therefore earthwork/cut features may not be located, compared to other drift/parent materials.

3.2.3 The costs for the geophysical survey are defined separately. The two techniques are defined below and will be carried out according to English Heritage Guidelines (1995):

3.2.4 ***Detailed Survey Methodology:*** the outlined site specific survey areas (Sites **5**, **36**/**37**, **42**, **45**, **50**/**51**, **78**, **75-77**) will be divided into 30m x 30m grids, within which data collection is taken. These will be located and tied into the Ordnance Survey grid.

3.2.5 A Bartington Grad601-2 gradiometer will be employed which has a depth of penetration of approximately 0.5m-1.0m with more subtle magnetic anomalies normally associated with archaeological features. However, this would increase with more strongly magnetic anomalies, such as those associated industrial activities. Sampling will be at 0.25m intervals with inter-transect distances being 1m,. The survey will be carried out in a 'zig-zag' mode with precautions to minimise the heading error on site.

3.2.6 The data are captured in the internal memory of the gradiometer and then downloaded to a portable computer. The individual grids are matched together to produce an overall plan of the surveyed area.

3.2.7 ***Report:*** interim results will be produced within one-two weeks of the site work in order to inform the positions of the intrusive evaluation investigations.

3.3 ARCHAEOLOGICAL EVALUATION

3.3.1 ***Introduction:*** the programme of archaeological evaluation will involve trial trenching to determine the presence or absence of any previously unsuspected archaeological deposits and, if established, will then test their date, nature, depth and quality of preservation. As per the WSI (RPS 2005), the UMAU sites have each been allocated an allotted trenching or test pitting amount. The location of these trenches will depend on the results of the geophysical survey.

3.3.2 The sites to be targeted with intrusive investigation are Sites **5**, **35**, **42**, **45**, **50**/**51**, **70**, **87**, **88**.

3.3.3 ***Test pits:*** the test pits shall be 1m x 1m in plan and manually excavated and cleaned. At least two sides will be recorded/planned.

3.3.4 ***Trenches:*** the topsoil will be subject to careful mechanical excavation (with a toothless ditching bucket) down to the depth of the first significant archaeological deposits or natural subsoils, depending on whichever is encountered first. This will be carried out under constant archaeological supervision, by a member of OA North staff experienced in such work. The deposits will be cleaned by hand, using either hoes, shovel scraping, and/or trowels depending on the subsoil conditions, and inspected for archaeological features. Thereafter, all excavation would proceed by hand in a stratigraphic manner.

3.3.5 The trenches will not be excavated deeper than 500mm, and only where agreed the trenches can be extended to a maximum 1.2m (observing health and safety constraints) in order to test depths of alluvium.

3.3.6 ***Methodology:*** trenches/test pits will be located by use of GPS equipment which is accurate to +/- 0.25m and tied into the Ordnance Survey grid. Altitude information will be established with respect to Ordnance Survey Datum. It is assumed that OA North will be provided with appropriate site plans containing OS information.

3.3.7 Features will be located in 3D within the trenches. The location of any samples will be recorded as appropriate.

3.3.8 Any investigation of intact archaeological deposits will be exclusively manual.

- Postholes will be fully excavated and the profile recorded, unless the diameter is greater than 300mm and this will then require a half-section excavation with both profile and section recorded. Sampling will be as appropriate.
- Pits will be half-sectioned, sampled and recorded as required.

- Linear features will be subject to a minimum of 10% sample or a length of 500mm (whichever is the greater), and extensive layers will, where possible, be sampled by partial rather than complete removal. All intersections and termini will be excavated and recorded to determine relationships and relative chronologies.
- It is hoped that in terms of the vertical stratigraphy, maximum information retrieval will be achieved through the examination of sections of cut features. All excavation, whether by machine or by hand, will be undertaken with a view to avoiding damage to any archaeological features, which appear worthy of preservation *in situ*.

3.3.9 ***Recording:*** all information identified in the course of the site works will be recorded stratigraphically, using a system, adapted from that used by Centre for Archaeology Service of English Heritage.

3.3.10 A sufficient pictorial record will be undertaken (plans, sections and both monochrome photographs (prints and negatives) and colour transparencies) to identify and illustrate individual features, as well as maintaining a record of general working shots/progress. Photographs will include a scale and header board showing site code and context/feature number.

3.3.11 As a minimum**,** one short and one long section will be recorded for each trench (WSI (RPS 2005), section 5.4). Primary records will be available for inspection at all times.

3.3.12 Results of all field investigations will be recorded on *pro forma* context sheets, and will employ the single-context method. The site archive will include both a photographic record and accurate large scale plans and sections at an appropriate scale (1:50, 1:20 and 1:10). All artefacts and ecofacts will be recorded using the same system, and will be handled and stored according to standard practice (following current Institute of Field Archaeologists guidelines) in order to minimise deterioration.

3.3.13 Levels will be recorded and reduced to their OD heights, with all benchmark and TBMS to be shown.

3.3.14 ***Reinstatement:*** it is understood that there will be no requirement for reinstatement of the ground beyond backfilling. As a health and safety precaution, all trenches will be backfilled immediately on completion of excavation and recording, unless there are significant deposits.

3.3.15 The excavated material will be stored alongside each trench, with topsoil and subsoil stored separately in order to avoid contamination for the purposes of backfilling. The ground will be backfilled so that the topsoil is laid on the top, and the ground will be roughly graded with the machine. Should there be a requirement by the client other than that stated this will involve recosting or a variation.

3.3.16 ***Contingency plan:*** a contingency costing may also be employed for unseen delays caused by prolonged periods of bad weather, vandalism, discovery of unforeseen complex deposits and/or artefacts which require specialist removal, use of shoring to excavate important features close to the excavation sections etc. This has been included in the Costings document and would be in agreement with the client.

3.3.17 The evaluation will provide a predictive model of surviving archaeological remains detailing zones of relative importance against known development proposals. In this way, any mitigation requirements can be proposed, and a strategy provided.

3.4 GENERAL PROCEDURES

3.4.1 ***Environmental Sampling:*** environmental samples (bulk samples of 30 litres volume, to be sub-sampled at a later stage) will be collected from stratified undisturbed deposits and will particularly target negative features (gullies, pits and ditches). Where appropriate, monolith samples will be collected from freshly exposed sections by trained staff. These will be returned to OA North's offices regularly for processing.

3.4.2 The location of all samples will be recorded on drawings and sections with heights OD etc.

3.4.3 An assessment of the environmental potential of the site will be undertaken through the examination of suitable deposits by the in-house palaeoecological specialist, who will examine the potential for further analysis. The assessment would include soil pollen analysis and the retrieval of charred plant macrofossils and land molluscs from former dry-land palaeosols and

cut features. In addition, the samples would be assessed for plant macrofossils, insect, molluscs and pollen from waterlogged deposits. The costs for the palaeoecological assessment are defined as a contingency and will only be called into effect if good deposits are identified and will be subject to the agreement of RPS, in consultation with the County Archaeologist and the client.

3.4.4 ***Faunal remains:*** if there is found to be the potential for discovery of bones of fish and small mammals a sieving programme will be carried out. These will be assessed as appropriate by OA north's specialist in faunal remains, and subject to the results, there may be a requirement for more detailed analysis. A contingency has been included for the assessment of such faunal remains for analysis.

3.4.5 ***Human Remains****:* any human remains uncovered will be left *in situ*, covered and protected. No further investigation will continue and RPS will be contacted within two hours of discovery, after which it is anticipated that RPS will inform the County Archaeologist and the local Coroner will be immediately. If removal is essential the exhumation of any funerary remains will require the provision of a Home Office license, under section 25 of the Burial Act of 1857. An application will be made by OA North for the study area on discovery of any such remains and the removal will be carried out with due care and sensitivity under the environmental health regulations.

3.4.6 ***Finds:*** all finds recovered during the evaluation investigation (metal detecting and trial trenching) will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the United Kingdom Institute for Conservation (UKIC) *First Aid For Finds*, 1998 (new edition) and the recipient museum's guidelines.

3.4.7 Finds recovery and sampling programmes will be in accordance with best practice (current IFA guidelines) and subject to expert advice. OA has close contact with Ancient Monuments Laboratory staff at the Universities of Durham and York and, in addition, employs in-house artefact and palaeoecology specialists, with considerable expertise in the investigation, excavation, and finds management of sites of all periods and types, who are readily available for consultation. Finds storage during fieldwork and any site archive preparation will follow professional guidelines (UKIC). Emergency access to conservation facilities is maintained by OA North with the Department of Archaeology, the University of Durham.

3.4.8 Neither artefacts nor ecofacts will be collected systematically during the mechanical excavation of the topsoil unless significant deposits, for example clay pipe waster dumps, are encountered. In such an eventuality, material will be sampled in such a manner as to provide data to enhance present knowledge of the production and dating of such artefacts, although any ensuing studies will not be regarded as a major element in any post-excavation analysis of the site. Other finds recovered during the removal of overburden or metal detecting survey will be retained only if of significance to the dating and/or interpretation of the site. It is not anticipated that ecofacts (eg unmodified animal bone) will be collected during this procedure.

3.4.9 Otherwise, artefacts and ecofacts will be collected and handled as per specification. All material will be collected and identified by stratigraphic unit during the evaluation trenching process. Hand collection by stratigraphic unit will be the principal method of collection, but targeted on-site sieving will serve as a check on recovery levels. Objects deemed to be of potential significance to the understanding, interpretation and dating of individual features, or of the site as a whole, will be recorded as individual items, and their location plotted in 3-D. This may include, for instance, material recovered from datable medieval pit groups.

3.4.10 Finds will be processed and administered at regular intervals (on a daily basis) and removed from the site. All finds will be treated in accordance with OA standard practice, which is cognisant of IFA and UKIC Guidelines. In general this will mean that (where appropriate or safe to do so) finds are washed, dried, marked, bagged and packed in stable conditions; no attempt at conservation will be made unless special circumstances require prompt action. In such case guidance will be sought from OA North's consultant conservator.

3.4.11 All waterlogged finds will be treated as appropriate. In the case of large deposits of waterlogged environmental material (eg unmodified wood), advice will be sought with the OA North consultant with regard to an appropriate sampling strategy.

3.4.12 Where possible, spot dates will be obtained on pottery and other finds recovered from the site. Artefacts will be examined and commented upon by OA North in-house specialists.

3.4.13 RPS will be informed immediately upon the discovery of any gold and silver artefacts. These will be recovered during the course of the excavation and removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act, 1996. Where removal cannot take place on the same working day as discovery, suitable security will be employed to protect the finds from theft.

3.5 MINING STUDY

3.5.1 A desk-based assessment will be undertaken as appropriate, depending on the availability of source material. It will concentrate on the mining activity and developments within the outlined study area, particularly concerning that of Wharton Hall Colliery, as well as consideration of Bank and Wharton collieries.

3.5.2 ***Documentary and cartographic material:*** this work will consult the range of potential sources of information, both primary and secondary and any relevant aerial photographs, referenced in the Historic Environment Record, including OS 1st Edition maps (both 6" to 1 mile and 25" to 1 mile). Local study libraries shall also be consulted.

3.5.3 ***Site Visit:*** in addition to the desk-based assessment, a site visit will be carried out to inspect Sites **59** (1909 railway), and **60**/**61** (coal pit/Bank House colliery). The WSI (RPS 2005) requires an assessment and photographic record to be made of any features relating to the former uses and especially any not recorded on historic mapping.

3.5.4 ***Reporting:*** the results intend to set the development of mining within the landscape in its historic context, and will assess the extent to which the historic landscape has changed. It will also present information regarding specific mining activities, such as layout and expansion of ancillary buildings, railways etc. and enable appropriate decisions to be made regarding the level of recording for the remains of recent mining activity.

3.6 REPORT

3.6.1 Regular progress reports/statement will be produced to inform the scope and extent of further field work and/or the level of post-excavation work should formal mitigation not be required (WSI (RPS 2005), section 4.1.20). This will include information on time and budget progress. As appropriate, spot-dates will be provided and any initial processing/assessment of finds/environmental samples.

3.6.2 Following the completion of the survey and evaluation for Stage 1, five copies of a draft report will be submitted to RPS. This will draw together the results of the geophysical subcontractor's results and intrusive investigations and will aim to include as a minimum;

- a concise, non-technical summary of the results
- the dates on which the fieldwork was undertaken
- description of the methodology and results, and an interpretation of identified features or sites
- statement of importance including brief conclusions on the data, e.g. Monument/site class represented, feature/context functions and relevant parallels. The criteria detailed in PPG 16 (DoE 1990) will be employed to assess the archaeological significance of the results
- recommendations for further work will be discussed, in relation to the impact and significance, and client's programme
- a site location plan related to the national grid
- trench location plans referenced to the OS grid
- appropriate plans showing the location and position of features or sites located
- a copy of this project design, and indications of any agreed departure from that design
- the report will also include a complete bibliography of sources from which data has been derived

- the geophysical survey results will be included as an appendices with appropriate discussion within the report.

3.6.3 ***Confidentiality:*** all internal reports to the client are designed as documents for the specific use of the Client, for the particular purpose as defined in the project brief and project design, and should be treated as such. They are not suitable for publication as academic documents or otherwise without amendment or revision.

3.7 ARCHIVE

3.7.1 The results of all archaeological work carried out will form the basis for a full archive to professional standards, in accordance with current English Heritage guidelines (*Management of Archaeological Projects*, 2nd edition, 1991). This archive will be provided in the English Heritage Centre for Archaeology format and a synthesis will be submitted to the appropriate SMR/HER (the index to the archive and a copy of the report). OA North will deposit the original record archive of projects (paper, magnetic and plastic media), and a full copy of the record archive (microform or microfiche), together with the material archive (artefacts, ecofacts, and samples) with the appropriate museum. The outlined development site is divided between three metropolitan boroughs and the final location for deposition needs to be agreed on by RPS and the relevant parties.

4 OTHER MATTERS

4.1 **Project Monitoring:** *whilst the work is undertaken for the client, monitoring and project management of the archaeological investigations will be undertaken by RPS.*

4.2 *OA North will report progress of the work weekly to RPS, via site meetings, to also include GMAU archaeologist, and as written statements as appropriate.*

4.3 **Access:** *site access for all elements of the fieldwork will be arranged with the client and OA North. It is understood that there will be access for both pedestrian and plant traffic to the site.*

4.4 **Site Welfare Facilities:** *health and safety regulations require access to adequate handwashing facilities to be provided for the duration of the fieldwork. Therefore, a portable toilet has been included, and a site office for the laying out of plans and the secure storage of tools.*

5 WORK TIMETABLE

5.1 ***Geophysical survey:*** this element is expected to take approximately four to five days.

5.2 ***Archaeological Trial Trenching and Test Pitting:*** this element is expected to take between approximately twelve to twenty-four days, depending on the required combination of investigation following the geophysical survey.

5.3 ***Mining Study and Site Visit:*** this element is expected to take five days to complete, for inclusion in the final report.

5.4 ***Report:*** the draft client report will be completed within approximately eight weeks following completion of the fieldwork.

6 STAFFING

6.1 The project will be under the direct management of **Emily Mercer BA (Hons) MSc AIFA** (OA North Senior Project Manager) to whom all correspondence should be addressed.

6.2 The trial trenching will be supervised in the field by an OA North project officer or supervisor experienced in such work and capable of carrying out projects of all sizes. Due to present scheduling commitments, it is not possible to provide precise staff details. However, the CVs have been provided for the likely candidates.

6.3 **Christine Howard-Davis**, **BA, MIFA** (OA North Finds Manager) has extensive knowledge of all categories of artefacts of all periods. Analysis of all artefacts recovered during the course of the investigation will be undertaken by or under the auspices of Christine.

6.4 **Environmental management** will be undertaken by **Elizabeth Huckerby BA, MSc** (OA North Project Officer), who will also provide specialist input on pollen analysis/charred and waterlogged plant remains. Elizabeth has extensive knowledge of the palaeoecology of the North, and has contributed to all of the English Heritage funded volumes of the Wetlands of the

North West. Elizabeth has also acted as palaeoenvironmental consultant for several archaeological investigations undertaken by Earthworks Archaeology. Elizabeth will advise on site sampling procedures and co-ordinate the processing of samples and organise internal and external specialist input as required.

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APPENDIX 2: GAZETTEER OF SITES

A gazetteer of sites was first collated in the original desk-based assessment of the development area, produced by UMAU (1996) for the purposes of the Environmental Impact Assessment. This identified the known archaeological resource from within the study area, from which the sites of significance were targeted for further work. Presented below is a gazetteer of the UMAU sites investigated in the current evaluation; the details are as per the desk based assessment of 1996 and the WSI (RPS 2005).

Site: **5**
Name: **Structure off Rosemary Lane**
Grid Reference: SD 9668 0525
Site Type: Site of structure
Period: Post-medieval
Description: A structure is probably shown on this site on the 1786 map. An L-shaped building is shown on the *c* 1800 Bridgewater Estate plan on a 'Croft leased to John Hindley; the key to the same map describes the property as a 'messuage with gardens and two crofts'. The 1844 and 1849 maps show a smaller additional building immediately fronting Rosemary Lane. The site is vacant on the 1894 and later maps.
Purpose for Evaluation: To locate the structure and characterise it and inform further mitigation.

Site: **35**
Name: Ashes Farm
Grid Reference: SD 6938 0420
Site Type: Farmstead
Period: Post-medieval
Description: The site was first listed in the 1674 marriage settlement of William Egerton when it was the tenement of Henry Mort. It was later documented in the Bridgewater survey of 1722 when it was occupied by Robert Mort and was described as including '9 bays of building". Two main structures are shown on the *c* 1800 Bridgewater Estate plan when they formed part of the holding of John Mort; the key to that map describes the property as a 'messuage with barr, fold, orchard and lane'. A third large structure has been added to the east on the 1894 map. The site was named on the 1844 and 1849 maps as 'Ashes' and on the 1894 and later maps as' Ashes Farm'. All buildings have now been demolished; the site is marked by brick debris and a well with a brick parapet.
Purpose for Evaluation: The site may have an earlier post-medieval or medieval origin. Therefore, the site was targeted for evaluation to characterise it and determine what evidence may exist for the longevity of the settlement.

Site: **36**
Name Tan Pit Croft
Grid Reference: SD 694 042
Site Type: Field name/industrial activity
Period: Post-medieval
Description: Given as the name of a field in the holding of John Mort of Ashes Farm on the *c* 1800 Bridgewater Estate plan. This field name does not appear in the Bridgewater survey of 1722.
Purpose for Evaluation: To determine whether any evidence exists of the activity suggested by the field name.

Site: **37**
Name Bleach Croft
Grid Reference: SD 6944 0418
Site Type: Field name/industrial site
Period: Post-medieval
Description: Given as the name of a field in the holding of John Mort of Ashes Farm on the *c* 1800 Bridgewater Estate plan. This field name does not appear in the Bridgewater survey of 1722.
Purpose for evaluation: To determine whether any evidence exists of the activity suggested by the field name.

Site: **42**
Name Cinder Hill
Grid Reference: SD 693 040
Site Type: Field Name/industrial workings
Period: Medieval/post-medieval
Description: Little Cinder Hill and Lower Cinder Hill are given as field names in the holding of Widow Hilton of Leadbeaters in the Bridgewater survey of 1722; Higher Cinder Hill and Lower Cinder Hill are shown as adjoining fields on the holding of James Horridge on the *c* l800 Bridgewater Estate map.
Purpose of the evaluation: To investigate the potential for evidence of the suggested former industrial activity, to characterise any remains and propose a suitable mitigation strategy.

Site: **45**
Name Coal Pit Meadow
Grid Reference: SD 696 039
Site Type: Field name/coal pit site
Period: Post-medieval
Description: **'**Coal Pitt Meadow' was given as a field name in the holding of Widow Hilton of Leadbeaters in the Bridgewater survey of 1722; Coal Pitt Meadow is shown in the holding of James Horridge on the 1800 map.
Purpose of the evaluation: To investigate the potential for evidence of the suggested former industrial activity, to characterise any remains and propose a suitable mitigation strategy.

Site: **50**
Name Kiln Meadow
Grid Reference: SD 699 040
Site Type: Field name/Kiln site
Period: Post-medieval
Description: Kiln Meadow is given as the name of the field immediately south of Hulton Heys on the *c* 1800 Bagot Estate map. This may be the 'Hill Field' listed in the 1734 and 1792 leases of Hulton Heys. Kiln Meadow lies adjacent to the 'Brick Hill' or 'Brick Kiln Field' belonging to the Clough.
Purpose of the evaluation: To investigate the potential for evidence of the suggested former industrial activity, to characterise any remains and propose a suitable mitigation strategy.

Site: **51**
Name Old Graces
Grid Reference: SD 6990 0398
Site Type: Farmstead
Period: Post-medieval
Description: The site was listed in the 1674 marriage settlement of William Egerton when it was the tenement of Ellis Macant. It was also documented in the Bridgewater survey of 1722, when it was occupied by Thomas Eckersley and was described as including '10 bays of building' and was also possibly shown on the 1786 map. Two adjacent rectangular structures are shown on the *c* 1800, 1844 and 1849 maps. Appears on the c 1800 map as part of the holding of Thomas Eckersley and is described in the key to that map as a 'messuage with barn, garden... and croft'. It was named Old Graces on the 1844 and 1849 maps. The site is vacant on the 1894 and later maps.
Purpose of the evaluation: The exact location of the farm is not known, and any associated activities. Therefore , the evaluation aims to investigate the location, and propose any necessary mitigation.

Site: **61**
Name Bank House Colliery
Grid Reference: SD 705043
Site Type: Colliery
Period: Post-medieval
Description: The site was named with 'Coal Pit' on the 1850 OS map, but it was vacant on the 1894 OS map and later editions.

Purpose of the evaluation: To include this site and its surrounding area within the mining research, to enable an assessment to be made of any extant remains, and suggest any mitigation measures.

Site: **70**
Name Wharton Hall
Grid Reference: SD 7070 0370
SMR: 160410
Site Type: Site of Wharton Hall
Period: Medieval/post-medieval
Description: The site is seen on the 1786 and later maps. From cartographic, photographic and written evidence, The hall consisted of a two-storey timber-framed house comprising a central range, aligned approximately north/south, with end cross- wings. Its plan and construction indicate a date in the sixteenth or seventeenth centuries. By the early twentieth century much of the building had been refaced in brick, although some original timbering remained. The Wharton or the de Warton family are documented from at least the early fourteenth century and it is likely that their medieval Hall stood on this same site. By the early seventeenth century the Wharton estate had passed to the Assheton family of Great Lever Rylands; in the late seventeenth it was owned by the Morts. In *c* 1870 it was sold to John Gerald Potter and others who formed the Wharton Hall Colliery Company Ltd, and in 1881 it was bought by the Bridgewater Trustees. The Hall was demolished in the 1960s. Its site appears to be partly covered by a concrete pavement, now overgrown, but there is also evidence of a flagstone floor. An L-shaped structure, presumably of an outbuilding, is shown to the west on the later 1849 OS map and later maps, and has also been demolished.
Purpose of the evaluation: The site may preserve the location of a medieval manor, the precursor to the Hall. The evaluation will investigate the potential , and provide an adequate mitigation strategy.

Site: **75**
Name: Old Coal Pit
Grid Reference: SD 6941 0367
Site Type: Coal Pit
Period: Post-medieval
Description: The pit is first seen on the 1850 OS map, but is not on any later editions.
Purpose of the evaluation: The site will be plotted from the mining study and subject to evaluation.

Site: **76**
Name: Old Coal Pit
Grid Reference: SD 6954 0362
Site Type: Coal Pit
Period: Post-medieval
Description: The pit is first seen on the 1850 OS map, but is not on any later editions.
Purpose of the evaluation: The site will be plotted from the mining study and subject to evaluation.

Site: **77**
Name: Old Coal Pit
Grid Reference: SD 6954 0369
Site Type: Coal Pit
Period: Post-medieval
Description: The pit is first seen on the 1850 OS map, but is not on any later editions.
Purpose of the evaluation: The site will be plotted from the mining study and subject to evaluation.

Site: **78**
Name Near Kiln Field and Further Kiln Field
Grid Reference: SD 696 035
Site Type: Field name/kiln site
Period: Post-medieval

Description: Near Kiln Field and Further Kiln Field are given as field names of two adjoining field in the 1847 map.
Purpose of the evaluation: To locate the possible site of a kiln and provide information on any requirements for mitigation.

Site: **87**
Name Hursts
Grid Reference: SD 7037 0343
Site Type: Structure
Period: Post-medieval
Description: The site is a structure shown on the 1847 and 1850 maps, but is vacant on later maps. It is thought to be possibly the home of Geoffrey Hurst of Shakerley, imprisoned for Protestantism in the 1550s.
Purpose of the evaluation: To locate and characterise the structure and determine the longevity of occupation.

Site: **88**
Name The Wash
Grid Reference: SD 7054 0339
Site Type: Possible farmhouse and associated structures
Period: Post-medieval
Description: A large irregular elongated structure is shown on the 1847 and 1850 maps. The 1847 map shows it as being divided into a large number of properties. The 1894 map shows the site as vacant, and covered by the Wharton Hall colliery spoil heap.
Purpose of the evaluation; To determine its function, extent, age and any further mitigation requirements.

Site: **89**
Name: Wharton Hall Colliery
Grid Reference: SD705 033
Site Type: Colliery
Period: Post Medieval
Description: Opened in 1873 by the Wharton Hall Colliery Company; bought in c 1880 by the Bridge water Trustees; coal winding ceased in the late 1920s and the colliery became a pumping station only(Hayes nd 113-4). The colliery is shown on the 1894-1928 maps. On the1960 map most of the buildings had been demolished. The pit head site is now largely covered with young woodland and the most prominent surviving features are the surrounding spoil heaps.
Purpose of the evaluation; Research on the site will examine the site's development within historical mining activity from the development site. It is intended to show how the historic landscape has changed and to aid in the formation of a mitigation strategy for the site.

Site: **114**
Name Wharton Colliery
Grid Reference: SD 7092 0420
Site Type: Colliery
Period: Post-medieval
Description: It was first shown on 1850 OS map but today there are no visible remains.
Purpose of the evaluation; Research on the site will examine the site's development within historical mining activity from the development site. It is intended to show how the historic landscape has changed and to aid in the formation of a mitigation strategy for the site.

APPENDIX 3: TRENCH DESCRIPTIONS

Site No: **5**
Trench No: 5a
Alignment: East/west
Length: 20.0m
Depth: 0.58m
Description: Topsoil, ***75***, comprised a very dark grey fine sand-silty-clay, 0.3m thick and very waterlogged. The underlying subsoil comprised a mid brown grey, fine sandy-silty-clay, 0.28m thick, with occasional small sub-rounded stone inclusions. Glacial till was described as a light orange-grey to mid brown grey coarse sandy-clay, with 10-15% sub-rounded stone inclusions of a maximum size of 0.34m by 0.32m by 0.28m Two field drains and one modern service were recorded cutting the subsoil layer.
Ditch, ***72***, was located at the eastern end of the trench, running parallel to the current field boundary. It measured a minimum of 2m wide and 0.78m deep, but could not be fully excavated due to the presence of a current service on its eastern extent. Deposit ***74*** comprised the primary fill of the ditch, material eroded from the sides of the feature while they stabilised, described as a mid orange-grey coarse sandy-clay. Deposit ***73***, overlying ***74***, comprised a very dark grey silty-clay with occasional small sub-rounded stones; material derived from surrounding eroding topsails. The upper fill, ***71***, was described as a mid grey-brown fine sandy-clay with occasional sub-rounded and sub-angular stone inclusions. It appeared to be a mix of topsoil and glacial till, possibly representing material deliberately backfilled into the ditch, contained late eighteenth to twentieth century pottery.

Site No: **5**
Trench No: 5b
Alignment: East/west
Length: 20m
Depth: 0.45m
Description: The topsoil 78 and subsoil, ***79***, and the glacial till ***80***, were identical to the those described in Trench 5a. The total soil horizon was 0.45m thick. A total of three field drains and one plough scar was recorded within the trench, but no deposits of an archaeological significance were located.

Site No: **5**
Trench No: 5c
Alignment: North/south
Length: 20.3m
Depth: 0.45m
Description: The topsoil, subsoil and glacial till deposits were given the same context numbers and descriptions as Trench 5b, as these two trenches were physically linked. The soil horizon was excavated to a depth of 0.45m. A single field drain was present, but no deposits of an archaeological significance were located.

Site No: **35**
Trench No: 35a
Alignment: North/south
Length: 10m
Depth: 0.75m
Description: The overburden, ***55***, comprised a very dark grey coarse sandy-silt, with 50-60% fragmented red brick inclusions of a maximum size of 0.26m by 0.22m by 0.11m, and measuring 0.70m thick.
The earliest features, cutting the natural till, were root action ***50*** and pit ***52***, both sealed by floor ***28***, and linear feature ***30***. The area of root action was irregular in shape, filled with a very dark grey humic deposit, ***49***. Pit ***52*** measured 0.52m in diameter and 0.14m deep. It was backfilled with a dark grey clay, a mix of till and topsoil. No finds were recovered from ***52***, and its purpose remains unresolved.

Linear feature ***30*** was orientated in a north/south direction, and respected footing ***38***. It measured a 0.56m deep, backfilled with a dark grey fine sandy clay deposit. Towards the base, located at the edge of the trench, abundant sub-rounded stone were located of a maximum size of 0.22m by 0.18m by 0.06m. The feature is thought to relate to drainage, possibly with a culvert located beyond the limit of excavation.
In the southern half of the trench a red brick floor and three wall footings were located, masonry ***28***, ***29***, ***37*** and ***38*** respectively (Fig 11). The bricks used to form these structures measured 0.23m by 0.11 by 0.07m, bonded with a consolidated dark grey brown sand. The floor, ***28***, largely comprised of stretchers, with headers placed adjacent to footing ***29***. Footing ***29*** measured 0.32m wide within construction cut ***65***.
A second footing was located along the north-eastern edge of the trench, masonry ***36***. It comprised of two courses of red brick, the bricks measuring 0.23m by 0.11m by 0.07m, arranged as headers and bonded with a very light yellow grey friable sandy mortar. As part of this footing a sandstone beam or sill, ***54***, had been placed measuring at least 2.0m in length and 0.27m high; possibly reused masonry. Posthole ***33*** was twentieth century in origin, with the post still present, the cut for the post respecting footing ***36***.

Site No.: **35**
Trench No. 35b
Alignment: North/south; east/west (T-shaped)
Length: 20m; 7m
Depth: 0.7m
Description: Trench 35b was excavated in a T-shape. Topsoil, ***68,*** measured 0.4m in depth and comprised a very dark grey fine sandy-silty-clay. Subsoil, ***69***, measured 0.3m thick, a mid brown grey fine sandy- clay. The underlying glacial till, *70*, comprised a mid-orange-grey medium sandy-clay.
Construction cut ***48*** contained an L-shaped trench-built foundation ***46***, orientated in an east-west and north south direction. This comprised of irregularly shaped sandstone, roughly faced, measuring a maximum of 0.4m by 0.41m by 0.19m. The stones were bonded with a mid orange-grey coarse-sandy clay, with abundant smaller irregular stones forming the core of the foundation. The foundation measured 0.6m wide, in a construction cut 0.84m wide. Deposit ***47,*** around the masonry, comprised a mid grey-brown friable silty-clay with 20% small sub-rounded stone inclusions. The foundation delimits the south-eastern corner of a building.
A second foundation, located in the north-eastern limit of the trench, ***58***, formed part of a cellar wall. The cellar and foundation were constructed within cut ***60***, the stone foundation consisted of irregular-shaped sandstone, stone-faced on the eastern elevation (interior). Its stone measured 0.38m by 0.28m by 0.25m, bonded with a light brown grey coarse sandy clay. The backfill between the construction cut and stone ***58,*** deposit ***61,*** comprised a dark brown-grey silty-clay with 20% to 30% medium sized angular and sub-angular stone inclusions. The cellar was constructed from red bricks, measuring 0.22m wide and 0.12m thick, laid as stretchers and bonded with a light grey consolidated mortar. These formed a vaulted ceiling to the cellar beyond the north and eastern extent of the trench, as well as the interior western wall. The cellar had been backfilled with a mid orange-brown coarse sand, ***61,*** mixed with approximately 80% building debris of fragmented bricks, wood and slate.
An interior red brick footing, ***57,*** was orientated in an east/west direction across the northern end of the trench. The bricks measured 0.23m by 0.11m by 0.07m, laid as two courses of stretchers. Overlying these bricks was an area of concrete floor, ***56,*** 0.12m thick.
At a depth of 0.05m below the vegetation of the topsoil an exterior cobbled surface, ***45,*** was located. Their existing extant measured 1.45m in width across the trench, but have clearly been truncated by later activity. The cobbles measured a maximum of 0.18m by 0.12m by 0.1m in size, with a very dark grey fine sand-silty-clay topsoil matrix accumulated between the stones, and were laid on a deposit of mid-grey clay. A line of red bricks, measuring 0.23m by 0.09m by 0.07m, two bricks wide were orientated in an east/west direction near the southern extant of this surface.
Two recent intrusions were noted in the trench. A lead water pipe, was observed as truncating the northern edge of cobbles ***45,*** and a recent cut in the soil horizon over the area of foundation ***46.*** Undoubtedly this is where the foundation was removed during the mid twentieth century.

Site No: **35**
Trench No: 35c
Alignment: East/west
Length: 13m
Depth: 0.09m

Description: Topsoil, ***42***, measured 0.4m thick and comprised a very dark grey fine sand. A dark brown-grey subsoil, ***43*** , measured 0.5m thick. The underlying glacial till, ***44,*** varied from a compact clay and coarse sand with frequent sub-rounded stone inclusions of a maximum size of 0.15m by 0.1m by 0.1m, to a loose coarse sandy gravel at the eastern end of the trench. The trench contained a single field drain as well as a large drain for waste water, but no deposits of an archaeological significance were present.

Site No: **36**
Trench No: 36a
Alignment: North-north-east/south-south-west
Length: 20m
Depth: 0.5m
Description: Topsoil, ***24,*** was excavated to a depth of 0.25m and comprised a dark grey-brown sandy-clay. The underlying subsoil, ***25***, was excavated a further 0.18m, a light grey sandy clay. The glacial till, ***26***, comprised a light orangey grey clay with less than 5% sub-rounded small stone inclusions. In total five field drains were located across the trench.
Cutting the natural, orientated in an north-east/south-west direction, was a shallow linear ***23,*** measuring 0.72m wide and 0.07m deep. It was filled by a mid grey-brown silt-clay with less than 5% small rounded stone inclusions, ***22***. The profile of the feature roughly gives a flat bottomed U-shape, but root action has made part of the sides and base irregular in shape. The feature is thought to form a small boundary or drainage ditch. No dating evidence was retrieved from its fill.

Site No: **36**
Trench No: 36b
Alignment: North-east/south-west
Length: 20m
Depth: 0.6m
Description: Topsoil***, 9,*** comprised a very dark grey silty-clay, 0.16m thick, and the underlying subsoil, **10**, a mid orange-brown silty-clay with less than 5% small sub-rounded stone inclusions, 0.22m thick. The glacial till ***12*** comprised a light grey-brown clay with less than 1% sub-rounded medium sized stone inclusions. A single field drain was noted in the north-eastern end of the trench.
In total three features were recorded cutting the glacial till. A linear gully was orientated in a north/south direction, measuring 0.45m wide and 0.12m deep, with a U-shaped profile. This had a physical relationship, and was recorded as possibly cutting, an irregular shaped area of root action, ***7***. These were both filled with a very dark brown-grey silty-clay, ***6*** and ***8*** respectively. It is highly likely that these features form a single period of root disturbance to the glacial till.
A possible pit ***14*** was also recorded, feature ***14***. It measured 1.47m by 0.78m and 0.13m deep, and comprised concave sides and base. It was filled with a mid grey-brown compact clay ***13,*** with less than 1% small sub-rounded stone inclusions. Although possibly a backfilled pit, an alternative interpretation is simply a small variation in the glacial till.

Site No: **36**
Trench No. 36c
Alignment: North- east/south- west
Length: 20m
Depth: 0.45m
Description: Topsoil, ***1***, was excavated to a depth of 0.21m and comprised a very dark brown-grey silty-clay. The underlying subsoil, ***2***, was excavated a further 0.23m and comprised a mid grey-brown silty-clay. Beneath the soil horizon was a layer of very dark brown grey light clay, ***3,*** representing a buried topsoil. The glacial till, ***4 ,*** comprised a light orange grey compact clay with less the 5% small sub-rounded stone inclusions.
A single field drain was noted in north-eastern half of the trench, but no features of an archaeological significance were present.

Site No: **37**
Trench No: 37a
Alignment: North east/south west
Length: 20m
Depth: 0.3m
Description: Topsoil, ***15***, measured 0.15m in depth, comprised a dark grey-brown fine sandy-silty-clay with less than 2% small irregular shaped stones. A mid grey-brown fine sandy-silty-clay subsoil, ***16***, measured 0.15m thick. The underlying glacial till, ***17***, comprised a mid orange-grey clay with occasional small sub-rounded stone inclusions.
Two inter-cutting features were located in the north eastern half of the trench. The earlier was an irregular shaped pit, ***21,*** measuring 1.38m by 1.14m and 0.29m deep. Its convex sides and a concave base was filled with a light orange-brown sandy-clay, ***.20***. This was cut by a shallow U-shaped gully, ***19,*** measuring 0.09m wide and 0.14m deep. It was filled with a mid dark grey sandy-clay, ***18;*** an accumulation of sediment eroded from surrounding topsoil. No finds were recovered to date these features. It is possible that they form one feature, irregular in shape, being the product of bioturbation, with some variation in its fills.

Site No: **42**
Trench No: 42a
Alignment: North/south; east/west (L-shaped)
Length: 20m; 15.85m
Depth: 0.82m
Description: Trench 42a was excavated in an L-shape. The topsoil, ***89***, comprised a dark grey-brown silty-clay, 0.25m in thickness. Included within the topsoil, particularly in the east/west and the northern half of the north/south parts of the trench, were frequent to abundant quantities of slag. Some of this material can be identified as tap slag from a bloomery furnace. The east/west section of the trench was excavated on a fairly steep gradient down to the nearby stream. It would appear that this material was discarded down the slope. The glacial till, ***90***, comprised a light orange-brown clay with occasional small sub-rounded stone inclusions. Three areas of root disturbance were recorded cutting the till, one slightly deeper area of root disturbance being located at the corner of the trench ***81***.
A linear feature, ***87*** ,was located at the southern end of the trench, measuring 0.9m wide and 0.4m deep. The north-western terminus of the feature was located within the trench with the rest of the feature extending eastwards out of the trench. Much of the cut measured only 0.14m deep, before cutting deeper (Fig 13). It was filled with a single secondary deposit, ***88***, an accumulation of sediment eroded from surrounding topsoil. This deposit comprised a mid brown grey medium sandy-clay with less than 1% small sub-rounded stone inclusions. The purpose of the feature was unresolved. A single sherd of mid twelfth to mid fourteenth century pottery was located from the topsoil, *89*, directly above ***88***.

Site No: **42**
Trench No: 42b
Alignment: North/south
Length: 20m
Depth: 0.5m
Description: Topsoil, ***101***, was excavated to a depth of 0.2m and comprised a dark brown-grey fine sandy-silty-clay. A dark brown fine sandy-silt-clay subsoil, ***102***, was excavated to a further 0.3m depth. The underlying glacial till, ***104***, varied from a mid yellow-brown sand, a mid grey clay, to a mid orange-grey clay. Five field drains were located crossing the trench, but no deposits of an archaeological significance were present.

Site No: **42**
Trench N: 42c
Alignment: North -east/south-west
Length: 20m
Depth: 2m
Description: Topsoil, ***96***, measured 0.28m thick and comprised a very dark grey fine sandy-silty-clay. A mid grey fine sandy-silt-clay subsoil, ***97***, measured 0.18m thick. The underlying glacial till, ***98***,

comprised a mid grey-orange coarse sandy-clay with occasional medium sized sub-rounded stone inclusions.
Four field drains were located within the trench. Two further features cutting the till included a pit/posthole feature, ***83***, and a possible feature, ***91***. Pit ***83*** measured 0.4m by 0.35m and 0.07m deep, being roughly circular in shape with concave sides and base. It was filled with a very dark grey fine sandy-silty-clay, with rare sub-rounded stone inclusions and frequent charcoal inclusions. No finds were recovered to date the feature.
Linear ***91*** was located in the south-eastern corner of the trench, but was only partly visible in the excavated area. It measured at least 0.3m in width and 0.5m deep, with a concave side and base. Its fill was a light orange-brown silty-clay, deposit ***92***, predominantly redeposited till. This area was carefully examined due to the presence of a geophysical anomaly at this end of the trench, but it is possible that this deposit simply represents a slight variation in the glacial till

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Site No: **45**
Trench No: 45b
Alignment: East/west
Length: 20m
Depth: 2.3m
Description: Topsoil, ***120***, was excavated to a depth of 0.2m and comprised a very dark grey fine sandy-silt-clay. A mid grey fine sandy-silt-clay subsoil, ***121***, measured 0.2m thick. The underlying glacial till, ***122***, comprised a mid grey-orange coarse sandy-clay with occasional small sub-rounded stone inclusions. Five field drains were located within the trench, but no deposits of an archaeological significance were present.

Site No: **45**
Trench No: 45c
Alignment: West-north-west/east-south-east
Length: 20m
Depth: 2.2m
Description: Topsoil, ***96***, was excavated to a depth of 0.24m and comprised a dark brown clayey-silt. A mid brown grey silt-clay subsoil, ***97***, measured 0.2m thick. The underlying glacial till, ***98***, comprised a yellow mottled sandy-clay. A single field drain was located within the trench, but no deposits of an archaeological significance were present.

Site No: **45**
Trench No: 45d
Alignment: 10m
Length: 2.3m
Depth: 0.38m
Description: Topsoil, ***99***, was excavated to a depth of 0.28m and comprised a dark brown-grey clayey-silt. A light brown-grey fine sandy-clay subsoil, ***100***, measured 0.2m thick. The underlying glacial till, ***101***, comprised a mid orange-brown sandy-clay with occasional small sub-rounded stone inclusions. No deposits of an archaeological significance were located.

Site No: **45**
Trench No: 45e
Alignment: North-west/south-east
Length: 10m
Depth: 0.36m
Description: Topsoil, ***93***, was excavated to a depth of 0.14m and comprised a dark grey-brown sandy-clay. A dark brown fine sandy-clay subsoil, ***94***, measured 0.1m thick with rare small sub-rounded stone inclusions. The underlying glacial till, ***95***, comprised a mid orange-brown sandy-clay with occasional small sub-rounded stone inclusions. Two field drains were located within the trench, but no deposits of an archaeological significance.

Site No.: **50**
Trench No. 50a
Alignment: East/west
Length: 20m
Depth: 2.3m
Description: Topsoil, ***126***, was excavated to a depth of 0.1m and comprised a dark brown sandy-clay. A dark brown fine sandy-clay subsoil, ***127***, measured 0.05m thick with rare small sub-rounded stone inclusions. The underlying glacial till, ***95***, comprised a mid orange-brown sandy-clay with occasional small sub-rounded stone inclusions. Two field drains were located within the trench, and one area root disturbance, but no deposits of an archaeological significance.

Site No: **50**
Trench No: 50b
Alignment: 10.1m
Length: 2.3m
Depth: 0.53m
Description: Topsoil, ***123***, was excavated to a depth of 0.26m and comprised a dark grey-brown silty-clay with occasional small sub-rounded stone inclusions. A mid grey-brown silty-clay subsoil, ***124***, measured 0.27m thick. The underlying glacial till, ***125***, comprised a mid brown-orange clay with rare small sub-rounded stone inclusions. A large pipe, the main drain from Hulton Heys Farm, was located within the trench, but no deposits of an archaeological significance.

Site No: **51**
Trench No: 51a
Alignment: 20m
Length: 2.2m
Depth: 0.5m
Description: Topsoil, ***105***, was excavated to a depth of 0.3m and comprised a dark grey-brown sandy-clay humic soil. No subsoil was present, but a series of three deposits were located across the extent of the trench. A dark reddish-pink gravel, ***107***, measured 0.2m thick and comprised a layer of hardcore, possibly from the construction of track located to the south of the trench. Underlying ***107***, *was a* mixed deposit*108*, varying between a mid brown, yellowish-brown and light grey-brown sandy-clay 0.15m thick. A mid orange-brown to light brown sandy-clay, ***109***, containing red brick fragments and post-medieval pottery, measuring 0.2m thick, was located below ***108*** and over the glacial till, ***119***. The latter comprised a light blue-grey sandy-clay with frequent large sub-rounded stone inclusions. A single field drain was located cutting across the middle of the trench.
Deposits ***107, 108*** and ***109*** may have been used to create a more level area of hard standing, or alternatively these layers represent success dumps of material. There is insufficient building material in these deposits for them to be interpreted as demolition debris. The pottery suggests an eighteenth to nineteenth century date for these deposits possibly associated with the activities of the once existing farm of Old Graces.

Site No: **51**
Trench No: 51b
Alignment: North/south
Length: 20m
Depth: 1.1m
Description: Topsoil, ***113***, comprised a dark brown silty clay 0.1m thick. A dark grey-brown clayey subsoil, ***114***, measured 0.2m thick. Below the subsoil a mid red-brown clay, ***115***, a deposit clay till, measured 0.1m thick. Underlying ***115***, was a blue-grey clay *116*, with occasional slate and sub-rounded stone inclusions as well as red brick fragments.
The underlying glacial till, ***106***, varied between a blue-grey, mid red-brown to a light red-brown clay. A single field drain was located across the centre of the trench.

Site No: **51**
Trench No: 51c
Alignment: East/west
Length: 20m
Depth: 0.7m
Description: Trench 51c records the same deposits as those located in Trench 51a, which it crosses. Here the topsoil is recorded as ***110***, and the subsoil as ***111***. Deposits ***107*** to ***108*** have been recorded as a single context ***112***, 0.1m thick, which comprised a mid orange-brown clay-silt containing small red brick fragments. The glacial till comprised a mid blue-grey clay with occasional sub-rounded small stone inclusions.

Site No: **70**
Trench No: 70a
Alignment: East-north-east/west-south-west
Length: 20m
Depth: 1.1m
Description: The overburden ***390*** comprised a dark orangey-grey clay with abundant twentieth century inclusions, much of which was removed by machine prior to the excavation of the trench. Beneath this a concrete floor, ***392***, covered the eastern 12.36m of the trench, measuring 0.18m thick. Between ***390*** and ***392*** was ***391***, a very dark grey humic silt measuring 0.05m thick. Associated with the concrete floor was a twentieth century brick sump, *395*, 1m wide, with a ceramic pipe to drain water away visible in the north -facing section. The position of a second sump, with connecting pipe, is marked on Figure 14. Contemporary with the concrete surface *392* was surface ***396***, which comprised Yorkshire stone with slabs 0.12m thick. A cobbled surface, ***393***, was located directly below concrete ***392***, the concrete having consolidated between the stone. It was not possible therefore to break out one surface without removing the other. The underlying levelling deposit, ***394***, comprised a dark grey silty coarse sand with abundant quantities of crushed slag measuring 0.3m thick. Below ***396*** two further levelling deposits were identified. These included a light orange-brown fine sand measuring 0.12m, ***397***, overlying 0.25m of a mixed deposit of very dark grey coarse sand-clay with frequent small coal and slag inclusions. Although identified as a separate deposit top ***394***, these two layers are considered to be contemporary, the later containing twentieth century frogged and stamped brick fragments.
Along the north eastern limit of the excavation was a line of upright sandstone slabs, ***399***, measuring 0.9m by 0.3m by 0.1m. These demarcate the extent of the floor surface, although it was not clear what this implied structurally to the north of these stones. Deposit ***400***, located of the northern side of ***399***, comprised a very dark grey coarse sand-silt-clay containing wood fragments, and twentieth century ceramic and brick fragments.

Site No: **70**
Trench No: 70b
Alignment: East-north-east/west-south-west
Length: 20m
Depth: 0.72m
Description: Topsoil was excavated to a maximum depth of 0.22m, although across much of the trench it was only 0.1m, thick. At the western and of the trench, where the soil horizon was deepest, a dark brown-grey medium sandy-silt-clay subsoil was identified, 0.2m thick. The glacial till, ***402***, comprised a mid grey-orange medium sandy till with occasional medium sized sub-rounded stone inclusions.
Below the soil horizon were two areas of flagstone floor and a number of foundations or footings. One of the earliest deposits was levelling layer ***212***, which comprised a dark grey clay medium sand. Included within this deposit were occasional cobble stones, evidently out of *situ* from their original position, measuring a maximum of 0.13m by 0.13m by 0.1m with flattened worn surfaces. Cutting this layer was the construction cut, ***235***, for sandstone foundation ***196***, Which measured at least 1.4m in length, 0.95m wide and 0.2m deep and continued beyond the western limit of the trench. Foundation ***196*** was trench-built with roughly-faced sandstone of a maximum size of 0.53m by 0.4m by 0.22m, with smaller irregular shaped stones within its core. The backfill around the foundation, ***403*** comprised a very dark grey sandy-silty-clay with occasional medium sized sub-angular stone inclusions; representing a redeposited topsoil. The eastern extent of this foundation is where the stone ceased, but when this area of the trench was excavated down to the glacial till it appears to have been disturbed by recent activity. Nevertheless, the

larger stone at this end of the foundation suggests an original terminus. It is debatable that the construction cut on the southern side of this foundation is as it first appeared, as the deposit ***402*** is nearly identical to deposits of the soil horizon.

Above ***212*** was a second levelling deposit ***211***, comprised of a mid orange-brown clayey fine sand measuring 0.14m thick. It is upon this that the flagged floor ***210*** was laid. The flags measured a maximum of 0.8m square and 0.07m thick. In the south-western area this floor had been removed prior to the excavation, and a line of three sub-rounded or sub-square sandstone blocks were located within deposit ***213***, of a maximum size of 0.56m by 0.54m by 0.52m. Unlike foundation ***196***, these stones were naturally worn, but they appear to align with foundation ***196***. They were within a linear cut, which, to the north was intercutting ***211.*** It measured 1.32 wide and 0.42 deep. The matrix of ***213*** comprised a very dark grey fine sandy-silt-clay, and it also contained an area of disturbed cobbles (Fig 15), of the same size as those recorded in deposit ***212***.

A second area of flagstone floor, but identical in form to ***210***, was ***224***. The underlying levelling deposit, ***222***, comprised a dark grey coarse sand with only limited quantities of silt within its matrix. The two areas of floor were separated by a sandstone footing ***223.***This is likely to represent an internal division within the hall and was comprised of roughly-squared sandstone measuring 0.48m in length and 0.29m wide **.**Within cut ***228*** was a stone and red brick drain, represented by ***227***, ***404***, ***405*** with ***403*** as the large sub-square sandstone sides of the drain. These measured a maximum of 0.5m by 0.4m by 0.2m. The base consisted of thin sandstone slabs, ***405***, which, measured 20m by 15m by 0.07m in size. The sediment within the drain comprised a very dark grey coarse sandy-silt-clay, ***227***. Part of the drain may have been modified with a course of red brick around the edge of the drain, which measured 0.24m by 0.11m by 0.07m, one course thick placed around part the edge of the drain; One brick had evidently being disturbed and was found within fill ***223***. This red brick may account for the floor in this area of the building having been removed.

Construction cut ***232*** contained sandstone foundation ***197***, which cut into the glacial till ***402***, and is thought to relate to the earliest phase of the structure. The cut measured 0.85m in width, and ***197*** comprised irregular sandstone blocks of a maximum size of 0.53m by 0.4m by 0.22m, within a mid grey coarse sandy-clay matrix containing smaller irregular stone inclusions, and two red brick fragment. Footing ***237*** comprised red brick which measured 0.24m by 0.11m by 0.07m, with a compact light grey coarse sandy mortar. The construction cut was, ***407***, truncated the fill of ***232*** (Fig 15) was orientated in an east/west and north/south direction. A flagstone floor ***234***, identical to those previously described was located to the east of the footing.

A third red-brick footing ***229*** was located extending beyond the southern limit of excavation. It measured 0.3m wide, and comprised red bricks and mortar identical to those of ***233***, within construction cut ***407*** that measured 0.74m wide.

It is thought that the footings ***233*** and ***234*** may represent a later addition or modifications to the original wall, the outline of which can be seen on the 1891 OS map of the area. It is thought these alterations took place prior to 1850, as the 1850 OS map gives the same building outline as the 1891 OS map.

To the east of floor ***224*** a single posthole was located 0.42m by 0.35m, with the wooden post in *situ*, It measured 0.42m by 0.35m, measuring 0.17m in diameter. A second possible posthole ***281***, was recorded as square in shape, although it continued beyond the northern limit of excavation, and measured 0.2m by at least 0.15m and 0.14m deep, with straight near vertical sides and a flat base. It was filled with a very dark grey medium sandy-silty-clay, ***280***.

Part of the southern edge of the trench was extended by 1.2m at its western end, due to recent disturbance of this area. Within this a single pit was located, ***217***, measuring 0.62m in diameter and 0.1m deep. It contained a single fill of redeposited topsoil, ***216***, which comprised a very dark grey medium sand-silt-clay.

Site No: **70**
Trench No: 70c
Alignment: North-east/south-west
Length: 20m
Depth: 0.65m
Description: Topsoil ***349*** comprised a dark brown clayey-silt, 0.34m thick. A light brown silty- clay subsoil, ***346***, measured 0.36m thick. The underlying glacial till, ***347***, varied between a light yellow- grey to mid orange-yellow clay.

The south-eastern corner of a ditch, ***331,*** was located along the eastern side of the trench. It was orientated in a north/south and east/west direction, and measured 3m wide and 0.5m deep. It contained mid brown-

orange medium sand-clayey-silt, derived from surrounding eroding topsails. It was cut by three features, postholes ***323*** and ***325***, as well as a modern service ***348***.
Pit, or possibly posthole, ***325*** was sub-square in shape and measured 0.8m square and 0.17m deep (Fig 16). Its fill, ***326***, comprised a very dark grey coarse sand-silty-clay. Adjacent to this was a second sub-square posthole *321*, 0.5m square and 0.7m deep. Its fill, ***322***, comprised a grey-brown coarse sandy-clay. Both postholes truncated a square posthole ***323***, which measured 0.35m square and 0.4m deep, filled with a mid brown-grey coarse sandy-clay ***322***.
Pit ***342*** was located at the northern end of the trench, measuring 0.45m by 0.34m and 0.45m deep. It had straight sides, at a gradient of approximately 1:2, with a slightly undulating base (Fig 16). It was filled with a mid orange-brown coarse sand-silty-clay with occasional small sub-rounded stone and ash inclusions. Its deep profile in comparison to its dimensions is suggestive of a posthole. Adjacent to ***342*** was pit ***340***, which measured 0.6m by at least 0.5m, continuing beyond the western limit of excavation, and 0.25m deep. Its shape in plan was irregular, but it had straight near vertical sides and a flat base. It contained a single deposit, ***341***, comprised of mid brown-orange fine sand-silty-clay with red brick and coal inclusions, re-deposited topsoil. The purpose of this feature was unresolved. A single field drain was located in the trench, truncated by service trench ***348***.

Site No: **70**
Trench No: 70d
Alignment: North-east/south-west
Length: 20m
Depth: 0.42m
Description: The overburden, ***408***, comprised of a very dark grey coarse sandy silty clay, within which crushed brick was located from buildings demolished on the site. The underlying glacial till, ***409***, comprised a mid orangey-grey medium sandy-clay.
Footing ***293*** comprised red brick measuring 0.23m by 0.11m by 0.075m bonded with a dark grey, consolidated, coarse sandy mortar. Although not all of the foundation was visible, an English Garden Wall bonding pattern could be observed. The footing measured at least 0.37m in depth and 0.53m wide. This was trench-built in a construction cut, ***306***, which comprised vertical straight sides backfilled with a friable very dark grey fine sandy-silty-clay, containing abundant quantities of red brick fragments, ***319***. A line of sub-square sandstone flags, ***292*** measuring a maximum of 0.57m by 0.47m by 0.15m were laid parallel to the footing, within a dark grey fine sandy-silt-clay sediment. These stones overly ***319*** in construction cut ***306***, and they must post-date footing ***293***.
To the north of this footing ***294***, four post or stakehole features were located (Fig 17). Two square postholes, ***300*** and ***303***, potentially form part of the internal structure of a building. Posthole ***300*** measured 0.35m square and 0.21m deep, with concave sides and base. A dark grey fine sand-silty-clay, ***314***, comprised the packing material around post pipe ***313***, a mid grey fine sandy-silt-clay. Posthole ***303*** measured 0.52m square and 0.15m deep, with straight sides and a flat base. Deposit ***318***, a mid-grey fine sandy silt clay, comprised redeposited topsoil used as packing material. A very dark grey fine sandy-silt-clay, ***317***, was found within the post pipe.
Posthole ***300*** was truncated on its western edge by a V-shaped rectangular cut measuring 0.26m by 0.13m and 0.08m deep, ***301***, filled with a very dark grey humic silt, ***315***. Here, a rectangular stake had decayed in *situ*. Adjacent to ***300*** was a small circular feature, ***305***, which measured 0.25m in diameter and 0.08m deep, with concave sides and base. It was filled with a red-orange medium sand, ***312***. The purpose of ***305*** was unresolved.
To the south of footing ***293*** was a sub-square feature, ***309***, measuring 0.41m by 0.41m and 0.08m deep, with straight sides and a flat base, filled with a very dark grey coarse sandy silt clay, deposit ***328***. Due to its similarity in size and shape to ***303***, this was also considered a likely posthole.
A straight drainage gully, ***308***, orientated along the trench, measured 0.21m wide and 0.1m with straight near vertical sides. Its fill comprised a very dark grey coarse sand with abundant quantities of crushed slag and clinker, ***327***. It was truncated by two large identical postholes, ***336*** and ***411***, only the former of which was excavated. This measured 1m by 1.35m and 0.58m deep with two slabs of sandstone, ***335***, at its base which measured 0.8m by at least 0.6m and 0.12m thick, used as a post pad. Around the edge of the feature, ***334*** comprised a mix of dark grey medium sandy-clay and mid orange clay with occasional small sub-rounded stone inclusions; a mixture of redeposited till and topsoil. This deposit comprised the packing material of the posthole within which a block of cemented masonry was included, measuring 0.52m by at least 0.4m and 0.27m deep, together with late nineteenth to twentieth century glass. The post pipe, ***333***, measured 0.64m wide and comprised a dark grey medium sandy-silt-clay with occasional small

sub-rounded stone inclusions. Posthole ***411*** still had the wooden post in *situ*, measuring 0.28m square. The packing of ***411***, ***410***, comprised a mid grey silty-clay topsoil mixed with mid orange-grey clay till.
In addition to the above, a layer of concrete covered the 2.0m of the north eastern end of the trench. An area of root action was identified along the south eastern edge of the trench, and two twentieth century ceramic pipes crossed the centre of the trench.

Site No: **70**
Trench No: 70e
Alignment: North-east/south-west
Length: 20m
Depth: 0.65m
Description: Topsoil, ***237***, measured 0.32m thick and comprised a very dark grey fine sandy-silty-clay. A dark brown grey fine sandy-silty-clay subsoil, ***238***, measured 0.28m thick. The underlying glacial till, ***239***, comprised a mid orange-grey medium sandy-clay.
At the southern end of the trench a well, ***291***, was located within construction cut ***289*** and measured 2.45m in diameter. Its masonry comprised irregular roughly-coursed sandstone of a maximum size of 0.45m by 0.3m by 0.15m, roughly faced on the interior and exterior. The upper interior deposit, ***290***, comprised a silty-clay that varied from light grey to light orange-grey in colour, with abundant large irregular stone inclusions where the well had been backfilled, and possibly included the upper masonry of the structure.
An area of root action, ***221***, in the north-eastern extent of the trench, measured 4.5m by 0.75m and 0.25 deep within the trench, and was irregular in shape and with an irregular base. Its fill comprised a mid orange-brown clay, ***220***, which was essentially disturbed till with limited quantities of the soil horizon, but it contained a single sherd of mid thirteenth to mid fourteenth century pottery.
Five likely postholes were located with the trench, ***202***, ***206*** and ***219*** to the north, and ***285*** and ***287*** in the centre of the trench. Posthole ***202*** measured 0.5m square and 0.22m deep, with straight near vertical sides and a flat base. Packing material ***200*** comprised a mid orange-brown silty-clay till that surrounded the post pipe, ***201***, which comprised a dark grey silty-clay. This was truncated by a sub-square posthole, ***206***, that measured 0.97m by 0.9m and 0.25m deep and had straight sides and a flat base. At its base was a sandstone post pad. The packing material varied between a dark brown-grey with light orange-grey clay, ***205***, a mid orange-brown silty-clay, ***204***, to a dark grey-brown silty-clay, ***203***, all of which comprise one episode of backfilling around the post with a mix of topsoil and clay till. The post pipe, ***207***, comprised a very dark grey silty-clay 0.2m wide, which was redeposited topsoil, presumably resulting from the removal of the post. Pit/posthole feature, ***219***, measured 0.5m in diameter and 0.14m deep, with concave sides and base. It was filled with a very dark grey-brown clayey-silt, ***218***, of redeposited topsoil.
Circular posthole ***287*** was positioned to the south of centre in the trench and measured 0.27m in diameter, with concave sides and base. It was filled by a single deposit of very dark grey silty-clay, which was redeposited topsoil ***286***. Adjacent to this a sub-square posthole, ***285***, measured 0.6m by at least 0.44m and 0.06m deep, with straight near vertical sides and a flat base. It was filled with a mid orange-brown silty-clay, ***284***, which was redeposited topsoil. Although the interpretation of this feature was not as conclusive as postholes ***202*** and ***206***, it had many similarities in form.
In the very north-west corner of the trench, a possible pit ***199*** measured at least 1m wide and 0.17m deep and contained a dark grey coarse sandy-clay, ***198***. Areas ***242***, ***284*** and ***296*** delimit the extent where the till has been effected by root action. Feature ***295*** comprised either a rectangular pit or a linear that measured at least 1.25m by 0.75m and 0.26m deep. A very dark grey coarse sandy-silt-clay containing modern brick fragments, ***294***, was the result of the feature being backfilled with topsoil and rubble.

Site No: **70**
Trench No: 70f
Alignment: East/west
Length: 20m
Depth: 2m
Description: Topsoil, ***276***, measured 0.4m and comprised a thick a very dark grey fine sand-silty-clay. The underlying glacial till varied between a mid grey-orangey clay and a mid grey medium sandy-clay. Three field drains were located within the trench, but no deposits of an archaeological significance were present.

Site No: **75**
Trench No: 75a
Alignment: North/south
Length: 20m
Depth: 0.7m
Description: Topsoil, ***129***, was excavated to a depth of 0.5m and comprised a dark grey- brown silty- clay with rare small sub-rounded stone inclusions. A mid brown-grey sandy-clay subsoil, ***130***, with similar inclusions, measured 0.17m thick. The underlying glacial till, ***131***, comprised a mid orange-grey clay.
Across the centre of the trench were two inter-cutting features (Fig 19; Plate 23). The earlier ditch, ***137***, measured 4.7m wide and 0.6m deep with concave sides and base. It contained three fills that were considered to be an accumulation of sediment eroded from surrounding topsails. The lower fill ***141*** comprised a mid brown silty-clay, 0.25m thick. On the northern edge of the cut this fill was recorded as ***143***, but is considered to be the same deposit, truncated by ditch ***136***. Above ***141*** lay a dark brown silty-clay, ***142***, 0.2m thick followed by a light brown-grey silty-clay, ***143***, 0.35m thick.
Ditch ***137*** was truncated or re-cut, on its northern edge by drainage ditch ***136***. This second cut measured 2m wide and 0.86m deep, with convex to straight sides and a concave base, containing fills ***139***, ***140*** and ***138***. fill ***139*** was a mid brown silty-clay and was positioned on the southern edge of the cut. The boundary between ***139*** and fills ***140*** and ***138*** may be suggestive of a re-cut, but deposit ***139*** is more likely to represent excavated sediment slumped back into the ditch during the construction of the drain. Fill ***140*** comprised light grey silt, 0.26m thick, with 90% stone inclusions of a maximum size of 0.22m by 0.18m by 0.08m. Wood was found placed in the base of the ditch, possible originally as by bundles to aid drainage. Fill ***139*** comprised a light grey silty clay with frequent medium sized sub-angular stone inclusions, 0.50m thick. Both of these fills represent the backfilling of the drainage ditch, with larger stones at the base to aid drainage.
To the south of this linear two parallel linear drainage ditches were located 0.4m apart, ***133*** and ***135*** (Fig 19). Ditch ***133*** measured 0.9m wide and 0.1m deep, with concave sides and base. It was filled with a mid grey-brown silty-sand, ***132***, with approximately 60% medium-sized sub-rounded stone inclusions. Ditch ***135*** measured 0.96m wide and 0.12m deep, and had concave sides and an irregular base. It was filled with an identical deposit as ***133***, but with up to 90% stone inclusions. Both fills contained red brick fragments. They appear to be drainage features to the south of the field boundary indicated by ditch ***137***, suggesting a bank and hedge possibly existed between features ***137*** and ***133***. This field boundary can be seen marked on the 1850 OS map of the area. A parallel late nineteenth / early twentieth century ceramic field drain was located to the north of ditch ***137***.

Site No: **76/77**
Trench No: 76/77a
Alignment: North/south
Length: 40m
Depth: 1.05m
Description: The topsoil, ***157***, measured 0.35m in depth and comprised a very dark brown sandy-silt-clay. The glacial till varied between a light yellow-grey clay, a loose yellow sand and a mid brown clay. The northern 3.1m of the trench was truncated by a large coal pit, ***151***, which extended beyond the limit of excavations. This was identifiable on the 1850 OS map of the area. Two sondages were excavated within it and a total of three fills were identified. However further investigation was prevented due to health and safety implications. The lowest fill, ***166***, comprised a mid grey silty-clay with a high percentage of wood fragments. There was an odour of decayed organic mater, and its colour suggested anaerobic conditions. It is suggested that this deposit represents a period when the coal pit had been infilled, thereby retaining significant quantities of water. Above this, a thin layer of mid orange-brown redeposited clay till *195*, was located. This measured 50mm thick and the upper deposit measured 0.30m thick, comprised a mid grey- brown re-deposited clay, ***165***. The upper two layers appear to be an attempt to backfill the feature, presumably to return the area of the pit to agricultural use. Three possible features ***148***, ***150*** and ***155*** were recorded cutting ***165,*** filled with crushed coal and sediment that represented areas where coal deposits had been included within ***166*** as part of the backfill material.
A further three features were noted cutting ***166***. The first a large, presumably linear, feature ***160*** was located along the north-eastern limit of excavation. It measured at least 2m wide and 0.56 deep containing five fills. The lowest, ***162***, measured 0.1m thick comprised a mid orange-red-brown clay, eroded from the natural till and ***166*** with abundant iron staining. Above this a very dark grey-brown coarse sandy-clay, ***161***, measured 0.18m thick, with coal, red brick and ash deposits within its matrix. Fill ***159***, 0.15m thick,

comprised a very dark brown coarse sandy-clay with abundant small coal inclusions. Above this fill ***158*** measured 0.12m thick, and comprised a very dark brown coarse sandy-clay with frequent coal inclusions. The upper deposit, ***157***, measured 0.35m thick, and comprised a very dark grey coarse sandy-clay with occasional deposits of sand and coal. The purpose of this feature was not resolved but the majority of its fills, ***157*** to ***159*** and ***161***, represent deliberate successional backfilling.

The second and third features cutting ***166*** were two pit or posthole features, ***164*** and ***388***. Feature ***164*** measured 0.32m wide and 0.22m deep, with near vertical concave sides and a concave base, filled with ***163***, a dark grey fine sandy-silty-clay. Feature ***388*** was near identical in form, measuring 0.3m wide and 0.2m deep, containing an identical fill, ***387***.

A second potential coal pit, ***184***, was located parallel to the south-eastern limit of the trench. It measured 10.5m 1.6m within the trench, but clearly extended beyond the limit of excavation. The lowest fill identified, ***185***, comprised a light orange-brown sandy-clay, with occasional coal and small sub-rounded stone inclusions, measuring at least 0.46m thick. Above this lay 0.2m of mid yellow-brown sandy-clay, ***185***, with approximately 20% red brick fragments and less than 5% coal inclusions. The upper fill, ***187***, measured 0.1m thick and comprised a mid brown-grey coarse sandy-silty-clay. This was a secondary fill derived from the surrounding eroding topsails. The fills and form of this feature were sufficiently similar to coal pit ***151***, and it was also abandoned due to health and safety considerations.

Cutting the fill of coal pit ***184*** were features ***189*** and ***174***. Linear ***189*** measured at least 1.55m in length, continuing beyond the western limit of excavation, 0.96m wide and 0.47m deep, with straight sides and a concave base. The lowest fill, ***194***, comprised a mid orange-grey clay, 0.7m thick, positioned on the southern side of the feature, that had eroded from the surrounding till. Above this a mid grey fine sandy-silty-clay, ***192***/***193***, with less than 1% medium-sized sub-rounded stone inclusions measured 0.42m thick, and had formed from backfilled glacial clay mixed with topsoil. The upper fill, ***188***, comprised a backfilled light orange-grey fine sandy-clay with similar stone inclusions. The purpose of this backfilled linear remains unresolved.

Feature ***174***, which measured 0.34m by 0.26m and 0.18m deep, formed a possible posthole. It was a rectangular shape, with straight near vertical sides and a flat base. It contained a mid brown-orange-grey silty-clay, ***175***, with small sub-rounded stones at the base, possibly used as a post pad or, alternatively disturbed packing material from when the post was removed. A small lens of crushed coal, 0.06m thick, was present in the upper part of the feature. A similar feature, ***172***, was located 0.5m to the south-west. Identical in form, it measured 0.34m by 0.26m and 0.14m deep. It was filled with ***176***, a mid orange-brown coarse sand-silty-clay with similar stones located at the base of the feature and less than 1% small coal inclusions.

A third comparable feature, posthole ***180***, approximately 11.0m further to the north, was identical in form and measured 0.45m by at least 0.37m and 0.3m deep (Fig 20). Deposit ***179*** around the edge of the feature comprised a mid orange-grey medium sandy-silty-clay, with occasional sub-rounded stone inclusions of a maximum size of 80mm by 80mm by 40mm. This formed the packing material around the post, being derived from glacial clay mixed with topsoil. Deposit ***178*** comprised a very dark grey silty-clay, derived from surrounding eroding topsoil after the post was removed.

Linear ***170***, was orientated in a east/west direction, measuring 0.68m wide and 0.37m deep, with near vertical or steep sides falling at a ration of 1:2 and a concave base. At the base, ***171*** comprised a mid yellow-brown sandy-clay, measuring 0.1m thick, and had derived from the clay edges of the feature. Above this, ***169***, a very dark grey-clayey gravel, had been backfilled into this drainage feature.

A second drainage feature, ***190***, was oriented east/west and consisted of a gully leading into a large backfilled sump measuring 2m wide. Its fill, ***191***, comprised a loose very dark grey sandy-silt with abundant stone and brick fragments and coal inclusions. This feature immediately filled with water during excavation. However, due to the recent date and obvious purpose of the feature, no further investigation was considered necessary.

Pit 181 measured 1.07m in diameter and 0.73m deep. Its lower fill, ***182***, comprised a mid orange-grey compacted clay, derived from the glacial till, ***157***, Its upper fill, ***183***, was a very dark grey silty-clay with abundant small coal fragments. Both deposits were backfill material, and contained late nineteenth to early twentieth century ceramics.

Site No: **78**
Trench No: 78a
Alignment: North-east/south-west
Length: 20m
Depth: 0.4m

Description: Topsoil, ***144***, measured 0.35m thick and comprised a dark grey silty-clay. The underlying glacial till, ***146***, comprised a mid orange-brown clay. Three field drains and two plough marks were located within the trench, but no deposits of an archaeological significance were present.

Site No: **87**
Trench No: 87a
Alignment: North/south
Length: 20.0m
Depth: 0.70m
Description: Topsoil, ***412***, comprised a very dark grey fine sandy-silty-clay 0.3m thick. A mid brown-grey fine sandy clay subsoil, ***413***, measured 0.35m thick. The underlying glacial till comprised a mid orange-grey fine sandy-clay.
A single modern intrusion was located in the centre of the trench but was not excavated, as it was visible as a recent excavation on the surface prior to any trench investigation. Two identical feature were located in Trench 87b; one containing a twentieth century oil drum and the second backfilled with recent vegetation. A number of these features were visible within the immediate vicinity.

Site No: **87**
Trench No: 87b
Alignment: East-north-east/south-south-west
Length: 20m
Depth: 0.5m
Description: Topsoil, ***418***, was excavated to a maximum depth of 0.38m and comprised a very dark grey fine sandy-silty-clay. A mid brown-grey fine sandy-silty-clay subsoil, ***419***, measured 0.18m thick. The underlying glacial till comprised a mid orange-grey medium sandy-clay with occasional medium sized sub-rounded stone inclusions.
At the western end of the trench a sub-circular pit/posthole feature, ***353***, measured 0.17m by 0.28m and 0.1m deep with straight near vertical sides and a flat base. Its fill, ***354***, comprised a mid grey-brown clayey-silt with occasional small sub-rounded stone inclusions.
Pits ***355*** and ***356*** are similar features, with straight near vertical sides and a flat base. Pit ***355*** measured 1m in width, and was filled with a light orange-grey clay to medium sand, ***457***. Pit ***365*** truncated the aforementioned feature, and measured 1.05m wide and 0.42m deep, filled with ***358***, which is directly comparable to deposit ***457***. The fills of these features are the result of deliberate backfilling, and it could be speculated that they are postholes, although post pipes were visible. Both were truncated by feature ***416*** which comprised a shallow V-shaped profile, 2.5m wide and visible in section. Its lower fill, ***415***, comprised a mid orange-brown fine sandy-silty-clay. Its upper fill was deliberately backfilled into the feature, ***359***, and comprised very dark grey medium sandy-silty-clay with occasional medium sized sub-rounded stone inclusions as well as twentieth century brick fragments.

Site No: **87**
Trench No: 87c
Alignment North-east/South-west
Length: 20m
Depth: 1.06m
Description: Topsoil, ***367***, comprised a very dark grey fine sandy-clay 0.54m thick. The underlying till, ***421***, was a mid grey-orange coarse sandy-clay. This was largely truncated by a series of large pits that extended beyond the eastern limit of excavation, most of which were identified as separate features in section. One of the earliest of these was pit ***344***, with a flat base and measuring 0.82m deep. Its lower fill, ***386***, comprised a mid orange-grey coarse sandy-silty-clay, a mix of topsoil and till backfilled into the feature 0.3m thick. Above this, a dark grey fine sandy-silty-clay, ***385***; with occasional small coal inclusions, measured 0.54m thick, potentially a redeposited topsoil overlying ***384*** comprised a mid brown-grey fine sandy-silty-clay that measured 0.35m thick, and believed to be sediment accumulated from the surrounding eroding topsoil.
Pit ***363*** measured 3.72m wide and at least 0.93m deep. Excavation ceased when the depth of the water table was reached. Its lower fill, ***383***, comprised a deposit 0.18m thick of crushed brick. Above this a mid orange-grey fine sand-clay, ***383***, represents either a secondary fill or sediment backfilled into the pit.

Backfill ***381*** comprised a dark grey fine sandy-silty-clay with occasional small coal inclusions. ***381***, was a very dark grey coarse sandy-clay fill with frequent small coal inclusions measured 0.44m thick, ***380***.

In the centre of the trench pit, ***379*** was only partially excavated. It measured at least 2.8m wide, 0.6m deep and extending across the width of the trench. Its only visible fill, ***378***, comprised a dark grey fine sandy-silty-clay with occasional coal and small sub-rounded stone inclusions presumed to be sediment eroded from topsoil. Pit ***379*** was truncated by pit ***377***, and measured 3.4m wide and 0.5m deep, with straight near vertical sides and a flat base. Its lower fill, ***376***, was only present on the northern side, as a dark grey fine sandy-silty-clay with occasional small coal inclusions, possibly deposited in waterlogged conditions. Its upper fill, ***375***, comprised a mid orange-grey medium sandy-silty-clay, which was a mix of topsoil and clay till backfilled into the pit. This pit was truncated on its northern edge by an oval pit ***374***, that measured at least 2m long, 1.5m wide and 0.36m with concave sides and base. Its lower fill, ***373***, comprised a mid grey medium sandy-silty-clay with occasional sub-rounded stone and small coal inclusions; This deposit also possibly accumulated in waterlogged conditions. Above this lay a mid-orange grey redeposited clay till, ***372***, that measured 0.09m thick.

Pit ***374*** was truncated along its northern edge by pit ***365***, which measured 2.5m by at least 1.25m and 0.9m deep. It's lower fill, ***366***, comprised backfilled topsoil, a dark grey fine sandy-silty-clay. Included with this deposit were occasional small sub-rounded stones as well as larger irregular sandstone fragments of a maximum size of 0.3m by 0.27m by 0.11m. Above ***366 was*** a layer of crushed coal that measured 0.12m thick, ***371***, followed by a second deposit of topsoil, ***370***, the same as ***366***, but without the larger stone inclusions. This is one of the latest pits in the sequence, but it varied from the others in that it could be seen to cut the soil horizon ***367***. Which suggested a recent date.

All of these pits show some evidence of being backfilled, but often only contain few finds. They are most likely to be clay extraction pits, the finds from pits ***363***, ***365*** and ***377*** suggesting a late nineteenth century date for this activity

APPENDIX 4: CONTEXT LIST

Context	Trench	Description
1	36c	Topsoil
2	36c	Subsoil
3	36c	Buried topsoil
4	36c	Glacial till
5	36b	Cut of gully
6	36b	Fill of ***5***
7	36b	Root action
8	36b	Fill of ***7***
9	36b	Topsoil
10	36b	Subsoil
11	36b	Glacial till
12	36b	Glacial till
13	36b	Fill of ***14***
14	36b	Possible pit
15	37a	Topsoil
16	37a	Subsoil
17	37a	Glacial till
18	37a	Fill of ***19***
19	37a	Gully
20	37a	Fill of ***21***
21	37a	Possible pit or root action
22	36a	Fill of 23
23	36a	Field boundary ditch
24	36a	Topsoil
25	36a	Subsoil
26	36a	Glacial till
27	35a	Fill of ***53***
28	35a	Brick floor
29	35a	Footing
30	35a	Linear
31	35a	Fill of ***30***
32	35a	Fill of ***32***
33	35a	Posthole
34	35a	Fill of ***35***
35	35a	Field Drain

36	35a	Wall
37	35a	Wall
38	35a	Wall
39	35a	Same as ***51***
40	35a	Same as ***52***
41	35a	Topsoil
42	35c	Topsoil
43	35c	Subsoil
44	35c	Glacial till
45	35b	Cobbles
46	35b	Foundation
47	35b	Construction cut
48	35b	Foundation
49	35b	Fill of ***50***
50	35b	Amorphous cut
51	35b	Fill of ***52***
52	35b	Possible pit
53	35b	Robber trench
54	35b	Concrete beam/footing
55	35b	Overburden
56	35b	Concrete
57	35b	Wall
58	35b	Stone foundation/cellar wall
59	35b	Foundation
60	35b	Construction cut
61	35b	Cellar backfill
62	35b	Backfill over vaulted cellar ***63***
63	35b	Vaulted cellar
64	35a	Glacial till
65	35a	Construction cut
66	35a	Layer
67	35b	Demolition debris
68	35b	Topsoil
69	35b	Subsoil
70	35b	Glacial till
71	5a	Fill of ***72***
72	5a	Ditch
73	5a	Fill of ***72***

74	5a	Fill of ***72***
75	5a	Topsoil
76	5a	Subsoil
77	5a	Glacial till
78	5b/c	Topsoil
79	5b/c	Subsoil
80	5b/c	Glacial till
81	42a	Root action
82	42a	Fill of ***81***
83	42c	Pit/posthole
84	42c	Fill of ***83***
85	42c	Topsoil
86	42c	Glacial till
87	42a	Ditch
88	42a	Fill of ***87***
89	42a	Topsoil
90	42a	Glacial till
91	42c	Pit?
92	42c	Fill of ***91***
93	42e	Topsoil
94	42e	Subsoil
95	42e	Glacial till
96	45c	Topsoil
97	45c	Subsoil
98	45c	Glacial till
99	45c	Topsoil
100	45d	Subsoil
101	45d	Glacial till
102	42b	Topsoil
103	42b	Subsoil
104	42b	Natural
105	51a	Topsoil
106	51a	Glacial till
107	51a	Gravel
108	51a	Layer
109	51a	Layer
110	51c	Topsoil
111	51c	Subsoil

112	51c	Layer
113	51b	Topsoil
114	51b	Subsoil
115	51b	Layer
116	51b	Layer
117	51c	Redeposited till
118	51b	Glacial till
119	51c	Glacial till
120	45b	Topsoil
121	45b	Subsoil
122	45b	Glacial till
123	50b	Topsoil
124	50b	Subsoil
125	50b	Glacial till
126	50a	Topsoil
127	50a	Subsoil
128	50a	Glacial till
129	75a	Topsoil
130	75a	Subsoil
131	75a	Glacial till
132	75a	Fill of ***133***
133	75a	Gully/drain
134	75a	Fill of ***135***
135	75a	Gully/drain
136	75a	Ditch
137	75a	Ditch
138	75a	Fill of ***136***
139	75a	Fill of ***136***
140	75a	Fill of ***136***
141	75a	Fill of ***137***
142	75a	Fill of ***137***
143	75a	Fill of ***137***
144	78a	Topsoil
145	78a	Interface with till ***146***
146	78a	Glacial till
147	76/77a	Fill of ***151***
148	76/77a	Void
149	76/77a	Fill of ***150***

150	76/77a	Pit
151	76/77a	Coal Pit
152	76/77a	Fill of ***151***
153	76/77a	Same as ***167; w***ooden posts within ***152*** of coal pit ***151***
154	76/77a	Fill of ***155***
155	76/77a	Pit
156	76/77a	Pit
157	76/77a	Topsoil
158	76/77a	Layer
159	76/77a	Layer
160	76/77a	Pit
161	76/77a	Fill of ***160***
162	76/77a	Fill of ***160***
163	76/77a	Land drain
164	76/77a	Fill of ***163***
165	76/77a	Fill of ***151***
166	76/77a	Fill of ***151***
167	76/77a	Wooden posts within ***152*** of coal pit ***151***
168	76/77a	Glacial till
169	76/77a	Fill of ***170***
170	76/77a	Linear
171	76/77a	Fill of ***170***
172	76/77a	Pit
173	76/77a	Fill of ***172***
174	76/77a	Pit
175	76/77a	Fill of ***174***
176	76/77a	Fill of ***177***
177	76/77a	Stakehole
178	76/77a	Fill of ***180***
179	76/77a	Fill of ***180***
180	76/77a	Posthole
181	76/77a	Pit
182	76/77a	Fill of ***181***
183	76/77a	Fill of ***181***
184	76/77a	Possible coal pit
185	76/77a	Fill of ***184***
186	76/77a	Fill of ***184***
187	76/77a	Fill of ***184***

188	76/77a	Pit
189	76/77a	Fill of ***188***
190	76/77a	Pit
191	76/77a	Fill of ***190***
192	76/77a	Fill of ***189***
193	76/77a	Fill of ***189***
194	76/77a	Fill of ***189***
195	76/77a	Fill of ***151***
196	70b	Foundation
197	70b	Foundation
198	70e	Fill of ***199***
199	70e	Pit
200	70e	Fill of **202**
201	70e	Fill of **202**
202	70e	Posthole
203	70e	Fill of ***206***
204	70e	Fill of ***206***
205	70e	Fill of ***206***
206	70e	Pit
207	70e	Fill of ***206***
208	70e	Fill of ***206***
209	70e	Fill of ***202***
210	70b	Flagged floor
211	70b	Levelling deposit
212	70b	Levelling deposit
213	70b	Linear
214	70b	Fill of ***215***
215	70b	Stakehole
216	70b	Fill of ***207***
217	70b	Pit/posthole
218	70e	Fill of ***219***
219	70e	Pit
220	70e	Fill of ***221***
221	70e	Root disturbance
222	70b	Levelling deposit
223	70b	Foundation
224	70b	Flagged floor
225	70b	Fill of ***226***

226	70b	Modern posthole
227	70b	Fill of ***228***
228	70b	Drain?
229	70b	Foundation
230	70b	Fill of ***231***
231	70b	Construction cut
232	70b	Construction cut
233	70b	Foundation
234	70b	Flagged floor
235	70b	Construction cut
236	70b	Layer
237	70e	Topsoil
238	70e	Subsoil
239	70e	Glacial till
240	70e	Fill of ***241***
241	70e	Posthole
242	70e	Fill of 243
243	70e	Root disturbance
244	70e	Posthole
245	70e	Fill of ***245***
276	70e	Topsoil
277	70e	Glacial till
278	70e	Same as ***283***
279	70e	Same as ***284***
280	70b	Fill of ***281***
281	70b	Posthole?
282	70b	Red brisk of drain
283	70e	Linear
284	70e	Fill of ***283***
285	70e	Pit
286	70e	Fill of ***285***
287	70e	Post/stakehole
288	70e	Fill of ***287***
289	70e	Well
290	70e	Fill of ***289***
291	70e	Stone wall of well ***289***
292	70d	Sandstone
293	70d	Red brick foundation

294	70e	Fill of ***295***
295	70e	Pit
296	70e	Fill of ***297***
297	70e	Linear area of root disturbance?
298	70d	Fill of ***299***
299	70d	Plough scar
300	70d	Posthole
301	70d	Stakehole
302	70d	Construction cut
303	70d	Posthole
304	70d	Void
305	70d	Pit/Posthole
306	70d	Construction cut
307	70d	Linear
308	70d	Field drain
309	70d	Pit/Posthole
310	70d	Fill of ***298***
311	70d	Fill of ***299***
312	70d	Fill of ***305***
313	70d	Fill of ***300***
314	70d	Fill of ***300***
315	70d	Fill of ***301***
316	70d	Fill of ***302***
317	70d	Fill of ***303***
318	70d	Fill of ***303***
319	70d	Fill of ***306***
320	70d	Fill of ***307***
321	70c	Pit
322	70c	Fill of ***321***
323	70c	Posthole
324	70c	Fill of ***323***
325	70c	Posthole
326	70c	Fill of ***325***
327	70d	Fill of ***308***
328	70d	Fill of ***309***
329	70c	Pit
330	70c	Fill of ***339***
331	70c	Ditch

332	70c	Fill of ***331***
333	70d	Fill of ***336***
334	70d	Fill of ***336***
335	70d	Fill of ***336***
336	70d	Posthole
337	70d	Fill of ***338***
338	70d	Pit
339	70d	Fill of ***338***
340	70c	Pit
341	70c	Fill of ***340***
342	70c	Posthole
343	70c	Fill of ***342***
344	70d	Footing?
345	70c	Topsoil
346	70c	Subsoil
347	70c	Glacial till
348	70c	Modern service
349	70c	Fill of ***348***
350	70c	Fill of ***352***
351	70c	Layer
352	70c	Pit/Ditch
353	87b	Posthole
354	87b	Fill of ***353***
355	87b	Pit
356	87b	Pit
357	87b	Fill of ***355***
358	87b	Fill of ***356***
359	87b	Fill of ***356***
360	87c	Stakehole
361	87c	Fill of ***360***
362	87c	Field drain
363	87c	Pit
364	87c	Void
365	87c	Pit
366	87c	Fill of ***365***
367	87c	Topsoil
368	87c	Pit
369	87c	Fill of ***368***

370	87c	Fill of ***365***
371	87c	Fill of ***365***
372	87c	Fill of ***374***
373	87c	Fill of ***374***
374	87c	Pit
375	87c	Fill of ***377***
376	87c	Fill of ***377***
377	87c	Pit
378	87c	Fill of ***379***
379	87c	Pit
380	87c	Fill of ***363***
381	87c	Fill of ***363***
382	87c	Fill of ***363***
383	87c	Fill of ***363***
384	87c	Fill of ***387***
385	87c	Fill of ***387***
386	87c	Fill of ***387***
387	87c	Pit
388	76/77a	Fill of ***389***
389	76/77a	Pit/posthole
390	70a	Overburden
391	70a	Humic layer
392	70a	Concrete floor
393	70a	Cobbled surface
394	70a	Levelling deposit
395	70a	Modern sump
396	70a	Levelling deposit
397	70a	Modern concrete and flagstone floor
398	70a	Levelling deposit
399	70a	Stone slabs
400	70a	Layer
401	70a	Glacial till
402	70b	Glacial till
403	70b	Fill of ***235***
404	70b	Stone of drain
405	70b	Stone base of drain
406	70b	Red brick of drain
407	70b	Construction cut

408	70d	Overburden
409	70d	Glacial till
410	70d	Fill of ***411***
411	70d	Posthole
412	87a	Topsoil
413	87a	Subsoil
414	87a	Glacial till
415	87b	Fill of ***416***
416	87b	Pit
417	87b	Void
418	87b	Topsoil
419	87b	Subsoil
420	87b	Glacial till
421	87c	Glacial till
422	70b	Cut of linear
423	70d	Red brick
424	70d	Red brick

APPENDIX 5: FINDS CATALOGUE

Tr = trench number, Ctxt = context number; OR = Object Record Number; Cat = Category; u/s = unstratified

Tr	Ctxt	OR	Material	Cat	No.	Description	Date
	u/s	64	Ceramic	building material	2	Small fragments of over-fired sand-cast tile	Post-medieval or later
	u/s	64	Ceramic	building material	1	Fragment of ?land drain	Post-medieval or later
5a	***71***	5	Ceramic	vessel	1	Fragment creamware.	Late eighteenth century or later
5a	***71***	5	Ceramic	vessel	1	Fragment self-glazed redware with white internal slip. Bowl or dish.	Late eighteenth century or later
5a	***71***	5	Ceramic	vessel	1	Fragment blue and white transfer-printed	Late eighteenth century or later
5a	u/s	12	Ceramic	vessel	1	Rim fragment white stoneware 1lb jar	Nineteenth century
5a	u/s	12	Ceramic	vessel	1	Base fragment plate or dish. Pearlware.	Late eighteenth - early nineteenth century
5a	u/s	6	Glass	vessel	1	Mould-blown vessel fragment in natural blue-green.	Late nineteenth to early twentieth century
5a	u/s	7	Ceramic	tobacco pipe	1	Stem fragment.	Post-medieval
5b	u/s	10	Ceramic	vessel	1	Fragment vessel with white earthenware body and olive green external glaze.	Nineteenth century or later
5b	u/s	10	Ceramic	vessel	3	Fragments under-glaze transfer-printed earthenware.	Late eighteenth - early nineteenth century
5b	u/s	10	Ceramic	vessel	1	Fragment Pearlware plate with blue feathered edge.	Late eighteenth - early nineteenth century
5b	u/s	10	Ceramic	vessel	2	Fragments white earthenware plates and cups.	Early nineteenth

							century onwards
5b	u/s	10	Ceramic	vessel	2	Fragment hard-paste porcelain.	Late eighteenth century or later
5b	u/s	10	Ceramic	vessel	1	Fragment late grey stoneware	Nineteenth century or later
5b	u/s	10	Ceramic	vessel	1	Fragment Pearlware soup plate with moulded rim and blue edge.	Late eighteenth - early nineteenth century
35a	***28***	2	Ceramic	vessel	1	Creamware bowl or dish fragment.	Late eighteenth century
35a	***28***	90	Ceramic	building material	1	Machine-made brick with deep frog on upper surface, filled with hard grey cement.	Modern
35a	***29***	89	Ceramic	building material	1	Handmade brick. Thick, and unevenly fired. Soft cream-coloured mortar with coal fleck.	Post-medieval
35a	***36***	87	Ceramic	building material	1	Handmade brick in hard purplish fabric. One surface covered in impressions of ?oat grains, and elsewhere numerous voids suggest the generous inclusion of chopped straw.	Post-medieval
35a	***38***	88	Ceramic	building material	1	Probably handmade brick in dense fine fabric. One surface appears to bear fine rustication, presumably intended as decoration.	Post-medieval
35b	***48***	11	Ceramic	vessel	4	Black-glazed redware body fragments.	Late eighteenth century?
35b	***59***	13	Ceramic	vessel	5	Body fragments. Black-glazed redware. Hard-fired and purplish..	Late seventeenth to early eighteenth century
35b	***59***	13	Ceramic	vessel	2	Body fragment. Black-glazed cream-bodied ware. Large vessel.	Eighteenth century
35b	***59***	13	Ceramic	vessel	1	Body fragment. Black-glazed pinkish-bodied ware. Large vessel.	Eighteenth century
35b	***59***	13	Ceramic	vessel	8	Small fragments of black-glazed fabrics, mainly redwares but also white	Late eighteenth century

						fabrics.	
35b	***59***	4	Glass	vessel	1	Dark olive green wine bottle body fragment.	Eighteenth century
35b	***61***	65	Ceramic	building material	2	Small fragments of brick, soft orange fabric.	Post-medieval or later
35b	***61***	65	Ceramic	building material	2	Fragments of modern machine-made brick, both bear partial stamps interpreted as GADBURY ATHERTON	Twentieth century?
35b	***62***	86	Ceramic	building material	2	Two joining fragments handmade brick. Soft fabric with a dense cream fleck and many large inclusions, including what appears to be part of a well-worn whetstone.	Post-medieval
35b	***62***	86	Ceramic	building material	1	Approximately half of a thick handmade brick, overfired. Coated with cream-coloured mortar with occasional black flecks.	Post-medieval
35b	u/s	1	Glass	vessel	1		Early twentieth century
35b	u/s	9	Bone	animal	1	Fragment animal bone. No species ID	Not dateable
35c	***43***	14	Glass	vessel	1	Dark olive green wine bottle body fragment	Late eighteenth century
35c	***43***	3	Ceramic	vessel	1	Fragment of white earthenware paste pot, plain	Late eighteenth century
35c	***43***	3	Ceramic	vessel	2	Fragments Black-glazed redware	Eighteenth century?
35c	***43***	3	Ceramic	vessel	1	Fragment of white earthenware plate with blue feathered rim	Late eighteenth - early nineteenth century
35c	***43***	3	Ceramic	vessel	1	Fragment Pearlware base.	Late eighteenth - early nineteenth century
35c	***43***	3	Ceramic	vessel	1	Fragment of white salt-glazed stoneware plate with moulded rim	Mid - late eighteenth century
35c	***43***	3	Ceramic	vessel	2	Fragments white earthenware	Late eighteenth or later
36c	u/s	8	Ceramic	vessel	1	Fragment Industrial slipware	Late

						bowl	eighteenth century
36c	u/s	8	Ceramic	vessel	1	Fragment white salt-glaze stoneware.	Mid - late eighteenth century
37a	u/s	17	Ceramic	vessel	3	Body fragments. Creamware. Spalled.	Late eighteenth century - early nineteenth century
42a	u/s	32	Ceramic	vessel	2	Body fragments redware with internal white	Nineteenth century or later
42a	u/s	32	Ceramic	vessel	1	Body fragment. Plain hard porcelain.	Nineteenth century or later?
42a	u/s	32	Ceramic	vessel	7	Body fragments blue and white underglaze transfer-printed earthenware. All small.	Late eighteenth century or later
42a	u/s	41	Ceramic	vessel	2	Body fragments. Black-glazed redware. Large vessel.	Eighteenth to nineteenth century
42a	u/s	41	Ceramic	vessel	1	Body fragment moulded white ?stoneware jug	Eighteenth century??
42a	u/s	41	Ceramic	vessel	1	Body fragment ?Pearlware	Late eighteenth century
42a	u/s	50	Ind	slag	1	Fragment ropy tapping slag debris	Post-medieval
42a	***89***	60	Ceramic	vessel	1	Clubbed rim, orange sandy incompletely reduced fabric	Mid-twelfth to mid-fourteenth century?
42a	u/s	62	Ind	slag	1	Tapping slag debris	Post-medieval
45d	u/s	47	Ceramic	vessel	3	Body fragments blue and white under-glaze transfer-printed earthenware	Late eighteenth century or later
45d	u/s	47	Ceramic	vessel	1	Body fragments black-glazed redware	Eighteenth century or later
50a	u/s	19	Ceramic	vessel	1	Fragment industrial slipware	nineteenth century or later
50a	u/s	19	Ceramic	vessel	2	Fragments white earthenware	Late eighteenth century or later
50a	u/s	19	Ceramic	vessel	1	Fragment Pearlware	Late eighteenth century

50b	u/s	21	Ceramic	vessel	1	Rim fragment. Mottles slipped redware. Plate.	Eighteenth century?
50b	u/s	21	Ceramic	vessel	1	Body fragment. Creamware	Late eighteenth–early nineteenth century
51a	***109***	46	Ceramic	vessel	3	Base fragments. Black-glazed redware. Waster?	Eighteenth to nineteenth century
51a	***109***	46	Ceramic	drain	1	Salt-glazed stoneware drain?	Not dateable
51a	***109***	84	Ceramic	building material	5	Small undiagnostic fragments.	Post medieval or later
51a	***110***	30	Ceramic	vessel	1	Body fragment. Plain hard porcelain.	Nineteenth century or later?
51a	***110***	30	Ceramic	figurine?	1	Fragment of moulded figure in white	Eighteenth century?
51a	***117***	80	Ceramic	building material	2	Very small fragments of sand-cast tile.	Twentieth century
51a	***117***	80	Ceramic	building material	2	Fragments of over-fired or refired brick, probably hand made.	Post-medieval or later
51b	***105***	27	Ceramic	vessel	2	Body fragments. Creamware. Spalled.	Late eighteenth - early nineteenth century
51b	***113***	44	Ceramic	vessel	1	Body fragment. White earthenware	Early nineteenth century
51b	***113***	44	Ceramic	vessel	1	Body fragment. Pearlware	Late eighteenth - early nineteenth century
51b	***113***	44	Ceramic	vessel	1	Body fragment. Late industrial slipware.	Early nineteenth century
51b	***113***	44	Ceramic	vessel	1	Body fragment. Creamware.	Early nineteenth century
51b	***114***	82	Ceramic	building material	2	Fragments of field drain.	Modern
51b	***114***	82	Ceramic	building material	3	Small undiagnostic fragments.	Post-medieval or later
70b	***212***	73	Ceramic	vessel?	1	Small fragment of what appears to be amphora.	First to third century??
70b	***212***	73	Ind debris	slag	1	Small fragment ?tapping slag	Not closely dateable

70b	***213***	37	Ceramic	vessel	3	Body fragments. Cream self-glazed yellowwares. Kitchen ware	Nineteenth century or later
70b	***213***	71	Ceramic	building material	2	Fragments only. Soft fabric with dense white fleck	Post-medieval
70b	***213***	72	Ceramic	building material	3	Fragments only. Thin handmade brick, coarse fabric with occasional grass or straw impressions. Soft fabric with dense white fleck	Post-medieval
70b	***213***	72	Ceramic	building material	3	Fragments only. Soft fabric with dense white fleck	Post-medieval
70b	***280***	35	Ceramic	vessel	1	Body fragment. Black-glazed redware.	Nineteenth century or later
70b	***280***	35	Ceramic	vessel	1	Very small body fragment. Creamware.	Late eighteenth - early nineteenth century
70b	***281***	74	Ceramic	building material	1	Fragment only. Soft fabric with dense white fleck	Post-medieval
70b	u/s	33	Ceramic	vessel	1	Body fragment creamware	Late eighteenth - early nineteenth century
70b	u/s	33	Ceramic	vessel	2	Body and handle fragments Brown stoneware.	Mid late eighteenth century?
70b	u/s	33	Ceramic	vessel	1	Base fragment drinking vessel in agate ware with slip banding	Mid - late eighteenth century?
70b	u/s	33	Ceramic	vessel	2	Body fragments. Black-glazed redware. Large vessel.	Eighteenth to nineteenth century
70b	u/s	7	Ceramic	vessel	1	Brown stoneware tankard base.	Late seventeenth to early eighteenth century
70b	u/s	7	Ceramic	vessel	1	Body fragment. Black-glazed redware. Hard-fired and purplish..	Late seventeenth to early eighteenth century
70c	***349***	55	Ceramic	vessel	1	Body fragment green and white underglaze transfer-printed earthenware.	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	1	Body fragment. White earthenware with poor	Nineteenth century or

						quality blue stencilling.	later
70c	***349***	55	Ceramic	vessel	2	Body fragments. White earthenware	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	1	Body fragment red and white underglaze transfer-printed earthenware. Straight-sided jar.	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	1	Body fragment. Late brown stoneware. Jar.	Nineteenth century or later
70c	***349***	55	Ceramic	vessel	2	Bowl fragments. Late industrial slipware.	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	3	Body fragments blue and white underglaze transfer-printed earthenware. Plates.	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	1	Rim fragment late white earthenware plate.	Twentieth century or later
70c	***349***	55	Ceramic	vessel	1	Body fragment late grey stoneware jar.	Late nineteenth century or later
70c	***349***	55	Ceramic	vessel	3	Body fragments. Redware with white internal slip.	Nineteenth century or later.
70c	***349***	55	Ceramic	vessel	1	Base fragment. Late hard paste porcelain. Polychrome decoration. Rear marked with crown and Victoria	Nineteenth century or later
70c	***349***	55	Ceramic	vessel	1	Rim fragment. Pink ?porcelain saucer	Nineteenth century or later
70c	***349***	55	Ceramic	vessel	3	Body fragments. White earthenware. One	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	1	Base fragment late grey stoneware jar.	Late nineteenth century or later
70c	***349***	55	Ceramic	vessel	1	Rim fragment. White earthenware. Dish.	Late eighteenth century or later
70c	***349***	55	Ceramic	vessel	2	Body fragments. Earthenware	Late nineteenth century or

							later
70c	***349***	55	Ceramic	vessel	1	Fragment self-glazed redware storage jar.	C18 onwards
70c	u/s	25	Ceramic	vessel	1	Body fragments pink and white underglaze transfer-printed earthenware.	Late eighteenth century or later
70c	u/s	25	Ceramic	vessel	2	Joining fragments porcelain saucer, polychrome transfer with gilding.	Nineteenth century or later?
70c	u/s	25	Ceramic	vessel	3	Body fragments white earthenware with green glaze	Nineteenth century or later?
70c	u/s	25	Ceramic	vessel	1	Body fragments green and white underglaze transfer-printed earthenware.	Late eighteenth century or later
70c	u/s	25	Ceramic	vessel	2	Body fragments blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
70c	u/s	25	Glass	vessel	1	Fragment opaque turquoise glass	Nineteenth century or later?
70c	u/s	56	Glass	vessel	1	Body fragment, natural bluish mould-blown	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Neck fragment, natural bluish mould-blown	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Body fragment. Dark green quart beer bottle embossed Cornbrook	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Opaque white fragment, probably moulded. Lamp shade?	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Base fragment, natural bluish mould-blown	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Base fragment, natural bluish mould-blown	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Codd bottle. Cornbrook Brewery Co Ltd, Hulme, Manchester	Late nineteenth – early twentieth century

70c	u/s	56	Glass	vessel	1	Bottle, natural bluish mould-blown, embossed Grill Sauce. CWS	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Body fragment, colourless mould-blown bottle	Late nineteenth century or later
70c	u/s	56	Glass	vessel	2	Body fragments, natural bluish plain mould-blown bottle	Late nineteenth century or later
70c	u/s	56	Glass	vessel	1	Press-moulded lid. Brefit and Co Limited, Castleford and London	Late nineteenth century or later
70d	***293***	76	Ceramic	building material	1	Machine made. Stamped MO [remainder lost], coated with grey cement	Twentieth century
70d	***293***	76	Ceramic	building material	1	Machine made. Coated with grey cement and, possibly, bitumen.	Twentieth century
70d	***316***	77	Ceramic	building material	1	?Machine made (extruded?) brick with no frog. Very coarse fabric, very thick.	Post-medieval or later
70d	***334***	43	Iron	nail	1	Large nail	Not dateable
70d	***334***	45	Glass	vessel	1	Greenish-natural embossed mould-blown mineral water bottle.	Late nineteenth to early twentieth century
70d	***334***	45	Glass	vessel	1	Almost complete colourless screw top jar, mould blown	Late nineteenth century or later
70d	***334***	66	Ceramic	building material	1	Fragment handmade brick, dense cream-coloured fleck, large inclusions.	Post-medieval
70d	***375***	58	Ceramic	vessel	1	Fragment white salt-glazed stoneware with blue-painted detail.	Late eighteenth century
70d	***375***	58	Ceramic	vessel	6	Rims. Creamware with blue feathered edges	Late eighteenth - early nineteenth century
70d	***375***	58	Ceramic	vessel	1	Heavily rilled body fragment. White earthenware, white glaze?	Nineteenth century or later
70d	***382***	18	Ceramic	vessel	1	Body fragment. Black-glazed redware.	Eighteenth to nineteenth century

70d	***382***	18	Ceramic	vessel	1	Rim fragment. Unglazed redware. Large jug?? Possibly most of body black0glazed.	Eighteenth to nineteenth century
70e	***198***	40	Ceramic	vessel	1	Body fragment. Black-glazed redware. Hard-fired and purplish..	Late seventeenth to early eighteenth century
70e	***200***	31	Ceramic	vessel	2	Very small body fragments Creamware, possibly slip decorated.	Late eighteenth century?
70e	***201***	54	Ceramic	vessel	2	Body fragments. Black-glazed redware.	Eighteenth to nineteenth century
70e	***201***	54	Ceramic	vessel	2	Body fragments. Late industrial slipware.	Late eighteenth century or later
70e	***201***	54	Ceramic	vessel	1	Body fragment. Creamware.	Late eighteenth - early nineteenth century
70e	***203***	22	Ceramic	vessel	1	Body fragment industrial slipware bowl	Late eighteenth century or later
70e	***203***	22	Ceramic	vessel	1	Body fragment. Cream fabric, self glaze Kitchenware.	Nineteenth century or later
70e	***203***	22	Ceramic	vessel	1	Body fragment. Late brown stoneware	Nineteenth century or later
70e	***203***	22	Ceramic	vessel	1	Body fragment. Nottingham brown stoneware	Eighteenth century
70e	***203***	22	Ceramic	vessel	1	Body fragment. Black-glazed redware	Nineteenth century?
70e	***203***	22	Ceramic	vessel	1	Body fragment. Black-glazed redware. Hard-fired purplish fabric.	Late seventeenth to early eighteenth century
70e	***203***	22	Ceramic	drain	1	Salt-glazed stoneware drain?	Not dateable
70e	***204***	36	Ceramic	vessel	1	Body fragment. Black-glazed redware.	Nineteenth century or later
70e	***204***	36	Ceramic	vessel	1	Body fragment. Late industrial slipware.	Late eighteenth century or later

70e	***204***	36	Ceramic	vessel	1	Body fragment. Cream fabric, brown slip and self glaze.	Nineteenth century?
70e	***204***	36	Ceramic	vessel	1	Body fragment. Creamware.	Late eighteenth - early nineteenth century
70e	***216***	49	Ceramic	vessel	1	Handle fragment. Black-glazed redware.	Eighteenth century?
70e	***218***	75	Ceramic	building material	1	Fragment only	Post medieval or later
70e	***220***	67	Ceramic	building material	1	Fragment handmade brick	Post-medieval
70e	***243***	61	Ceramic	vessel	2	Abraded body fragment pinkish-orange gritty oxidised fabric (calcite/quartz)	Mid-twelfth to mid-fourteenth century?
70e	***243***	61	Ceramic	vessel	1	Small hook-rimmed fragment unglazed cream fabric with purplish slip. Nene Valley??	Either third-fourth century or eighteenth century
70e	***276***	48	Ceramic	vessel	1	Body fragment. Late brown stoneware.	Nineteenth century or later
70e	***276***	48	Ceramic	vessel	4	Body fragments. White earthenware	Early nineteenth century onwards
70e	***276***	48	Ceramic	vessel	2	Body fragment blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
70e	***276***	48	Ceramic	vessel	1	Body fragment polychrome earthenware.	Nineteenth century or later
70e	***276***	48	Ceramic	vessel	2	Body fragment. Late grey stoneware.	Nineteenth century or later
70e	***276***	48	Ceramic	vessel	1	Body fragment. Late stoneware	Nineteenth century or later
70e	***276***	48	Ceramic	vessel	3	Body fragments. Hard paste porcelain.	Nineteenth century or later
70e	***276***	48	Ceramic	vessel	1	Body fragments. Cream self-glazed yellowwares. Kitchen ware	Nineteenth century or later
70e	***276***	48	Glass	vessel	1	Fragment opaque turquoise glass	Nineteenth century or later?

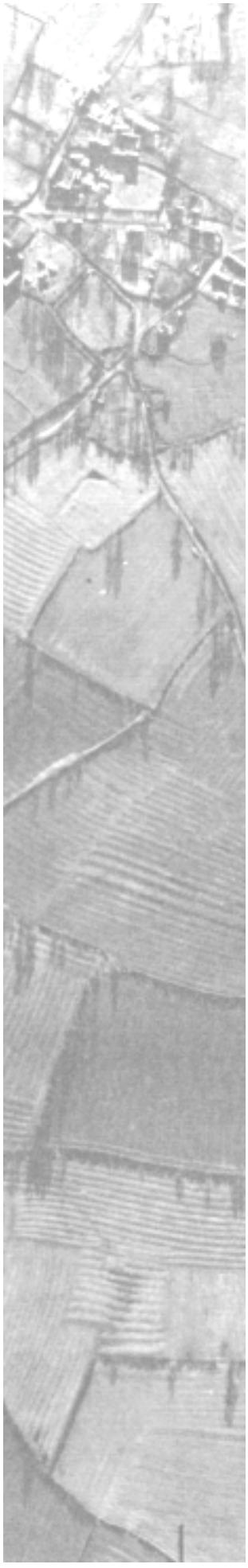
70e	***279***	34	Ceramic	vessel	1	Body fragment slip-decorated hollowware. Staffordshire?	Late seventeenth to early eighteenth century
70e	***290***	16	Ceramic	Tobacco pipe	1	Plain stem fragments	Post-medieval
70e	***294***	68	Ceramic	building material	2	Fragments of handmade brick, coarse hard fabric with large inclusions (>20 mm)	Post-medieval
70e	***294***	69	Bone	Animal	6		Not closely dateable
70e	***294***	70	Iron	Nail	1	Hand-forged nail?	Not closely dateable
70e	u/s	26	Ceramic	Vessel	2	Body fragments. Brown stoneware.	Eighteenth century?
70e	u/s	26	Ceramic	Vessel	1	Body fragment. Black-glazed redware.	Eighteenth century
70e	u/s	26	Ceramic	Vessel	1	Abraded body fragment. Pinkish gritty fabric	Mid-twelfth to mid fourteenth century
70e	u/s	26	Ceramic	Vessel	1	Rim fragment. Brown stoneware. Dish.	Eighteenth century?
75a	***142***	79	Ceramic	building material	1	Very small fragment, dense cream-collared fleck.	Post medieval
75a	Land drain	23	Ceramic	vessel	1	Body fragment. White earthenware.	Nineteenth century or later?
75a	Land drain	24	Copper alloy	collar	1	Small but deep copper annoy ring or collar	Not dateable
75a	u/s	42	Ceramic	vessel	1	Body fragment. Late brown stoneware	Nineteenth century or later
75a	u/s	42	Ceramic	vessel	3	Fragment blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
75a	u/s	42	Ceramic	vessel	4	Fragment white earthenware.	Late eighteenth century or later
75a	u/s	42	Ceramic	vessel	1	Fragment green and white underglaze transfer-printed earthenware.	Late eighteenth century or later
75a	u/s	42	Ceramic	vessel	1	Fragment pink-slipped industrial slipware	Late eighteenth century or later

76/ 77a	***161***	81	Ceramic	building material	1	Fragment, handmade brick, dense cream-coloured fleck.	Post medieval
76/ 77a	***161***	85	Ceramic	building material	2	Fragments of ?tapping slag.	Post medieval or later
76/ 77a	***181***	38	Ceramic	vessel	2	Body fragments. Black-glazed redware. Large vessel.	Nineteenth century or later
76/ 77a	***181***	38	Ceramic	vessel	1	Body fragment. Late Nottingham stoneware.	Nineteenth century or later
76/ 77a	***181***	38	Ceramic	vessel	1	Rim fragment. White earthenware, mauve paint. Saucer	Nineteenth century or later
76/ 77a	***181***	38	Ceramic	vessel	1	Body fragment blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
76/ 77a	***181***	38	Ceramic	vessel	1	Body fragment. Creamware	Late eighteenth - early nineteenth century
76/ 77a	***181***	38	Ceramic	vessel	1	Body fragment. Late brown stoneware, greenish fabric.	Nineteenth century or later
76/ 77a	***181***	38	Ceramic	vessel	1	Manganese speckled vase fragment?	Nineteenth century??
76/ 77a	***181***	39	Glass	vessel	1	Small bluish natural mould-blown bottle with applied rim	Late nineteenth-early twentieth century
76/ 77a	***181***	52	Ceramic	tobacco pipe	1	Plain stem fragment	
76/ 77a	***185***	29	Ceramic	vessel	2	Neck fragments magnesium-speckled flagon	Late seventeenth to early eighteenth century
76/ 77a	***213***	83	Ceramic	building material	2	Small joining but undiagnostic fragments.	Post medieval or later
76/ 77a	***213***	83	Ceramic	building material	1	Small fragment red sandstone.	Not closely dateable
76/ 77a	u/s	28	Ceramic	vessel	1	Body fragment hard-paste porcelain	Late eighteenth century or later
76/ 77a	u/s	28	Ceramic	vessel	1	Late grey stoneware jar	Nineteenth century or later
76/ 77a	u/s	28	Ceramic	vessel	3	Body fragments industrial slipware	Late eighteenth

							century or later
76/77a	u/s	28	Ceramic	vessel	4	Body fragments blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
76/77a	u/s	53	Ceramic	tobacco pipe	2	Plain stem fragments.	Post-medieval
78a	u/s	59	Ceramic	vessel	1	Fragment stoneware	Twentieth century or later
78a	u/s	59	Ceramic	vessel	1	Body fragment. Late brown stoneware	Nineteenth century or later
78a	u/s	59	Ceramic	vessel	2	Body fragments blue and white underglaze transfer-printed earthenware.	Late eighteenth century or later
78a	u/s	59	Ceramic	vessel	1	Body fragment green-painted white	Nineteenth century or later
78a	u/s	59	Ceramic	vessel	2	Body fragments white earthenware.	Late eighteenth century or later
78a	u/s	59	Ceramic	vessel	1	Body fragment industrial slipware	Late eighteenth century or later
87b	***357***	15	Ceramic	vessel	1	Body fragment. Black-glazed redware. Large vessel.	Eighteenth to nineteenth century
87b	***358***	78	Ceramic	building material	1	Fragment handmade brick, extremely coarse fabric, inclusions up to c 30 mm	Post medieval or later
87b	***358***	78	Ceramic	building material	1	Fragment handmade brick, extremely coarse fabric, inclusions up to c 30 mm, coated in soft sandy white mortar.	Post medieval or later
87c	***365***	57	Ceramic	vessel	6	Body fragments. White earthenware.	Late eighteenth century or later
87c	***365***	57	Ceramic	vessel	2	Body fragments late industrial slipware	Late eighteenth century or later
87c	***365***	57	Ceramic	vessel	8	Joining fragments white earthenware tankard with blue slip decoration.	Late eighteenth century?
87c	***365***	57	Ceramic	vessel	1	Body fragment. Cream	Late

						fabric, black glaze. Hollowware.	eighteenth century?
87c	***365***	57	Ceramic	vessel	2	Body fragments. Polychrome sponge decorated	Late eighteenth century or later
87c	***365***	57	Ceramic	vessel	2	Rim fragments. Late porcelain saucer with blue applied sprigs.	Late eighteenth century or later
87c	***365***	57	Ceramic	vessel	1	Body fragments pink and white underglaze transfer-printed earthenware. Cup.	Late eighteenth century or later
87c	***365***	57	Ceramic	vessel	2	Joining rim fragments. Black-glazed redware. Large bowl.	Eighteenth to nineteenth century
87c	***365***	57	Ceramic	vessel	4	Body fragments. Late cream bodied yellowwares. Kitchenware.	Nineteenth century or later
87c	***369***	62	Ceramic	building material	2	Fragments handmade brick, soft bright orange fabric. Possible deliberately shaped by knife cutting.	Post-medieval
87c	***375***	63	Ceramic	building material	2	Undiagnostic fragments. Coarse fabric, probably handmade.	Post-medieval
87c	***381***	20	Ceramic	vessel	2	Body fragments. Black-glazed redware. Hard-fired and purplish. Thin-walled upright	Late seventeenth to early eighteenth century

APPENDIX 6: GEOPHYSICAL SURVEY REPORT



ARCHAEOLOGICAL SURVEYS

GEOPHYSICAL SURVEY REPORT

Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Magnetometer survey

for

Oxford Archaeology North

David Sabin and Kerry Donaldson

November 2005

Ref no. 122

ARCHAEOLOGICAL SURVEYS

Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Magnetometer survey

for

Oxford Archaeology North

Report and fieldwork by David Sabin and Kerry Donaldson

Survey date – **19th to 20th November 2005**
Ordnance Survey Grid Reference – **SD 6980 0404**

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CONTENTS

TABLES

PLATES

LIST OF FIGURES

SUMMARY

A geophysical survey was conducted over 2.5ha on land to the north-east of Atherton (south of Bolton) as part of an archaeological investigation on the proposed site of the Cutacre Surface Mining and Reclamation Facility. Although some areas originally outlined in the Written Scheme of Investigation were unsurveyable a total of 2.5ha was surveyed in seven separate areas. The magnetic survey located a number of geophysical anomalies within the survey areas, however, the majority of them could not be accurately characterised. Although several positive linear, curvilinear and rectilinear anomalies within Areas 75, 76, and 77 in the south of the development area are of uncertain origin it is possible that they relate to archaeological features possibly associated with former coal workings in the vicinity.

1 INTRODUCTION

1.1 Survey background

1.1.1 Archaeological Surveys was commissioned by Oxford Archaeology North on behalf of UK Coal Mining to undertake a geophysical survey of an area of land to the north-east of the town of Atherton that has been outlined for development as a surface mining and reclamation facility. This survey formed part of an assessment of any potential archaeology that may be affected by the development.

1.2 Survey objectives

1.2.1 The objective of the survey was to use magnetometry to locate geophysical anomalies that may be archaeological in origin so that they may be assessed prior to development of the site. The geophysical survey areas were targeted on sites selected from a Written Scheme of Investigation (WSI) prepared by RPS and based on an archaeological assessment carried out by the University of Manchester Archaeological Unit in 1996.

1.3 Site location

1.3.1 The site is located to the north-east of Atherton at OS grid reference SD 6980 0404. The development area is currently bounded to the north by the A6 and M61, to the south by a railway line and to the east by spoil from the former Wharton Hall Colliery.

1.4 Site description

1.4.1 Survey areas were set out with reference to mapping produced for the WSI. These areas consisted of targeted grids that were either combined to form single blocks or ‘checkerboard’ patterns. The table below outlines the referencing numbers and indicates the size of the associated areas used in this survey and is taken directly from the WSI. Reference should also be made to Figures 2 and 3.

Reference No.	Size and layout
Area 5	A single 30m x 30m grid
Area 36	A single block of 90m x30m
Area 37	A single 30m grid
Area 42	A checkerboard of six 30m x 30m grids covering a 180m x 60m area
Area 45	A checkerboard of six 30m x 30m grids covering a 120m x 90m area
Area 50a	A single 30m x 30m grid
Area 50b	A single 30m x 30m grid
Area 51	A single block of 60m x 60m
Area 75	A single block of 50m x 50m
Area 76	A single block of 50m x 50m
Area 77	A single block of 50m x 50m
Area 78	A single block of 90m x 60m

Table 1 Survey area reference numbers indicating size and layout

1.4.2 Table 2, below, describes the survey conditions for each area indicated in Table 1. It should be noted that a number of the areas were unsurveyable and this has been indicated with a description of ground problems. Photographs (Plates 1 – 3) are also included to indicate the general range of surveying conditions.

Reference No.	Topographic description	Survey conditions
Area 5	South of Adises Farm on pasture west of track	Unsurveyable due to heavy waterlogging of survey area
Area 36 (Plate 2)	West of Leadbeaters Farm, northeast of Mills Brow Farm	Unsurveyable due to vegetation, upstanding building remains with possible hidden shafts, two barbed-wire fences, trackway and steep gully
Area 37	West of Leadbeaters farm, northeast of Mills Brow Farm	Unsurveyable due to barbed-wire fencing, vegetation and steep gully
Area 42	East of Mills Brow Farm on pasture sloping down to the south and steeply to the west	Area surveyed with a small area missing close to a waterlogged gateway in the north eastern corner
Area 45 (Plate 1)	South of Leadbeaters farm on pasture sloping down to the south – a notable depression in the north western corner	Area surveyed across short grass
Area 50a	Southwest of Hulton Heys Farm on pasture sloping down to the south	Area surveyed across short grass

Area 50b	South of Hulton Heys Farm on pasture sloping down to the south	Area surveyed across short grass
Area 51	South of Hulton Heys Farm, sloping down to the north	Unsurveyable due to crossing several land packages including a trackway, three barbed-wire fences and a small stream with adjacent bramble growth. Part of the area had been subject to a fresh slurry spread and on test contained exceptionally high levels of magnetic disturbance from steel pipelines and a pylon
Area 75	West of Oliver Fold Farm on overgrown pasture – notable depressions within and adjacent to the area	Area surveyed with a section of the northwest corner missing due to the presence of a new wire fence – long grass and wild plants affecting survey slightly
Area 76	West of Oliver Fold Farm on overgrown pasture – notable depressions within and adjacent to the area	Area surveyed across long grass with wild plants affecting survey slightly
Area 77	West of Oliver Fold Farm on overgrown pasture – notable depressions within and adjacent to the area	Area surveyed with a section of the northern end missing due to the presence of a hedgerow – long grass and wild plants affecting survey slightly
Area 78 (Plate 3)	Southwest of Oliver Fold Farm on overgrown pasture – a notable linear depression orientated north south runs through the area and contains rubbish including tarmac, asbestos sheeting and pallets – part of the depression also contained a small, recently collapsed, shaft	Area surveyed with small sections missing due to the presence of rubbish and an open hole/shaft – long grass and wild plants affecting survey slightly

Table 2 Topographic description and survey conditions within each area

Plate 1 Area 45, looking east

Plate 2 Area 36, looking south

Plate 3 Area 78, looking west

1.5 Site history and archaeological potential

1.5.1 Work carried out by the University of Manchester Archaeological Unit as part of an archaeological assessment carried out in 1996, identified a number of sites generally of post-medieval date. The geophysical survey is targeted over these sites and has the potential to locate and determine their extent and form (OAN 2005). Table 3, below, outlines the archaeological evidence or potential for each survey area.

Reference No.	Archaeological evidence/potential
Area 5	A structure off Rosemary Lane that may predate 1789
Areas 36 and 37	Field names of Tan Pit Croft and Bleach Croft
Area 42	Field name of Cinder Hill
Area 45	Field name of Coal Pit Meadow
Areas 50a and b Area 51	Possible site of Old Graces Farm known to exist in 1674 and a possible kiln from an area known as Kiln Field
Areas 75, 76 and 77	Position of coal pits shown on First Edition Ordnance Survey mapping
Area 78	Field name referring to a possible Kiln

Table 3 Outline of archaeological evidence or potential for each survey area

1.6 Geology and soils

1.6.1 The underlying geology is Carboniferous Lower Wesphalian mainly productive coal measures (BGS 2001) with overlying boulder clay and morainic drift (BGS 1977).

1.6.2 The overlying soils are unmapped although adjacent soils are from the Brickfield 3 association which are cambic stagnogley soils. These consist of slowly permeable seasonally waterlogged fine loamy over clayey soils. (Soil Survey of England and Wales 1983).

1.6.3 The presence of boulder clay and drift geology can produce soils with an unpredictable, often poor, magnetic response. However, the results obtained during the survey suggest conditions reasonably conducive to magnetic survey and this may be associated with the specific mineralogy of local rocks and the distribution or modification of material throughout the industrial period.

2 METHODOLOGY

2.1 Technical synopsis

2.1.1 Detailed magnetometry records localised magnetic fields that can relate to former human activity. Alteration of iron minerals present within topsoil is

related to activities such as burning and the break down of biological material. These minerals become weakly magnetic within the Earth's magnetic field and can accumulate in features such as ditches and pits that are cut into the underlying subsoil. Mapping this magnetic variation can provide evidence of former settlement and land use. Additional technical details can be found in Appendix A.

2.2 Equipment details and configuration

2.2.1 The detailed magnetic survey was carried out using a Bartington Grad601-2 gradiometer. This instrument effectively measures a magnetic gradient between two fluxgate sensors mounted vertically 1m apart. Two sets of sensors are mounted on a single frame 1m apart horizontally. The instrument is extremely sensitive and is able to measure magnetic variation to 0.1 nanoTesla (nT). All readings are saved to an integral data logger for analysis and presentation.

2.2.2 Data was collected at 0.25m centres along traverses 1m apart. The survey area was separated into 30m by 30m grids giving 3600 recorded measurements per grid. This sampling interval is very effective at locating archaeological features and is the recommended methodology for archaeological prospection (English Heritage, 1995). The survey grids were located using a CSI Wireless dGPS and set out using a Topcon GTS212 total station. The location of the survey grids were set out from those illustrated on digital base mapping supplied by the client.

2.3 Data processing and presentation

2.3.1 Magnetometry data downloaded from the Grad 601-2 data logger is analysed and processed in specialist software known as ArcheoSurveyor. The software allows greyscale and trace plots to be produced for presentation and display.

2.3.2 Only minimal processing is carried out in order to enhance the results of the survey for display. Raw data is always analysed and displayed in the report as processing can modify anomalies. The following schedule sets out the data and image processing used in this survey. It should be noted that image processing does not change the values of the data and is used for visual enhancement; data processing will alter values through mathematical functions.

Image processing

- Clipping of the raw data at ±10nT to improve greyscale resolution
- Clipping of processed data at ±3nT to enhance low magnitude anomalies
- Clipping of trace plots at ±100nT in order to minimise strong readings obscuring low magnitude responses
- Destagger may also be used to enhance linear anomalies

Data processing

- Zero mean traverse is applied in order to balance readings along each traverse

3 RESULTS

3.1.1 The detailed magnetic survey was carried out over a total of seven survey areas covering an area of 2.5ha, see Table 2. Geophysical anomalies located can be generally classified as positive and negative linear anomalies of an uncertain origin, linear anomalies of an agricultural origin, areas of magnetic debris and strong dipolar anomalies relating to ferrous objects and material in the topsoil.

3.2 Area 42 (Figures 4-8)

3.2.1 Anomalies with an uncertain origin

3.2.1.1 In the centre of the survey area are several fragmented positive linear and a possible curvilinear anomaly. Although their fragmented form does not make it possible to accurately determine their origin, it is possible that they are a response to magnetically enhanced material within cut features.

3.2.1.2 Towards the south-east are a pair of positive linear anomalies with a magnitude of generally 2.5 to 5nT. Although their form may suggest cut features they do not appear to extend to the northeast and they are parallel to the adjacent field boundary and with the ploughing trend and may be agricultural in origin. A discrete low magnitude positive anomaly is located close to these linears and may be a cut feature such as a pit but this is uncertain.

3.2.1.3 A negative linear anomaly in the south-west is also parallel to the ploughing trend and south-easterly field boundary perhaps also suggesting an agricultural origin for this anomaly.

3.2.1.4 An area of magnetic debris is situated towards the north of the site and although may relate to a spread of thermoremnant material such as brick or clinker its origin is uncertain.

3.2.2 Anomalies with an agricultural origin

3.2.2.1 Predominantly seen within one grid in the west of the survey area are a series of low magnitude parallel linear anomalies. These are likely to relate to former agricultural activity.

3.2.2.2 A series of parallel linear anomalies can be seen within the majority of the survey area and are orientated approximately west-south-west to east-north-east. These anomalies have the characteristics of land drains.

3.2.3 Anomalies with a modern origin

3.2.3.1 The site contains several strong dipolar anomalies which are likely to relate to ferrous objects within the topsoil.

3.3 Area 45 (Figures 9-13)

3.3.1 Anomalies with an uncertain origin

3.3.1.1 Area 45 contains several low magnitude positive linear anomalies with a general north-north-west to south-south-east orientation. These can be seen within several grids and although their fragmentary nature makes it difficult to be certain of their origin they may have been caused by former agricultural activity.

3.3.1.2 Within the centre of the survey area are two negative linear anomalies. Although less enhanced than the surrounding soil it is not possible to accurately characterise them.

3.3.1.3 In the south-west of the area are two discrete positive anomalies. These have a moderate magnitude and may suggest possible cut features although this is not certain.

3.3.1.4 In the north of the site is a very low magnitude positive area anomaly. This response corresponds to a visible depression in the field and may relate to increased soil depth or enhanced magnetic properties of subsoil or infill material.

3.3.2 Anomalies with an agricultural origin

3.3.2.1 A series of parallel linear anomalies can be seen within the majority of the northern half of the survey area and are the possible response to land drains.

3.3.3 Anomalies with a modern origin

3.3.3.1 In the east of the survey area appears a weak dipolar linear anomaly which extends partially across a grid. Generally this response indicates a possible pipe or cable.

3.3.3.2 There are several strong discrete dipolar anomalies which indicate the presence of ferrous objects within the topsoil.

3.4 Area 50a (Figures 14-18)

3.4.1 Anomalies with a modern origin

3.4.1.1 Area 50a contains a series of parallel linear anomalies which have the characteristics of land drains.

3.4.1.2 An area of magnetic disturbance within the south-western corner is a response to the nearby gas pipeline.

3.5 Area 50b (Figures 14-18)

3.5.1 Anomalies with an uncertain origin

3.5.1.1 Area 50b contains several positive linear and area anomalies and negative linear anomalies. A positive linear anomaly in the west of the site is moderately enhanced (5-24nT) while the others are of a low magnitude. This survey area is situated on a relatively steep slope and may indicate former water channels.

3.6 Area 75 (Figures 19-23)

3.6.1 Anomalies with an uncertain origin

3.6.1.1 In the south of the survey area are three broadly parallel positive linear anomalies and a negative linear response. These anomalies extend approximately west to east across the southern part of the survey area and are likely to extend beyond the limits of the area. The most southerly of the positive anomalies is generally of a moderate magnitude (10-20nT) while the others are generally less than 10nT. The enhancement of these linears suggests a anthropogenic origin although their form cannot be fully characterised.

3.6.1.2 Towards the east of the survey area are three parallel linear anomalies. These appear as three generally positive linear anomalies with some negative responses. It is difficult to be certain of their origin although the strength and characteristic of the response suggests some thermoremnant (brick/tile) content such as ceramic land drains, linear responses within Area 75 and 77 show the probable linear trend of land drains in this field to be of a different orientation. (see 3.6.2.1 below).

3.6.2 Anomalies with an agricultural origin

3.6.2.1 One positive linear anomaly extends across the majority of the survey area with a north-east to south-west orientation. This anomaly has a similar orientation to others seen in Area 77 to the east which suggests that this anomaly may be a land drain.

3.6.3 Anomalies with a modern origin

3.6.3.1 There are two strong discrete dipolar anomalies which indicate the presence of ferrous objects within the site.

3.7 Area 76 (Figures 19-23)

3.7.1 Anomalies with an uncertain origin

3.7.1.1 In the centre of Area 76 is a discrete positive anomaly with a magnitude of generally between 7nT and 24nT. It is possible that this is not a response to one but two features but this is not certain. The form of the response suggests a discrete cut feature or features with dimensions of up to 8x12m.

3.7.1.2 To the north of the survey area is an area of magnetic debris which suggests the presence of thermoremnant material such as brick. It seems possible that associated with this area of magnetic debris are two positive linear anomalies and a curvilinear anomaly. These linear anomalies may relate to cut features however they are moderately enhanced and may suggest the remains of brick structures.

3.7.1.3 Towards the east of the site are two low magnitude discrete positive anomalies. Although they may be a response to the magnetically enhanced fill of cut features this is not certain.

3.7.1.4 Within the southern part of the survey area is a negative linear anomaly. Although of uncertain origin it is possible that this anomaly relates to a former embankment. It is parallel to a series of positive linear anomalies within the vicinity (see 3.7.2.1) which suggest that it may be of agricultural origin.

3.7.2 Anomalies with an agricultural origin

3.7.2.1 Several low magnitude positive linear anomalies can be seen in the south of the survey area and are likely to have been caused by former agricultural activity.

3.8 Area 77 (Figures 19-23)

3.8.1 Anomalies with an uncertain origin

3.8.1.1 Three positive linear anomalies and a possible curvilinear/rectilinear anomaly can be seen in Area 77. It is difficult to be certain of their origin. Their moderately high magnitude suggests some thermoremnant content and it is possible that there may be some association with moderate linear anomalies seen within Area 76 to the south (see 3.7.1.2). It is possible that they relate to former brick structures.

3.8.2 Anomalies with an agricultural origin

3.8.2.1 A series of positive linear anomalies extend across the site and suggest the presence of land drains.

3.8.3 Anomalies with a modern origin

3.8.3.1 A strong dipolar linear anomaly extends across the northern part of the survey area and is a response to a pipeline or service.

3.9 Area 78 (Figures 24-28)

3.9.1 Anomalies with an uncertain origin

3.9.1.1 In the west of the survey area are several positive linear anomalies extending generally northeast to southwest. It is difficult to accurately determine the origin of these anomalies although they may relate to cut features.

3.9.1.2 In the north-west of the site are a series of positive and negative linear anomalies. Although of uncertain origin it is possible that these anomalies have been formed by agricultural activity.

3.9.1.3 One curvilinear anomaly in the form of a semi-circle can be seen in the west of the survey area. Generally of a magnitude of less than 1nT it is possible that this is the response to the fill of a cut feature but this is not certain.

3.9.2 Anomalies with an agricultural origin

3.9.2.1 Area 78 appears to contain two sets of land drains, in the east they are oriented approximately north-west to south-east and in the west they are oriented approximately north-east to south-west.

3.9.3 Anomalies with a modern origin

3.9.3.1 Towards the centre of the survey area is an extended area of magnetic disturbance with some magnetic debris. This area in the field correlates with a noticeable depression (with the appearance of former surface mining), there is also an open hole in this area. This part of the site has been in-filled with modern dumping including ferrous objects. To the south-east an area of magnetic disturbance is a response to ferrous material used in adjacent fencing.

4 CONCLUSION

4.1.1 The detailed magnetic survey located a number of geophysical anomalies within the survey areas although the origin of the majority of these is uncertain.

4.1.2 Although of uncertain origin it is possible that several positive linear, curvilinear and possible rectilinear anomalies as well as a discrete positive area in survey Areas 75, 76 and 77 may have an archaeological origin and relate to former coal workings in the vicinity.

4.1.3 Further characterisation of geophysical anomalies is likely only to be achieved by follow-up targeted intrusive investigations.

5 REFERENCES

British Geological Society, 1977, *Geological Survey Ten Mile Map, South Sheet, First Edition (Quaternary),* Scale 1:625 000*.*

British Geological Society, 2001, *Solid Geology Map, UK South Sheet, 1:625 000 scale, 4th edition.*

English Heritage, 1995, *Geophysical survey in archaeological field evaluation. Research and Professional Service Guideline No 1*.

Oxford Archaeology North, 2005. *Surface Mining and Reclamation Facility, Cutacre, Wigan, Greater Manchester. Archaeological Investigation Project Design. Unpublished.*

Soil Survey of England and Wales, 1983, *Soils of England and Wales, Sheet 1 Northern England.*

Appendix A – basic principles of magnetic survey

Iron minerals are always present to some degree within the topsoil and enhancement associated with human activity is related to increases in the level of magnetic susceptibility and thermoremnant material.

Magnetic susceptibility is an induced magnetism within a material when it is in the presence of a magnetic field. This can be thought of as effectively permanent due to the presence of the Earth's magnetic field.

Thermoremnant magnetism occurs when ferrous material is heated beyond a specific temperature known as the Curie Point. Demagnetisation occurs at this temperature with re-magnetisation by the Earth's magnetic field on cooling.

Enhancement of magnetic susceptibility can occur in areas subject to burning and complex fermentation processes on biological material; these are frequently associated with human settlement. Thermoremnant features include ovens, hearths and kilns. In addition thermoremnant material such as tile and brick may also be associated with human activity and settlement.

Silting and deliberate infilling of ditches and pits with magnetically enhanced soil can create an area of enhancement compared with the surrounding soils and subsoils into which the feature is cut. Mapping enhanced areas will produce linear and discrete anomalies allowing an assessment and characterisation of hidden subsurface features.

It should be noted that areas of negative enhancement can be produced from material having lower magnetic properties compared to topsoil. This is common for many sedimentary bedrocks and subsoils which were often used in the construction of banks and walls etc. Mapping these 'negative' anomalies may also reveal archaeological features.

Magnetic survey or magnetometry can be carried out using a fluxgate gradiometer and may be referred to as gradiometry. The gradiometer is a passive instrument consisting of two fluxgate sensors mounted vertically 1m apart. The instrument is carried about 30cm above the ground surface and the upper sensor measures the Earth's magnetic field as does the lower sensor but this is influenced to a greater degree by any localised buried field. The difference between the two sensors will relate to the strength of magnetic field created by the buried feature. If no enhanced feature is present the field measured by both sensors will be similar and the difference close to zero.

There are a number of factors that may affect the magnetic survey and these include soil type, local geology and previous human activity. Situations arise where magnetic disturbance associated with modern services, metal fencing, dumped waste material etc., obscures low magnitude fields associated with archaeological features.

N

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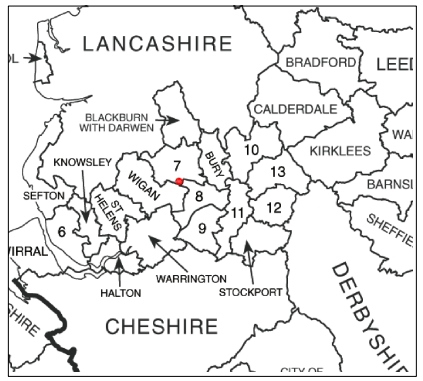
Map of survey area



● Survey location

Site centred on OS NGR SD 6980 0404

SCALE 1:50 000

0km 1 2km

FIG 01

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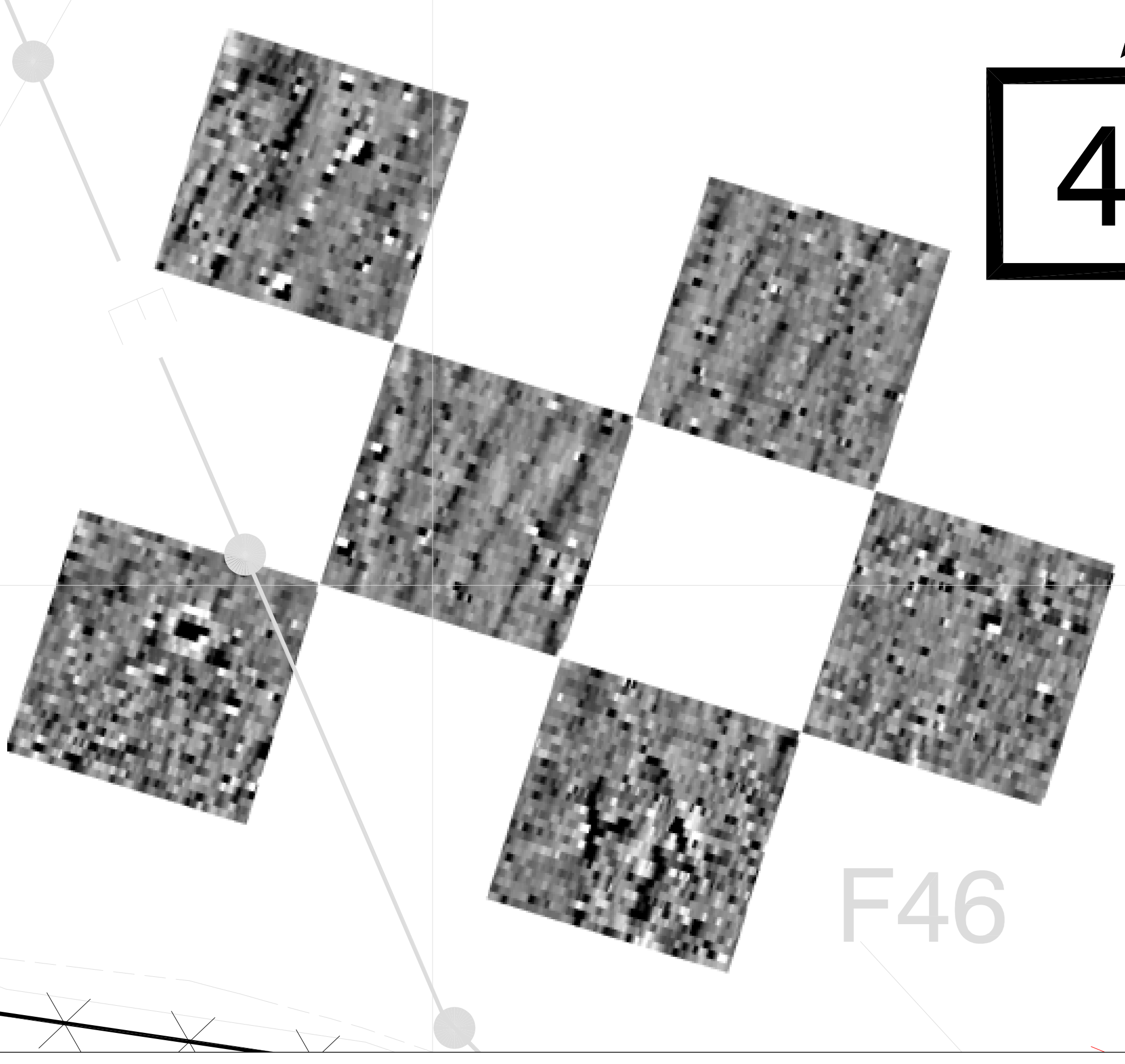
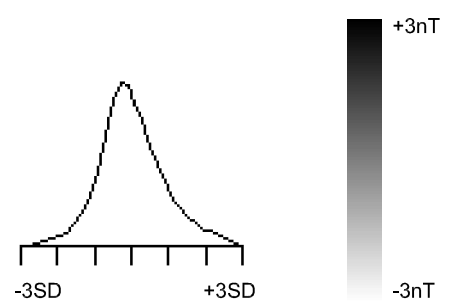
Greyscale plot of processed magnetometer data - Area 45





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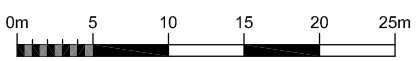

FIG 12

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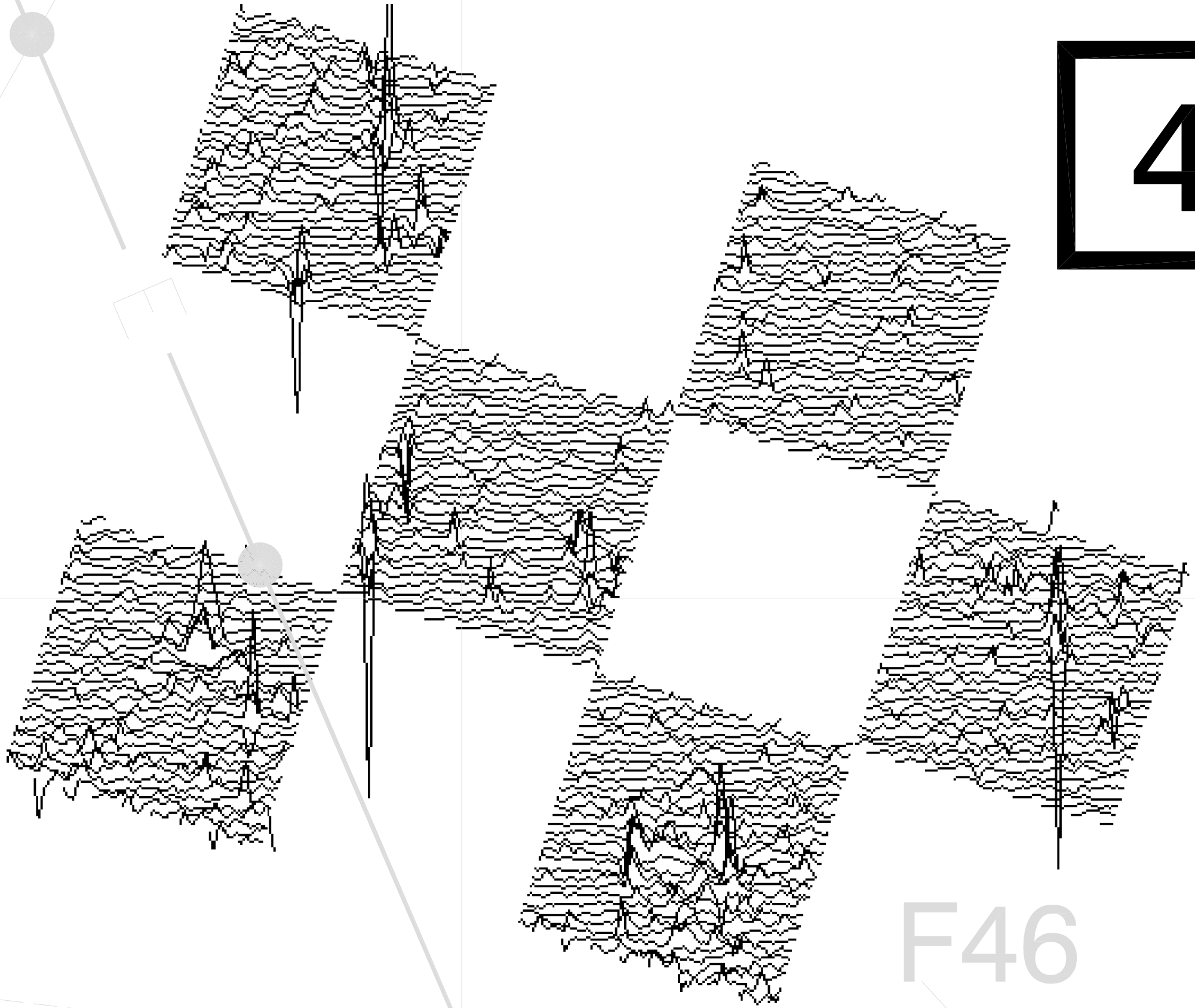
Greater Manchester

Traceplot of raw magnetometer data - Area 45



+20nT
+10nT
0nT
-10nT
-20nT

10nT/ cm vertical displacement.

Data has been clipped at ± 100nT.

SCALE 1:500

0m 5 10 15 20 25m

FIG 11

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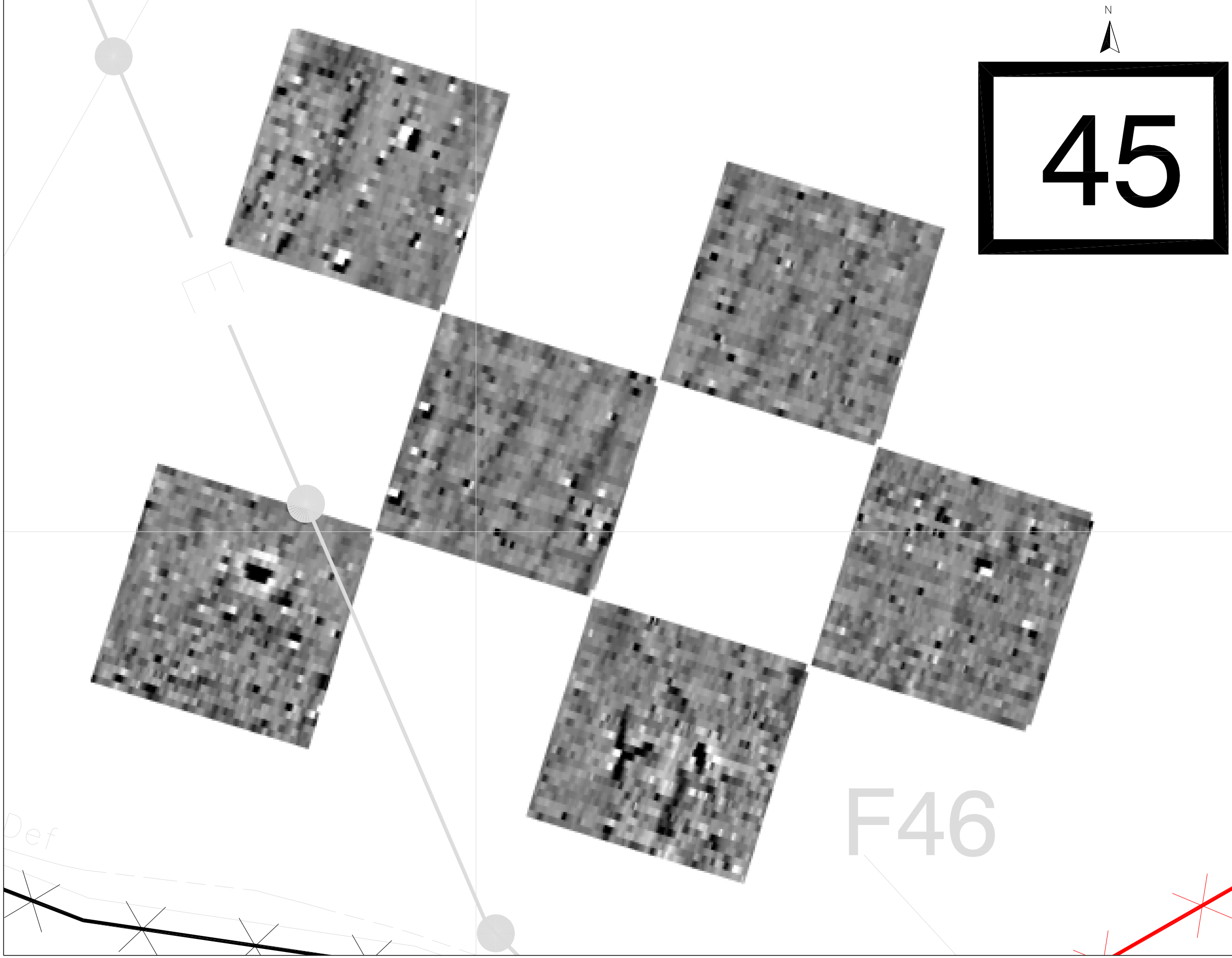
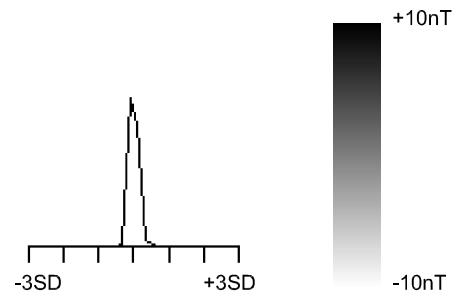
Greyscale plot of raw magnetometer data - Area 45





SCALE 1:500

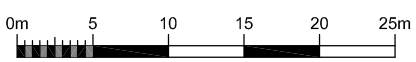


FIG 10

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Referencing information - Area 45

A - B 120m baseline

A 369566.70, 403937.57

B 369681.38, 403902.23

Start of survey & traverse direction

N

45

A

B

1

2

3

4

5

6

F46

Pond

Def

SCALE 1:500

0m 5 10 15 20 25m

FIG 09

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Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Abstraction and interpretation of magnetometer anomalies - Area 42

- Positive linear anomaly - ?cut feature of uncertain origin
- Positive linear anomaly - possible land drain
- Negative linear anomaly - possible former earthwork
- Positive linear anomaly - of agricultural origin
- Discrete positive anomaly - ?possible pit
- Magnetic debris - spread of thermoremnant material
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:1000

0m 10 20 30 40 50m

FIG 08

35

37

42

N

F10

F9A

F9

MILLS BROW FARM

SEPTIC TANK

COES UG

Well

Well

MH

WT

ST

F10

F9A

F9

35

37

42

Well

Well

MH

WT

ST

COES UG

MILLS BROW
FARM

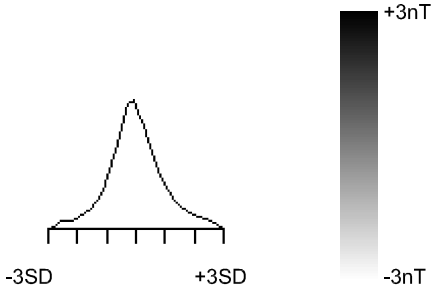
SEPTIC TANK

N

Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Greyscale plot of processed magnetometer data - Area 42



SCALE 1:1000

0m 10 20 30 40 50m

FIG 07

F10

MH WT

ST

Well

COES UG

F9A

ST

SEPTIC TANK

MILLS BROW
FARM

Well

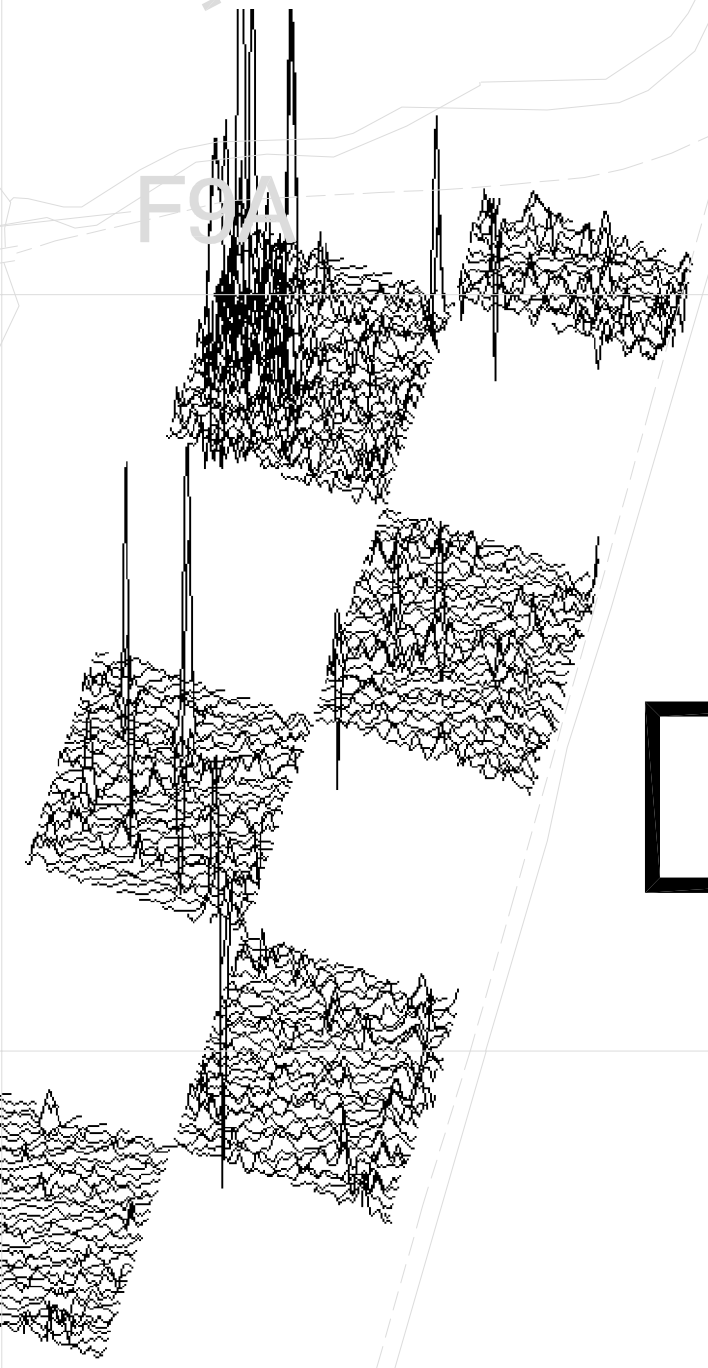
F9

35

37

42

N



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Traceplot of raw magnetometer data - Area 42

+40nT
+20nT
0nT
-20nT
-40nT

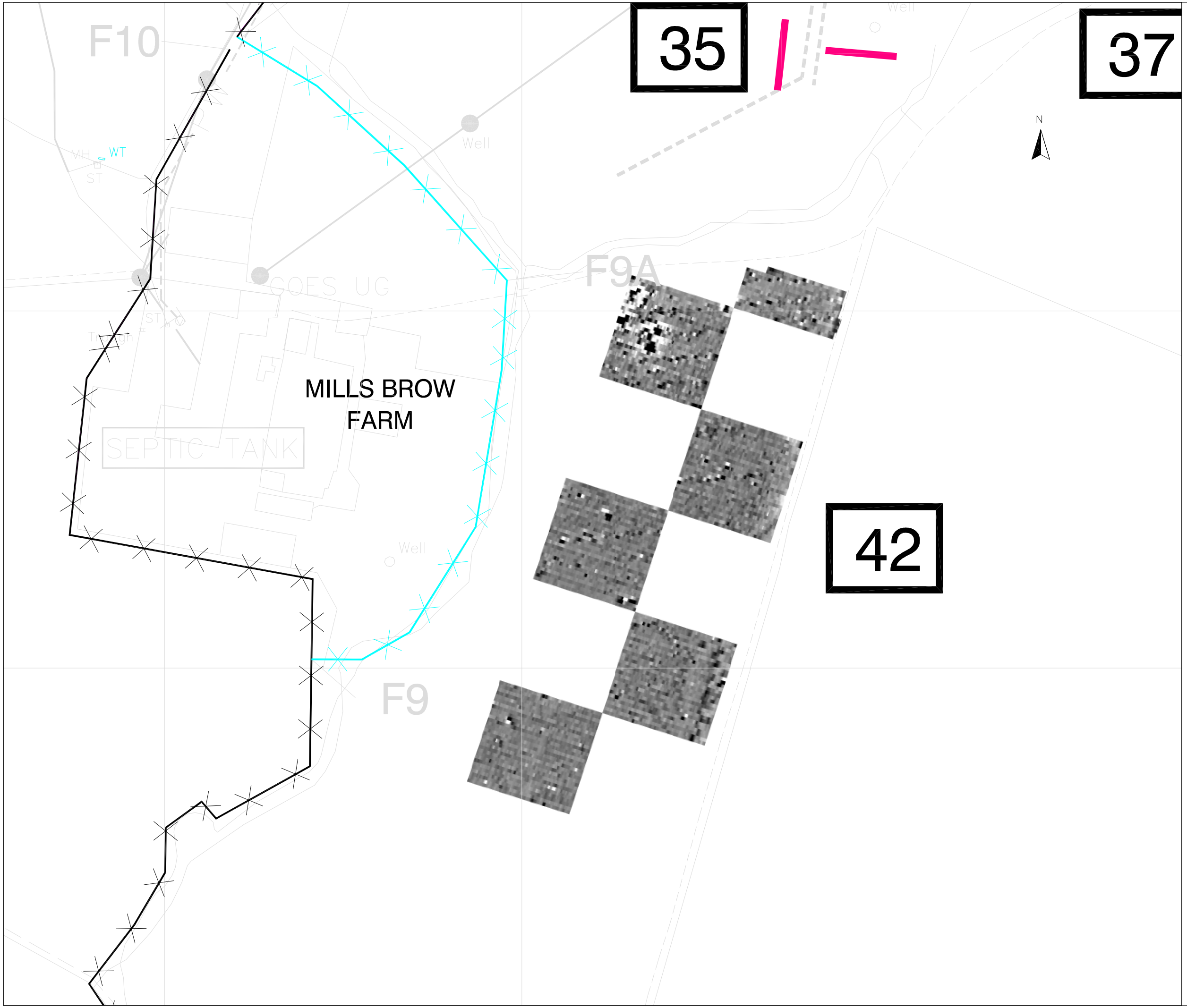
20nT/ cm vertical displacement.

Data has been clipped at ± 100nT.

SCALE 1:1000

0m 10 20 30 40 50

FIG 06



Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

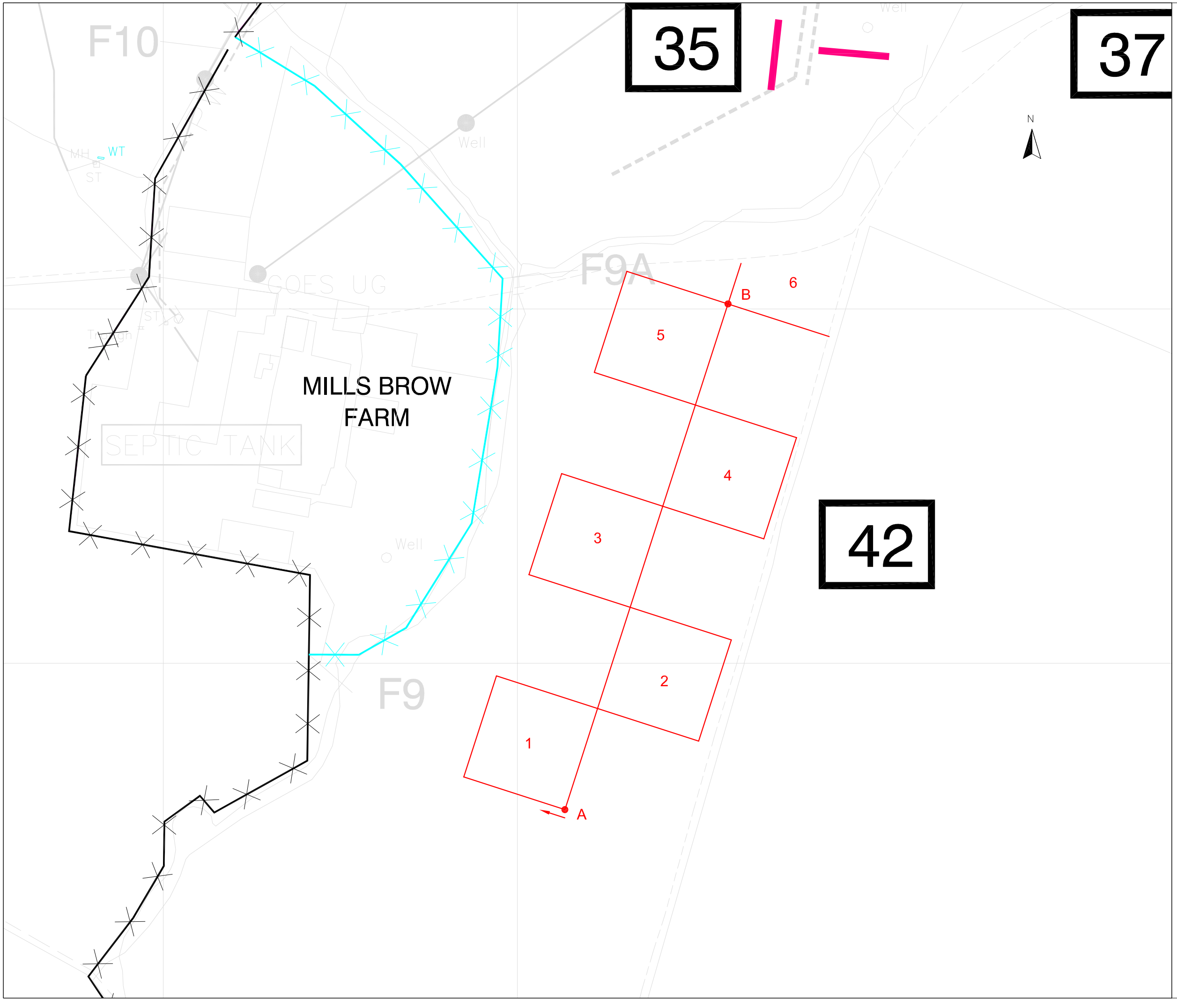
Greyscale plot of raw magnetometer data - Area 42

+10nT
-10nT
-3SD
+3SD

SCALE 1:1000

0m 10 20 30 40 50

FIG 05



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Geophysical Survey
Cutacre Surface Mining and Reclamation Facility,
Greater Manchester

Referencing information - Area 42

A - B 150m baseline

A 369313.42, 403958.68

B 369359.48, 404101.43

Start of survey & traverse direction

SCALE 1:1000

0m 10 20 30 40 50m

FIG 04

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Location of geophysical surveying grids (north) (Area 5) (not surveyed due to waterlogging)

SCALE 1:3000

0m 30 60 90 120 150m

FIG 03

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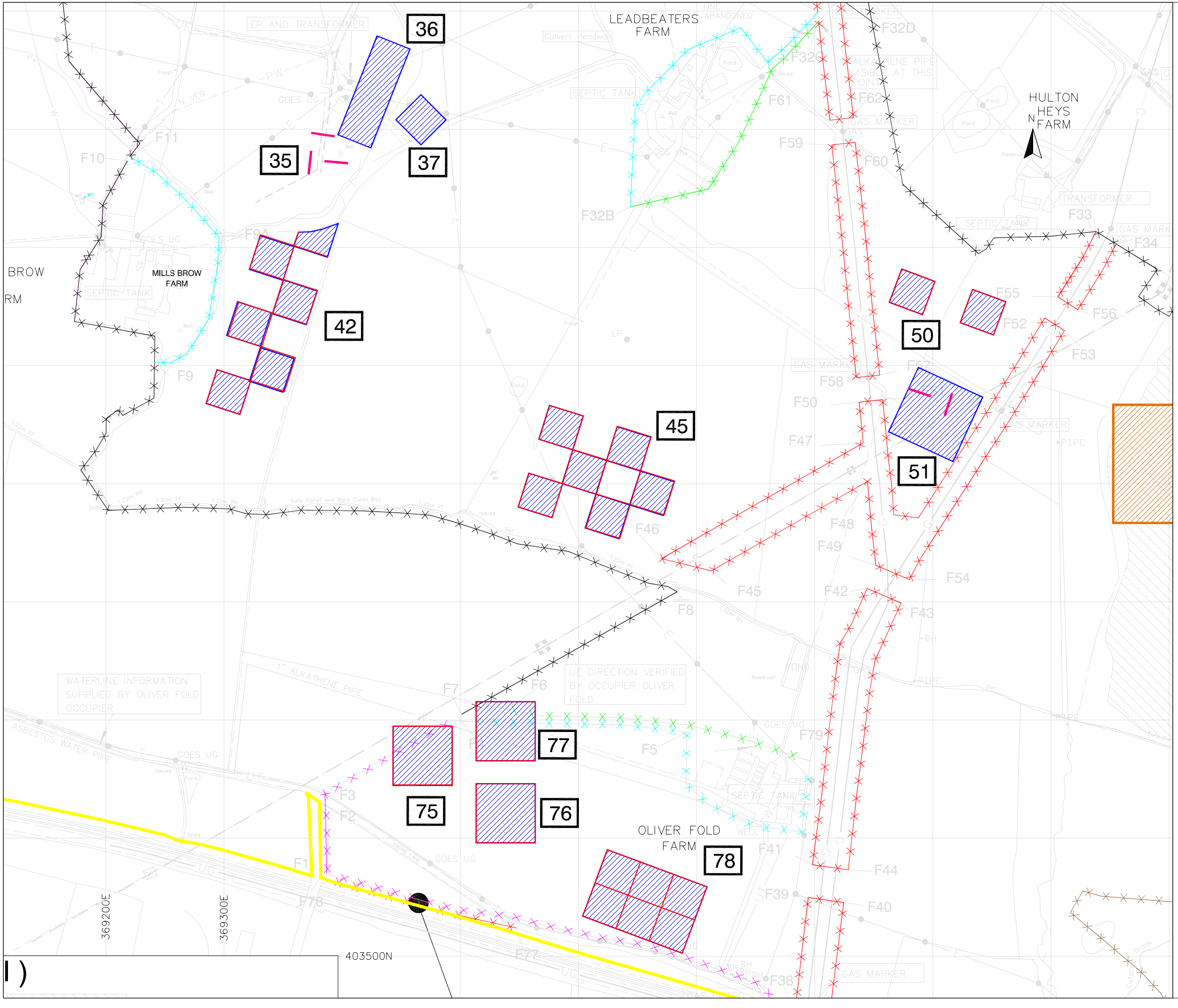
Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

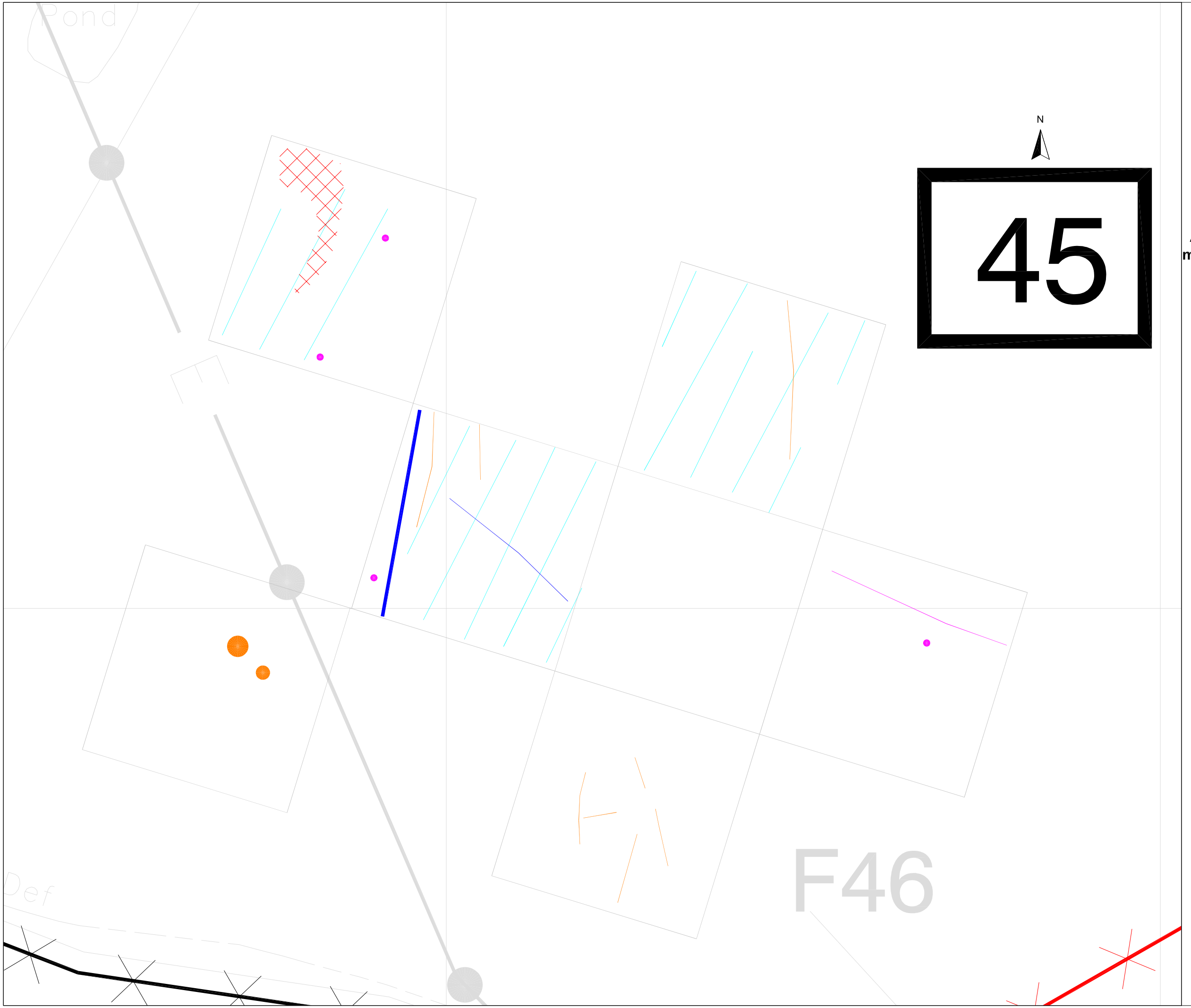
Location of geophysical surveying grids (south)
(Areas 36, 37, 42, 45,50, 51, 75, 76, 77 & 78)
(Areas 36, 37 and 51 were unsurveyable)



SCALE 1:3000

0m 30 60 90 120 150m

FIG 02



Archaeological Surveys

Geophysical Survey Cutacre Surface Mining and Reclamation Facility, Greater Manchester

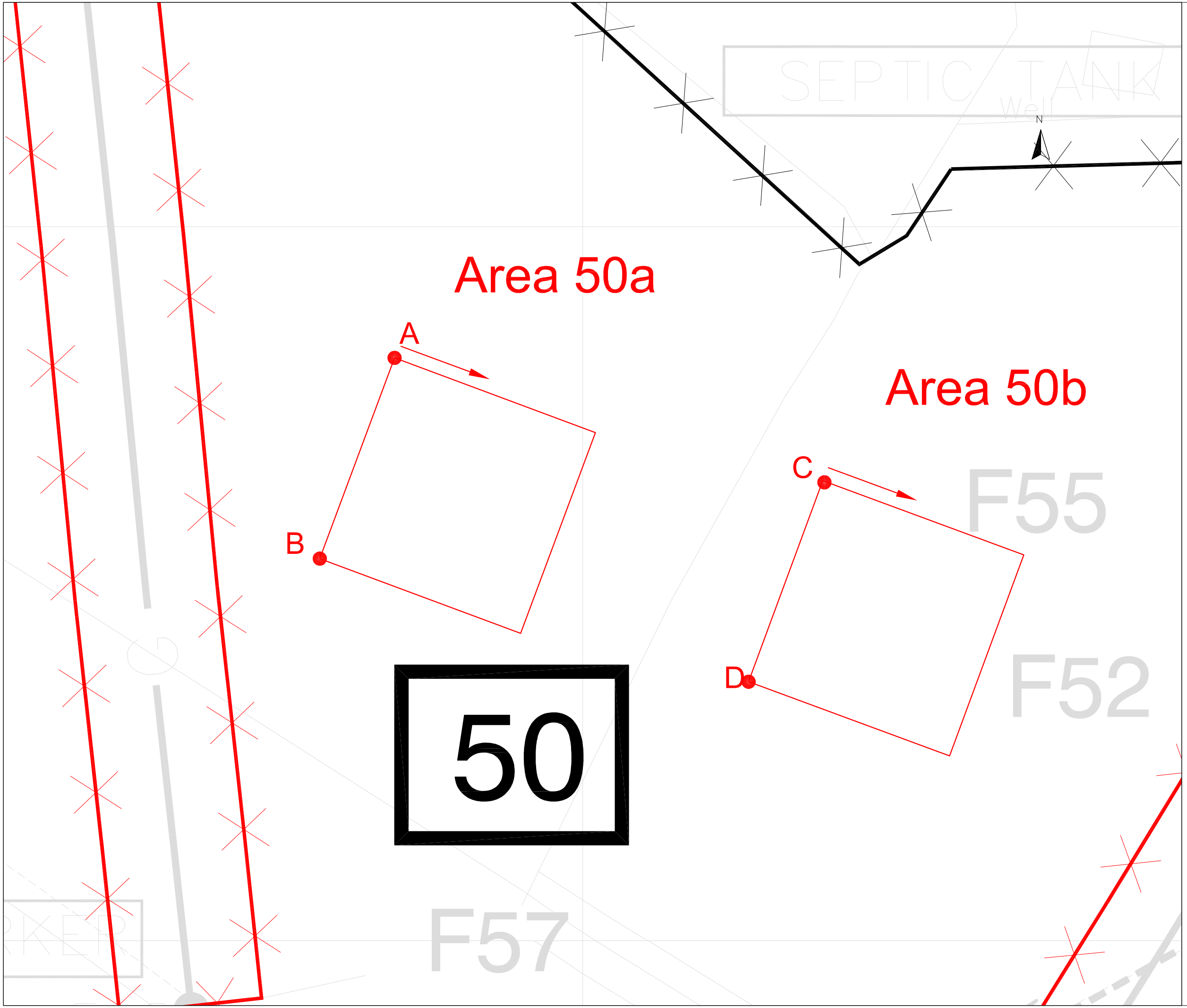
Abstraction and interpretation of magnetometer anomalies - Area 45

- Positive linear anomaly - cut feature of uncertain origin
- Positive linear anomaly - possible land drain
- Negative linear anomaly - possible former earthwork
- Discrete moderately enhanced response - ?cut feature of uncertain origin
- Low magnitude positive area anomaly associated with visible depression in field
- Strong dipolar linear anomaly - ?pipeline / cable / service
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:500

0m 5 10 15 20 25m

FIG 13



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Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Referencing information - Area 50

A 369873.66, 404081.62

B 369863.19, 404053.51

C 369933.60, 404064.42

D 369923.23, 404036.27

A - B Baseline Area 50a

C - D Baseline Area 50b

Start of survey & traverse direction

SCALE 1:500

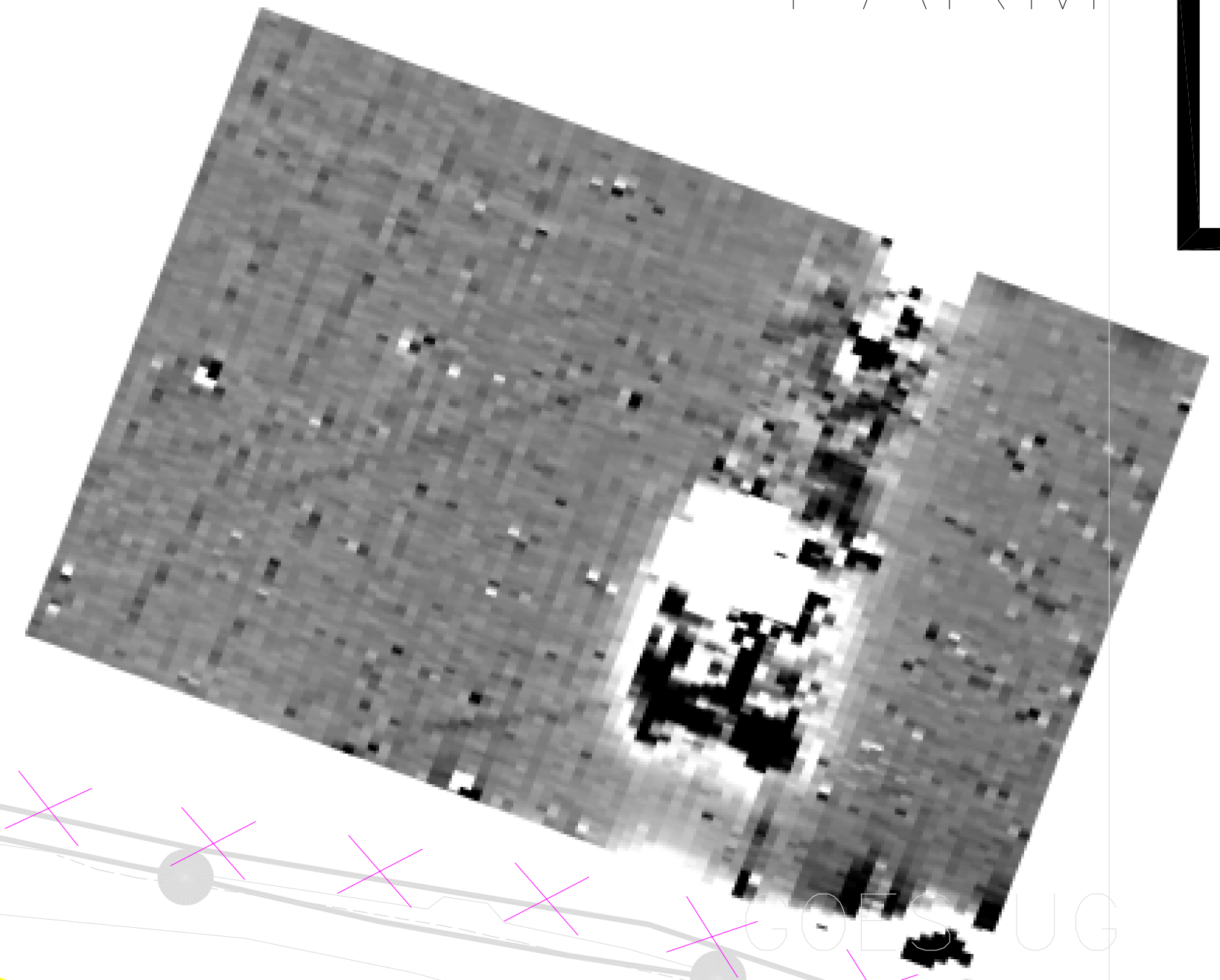
0m 5 10 15 20 25m

FIG 14

6

OLIVER FOLD FARM

78

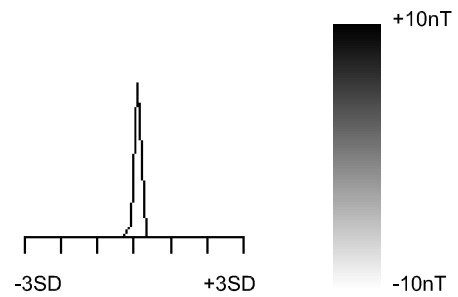


N

Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Greyscale plot of raw magnetometer data - Area 78



SCALE 1:500

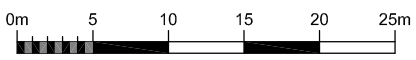


FIG 25

6

OLIVER FOLD FARM

78

N

3

2

1

6

5

4

B

A

Archaeological Surveys

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Greater Manchester

Referencing information - Area 78

A 369687.90, 403502.55

B 369603.55, 403533.93

A - B 90m baseline

Start of survey & traverse direction

SCALE 1:500

0m 5 10 15 20 25m

FIG 24

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Abstraction and interpretation of magnetometer anomalies - Areas 75, 76 & 77

- Positive linear anomaly - cut feature of uncertain origin
- Positive linear anomaly - possible land drain
- Negative linear anomaly - of uncertain origin
- Discrete positive response - ?cut feature of uncertain origin
- Discrete positive anomaly - possible pit-like feature
- Magnetic debris - spread of thermoremnant material
- Strong dipolar anomaly - ferrous object in topsoil
- Strong dipolar linear anomaly - response to pipeline

N

77

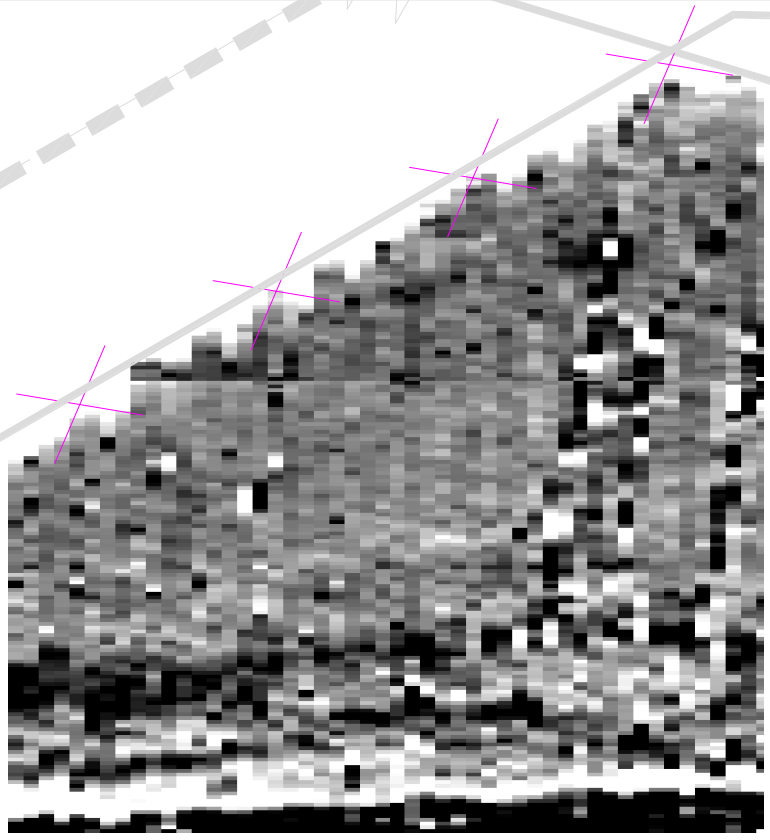
75

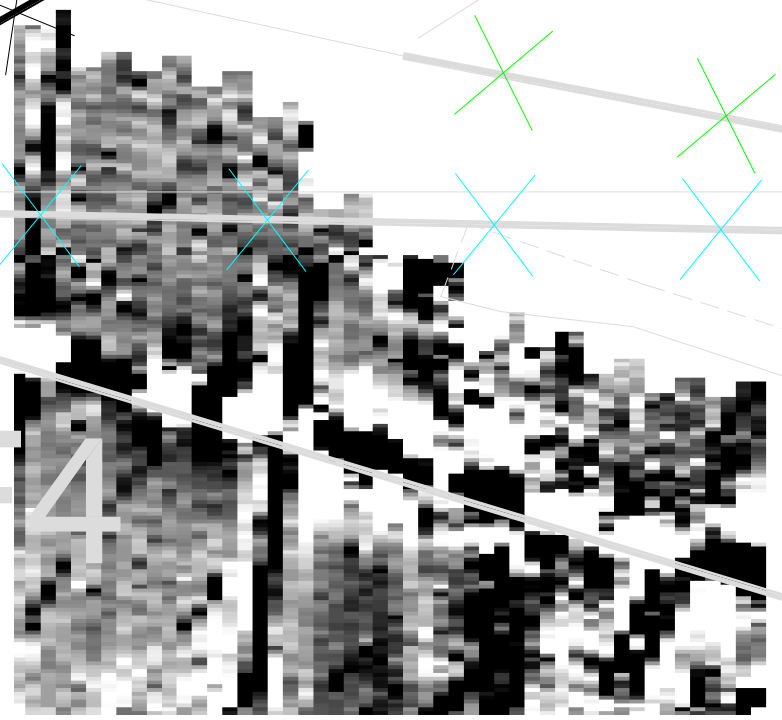
76

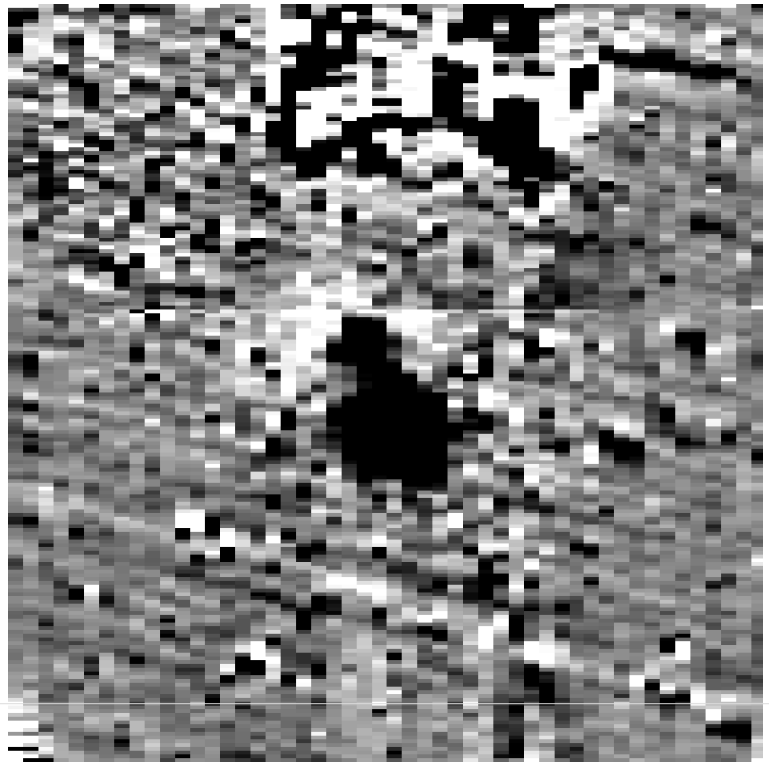
SCALE 1:500

0m 5 10 15 20 25m

FIG 23







77

75

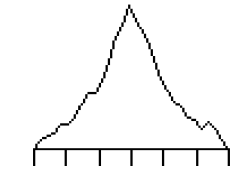
76

Archaeological Surveys

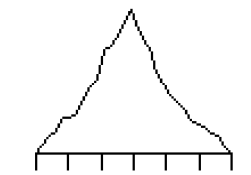
Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

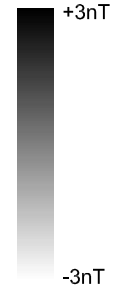
Greyscale plot of processed magnetometer data - Areas 75, 76 & 77

Area 75

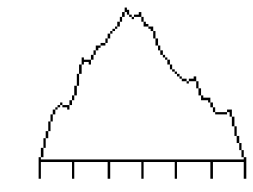


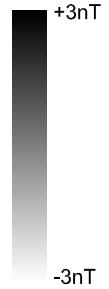
Area 76





Area 77





SCALE 1:500

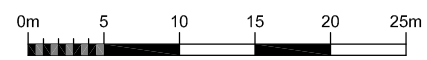


FIG 22

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Cutacre Surface Mining and Reclamation Facility,
Greater Manchester

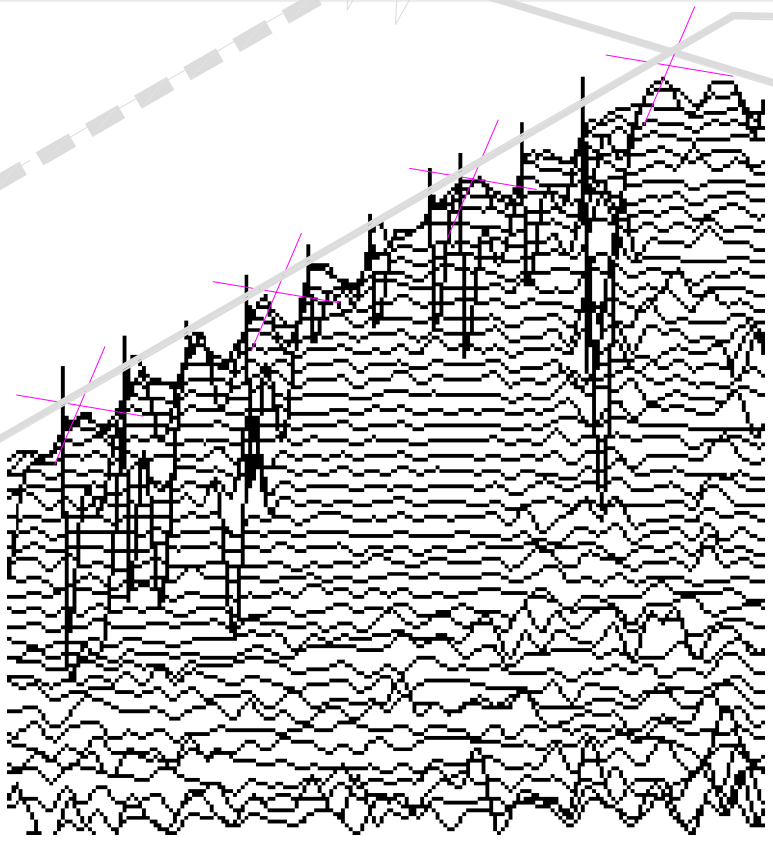
Traceplot of raw magnetometer data - Areas 75, 76 & 77

+20nT
+10nT
0nT
-10nT
-20nT

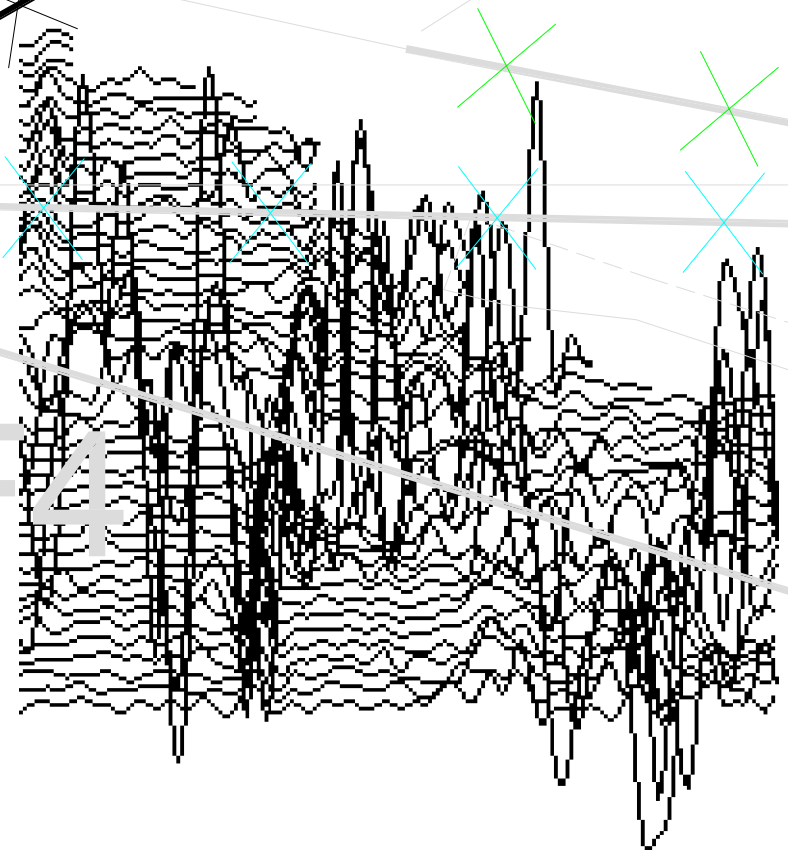
10nT/ cm vertical displacement.

Data has been clipped at ± 100nT.

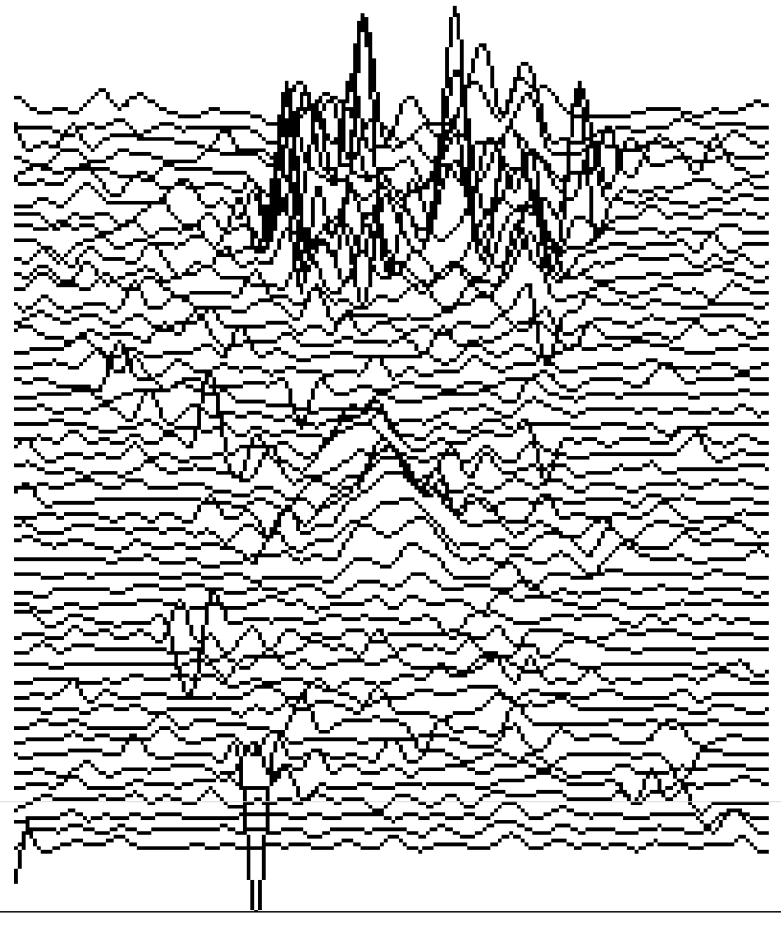
N



75



77



76

SCALE 1:500

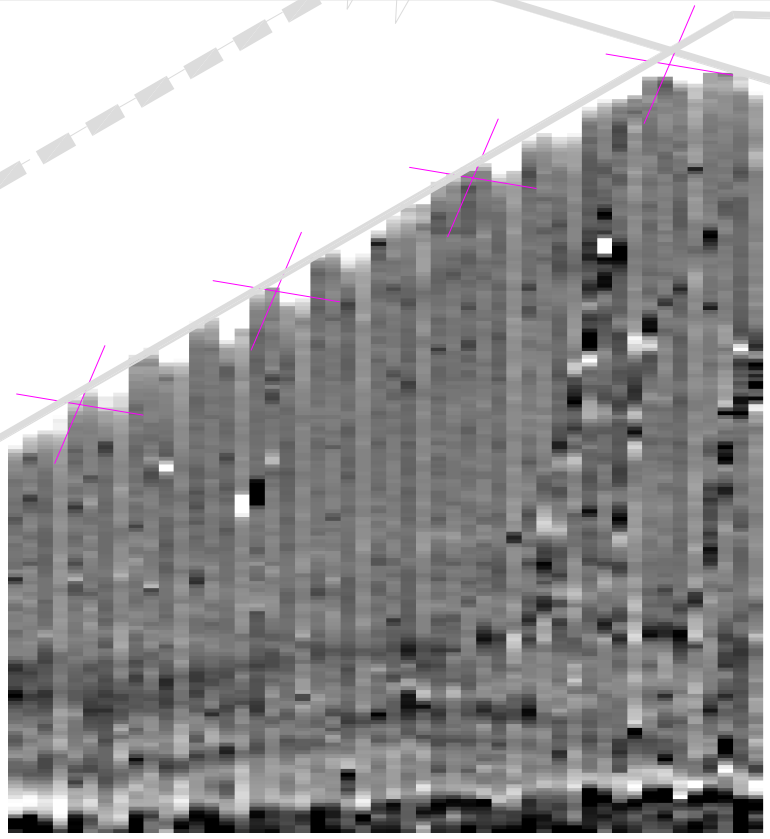
0m 5 10 15 20 25m

FIG 21

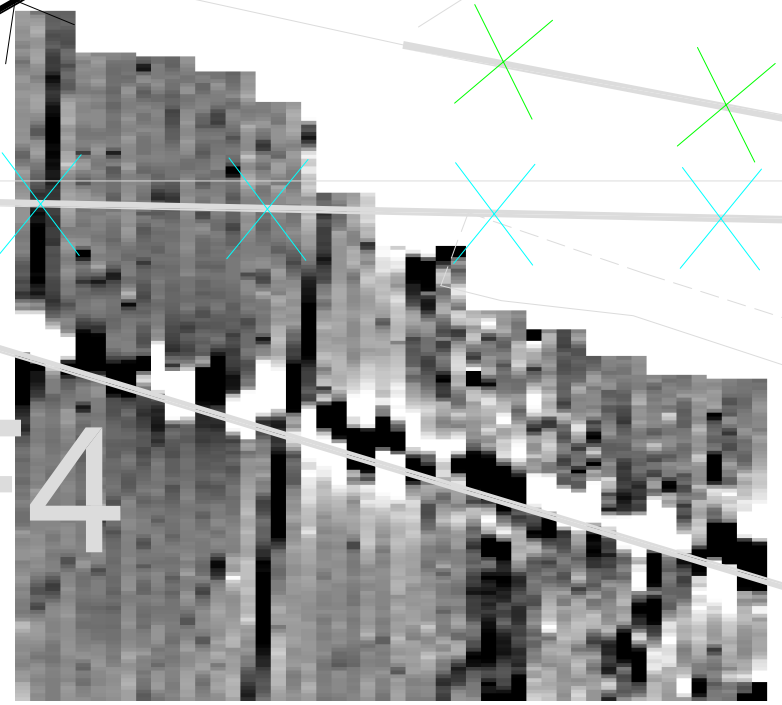
Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

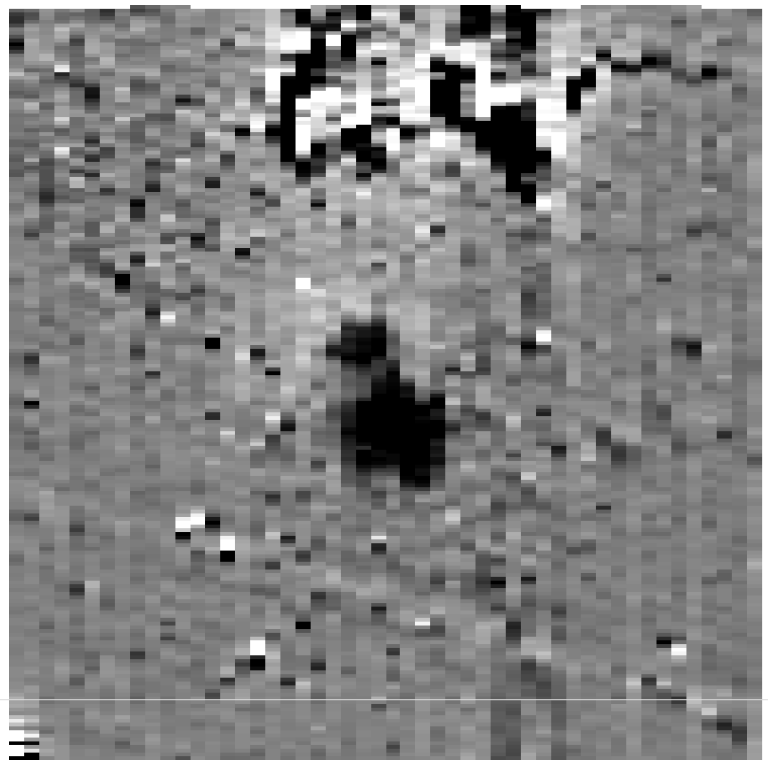
Greyscale plot of raw magnetometer data - Areas 75, 76 & 77



75

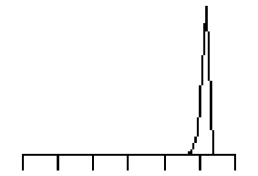


77

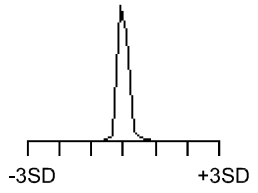


76

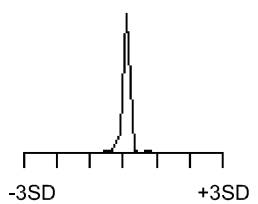
Area 75



Area 76



Area 77



SCALE 1:500

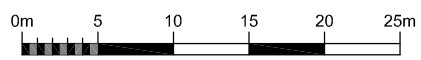
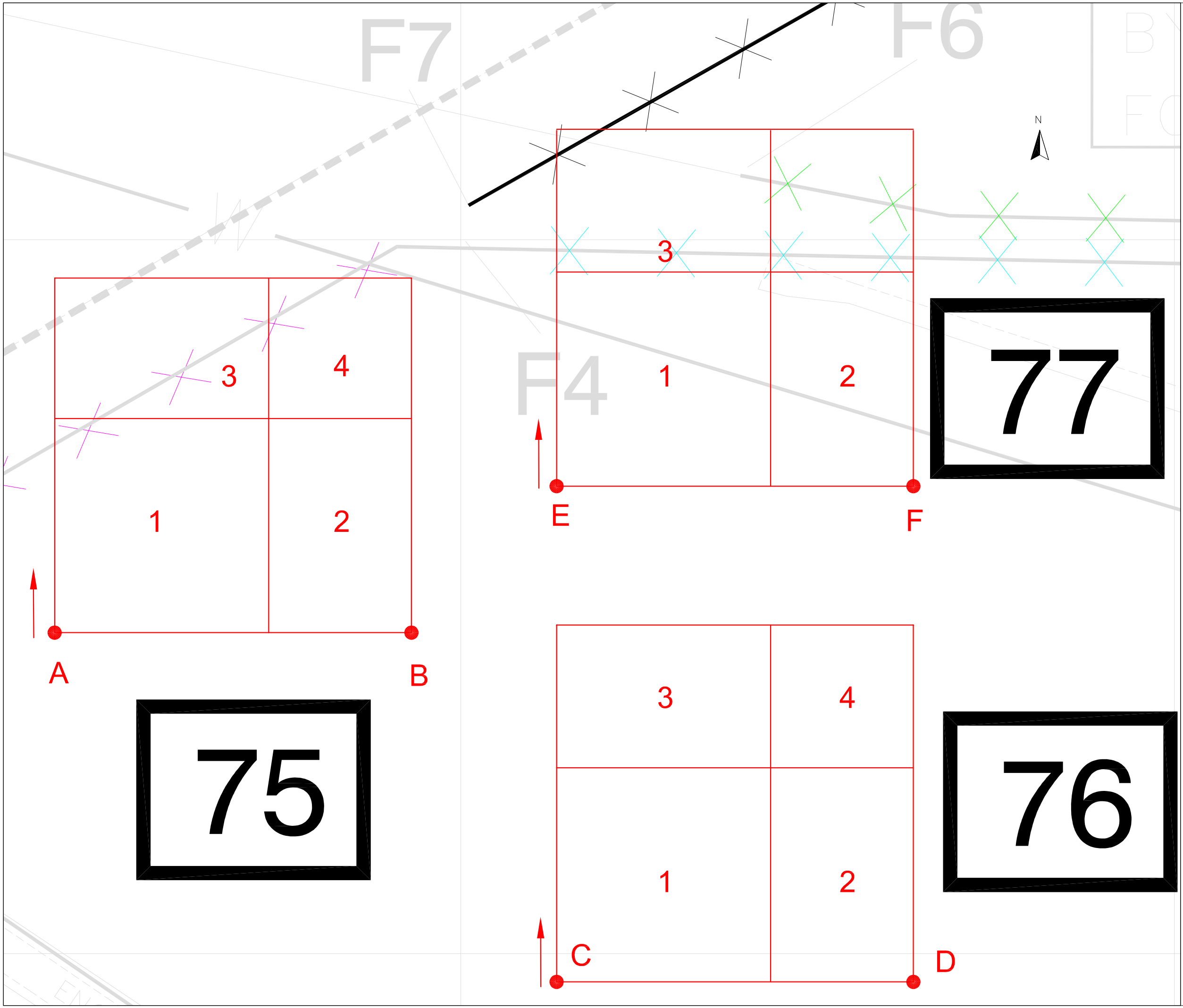


FIG 20



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Greater Manchester

Referencing information - Areas 75, 76 & 77

A	369443.08,	403644.95
B	369493.08,	403644.95
C	369513.43,	403596.02
D	369563.43,	403596.02
E	369513.43,	403665.48
F	369563.43,	403665.48

A - B 50m baseline Area 75

C - D 50m baseline Area 76

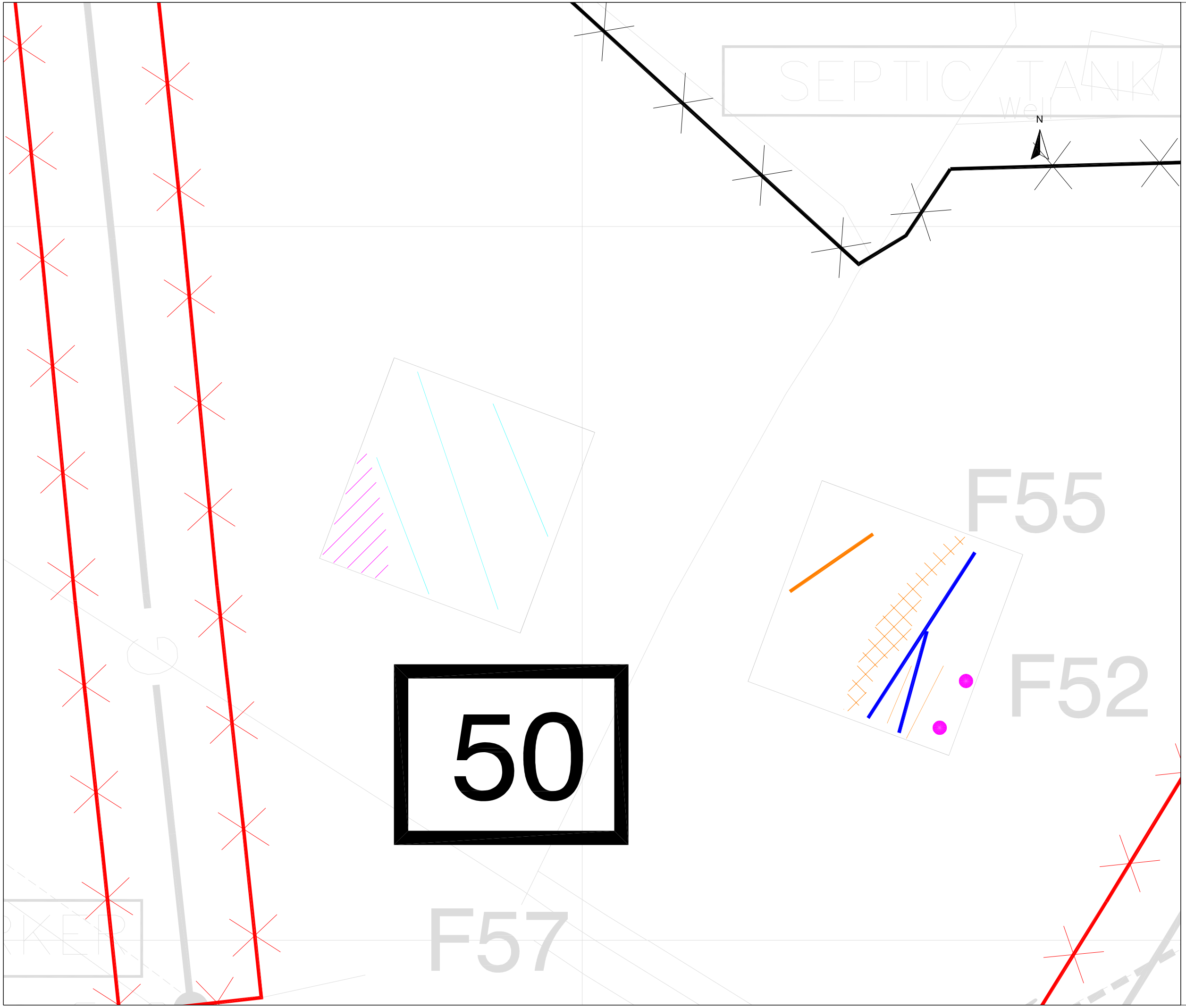
E - F 50m baseline Area 77

Start of survey & traverse direction

SCALE 1:500

0m 5 10 15 20 25m

FIG 19



Archaeological Surveys

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Abstraction and interpretation of magnetometer anomalies - Areas 50a & 50b

- Positive linear anomaly - cut feature of uncertain origin
- Positive linear anomaly - possible land drain
- Negative linear anomaly - ?of uncertain origin
- Positive area anomaly of uncertain origin
- Magnetic disturbance from nearby gas pipeline
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:500

0m 5 10 15 20 25m

FIG 18

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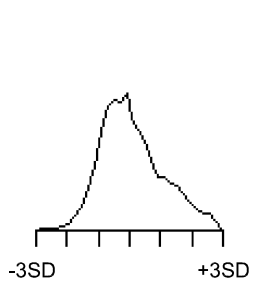
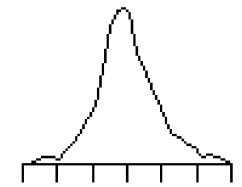
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

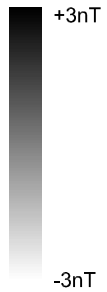
Greyscale plot of processed magnetometer data - Area 50

Area 50a (left)



Area 50b (right)





SCALE 1:500

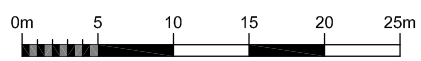
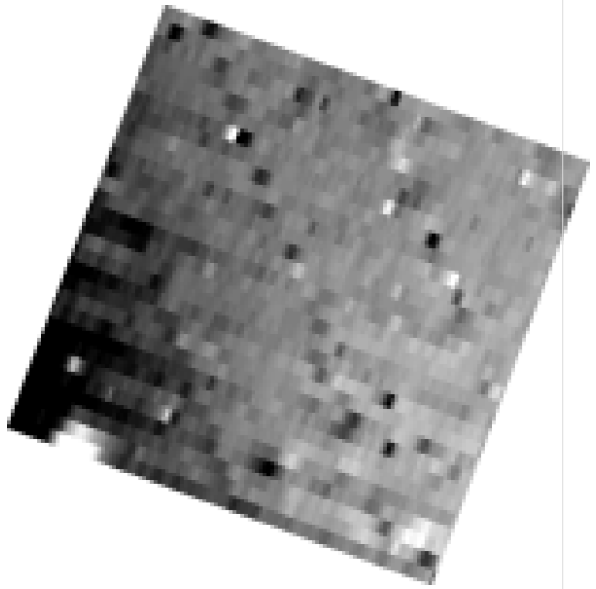
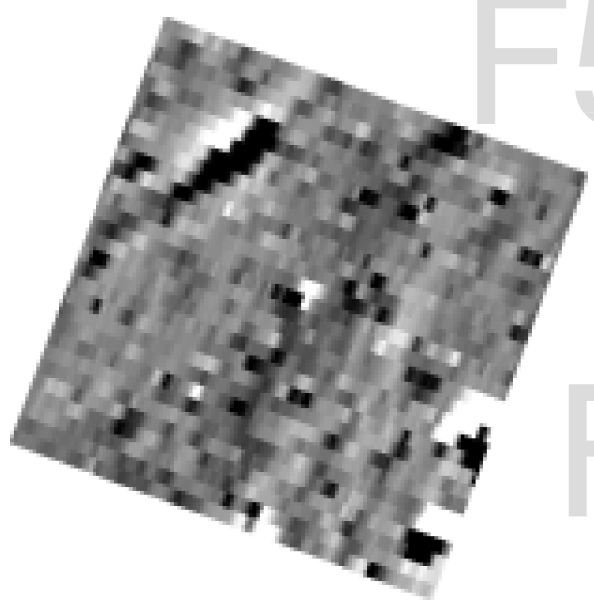


FIG 17





50

SEPTIC TANK

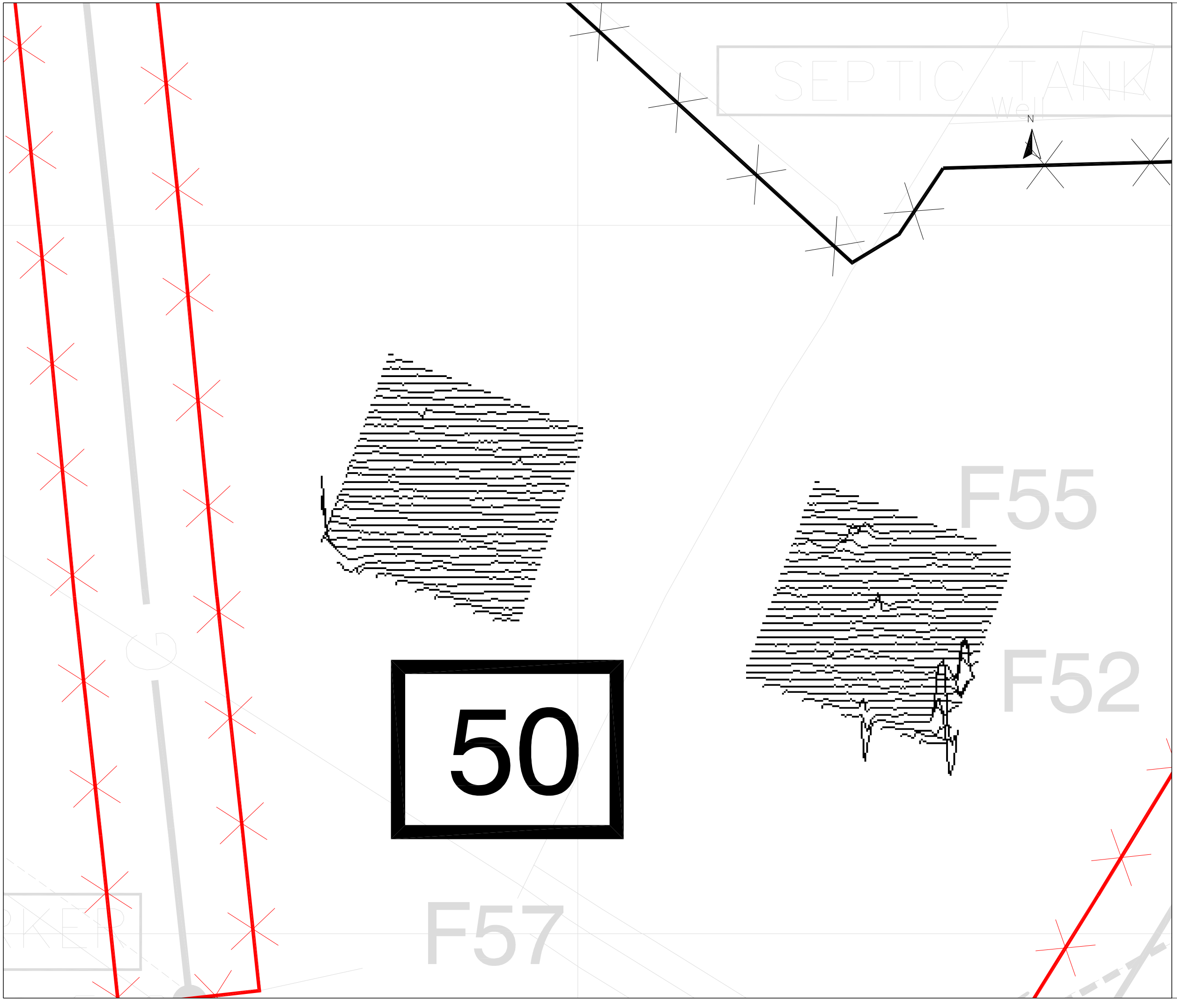
Weir

N

F55

F52

F57



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Greater Manchester

Traceplot of raw magnetometer data - Area 50

+20nT — 10nT/ cm vertical displacement.

+10nT — Data has been clipped at ± 100nT.

0nT

-10nT

-20nT

SCALE 1:500

0m 5 10 15 20 25m

FIG 16

Archaeological Surveys

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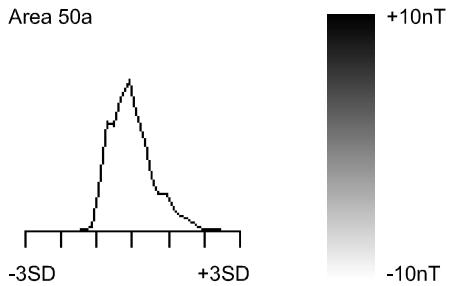
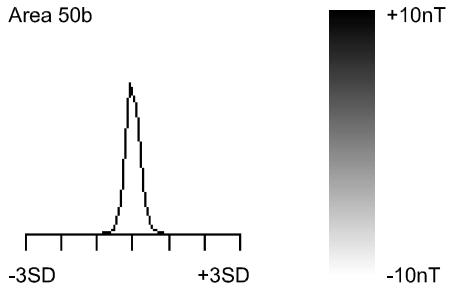
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Greyscale plot of raw magnetometer data - Area 50





SCALE 1:500

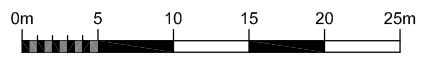
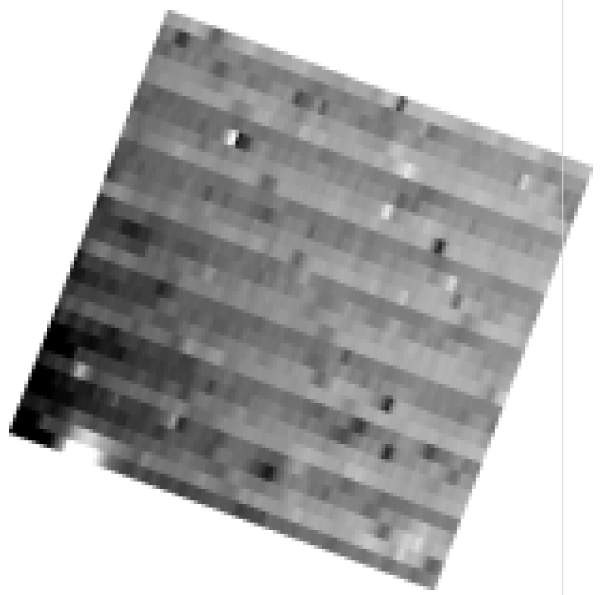
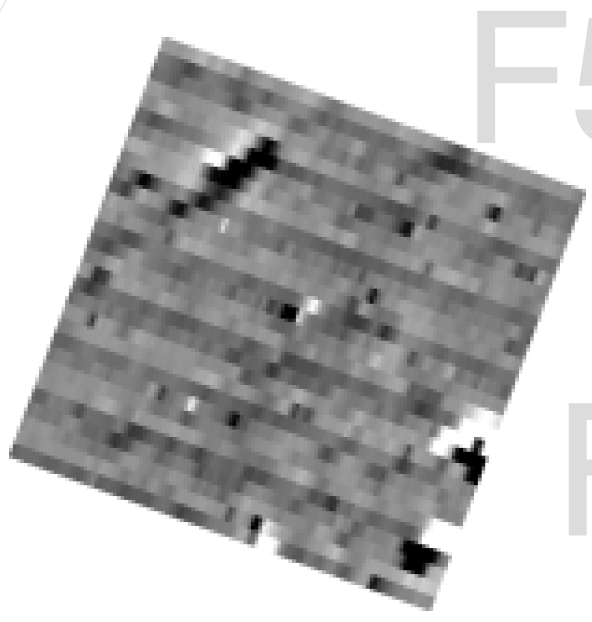


FIG 15



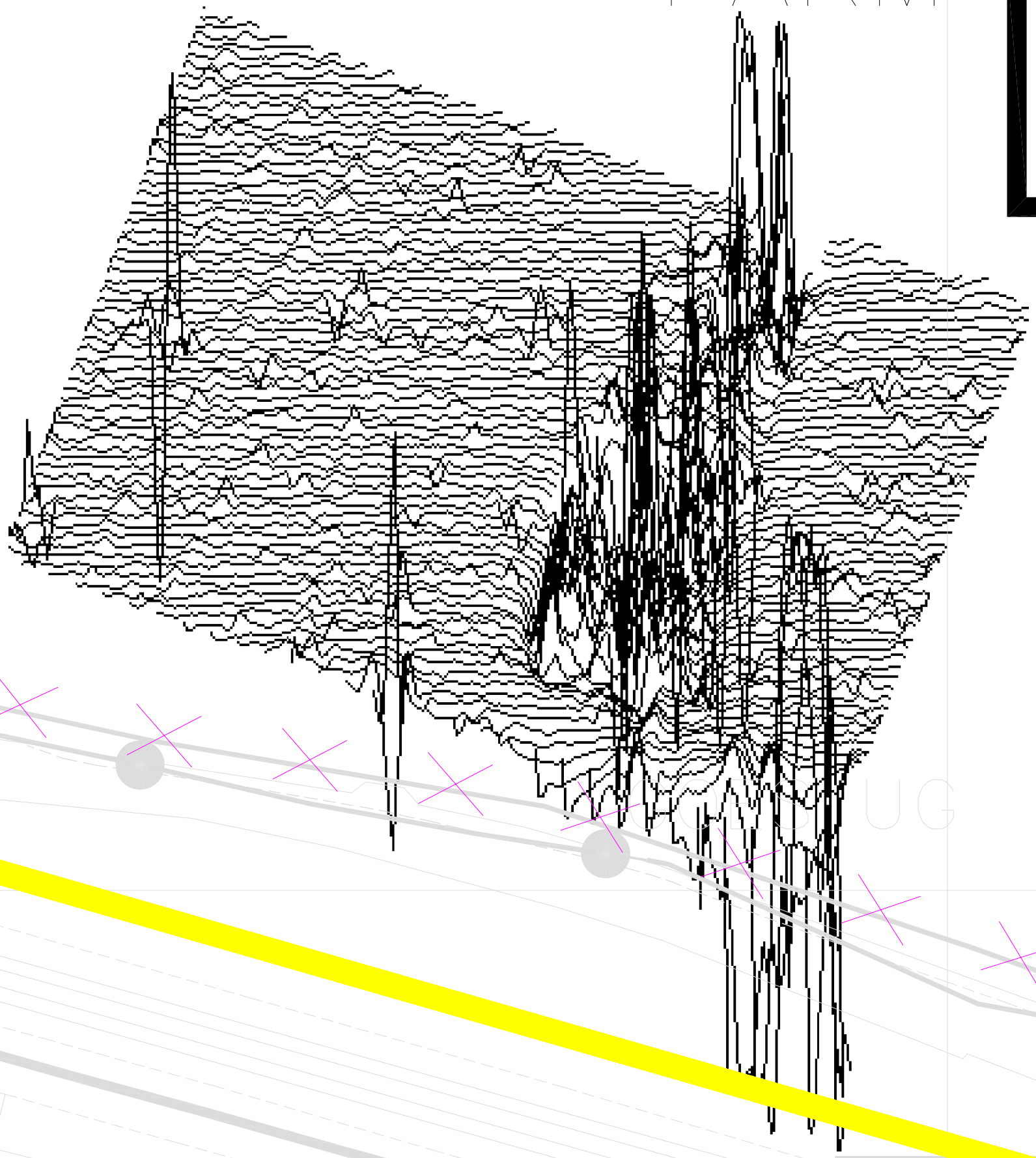


50

OLIVER FOLD FARM

78

N



Archaeological Surveys

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Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Traceplot of raw magnetometer data - Area 78

+20nT
+10nT
0nT
-10nT
-20nT

10nT/ cm vertical displacement.

Data has been clipped at ± 100nT.

SCALE 1:500

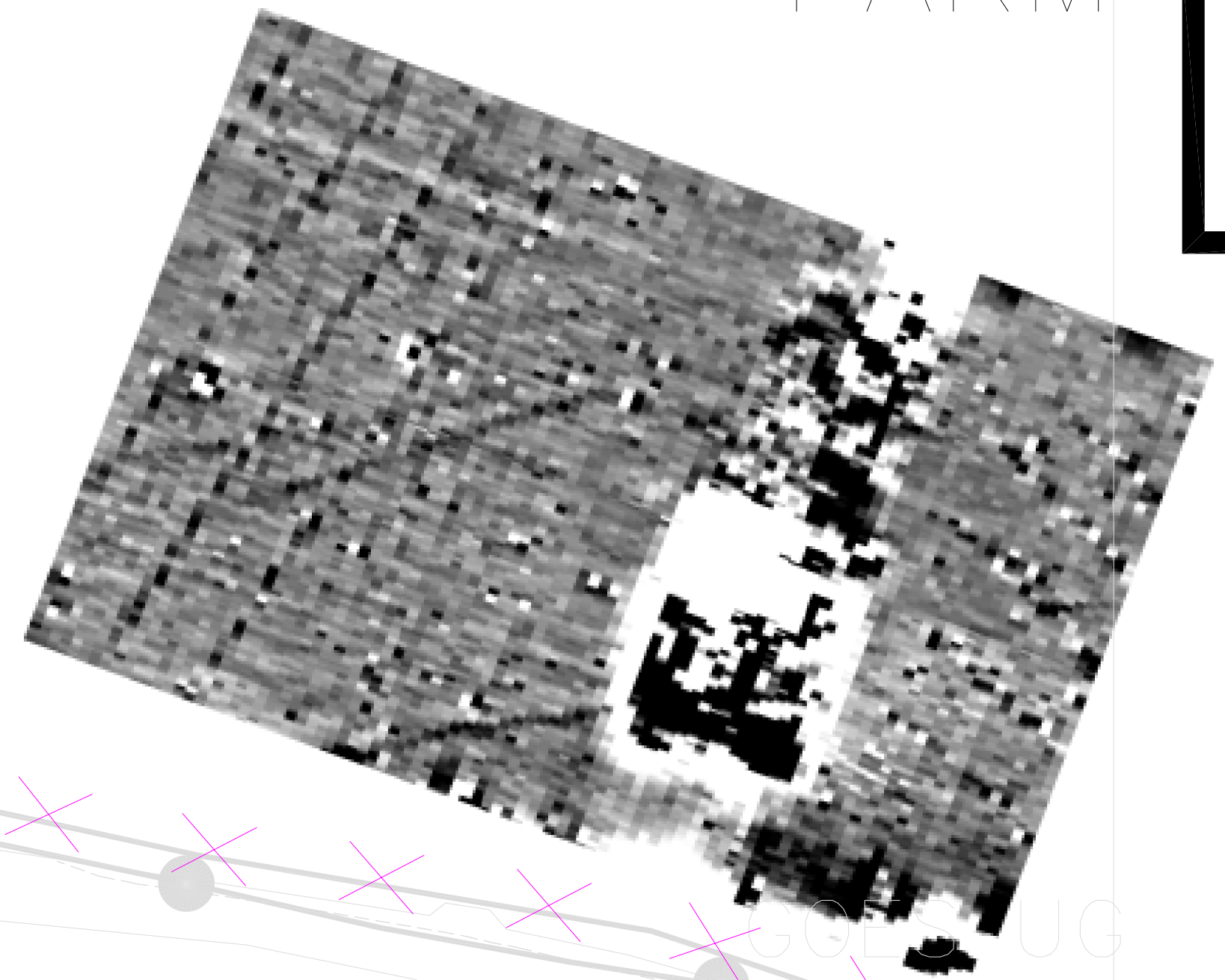
0m 5 10 15 20 25m

FIG 26

6

OLIVER FOLD FARM

78

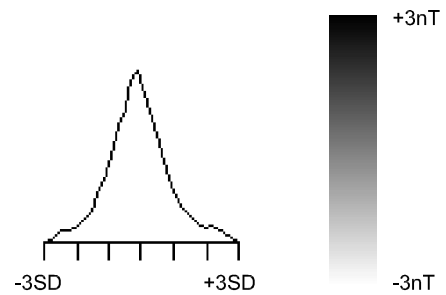


N

Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Greyscale plot of processed magnetometer data - Area 78



SCALE 1:500

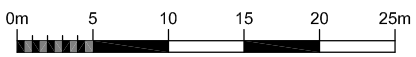


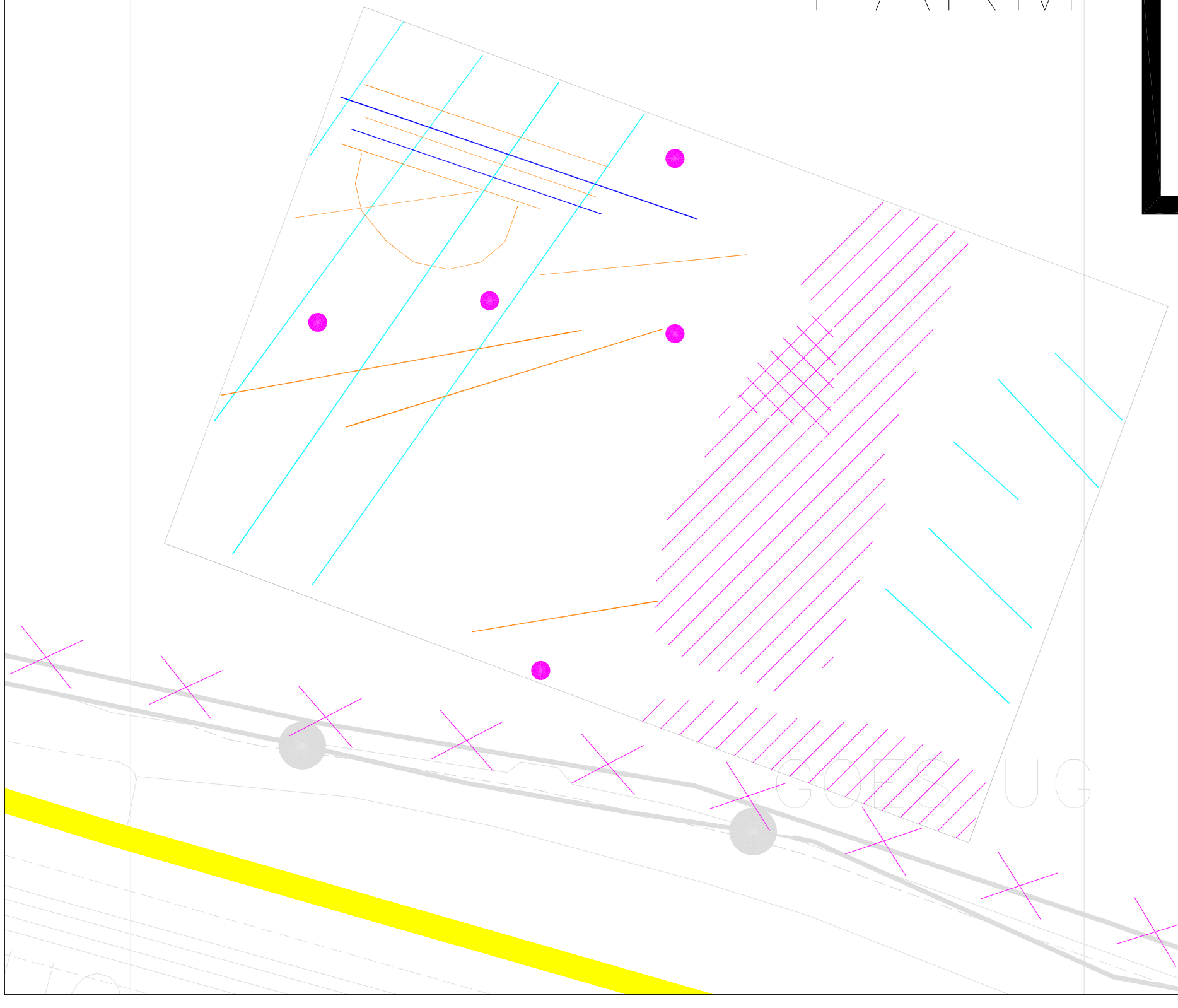
FIG 27

6

OLIVER FOLD FARM

78

N



Archaeological Surveys

Geophysical Survey
Cutacre Surface Mining and Reclamation Facility, Greater Manchester

Abstraction and interpretation of magnetometer anomalies - Area 78

- Positive linear anomaly - cut feature of uncertain origin
- Linear anomaly - possible land drain
- Negative linear anomaly - of uncertain origin
- Magnetic debris - spread of thermoremnant material
- Magnetic disturbance from ferrous material
- Strong dipolar anomaly - ferrous object in topsoil

SCALE 1:500

0m 10 20 30 40 50

FIG 28