

AD358

**Quarry Farm Phase 3,
Hartlepool, Cleveland**

Archaeological Geophysical Survey



Author	Warren Muncaster
Commissioned by	Cecil M. Yuill
Project Number	358
OASIS Number	adarchae1-406263
Date	October 2020

For further information please contact:

AD Archaeology Ltd

South Shields Business Works,

Henry Robson Way,

South Shields,

NE33 1RF

Tel: 0191 603 0377

Email: info@adarchaeology.co.uk

TABLE OF CONTENTS

<i>Executive Summary</i>	1
1 INTRODUCTION	2
1.1 The Project	2
1.2 Aims and Objectives	2
1.3 Geology and Topography	2
2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND	3
3 THE GEOPHYSICAL SURVEY	8
3.1 Technique	8
3.2 Methodology	8
3.3 Post-Processing	8
4 SURVEY RESULTS	9
4.1 Magnetic Anomaly Interpretation	9
4.2 Services, Modern Disturbance and Geological Features	9
4.3 Ridge and Furrow and Later Field Boundaries	10
4.4 Other Magnetic Anomalies	11
5 DISCUSSION	12
6 BIBLIOGRAPHY	13
APPENDIX 1: CATALOGUE OF HISTORIC ENVIRONMENT RECORD FEATURES	14

LIST OF FIGURES & PLATES

Figure 1: Site Location

Historic Background

Figure 2: Location of Historic Environment Record (HER) features

Figure 3: Throston tithe map

Figure 4: Plan of Throston, 1839

Figure 5: Ordnance Survey first edition, 1857

Figure 6: Ordnance Survey second edition, 1896

Figure 7: Ordnance Survey third edition, 1914

Geophysical Survey

Figure 8: Geophysical survey grid layout

Figure 9: Overall greyscale plot of geophysical survey

Figure 10: Overall interpretative plan of geophysical survey

Figure 11: Field 1: Greyscale plot of processed geophysical survey

Figure 12: Field 1: Interpretative plan of processed geophysical survey

Figure 13: Field 2: Greyscale plot of processed geophysical survey

Figure 14: Field 2: Interpretative plan of processed geophysical survey

Figure 15: Field 3 North: Greyscale plot of processed geophysical survey

Figure 16: Field 3 North: Interpretative plan of processed geophysical survey

Figure 17: Field 3 South: Greyscale plot of processed geophysical survey

Figure 18: Field 3 South: Interpretative plan of processed geophysical survey

Figure 19: Fields 1 & 2: Greyscale plot of unprocessed geophysical survey

Figure 20: Field 3: Greyscale plot of unprocessed geophysical survey

Plate 1: Overall view of site taken from Field 3 facing south towards Quarry Farm

EXECUTIVE SUMMARY

AD Archaeology Ltd. was commissioned by Cecil M. Yuill to carry out a geophysical survey (magnetometry) in advance of a proposed residential development on land at Quarry Farm, Hartlepool, Cleveland.

Overall no clear archaeological site could be identified from the results of the geophysical survey or from the earlier archaeological assessment of the site. The geophysical survey detected a small number of positive anomalies of uncertain origin in Fields 1 & 2 that did not follow the orientations of the numerous anomalies clearly associated with various ploughing regimes over many years. Although these fragmentary anomalies are of potential archaeological interest, an agricultural or relatively recent origin is still the most likely origin for them.

The geophysical survey detected numerous linear magnetic anomalies associated with former field systems of ridge and furrow throughout the site. The results of the survey corresponded with many of the earlier field systems now no longer extant that were depicted on the earlier township plan and tithe map of 1839/40 and the Ordnance Survey first edition map of 1857. The best example of this was in the southern portion of Field 3 where a well-defined ridge and furrow system (anomaly 7, Fig 18) was detected possibly in association with a boundary ditch (anomaly 8) of field depicted on the early mapping.

1 INTRODUCTION

1.1 The Project (Figs. 1, 2, 8, Plate 1)

1.1.1 AD Archaeology Ltd. was commissioned by Cecil M. Yuill to carry out a geophysical survey (magnetometry) in advance of a proposed third phase of residential development on land at Quarry Farm. Hartlepool, Cleveland. The site measures 22.16ha and is centred on NGR: NZ 477 333.

1.1.2 The geophysical survey was carried out in the week commencing 5th October 2020.

1.2 Aims and Objectives

1.2.1 The objective of the geophysical survey was to evaluate the presence of sub-surface archaeological remains on the site by means of the location and interpretation of geophysical anomalies.

1.3 Geology and Topography

1.3.1 The underlying geology at the site consists of Roker Formation Dolostone, sedimentary Bedrock formed approximately 251 to 271 million years ago in the Permian Period. The superficial geology is Devensian glacial till formed up to 2 million years ago in the Quaternary Period (BGS 2020).

1.3.2 The survey covered three fields (Fields 1-3) either side of a small valley that lay between two roads that ran alongside the ridges of higher ground; Worset Lane to the north and Elwick Road to the south (Fig. 1, 8). Fields 1 and 2 lie to the north of Elwick Road on the south side of the valley with an overall gentle slope to the North East. Field 3 on the opposite side of the valley consists of a large field which runs from a plateau of higher ground at the north end before falling away with an undulating slope in a general S and SSE direction. Field 1 was under grass pasture; Field 2 was under young crops and Field 3 was under young crop with the western third of the field consisting of grass. A former quarry occupied the base of the valley with a now grassed over former trackway leading east from it down the valley. A stream flows eastwards within a ditch around the edge of the quarry bordering the southern edge of Field 3, turning northwards briefly in the southwest corner of the field.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 An archaeological desk-based assessment for Phase II of the Quarry Farm development site was carried out in 2015 by AD Archaeology (2015a). This work provided a detailed archaeological and historical background for the site which is reproduced below.

2.2 Prehistoric Period

2.2.1 There are no known prehistoric sites or finds spots on the development site itself, though the possibility of as yet unrecorded prehistoric remains being present cannot be entirely discounted. Within the study area of the site the SMR lists a polished stone axehead of Neolithic date found 785m east of the development site (Catalogue Reference 3, see Appendix 1 and Figure 2) and a scatter of twelve worked flint artefacts found by fieldwalking in the field directly to the south-west of the development site (Cat. Ref. 11).

2.2.2 In the wider vicinity of the site Mesolithic tools found on the beach and Neolithic cist burials found along the coast near Hartlepool show the evidence of occupation and activity in the area during the early prehistoric period probably in the form of seasonal hunter-gather activity.

2.2.3 Bronze Age activity was recorded at Catcote approximately 2km southeast of the site near to the Summerhill Country Park where a series of enclosures were found containing the postholes of small buildings. Two round barrows were also found to the south of this site, one containing three cist burials. To the north of the site at High Throston a pit was found containing ash, bronze artefact and Bronze Age pottery.

2.2.4 An Iron Age settlement was also found at Catcote near the Bronze Age settlement consisting of a series of ditched enclosures containing roundhouses. In the wider area around the site analysis of aerial photographs has also identified a number of cropmark features which may represent prehistoric period settlements or features.

2.3 Romano-British Period

2.3.1 Although there is no evidence for Roman activity on the development site the settlement at Catcote continued into the Roman period.

2.4 Early-Medieval Period

2.4.1 There is no evidence for activity of this date on the site itself or in the immediate area of the site. Near to the site the village of High Throston may have its origins in the early-medieval period as its name is from the Saxon *thosson* meaning hill.

2.4.2 Historical documents infer that Hartlepool was established as a Saxon settlement with the land surrounding it including the site given over to agriculture. The name Hartlepool is probably derived from the Saxon words *Heorot eg pol*. *Heorot* is Saxon for hart (deer). The word *eg* refers to island or peninsula and *pol* meant pool or bay. In AD 640 St Aidan established a monastery near to the site of St Hilda's Church. During the 8th century the monastery declined and by the 9th century it was in a state of ruin. Some accounts suggest that it was destroyed by the raiding Danes in this period but excavation of a number of Northumbrian monasteries suggests they were abandoned following the political troubles of the late 8th century.

2.5 Medieval Period

2.5.1 There are no known sites or finds spots of medieval date on the site itself. In the study area around the site the SMR lists the site of the deserted medieval village of Low Throston, a Scheduled Ancient Monument (Cat. Ref. 1 and 14) which lies 850m east of the development site. The SMR also lists the site of the deserted medieval village of High Throston (Cat. Ref. 2) the core of which is believed to have been approximately 200m north-east of the northern edge of the development site. Associated with this village the SMR lists a medieval field system of ridge and furrow (Cat. Ref. 6), earthworks (Cat. Ref. 15) and finds of pottery (Cat. Ref. 10), a coin (Cat. Ref. 16) and a seal matrix (Cat. Ref. 20) of medieval date.

2.5.2 The development site lies to the south-west of the deserted medieval village of High Throston, and given the relative proximity of the northernmost fields of the development site to the village it is possible that outlying settlement remains associated with the village (such as boundaries and backplots) may infringe upon the north-easternmost edge of the development area. The site lies some distance to the west of the medieval moated site and deserted medieval village of Low Throston and as such it is considered highly unlikely that structural remains associated with this settlement would be present on the development site. It is probable that the area of the site fell within the agricultural lands of these villages and may contain evidence of medieval agricultural activity.

2.5.3 Hartlepool, to the east of the site, continued to grow in the 11th century and documents suggest that at this time Robert de Brus was given lands in the area and became Lord of Hartness and Lord of the Manor of Hartlepool. There are various references to the town in the 12th century, with one document referring to it as Hertepol. The settlement continued to grow throughout the medieval period and became a well-established port, which was borne out by the booming fishing industry. The harbour was an important part to the settlement and was originally founded by the de Brus family. The port soon monopolised the shipping of the Durham Bishopric and was one of the busiest places on the eastern coast. It is purported that in the early 13th century the town had a population of several hundred and consisted of a few main streets including Southgate Street, St Marys

Street and St Helens Street which still form part of the old town. In 1201 King John granted Hartlepool its first charter and the merchants of Hartlepool were given the same status as those in Newcastle. At this time the coastal port and town became a fortified peninsula at the heart of which was St Hilda's Church, which dates from the 13th century. This was originally built as a burial place for Norman de Brus.

2.5.4 Throughout its medieval history the town has been the focus of a number of attacks due to its strategic position and importance as a port. The first attack came in 1068 when settlements between York and the River Tees were subject to varying degrees of destruction. Accounts dating to 1153 refer to another attack on the port from Norwegian pirates under King Eystein in 1153. The port was also the landing platform for 40 knights and 500 infantry in 1174. They were brought in to help the Scottish campaigns but shortly after their landing the Scots were defeated and subsequently they returned to Belgium. The port became a regular target for marauding Scots and seaborne attacks, which led to the fortification of the peninsula with defensive walls by Robert de Brus.

2.6 Post-medieval Period

2.6.1 Within the site boundary the SMR lists two limestone quarries (Cat. Ref. 17 & 18) and an associated lime kiln (Cat. Ref. 19) of post-medieval date on the site itself. In the study area around the site the SMR lists a field system of narrow rigg post-medieval ridge and furrow at High Throston (Cat. Ref. 13) to the north-east of the site, along with a farmstead (Cat. Ref. 21) and barn from (Cat. Ref. 22) the post-medieval period. The SMR also records a farmstead at High Tunstall (Cat. Ref. 25) 320m south of the site and the line of a historic road leading from Naisberry Quarry (Cat. Ref. 23) which runs to the east of the site.

2.6.2 Historic mapping and tithe maps suggests that the majority of the site would have been agricultural land during the post-medieval period with the exception of the area of limestone quarrying and processing. The fields forming the development site are depicted on the Throston tithe map of 1840 (Fig. 3) which also shows the location of the limekilns on the site at this time. The plan also marks one of the central fields of the site as 'four man shaws lane' and shows an unusual layout with a long narrow field in the centre of the site which is still present within the modern field layout. It is possible that this represents the remains of a road or track leading from the quarries and limekilns. On the 1839 plan of the Township of Throston in the Parish of Hart (Fig. 4) the site is listed as being part of Throston Farm owned by The Duke of Cleveland and occupied by Edward Wilson.

2.6.3 Hartlepool saw significant development in the post-medieval period and the town's expansion continued into the agricultural landscape. Such development began to occur in the 16th and 17th centuries in part due to its strategic coastal position, which was the cause for a number of conflicts. By the 18th century the town's importance began to waiver, in part due to the decline of the port, which gradually fell into disrepair. This was aggravated by the partial destruction of the old pier

during a storm and the introduction of a toll on ships using the port. By the 19th century the port was more or less redundant and became known merely as a health resort rather than a strategic port. Further demise was seen due to the enclosure of the harbour for agricultural purposes in the early 19th century; however, a petition forced the reverse of the enclosure in 1813. To improve the economic situation of the town a new docks was built in 1835 and a railway was laid in 1839, which connected Hartlepool to other towns. This infrastructure made it possible to export coal from the Durham coalfield through Hartlepool. As a result Hartlepool boomed and by 1841 it had a population of 5,236 and by 1851 it had reached 9,227.

2.7 Victorian and Modern Periods

2.7.1 There are no features of archaeological or historical significance recorded on the site from the Victorian or modern periods. In the study area around the site the SMR lists a number of modern features associated with the defence of Britain during the Second World War. These include the site of pillboxes at Sea View Farm (Cat. Ref. 4 & 5) 300m north of the site, at High Throston (Cat. Ref. 9 & 12) immediately north of the site and at Naisberry Park (Cat. Ref. 7) immediately adjacent to the eastern boundary of the site, and the site of a searchlight battery at Low Throston (Cat. Ref. 24). The SMR also records the probable location of a First World War training ground at Naisberry (Cat. Ref. 26) 460m south-east of the site though its exact location has not been found.

2.7.2 Historic map regression shows the location of the limestone quarries and limekilns on the site on the first edition Ordnance Survey of 1857 (Figure 5). The majority of the remainder of the site is shown as being undeveloped agricultural land.

2.7.3 The second edition Ordnance Survey of 1896 (Figure 6) shows the quarries as still being in use at this time and also shows the possible line of the track or road leading from the quarries through the central band of the site. The remainder of the development site is shown as agricultural land, with the first buildings of Quarry Farm at the southern edge of the site depicted at this time. The map shows that the earlier patchwork of fields, in the north of the site (occupied by Field 3) depicted on earlier mapping had by this time been consolidated into one very large field.

2.7.4 By the time of the third edition Ordnance Survey of 1914 (Figure 7) the quarries and limekilns are marked as Old indicating that they had gone out of use at this time. The majority of the site is again shown as agricultural land with Quarry Cottages marked.

2.7.5 The fourth edition Ordnance Survey of 1939 shows the same layout as that seen in 1913.

2.7.6 During the mid-19th century a new town known as West Hartlepool developed. It began when the owners of the railway and the proprietor of the docks

fell out, subsequently the railway owners decided to build their own docks to the south-west of the town. These were completed in 1847. By the 1880s West Hartlepool had overtaken the size of the old town and by 1881 it had a population of 28,000, which almost trebled by the turn of the century with it recorded at 63,000. For many years the two towns were separate but merged as one in 1966 under the Hartlepool Order.

2.8 Previous Archaeological Work

2.8.1 An archaeological assessment was conducted by AD Archaeology as part of the Quarry Farm Phase 1 works in June 2014 (AD Archaeology 2014a). As part of the assessment works aerial photographs of the area of the site and surrounding fields were consulted and no clear archaeological features were identified as cropmarks. A geophysical survey carried out by AD Archaeology in June 2014 (AD Archaeology 2014c) identified and recorded the remains of earthworks from ridge and furrow agriculture on the site along with faint linear features of unknown origin. A trenching evaluation carried out by AD Archaeology in July 2014 (AD Archaeology 2014d) recorded the remains of ridge and furrow agriculture of the medieval broad rigg type on the site. The other linear anomalies identified by the geophysical survey were found to be features of a natural geological origin. Therefore no significant archaeological features were found on the Phase I site.

2.8.2 As part of the Phase 2 works, the archaeological assessment and HER search were updated by AD Archaeology in June 2015 (AD Archaeology 2015a). This was followed by the Phase 2 geophysical survey. (AD Archaeology 2015b) which identified a series of anomalies mainly associated with ridge and furrow and former post-medieval field boundaries. Several anomalies (2, 3, 4, 5 and 6) identified were likely to represent soil filled ditches or gullies associated with field boundaries depicted on the Township plan of Low Throston from 1839. The origin of several anomalies (9, 10, 11, 12) which crossed a ridge and furrow system in the eastern portion of the field were of uncertain origin.

3 THE GEOPHYSICAL SURVEY

3.1 Technique

3.1.1 Geophysical survey is a method by which examination of the Earth's physical properties takes place using non-invasive ground survey techniques in order to reveal buried sub-surface features and anomalies (Gaffney and Gater 2004). A hand-held magnetic fluxgate gradiometer records differences in electromagnetic field to a depth of approximately 1 metre into the ground. Differences or disturbances in sub-soil magnetic susceptibility can be the result of archaeological features, geology or modern intrusions.

3.1.2 This geophysical survey was conducted in line with all professional guidelines (CifA 2014a, b) and recommendations as laid out and presented in *EAC Guidelines for the use of geophysics in archaeology* (Schmidt et al. 2015) *Geophysical survey in archaeological field evaluation* (David, Linford and Linford 2008), *Geophysical Data in Archaeology* (Schmidt 2001), and discussed in, *Revealing the Buried Past: Geophysics for Archaeologists* (Gaffney & Gater 2004).

3.2 Methodology (Fig. 8)

3.2.1 The magnetometer survey was carried out using a *Bartington Grad 601-2* fluxgate gradiometer, which scanned and stored all magnetic data. The sample interval was set at 0.25m and the traverse interval at 1m using a north and east traverse direction in a zigzag scheme. The data was then downloaded onto a laptop computer on site for assessment, and later processed on a PC.

3.2.2 The survey comprised 234 full and partial 30m by 30m grids (see Fig. 8) which were set out using a Trimble R6 GNSS GPS system. The former quarry in the centre of the site was for obvious reasons excluded from the survey.

3.2.3 All grid locations have been accurately tied in to Ordnance Survey mapping and NGR co-ordinates.

3.3 Post-Processing

3.3.1 *TerraSurveyor* software was used to process all of the data recorded. AutoCAD software was used for the presentation of the figures.

3.3.2 The post-processing of the recorded raw data includes the application of certain functions in order to aid both the presentation and interpretation of the results. In this instance, data has been 'de-striped' to negate the effect of a zig-zag traverse a cause of striped data; 'despiked' to remove data spikes caused by small surface iron anomalies usually the result of metal 'rubbish' in the topmost surface layers; 'Destagger' to adjust the displacement of geomagnetic anomalies caused by alternate zig-zag traverses;; 'low pass' filter applied to smooth the data; 'clipped' to

limit data to specified minimum and maximum values; thus removing extreme data point values. The data presentation includes three formats: Greyscale Plots (demonstrating unprocessed and processed data); Magnetic Anomaly Interpretation Plan (identifying possible archaeological features, modern features and other anomalies).

4 SURVEY RESULTS (Figs. 9 - 20)

4.1 Magnetic Anomaly Interpretation

4.1.1 The data displays three different types of magnetic anomalies:

- *Positive magnetic anomalies* identifiable through darker grey shades on the greyscale images, which can be suggestive of soil-filled pit and ditch type features representing high magnetic susceptibility.
- *Negative magnetic anomalies* are identifiable through lighter grey shades on the greyscale images, which can be suggestive of wall footings and other stone concentrations or features representing low magnetic susceptibility.
- *Dipolar magnetic anomalies* identifiable through concentrations of mixed dark and light grey shades on the greyscale images which can be suggestive of fired and ferrous materials and structures; and/or modern intrusion and disturbance, representing paired positive and negative magnetic susceptibility.

4.2 Services, Modern Disturbance and Geological Features (Figs. 11-18)

Field 1 (Figs. 11 & 12)

4.2.1 A buried service orientated NW-SE across the SW portion of Field 1 produced strong magnetic disturbance (anomaly 1, grey hatch on Fig. 12) along its line. Elsewhere a metal clad barn caused strong magnetic disturbance along the eastern edge of the field. Elsewhere there was magnetic disturbance in places around the perimeter of the field from wire fencing.

4.2.2 A series of linear positive linear anomalies (anomaly 2, magenta) running E-W and NNE in the south central portion of the field were probably caused by field drainage, although an archaeological origin cannot be ruled out at this stage.

4.2.3 A scatter of isolated positive and dipolar magnetic responses (red on Fig. 12, smaller/ weaker anomalies not marked) throughout the field are likely to relate to stray ferrous objects from agricultural activity and variations in the geological background.

Fields 2 and 3 (Figs. 13, 14 & 15-18)

4.2.4 There was magnetic disturbance around the perimeters of both fields from boundary fencing. A scatter of isolated positive and dipolar magnetic responses (red on Figs. 14, 16, 18; smaller/ weaker anomalies not marked) throughout the field are likely to relate to stray ferrous objects from agricultural activity and variations in the geological background.

4.2.5 A buried service in the NW corner of Field 3 produced strong magnetic disturbance (anomaly 3, grey hatch on Fig. 16) for a short distance where it crossed the edge of the field.

4.2.6 Towards the westernmost edge of the Field 3 the geophysical survey detected large irregular and relatively weak positive anomalies (Figs. 8, 15, 17) that corresponded with a steep change in slope westwards indicating a likely natural geomorphological or sub-surface geological origin. A very weak positive curvilinear anomaly (anomaly 21, brown) was detected near the centre of the field which is most likely to be natural in origin.

4.3 Ridge and Furrow and Later Field Boundaries (Figs. 11-18)

Field 1 (Figs. 11 & 12)

4.3.1 The survey has detected linear magnetic anomalies (green on Fig. 12) throughout the site from a ridge and furrow system orientated approximately north-south with a slight curve eastwards spaced at intervals of mainly between 4m-5m apart. Faint traces of modern ploughing regimes (not marked) were also detected mainly orientated approximately east-west.

Field 2 (Figs. 13 & 14)

4.3.2 The survey detected linear magnetic anomalies (green on Figs. 14) throughout Field 2 from several systems of ridge and furrow. Most of the field was occupied by an east-west orientated system (4) spaced at intervals of an average of 7m apart. A north-south orientated system was detected at the eastern end of the field (5) which was followed by a later field boundary last depicted on the Ordnance Survey second edition map (Fig. 6). Another system (6) ran approximately ESE-WNW underlying the northern boundary clearly predating it.

4.3.3 A series of mainly weak anomalies that are likely to originate from modern ploughing regimes were detected orientated NbyE (11°15' east of north) respecting the orientation of the existing eastern boundary.

Field 3 (Figs. 15-18)

4.3.4 Throughout Field 3 the survey detected linear magnetic anomalies (green on Figs. 10, 16, 18) from several ridge and furrow systems, which can be followed in part by earlier field boundaries depicted on earlier tithe maps (Fig. 3) and last shown on the Ordnance Survey first edition map of 1857 (Fig. 5). The southern portion of the field was occupied by system (7) that gently arced in a NW-SE orientation and

with furrows spaced at intervals of mainly between 6-7m apart. The northernmost positive anomaly (anomaly 8, magenta on Figs. 10, 16, 18) from this group was particularly well defined and may be related to a post-medieval boundary. The western end of anomaly 8 curves sharply southwards to presumably form the earlier western limit of the former enclosure.

4.3.5 To the north of ridge and furrow system (7) was a weaker series of anomalies (9) from another east-west ridge and furrow system along the eastern edge of the field which corresponds with the position of another of the earlier fields (Figs. 3-5). The furrows were spaced at intervals at an average of 6m apart.

4.3.6 Two systems were detected in the northwest portion of the field. The clearest series of anomalies (10) were orientated ENE-WSW with a spacing of 6m. To the west of system (10) was another possible system (11) orientated NNW-SSE which appeared to correspond with the edge of an enclosure depicted on the 1840 tithe map (Fig. 3).

4.3.7 A series of linear positive anomalies throughout the field, some of which were very broad and very pronounced (thicker green line on Figs. 10, 16, 18) were orientated north-south and ran parallel to the existing eastern boundary. These anomalies, which include a negative anomaly (anomaly 12) possibly related to a field drain, are likely to originate from modern ploughing and drainage regimes. It is possible that the northern most of these series of anomalies that lie very slightly on a differing orientation (13) may relate to another earlier system of ridge and furrow.

4.4 Other Magnetic Anomalies (Figs. 11-18)

Field 1

4.4.1 In Field 1 the survey detected a fragmentary weak positive anomaly (anomaly 14, magenta on Fig. 12) running roughly NW-SE across the southwest corner of the site. Although this linear anomaly does not correspond with the line of any feature visible on early mapping or the ridge and furrow anomalies, it is notable that it runs parallel to a gas main that cuts across the site and may reflect associated disturbance during pipe laying as may another perpendicular anomaly 13m to the north.

4.4.2 A strong positive anomaly (anomaly 15) measuring 8.5m by 5.8m of uncertain origin was detected in the northwest portion of the site. The anomaly may represent a cut feature containing magnetically enhanced material within its fill. Alternatively the feature may represent a natural feature or simply a localised area of magnetically enhanced material within the topsoil.

Field 2

4.4.3 Several mainly weak positive anomalies were identified in Field 2. In the northwest corner of the field a faint semi-circular positive anomaly was detected (anomaly 16, magenta on Fig. 12). Although the shape of this anomaly is suggestive of an archaeological feature its position in an area of relatively steeply sloping

ground suggests instead a relatively modern origin is highly likely.

4.4.4 Several weak linear positive anomalies (18, 19, 20) were detected in the southeastern edge of field with another (anomaly 17) near the western edge. The origin of these anomalies is uncertain and although they do not lie on the main orientations of anomalies associated with various ploughing regimes they are most likely to be agricultural in origin.

5 DISCUSSION

5.1 Overall no clear archaeological site could be identified from the results of the geophysical survey or archaeological assessment of the site. The geophysical survey detected a small number of positive anomalies of uncertain origin in Fields 1 & 2 (Field 1 anomalies 2, 15, 14; Field 2 anomalies 16-20) that did not follow the orientations of the numerous anomalies clearly associated with various ploughing regimes over many years. Although these fragmentary anomalies are of potential archaeological interest, a relatively recent agricultural origin is still the most likely cause for them (refer 4.2.2 & 4.4).

5.2 The geophysical survey detected numerous linear magnetic anomalies associated with former field systems of ridge and furrow throughout the site. The results of the survey corresponded with many of the earlier field systems now no longer extant that were depicted on the earlier township plan and tithe map of 1839/40 (Figs. 3, 4) and the Ordnance Survey first edition map of 1857 (Fig 5). The best example of this phenomena was a well-defined ridge and furrow system (anomaly 7, Fig 18) possibly associated with a boundary ditch (anomaly 8) identified in the southern portion of Field 3.

5.3 A very strong response was detected from services in the southern portion of Field 1 and the northwest edge of Field 3.

6 BIBLIOGRAPHY

AD Archaeology 2014a *Land at Quarry Farm, Hartlepool, Cleveland, Rapid Desk-Based Assessment* (unpublished client report)

AD Archaeology 2014b *Land at Quarry Farm, Hartlepool, Cleveland, Desk-Based Assessment* (unpublished client report)

AD Archaeology 2014c *Land at Quarry Farm, Hartlepool, Cleveland, Archaeological Geophysical Survey* (unpublished client report)

AD Archaeology 2014d *Land at Quarry Farm, Hartlepool, Cleveland, Archaeological Evaluation* (unpublished client report)

AD Archaeology 2015a *Quarry Farm, Hartlepool, Phase II, Archaeological Desk-based Assessment* (unpublished report)

AD Archaeology 2015b *Land at Quarry Farm, Hartlepool, Cleveland, Archaeological Geophysical Survey* (unpublished client report)

BGS 2020 British Geological Survey, Geology of Britain viewer
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Chartered Institute for Archaeologists, 2014 (a), *Code of Conduct*.

Chartered Institute for Archaeologists, 2014 (b), *Draft Standard and Guidance for Archaeological Geophysical Survey*.

David, A., Linford, N., and Linford, P. 2008. *Geophysical Survey in Archaeological Field Evaluation*, 2nd Ed., Research and Professional Services Guideline No 1: English Heritage.

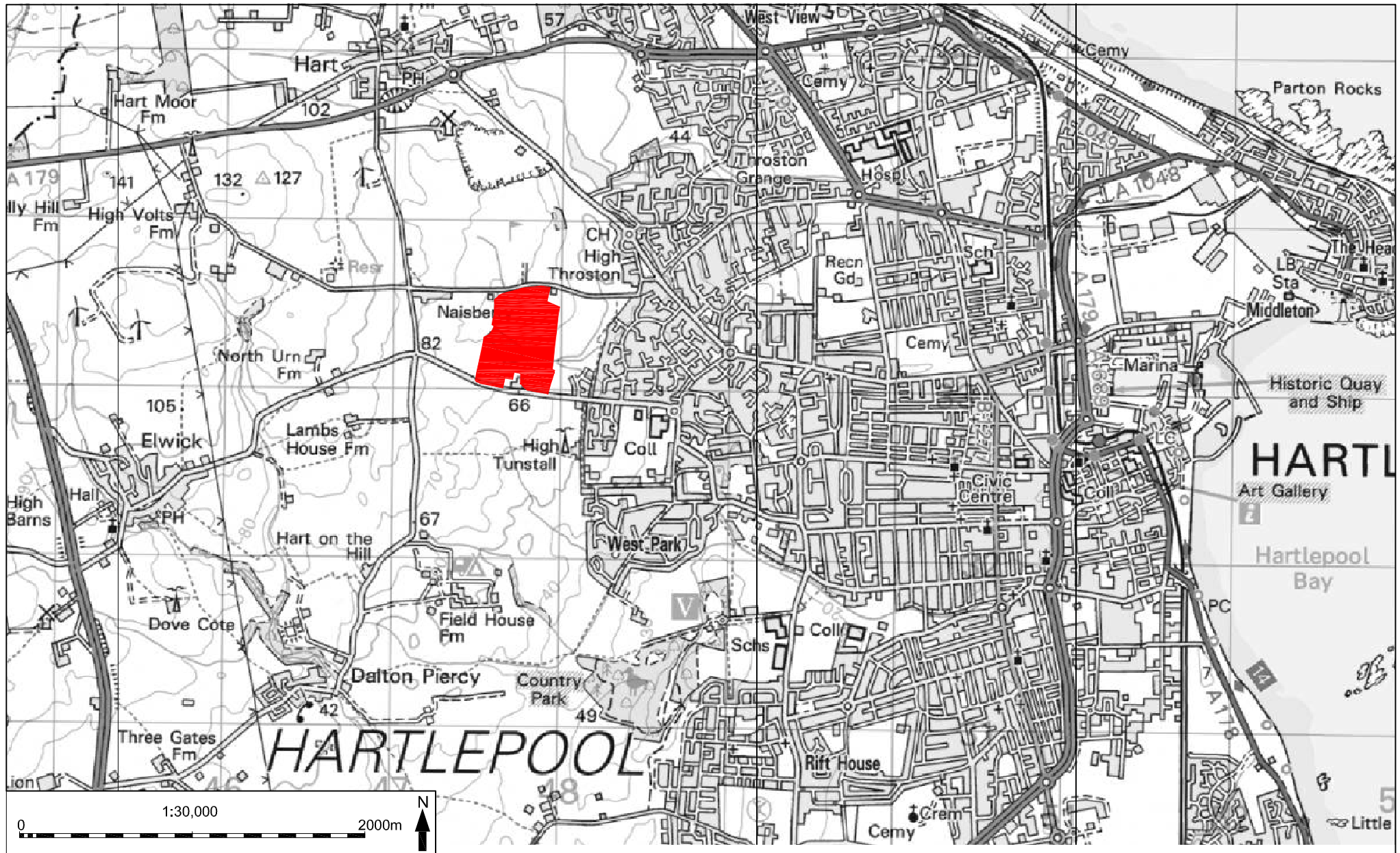
Gaffney, C., & Gater, J. 2004. *Revealing the Buried Past: Geophysics for Archaeologists*, Stroud: Tempus.

Schmidt, A. 2001. *Geophysical Data in Archaeology: A Guide to Good Practice*.
 Archaeological Data Service.

Schmidt, A., Linford, P., Linford, N., David, A., Gaffney, C., Sarris A., Fassbinder J., 2015 EAC Guidelines for the use of geophysics in archaeology, questions to ask and points to consider EAC guidelines 2.

APPENDIX 1: CATALOGUE OF HISTORIC ENVIRONMENT RECORD FEATURES

ID	SMR No	Easting	Northing	Description	Period	Statutory Designation
1	775	449046	533311	Low Throston deserted medieval village	Medieval	SAM
2	776	448520	533660	High Throston deserted medieval village	Medieval	
3	783	449000	533000	Stranton stone axehead	Prehistoric	
4	962	448494	533885	Pillbox north of Sea View Farm	Modern	
5	963	448575	533730	Pillbox south of Sea View Farm	Modern	
6	970	448300	533700	Sea View Farm field system	Medieval	
7	988	448194	532979	Pillbox Naisberry Park	Modern	
8	1186	448300	532500	Medieval bronze vessel	Medieval	
9	1191	448381	533600	Pillbox at High Throston Farm	Modern	
10	1778	448520	533690	Pottery scatter	Medieval	
11	2865	447600	532900	Flint scatter	Prehistoric	
12	2875	448280	533851	Pillbox at High Throston	Modern	
13	3406	448800	533928	High Throston field system	Post-medieval	
14	3491	449040	533225	Low Throston medieval buildings (1972 excavation)	Medieval	
15	3492	448530	533800	High Throston Earthworks	Medieval	
16	4061	448570	533900	Coin found at Sea View Farm	Medieval	
17	4507	447480	533290	Limestone Quarry	Post-medieval	
18	4508	447685	533220	Limestone Quarry	Post-medieval	
19	4509	447700	533210	Lime Kiln	Post-medieval	
20	5249	448570	533910	Seal matrix from Sea View Farm	Medieval	
21	5327	448450	533640	High Throston farmstead	Post-medieval	
22	5328	448440	533610	Barn at High Throston Farm	Post-medieval	
23	8049	448866	533246	Road from Naisberry Quarry	Post-medieval	
24	8050	449059	533228	Searchlight battery	Modern	
25	8205	448085	532630	High Tunstall farmstead	Post-medieval	
26	8463	448500	532600	Louvine House	Modern	
27	8476	447250	533500	Naisberry Training Ground	Modern	

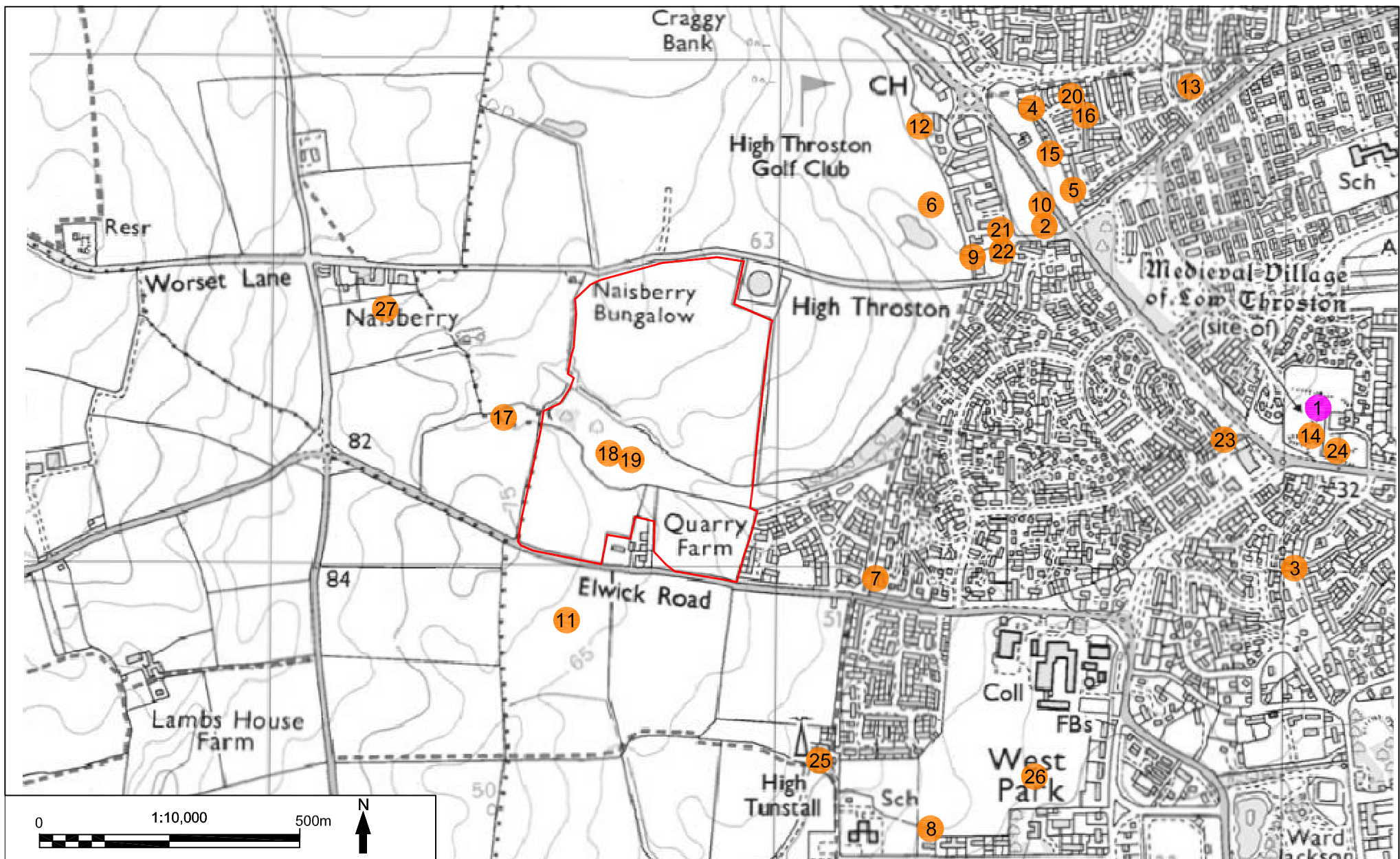


Ordnance Survey © Crown copyright 2020. All rights reserved. Licence number 100055020.

Figure 1: Site location



AD Archaeology Ltd



Ordnance Survey © Crown copyright 2020. All rights reserved. Licence number 100055020.

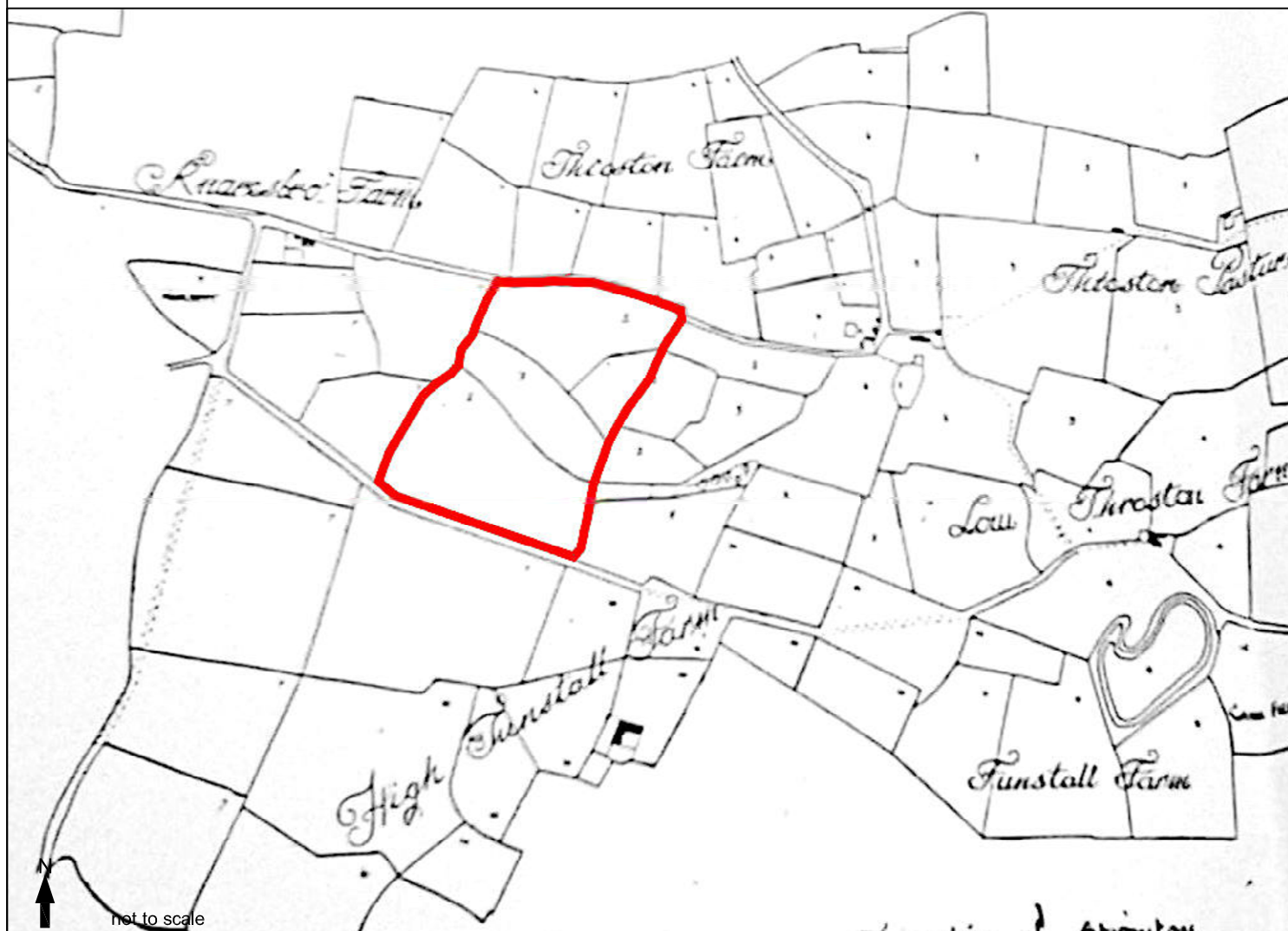
Figure 2: Location of Historic Environment Record (HER) features





not to scale

Figure 3: Throston tithe plan



not to scale

Figure 4: Township plan of Throston 1839



AD Archaeology Ltd

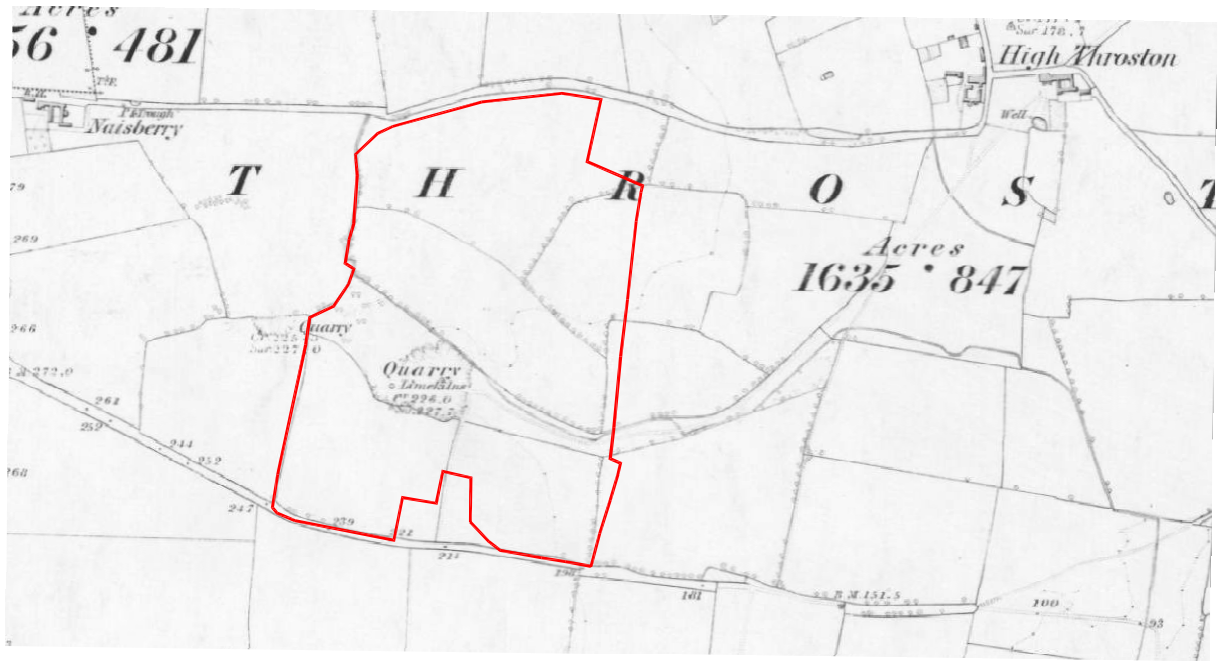
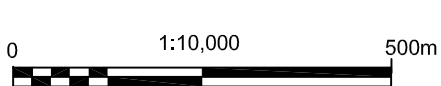


Figure 5: Ordnance Survey first edition map, 1857



Figure 6: Ordnance Survey second edition map, 1896



AD Archaeology Ltd

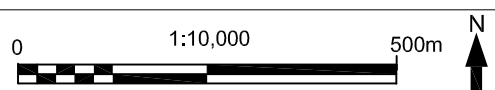


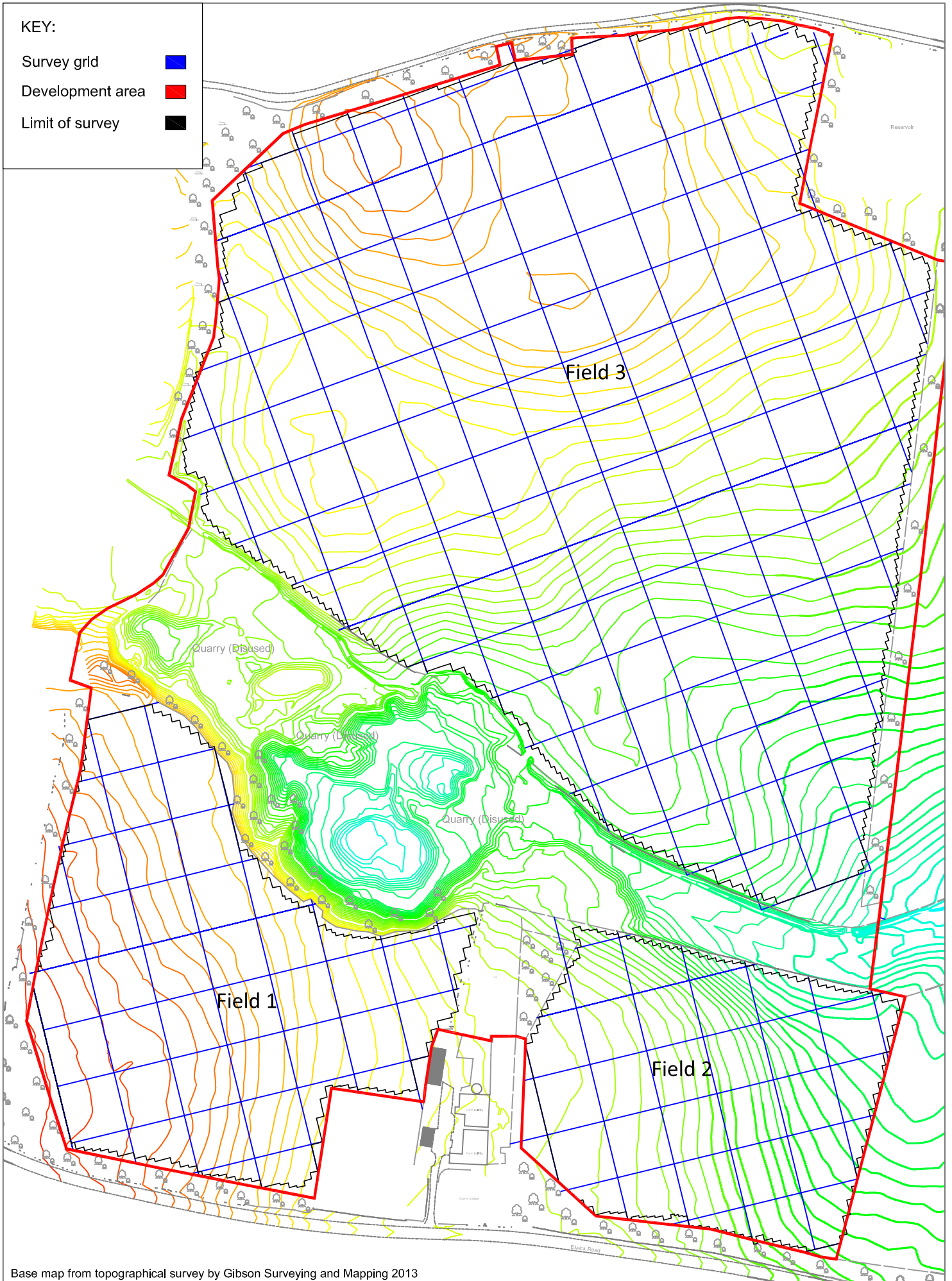
Figure 7: Ordnance Survey third edition map, 1914



AD Archaeology Ltd

KEY:

- Survey grid ■
- Development area ■
- Limit of survey



Base map from topographical survey by Gibson Surveying and Mapping 2013



AD Archaeology Ltd

Figure 8: Plan of geophysical survey grids showing contours



0 1:2500 at A4 100m

Quarry Farm Phase 3, Project number AD358



Base map from topographical survey by Gibson Surveying and Mapping 2013



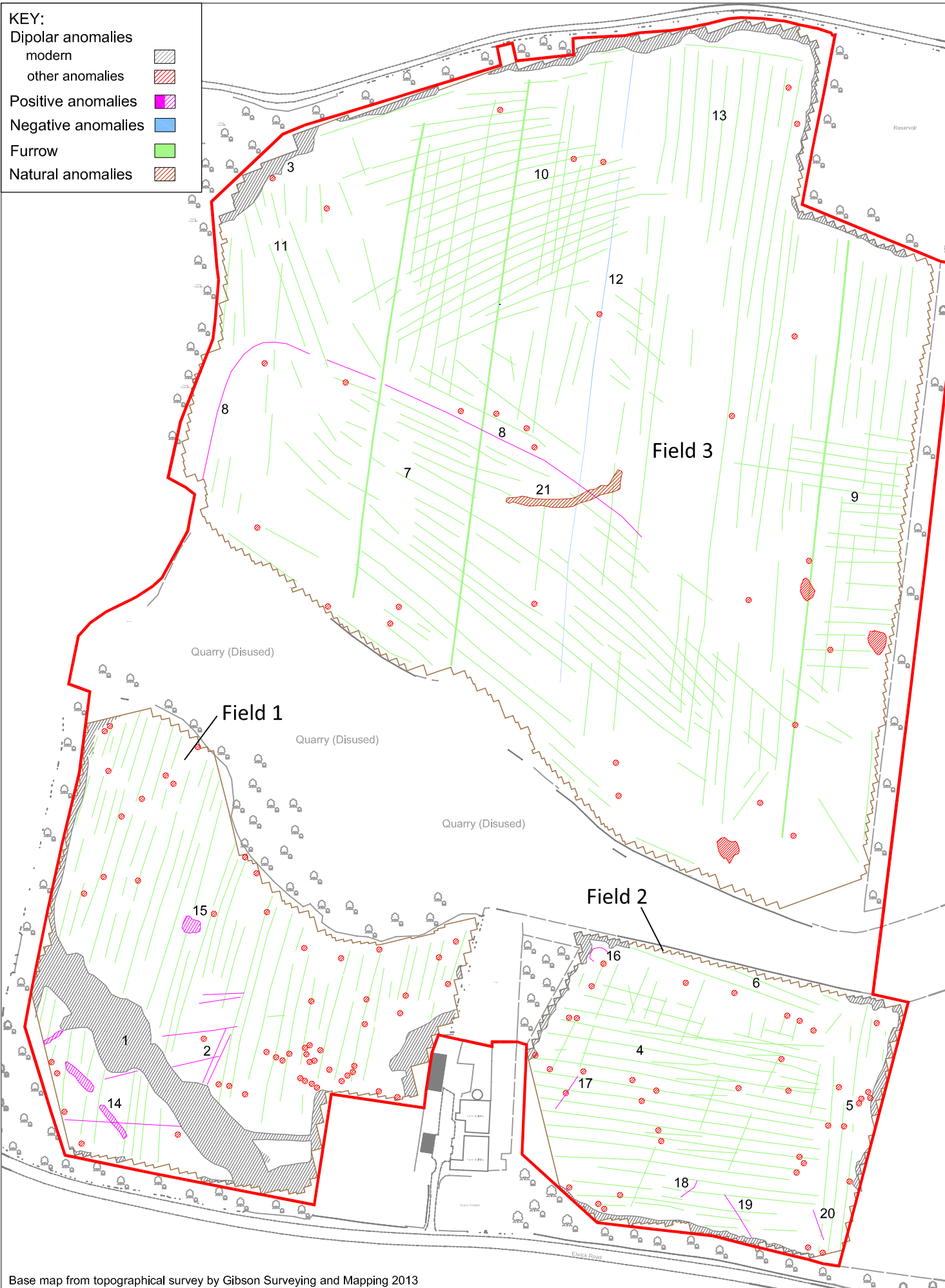
AD Archaeology Ltd

Figure 9: Overall greyscale plot of processed geophysical survey



0 1:2500 at A4 100m

Quarry Farm Phase 3, Project number AD358



Base map from topographical survey by Gibson Surveying and Mapping 2013



AD Archaeology Ltd

Figure 10: Overall interpretative plan of processed geophysical survey



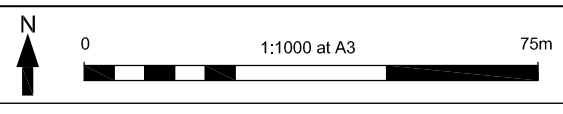
0 1:2500 at A4 100m

Quarry Farm Phase 3, Project number AD358



Figure 11: Field 1: Greyscale plot of processed geophysical survey

Quarry Farm Phase 3, Project number AD358



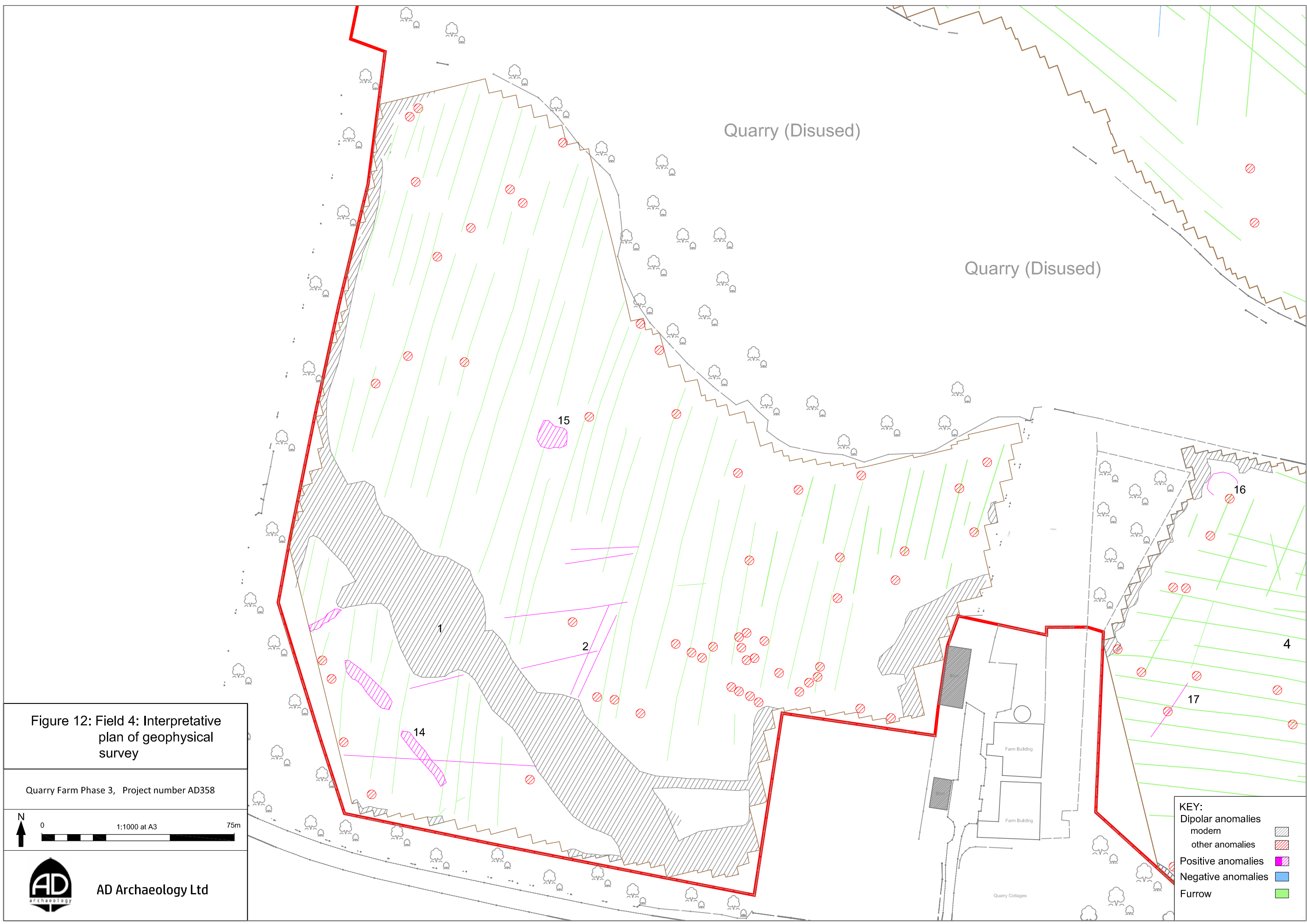
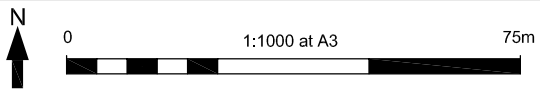


Figure 12: Field 4: Interpretative plan of geophysical survey

Quarry Farm Phase 3, Project number AD358



AD Archaeology Ltd

KEY:

Dipolar anomalies modern	
other anomalies	
Positive anomalies	
Negative anomalies	
Furrow	

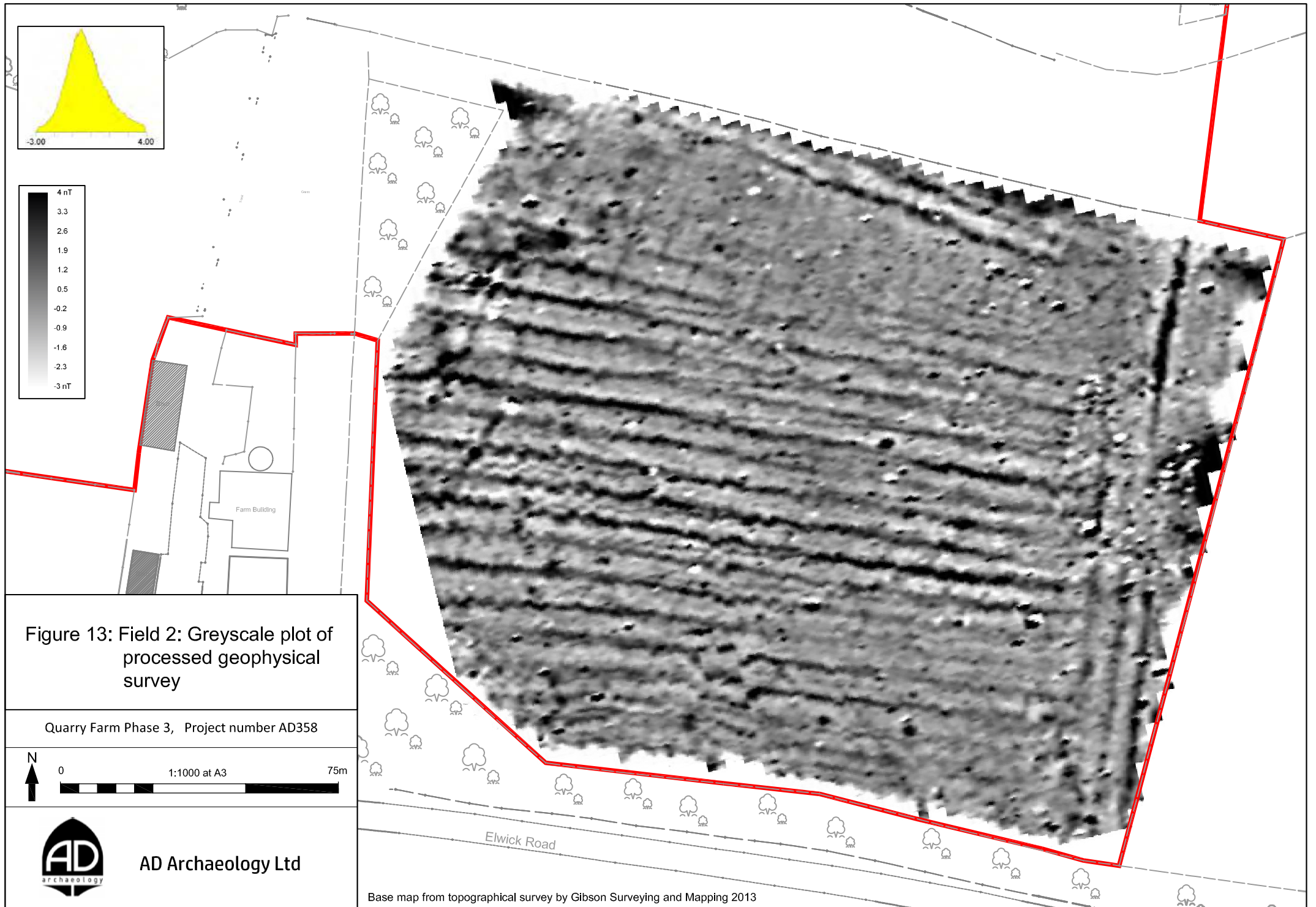
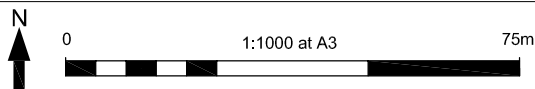


Figure 13: Field 2: Greyscale plot of processed geophysical survey

Quarry Farm Phase 3, Project number AD358



AD Archaeology Ltd

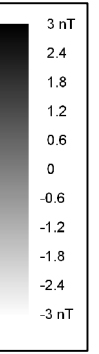
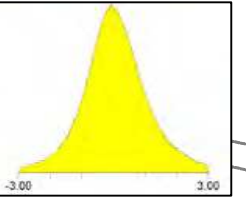
Base map from topographical survey by Gibson Surveying and Mapping 2013



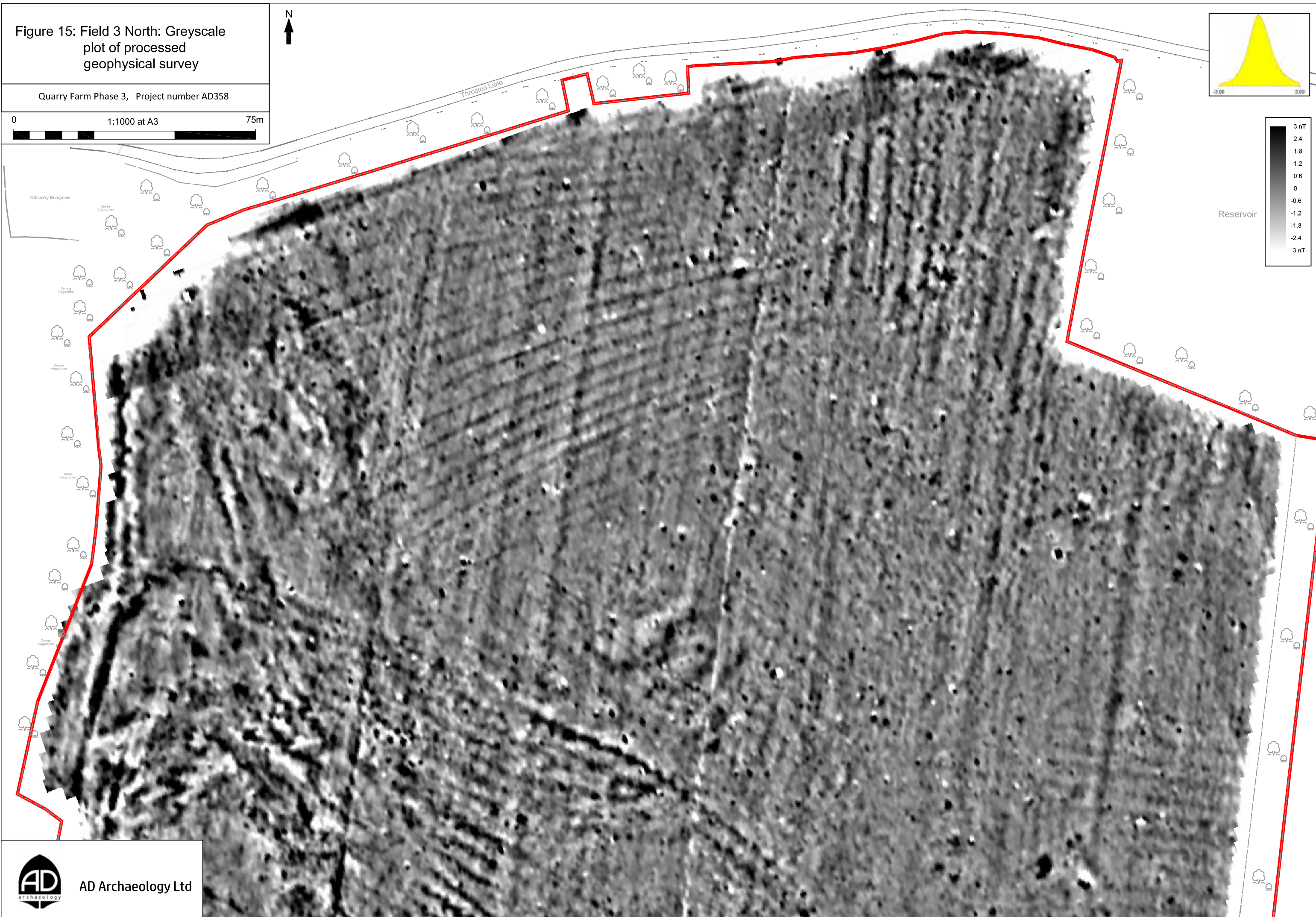
Figure 15: Field 3 North: Greyscale plot of processed geophysical survey

Quarry Farm Phase 3, Project number AD358

0 1:1000 at A3 75m



Reservoir



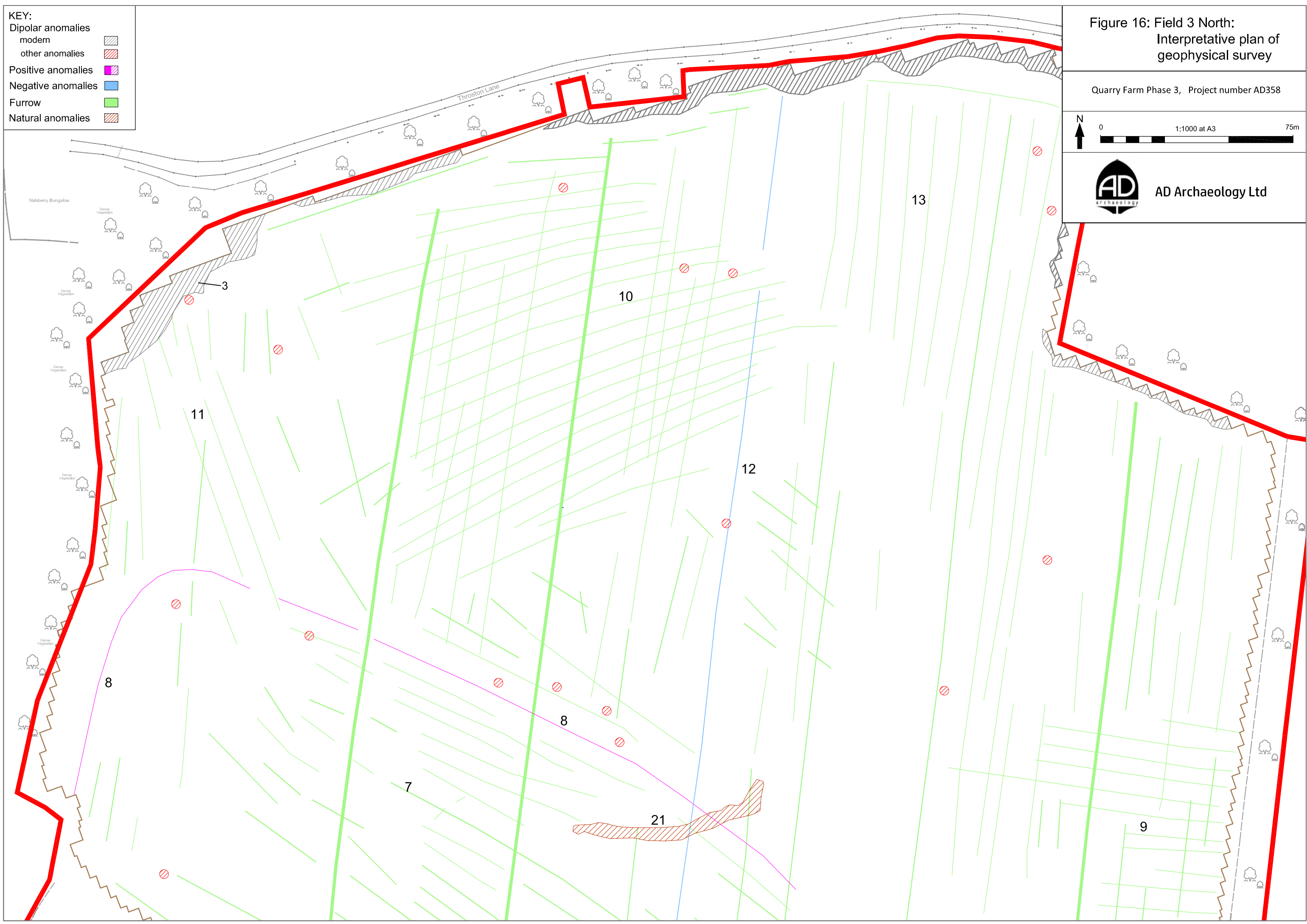
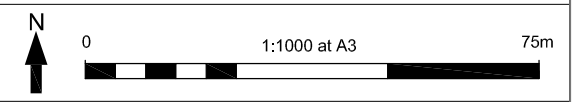
AD Archaeology Ltd

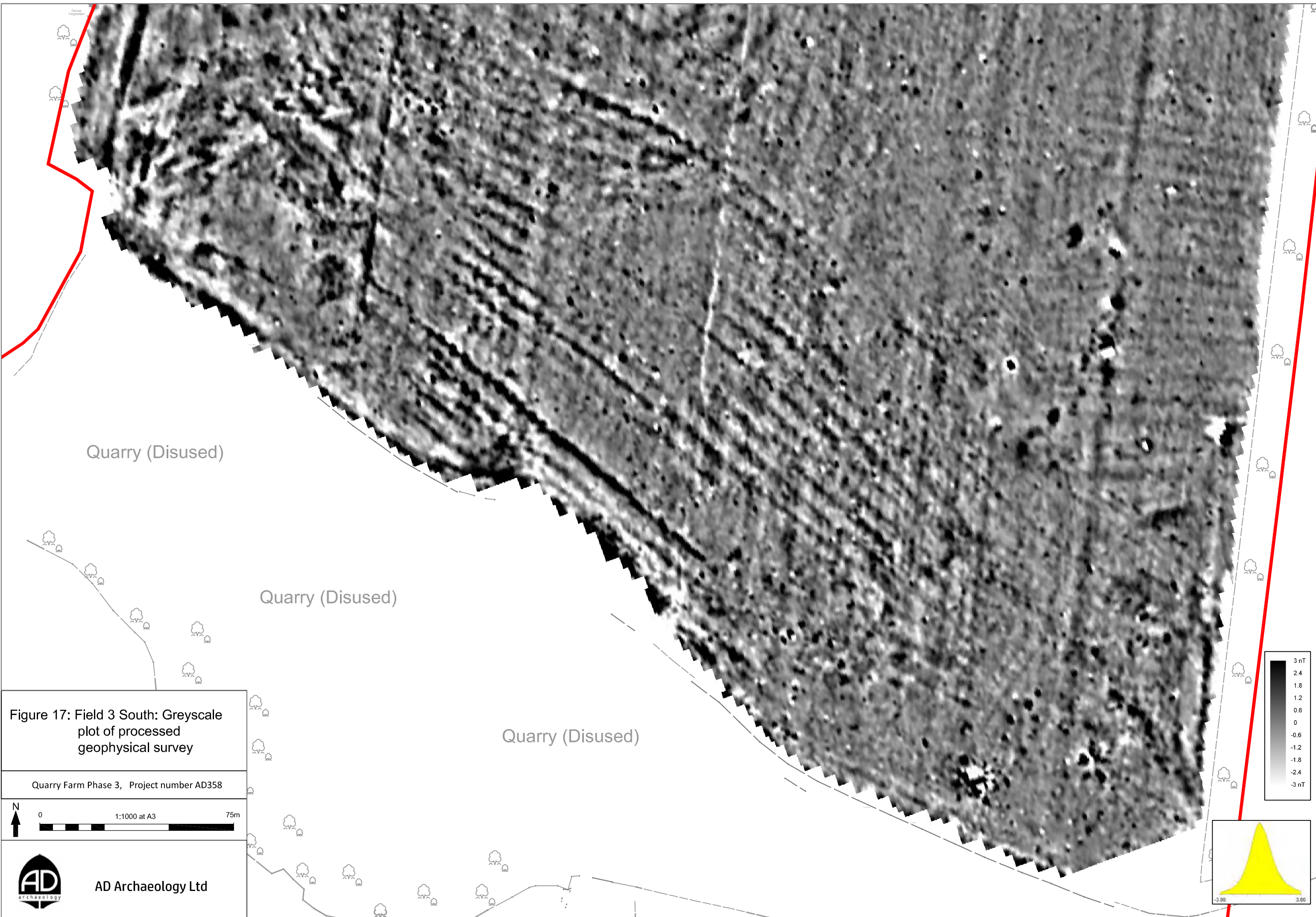
KEY:

- Dipolar anomalies
 - modern
 - other anomalies
- Positive anomalies
- Negative anomalies
- Furrow
- Natural anomalies

Figure 16: Field 3 North:
Interpretative plan of
geophysical survey

Quarry Farm Phase 3, Project number AD358





Quarry (Disused)

Quarry (Disused)

Quarry (Disused)

Figure 17: Field 3 South: Greyscale plot of processed geophysical survey

Quarry Farm Phase 3, Project number AD358

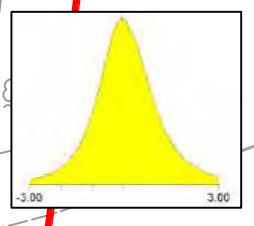
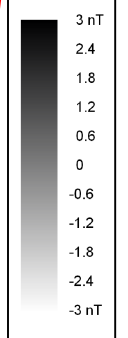
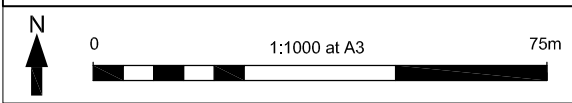
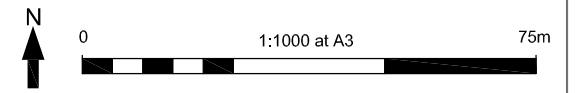
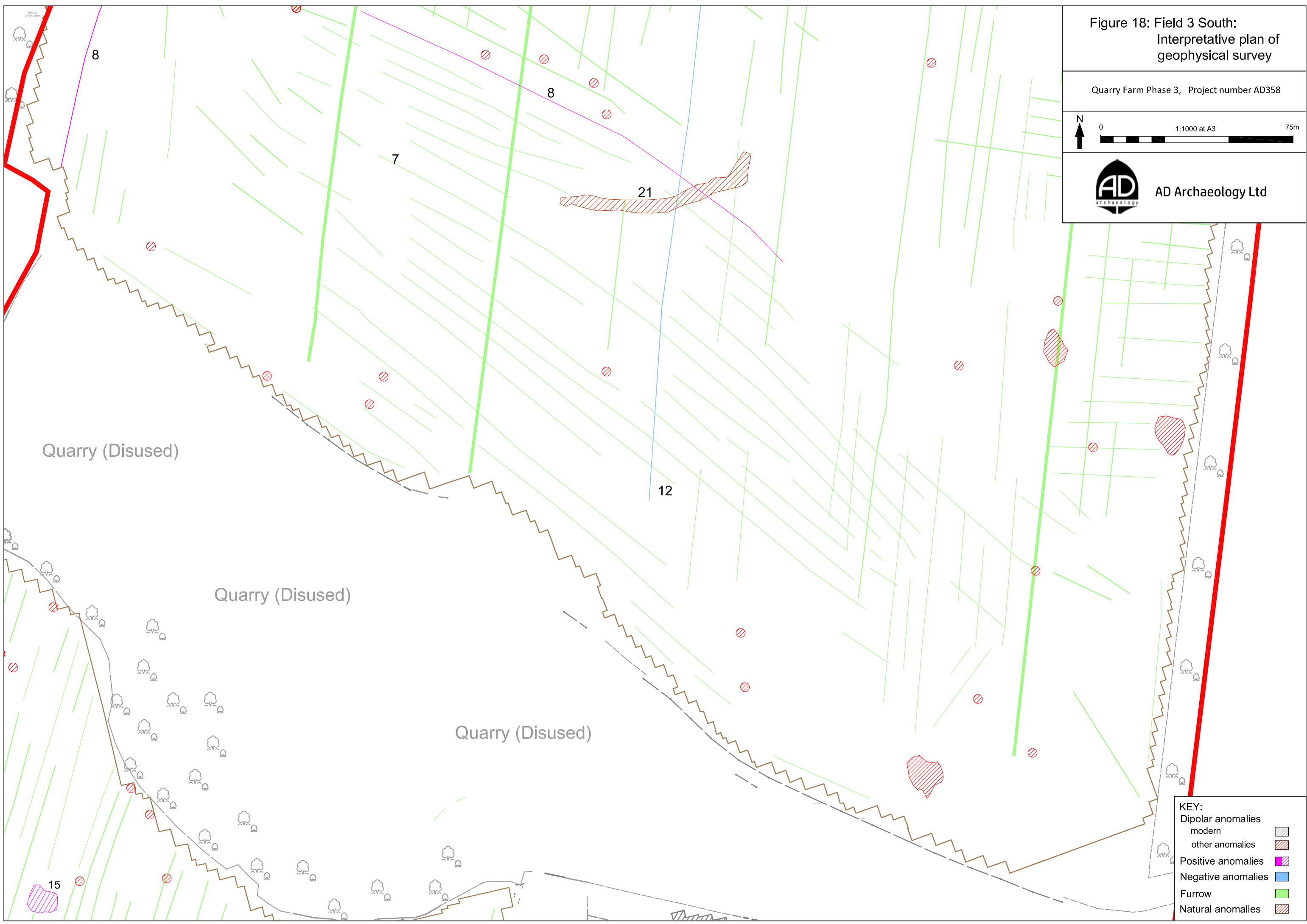


Figure 18: Field 3 South:
Interpretative plan of
geophysical survey

Quarry Farm Phase 3, Project number AD358



AD Archaeology Ltd



KEY:

Dipolar anomalies	
modern	
other anomalies	
Positive anomalies	
Negative anomalies	
Furrow	
Natural anomalies	



Figure 19: Fields 1 & 2: Greyscale plot of unprocessed geophysical survey

Quarry Farm Phase 3, Project number AD358

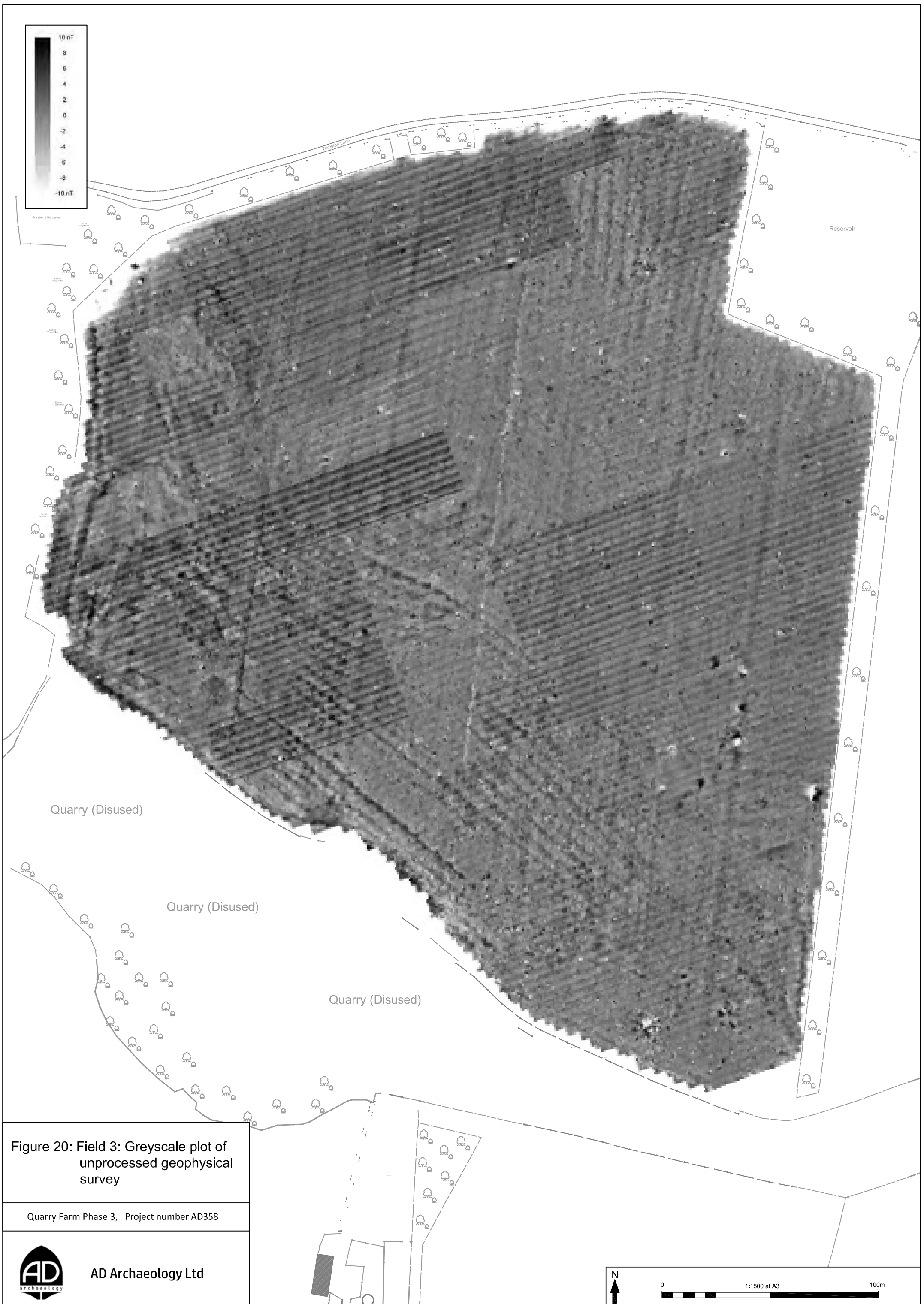


Figure 20: Field 3: Greyscale plot of unprocessed geophysical survey

Quarry Farm Phase 3, Project number AD358



AD Archaeology Ltd



0 1:1500 at A3 100m



Plate 1: Overall view of site taken from Field 3 facing south towards Quarry Farm



AD Archaeology Ltd
South Shields Business Works,
Henry Robson Way,
South Shields,
NE33 1RF
Office: 0191 603 0377
info@adarchaeology.co.uk