HS2

High Speed Two Phase 2a (West Midlands - Crewe)

Background information and data

Cultural heritage survey data used in the Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement (BID-CH-004-000)

February 2019

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Department for Transport

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1 Introduction

1.1 Structure of this report

1.1.1 This document sets out cultural heritage survey reports and forms part of the Background Information and Data (BID) documents that accompany the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES)[1].

1.1.2 This report should be read with reference to the following:

- the High Speed Two (West Midlands - Crewe) Environmental Statement (ES)[2] published in July 2017 (the main ES);
- the High Speed Two (West Midlands - Crewe) Background Information and Data (BID)[3] which accompanies the main ES published in July 2017;
- the High Speed Two (West Midlands - Crewe) Supplementary Environmental Statement and Additional Provision Environmental Statement (SES1 and AP1 ES)[4] published in March 2018; and
- the High Speed Two (West Midlands - Crewe) Background Information and Data (BID)[5] which accompanied the SES1 and AP1 ES published in March 2018.

1.1.3 In order to differentiate between the original scheme and subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in July 2017, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with the changes described in the SES1 submitted in March 2018;
- 'the AP1 revised scheme' – the SES1 scheme as amended by the AP1 submitted in March 2018;
- 'the SES2 scheme' – the SES1 scheme with the changes described in the SES2; and
- 'the AP2 revised scheme' – the SES2 scheme as amended by the AP2.

1.1.4 The information set out in this report presents:

[1] HS2 Ltd (2019), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement*, https://www.gov.uk/government/organisations/high-speed-two-limited
[2] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement
[3] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data accompanying Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement#background-information-and-data
[4] HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement (SES1) and Additional Provision Environmental Statement (AP1 ES)*, https://www.gov.uk/government/collections/hs2-phase-2a-supplementary-environmental-statement-and-additional-provision-environmental-statement
[5] HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data accompanying Supplementary Environmental Statement (SES1) and Additional Provision Environmental Statement (AP1 ES)*, https://www.gov.uk/government/collections/hs2-phase-2a-supplementary-environmental-statement-and-additional-provision-environmental-statement#background-information-and-data

- SES2: data defined as a 'SES2 change' as it presents updated and corrected baseline information to supplement the information that was reported in the main ES and SES1; and
- AP2 ES: data to inform an 'AP2 amendment'.

1.1.5 The cultural heritage assessment is detailed in the SES2 and AP2 ES:

- Volume 2, Community area reports;
- Volume 3, Route-wide effects, and
- Volume 5, Appendices.

1.1.6 Maps referred to throughout the cultural heritage appendices are contained in the SES2 and AP2 ES Volume 5: Cultural heritage Map Book. Where appropriate, sites or assets discussed within this report have been cross-referenced with the gazetteer of heritage assets (see SES2 and AP2 ES Volume 5: CH-002-000) via the unique identifiers, and can be viewed in the SES2 and AP2 ES Volume 5: Cultural heritage Map Book, Map Series CH-01 and CH-02 and in the maps in Annex B.

1.2 Surveys undertaken

1.2.1 This report contains the results of a series of archaeological surveys. These surveys comprised:

- a geophysical survey at various locations along the route, encompassing an area of approximately 168ha. The locations surveyed are reported within the following community areas:
  - Fradley to Colton (CA1);
  - Colwich to Yarlet (CA2);
  - Stone and Swynnerton (CA3);
  - Whitmore Heath to Madeley (CA4); and
  - South Cheshire (CA5).
- a fully integrated remote sensing survey incorporating light detection and ranging (LiDAR), hyperspectral imagery and aerial photographic analysis of the additional land required at Handsacre and Parkgate within the Fradley to Colton area.

Part 1: Supplementary Environmental Statement 2

2 Geophysical surveys in Fradley to Colton

2.1 Survey area 1: West of Fradley Junction

Site details

2.1.1 A geophysical survey was carried out on an area of land west of Fradley Junction (land parcel 320, centred on NGR 413090,314122 - Figure 1). This 12.4ha area was highlighted as a priority area in January 2018 but had largely been surveyed previously (November 2016) with the exception of two small areas within the land parcel.

2.1.2 The survey area was selected as it is within an area of archaeological potential. This is due to the presence of cropmarks identified immediately to the south, possibly associated with a Bronze Age barrow cemetery, as well as further possible prehistoric cropmarks to the north of the River Trent. The site is also identified as part of a post-medieval water meadow.

2.1.3 This survey area comprises agricultural land, largely in use as pasture, with bands of woodland within the southern portion of the survey area.

2.1.4 The area lies 2.9km west of Fradley and 4.8km north of Lichfield. The limits of the geophysical survey area were defined by hedgerow field boundaries and pre-defined survey extents within fields. The gradiometer survey covered an additional 0.9ha of the land parcel. This represents a 7% coverage of the overall survey area, the majority of which has already been subject to surveys. A combined total of 11.1ha of the 12.4ha survey area has been achieved. This represents approximately 90% coverage. The remaining areas that were not surveyed were inaccessible due to the presence of overgrowing hedgerows and woodland.

2.1.5 This survey area is on a broadly north facing slope. The southernmost extremity of the survey area lies at 69m above Ordnance Datum (AOD), falling to 62m AOD at the northern extent.

2.1.6 The underlying geology is mapped as the Mercia Mudstone Group. Superficial deposits of Quaternary glaciofluvial sheet deposits of sand and gravel are mapped across most of the survey area, with a band of alluvium running north to south across the middle of the area near Pyford Brook[6].

2.1.7 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[7]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

2.1.8 Two possible ring ditches are located just to the north of the survey area (SHERNST3961). These may be the remains of Bronze Age ring ditches or barrows, although the features could also be the result of modern cultivation processes.

[6] British Geological Survey, http://www.bgs.ac.uk
[7] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

2.1.9 Within the northern portion of the survey area two linear features identified from the LiDAR data can be seen to correspond to former field boundaries visible on the 1st edition Ordnance Survey map (LiDAR 1190, 1191). Also depicted on this edition map are two former extraction pits, which are now within woodland to the east and west of the survey area, one of which is labelled as an old marl pit. LiDAR has also detected several other possible extractive pits in the locality (LiDAR 1001, 1002)[8].

2.1.10 The survey area has previously been subject to a geophysical survey. The survey identified several fragmented ditches and pit-like features of a possible archaeological origin. A number of former field boundaries were also detected, along with natural and modern anomalies[9].

Results

2.1.11 The gradiometer survey, carried out between 26–27 March 2018 using hand held equipment, has not identified any anomalies that can be confidently attributed to archaeological activity.

2.1.12 A former field boundary, natural geological anomalies, and ploughing have all been detected along with numerous ferrous responses.

2.1.13 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 2–5). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: modern agricultural

2.1.14 A single linear anomaly has been identified in the northern survey area (anomaly ID 4000). This corresponds to a former field boundary identified on historic Ordnance Survey mapping dating to 1884.

2.1.15 Several closely spaced, parallel linear anomalies have been identified in the southern survey area. These are indicative of modern agricultural activity, such as ploughing.

Interpretation: natural

2.1.16 A magnetically variable response has been detected at the northern survey area. This is thought to pertain to localised variation in the underlying deposits and corresponds to findings from the previous geophysical survey.

Conclusions

2.1.17 The survey has not identified any anomalies that can be interpreted as being of definite archaeology. There is no evidence for Bronze Age activity, which is recorded to the south of the site as cropmarks.

2.1.18 A former field boundary visible on historic Ordnance Survey mapping from 1883–84 has been identified. In addition, there is notable geological variation that corresponds to results identified in the previous geophysical survey.

[8] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*
[9] HS2 Ltd (2017), *Geophysical Survey Results for Phase 2a West Midlands to Crewe – CA1 Fradley to Colton*

2.2 Survey area 2: Pipe Ridware

Site details

2.2.1 A geophysical survey was carried out on an area of land in the vicinity of Pipe Ridware (land parcel 1400), located between the River Trent and King's Bromley Lane (centred on NGR 409800,317190 - Figure 6).

2.2.2 The survey area was selected as it is within an area of archaeological potential. This is due to the presence of cropmarks possibly associated with a Bronze Age barrow cemetery, identified immediately south of the location, as well as further possible prehistoric cropmarks to the north of the River Trent suggestive of a wider prehistoric mortuary landscape. The site is also identified as part of a post-medieval water meadow.

2.2.3 This survey area comprises agricultural land, largely in use as pasture however a small copse and band of woodland lie within the southern portion of the survey area. The northern boundary is formed by the River Trent.

2.2.4 The area lies 2.3km west north-west of King's Bromley, 1.4km north-east of Handsacre, and 5.3km south-east of the centre of Rugeley. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 5.7ha of the 7.7ha survey area, with the outstanding area deemed as unsuitable for survey as a result of overgrowing hedgerows and a greyhound training track to the south-east. This represents approximately 74% coverage of the survey area.

2.2.5 This survey area is broadly flat, with a slight south facing slope. The southernmost extremity of the survey area lies at 62m AOD, rising to 63m AOD at the northern extent.

2.2.6 The underlying geology is mapped as the Mercia Mudstone Group with superficial deposits of alluvium recorded across most of the area. River terrace deposits are recorded along the southern edge of the survey area[10].

2.2.7 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[11]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

2.2.8 Land immediately to the south of the survey area is the location of a probable Bronze Age barrow cemetery, largely identified from aerial photographs (SHERMST13431, MST13432, MST13452, MST13453, MST13454, AP16). Also within this area and extending into the survey area is a possible pit alignment, likely of prehistoric date (SHERMST1481). A linear depression was identified within the LiDAR data at the north end of this pit alignment, although the exact nature and purpose of this feature was unclear (LiDAR1011). Another pit alignment on an east-west alignment has also been identified just to the south-west of the survey area (SHERMST13455).

[10] British Geological Survey, http://www.bgs.ac.uk
[11] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

An enclosure within the area of the barrow cemetery may represent further prehistoric activity (SHERMST13451).

2.2.9 An assessment of aerial photographs has identified possible additional prehistoric activity to the north of the river in the form of a ring ditch and pits (AP17). Potential medieval ridge and furrow and post-medieval field systems are also located in this area.

2.2.10 The survey area and areas to the west and east form part of an extensive series of post-medieval water meadows, situated on the southern edge of the River Trent (SHERMST13441, AP19). Within the north-western part of the survey area a 'U' shaped linear feature may be related to drainage or water management as it follows the line of a current water channel (LiDAR1244). A linear feature in the eastern part of the survey area can be identified as a former field boundary visible on the 1st edition Ordnance Survey map (LiDAR1106)[12].

Results

2.2.11 The gradiometer survey, carried out on 28 February 2018 using cart based systems, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a number of anomalies are interpreted as possible archaeology.

2.2.12 In addition, areas of modern debris and burning, and natural geological anomalies have all been detected along with numerous trends.

2.2.13 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 7–8). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

2.2.14 Numerous discrete, positive anomalies with diameters of 1m–5m have been identified throughout the survey area. These are predominantly located within areas of weakly variable magnetic response interpreted as localised variation in the underlying geological deposits. The positive anomalies are indicative of pit features, although their exact origin is not clear. It is possible that these anomalies are archaeological in origin, pertaining to localised extraction activity or refuse pits. However, there are many of these anomalies and there is no clear consistency in their size or shape. It is, therefore, more likely that these relate to natural pitting in the underlying bedrock, or are a result of the river terrace deposits covering the area.

2.2.15 Several trends have been identified within the survey area. Again, these broadly correspond to areas of variable geological deposits and are unclear as to their origin. It is possible they could pertain to archaeological features. However, it is equally possible these trends pertain to modern agricultural activity or geological variation.

[12] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

Interpretation: geological

2.2.16 There are numerous amorphous positive anomalies throughout the site. In addition, there are areas where a generally positive variable background magnetic response has been identified. These areas are interpreted as areas of geological variation, likely associated with the river terrace deposits recorded across the area.

Interpretation: agricultural

2.2.17 In the south of the area, a positive linear anomaly has been identified (4000). This is in the same location as a concentration of magnetically strong dipolar responses. This relates to a drain present on the 1884 Ordnance Survey map of the area.

2.2.18 Also in the south of the area, a pair of parallel, positive linear trends has been identified (4001). These extend 88m on a north-west to south-east alignment with a 1.5m separation. It is likely that these relate to wheel ruts of a modern trackway. However, they appear to continue into an area of dipolar responses, similar to that seen around the drain at 4000. It is therefore, possible that these are related to the drain feature.

2.2.19 An area of increased magnetic response has been identified traversing the north-western boundary of the centre of the survey area at 4002. Within this response, there is a notable trend on a broadly south-west to north-east alignment. This corresponds to a trackway identified traversing the agricultural land on historic Ordnance Survey mapping dating to 1884.

Conclusions

2.2.20 The survey has not identified any anomalies that can be interpreted as being of definite archaeology. A large number of positive pit-like anomalies are tentatively considered to be evidence of extraction activity or refuse pits. It is possible that some of these are associated with the extensive Bronze Age activity identified to the south of the area from cropmarks. However, these could equally be geological in origin.

2.2.21 Similarly, a number of sub-linear trends have been identified within the variable geological response that could possibly pertain to archaeological activity. However, it is also possible these anomalies are evidence of geological variation or agricultural activity.

2.2.22 An increased magnetic response identified throughout the north-west of the survey area is indicative of a former trackway.

2.3 Survey area 3: Pipe Ridware

Site details

2.3.1 A geophysical survey was carried out on an area of land in the vicinity of Pipe Ridware (land parcel 1625, centred on NGR 410300,317250 - Figure 9).

2.3.2 The survey area was selected as it is within an area with elevated archaeological potential. This is due to the presence of cropmarks identified south-west of the location, possibly associated with a Bronze Age barrow cemetery, as well as further possible prehistoric cropmarks to the north of the River Trent.

2.3.3 This survey area comprises largely cultivated agricultural land. The northern boundary is formed by the River Trent.

2.3.4 The area lies 1.9km north-west of King's Bromley, 1.7km north-east of Handsacre, and 4.9km south-east of the centre of Rugeley. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 2.8ha of the 3.8ha survey area, with the outstanding area deemed as unsuitable for survey as a result of overgrowing hedgerows. This represents approximately 74% coverage of the survey area.

2.3.5 This survey area is broadly flat, with a slight south facing slope. The southernmost extremity of the survey area lies at approximately 61m AOD, rising to 62m AOD at the northern extent.

2.3.6 The River Trent forms the northern boundary. Internal field boundaries are formed of hedgerows and dykes.

2.3.7 The underlying geology is mapped as the Mercia Mudstone Group with superficial deposits of alluvium recorded across most of the area[13].

2.3.8 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[14]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

2.3.9 Land immediately to the south-west of the survey area is the location of a probable Bronze Age barrow cemetery, largely identified from aerial photographs (SHERMST13431, MST13432, MST13452, MST13453, MST13454, AP16). Also within this area there is a possible pit alignment, likely of prehistoric date (SHERMST1481). A linear depression was identified within the LiDAR data at the north end of this pit alignment, although the exact nature and purpose of this feature is unclear (LiDAR1011). Another pit alignment on an east-west alignment has also been identified immediately to the south-west of the survey area (SHERMST13455). An enclosure within the area of the barrow cemetery may represent further prehistoric activity (SHERMST13451).

2.3.10 An assessment of aerial photographs has identified possible additional prehistoric activity to the north of the river in the form of a ring ditch and pits (AP17). Potential medieval ridge and furrow and post-medieval field systems are also located in this area.

2.3.11 Areas to the west and east form part of an extensive series of post-medieval water meadows, situated on the southern edge of the River Trent (SHERMST13441, AP19). Within the north-western part of the survey area a 'U' shaped linear feature may be related to drainage or water management as it follows the line of a current water channel (LiDAR1244). A linear feature in the eastern part of the survey area can be

[13] British Geological Survey, http://www.bgs.ac.uk
[14] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England, Ordnance Survey: Southampton*

identified as a former field boundary visible on the 1st edition Ordnance Survey map (LiDAR1106)[15].

Results

2.3.12 The gradiometer survey, carried out on 26 March 2018 using hand held systems, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a number of anomalies have been identified as possible archaeology.

2.3.13 In addition, natural geological anomalies have been detected along with linear trends.

2.3.14 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 10–11). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

2.3.15 Numerous discrete, positive anomalies with diameters of 1m–5m have been identified throughout the survey area. These are predominantly located within areas of weakly variable magnetic response interpreted as localised variation in the underlying geological deposits. The positive anomalies are indicative of pit features, although their exact origin is not clear. It is possible that these anomalies are archaeological in origin, pertaining to localised extraction activity or refuse pits. However, there are many of these anomalies and there is no clear consistency in their size or shape. It is, therefore, more likely that these relate to natural pitting in the underlying bedrock, or are a result of the river terrace deposits covering the area.

2.3.16 A single weak, positive trend has been identified to the south of the survey area at 4000. It is possible that this anomaly represents an archaeological ditch. However, the weak nature of this anomaly makes an accurate interpretation difficult and further investigation would be required. It could equally be geological or agricultural in origin.

Interpretation: geological

2.3.17 There are numerous amorphous positive anomalies throughout the site. In addition, there are areas where a generally positive variable background magnetic response have been identified. These areas are interpreted as areas of geological variation, likely associated with the river terrace deposits recorded across the area.

Conclusions

2.3.18 The survey has not identified any anomalies that can be interpreted as being of definite archaeology origin although many positive pit-like anomalies are tentatively considered to be evidence of earlier extraction activity or refuse pits. It is possible that some of these are associated with the extensive Bronze Age activity identified to the south of the area from cropmarks. However, these could equally be geological in their origin.

[15] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

2.3.19 Similarly, a single linear trend is noted to the south of the survey area that could possibly pertain to earlier activity. However, it is also possible this anomaly is evidence of geological variation or agricultural activity.

2.4 Survey area 4: Borrow pit 1 (Area 1)

Site details

2.4.1 A geophysical survey was carried out over the area proposed for Borrow pit 1, north of Rice's Spinney, Staffordshire (centred on NGR 412876,314821, - Figure 12).

2.4.2 This area was selected for a geophysical survey as it is an area of elevated archaeological potential. This is due to the presence of cropmarks possibly associated with prehistoric barrows and pit alignments, as well as later enclosures.

2.4.3 This survey area comprises parts of four arable fields, with an access track separating three of the fields. This includes land parcels 410, 495, 570, and 720. The area lies 850m to the east of Lichfield Road (A515), 1.6km south of King's Bromley, and 5.5km north of the centre of Lichfield. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 14.7ha of the 24.3ha survey area, with no access to the remaining area at the time of survey. This represents approximately 61% coverage of the survey area.

2.4.4 This survey area lies on a slight, north-facing slope. The southern extent of the area lies at approximately 64m AOD, falling to 60m AOD at the northern extent.

2.4.5 There were no overhead cables or watercourses present within the survey area. There was a small watercourse recorded on Ordnance Survey mapping traversing the western boundary of the survey area. Internal field boundaries were formed of hedgerows and dykes.

2.4.6 The underlying geology is mapped as mudstone of the Gunthorpe Member. Sand and gravel deposits of the Holme Pierrepont Sand and Gravel Member are recorded across the north of the area, with sand and gravel of the Beeston Sand and Gravel Member across the south[16].

2.4.7 The underlying soils across the north of the area are likely to be typical cambic gley soils of the Wigton Moor (831c) association. The centre of the area is covered by typical brown sands of the Bridgnorth (551d) formation, with an area of typical sandy gley soils of the Blackwood (821b) association in the south[17]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

2.4.8 Assessments of aerial photographs, both from the SHER and from the AP survey carried out by HS2 Ltd for the Phase 2a main ES have identified a complex series of multi-period cropmark features immediately to the north of the survey area (see assets FRC018 and FRC019 in the main ES Volume 5: Appendix CH-002-001).

[16] British Geological Survey, http://www.bgs.ac.uk
[17] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

2.4.9 The northern field of the survey area lies within a complex of cropmarks including Bronze Age barrows, probable Iron Age pit alignments and field boundaries, a possible late prehistoric enclosure, and post-medieval field boundaries (FRC019). Several of the cropmarks stop immediately adjacent to the eastern edge of the survey area (FRC018); however, these features may once have extended into the survey area itself.

2.4.10 A rectangular cropmark enclosure of possible Roman date has been identified approximately 25m to the north of the survey area. The putative enclosure, which measures approximately 70m by 68m, appears to be defined on three sides by a single ditch (FRC019; SHER MST14397).

2.4.11 Two circular cropmarks are noted in the SHER to the north-west of Fradley Wood, which may be the remains of Bronze Age ring ditches or barrows, although they could also be the result of modern cultivation processes (FRC018; SHERMST3961).

2.4.12 A small depression visible on LiDAR imagery undertaken by HS2 Ltd for Phase 2a within the survey area can be seen to correspond with a gravel pit labelled on the 1st edition Ordnance Survey map (LiDAR1003). An 'Old Marl Pit' can also be seen on this edition to the west of the survey area.

2.4.13 Two linear features detected during assessments of LiDAR imagery undertaken by HS2 Ltd immediately to the east of the survey area appear to correspond with former field boundaries shown on the 1st edition Ordnance Survey map (FRC231; LiDAR1190, 1191).

Results

2.4.14 The gradiometer survey was carried out on 19–20 October and 15–16 November 2017 using a cart based system and has not identified any anomalies of definite archaeological origin, although a small number of smaller possible archaeological anomalies can be seen. Former field boundaries, areas of modern debris or burning, natural geological anomalies, field drains, and ploughing have all been detected. Numerous trends have also been identified; however their weak and often small nature makes accurate interpretation difficult.

2.4.15 Results are presented as a series of greyscale and archaeological interpretations, at a relevant scale (Figures 13–17). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

2.4.16 Several small discrete positive anomalies have been identified to the north-east and south of the eastern survey field (BP1-001 and BP1-002). These are approximately 1m in diameter and are indicative of pit-like features. The origin of the anomalies is unclear and therefore they have been interpreted as possible archaeology, possibly relating to localised extraction pits. However, they could also be representative of natural pits or variation in the underlying sand and gravel deposits.

2.4.17 At the western periphery of the eastern field, two positive anomalies have been identified (4000). These are 4m–5m in diameter and are indicative of pit features. It is possible these are archaeological, pertaining to extraction activity or refuse pits.

However, these anomalies could be more modern in their providence or the result of natural pits in the underlying bedrock.

Interpretation: modern agricultural

2.4.18 Towards the north-eastern and south-western extents of the survey area, several spreads of increased magnetic response have been identified (BP1-003 and BP1-004). These may be the result of the spreading of 'green-waste' as fertiliser. They could also relate to surface spreads of other modern agricultural waste.

2.4.19 Protruding from the centre of the survey area, two linear trends have been identified. (BP1-005 in the west and B1P-006 in the east). These correspond to former field boundaries identified on the 1884 edition Ordnance Survey map of the area.

2.4.20 Closely spaced (2m–4m), parallel linear trends have been identified in the southern portion of the eastern field. These are interpreted as evidence of modern agricultural activity, such as ploughing, due to their alignment and apparent respect for the former field boundary identified to the north (BP1-006).

2.4.21 A series of dipolar linear responses form a herringbone pattern in the northern portion of the western field. This pattern and magnetic response is indicative of ceramic land drains.

2.4.22 To the south-west of the eastern field, a continuation of a linear anomaly identified during the previous phase of geophysical survey has been identified (4001). This anomaly corresponds to a former field boundary visible on historic Ordnance Survey mapping dating to 1883.

Interpretation: modern

2.4.23 The eastern boundary of the survey area is dominated by a largely increased, ferrous response. This can be attributed to the modern fence bounding the site.

Interpretation: geological or natural

2.4.24 Several areas where a variable magnetic response has been identified have been interpreted as evidence of changes in the underlying geology. Three broad (20m–28m) bands of elevated magnetic responses have been identified (in the north-west at BP1-007, south-west at BP1-008) and protruding from the eastern boundary of the survey area (BP1-009). Similarly, broad but represented by a lower response anomalies in the north-east of the western field have also been identified. These are likely to be indicative of notable variation in the underlying geology based on their increased magnitude.

2.4.25 Areas of weaker and more sinuous responses have been identified in the east (BP1-010 to BP1-013). These are likely to be more subtle variations in the superficial geology or soils.

Conclusions

2.4.26 The survey has not identified any anomalies that can be confidently interpreted as being of an archaeological origin. There is no evidence for any archaeological features associated with cropmarks to the north and east extending into the area.

2.4.27 The survey has identified a small number of pit-like anomalies interpreted as possible archaeological origin. These could however relate to natural pitting or variation in the sand and gravel deposits. It is not possible to distinguish between these features from the geophysical data alone, and the results would need to be subject to ground truthing (such as trenching or trial pitting), to clarify whether they are natural or archaeological in origin.

2.4.28 Two small, positive anomalies have been interpreted as possible archaeology. These could be evidence of archaeological extraction activity or refuse pits. However, these anomalies could also be the result of natural pits in the underlying geological deposits, or modern in their providence.

2.4.29 A linear anomaly identified during the previous phase of survey has been found to continue to the west of the eastern field. This anomaly corresponds to a former field boundary visible on historic Ordnance Survey mapping

2.4.30 The remaining anomalies identified across the survey area most likely relate to modern agricultural activity and natural variation in the underlying geology and soils.

2.5 Survey area 5: Borrow pit 3

Site details

2.5.1 A geophysical survey was carried out over the area proposed for Borrow pit 3, south of Tomlinson's Spinney, Staffordshire (centred on NGR 411065,315981 - Figure 18).

2.5.2 This area was selected for a geophysical survey as it is an area with elevated archaeological potential due to the presence of several possible prehistoric cropmarks identified through remote sensing undertaken by HS2 Ltd for Phase 2a. The area also lies on geological deposits considered to have a high potential for earlier prehistoric remains.

2.5.3 The survey area comprised three arable fields to the west of Shaw Lane, all lying within land parcel 1015. The area lies approximately 1.2km south-west of King's Bromley and approximately 6.2km north of Lichfield. The limits of the geophysical survey area were defined by open boundaries forming the perimeter of the survey area. The gradiometer survey covered approximately 3.6ha of the 18.9ha survey area, with the remaining area under a potato crop at the time of the survey. This represents approximately 19% coverage of the survey area.

2.5.4 The survey lies on generally flat ground, varying between 62m and 65m AOD.

2.5.5 The solid geology is recorded as mudstone of the Gunthorpe Member with overlying sand and gravel river terrace deposits[18].

2.5.6 The soils underlying the north of the area likely comprise the typical brown sands of the Newport 1 (551d) association. The south is likely covered by typical cambic gley soils of the Wigton Moor (831c) association[19]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies.

[18] British Geological Survey, http://www.bgs.ac.uk
[19] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western Engl*and, Ordnance Survey: Southampton

Archaeological background

2.5.7 Several cropmarks within the survey area are thought to relate to prehistoric and Roman features (see asset FRC074 in the main ES Volume 5: Appendix CH-002-001). These include an enclosure (MST1487), a possible Bronze Age barrow within the enclosure (MST13444), and a possible medieval or post-medieval field system (MST13445). Analysis of LiDAR data carried out by HS2 for the Phase 2a Environmental Statement has also identified a linear feature of unknown date (LiDAR1251) within the survey area.

2.5.8 The survey is located in an extensive area of archaeological features identified through the analysis of aerial photographs undertaken by HS2 Ltd (FRC024). These include a cropmark complex of late prehistoric enclosures and pits, Bronze Age barrows, an Iron Age enclosure, and medieval/post-medieval features immediately to the east (FRC024; MST1490, AP11). Features associated with medieval and post-medieval agricultural practices (FRC030; MST 13440, MST13448, MST13449) lie to the north and west of the site, while to the north a sub-rectangular area, identified from analysis of LiDAR, is defined by a bank and ditch containing extant earthworks relating to ridge and furrow agriculture data (LiDAR1007).

Results

2.5.9 The gradiometer survey was carried out on 7 November 2017 using hand held equipment. It has not identified any anomalies interpreted as of archaeological origin, although several agricultural features, a modern service, and numerous trends and ferrous responses have been identified.

2.5.10 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 19–20). The interpretation of the datasets highlights the presence of ferrous, burnt or fired objects, and magnetic trends.

Interpretation: modern

2.5.11 A strong, dipolar linear anomaly has been identified aligned north to south across the survey area (BP3-001). This is interpreted as a modern service, likely to be a pipe or cable.

2.5.12 To the south-west corner of the survey area, a large, dipolar response has been identified (BP3-002). The magnitude of this magnetic anomaly suggests a modern ferrous feature. However, its location at the edge of the survey area makes further interpretation difficult. The anomaly does not relate to anything on the surface at the time of survey, indicating a buried feature, such as a service.

Conclusions

2.5.13 The survey has not identified any anomalies interpreted as relating to archaeological activity. There is no evidence in the data for the cropmarks seen on aerial photography. However, the main focus of the possible enclosure and associated features lies to the east in an area not available for survey. It is not clear whether this is due to the features being severely plough damaged to the point that they no longer create a strong enough magnetic contrast against the natural background, or an effect of the local geology.

2.5.14 The anomalies identified are all thought to relate to modern features. These include a service and an unknown buried ferrous feature.

2.6 Survey area 6: Borrow pit 4

Site details

2.6.1 A geophysical survey was carried out over the area proposed for Borrow pit 4, east of Pipe Ridware, Staffordshire (centred on NGR 410185,317765 - Figure 21).

2.6.2 This area was selected for a geophysical survey as it is within an area of elevated archaeological potential. This is due to the site lying in an extensive archaeological landscape identified by cropmarks, some of which lie within the survey area. The survey area also lies on geological deposits considered to have a high potential to yield earlier prehistoric remains.

2.6.3 This survey area comprises four arable fields to the south of Pipe Wood Lane. This includes land parcels 1750, 1785, and 1920. The survey area lies approximately 1.9km west of King's Bromley and 5.4km north-east of Rugeley, Staffordshire. The limits of the geophysical survey area are defined by hedgerow field boundaries for the majority of the survey area. The gradiometer survey has covered approximately 4.7ha of the 19.9ha survey area, with the remaining area unavailable at the time of the survey. This represents approximately 24% coverage of the survey area.

2.6.4 The area is generally flat, lying at approximately 63m AOD. There were no overhead cables at the survey area. Internal field boundaries were formed of predominantly hedgerows.

2.6.5 The solid geology is recorded as mudstone of the Mercia Mudstone Group with superficial alluvial deposits of clay, silt, sand, and gravel[20].

2.6.6 The soils underlying this survey area are likely to comprise the typical brown earths of the Wick 1 (541r) association[21]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

2.6.7 Several potential archaeological features are recorded within the survey area comprising two round barrows (MST3962, MST20539), a series of linear features (MST20537) and a medieval field boundary (MST20535) (see asset FRC074 in the main ES Volume 5: Appendix CH-002-001). Analysis of aerial photographs carried out by HS2 Ltd for the Phase 2a main Environmental Statement has also identified a penannular ring ditch, a number of small pits, and earthworks of medieval ridge and furrow (AP20).

2.6.8 Within the surrounding landscape a number of archaeological features have been identified through remote sensing for HS2 Phase 2a. These include a post-medieval water meadow to the south (FRC072; MST13441), several pits and a linear feature identified from cropmarks, and a ring ditch identified during archaeological works to

[20] British Geological Survey, http://www.bgs.ac.uk
[21] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

the north-west of the survey area (FRC084; MST1549). Aerial photographic interpretation carried out for HS2 Ltd has identified features associated with field systems to the north of the survey area, dating from the Iron Age and Romano-British period through to the post-medieval period (FRC085; AP22, AP33).

Results

2.6.9 The gradiometer survey was carried out on 30 October 2017 using a cart based system. The survey has not identified any anomalies interpreted as relating to archaeological activity. Anomalies identified by the survey are interpreted as predominantly agricultural and geological in origin, as well as numerous trends and ferrous responses.

2.6.10 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 22–23). The interpretation of the datasets highlight the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends (Figure 23).

Interpretation: modern agricultural

2.6.11 To the north of the surveyed area a weak linear anomaly has been identified (BP4-001). This traverses the surveyed area on a west-south-west to east-north-east alignment. A similar anomaly has been identified on a north-west to south-east alignment in the south-eastern corner of the data set at BP4-002. These anomalies correspond to former field boundaries visible on the 1884 edition Ordnance Survey map of the area.

2.6.12 Weak, broadly spaced (10m to 20m) dipolar trends have been identified in the northern portion of the survey area (BP4-003) and throughout the central area (BP4-004). The arrangement and magnetic response of these anomalies is indicative of ceramic land drains.

2.6.13 Closely spaced, parallel linear trends have been identified throughout the survey area. These are most prominent in the southern portion of the survey area where they are noted on a north-east to south-west alignment. These anomalies are indicative of ploughing.

Interpretation: geological

2.6.14 Across the southern portion of the survey area, a small number of weak amorphous anomalies have been identified (BP4-005). The lack of any shape or pattern to these anomalies, compared to their weak magnetic response suggests they are likely related to localised variation in the underlying geological deposits.

Conclusions

2.6.15 The detailed gradiometer survey has not identified any anomalies interpreted as being of archaeological origin. There is no evidence for features relating to the recorded cropmarks, however the cropmarks lie to the west of the area accessible at the time of survey.

2.6.16 Anomalies noted at this location are interpreted as predominantly modern in origin, relating to ploughing and land drains.

2.6.17 Several responses are interpreted as being indicative of variable geological deposits.

2.7 Survey area 7: North of Pipe Ridware

Site details

2.7.1 A geophysical survey was carried out over land north of Pipe Ridware, Staffordshire (centred on NGR 409428,318418 - Figures 24 and 29).

2.7.2 The survey area was selected as it falls within an area of elevated archaeological potential. This is due to the presence of linear and curvilinear cropmarks both within asset FRC086 and in the immediate vicinity (see the main ES Volume 5: Appendix CH-002-001).

2.7.3 The survey area comprises parts of eight fields to the immediate north of Pipe Ridware. This includes land parcels 1750, 1845, 1855, 1908, 1912, 1913, 1914, 1971, 1990, 1991, 1992, 1993, 1994, 2075, 2095 and 2135. The area lies 2.2km to the north of Handsacre and 5.1km east of the centre of Rugeley. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 11ha of the 51.8ha survey area, with the remaining area not available at the time of survey. This represents coverage of approximately 21% of the survey area.

2.7.4 This survey area is broadly flat across the southern portion, and orientates itself on a south facing gradient to the north. The southernmost extremity of the survey area lies at approximately 64m AOD, rising to 66m AOD in the centre and 79m AOD at the northern extent.

2.7.5 The site is divided by a trackway in the eastern portion, and internal field boundaries are formed by hedgerows. No overhead cables or watercourses traverse the survey area.

2.7.6 The underlying geology is mapped as mudstone of the Sidmouth Formation throughout much of the area. Superficial deposits of alluvium are recorded throughout the southern portion of the survey area, with none recorded to the north[22].

2.7.7 The underlying soils across the north of the survey area are typically stagnogleyic argillic brown earths of the Whimple 3 (572f) association[23] and pelo-alluvial gley soils of the Fladbury 2 (813c) association. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.7.8 Assessments of aerial photographs, both from the SHER and from the AP survey carried out by HS2 Ltd for the Phase 2a main Environmental Statement, have identified possible former quarrying throughout the northern portion of the survey area. To the south, linear features are noted as evidence of ridge and furrow cultivation.

[22] British Geological Survey, http://www.bgs.ac.uk
[23] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

2.7.9 Analysis of LiDAR data undertaken by HS2 Ltd has shown the surrounding landscape to contain several linear features that are indicative of ditch or enclosure features. These correspond to former field boundaries evident on Ordnance Survey mapping from the early 20th century, as well as to ridge and furrow cultivation (LiDAR 1108, 1183, 1184, 1185, 1186).

2.7.10 Ridge and furrow has been identified across much of the north-eastern part of the survey area (AP34), the characteristically narrow form of these earthworks suggests a post-medieval date. At the southern edge of the survey area a north-west to south-east aligned linear feature has been identified (LiDAR1108), which can be seen to correspond to a trackway visible on the 1st edition Ordnance Survey, continues across the survey area. A linear feature within the southern part of the area broadly corresponds to a former 19th century field boundary (LiDAR1185).

2.7.11 Furthermore on the late 19th century maps several small ponds and hollows can be seen within the survey area which are likely to relate to former quarrying activity.

2.7.12 The medieval moated site of Pipe Ridware Hall, along with a possible deserted medieval village, church and associated features, is located to the south-west of the site (SHER MST10178, MST2537). It is likely that the site was part of the agricultural hinterland of this settlement.

2.7.13 A series of cropmarks seen on aerial photographs immediately to the south-east of the survey area were originally identified in the SHER as evidence of an enclosure and ring ditches. However, subsequently these features have been reinterpreted as more likely to be of modern origin (SHERMST1548)[24].

2.7.14 Several features in the surrounding landscape are recorded in the SHER. Within the survey area, a cropmark enclosure and ring-ditch features are recorded (FRC086; SHER MST 1548). To the south-east, similar cropmark features such as pits, linear ditches and ring ditches have also been identified (FRC084; SHER MST 1549).

2.7.15 To the east of the survey area, former field boundaries are prevalent as cropmark features (FRC085; SHER MST 4192), as well as several extant houses and farm buildings (SHER MST 10045, 10170, 14076).

Results

2.7.16 A gradiometer survey was carried out on 4 December 2017 using a cart based system. The survey has not identified any anomalies of archaeological origin. Evidence of modern ploughing, ferrous anomalies and weak linear trends were visible in the survey results.

2.7.17 The gradiometer survey, carried out between 13–15 March 2018 using hand held and cart based systems, has identified evidence of post-medieval material extraction as the only archaeology. However, a small number of anomalies have been identified as possible archaeology.

2.7.18 In addition, areas of modern debris and burning, field drains, and ploughing have all been detected along with numerous trends.

[24] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

2.7.19 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 25–28 and 30–31). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: archaeology

2.7.20 An area of magnetically strong dipolar responses has been identified at 4000. This response corresponds to a former marl pit present on 1882 Ordnance Survey mapping. The increased magnetic response in this instance is the result of the variable materials used during the infill as well as a surrounding spread of activity and material, particularly clear to the south of the anomaly.

Interpretation: possible archaeology

2.7.21 Two positive linear anomalies have been identified to the south of the survey area (4001). The first anomaly is on a broadly east-west alignment, and is 22m in length by 1.3m wide. The second is broadly perpendicular to the western end of the first, on a north-south alignment measuring 10.5m in length by 1.6m wide. These anomalies could form part of a ditched enclosure, although a more definitive interpretation is not clear due to the proximity of a highly ferrous response to the south-east and the position of the modern field boundary. Further investigation would be required to confirm the exact origin of these anomalies.

Interpretation: modern agricultural

2.7.22 A small number of closely spaced, parallel linear trends have been identified (PA05-001). These are likely to be an indication of modern agricultural activity, such as ploughing.

2.7.23 An area of weak dipolar responses has been identified in the north of the area (4002). The covers a 50 by 20m area, although its exact origin is not clear. The most likely explanation is that this represents a modern agricultural spread of a foreign material.

2.7.24 Closely spaced, parallel linear trends have been identified throughout all portions of the survey area. These are indicative of modern agricultural activity, such as ploughing.

2.7.25 Weakly dipolar, linear trends have also been identified within the survey area. This type of response is typically associated with material that has been burnt or fired. Due to the regular alignment of the anomalies, these are thought to be field drains. An example of these anomalies is evident (4003).

Interpretation: modern

2.7.26 A magnetically strong linear anomaly has been identified traversing the south of the survey area on an east-west alignment (4004). This type of response is typical of a modern service, such as a pipe or cable.

Conclusions

2.7.27 The survey has identified a former marl pit as the only archaeology within the area. Whilst this is present on 1882 Ordnance Survey mapping, the initial extraction activity

would have predated this. It is possible that this is evidence of medieval activity, which is thought to be in the area.

2.7.28 Two linear anomalies identified to the south of the survey have been identified as possible archaeology. These may relate to ditches forming an enclosure, possibly associated with the Bronze Age activity identified from cropmarks to the south of the area. However, further investigation would be required to determine the exact origin of these anomalies.

2.7.29 Closely spaced trends have been identified that are likely to pertain to modern agricultural activity, as well as dipolar linear trends indicative of field drains. The remaining identified anomalies are evidence of modern activity. This includes a modern service, such as a pipe or cable.

2.7.30 All identified anomalies from the survey have been interpreted as evidence of modern agricultural activity and ferrous disturbance at the periphery of the survey area.

2.8 Survey area 8: Great Haywood

Site details

2.8.1 A geophysical survey was carried out within the designated survey area at Great Haywood, located between the River Trent and King's Bromley Lane (centred on NGR 399920,323780 - Figure 32).

2.8.2 The survey area was selected as it falls within an area of elevated archaeological potential. This is due to the presence of cropmarks possibly associated with a Bronze Age barrow cemetery, identified immediately south of the location, as well as further possible prehistoric cropmarks to the north of the River Trent. The site is also identified as part of a post-medieval water meadow.

2.8.3 This survey area comprises agricultural land, largely in use as pasture. The eastern boundary is formed by the A51 and the west by a railway track. The survey area comprises land parcels 4855, 4985 and 5220.

2.8.4 The area lies 1km north of Great Haywood, 1.4km north-east of Handsacre, 2.3km south of Hixon and 7km north-west of Rugeley. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 5.5ha of the 18.9ha survey area, with the outstanding area deemed as unsuitable at the time of the survey due largely to grazing livestock. This represents approximately 29% coverage of the survey area.

2.8.5 This survey area is broadly flat between 75m–76m AOD.

2.8.6 The underlying geology is mapped as the Mercia Mudstone Group with superficial river terrace deposits recorded[25].

2.8.7 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[26]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

[25] British Geological Survey, http://www.bgs.ac.uk
[26] Soil Survey of England and Wales (1983), Sheet 3, *Soils of Midland and Western England*, Ordnance Survey: Southampton

Archaeological background

2.8.8 The majority of the survey area lies extensively within an area of water meadows (SHERMST4657, AP86, LiDAR1241). These are depicted on the 1st edition Ordnance Survey map as containing a series of drains and sluices. Excavation has demonstrated that the drains, some of which were brick-lined, criss-crossed each other, suggesting that they may represent several phases of activity.

2.8.9 The survey area also lies within an area of identified ridge and furrow, which is likely to be indicative of possibly medieval and post-medieval cultivation (AP121).

2.8.10 To the west of the survey area lies the course of the Trent and Mersey Canal, which was opened in 1771 (SHERMST2203). An irregular raised platform adjacent to the canal may be associated with the construction of the nearby marina to the south (LiDAR1227).

2.8.11 Areas of depressions were noted within the LiDAR data to the north-east and south-east of the area, which may be associated with quarrying activity (LiDAR1066, 1076)[27].

Results

2.8.12 The gradiometer survey, carried out between 15–22 March 2018, using hand held and cart based systems has not identified any anomalies that can be confidently attributed to archaeological activity.

2.8.13 A clear network of field drains has been identified along with numerous trends, likely to be of agricultural in origin.

2.8.14 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 33–36). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: agricultural

2.8.15 Broadly spaced, weakly dipolar, parallel linear anomalies have been identified across the south-western field. This response and the 'herring bone' arrangement of the anomalies is indicative of a network of field drains.

2.8.16 Several weak trends have been detected throughout the survey areas. However, these are not clear enough to confidently interpret. It is likely that these anomalies are the result of agricultural activity, such as ploughing.

Interpretation: modern

2.8.17 A magnetically strong, dipolar linear anomaly traverses the north of the southern field on a broadly east-west alignment (4000). A second similar response is located traversing the east of the field (4001) on a north-south alignment. A third response of this type has been identified to the north of the survey, also on an east-west alignment (4003). This type of response is typically associated with modern services, such as a pipes or cables.

[27] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

2.8.18 A magnetically enhanced, ferrous response is noted traversing the western portion of the north-western and south-western fields (4004). This is thought to be associated with the railway line traversing the western boundary.

Conclusions

2.8.19 The survey has not identified anomalies that can be interpreted confidently as archaeological in origin. There is no evidence for prehistoric activity, which has been identified from cropmarks in the surrounding area.

2.8.20 A network of land drains is evident across the south of the area. Further evidence of modern agricultural activity can be seen in the form of several linear trends, likely related to ploughing. The remaining identified anomalies are evidence of modern activity. These include modern services and disturbance along the western boundary associated with a railway line.

3 Geophysical surveys in Colwich to Yarlet

3.1 Survey area 9: Showground

Site details

3.1.1 A geophysical survey was carried out within an area referred to as Showground, located south of Staffordshire County Showground (centred on NGR 395730,324940 - Figure 37).

3.1.2 The survey area was selected as it lies close to the edge of an area of post-medieval parkland and a World War II encampment.

3.1.3 This survey area comprises agricultural land and comprises land parcels 6775, 6805, 6810, 6840, and 6976.

3.1.4 The area lies 2.3km north-west of King's Bromley, 14.1km north-east of Stafford, immediately south of Stafford County Showground. The limits of the geophysical survey area are defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 3.4ha of the 6ha survey area, with the outstanding area deemed as unsuitable for survey as a result of overgrowing hedge rows and extant obstacles associated with horse riding. This represents approximately 56% coverage of the survey area. The southern portion of the proposed survey area has previously been subject to geophysical survey, covering an additional 1.3ha. Including the previous survey data, a total coverage of approximately 78% has been achieved.

3.1.5 This survey area is broadly flat, with a slight south facing slope. The northern extremity of the survey area lies at 112m AOD, rising to 114m AOD towards the south.

3.1.6 The underlying geology is mapped as the Kidderminster Formation - interbedded sandstone and conglomerate across most of the survey area, with the north-eastern part mapped as Bromsgrove Sandstone Formation - gravelly sandstone. There are no recorded superficial deposits[28].

3.1.7 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[29]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

3.1.8 To the north-west and south-west of the survey area, there are areas recorded within Ingestre Hall Park (SHER MST5986) which is a 17th century landscaped park, re-designed by Capability Brown in the mid-18th century. Historic maps show that the eastern boundary was a carriageway leading through the parkland towards the main house. Within the wooded area of Lower Berryhill to the south, a number of faint linear features have been identified from the LiDAR data (LiDAR2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023).

[28] British Geological Survey, http://www.bgs.ac.uk
[29] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

3.1.9 Aerial photography has identified that the survey area was part of or in close proximity to a military encampment during the Second World War (AP102). LiDAR has also identified a group of three rectangular features, likely derived from modern activity associated with the Staffordshire Showground, directly to the west. Alternatively, these features could be derived from an earlier phase of activity associated with MoD/RAF Stafford[30].

Results

3.1.10 The gradiometer survey, carried out between 21–23 November 2017 using hand held and cart based systems, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a small number of anomalies have been identified as possible archaeology.

3.1.11 In addition, areas of modern debris and burning, natural geological anomalies, field drains, and ploughing have all been detected along with numerous trends.

3.1.12 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figure 38–39). The interpretation of the datasets highlight the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

3.1.13 Several small (1m diameter), positive discrete anomalies are noted throughout the dataset. These anomalies are indicative of pit features, and may relate to localised extraction or refuse pits. However, it is equally probable that these anomalies are natural in origin and are the result of pits in the underlying bedrock.

Interpretation: agricultural

3.1.14 In the eastern portion of the survey area, a weak positive linear anomaly has been identified (4000). This extends 52m on a north-north-west to south-south-east alignment and relates to a former field boundary present on the 1882 Ordnance Survey map of the area.

3.1.15 Closely spaced (2m–3m), parallel linear anomalies are noted on a broadly east-west alignment. These are interpreted as evidence of modern agricultural activity such as ploughing. These trends are also noted on a north-west to south-east alignment. Additional trends are also visible in the dataset, however these are largely lacking in coherent pattern and are possibly agricultural in origin.

Interpretation: modern

3.1.16 Highly ferrous, dipolar linear responses have been identified on a north-east to south-west alignment (4001), on a north-west to south-east alignment (4002), and on a north-east to south-west alignment (4003). These anomalies are indicative of modern services, such as pipes or cables.

3.1.17 Large portions of the dataset have presented a highly ferrous or increased background magnetic response. These are largely attributed to the modern land use as an active

[30] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

farm as well as portions of the survey in use as a caravan park and are subsequently not considered of archaeological origin. It is possible that the area (4004) relates to the removal of buildings present on the 1923 Ordnance Survey map.

Conclusions

3.1.18 The survey has been successful in detecting anomalies of possible archaeological origin that could pertain to earlier extraction activity or refuse pits. However, this interpretation should be considered tentative as the anomalies could be natural in their origin.

3.1.19 A large amount of ferrous responses have been identified across the area. The majority of these are likely related to the recent agricultural past of the area or removal of early 20th century buildings. However, it is not possible to completely discount them as being associated with the Second World War encampment thought to exist in the area.

3.1.20 Other modern anomalies identified in the area relate to services.

3.2 Survey area 10: Ingestre Golf Course

Site details

3.2.1 A geophysical survey was carried out on land at Ingestre Golf Course, Staffordshire (centred on NGR 397770,324158 - Figure 40).

3.2.2 This survey area was selected as it lies within an area of elevated archaeological potential. This is due to the presence of a Saxon settlement to the east of the survey area as well as ridge and furrow identified within the bounds of the survey area (see asset COY053 in the main ES Volume 5: Appendix CH-002-002). Further cropmarks identified are also noted in the surrounding landscape.

3.2.3 This survey area comprises part of Ingestre Golf Course. This includes land parcels 5645 and 5995. The area lies 2.6km to the north-west of Great Haywood, and 5.7km east-north-east of the centre of Stafford. The limits of the geophysical survey area are defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 10ha of the 19.2ha survey area, with the remaining area not available at the time of survey. This represents coverage of approximately 52% of the survey area.

3.2.4 This survey area is on a broadly north-east facing slope. The south-western boundary of the survey area lies at approximately 118m AOD, falling to 80m AOD at the eastern extent.

3.2.5 No overhead cables or watercourses traverse the survey area. Within the boundary of the area, notable divisions between fairways of the golf course are formed of trees and shrubs, as well as golf course hazards, primarily bunkers.

3.2.6 The underlying geology is mapped as mudstone of the Mercia Group throughout the survey area. No superficial deposits are recorded[31].

[31] British Geological Survey, http://www.bgs.ac.uk

3.2.7 The underlying soils across the north of the area are likely to be typical stagnogleyic argillic brown earths of the Whimple 3 (572f) association[32]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

3.2.8 Assessment of aerial photographs, both from the SHER and from the survey carried out by HS2 Ltd for the Phase 2a main Environmental Statement, have identified that the survey area lies within an extensive medieval and post-medieval agricultural landscape with fields, boundaries, stack stands and hollow-ways (COY053).

3.2.9 Analysis of LiDAR imagery undertaken by HS2 Ltd for corroborates that the surrounding landscape has a rich agricultural history. Bank and ditch like features, as well as parallel linear features, suggest former field boundaries and ridge and furrow cultivation are prominent in the landscape (COY053; LiDAR 1070, 1071, 1072, 1073, 1151, 1152, 1153, 1154, 1158, 1159, 1231, 1248, 1249, 1253).

3.2.10 Further enclosures and linear features are recorded in the SHER to the south-east of the survey area (COY045; COY048, MST4272). These relate to cropmarks identified on aerial photography from the 1970's.

3.2.11 Ingestre Hall and the surrounding outbuildings are located approximately 400m to the north of the survey boundary (COY063; SHER MST 5144). The building is a 17th century mansion and stands approximately 300m to the west of the location of the Saxon settlement of Ingestre/Gestreon, recorded in the Domesday Survey of 1086 (SHER MST 2514).

Results

3.2.12 A gradiometer survey was carried out on the 12–15 December 2017 using a cart based system. Several areas of ridge and furrow cultivation were noted throughout the survey area. Areas of modern debris/burning and land drains have been detected, along with numerous trends.

3.2.13 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 41–44). The interpretation of the datasets highlight the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: archaeology

3.2.14 Throughout the survey area, broadly spaced parallel linear trends have been identified on a north-east to south-west alignment, spaced between 6m and 8m apart. The anomalies are interpreted as evidence of ridge and furrow cultivation and correspond to cropmarks visible on aerial photography.

Interpretation: modern

3.2.15 Several areas were identified with a marked increase in magnetic response. Towards the eastern extent of the survey area a broad, linear anomaly measuring

[32] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

approximately 100m long by 5m wide has been identified (PA04-001). This anomaly corresponds to a modern trackway that forms part of the golf course. Similar anomalies are also noted to the south (PA04-002 and PA04-003), which also correspond to modern trackways.

3.2.16 Circular areas of variable size and magnetic response have been identified (PA04-004 and PA04-005) in the south-west of the survey area. These anomalies correspond to areas of the golf course that have since been subject to landscaping or other alterations visible on older satellite imagery. A similar response has been identified at the eastern-most extent of the survey (PA04-006). This anomaly does not correspond to any former golf course infrastructure visible on satellite imagery or aerial photography. However, it is likely this anomaly could be indicative of a former 'green' or 'tee'.

3.2.17 Low magnitude, dipolar linear responses have been identified and are dispersed throughout the survey area, examples of which can be seen (PA04-007 and PA04-008). The responses are indicative of burnt or fired material such as ceramics. Based on their alignments and likely source material, these anomalies are interpreted as being land drains for the golf course.

3.2.18 High magnitude, dipolar linear responses have been identified traversing the survey area. PA04-009 and PA04-010 are on a south-east to north-west alignment, PA04-011 on a north-east to south-west alignment, and PA04-012 on an east-west alignment. They are all indicative of modern services. It is likely that some of them form part of the land drainage system covering much of the survey area, but the increased magnetic response suggests they are larger ferrous pipes rather than those interpreted as land drains.

Conclusions

3.2.19 The survey has identified evidence of ridge and furrow cultivation across the area of focus. These are seen on older satellite imagery as cropmarks as well as LiDAR imagery. No clear settlement activity, such as enclosure ditches, has been identified, which suggests that the putative Saxon or earlier settlement is located outside the surveyed area.

3.2.20 Most of the anomalies identified are evidence of the modern golf course activity where the location of 'green' and 'tee' features have been moved or altered, as well as drainage infrastructure and modern services.

4 Geophysical surveys in Stone and Swynnerton

4.1 Survey area 11: The Rowe

Site details

4.1.1 A geophysical survey was carried out on land east of The Rowe, Staffordshire (centred on NGR 382769, 338403 - Figure 45).

4.1.2 This survey area was selected as it falls within an area of elevated archaeological potential. The presence of cropmarks identified in aerial photography and LiDAR data may be evidence of earlier settlement (see assets STS064 and STS065 in the main ES Volume 5 Appendix CH-002-003).

4.1.3 The survey area comprises parts of two fields, 740m to the east of The Rowe, 2.3km west of Beech, and 8.3km south-west of the centre of Stoke-on-Trent, covering land parcels 10341 and 10400. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered the entire 5.6ha survey area.

4.1.4 This survey area is on a slight south-west facing slope, with the north-eastern boundary lying at approximately 138m AOD, falling to 134m AOD in the south-west.

4.1.5 No overhead cables or watercourses traverse the survey area. Internal field boundaries are formed by hedgerows and dykes.

4.1.6 The underlying geology is mapped as sandstone of the Wildmoor Member throughout the survey area. No superficial deposits are recorded[33].

4.1.7 The underlying soils across the area are likely to be typical brown sands of the Bridgnorth (551a) association[34]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer surveys.

Archaeological background

4.1.8 Analysis of APs, LiDAR and the SHER carried out by HS2 Ltd for the Phase 2a main Environmental Statement has not shown any activity within the boundary of the proposed survey.

4.1.9 Assessment of LiDAR imagery surrounding the survey area by HS2 Ltd has revealed a number of linear features indicative of possible ridge and furrow cultivation, as well as former field boundaries suggesting a high level of activity in the area during the medieval and post-medieval period (LiDAR 3003, 3004, 3005, 3006, 3186).

4.1.10 To the south-east of the survey area, there is a SHER record for Hatton/Hetone, a settlement noted in the Domesday Book (STS064; SHER MST 2472).

[33] British Geological Survey, http://www.bgs.ac.uk
[34] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

4.1.11 Further to the south-east, there is a recorded Cold War site at Hatton Rough, where fenced rectangular buildings are believed to be a former munitions store or bunkers (STS053; SHER MST 19350).

Results

4.1.12 A gradiometer survey was carried out on the 27–29 November 2017 using a cart based system. No anomalies of definite archaeological interest were identified. However, a small number of possible archaeological anomalies can be seen. Natural geological anomalies and ploughing have also been detected, along with numerous trends.

4.1.13 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 46–47). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

4.1.14 Two low magnitude, positive linear anomalies have been identified in the western field. PA03-001 is on a north-east to south-west alignment and is 40m long by 2.5m wide. PA03-002 is to the south of PA03-001 on a north-west to south-east alignment. It is 70m long by 2.5m wide. These anomalies are indicative of ditch features and may represent part of an archaeological enclosure or land divisions. However, the weak nature of these anomalies makes interpretation difficult.

4.1.15 Several small, discrete positive anomalies have also been observed to the south of the linear anomalies. These are interpreted as likely to be naturally silted, pit-like features in the underlying geology. It is not possible to determine whether these anomalies are archaeological or natural features from the geophysical data alone. Both features would give similar discrete positive responses, as is seen in the data.

Interpretation: agricultural

4.1.16 Closely spaced parallel linear trends have been identified across the eastern field (PA03-003) as well as less frequently in the western field. These are visible on a north to south alignment, as well as running north-west to south-east, and east to west. This is indicative of various phases of modern agricultural activity, such as ploughing.

Interpretation: geological or natural

4.1.17 In the western field, sinuous, low magnitude anomalies have been identified throughout (PA03-004). These anomalies are also noted in the eastern field (PA03-005 and PA03-006). The weak nature and lack of any discernible pattern to these anomalies suggest they likely relate to natural variation in the underlying geology or soils.

4.1.18 A broad (9m–14m), linear band of weakly positive responses has been identified traversing the northern portion of the western field (PA03-007) and protruding into the north-west of the eastern field. This anomaly is likely to be indicative of build-up of magnetically variable superficial deposits in a natural depression in the underlying bedrock geology.

Interpretation: uncertain trends

4.1.19 Near the south-eastern extent of the eastern field, several weak linear and curvilinear trends have been identified (PA03-008). These form two roughly concentric circular anomalies with diameters of 35m and 50m respectively. Whilst it is possible these could represent an archaeological enclosure, the very weak nature of the responses and number of ploughing trends in the area make interpretation uncertain. It is most likely that the anomalies are plough trends and natural geological variation on various alignments.

Conclusions

4.1.20 The survey has not identified any anomalies that can be definitively interpreted as archaeology. Two possible ditch-like features may represent a former enclosure. Whilst it is possible these are related to the medieval activity recorded in the surrounding area, it is equally possible that they relate to more recent agricultural activity. Further investigation would be required to determine the exact origin of these anomalies. Weak evidence for a circular enclosure is also seen in the form of several trends. However, these trends are considered more likely to relate to the modern agricultural activity and variable geological background across the area.

4.1.21 The remaining geophysical anomalies are thought to relate to various phases of modern ploughing activity and variation in the underlying geology or soils.

5 Geophysical surveys in Whitmore Heath to Madeley

5.1 Survey area 12: Borrow pit 5

Site details

5.1.1 A geophysical survey was carried out over the area proposed for Borrow pit 5, north-west of Hey Spink, Staffordshire (centred on NGR 377968,343295 - Figure 48).

5.1.2 This survey area was selected for a geophysical survey as it lies on geological deposits that are considered to have a high potential to yield earlier prehistoric remains.

5.1.3 The survey area comprised five fields of mostly arable land, with a small area of pasture to the west of Netherset Hey Lane. This includes land parcels 11680, 11760 and 11765. The area lies approximately 900m south of Madeley and 7km west of the centre of Newcastle-under-Lyme, Staffordshire. The limits of the geophysical survey area were defined by an open boundary with internal divisions of hedgerow and fence line boundaries. The gradiometer survey covered the entire 27.6ha area of Borrow pit 5.

5.1.4 The survey area lies on a west-facing slope, falling from approximately 115m AOD in the east to 108m AOD in the west.

5.1.5 There were no overhead cables or watercourses recorded at the survey area.

5.1.6 The solid geology is recorded as mudstone, sandstone, and conglomerate of the Salop Formation across the south of the area. The north-east of the area is composed of mudstone, siltstone, and sandstone of the Halesowen Formation, with sandstone of the Springpool Sandstone Bed in the north-west. Sand and gravel Devensian glaciofluvial sheet deposits underlie the west of the area, with no recorded superficial deposits in the east[35].

5.1.7 The soils across this survey area are likely to comprise the typical brown earths of the Wick 1 (541r) association[36]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

5.1.8 Analysis of LiDAR data carried out by HS2 Ltd for the Phase 2a main Environmental Statement has identified two slight bank features within the survey area (LiDAR3049), which have been interpreted as former field boundaries. No other archaeological features have been identified within the survey area.

5.1.9 Within the surrounding area, a medieval deer park is recorded immediately to the east (MST1219), with the remains of two 19th century railways to the north and south (see asset WHM026 in the main ES Volume 5: Appendix CH-003-004). Analysis of aerial

[35] British Geological Survey, http://www.bgs.ac.uk
[36] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

photographs undertaken by HS2 Ltd has revealed the remains of a medieval to post-medieval field system to the west of the survey area.

5.1.10 Analysis of LiDAR data undertaken by HS2 Ltd has revealed a series of ditch features of unknown date within an area of woodland to the south-east of the survey area (LiDAR3047) and an area of likely former extraction to the west (LiDAR3047, LiDAR3051, LiDAR3187).

Results

5.1.11 The gradiometer survey was carried out on the 23–27 October 2017. It used a combination of cart based and hand held systems. The survey has identified some anomalies that may indicate archaeological activity, as well as modern agricultural features, and ferrous responses. Numerous trends have also been identified, however their weak and often small nature makes accurate interpretation difficult.

5.1.12 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 49–54). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends (Figures 50–52 and 54).

Interpretation: archaeology

5.1.13 Broadly spaced (4m to 5m), parallel linear trends have been identified on a south-west to north-east alignment (BP5-001) near the centre of the survey area (Figure 52). The regular spacing of these anomalies and the presence of a possible headland on a north-west to south-east alignment is indicative of ridge and furrow cultivation. The relatively straight nature of the anomalies suggests mechanical ploughing, and is therefore likely post-medieval in date.

Interpretation: possible archaeology

5.1.14 In the centre of the survey area, a poorly defined and weak annular anomaly has been identified (BP5-002). The anomaly measures approximately 9.5m in diameter and appears to have a small linear extension protruding to the north. This anomaly could relate to a round barrow or other archaeological enclosure feature. However, the anomaly is surrounded by an area of variable magnetic response that is likely to be caused by variations in the underlying superficial geology (BP5-021). It is not possible to clearly differentiate between the two anomalies, making it unclear whether the circular anomaly relates to archaeological activity or natural geological variation. As such it has been interpreted as possible archaeology and will require further ground truthing.

5.1.15 Approximately 110m to the east of BP5-002, a small linear anomaly on a south-west to north-east alignment has been identified (BP5-003). The anomaly measures 24m long by 1.7m wide and has been interpreted as possible archaeology as it has little or no discernible alignment with the pattern of current or historic former field boundaries visible on available mapping. Whilst this may relate to an archaeological ditch feature, it is difficult to distinguish from the geological variation also seen in the area.

5.1.16 There are several small, discrete positive anomalies throughout the dataset, a concentration of which has been identified (BP5-004). These have been interpreted as possible archaeological pits due to their increased magnetic response when compared

to other anomalies thought to be natural and their proximity to another anomaly of possible archaeological origin (BP5-002). However, there is no discernible pattern to the anomalies and the possibility that they relate to natural variation in the geological deposits cannot be discounted.

Interpretation: modern agricultural

5.1.17 In the northern portion of the survey area, several linear anomalies have been identified that correspond with the historic pattern of land division visible on the 1887 edition Ordnance Survey map. These are on a broadly west-east alignment (BP5-005 to BP5-008), or a west-north-west to east-south-east alignment (BP5-009 to BP5-010). A negative anomaly in the centre of the area at BP5-011 is also related to a former field boundary, which is first seen as a trackway on the 1887 edition Ordnance Survey map. This continues to the north, but is only seen as a weak trend in the data.

5.1.18 A further trackway evident on the 1887 Ordnance Survey map has been identified in the centre of the area at BP5-012. This can be seen as an 8m band of dipolar responses on a roughly east-west alignment across the area.

5.1.19 Closely spaced (2m) parallel trends have been identified in the southern part of the survey area. The clearest example of these (BP5-013) is where the trends traverse an area of increased response, interpreted as a natural variation in superficial deposits. Due to their uniformity and close spacing, these have been interpreted as evidence of modern ploughing.

5.1.20 Numerous dipolar trends have been identified throughout the entire survey area. These are most prominent in the northern portion of the survey area (BP5-014), but are also noted in the centre and south (BP5-015 to BP5-017). The dipolar nature and mostly parallel distribution of these anomalies is indicative of ceramic land drains. Several similar, albeit weaker, anomalies are noted in the southern portion of the survey area but have been labelled as trends. This is due to the increased magnetic response surrounding them, making a definitive distinction of the anomalies difficult.

Interpretation: geological

5.1.21 Many variable responses throughout the data set have been interpreted as evidence of geological variation. These are evident in the northern corner (BP5-018), the north-west (BP5-019), and west (BP5-020) as weakly magnetised sinuous anomalies. Magnetically stronger, positive responses with a weak negative halo can also be seen in the central to southern portion of the survey area (BP5-021 and BP5-022). Whilst these anomalies vary in magnetic response, they all form large areas of magnetic variation with no clear shape or pattern. It is therefore likely that these relate to geological variation and reflect the differing bedrocks and superficial deposits recorded across the area.

Interpretation: modern

5.1.22 Three small areas of increased magnetic response have been identified across the north of the dataset (BP5-023 to BP5-025). It is unlikely that these relate to any archaeological activity. These are thought to be the results of areas of backfilling or spreads of modern agricultural waste.

5.1.23 A single, strong dipolar linear anomaly extends 145m along the southern boundary of the second northern most field (BP5-026). This is indicative of a modern service.

5.1.24 Three trends on a north-west to south-east alignment consisting of evenly spaced negative anomalies have been identified (BP5-027 to BP5-029). These are the result of extant fences traversing the survey area.

Conclusions

5.1.25 The detailed gradiometer survey has identified an area of post-medieval ridge and furrow cultivation as the only anomalies that can be confidently interpreted as archaeology. Several anomalies of possible archaeological origin have also been interpreted in the centre of the area. These include a possible ring ditch, a linear ditch, and pit-like features.

5.1.26 The two low bank features identified in the LiDAR data undertaken by HS2 Ltd are not evident in the geophysics data. It is probable that these subtle earthwork features do not have a significantly different magnetic signature to the surrounding area and for this reason are not seen in the survey.

5.1.27 The remaining anomalies detected by the survey are indicative of historic cultivation and land divisions, as well as geological and natural variation in the underlying deposits. Several trends have been noted within the dataset but these are not considered likely to be archaeological in their origin. A single modern service has also been identified.

5.2 Survey area 13: Madeley

Site details

5.2.1 A geophysical survey was carried out on land west of Madeley, Staffordshire (centred on NGR 376572, 344153 - Figure 55).

5.2.2 This survey area was selected as it is within an area of elevated archaeological potential. This is due to the presence of cropmarks possibly associated with a potential Roman villa (WHM061) and medieval moated site at the northern boundary of the survey area (see main ES Volume 5: Appendix CH-002-004), as well as further linear cropmarks in the surrounding landscape.

5.2.3 This survey area comprises parts of ten fields to the north and south of the A525. This includes land parcels 11805, 11835, 11840, 11855, 11860, 11865, 11910, 11960, 11970, 11985, 12020, 12025, 12035, 12075, 12260, 12260, 12285, 12290, 12305, 12310, 12320, and 12350. The area lies 840m west-south-west of Madeley, 1.8km north-east of Onneley, and 8.7km west-south-west of the centre of Newcastle-under-Lyme. The limits of the geophysical survey area are defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 14.6ha of the 26.4ha area, with the remainder not available at the time of survey. This represents coverage of approximately 55% of the survey area.

5.2.4 This survey area is on an east facing slope with an increasing gradient to the west. The south-eastern extent of the survey area lies at approximately 112m AOD, rising to 128m AOD at the northern boundary and to 154m AOD at the north-west.

5.2.5 No overhead cables traverse the survey area. There is a small body of water in the southern portion of the survey area. Internal field boundaries are formed by hedgerows and dykes.

5.2.6 The underlying geology for the south of the survey area is mapped as Chester Sandstone Formation. The northern portion of the survey area consists of mudstone of Halesowen Formation. Superficial deposits of Devensian till are also recorded throughout most of the survey area, with the western boundary having no recorded deposits[37].

5.2.7 The underlying soils across the north of the area are likely to be typical brown sands of the Bridgnorth (551a) association[38]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

5.2.8 Assessments of aerial photographs, both from the SHER and from the AP survey carried out by HS2 Ltd for the Phase 2a main Environmental Statement have identified cropmarks related to ditch-like features in the immediate vicinity of the survey area. In addition, areas of medieval and post-medieval ridge and furrow cultivation have also been identified.

5.2.9 A possible round barrow, or mound is recorded to the immediate west of the survey area (WHM063; SHER MST491).

5.2.10 Significant archaeological features, were identified during geophysical survey comprising indicating the footprint of a building, potentially of Roman date (main ES, Volume 5 Appendix CH-004-004 LiDAR feature 3080, 3081, 3082, 3084; Geophysics CA04-2876; AP2) and, to the north, a possible ring ditch (Background Information and Data (BID CH-004-004) accompanying the main ES, Area 13, feature PA02-004).

5.2.11 A medieval moated site is noted to the north-east of the survey, and encroaches into the north-eastern most boundary of the area (WHM058; SHER MST3724). A late 19th century milepost is recorded to the north-east of the southern portion of the survey area (WHM049; SHER MST7036).

5.2.12 Depressions visible on LiDAR imagery within and surrounding the survey area are attributed to bank and ditch like features (WHM062; LiDAR3067, 3068, 3072, 3074, 3076, 3078, 3080, 3081, 3082, 3084). Some of these features related to the historic pattern of land division and can be seen on historic mapping as well as ridge and furrow earthworks within possible enclosures.

Results

5.2.13 Gradiometer survey was carried out on the 5–7 December 2017 using a cart based system. Areas of ridge and furrow cultivation, as well as a small number of possible archaeological anomalies were identified. Former field boundaries, areas of modern

[37] British Geological Survey, http://www.bgs.ac.uk
[38] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

debris/burning, natural geological anomalies, field drains, and ploughing have all been detected along with numerous trends.

5.2.14 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 56–57). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: archaeology

5.2.15 Across the southern field, areas of broadly spaced (8m–12m) parallel linear anomalies have been identified (PA02-001 to PA02-003). These are aligned south-west to north-east and are indicative of ridge and furrow cultivation. The relatively straight nature of the anomalies is indicative of mechanical ploughing, and therefore suggests a post-medieval date.

Interpretation: possible archaeology

5.2.16 In the northern field, a small, roughly circular anomaly has been identified (PA02-004). The anomaly measures approximately 4m in diameter and appears to have an opening or break on the southern side. The small and weak nature of this anomaly makes a confident interpretation difficult. It is possible the anomaly relates to a ring ditch associated with a barrow or round house, such as the round barrow recorded to the west of the survey area (SHER MST491). However, the anomaly is also similar to that which would be expected from an area with variable geological deposits.

5.2.17 In the southern field, several discrete, positive anomalies have been identified (PA02-005). These are indicative of pit features and have been tentatively interpreted as possible archaeology (extraction pits). However, it is equally possible that these relate to natural pitting in the bedrock.

Interpretation: modern agricultural

5.2.18 Several linear anomalies traversing the survey area correspond to former field boundaries recorded on the 1877 Ordnance Survey map. One is seen in the northern field on an east-west alignment, recorded as PA02-006. Three have been identified in the southern field on a north-west to south-east alignment (PA02-007 and PA02-008), south-west to north-east alignment (PA02-009), and north-south alignment (PA02-010).

5.2.19 Closely spaced (2m) parallel linear trends were observed across the northern field. These are interpreted as evidence of modern cultivation activity, such as ploughing.

5.2.20 Sporadically dispersed across the southern field, several broadly dipolar linear trends have been identified. These anomalies generally form parallel alignments and traverse all, or most, of the survey area on a variety of orientations. The pattern and response of these anomalies is indicative of a network of land drains.

Interpretation: uncertain trends

5.2.21 In the southern portion of the southern field, an area of linear trends has been identified (PA02-011). These anomalies correspond to an area identified on LiDAR imagery as ridge and furrow cultivation, however the weak nature and lack of clear

pattern to these anomalies makes a definitive interpretation difficult. It is possible these trends could be an indication of natural geological variation or various phases of agricultural activity.

Interpretation: modern

5.2.22 Along the south-eastern border of the northern survey field, a highly magnetic, dipolar linear anomaly has been identified on a north-west to south-east alignment (PA02-012). This is indicative of a modern service, such as a pipe.

5.2.23 Across the southern field, three areas of magnetically strong dipolar responses have been identified (PA02-013 to PA02-015). Anomaly PA02-013 corresponds with a cut feature recorded in the LiDAR data and on the 1877 Ordnance Survey map. Later mapping records the feature as a pond. The strong magnetic response is indicative of an area of backfilling. However, it is not clear whether the original cut feature was a pond or an earlier extraction pit. The other two anomalies (PA02-014 and PA02-015) are not recorded on historic mapping or within the LiDAR data, but are likely similar areas of backfilling.

Conclusions

5.2.24 The survey has identified areas of ridge and furrow cultivation as the only anomalies that can be confidently interpreted as archaeology.

5.2.25 A possible small ring-ditch feature and several pit-like features have also been identified by the survey. Whilst an archaeological interpretation is supported by the presence of a ring-ditch recorded to the west of the area, these anomalies could also conceivably be natural in origin, or the result of agricultural practices.

5.2.26 There is no evidence of the moated site recorded as encroaching into the survey area to the north.

5.2.27 Many of the remaining anomalies are evidence of the modern agricultural activity. These include former field boundaries, land drains, and areas of ploughing. Areas of backfilling and a modern service have also been identified.

6 Geophysical surveys in South Cheshire

6.1 Survey area 14: Borrow pit 6

Site details

6.1.1 Geophysical survey was carried out over the area proposed for Borrow pit 6 (also known as BP 241), West of Wrinehill, Cheshire (centred on NGR 374309,347146 - Figure 58).

6.1.2 This survey area was selected for geophysical survey as it lies on geological deposits that are considered to have a high potential for early prehistoric remains.

6.1.3 The area covers 11 fields of mixed arable and grassland. This includes land parcels 12835, 12865, 12866, 12905, 12920, 12925, 12930, 12940, and 12950. The survey area lies to the north of Checkley Lane, 650m west of Wrinehill and 7.5km south of Crewe, Cheshire. The limits of the geophysical survey area was defined by an open boundary with internal divisions of hedgerow and fence line boundaries. The gradiometer survey covered 7.4ha of the 28ha survey area, with the remaining area unavailable at the time of survey. This represents approximately 26% coverage of the survey area.

6.1.4 The survey area lies on a north-west facing slope, falling from 103m AOD at the south-east to 73m AOD on the north-western boundary.

6.1.5 An overhead cable traversed the south of the site on a north-west to south-east orientation. There were no watercourses recorded in the area.

6.1.6 The solid geology is recorded as mudstone of the Sidmouth Mudstone Formation across the north-west of the area with halite and mudstone of the Northwich Halite Member across the south-east. The north of the area is covered by sand and gravel glaciofluvial deposits with diamicton till in the south-east[39].

6.1.7 The soils underlying the north-west of the survey area are likely to comprise typical stagnogley soils of the Clifton (711n) association, with the south-east comprising typical brown earths of the Wick 1 (541r) association[40]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

6.1.8 Analysis of LiDAR data undertaken by HS2 Ltd for the Phase 2a main Environmental Statement has revealed a number of features within the survey area (see asset SCH089 in the main ES Volume 5: Appendix CH-002-005) comprising a series of pits related to previous extraction operations (LiDAR 3116), linear features representing former field boundaries (LiDAR3121, LiDAR3122, LiDAR3123), and the remains of medieval to post-medieval ridge and furrow agriculture (LiDAR3124, LiDAR3185).

6.1.9 Within the surrounding landscape, aerial photographs analysed by HS2 Ltd have identified the remains of medieval ridge and furrow agriculture to the north-west of

[39] British Geological Survey, http://www.bgs.ac.uk
[40] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton

the survey area (AP166). Analysis of LiDAR data undertaken by HS2 Ltd indicates the presence of medieval to post-medieval ridge and furrow (LiDAR 3114) to the east of the survey area.

Results

6.1.10 The gradiometer survey was carried out from 20–24 November 2017 using cart-based and hand-held systems. The survey has not identified any anomalies interpreted as relating to archaeological activity, although several anomalies are thought to relate to modern agricultural activity or natural variation, trends, and ferrous responses.

6.1.11 The results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 59–62). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends (Figures 60 and 62).

Interpretation: modern agricultural

6.1.12 In the central and southern portions of the survey area, widespread dipolar responses have been identified (BP6-001 BP6-002). These are likely the result of agricultural activity, such as the spreading of 'green-waste' for fertilisation. The increased magnetic response caused by this practice has the potential to mask weaker archaeological anomalies.

6.1.13 To the south of the central portion of the survey area, two broad (5m to 15m) linear areas of increased magnetic response have been identified (BP6-003 and BP6-004). These correspond to a former boundary and an area of 'rough pasture' that has since been removed, first visible on the 1876 edition Ordnance Survey map of the area.

6.1.14 In the north-west of the area, two strongly magnetic linear anomalies have been identified (BP6-005). These are likely related to land drains, however the possibility that they relate to modern services cannot be discounted.

6.1.15 Closely spaced, parallel linear trends have been identified in the central portion of the survey area. Based on their spacing, these anomalies have been interpreted as evidence of modern agricultural activity, such as ploughing.

Interpretation: geological

6.1.16 In the south of the survey area, a weak sinuous anomaly has been identified (BP6-006). The lack of shape or pattern to this anomaly suggests it relates to the variable background geology recorded across the area.

Interpretation: modern

6.1.17 Across the north-west of the survey area, three strongly magnetic, dipolar, linear anomalies have been identified (BP6-007 to BP6-009). BP6-007 is aligned east-west, while BP6-008 and BP6-009 are aligned north-north-west to south-south-east. These linear anomalies are indicative of modern services, such as pipes or cables. It is likely that BP6-008 and BP6-009 are part of the same service, but due to the limited area surveyed it is not possible to confirm this from the geophysics data alone.

6.1.18 In the north of the area, a linear band of increased magnetic response has been identified (BP6-010). This is related to a modern trackway.

Conclusions

6.1.19 The detailed gradiometer survey has not identified any anomalies interpreted as being indicative of archaeological features. There is no evidence for early prehistoric activity, for which the area is thought to have some potential. However, it is possible that any early prehistoric features that may be in the area have a too small or too weak magnetic signature to be detected by the survey.

6.1.20 The anomalies identified relate to modern agricultural activity, geological variation, and other modern features.

6.1.21 Areas where 'green waste' has been spread have been identified, which has the potential to mask weaker archaeological anomalies. The other anomalies relate to land drains, modern services, and a trackway.

6.2 Survey area 15: Godwyneslegh

Site details

6.2.1 Geophysical survey was carried out at a location associated with the deserted medieval village (DMV) of Godwyneslegh, on land north-east of Wrinehill Road, Cheshire (centred on NGR 373280, 348533 - Figure 63).

6.2.2 The survey area was selected as it is within an area with elevated archaeological potential. This is due to the presence of cropmarks possibly associated with the deserted medieval village of Godwyneslegh (see asset SCH020 in the main ES Volume 5: Appendix CH-002-005), located to the north of the survey area.

6.2.3 A geophysical survey undertaken in November 2017 to the south of the area identified several anomalies tentatively considered to be archaeological in origin. The current phase of works was undertaken between February and March 2018 and has identified more anomalies that are thought to be archaeological in origin.

6.2.4 This survey area comprises parts of nine fields to the north-east of Wrinehill Road and north of Mill Lane. This includes land parcels 13180, 13290, 13410, 13425, and 13450. The area lies 2.5km north-west of Wrinehill, 2km west of Betley, and 8.2km south-west of the centre of Nantwich. The limits of the geophysical survey area were defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 19.2ha of 38ha survey area, across the northern part of the proposed area. The southern portion of the survey are previously covered 7.1ha of survey. This gives a total coverage of 26.3ha, which represents approximately 69% of the survey area.

6.2.5 This survey area is broadly flat, with a slight south facing slope. The southernmost extreme of the survey area lies at approximately 73m AOD, rising to 79m AOD in the centre and falling again to 74m AOD at the northern extent.

6.2.6 Overhead cables traverse the centre of the survey on a south-west to north-east alignment. There is a small watercourse recorded on Ordnance Survey mapping traversing the southern portion of the survey area. Internal field boundaries are formed of hedgerows and dykes.

6.2.7 The underlying geology is mapped as mudstone of the Wilkesley Halite Member throughout most of the survey area. Superficial deposits of Diamicton Devensian Till are also recorded throughout the survey area[41].

6.2.8 The underlying soils across the north of the area are likely to be typical stagnogley gley soils of the Clifton (711c) association[42]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

6.2.9 Assessments of aerial photographs and LiDAR carried out by HS2 Ltd for the Phase 2a main Environmental Statement have identified a complex series of cropmark and earthwork features to the north of and within the northern boundary of the survey area (LiDAR 3139). These correspond to a known group of earthworks possibly representing house platforms, fields and ridge and furrow cultivation which may be the lost medieval hamlet of Godwyneslegh (SCH020; CHER MST4538).

6.2.10 Parallel linear features, identified during assessments of LiDAR imagery, are visible throughout the survey area and surrounding study area and are thought to be indicative of ridge and furrow cultivation (LiDAR 3135, 3137).

6.2.11 LiDAR imagery also identified four cut features within the survey area, thought to be former sand pits (LiDAR 3138). These are recorded on historical mapping, and appear to have been in use as ponds and later filled in. This could suggest the pits pre-date the earliest available historic mapping (1876). Several more of these feature types are noted to the south of the survey area (LiDAR 3131, 3136) and to the north (LiDAR 3140, 3149).

6.2.12 To the south of the survey area, Higher Hayward is recorded in the CHER (MST 7758) as a 16th century farmstead and sand pit. It is depicted on a map of 1777 and from the late 19th century the farm it was called Lower Den. By 1909 the old building was demolished and a new farm constructed nearby.

Results

6.2.13 The gradiometer survey, carried out between 21–23 November 2017 using hand held and cart based systems, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a small number of anomalies could be possible archaeology.

6.2.14 In addition, former field boundaries, areas of modern debris/burning, natural geological anomalies, field drains, and ploughing have all been detected along with numerous trends.

6.2.15 The gradiometer survey, carried out between 26 February and 09 March 2018 using a cart based system, has identified anomalies that are interpreted as evidence of archaeological activity. Several smaller anomalies are considered to be possible archaeology.

[41] British Geological Survey, http://www.bgs.ac.uk
[42] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

6.2.16 In addition, former field boundaries, areas of modern debris and burning, natural geological anomalies, field drains, and ploughing have all been detected along with numerous other trends.

6.2.17 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 64–65). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: archaeology

6.2.18 In the northern-most portion of the survey, two weak positive linear anomalies have been identified (4000). The anomalies exact size is unclear due to the highly ferrous anomaly corresponding to a fence traversing to the south-east on a south-west to north-east alignment. The anomalies appear to form a 30m by 30m rectilinear shape on a north-south alignment and are 2m–3m in width. These anomalies broadly correspond to cropmarks identified in aerial photography and are thought to indicate the south-east corner of an enclosure that form part of the wider DMV.

6.2.19 There are a number of areas of magnetically strong dipolar responses. These are predominantly in the north of the survey area. The anomalies at 4001 and 4002 correspond to former sand pits noted on historical Ordnance Survey mapping dating to 1876. The increased magnetic response is likely to be the result of variable deposits used during the in-filling of the features. The anomaly at 4003 is possibly associated with the sand pit noted on the historic Ordnance Survey mapping, such as a spread of associated material or peripheral activity.

Interpretation: possible archaeology

6.2.20 In the eastern portion of the survey area, a weak positive linear anomaly has been identified (PA01-001). The anomaly is roughly aligned north-south and extends for 52m. It is indicative of a ditch like feature, and may be archaeology. However, it is equally likely the anomaly relates to a land drain or a field boundary not recorded on historic mapping.

6.2.21 To the east of 4000, a weak positive linear anomaly on an east-west alignment has been identified (4004). This anomaly is 98m in length and is 1.4m wide. The anomaly is indicative of a ditch feature, which may be associated with the nearby DMV. However, this interpretation should be considered tentative as the anomaly could be agricultural in its origin possibly pertaining to an unmapped former boundary or field drain.

6.2.22 Numerous discrete 1–3 m diameter pit-like anomalies have been identified in the dataset. Examples of these anomalies can be seen at the site (4005, 4006 & 4007). These are possibly evidence of localised extraction activity or refuse pits. However, this interpretation should be considered tentative as the anomalies could be the result of natural pits in the underlying bedrock.

Interpretation: industrial, burnt or fired material

6.2.23 Large areas of increased magnetic response are noted. At 4008 and 4009, areas of the background magnetic response are slightly increased. This is possibly the result of

fertilisation activity. However, it is also possible these larger variations are the result of natural variation in the underlying superficial deposits.

Interpretation: modern agricultural

6.2.24 Several linear anomalies throughout the southern portion of the survey area are indicative of former field boundaries, visible on Ordnance Survey mapping from 1876. The anomalies identified as PA01-002, PA01-003, and PA01-004 are broadly parallel and regularly spaced (59m–60m apart), traversing the area on a north-west to south-east alignment. A curvilinear anomaly (PA01-005) extends south from the western end of PA01-003. This feature appears to be recorded on the 1876 Ordnance Survey map.

6.2.25 An area of increased magnetic response (PA01-006) has been identified at the south-eastern end of PA01-004. This corresponds to a former pit or pond noted on Ordnance Survey mapping from 1899. The feature is no longer present on the 1912 map, suggesting it was backfilled. The increased magnetic response is likely to be a result of the variable magnetic response of the materials used to fill in the feature.

6.2.26 A number of closely spaced (2m) parallel linear anomalies have been identified by the survey, prominently across the north-western fields. PA01-007 has been interpreted as evidence of modern agricultural activity, such as ploughing.

6.2.27 A series of broadly spaced (10m–20m), dipolar linear anomalies has been identified across the southern survey field (PA01-008). The arrangement and dipolar response of these anomalies is indicative of ceramic land drains.

6.2.28 To the north of the survey area, a liner anomaly corresponding to a former field boundary has been identified at 4010. The anomaly is not clearly defined due to the increased magnetic background in this area; however, it has been identified on a north-west–south-east orientation, with a north-easterly projection. This corresponds with a field boundary visible on historic mapping dating to 1876. A second anomaly that also corresponds to a former field boundary on the 1876 mapping is noted to the south-west of the dataset at 4011. This anomaly protrudes from the northern boundary of the field and continues north-south into the field to the south.

6.2.29 Several weakly dipolar linear anomalies have been identified within the dataset. This type of response is typically associated with materials that have been burnt or fired, such as ceramics. Due to the anomalies regular alignment these are interpreted as field drains.

Interpretation: modern

6.2.30 A magnetically strong, dipolar linear anomaly has been identified to the east of the northern field as PA01-009. It is indicative of a modern service, such as a pipe.

6.2.31 To the west of the survey area, a highly magnetic ferrous response has been identified as PA01-010. This corresponds to a pylon between the two fields.

6.2.32 A highly ferrous, dipolar, linear response has been identified traversing the south-east corner of the dataset at 4013. The anomaly protrudes south-west from the north-eastern boundary for 78m and turns to a broadly north-south alignment before joining the southern boundary. This type of anomaly is indicative of an underground service

such as a pipe or cable. A corresponding anomaly was identified to the south during the previous survey.

Interpretation: natural

6.2.33 The south-western portion of the dataset contains several amorphous, weakly negative anomalies. These are interpreted as evidence of localised natural variation in the underlying superficial deposits based on the sporadic distribution and weak magnitude of the anomalies. Examples of these anomalies are noted at 4012.

Conclusions

6.2.34 The survey has identified anomalies that are thought to be evidence of archaeological activity associated with the DMV noted within the site. Two linear anomalies are thought to be the south-east corner of a small enclosure noted as a cropmark close to the assumed location of the medieval hamlet of Godwyneslegh.

6.2.35 A linear anomaly located to the east of the DMV may represent an archaeological ditch feature. However, it could equally be evidence of a more modern field boundary or field drain.

6.2.36 Further linear anomalies have been identified across the south of the area that relate to former field boundaries and evidence of more recent agricultural activity is also evident in the form of ploughing and land drains. The remaining identified anomalies are evidence of modern activity. These include a backfilled pond or pit, and a modern service.

6.2.37 A linear anomaly may represent an archaeological ditch-like feature. However, it could equally be evidence of a former field boundary not recorded on the earliest available historic mapping.

6.2.38 The remaining identified anomalies are evidence of modern activity. These include a backfilled pond or pit, and a modern service pipe.

6.3 Survey area 16: North of Checkley Hall Farm

Site details

6.3.1 Geophysical survey was carried out on an area north of Checkley Hall Farm (centred on NGR 373750,347210 - Figure 66).

6.3.2 The survey area was selected as it is within an area of elevated archaeological potential. LiDAR and aerial photography indicate potential medieval and post-medieval agricultural activity within the survey area. There is also evidence of extraction activity of at least 19th century date.

6.3.3 This survey area comprises cultivated agricultural land. The northern boundary is defined by a hedgerow with the southern open on to further agricultural land. The survey area falls within land parcel 12850.

6.3.4 The area lies 1.6km north-west of Wrinehill. The limits of the geophysical survey area are defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 6.3ha of the 6.4ha survey area. This represents approximately 98% coverage of the survey area.

6.3.5 This survey area is on a broadly south facing slope. The southernmost extreme of the survey area lies at 84m AOD, rising to 89m AOD at the northern extent.

6.3.6 No overhead cables traverse the survey area.

6.3.7 The underlying geology is recorded as the Sidmouth Mudstone Formation. Superficial deposits of till are recorded across the majority of the area and glaciofluvial, deposits along the northern edge of the survey area[43]. Although the presence of overlying deposits of till may reduce the effectiveness of magnetometer survey, potentially providing random false positive readings in the geophysical survey, soils derived from these parent geological materials are considered suitable for magnetometry

6.3.8 The underlying soils are likely to be pelo-alluvial gley soils of the Fladbury 2 (813c) association[44]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

6.3.9 There are numerous possible extractive pits and ponds within and to the north, south and east of the area identified (LiDAR3116). Several of them are depicted on the 1st edition Ordnance Survey map, with one to the south-east labelled as a 'sand pit'. Historic maps also show several field boundaries within the survey area which have been removed. Narrow ridge and furrow, probably from the post-medieval period, has been identified from aerial photographs to the north (AP166).

6.3.10 A sinuous, 330m long linear feature has also been recorded from the LiDAR data (LiDAR3129). This may be a former field boundary, but it is not depicted on Ordnance Survey maps and may be natural in origin[45].

Results

6.3.11 The gradiometer survey, carried out on the 21–22 March 2018 using cart based systems, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a small number of anomalies have been identified as possible archaeology.

6.3.12 In addition, areas of modern debris and burning, field drains, and ploughing have all been detected along with numerous trends.

6.3.13 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 67–68). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

6.3.14 A number of anomalies identified to the south-east of the survey area have been interpreted as possible archaeology (4000). Two parallel, weakly positive linear anomalies are 15m in length by 2m wide. These anomalies are indicative of ditch features and may be evidence of a trackway or land division not recorded on historic

[43] British Geological Survey, http://www.bgs.ac.uk
[44] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England*, Ordnance Survey: Southampton
[45] HS2 (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

mapping. However, their weak nature makes accurate interpretation difficult and they could equally be of a natural or agricultural origin.

6.3.15 A further, weakly positive sub-circular anomaly, approximately 9m in diameter, is located to the south of the two parallel anomalies at 4000. The northern portion of the anomaly is not clearly identifiable in the dataset. It is possible this anomaly pertains to a ring-ditch. However, a clear interpretation is not possible due to the weak nature of the anomaly and the surrounding increased magnetic response. It is equally possible this anomaly is natural or agricultural in origin.

6.3.16 A small number of positive discrete anomalies have also been identified across the area. These vary in size from 1m to 2.5m in diameter. Anomalies such as these are indicative of pit features, and may relate to archaeological activity. However, they are equally likely to relate to natural variation in the underlying geology or soils.

Interpretation: agricultural

6.3.17 An area of increased magnetic response has been identified to the east of the survey at 4001. The anomaly is likely to the be the result of a former trackway noted on 1876 Ordnance Survey mapping

6.3.18 In the east of the area, a weak positive linear anomaly has been identified at 4002. This extends north-south across the site, turning towards the south-west at the southern end. This relates to a former field boundary present on the 1898 Ordnance Survey map of the area.

6.3.19 Further evidence of modern agricultural activity has been identified along the northern boundary of the area. Parallel positive linear anomalies can be seen on a west-north-west to east-south-east alignment. These are indicative of ploughing activity.

Interpretation: modern

6.3.20 A magnetically strong linear anomaly has been identified to the west of the dataset on a broadly north-north-east to south-south-west alignment at 4003. The anomaly traverses the entire dataset. Anomalies of this type are typically associated with modern services, such as pipes or cables.

6.3.21 In the centre of the area, two magnetically strong dipolar anomalies have been identified at 4004. These are indicative of buried ferrous objects, although their exact origin is not clear. Weak linear trends appear to extend south-east and north-west from the anomalies, suggesting that they may be buried manholes with associated services or drains.

Conclusions

6.3.22 The survey has not identified any anomalies that can be confidently interpreted as evidence of archaeology. Two linear anomalies and a sub-circular anomaly may represent archaeological ditch-like features in the underlying deposits. However, due to the broadly increased magnetic response in this portion of the dataset, a definitive conclusion is not possible. These anomalies could equally relate to agricultural activity or alternatively natural variation in the local geology and soils.

6.3.23 Evidence of 19th century agricultural activity, thought to be in the area, has been identified in the form of a former trackway and a former field boundary. Both of these are evident on historic Ordnance Survey mapping of the area, with the former field boundary also identified from LiDAR data.

6.3.24 The remaining identified anomalies are evidence of modern activity. This includes a service and ploughing activity.

6.4 Survey area 17: Checkley Brook

Site details

6.4.1 Geophysical survey was carried out on an area at Checkley Brook (centred on NGR 374840, 346100 - Figure 69).

6.4.2 The survey area was selected as it is within an area of elevated archaeological potential. LiDAR and aerial photography indicate potential medieval and post-medieval agricultural activity within the survey area. There is also evidence of extraction activity of at least 19th century date.

6.4.3 This survey area comprises cultivated, agricultural land. The northern boundary is defined by a hedgerow with the southern section expanding onto further agricultural land. The survey area falls within land parcels 12510 and 12655.

6.4.4 The area lies 1km south-west of Wrinehill. The limits of the geophysical survey area are defined by hedgerow field boundaries and predefined survey extents within fields. The gradiometer survey covered 8.7ha of the 25.4ha survey area. This represents approximately 34% coverage of the survey area.

6.4.5 This survey area lies broadly on a south facing slope. The southernmost extreme of the survey area lies at 80m AOD, rising to 91m AOD at the northern extent.

6.4.6 The underlying geology is recorded as the Sidmouth Mudstone Formation. Superficial glaciofluvial deposits are recorded across the northern edge of the survey area, with deposits of till at the centre of the area and alluvium to the south[46]. Although the presence of overlying deposits of till and alluvium may reduce the effectiveness of magnetometer survey in places, potentially providing random false positive readings in the geophysical survey, soils derived from these parent geological materials are considered suitable for magnetometry.

6.4.7 The underlying soils are typically brown earths of the Wick 1 (5411) association[47]. Soils in such geological settings have been shown to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

6.4.8 To the west and south-west of the survey area lies the location of the post-medieval Wrinehill Mill along with a range of associated features including a former brickworks and former garden are recorded (SHERMST2218, MST2219, MST6261). LiDAR data also indicates the presence of a 245m long relict section of the former millrace which

[46] British Geological Survey, http://www.bgs.ac.uk
[47] Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England,* Ordnance Survey: Southampton

historic Ordnance Survey mapping indicates was still present on the 1920s map series extending into the survey area (LiDAR 3104).

6.4.9 Numerous linear features have been identified to the south of the survey area from the LiDAR data which are thought to represent drainage channels and/or field boundaries (LiDAR 3096, 3097, 3098, 3099). Features identified from aerial photographs to the south of the survey area indicate the presence of a field system containing levelled narrow ridge and furrow (AP162)[48].

Results

6.4.10 The gradiometer survey, carried out on the 19–20 March 2018, using a cart based system, has not identified any anomalies that can be confidently attributed to archaeological activity. However, a small number of anomalies have been identified as possible archaeology.

6.4.11 In addition, former field boundaries, areas of modern debris/burning, natural geological anomalies, and field drains have all been detected along with numerous trends.

6.4.12 Results are presented as a series of greyscale plots and archaeological interpretations, at a relevant scale (Figures 70–71). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous, burnt or fired objects, and magnetic trends.

Interpretation: possible archaeology

6.4.13 In the south of the area, a weak negative rectilinear anomaly has been identified at 4000. This extends 41m north-east to south-west before turning north-west for 43m at its south-western end. This is indicative of a broad (5m) bank feature and may form part of a larger square or rectangular enclosure. A further possible part of this is seen to the north at 4001. Here another weak negative linear anomaly extends 41m north-east to south-west. Whilst it is possible these anomalies relate to a large banked enclosure or other form of land division; their weak nature makes accurate interpretation difficult. Further investigation would be required to confirm the exact origin of these anomalies.

6.4.14 A small area of increased magnetic response has been identified at 4002. This feature is clear on historic Ordnance Survey mapping dating to 1876 and, although unlabelled, is likely to be evidence of earlier extraction activity. It is not possible to determine an exact date for this feature but it is possible this pertains to the mid to late Medieval period.

6.4.15 Several discrete positive anomalies have been identified throughout the survey area. These are 1m–2m in diameter and are considered to be of a possible archaeological origin, possibly pertaining to extraction activity or refuse pits. However, it is equally possible these anomalies are the result of localised variation or pitting in the underlying bedrock.

[48] HS2 Ltd (2017), *Written Scheme of Investigation for Geophysical Surveys- Phase 2a West Midlands to Crewe*

Interpretation: agricultural

6.4.16 Two magnetically strong curvilinear anomalies have been identified in the west of the surveyed area at 4003. The eastern of the two parallel anomalies is 215m long by 3.5m wide, while the western is 60m long by 4m wide. This anomaly corresponds to a former land division or trackway visible on historic Ordnance Survey mapping dating to 1876.

6.4.17 Weakly dipolar, parallel, linear anomalies have been identified throughout the survey area. Examples are evident at 4004–4007. The dipolar response and 'herring bone' pattern seen in places is indicative of land drains.

Interpretation: natural

6.4.18 Several weakly positive amorphous anomalies have been identified sporadically throughout the survey area. The lack of any clear shape or pattern to these anomalies suggests that they are likely the result of local variation in the underlying geological deposits or soils.

Conclusions

6.4.19 The survey has not identified any anomalies that can be interpreted as definite archaeology. However, rectilinear anomalies may represent the remains of a square banked enclosure. However, the weak anomalies make accurate interpretation difficult and further investigation would be required to confirm the origin of these anomalies. Several pit-like anomalies have also been identified. Whilst an archaeological origin is possible, these could equally relate to natural pitting in the underlying bedrock.

6.4.20 Two dipolar curvi-linear anomalies have been identified that correspond to a former trackway or land division identified on historic Ordnance Survey mapping. The exact origin of these anomalies is not clear but it could pertain to the mid to late medieval period.

6.4.21 The remaining anomalies identified are believed to be associated with modern agricultural activity and geological variation.

Part 2: Additional Provision 2 Environmental Statement

7 Remote sensing report

7.1 Introduction

7.1.1 This section outlines the results of an archaeological remote sensing survey of the additional land required for the AP2 revised scheme in the Parkgate and Handsacre areas of the Fradley to Colton area not covered by the remote sensing studies published in the main BID reports[49]. The survey involved the systematic mapping, recording, analysis and interpretation of potential archaeology from aerial photographs, multi-spectral imagery and LiDAR data.

7.1.2 The aim was to accurately map and record the form and extent of archaeological features visible as cropmarks, soil marks, earthworks or structures to inform the baseline assessment of cultural heritage resource associated with the AP2 revised scheme.

7.1.3 A full methodology, covering identification, digitisation and interpretation and data sources used is set out in Background Information and Data (BID CH-004-001) accompanying the main ES.

7.2 Study area

7.2.1 The study area comprises a 100m buffer for LiDAR, multi-spectral data and aerial photographic survey extending from the limits of the land required for the AP2 revised scheme.

7.3 Limitations

7.3.1 The survey was based on HER and NHL data obtained between 2015 and 2017. Any information added to these databases after that time would not have been available as a reference during the course of this survey.

7.3.2 High resolution (250mm) aerial imagery did not cover the full extent of the AP2 revised scheme. This was the case for the north-east part of the Parkgate area of the AP2 revised scheme. Freely available data sources were utilised as an alternative, such as Google Earth, and ESRI's Aerial Imagery. These however, are inferior in resolution and quality to the project-specific aerial imagery collected.

7.3.3 The LiDAR coverage did not extend to the cover the north-eastern 1.5km of the Parkgate area.

7.4 Results

LiDAR

Overview

7.4.1 A total of 16 assets (individual or grouped) of possible archaeological interest were identified within the study area. The majority of the potential archaeological assets

[49] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data, Report refs BID-CH-004-001, BID-CH-004-002, BID-CH-004-003, BID-CH-004-004, BID-CH-004-005,* https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement#background-information-and-data

deriving from the LiDAR, were also visible on the multi-spectral (RGB) imagery. However, analysis of the LiDAR data provided substantially greater clarity when compared to the multi-spectral imagery.

7.4.2 The features could predominantly be ascribed to one of two interpretative classes; disused extractive pits or minor earthworks. In addition, a number of potential areas of early medieval or medieval ridge and furrow were also identified through using LiDAR data, and were corroborated by the Historic Environment Records.

7.4.3 Features identified during the remote sensing assessment are described (Annex A) and have been illustrated (Figures 72–76).

Extractive pits and mining

7.4.4 Amongst the most frequently identified features were small depressions, often sub-circular in plan and typically in the range of 20m–50m in diameter. These depressions were distributed throughout the study area without any obviously meaningful spatial patterning. A result of small scale, localised mining techniques extractive pits are found largely within the area west of Newborough (Figure 76: 3227; 3226; 3222) and south-east of Blithfield Reservoir (Figure 73: 3200; 3201; 3202 & 3203) as well as in other sporadic areas (Figures 74–75: 3213; 3207 & 3221).

7.4.5 Although a natural origin might be ascribed to some of the depressions, the majority of these features are likely to be the result of human activity. Although their date and original purpose often cannot be distinguished with certainty, it is likely that many of these features represent various forms of extractive pits, or open-cast workings, associated with rural industry and/or extraction of clay to increase the fertility of the soil ('marling').

7.4.6 The results of the assessment of these identified pits were largely consistent with expectations based on the rural character of the study area. The majority of these asset types identified during the assessment are likely to represent disused extractive pits or quarries of post-medieval date.

7.4.7 The features were most commonly identified within, or at the edges of agricultural fields. However, a small number were also identified within woodland, or in close proximity to areas of settlement. A post-medieval date is likely for the majority of these features, although occasional examples could be earlier in origin. In many instances, a minimum age can be confirmed on the basis that they can be correlated with features depicted by late 19th and early 20th century Ordnance Survey mapping.

Other features

7.4.8 Other assets identified during the assessment included a number of possible curvilinear archaeological earthwork features, possible plough headlands, such as 3186 (Figure 72), approximately 700 metres long but not aligning to modern field boundaries or features. Other curvilinear features include a number of potential enclosures (3197 and 3224, Figures 72 and 76).

7.4.9 Faint linear features visible on LiDAR and aerial photographs may be evidence of historic trackways (3190 and 3215, Figures 72 and 75).

7.4.10 A sub-circular shaped mound may have prehistoric origins (Figure 73: 3199).

7.4.11 LiDAR was suggestive of a possible rectilinear earthwork enclosure consistently respected on historic and current imagery east of Stockwell Heath (Figure 74: 3189).

7.4.12 A possible paleo-channel was observed along with a possible ring ditch at Bromley Hurst (Figure 74: 3209).

7.4.13 A possible oval-shaped enclosure feature was seen to the west of Bentilee Park Farm (Figure 75: 3217).

7.4.14 A group of linear features forming a jagged pattern was identified in close proximity to enclosure features to the south and west (Figure 76: 3218).

Ridge and furrow

7.4.15 Amongst the most common assets identified during the assessment were characteristic landforms derived from medieval and/or post-medieval ridge and furrow cultivation. These included groups of ridges/furrows in individual parcels ('furlongs', 'gores' and 'butts') and, less commonly, the vestigial ploughing headlands which divided them.

7.4.16 The majority of the vestigial ridge and furrow landforms identified during the assessment were isolated from one another and distributed intermittently across the study area. This is likely to reflect differential rates of preservation, which are likely to have been heavily influenced by the location and intensity of modern and historical ploughing.

7.4.17 Identified traces of ridge and furrow could frequently be correlated with features previously recorded during the Staffordshire NMP.

7.4.18 The majority of the vestigial ridge and furrow landforms can be morphologically dated to the medieval and post-medieval periods. Earlier origins of ridge and furrow, (dating to the early medieval period) were documented on either side of the River Blithe at Blithford Farm, Poplar Farm and Bromley Hurst (Figure 72: 3191; Figure 74: 3205, 3204, 3211 and 3212).

Field boundaries

7.4.19 A large proportion of the geographical expanse contained within the study area is composed of fields under a mixture of arable cultivation and pasture. It is probable that the spatial patterning of these field systems is largely the product of the Enclosure Acts of the 18th and 19th centuries. However, some elements within the spatial patterning of these field systems may correspond with earlier land divisions, including fossilised components of medieval open field systems.

7.4.20 Subsequent opening out of previously enclosed fields, particularly during the 20th century, has resulted in the loss of numerous field boundaries recorded on late 19th century and early 20th century Ordnance Survey maps. Many of these former field boundaries are seen in the LiDAR imagery in the form of (often very faint) linear banks and depressions.

7.4.21 Fourteen possible former field boundaries were identified within the study area (Figure 72: 3187, 3188, 3192, 3193-6; Figure 74: 3206, 3208, 3210, 3216; Figure 75: 3220; and Figure 76: 3223). Amongst these are numerous examples, which appear on early Ordnance Survey mapping.

Aerial photographs

Overview

7.4.22 A total of 41 individual or grouped features of possible archaeological interest were identified within the land required at Handsacre and Parkgate. The feature types varied over the course of the study area, and comprised of relict field boundaries or boundaries of another nature, extractive pits or pits of unknown cause, pit linear features, trackways, possible enclosures, ridge and furrow, and other undefined potential archaeological features.

7.4.23 Features identified during the remote sensing assessment are described in Annex A and have been illustrated (Figures 72–76).

Undated or tentatively dated sites

7.4.24 A number of features identified through aerial photographs include a field boundary of unknown date (Figure 72: 176); a possible archaeological earthwork feature (Figure 73: 179) which is bell-shaped and could represent a ditch or enclosure; circular shaped extractive pits (Figure 73: 178 and Figure 74: 184), and a mine or extractive pit (Figure 74: 183), which was also seen from LIDAR and Tithe Mapping.

7.4.25 A possible pit alignment (Figure 72: 177) is evident through aerial photographs. These are likely to be former boundaries, of unknown date, and are visible as crop marks.

Prehistoric periods

7.4.26 A possible sub-circular ring ditch (Figure 72: 171) may represent the remains of an Early Bronze Age burial mound. A further similar site was observed (Figure 72: 170) as a sub-circular cropmark.

Medieval periods

7.4.27 Traces of open field medieval cultivation were evident at Handsacre, albeit modern ploughing has eroded much of this. The majority of the ridge and furrow south of Longdon Green has been heavily eroded and survives only as crop marks or very residual earthworks.

7.4.28 To the north at Parkgate the medieval landscape was quite different in nature given the extensive forestry indicated in documentary records. These along with place name evidence, indicate significant rural industry in the area, notably glassmaking. At the southern end of Parkgate, there is significant evidence Of this: pit clusters and extraction pits, along with place name evidence supports the suggestion that glass making was being undertaken in the Bromley Hurst area, but could have extended towards Stockwell Heath.

Post-medieval periods

7.4.29 There is widespread cropmark evidence for post-medieval enclosure/field boundaries, many of which have been removed in the post-Second World War period.

7.5 Conclusions

7.5.1 The remote sensing of the Handsacre and Parkgate areas has provided useful additional understanding. At Handsacre the relative lack of obvious prehistoric

settlement evidence forms a striking contrast with the extensive cropmark evidence from the area immediately to the north. It is not clear whether this is a true reflection of an absence of prehistoric evidence towards the southern edge of the Trent Valley, or simply reflects a change in soil conditions.

7.5.2 The evidence from Parkgate points towards an active medieval and post-medieval landscape. It forms a significant contrast with areas further south in that there is an absence of evidence for medieval settlement, reflecting the fact that the area was substantially forest and subsequently parkland. Widespread indications of later medieval or early post-medieval glassmaking is of particular interest.

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Annex A: Sites identified by remote sensing

Table 1: LiDAR and multi-spectral sites within the Parkgate and Handsacre areas of Fradley to Colton (CA1)

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
3186			Undated	A potential historic route way, approximately 700m in length, located north of Wood End Lane, evident in oblique and vertical imagery.
3187			Post-medieval	Historic field boundary, approximately 170m in length, bisecting a modern agricultural field, evident in aerial imagery.
3188		273	Undated	Sub-circular feature, possible ring ditch, approximately 63m in diameter, east of Hanch Hall Park, evident in oblique and vertical imagery.
3190			Post-medieval	Historic field boundary, approximately 600m in length, outlining historically-enclosed land parcel within a modern open field system. Evident through aerial imagery.
	172	274	Undated	Sub-circular feature, possible ring ditch, approximately 53m in diameter, located north of Wood End Lane junction with A515, evident in oblique and vertical imagery.
	173	275	Undated	Possible square enclosure, approximately 168m in length, it is respected by modern woodland outlay, evident is LiDAR and aerial imagery.
	174		Undated	Historic field boundary, approximately 710m in length, running north- south, west of Bromley Hayes Marina, evident in LiDAR and aerial imagery.
	175		Iron Age	Iron Age pit linear, running northeast- southwest, approximately 274m in length, evident in oblique and vertical imagery.
	176		Undated	Possible east-west aligned trackway, approximately 844m in length, evident in oblique and vertical imagery.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
	177		Undated	Possible feature adjacent to road B5014, approximately 154m in length, evident in oblique and vertical imagery.
3192			Undated	Possible pit cluster, located in the field alongside Tewnals Lane, A515, evident in oblique and vertical imagery.
3193			Post-medieval	Historic field boundary, approximately 150m in length, located southwest of Bromley Hayes Marina, evident in oblique and vertical imagery.
3194			Iron Age	Iron Age pit linear, running northeast-southwest, approximately 293m in length, evident in oblique and vertical imagery.
3195		283	Early Medieval	Area of extant wide ridge and furrow, approximately 344m in length, running northeast-southwest, to the west of Bromley Hayes Marina, evident in LiDAR and aerial imagery.
3196			Post-medieval	Historic field boundary, bisecting a modern field, approximately 183m in length, evident in aerial imagery.
3197			Post-medieval	Historic field boundary, bisecting a modern field, approximately 300m in length, evident in aerial imagery.
3199			Post-medieval	Historic field boundary, bisecting a modern field, approximately 216m in length, evident in aerial imagery.
	180		Post-medieval	Historic field boundary, running across the length of a modern field, approximately 400m in length, located northwest of Bromley Hayes Marina, evident in aerial imagery.
3200			Post-medieval	Historic field boundary network within modern open field system, approximately 400m in length, located to the north of Shaw Lane, evident in aerial imagery.

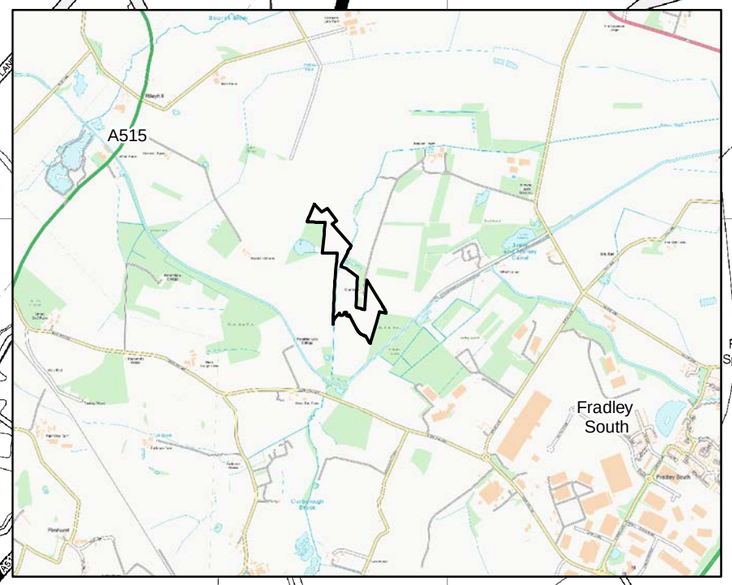
LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
	182		Undated	Possible sub-circular feature, approximately 150m in diameter, located to the east of Tuppenhurst Lane, evident in LiDAR.
	185	286	Undated	Rectilinear feature, possible square enclosure, approximately 68m in length, located alongside the B5014, south of Handsacre within a modern field system, evident in aerial imagery.
	170		Undated	Circular shaped feature, possible extractive pit, approximately 21m in diameter, located east of Stockwell Heath, evident in oblique and vertical imagery.
	171	312	Undated	Key-hole shaped feature, possible extractive pit, approximately 35m in length, located west of Hadley Gate, evident in oblique and vertical imagery.
3189			Undated	Sub-circular feature, possible ring ditch, approximately 96m in diameter, located in modern field systems east of Stockwell Heath, evident in aerial imagery.
3191			Undated	Two circular features, possible extractive pits, approximately 20m each in diameter, located east of Stockwell Heath.
3198			Post-medieval	Square pit features.
	179		Undated	Evidence on Colton_Tithe_1845 Tithe mapping as a potential extractive asset.
	178		Undated	Circular feature, possible extractive pit.
3201	181		Undated	Bell shaped grass mark, lining up with evidence on Colton_Tithe_1845 Tithe mapping as a potential extractive asset.
3202			Post-medieval	Evidence of a pit like extraction. Evident from the LIDAR, Aerial imagery and Tithe Mapping.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
	183		Undated	Circular feature, possible extractive pit.
3203		315	Post-medieval	Narrow ridge and furrow evident on NMP.
3205			Undated	Possible ridge and furrow, partially visible.
3206			Undated	Historic Field Boundary.
3207			Undated	A series of sub-circular features, possible pits.
3208			Medieval	Linear feature bisecting modern field system, however lines up with ridge and furrow documented by NMP.
3209			Undated	Sub-circular archaeological feature, possible ring ditch, and possible secondary occupation in GE 2013 Imagery.
	184		Undated	Pit feature, possible mine.
3213			Undated	Possible field boundary within modern field boundary.
3214		323	Post-medieval	Bowlingally Lane 1st edition 6 inch (1886).
3215		326	Medieval	Ridge and furrow evident On ESRI aerial Imagery across the entire field.
3216		327	Early medieval	Wide ridge and furrow evident on NMP.
3217			Undated	Circular feature, possible pit.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
3218			Undated	Series of adjacent features, possible boundaries or enclosures.
3219			Modern	D-shaped boundary.
3220			Undated	Historic field boundary running along the top of the modern field.
3221			Undated	Oval shaped feature enclosing an area within, potentially related to linear features to the north-east.
3225			Undated	Group of linear features forming a jagged pattern, in close proximity to enclosures to the south and west.
3204			Undated	Large rectangular feature, crossing over two fields, possible enclosure.
3210			Undated	Historical field boundary bisecting a modern field boundary.
3211			Undated	Circular feature, possible pit.
3212			Modern	Likely extractive pit.
3223		364	Undated	Sub-circular boundary.
3224		366	Undated	Circular feature, possible circular enclosure.
3222			Undated	Rectangular shaped boundary.
3226			Modern	Likely extractive pit.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
3227			Modern	Likely extractive pit.

Annex B: Geophysical survey and remote sensing figures



Ashby Sitch
Rice's Spinney
Alrewas Hayes
Alrewas Hayes Cottages
Pool Wood
Fradley Reservoir
Trent and Mersey Canal
Sale Barn
Wharf House
SALE LANE
Rice's Gorse
Wood End Farm
Ravenshaw Cottage
Cranberry
Brokendown Wood
Ravenshaw Wood
Woodend Lock Cottage
Fradley Wood
Fradley Gorse
GORSE LANE
HAY END LANE
WOOD END LANE
Baskerville House
Black Slough Farm
End
Tomhay Wood
Wood End Farm
iew Farm
Full Brook
HALIFAX CLOSE
HALIFAX AVENUE
LOVE

315000
314000
313000
412000
413000
414000
415000

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 1
Map Name	Survey Area 1: West of Fradley Junction (Site Location)
	Geophysical Survey

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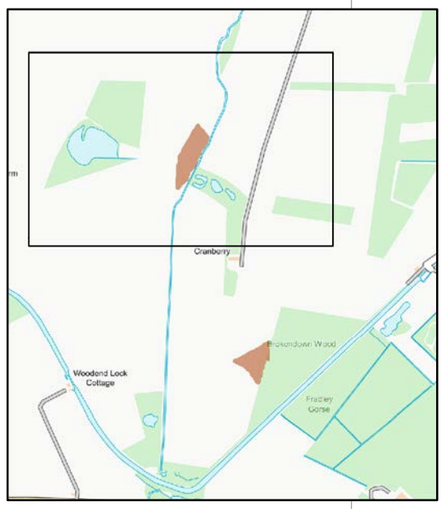

314200

314000

+3nT

-2nT

412800

413000

413200

413400

Legend

Site boundary

Detail Survey Extents

Map Number	Figure 2
Map Name	Survey Area 1: West of Fradley Junction (North) (Greyscale Plot)
	Geophysical Survey

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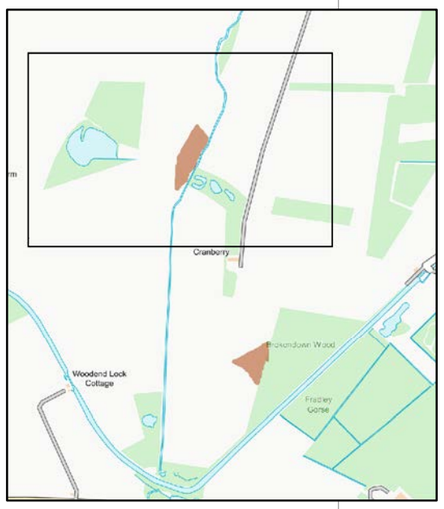

314200

314000

412800

413000

413200

413400

Legend

- Site boundary
- Detail Survey Extents
- Agriculture - Ploughing
- Natural
- Ferrous
- Former Field Boundary

Map Number: Figure 3

Map Name: Survey Area 1: West of Fradley Junction (North) (Interpretation)

Geophysical Survey

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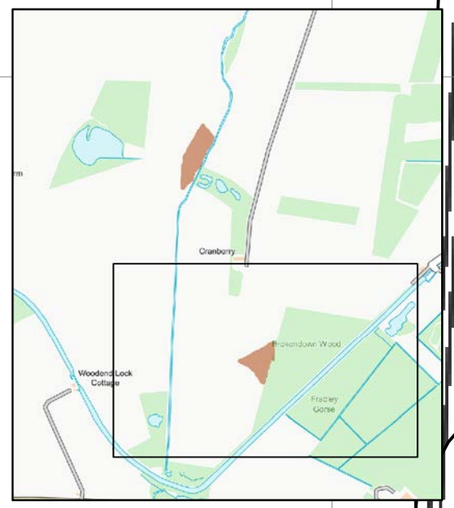
Date: 23/01/19



Brokendown Wood

Fradley Gorse

Lock

+3nT

-2nT

313800

313600

313400

413000

413200

413400

413600

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 4

Map Name: Survey Area 1: West of Fradley Junction (South) (Greyscale Plot)

Geophysical Survey

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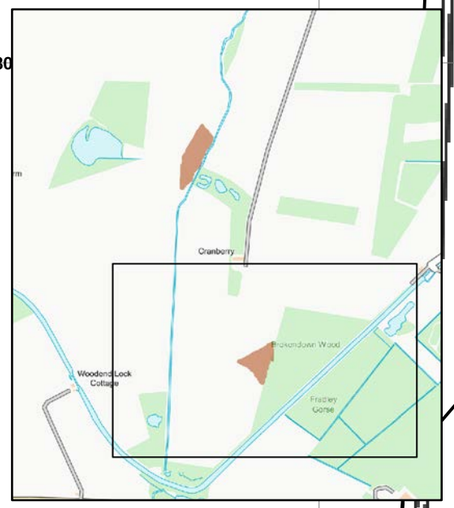

313800

313600

313400

413000

413200

413400

413600

Brokendown Wood

Fradley Gorse

Lock

e

HS2

Legend

- Site boundary
- Detail Survey Extents
- Agriculture - Ploughing
- Natural
- Ferrous
- Former Field Boundary

Map Number: Figure 5

Map Name: Survey Area 1: West of Fradley Junction (South) (Interpretation)

Geophysical Survey

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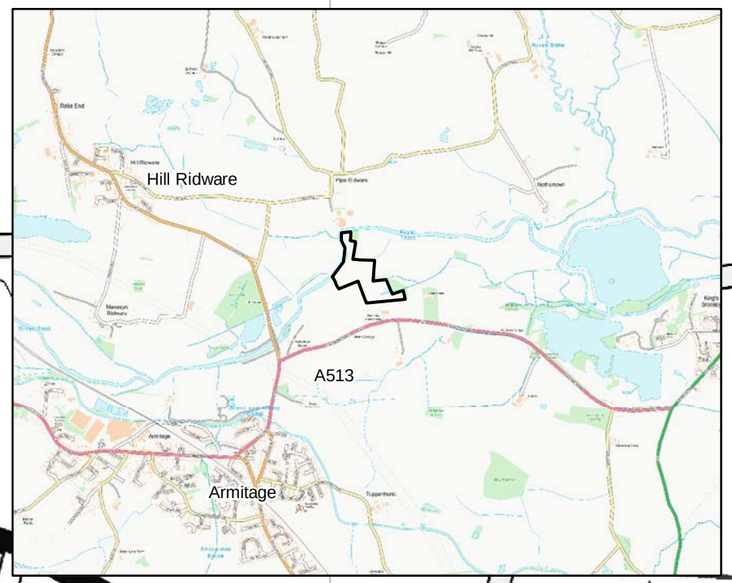

Pipe Ridware

PIPE LANE

River Trent

RIDWARE ROAD

Sitch Covert

Toll House

B5014

Oak Farm

317000

Bromley Lane Farm

A513

KING'S BROMLEY LANE

Glebe Cottage

Highbridge House

OSIER BED LANE

Pingle Covert

409000

410000

HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 6
Map Name	Survey Area 2: Pipe Ridware (Site Location)
	Geophysical Survey

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Scale at A3: 1:5,000

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Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

River Trent

Hill Ridware

A513

Armitage

+3nT

-2nT

317200

409600

411000

Bromley Lane Farm

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 7

Map Name: Survey Area 2: Pipe Ridware (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686. Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,500

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Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

River Trent

Hill Ridware

A513

Armitage

317200

Oak

Bromley Lane Farm

409600

410000

HS2

Legend

- Site boundary
- Detail Survey Extents
- Archaeology
- Ferrous
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural

Map Number: Figure 8

Map Name: Survey Area 2: Pipe Ridware (Interpretation)

Geophysical Survey

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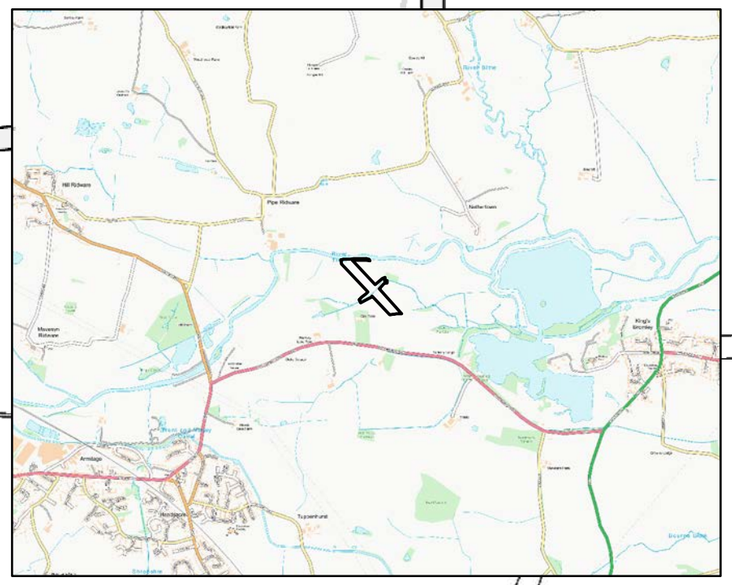

Pipe Ridware

Nethertown

Hill Ridware

King's Bromley

A513

River Trent

Armitage

Tuppenhurst

Oak Farm

317000

Rookery Plantation

Bromley Lane Farm

A513

KING'S BROMLEY LANE

A513

KING'S BROMLEY LANE

Rookery Lodge

OSIER BED LANE

Highbridge House

Glebe Cottage

Little Spinney

Westfield Covert

410000

411000

HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 9

Map Name: Survey Area 3: Pipe Ridware (Site Location)

Geophysical Survey

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

River Trent

Hill Ridware

King's Bromley

A513

Armitage

Tuppenhurst

317200

+3nT

-2nT

Oak Farm

410000

410400

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 10

Map Name: Survey Area 3: Pipe Ridware (Greyscale Plot)

Geophysical Survey

HS2

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Scale at A3: 1:2,000

0 20 40 60 80

Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

River Trent

Hill Ridware

King's Bromley

A513

Armitage

Tuppenhurst

317200

Oak Farm

410000

410400

HS2

Legend

- Site boundary
- Detail Survey Extents
- Ferrous
- Natural
- Possible Archaeology

Map Number: Figure 11

Map Name: Survey Area 3: Pipe Ridware (Interpretation)

Geophysical Survey

HS2

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Scale at A3: 1:2,000

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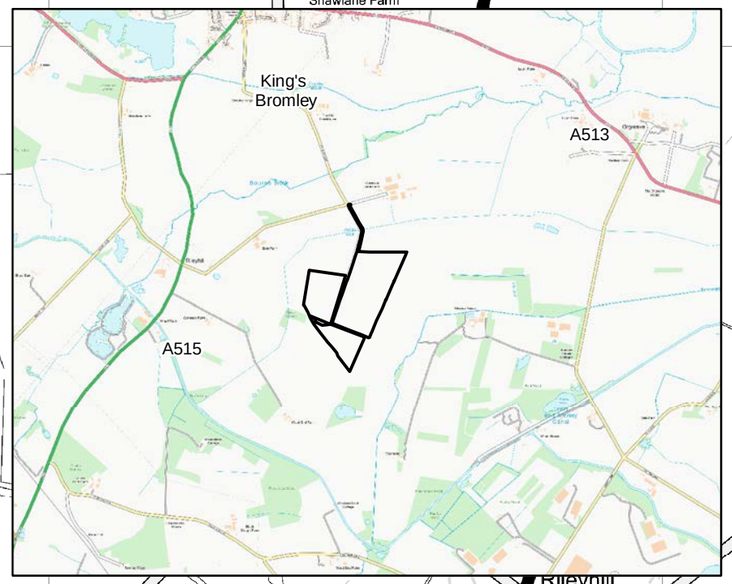
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Shawlane Farm
The Old Farmhouse
Lupin Farm
Orgreave
Wellfield Farm
GRANLEY LANE
Bourne Brook
Common Lane Farm
Ashby Sitch
Barn Farm
Rileyhill
Rice's Spinney
Alrewas Hayes
Wharf Farm
Common Farm
Alrewas Hayes Cottages
Pool Wood
Fradley Reservoir
Trent and Mersey Canal
Rice's Gorse
Wood End Farm
Ravenshaw Cottage
Wharf House
Cranberry
Vicar's Coppice
Vicars Croft Farm
Ravenshaw Wood
Brokendown Wood
SQUIRE LANE
315000
314000
411000
412000
413000
414000
A38
A513

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 12
Map Name	Survey Area 4: Borrow Pit 1 (Site Location)
	Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

412600
412800
413000
413200
315000
314800
Rice's
Spinney
+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 13

Map Name
Survey Area 4:
Borrow Pit 1
(Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000
0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

412600
412800
413000
413200
315000
314800
Rice's Spinney
BP1-003
BP1-010
BP1-007
BP1-011
BP1-012
BP1-005
BP1-001
BP1-004
BP1-009
BP1-008
BP1-006
BP1-002
BP1-013

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Old Field Boundary

Map Number: Figure 14

Map Name: Survey Area 4: Borrow Pit 1 (Interpretation)

Geophysical Survey

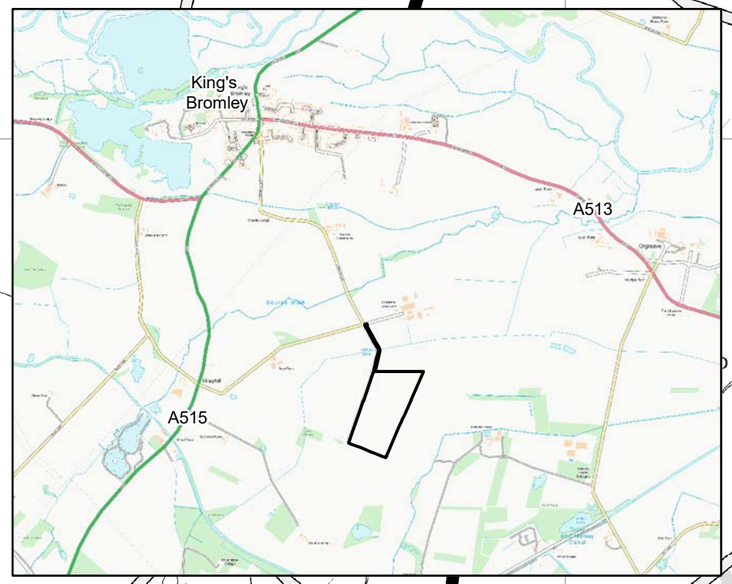
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19



Spinney
Brook
The Old Farmhouse
Lupin Farm
A513
Orgreave
316000
CRAWLEY LANE
Wellfield Farm
ourne Brook
Common Lane Farm
The Orgreave Lodge
Ashby Sitch
Barn Farm
SHAW LANE
Rileyhill
315000
Rice's Spinney
Wharf Farm
Common Farm
Alrewas Hayes
A513
Alrewas Hayes Cottages
Pool Wood
Rice's Gorse
Fradley Reservoir
Trent and Mersey Canal
Sale Barn
Wood End Farm
Wharf House
SALE LANE
314000
Ravenshaw Cottage
Cranberry
Vicar's Coppice
412000
413000
414000

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 15

Map Name: Survey Area 4: Borrow Pit 1 North of Rice's Spinney (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 22/01/19

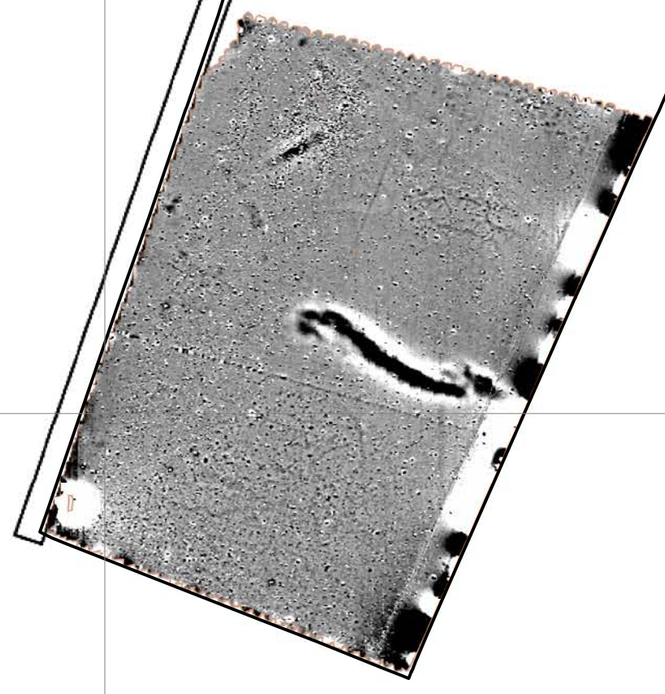
King's
Bromley

A513

Ashby
Sitch

A515
Barn Farm

315200



Rice's
Spinney

Alrewas Hayes

314800

+3nT

-2nT

412400

412800

413200

413600

Legend

Site boundary

Detail Survey Extents

Map Number

Figure 16

Map Name

Survey Area 4: Borrow Pit 1
North of Rice's Spinney
(Greyscale Plot)

Geophysical Survey

HS2

N

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:4,000

0 40 80 120 160

Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

King's Bromley

A513

Ashby Sitch

Barn Farm

A515

315200

Rice's Spinney

Alrewas Hayes

314800

412400

412800

413200

413600

HS2

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Ferrous
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Old Field Boundary

Map Number: Figure 17

Map Name: Survey Area 4: Borrow Pit 1 North of Rice's Spinney (Interpretation)

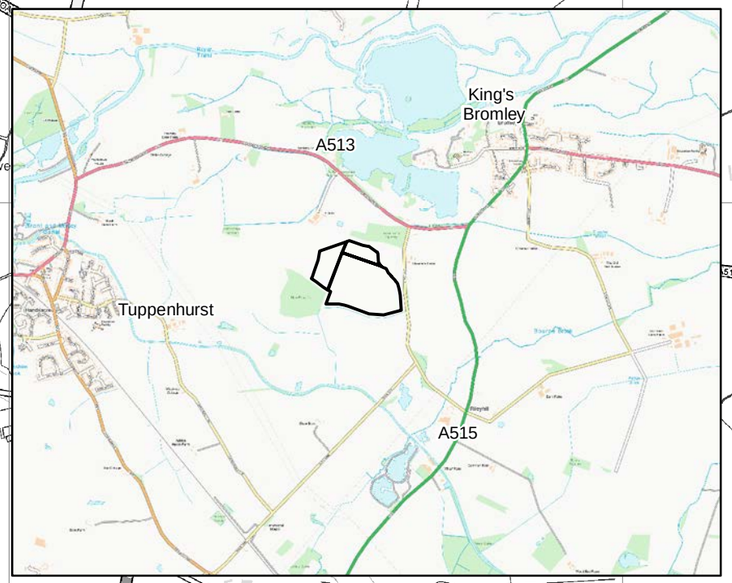
Geophysical Survey

Scale at A3: 1:4,000

0 40 80 120 160 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Oak Farm
Rookery Plantation
New Trent
Rookery Lodge
Little Spinney
Westfield Covert
Echills
Ketchithays Plantation
Marsh Barn Farm
Tomlinson's Spinney
The Belt
Shawlane Farm
New Plantation
Tuppenhurst
Westview Cottage
Ashton Hayes Farm
Shaw Barn
Rileyhill
Crawley Lodge
Crawley Brook
The Old Farmhouse
Bourne Brook
Barn Farm
King's Bromley
Medical Care
Education Facility
Education Facility
KINGS BROMLEY LANE
A513 BURGELEY ROAD
BURGELEY ROAD
A513
TUPPENHURST LANE
SHAW LANE
CRAWLEY LANE
MANOR ROAD
ALREWAS ROAD A513
CHURCH LA
VICARAGE LANE
LANES CLOSE
VICTORIA MEW
TUPPENHURST LANE
BRIDGE ROAD
PROCTORS ROAD
HILL TOP VIEW
CHESTNUT CL
317000
316000
315000
409000
410000
411000
412000

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 18
Map Name	Survey Area 5: Borrow Pit 3 (Site Location)
	Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 22/01/19

410600
410800
411000
411200
316200
316000
Tomli
Spir
+3nT
-2nT
New Plantation
HS2

Legend

Site boundary
Detail Survey Extents

Map Number: Figure 19

Map Name: Survey Area 5: Borrow Pit 3 (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

410600
410800
411000
411200
316200
316000
BP3-001
BP3-002
New Plantation
Tomli
Spir

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Ferrous
- Pipe, Modern Service

Map Number: Figure 20

Map Name: Survey Area 5: Borrow Pit 3 (Interpretation)

Geophysical Survey

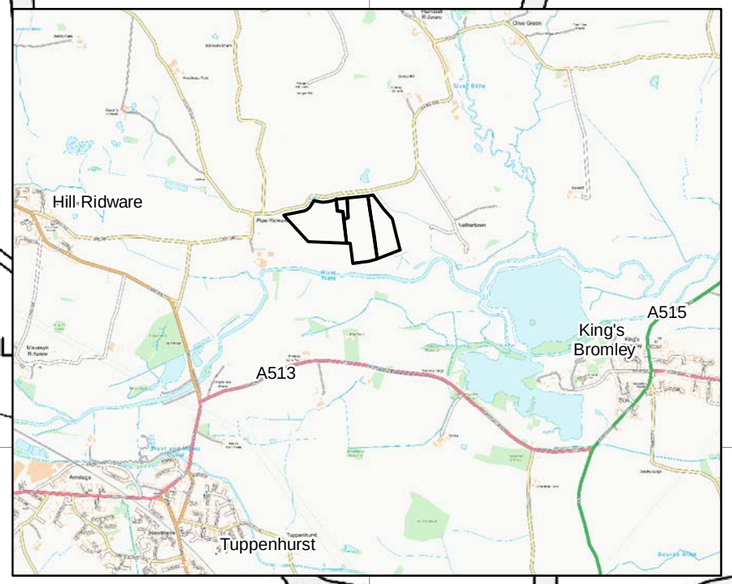
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 22/01/19



Pipe Ridware

Luth Burn

Nethertown

PIPE LANE

River Trent

318000

317500

409500

410000

410500

411000

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 21

Map Name: Survey Area 6: Borrow Pit 4 (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 22/01/19

410200
410400
410600
410800
318000
317800
+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number: Figure 22

Map Name: Survey Area 6: Borrow Pit 4 (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 22/01/19

410200
410400
410600
410800
318000
317800
317600
BP4-003
BP4-001
BP4-004
BP4-002
BP4-005

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Natural
- Ferrous
- Former Field Boundary

Map Number: Figure 23

Map Name: Survey Area 6: Borrow Pit 4 (Interpretation)

Geophysical Survey

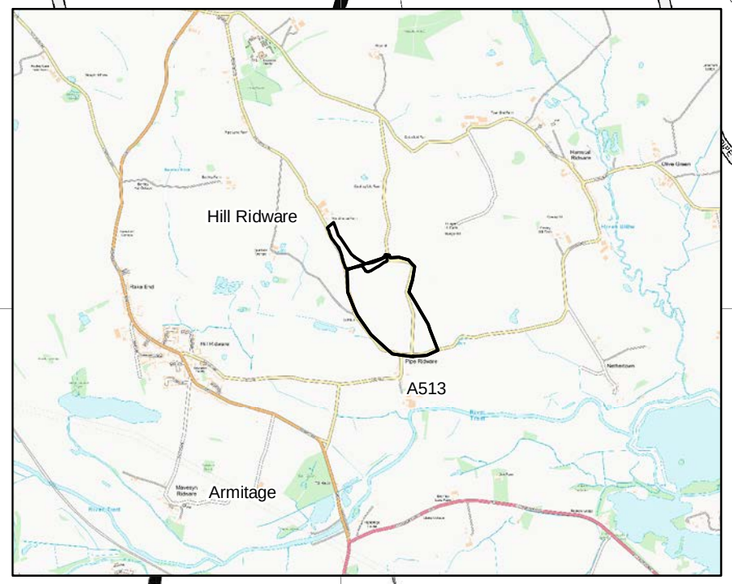
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 22/01/19



Cover

Town End Farm

PW

Cotesfield Farm

BLITHBURY ROAD

Hamstall Ridware

YOXALL ROAD

Olive

319000

WEST WOOD LANE

Goldhayfield Farm

Woodhouse Farm

Hunger Hill Farm

Hunger Hill

Cowley Hill

Cowley Hill Farm

River Blithe

LICHFIELD ROAD

PIPE ROOKERY LANE

Quintin's Orchard

LONGDOGLEY ROAD

RAKE END LANE

B5013

Rake End

Luthbur

318000

Hill Ridware

CHADWICK CRESCENT

OAK LANDS CL

VENUE CL

WISE LANE

HAWKHURST DRIVE

THE MALTINGS

Education Facility

SCHOOL LANE

PIPE LANE

Luth Burn

Pipe Ridware

Nethertown

Lawnmeadow Covert

MAVESYN CL

SANDFORD CL

B5013

MIDWAREROAD

River Trent

CHURCH LANE

Keeper's Covert

Sitch Covert

Oak Farm

408000

409000

410000

411000

HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 24

Map Name: Survey Area 7: North of Pipe Ridware (Site Location)

Geophysical Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 25

Map Name: Survey Area 7: North of Pipe Ridware (North) (Greyscale Plot)

Geophysical Survey

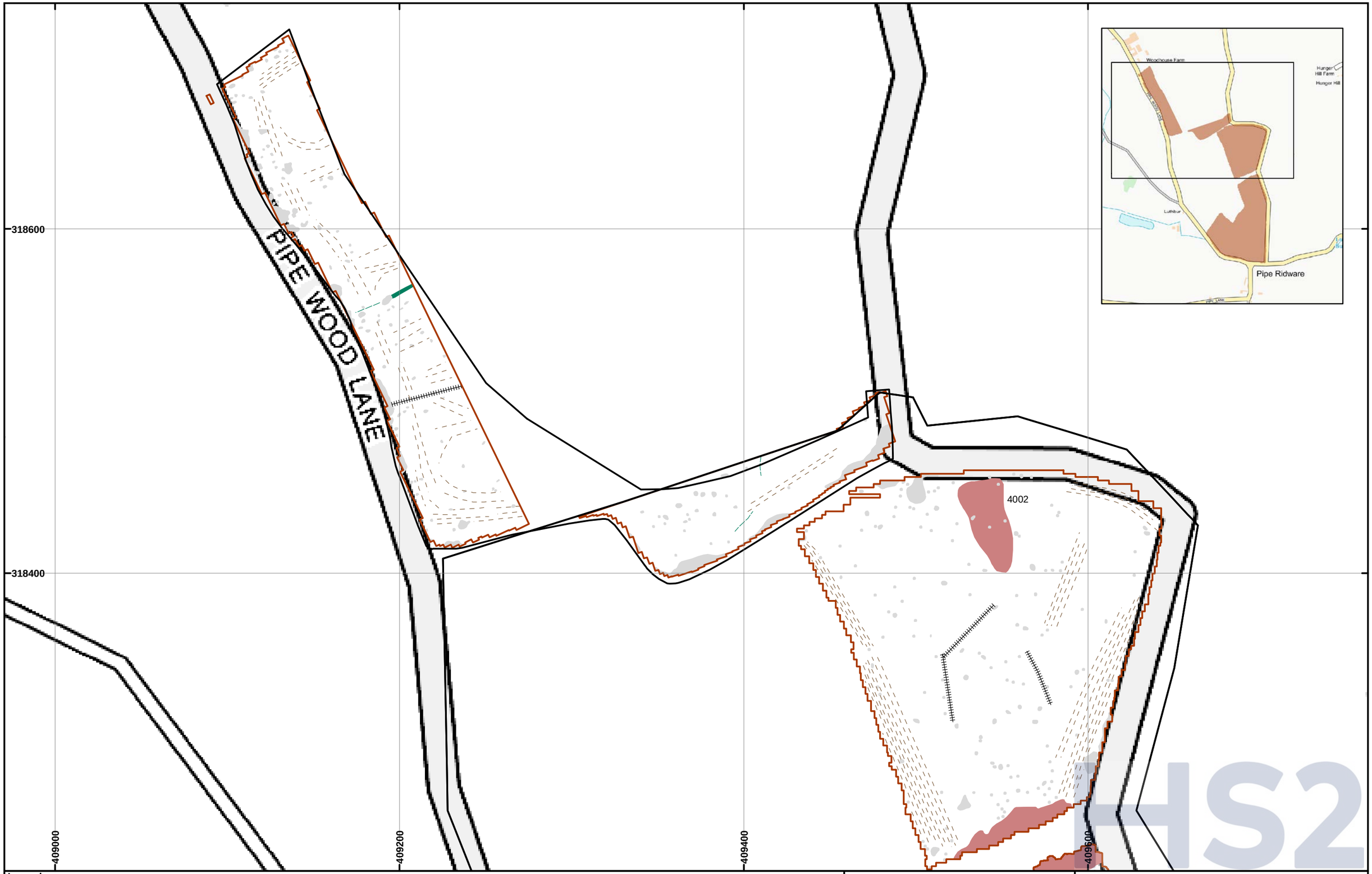
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number

Figure 26

Map Name

Survey Area 7:
North of Pipe Ridware (North)
(Interpretation)

Geophysical Survey

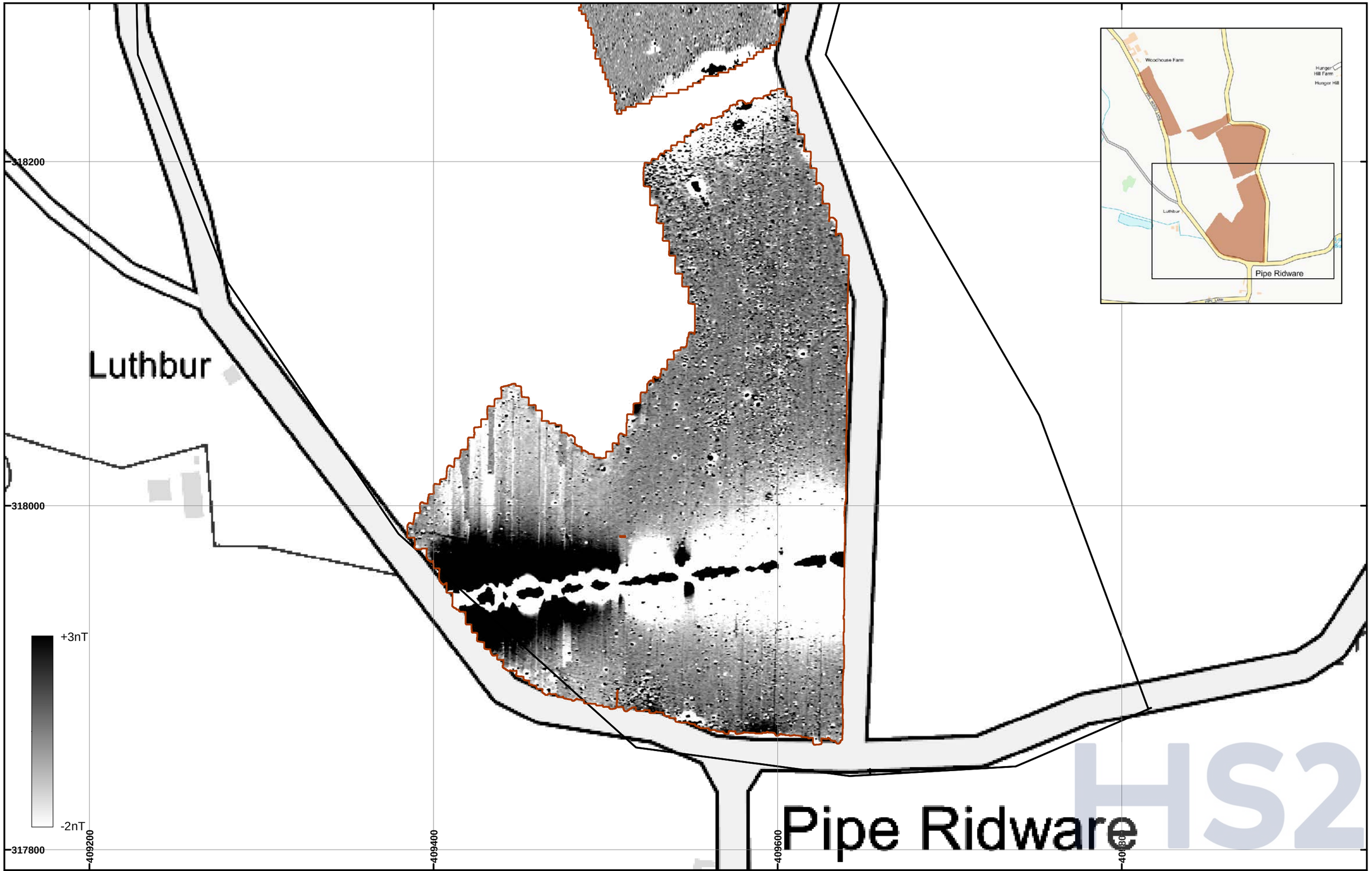
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 27

Map Name: Survey Area 7: North of Pipe Ridware (South) (Greyscale Plot)

Geophysical Survey

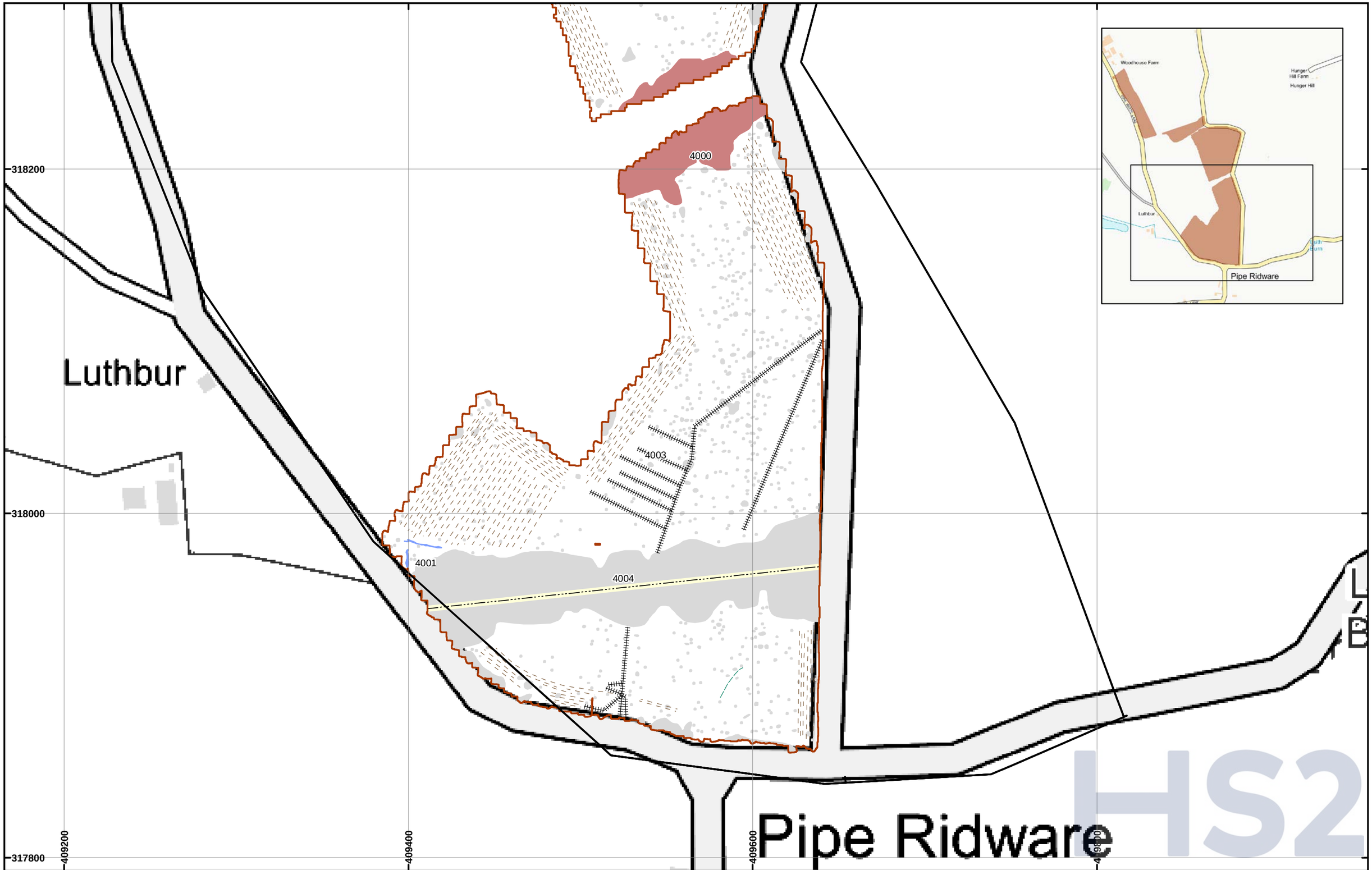
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 28

Map Name: Survey Area 7: North of Pipe Ridware (South) (Interpretation)

Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Town End Farm
PW
Cotesfield Farm
BLITHBURY ROAD
Hamstall Ridware
Olive G
319000
YOXALL ROAD
Goldhayfield Farm
Woodhouse Farm
Hunger Hill Farm
Hunger Hill
Cowley Hill
Cowley Hill Farm
River Blithe
LICHFIELD ROAD
Quintin's Orchard
CLIFF WOOD LANE
Luthbur
318000
Luth Burn
Pipe Ridware
Nethertown
Rake End
Hill Ridware
CHADWICK CRESCENT
OAKLANDS CT
WADE CL
WADE LANE
HAWKHURST DRIVE
THE MALTINGS
Education Facility
SCHOOL LANE
PIPE LANE
MAVESYN CL
SANDFORD PL
awnmeadow Covert
RIDWARE ROAD
CHURCH LANE
River Trent
Keeper's Covert
Sitch Covert
Oak Farm
408000
409000
410000
411000

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 29

Map Name: Survey Area 7: North of Pipe Ridware (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

PIPE WOOD LANE

318600

318400

409200

409400

409600

+3nT

-2nT

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 30

Map Name: Survey Area 7: North of Pipe Ridware (Greyscale Plot)

Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

PIPE WOOD LANE

318600

318400

409200

409400

409600

HS2

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ploughing
- Ferrous

Map Number: Figure 31

Map Name: Survey Area 7: North of Pipe Ridware (Interpretation)

Geophysical Survey

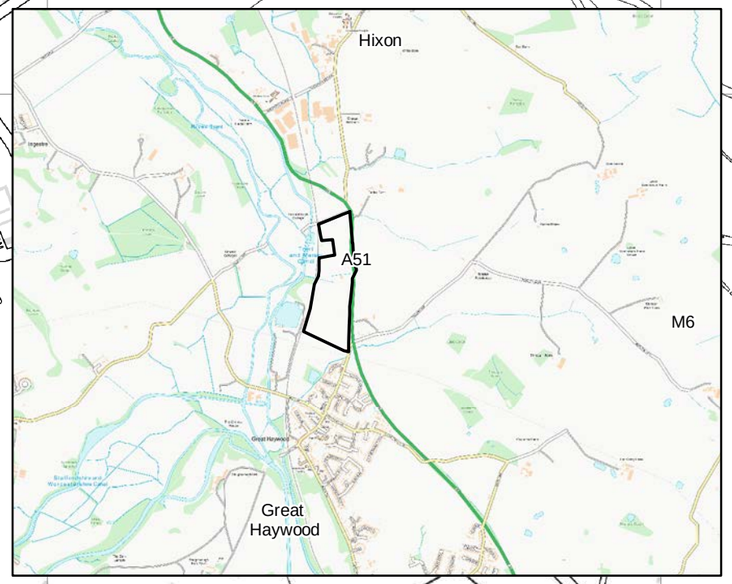
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Medical Care
PASTUREFIELDS LANE
Pasture Fields Farm
Trent
A51
Grange Hill Farm
Yoxley Plantation
EGG LANE
Swansmoor
Thatchholme Covert
Farley Farm
Hoo Mill Lock Cottage
Gorse House
Lionlodge Covert
Hoomill Cottages
HOOMILL LANE
Trent and Mersey Canal
Flushing Covert
Tolldish Farmhouse
MORETON LANE
TOLLDISH LANE
Bricklawn Covert
Little Covert
Tithebarn Farm
Tithebarn Covert
Jewstrump Covert
Oaklands Farm
The Chinese House
Great Haywood
MILL LANE
Medical Care
PO
PW
LITTLE TIXALL LA
MANOR CL
SCHOOL LA
THE UPLANDS
UPLANDS
ELM CLOSE
ABBEY FIELDS
MILL CL
FRIARS CL
COVERT CL
ESSEX DR
EARLS WK
NURSERY WK
GREEN CL
OLD FIELDS
PRESTON
TSUNE FARM CT
325000
324000
323000
398000
399000
400000
401000

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 32

Map Name: Survey Area 8: Great Haywood (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686. Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 33

Map Name: Survey Area 8: Great Haywood (North) (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

A51

Farley F

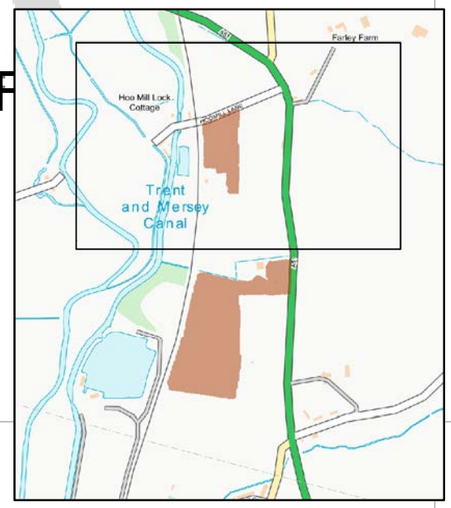
Hoo Mill Lock Cottage

HOOMILL LANE

4002

4004

Trent and Mersey Canal



324200

324000

323800

399600

399800

400000

400200

400400

HS2

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service

Map Number: Figure 34

Map Name: Survey Area 8: Great Haywood (North) (Interpretation)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,500

0 25 50 75 100 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 35

Map Name: Survey Area 8: Great Haywood (South) (Greyscale Plot)

Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Canal

323800

323600

4000

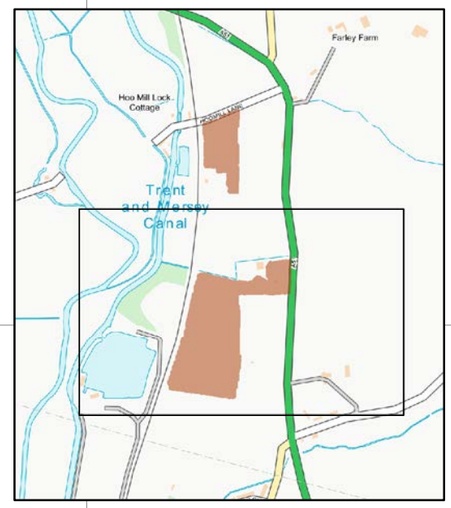
4001

399600

399800

400000

400200



Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service

Map Number

Figure 36

Map Name

Survey Area 8:
Great Haywood (South)
(Interpretation)

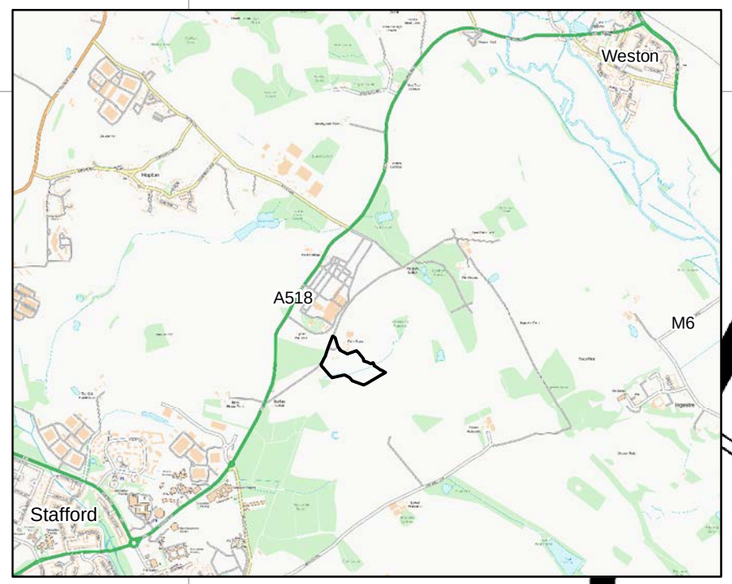
Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Fiddler's Lodge

Lambert's Coppice

Parkhouse

325500

A518

Weetman's Plantation

Upper Berryhill

Park Farm

325000

Brick House Farm

Stafford Lodge

A518

Upper Hanyards

324500

395000

395500

396000

396500

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 37

Map Name: Survey Area 9: Showground (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 38

Map Name: Survey Area 9: Showground (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:1,500

0 10 20 30 40 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Weston

Upper Berryhill

A518

M6

Park Farm

Stafford

325000

324800

395600

395800

396000

HS2

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Ferrous
- Industrial, Burnt-Fired, Increased Magnetic Response
- Old Field Boundary

Map Number: Figure 39

Map Name: Survey Area 9: Showground (Interpretation)

Geophysical Survey

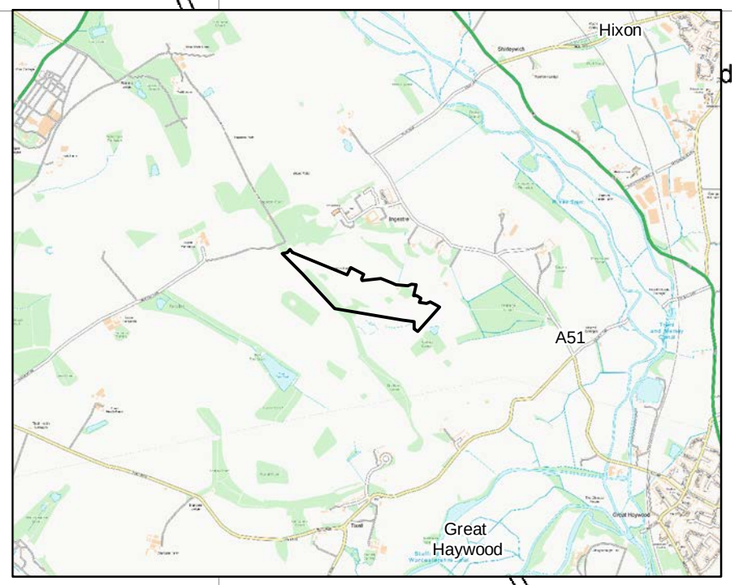
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:1,500

0 10 20 30 40 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Art Gallery

PW

HOME FARM CT

Ingestre

Church Field

Lionlodge
Covert

Flushing
Covert

325000

324500

324000

397000

397500

398000

398500

HS2

Legend

Site boundary

Detail Survey Extents

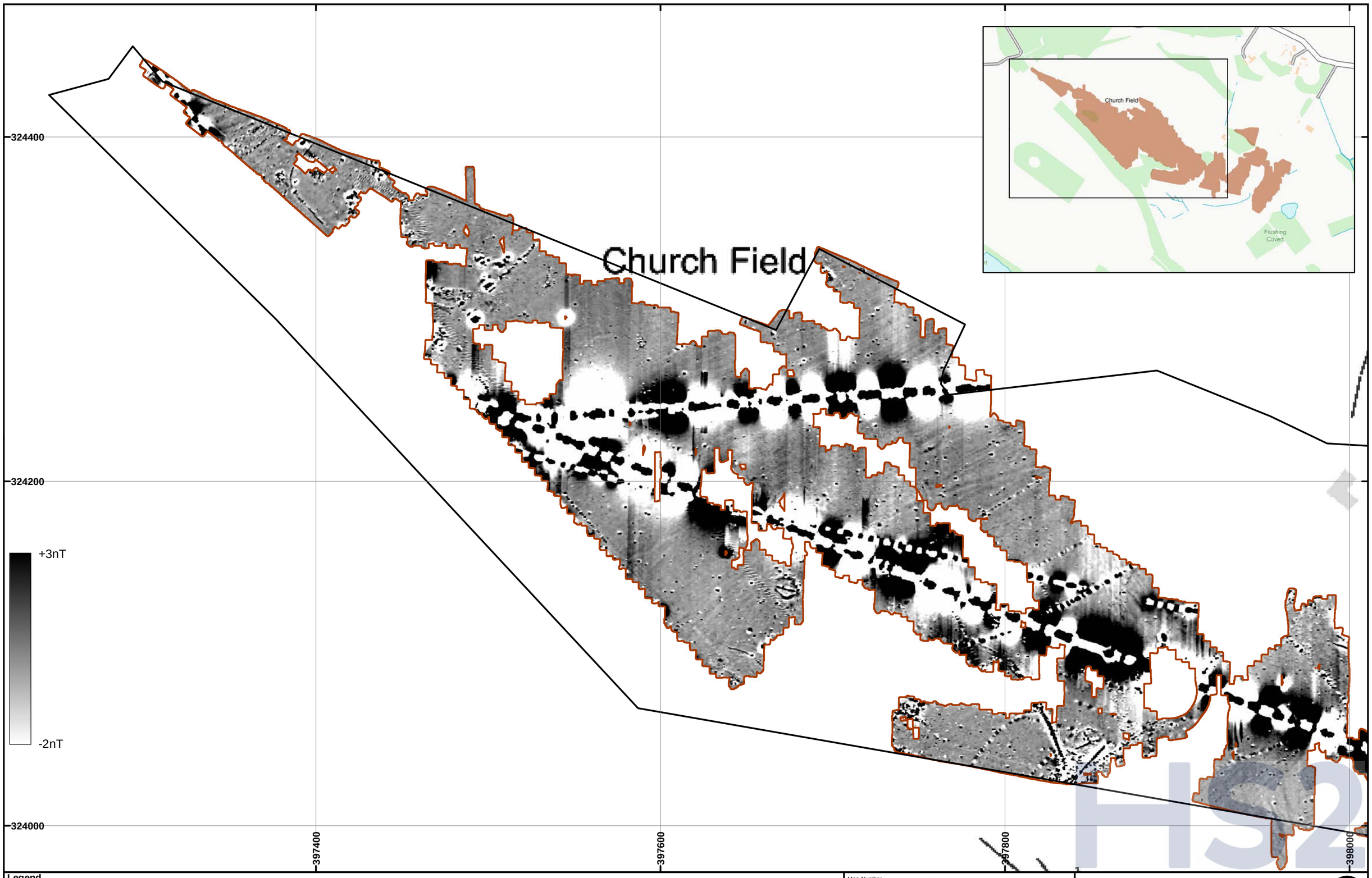
Map Number	Figure 40
Map Name	Survey Area 10: Ingestre Golf Course (Site Location)
	Geophysical Survey

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 41

Map Name: Survey Area 10: Ingestre Golf Course (West) (Greyscale Plot)

Geophysical Survey

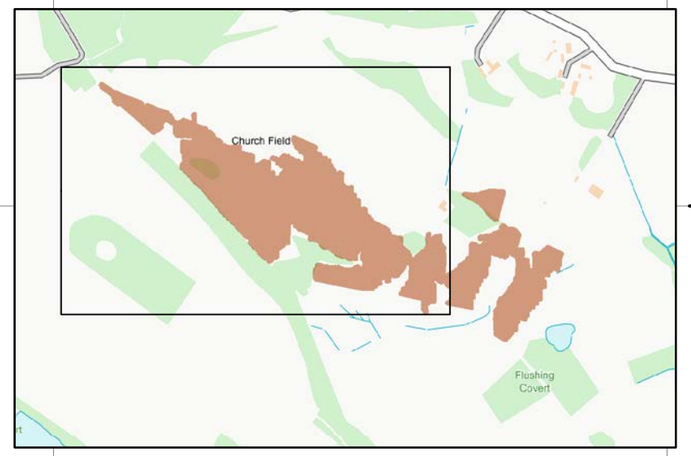
Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Church Field



PA04-012
PA04-009
PA04-008
PA04-011
PA04-004
PA04-005
PA04-003
PA04-002

324400
324200
324000
397400
397600
397800
398000

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service
- Trackway

Map Number: Figure 42

Map Name: Survey Area 10: Ingestre Golf Course (West) (Interpretation)

Priority Area 4

HS2

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

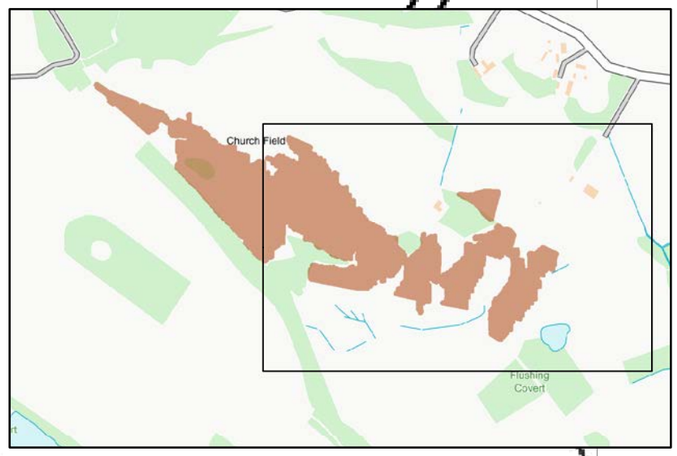
Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Field



324200

324000

+3nT

-2nT

397800

398000

398200

398400

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 43

Map Name: Survey Area 10: Ingestre Golf Course (East) (Greyscale Plot)

Geophysical Survey

HS2

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80

Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Field

PA04-012

PA04-008

PA04-011

PA04-001

PA04-003

PA04-002

PA04-010

PA04-007

PA04-006

324200

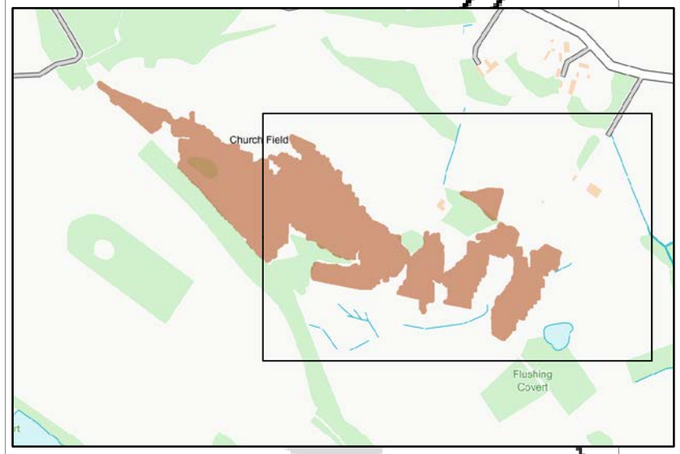
324000

397800

398000

398200

398400



Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service
- Trackway

Map Number: Figure 44

Map Name: Survey Area 10: Ingestre Golf Course (East) (Interpretation)

Geophysical Survey

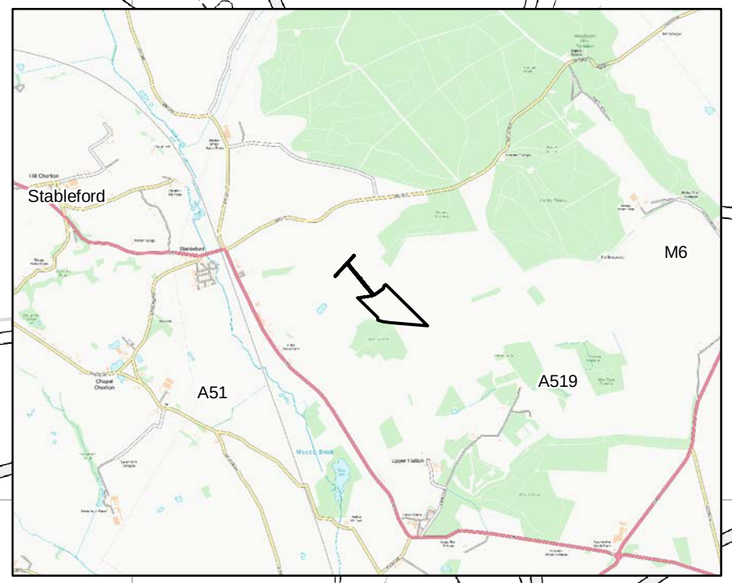
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



DRAYTON ROAD

HARLEY THORN

Byatt's Common

Keepers Cottage

DOG LANE

Harley Thorns

Harley Thorn Farm

339000

Nursery Common

Weston Lodge

Stableford

A51

The Sheepcotes

STAMFORD BANK

The Cliffs

LITTLE CROFT

Little Rowe Farm

Hatton Common

Hatton Rough

Old Waste Plantation

338000

HADDON LANE

Chapel Chorlton

PW

New Waste Plantation

Swinchurch Rough

381000

Swinchurch Cottages

BUTTHOUSE LANE

382000

Meece Brook

Upper Hatton

383000

384000

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 45

Map Name: Survey Area 11: The Rowe (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

338600

338400

+3nT

-2nT

Hatton Common

338200

382400 382600 382800 383000

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 46

Map Name: Survey Area 11: The Rowe (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

338600

338400

Hatton Common

338200

382400 382600 382800 383000

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Natural
- Ferrous

Map Number: Figure 47

Map Name: Survey Area 11: The Rowe (Interpretation)

Geophysical Survey

HS2

N

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

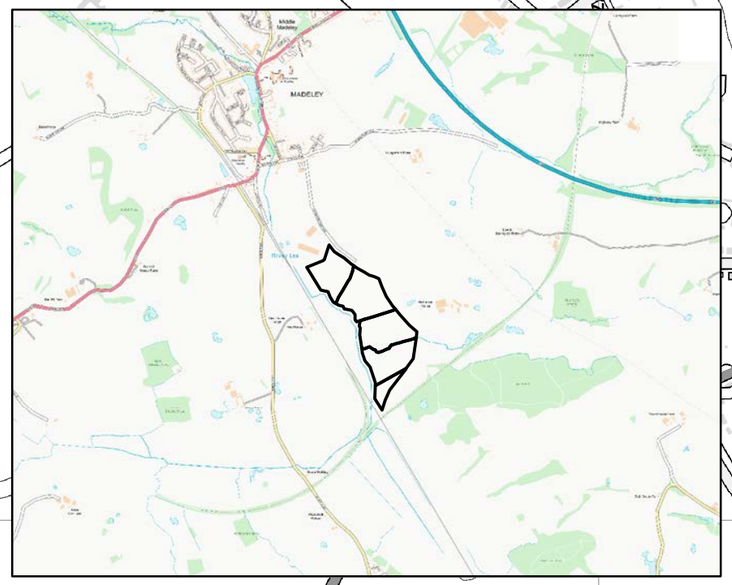
Scale at A3: 1:2,000

0 20 40 60 80

Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



MADELEY

376000

378000

379000

344000

343000

Education Facility

PW

ASH

POOLSIDE

THE HOLBORN

PASTORAL CL

CASTLE LANE

VICARAGE LANE

BAR HILL

STATION ROAD

MANOR ROAD

NETHERSETHEY LANE

HUNGERFORD LANE

KNIGHT ST

Hungerford Farm

Highway Farm

M6

M6

River Lea

Lower Stoneylow Farm

Bar Hill House Farm

A525

Netherset House

Aldersey's Rough

Hey House Lodge

Hey House

Upper Bitterns Wood

M6

A525

Lower Bitterns Wood

Manor Farm

Hey Sprink

Woodhouse F

HS2

Legend

Site boundary

Detail Survey Extents

Map Number	Figure 48
Map Name	Survey Area 12: Borrow Pit 5 (Site Location)
	Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400

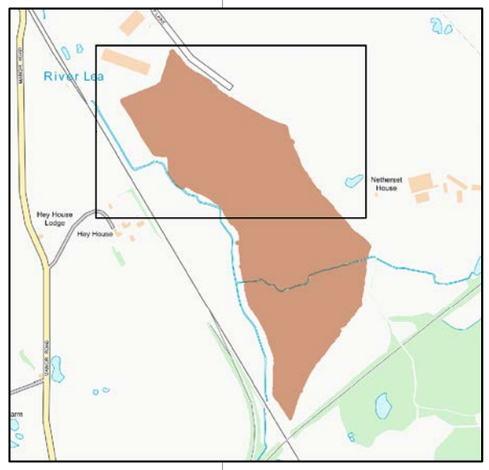
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

377600
377800
378000
378200
343800
343600
343400

+3nT
-2nT



Legend

Site boundary
Detail Survey Extents

Map Number: Figure 49

Map Name: Survey Area 12: Borrow Pit 5 (North) (Greyscale Plot)

Geophysical Survey

Scale at A3: 1:2,000

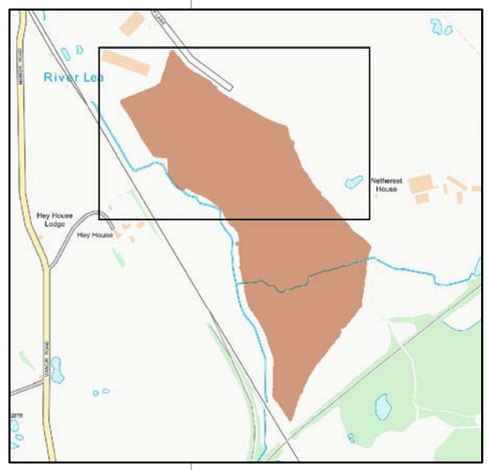
0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

377600
377800
378000
378200
343800
343600
343400

BP5-018
BP5-005
BP5-023
BP5-006
BP5-009
BP5-008
BP5-029
BP5-014
BP5-024
BP5-007
BP5-010
BP5-028
BP5-019
BP5-015
BP5-027
BP5-025
BP5-020
BP5-016
BP5-026
BP5-001



Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 50

Map Name: Survey Area 12: Borrow Pit 5 (North) (Interpretation)

Geophysical Survey

Scale at A3: 1:2,000

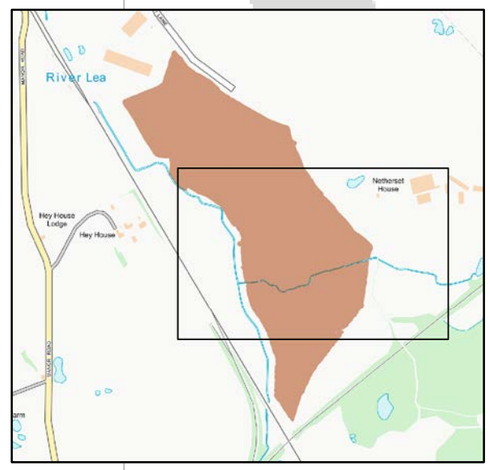
0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

377800
378000
378200
378400
343400
343200
343000

Netherset House



+3nT

-2nT

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 51

Map Name: Survey Area 12: Borrow Pit 5 (Central) (Greyscale Plot)

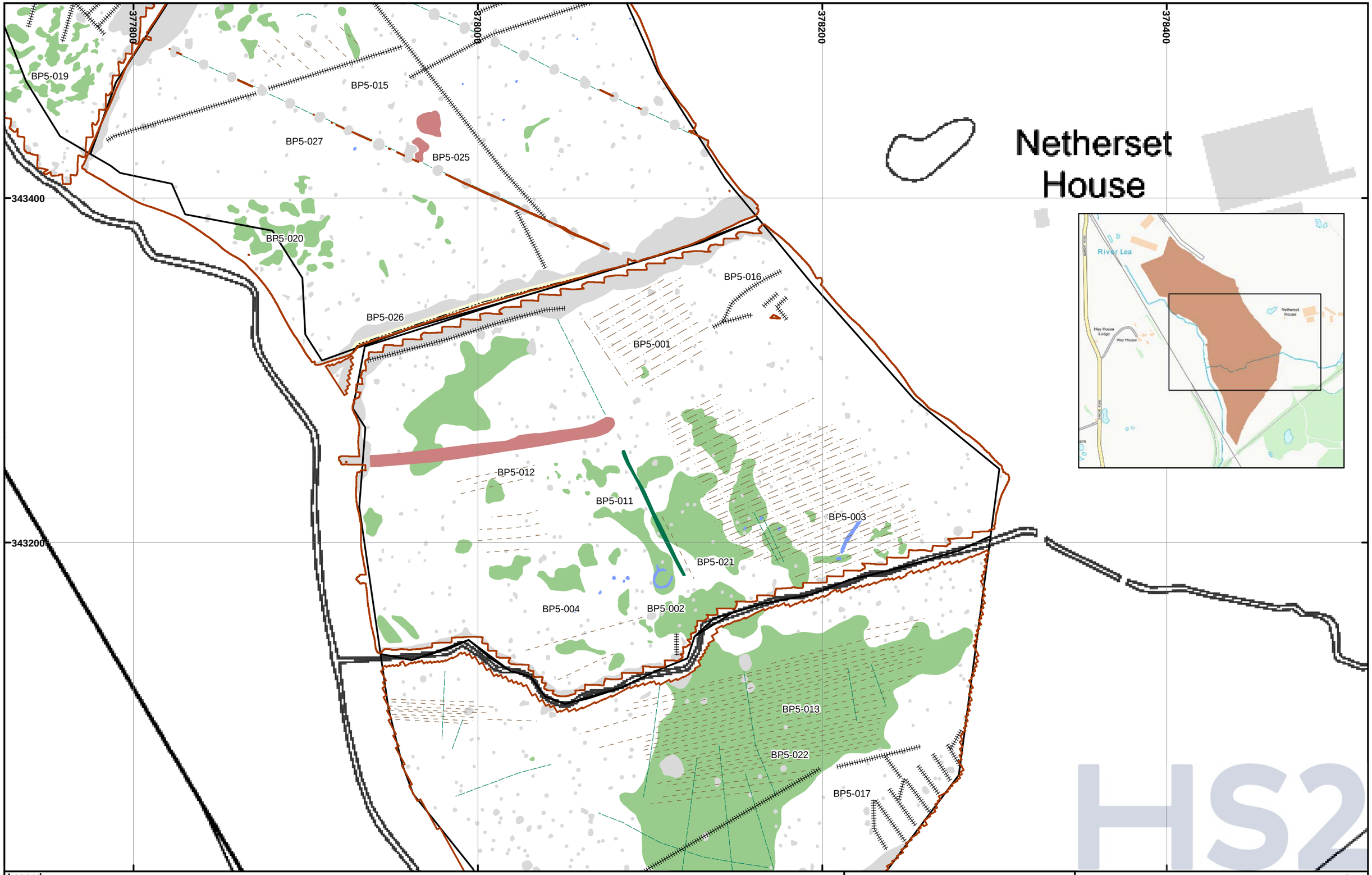
Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 52

Map Name: Survey Area 12: Borrow Pit 5 (Central) (Interpretation)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

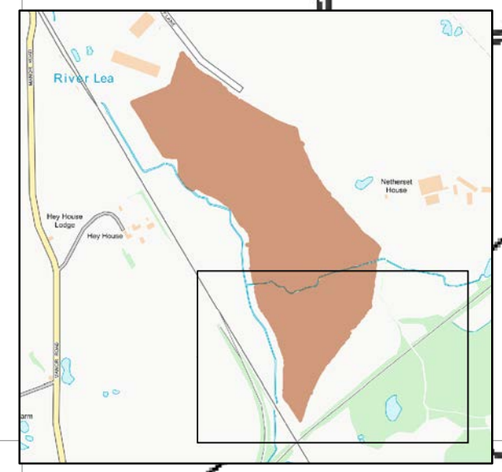
Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

377800
378000
378200
378400
343000
342800
+3nT
-2nT



HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 53

Map Name: Survey Area 12: Borrow Pit 5 (South) (Greyscale Plot)

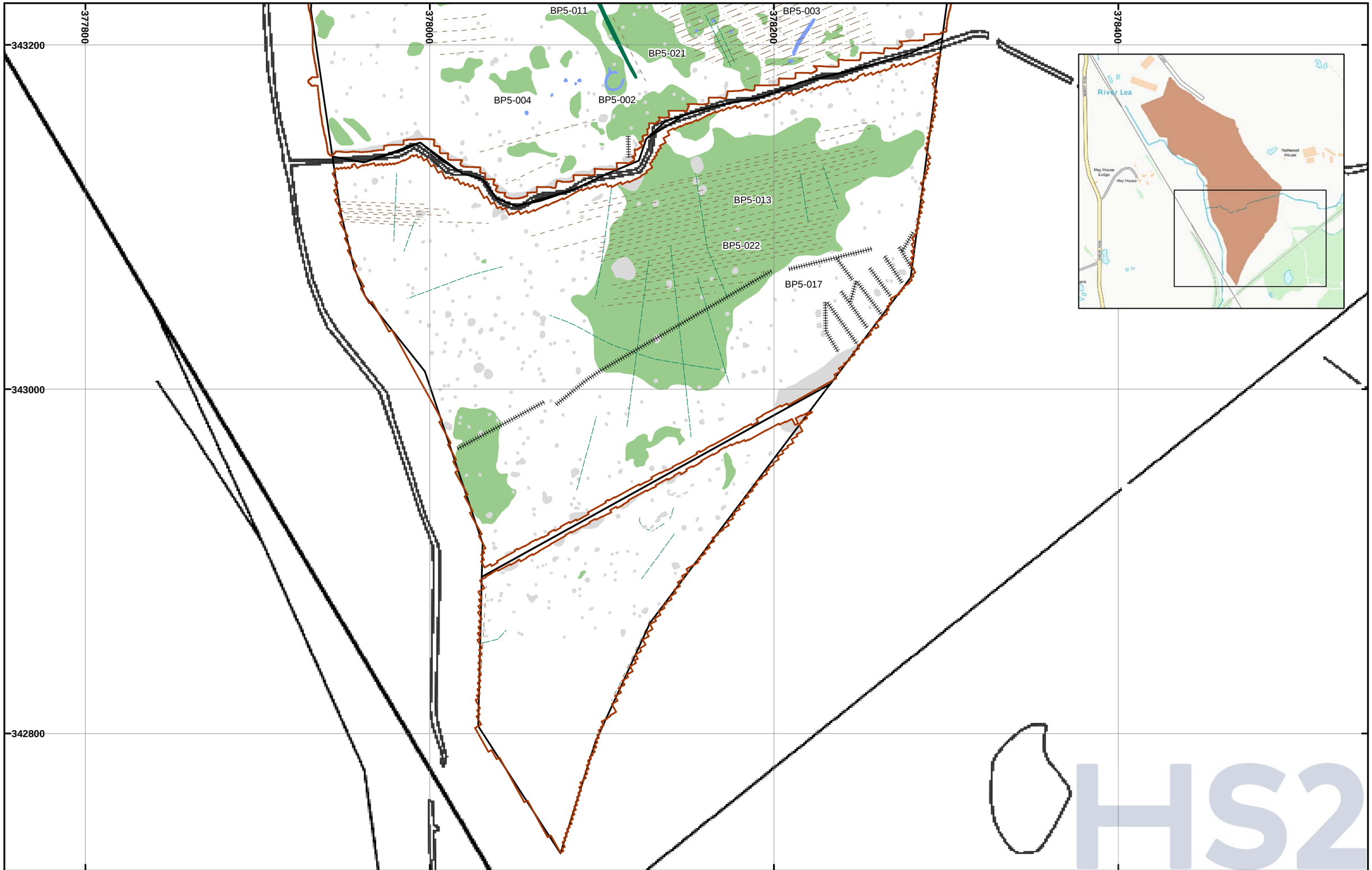
Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 54

Map Name: Survey Area 12: Borrow Pit 5 (South) (Interpretation)

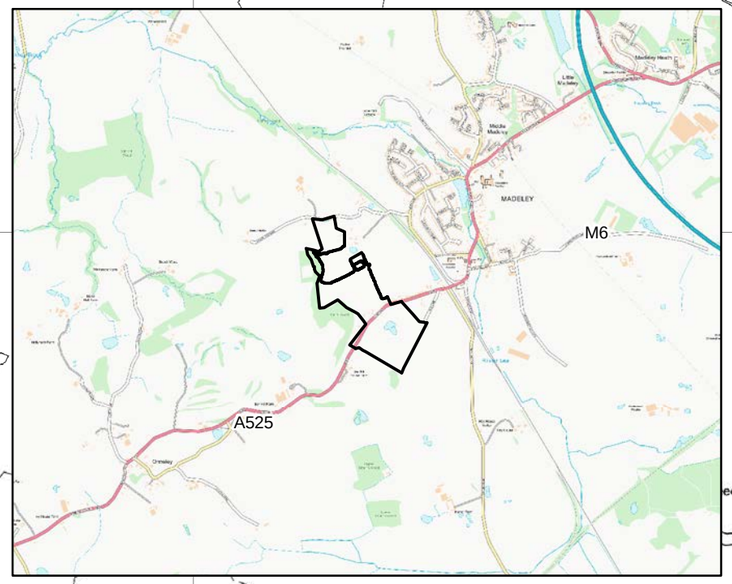
Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19



Lower Mill Cottage
Grafton's Wood
Middle Madeley
Hazeley Brook
345000
MADELEY
Education Facility
PW
Education Facility
PW
Beech Wood
Whitemoor Farm
Blake Hall Farm
Barhill Wood
344000
River Lea
Bar Hill House Farm
Bar Hill Farm
Netherset House
Hey House Lodge
Hey House
Onneley
Upper Bitterns Wood
Hungerford Farm
375000
376000
377000
378000
343000

HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 55
Map Name	Survey Area 13: Madeley (Site Location)
	Geophysical Survey

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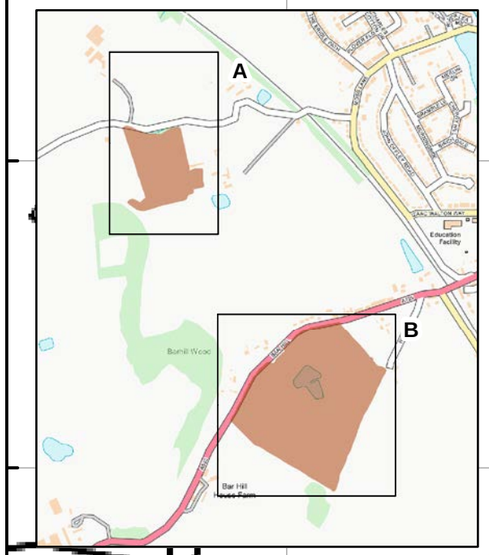
Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



+3nT

-2nT

A

B

344800

344700

344600

344500

344400

344100

344000

343900

343800

343700

376300

376400

376500

376600

376700

376800

376900

BAR HILL

Bar Hill

ouse Farm

HS2

Legend

Site boundary

Detail Survey Extents

Map Number	Figure 56
Map Name	Survey Area 13: Madeley (Greyscale Plot)
	Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

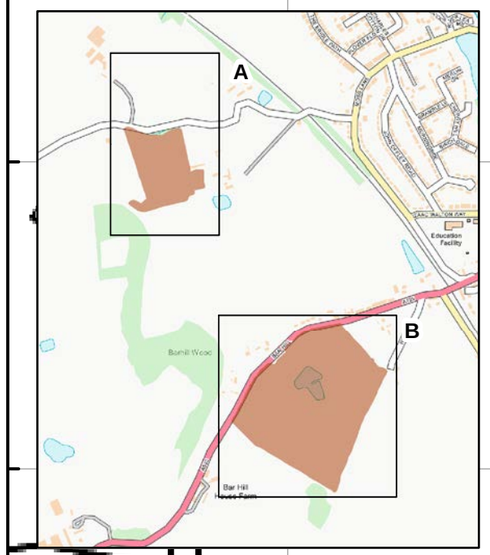
Scale at A3: 1:2,000

0 20 40 60 80

Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



A

B

344800

344700

344600

344500

344400

344100

344000

343900

343800

343700

376300

376400

376500

376600

376700

376800

376900

BAR HILL

PA02-001

PA02-007

PA02-013

PA02-003

PA02-014

PA02-002

PA02-008

PA02-010

PA02-005

PA02-009

PA02-011

PA02-015

PA02-004

PA02-006

Bar Hill House Farm

HS2

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 57

Map Name: Survey Area 13: Madeley (Interpretation)

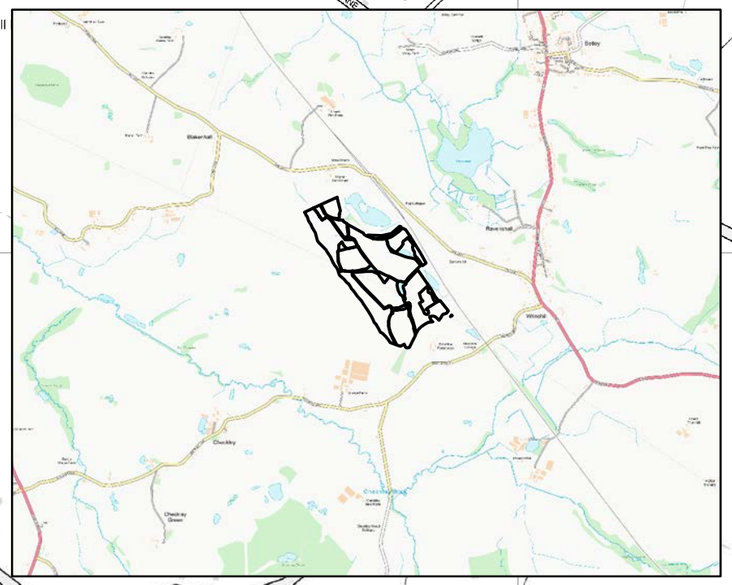
Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



373000
374000
375000
376000
348000
347000
Gonsley Cottages
DEN LANE
Blakenhall
Lower Den Farm
Moss House
Higher Den House
Fog Cottages
Betley Mere
Wrench's Wood
Shuffers Wood
Education Facility
CHURCH LANE
PW
COURT WALK
A531
MAIN ROAD
Ravenshall
CRACOW MOSS
THE MERE
OLD ROAD
Bunkers Hill
MILL LANE
Betley
Ash Coppice
A531
Randilow Farmhouse
Randilow Cottage
CHECKLEY LANE
Wrinehill
Shaw's Rough
Grange Farm
Checkley
HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number	Figure 58
Map Name	Survey Area 14: Borrow Pit 6 (Site Location)
	Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

374000

374200

374400

347600

347400

347200

+3nT

-2nT

Legend

Site boundary

Detail Survey Extents

Map Number

Figure 59

Map Name

Survey Area 14:
Borrow Pit 6 (North)
(Greyscale Plot)

Geophysical Survey

HS2

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Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

374000
374200
374400
347600
347400
347200
BP6-010
BP6-008
BP6-005
BP6-007
BP6-001
BP6-009
BP6-004
BP6-003
Higher Don House
Fog Cottages
Bunkers
Randlow Farmhouse
HS2

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary
- Trackway

Map Number: Figure 60

Map Name: Survey Area 14: Borrow Pit 6 (North) (Interpretation)

Geophysical Survey

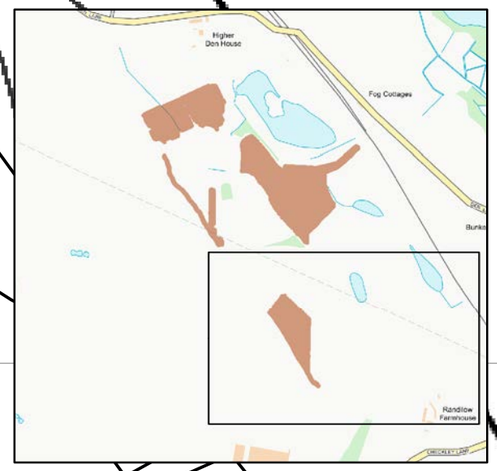
Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

374200
374400
374600
374800
347000
346800



+3nT

-2nT

Randilow Farmhouse

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 61

Map Name: Survey Area 14: Borrow Pit 6 (South) (Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19

374200
374400
374600
374800
347000
346800
BP6-006
BP6-002
Higher Don House
Fog Cottages
Bunks
Randilow Farmhouse
Randilow Farmhouse

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Ferrous
- Pipe, Modern Service
- Former Field Boundary
- Trackway

Map Number: Figure 62

Map Name: Survey Area 14: Borrow Pit 6 (South) (Interpretation)

Geophysical Survey

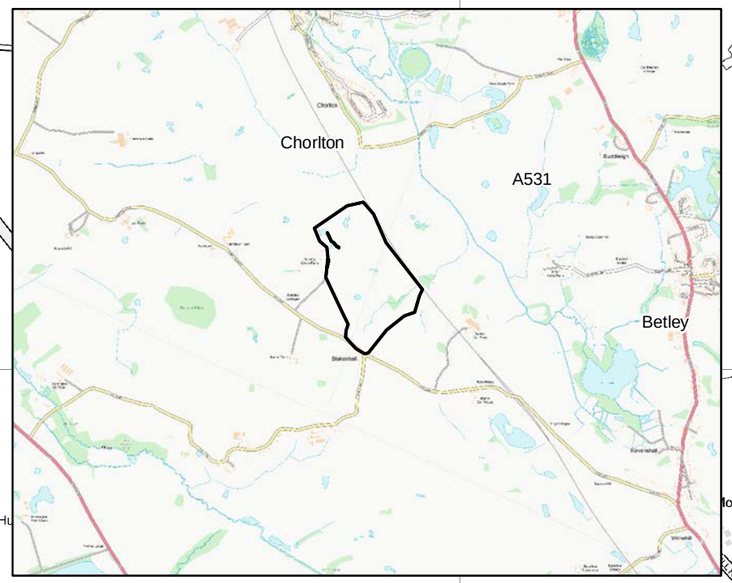
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV -REP-000-001174

Date: 23/01/19



Buddileigh

Betley Common

Bluebell Lodge

Green Valley Farm

COMMON LANE

Gonsley Green Farm

Gonsley Cottages

DEN LANE

Blakenhall Moss

Lower Den Farm

Manor Farm

Blakenhall

Moss House

Higher Den House

Fog Cottages

Betley Mere

Doddington Mill Farm

MILL LANE

Mill Covert

Robin Knight's Rough

Mildale

Bunkers Hill

349000

348000

372000

373000

374000

375000

Legend

Site boundary

Detail Survey Extents

Map Number	Figure 63
Map Name	Survey Area 15: Godewyneslegh (Site Location)
	Geophysical Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

348400

348200

373400

373600

+3nT

-2nT

Blakenhall

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 64

Map Name: Survey Area 15: Godewyneslegh (Greyscale Plot)

Geophysical Survey

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

348400

348200

PA01-001

PA01-002

PA01-003

PA01-004

PA01-005

PA01-006

PA01-007

PA01-008

PA01-009

PA01-010

Blakenhall

373400

373600

HS2

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number: Figure 65

Map Name: Survey Area 15: Godewyneslegh (Interpretation)

Geophysical Survey

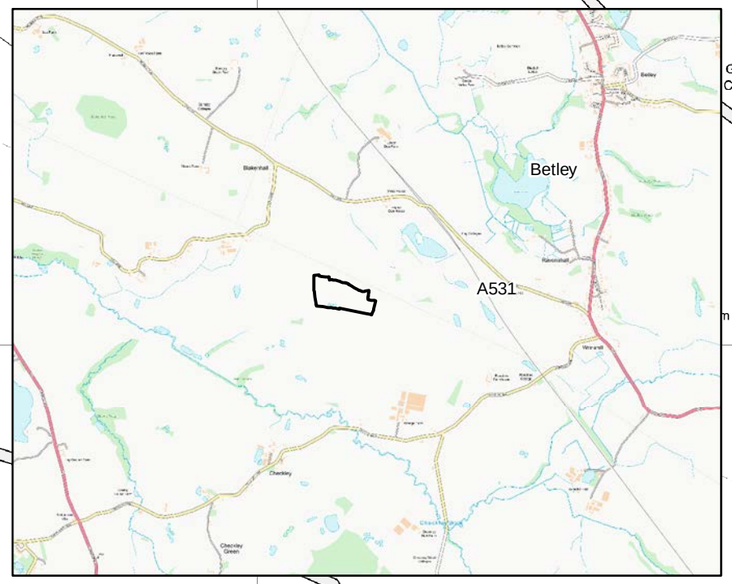
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Gonsley Cottages

Blakenhall

Lower Den Farm

Green Valley Farm

COMMON LANE

PO

COURT WALK

A531

348000

Moss House

DEN LANE

MILL LANE

Higher Den House

Betley Mere

Fog Cottages

Ravenshall

CRACOW MOSS

MAIN ROAD

THE MEADOWS

OULDERODS

Robin Knight's Rough

Millidale

MILL LANE

DEN LANE

Bunkers Hill

347000

Wrinehill

A531

CHECKLEY LANE

Randilow Farmhouse

Randilow Cottage

Ash Coppice

LONDON ROAD

Shaw's Rough

Grange Farm

CHECKLEY LANE

Ley Ground Farm

372000

373000

374000

375000

HS2

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 66

Map Name: Survey Area 16: North of Checkley Hall Farm (Site Location)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Higher
Den House

Betley

A531

347000

347200

+3nT

-2nT

373200

373600

374000

374400

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 67

Map Name: Survey Area 16:
North of Checkley Hall Farm
(Greyscale Plot)

Geophysical Survey

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:4,000

0 40 80 120 160
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Higher
Den House

Betley

A531

347600

347200

373200

373600

374000

374400

346800

Legend

- Site boundary
- Detail Survey Extents
- Ferrous
- Industrial, Burnt-Fired, Increased Magnetic Response
- Old Field Boundary
- Possible Archaeology

Map Number: Figure 68

Map Name: Survey Area 16: North of Checkley Hall Farm (Interpretation)

Geophysical Survey

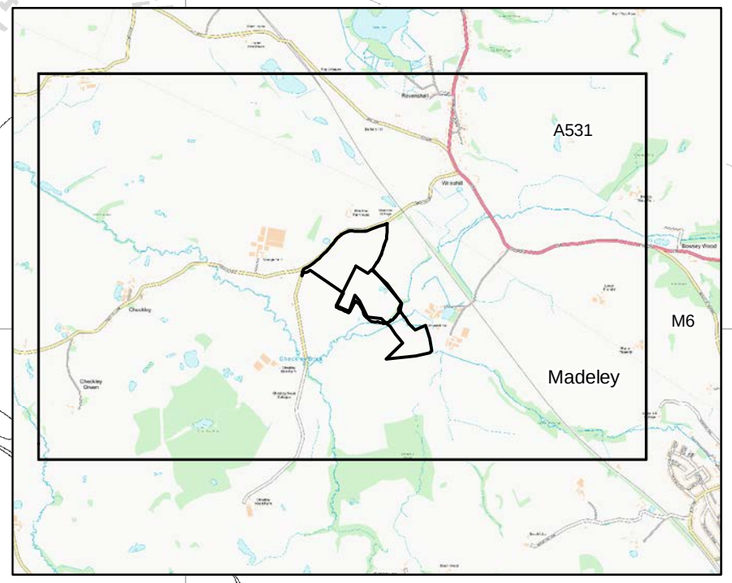
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:4,000

0 40 80 120 160
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Ravenshall
CRACOW MOSS
MAIN ROAD
THE MEADOWS
COTTERSMOOR
DEN LANE
Bunkers Hill
DEN LANE
Bowsey
347000
Wrinehill
A531
CHECKLEY LANE
Randilow Farmhouse
Randilow Cottage
CHECKLEY LANE
Grange Farm
MAIN ROAD
A531
MAIN
CHECKLEY LANE
Checkley
Lower Thornhill
346000
Wrinehill Hall
Higher Thornhill
Checkley Brook
Checkley New Farm
Checkley Green
Checkley Wood Cottages
Checkley Wood
Grafton's Wood
373000
374000
375000
376000
Wrinehill Wood

HS2

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 69

Map Name: Survey Area 17: Checkley Brook (Site Location)

Geophysical Survey

HS2

Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:10,000

0 100 200 300 400
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 70

Map Name: Survey Area 17: Checkley Brook (Greyscale Plot)

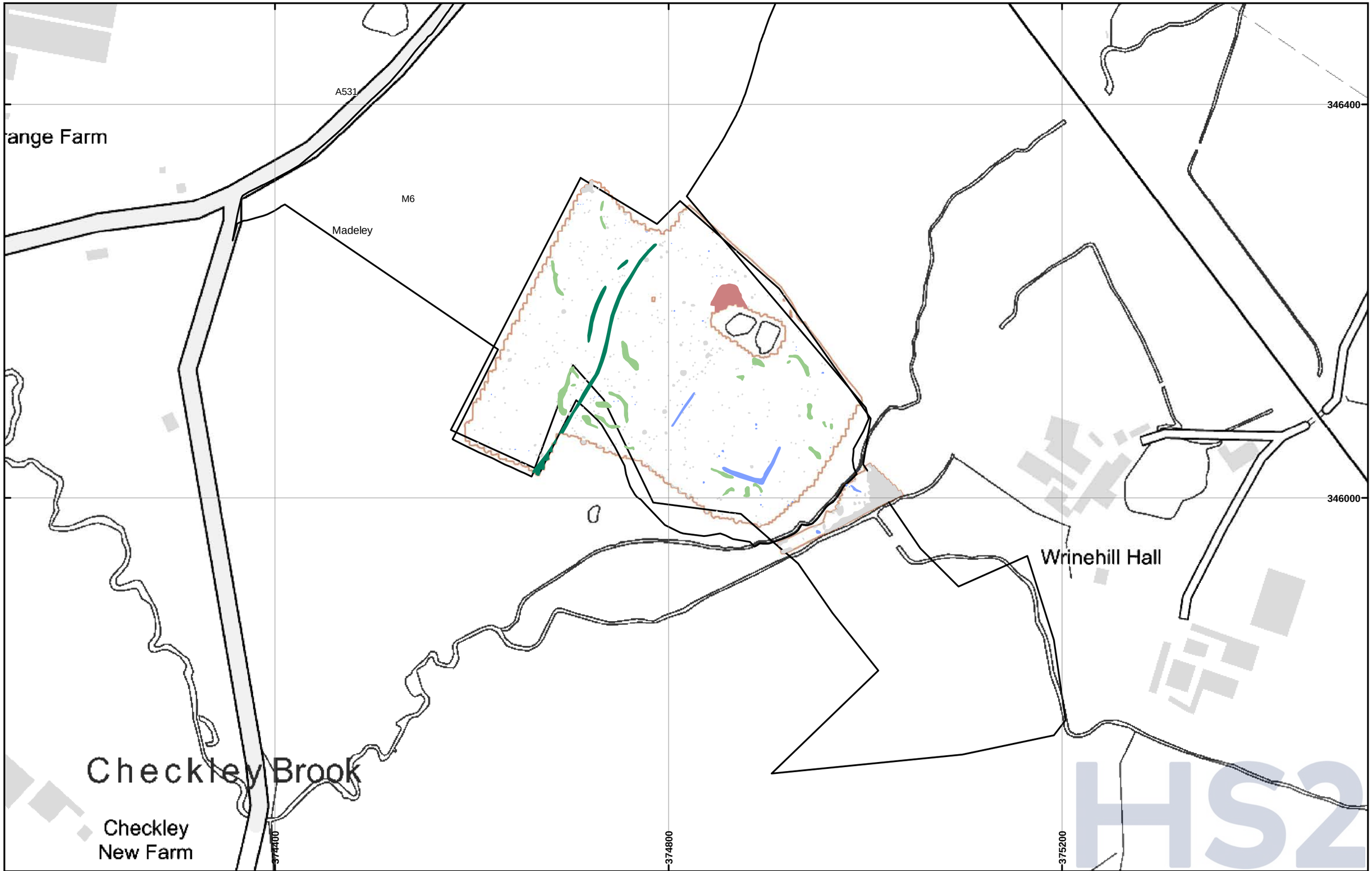
Geophysical Survey

Scale at A3: 1:3,500

0 30 60 90 120
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19



Legend

- Site boundary
- Detail Survey Extents
- Ferrous
- Industrial, Burnt-Fired, Increased Magnetic Response
- Natural
- Old Field Boundary
- Possible Archaeology

Map Number: Figure 71

Map Name: Survey Area 17: Checkley Brook (Interpretation)

Geophysical Survey

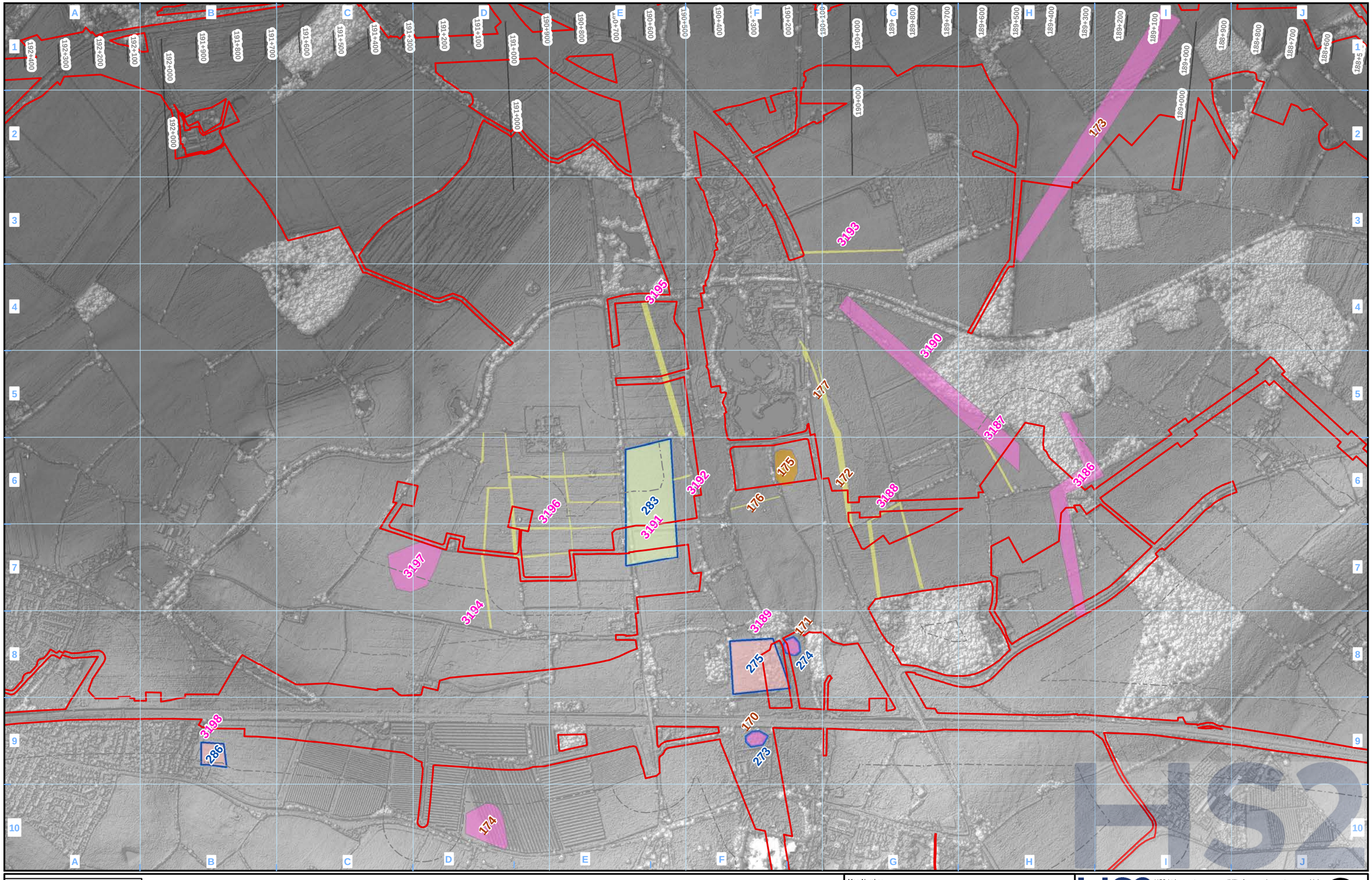
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

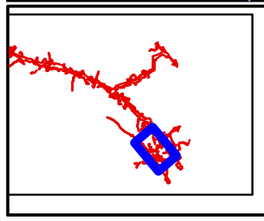
Scale at A3: 1:3,500

0 30 60 90 120
Metres

Doc Number: C861-ARP-EV-REP-000-001174

Date: 23/01/19





Legend

- Land required for the Proposed Scheme
- Remote Sensing Study Area
- Gazetteer entry
- Bank
- Enclosure
- Former field boundary
- Pit
- Possible feature
- Ridge and furrow

Label Symbology

- 327 Gazetteer
- 3188 LiDAR/Multi-Spec
- 171 AP

Map Number: Figure 72

Map Name: AP2 Remote Sensing Survey Data CA1

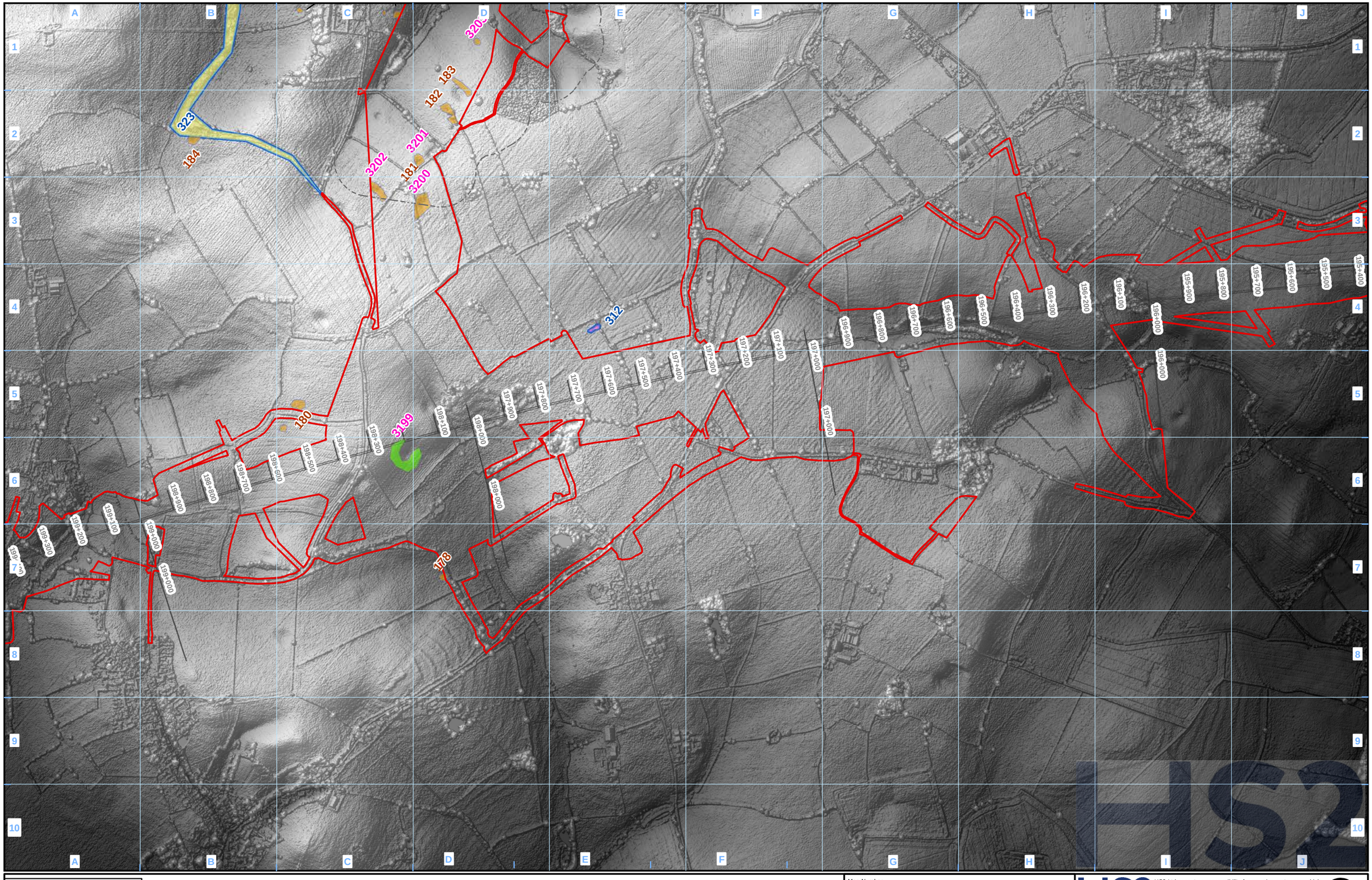
Remote Sensing Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number:

Date: 23/01/19



Legend

- Land required for the Proposed Scheme
- Remote Sensing Study Area
- Gazetteer entry
- Bank
- Enclosure
- Former field boundary
- Pit
- Possible feature
- Ridge and furrow

Label Symbology

- 327 Gazetteer
- 3188 LiDAR/Multi-Spec
- 171 AP

Map Number: Figure 73

Map Name: AP2 Remote Sensing Survey Data CA1

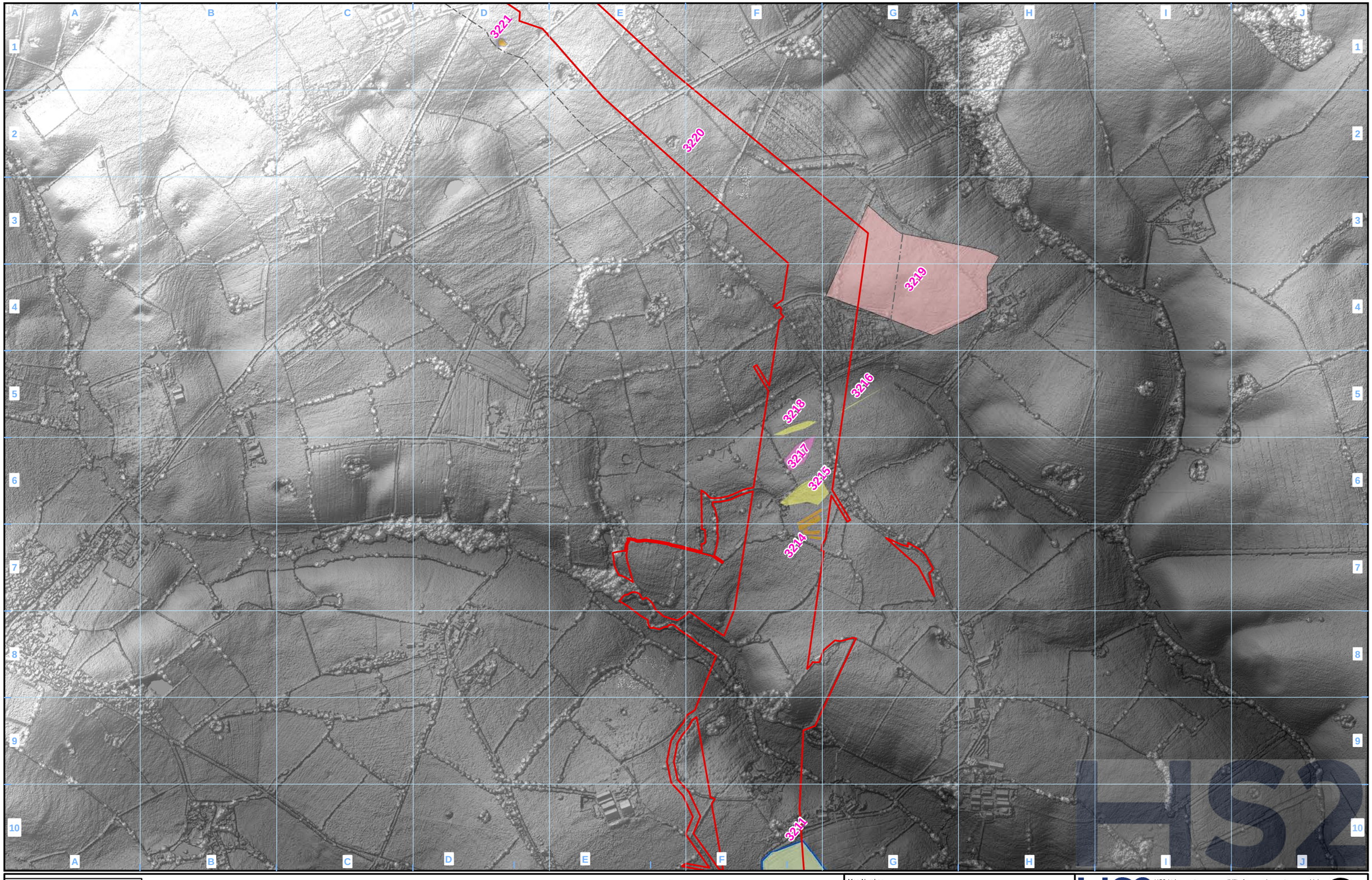
Remote Sensing Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number:

Date: 23/01/19



Legend

- Land required for the Proposed Scheme
- Remote Sensing Study Area
- Gazetteer entry
- Bank
- Enclosure
- Former field boundary
- Pit
- Possible feature
- Ridge and furrow

Label Symbology

- 327 Gazetteer
- 3188 LiDAR/Multi-Spec
- 171 AP

Map Number: Figure 74

Map Name: AP2 Remote Sensing Survey Data CA1

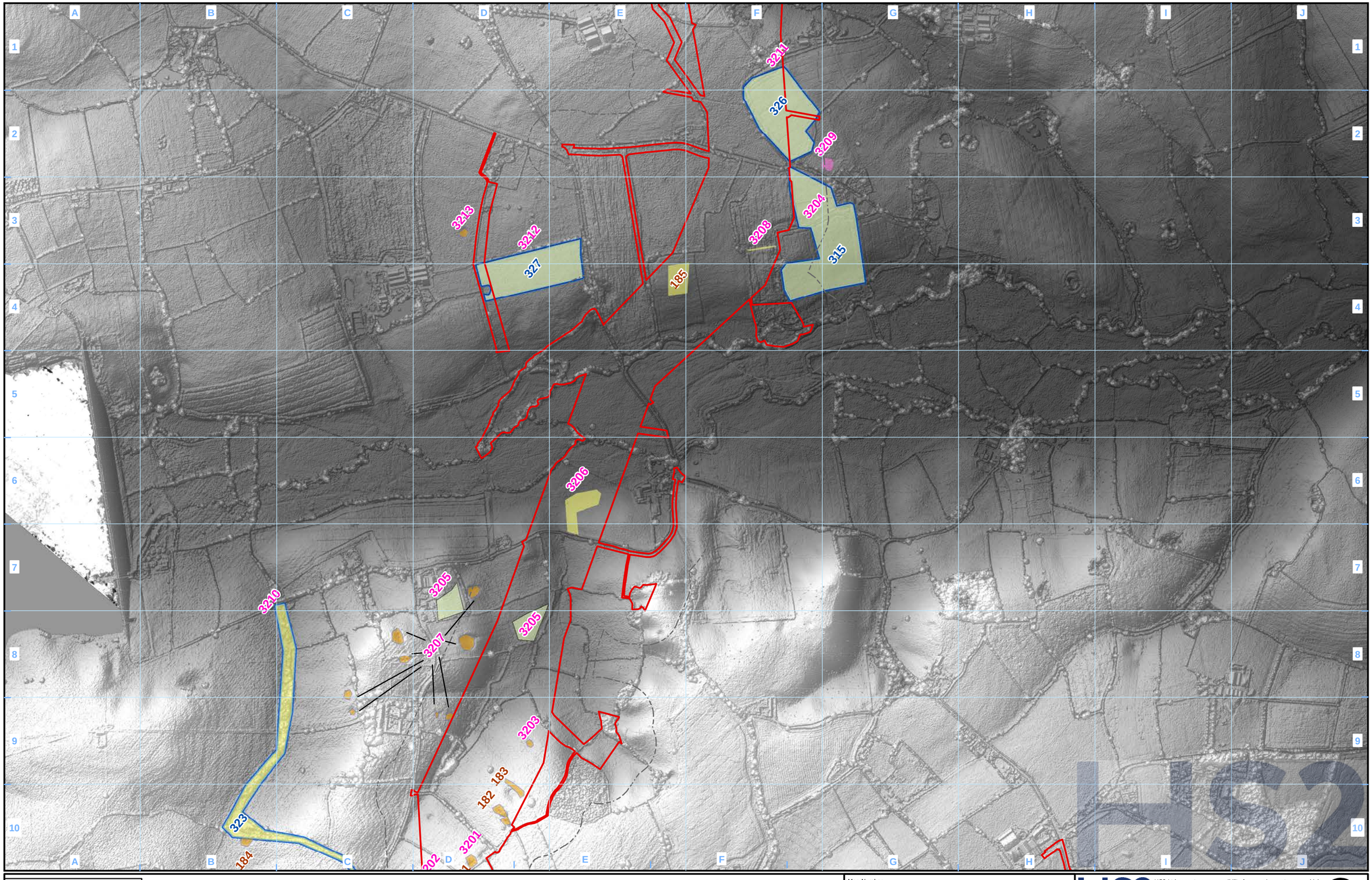
Remote Sensing Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number:

Date: 23/01/19



Legend

- Land required for the Proposed Scheme
- Remote Sensing Study Area
- Gazetteer entry
- Bank
- Enclosure
- Former field boundary
- Pit
- Possible feature
- Ridge and furrow

Label Symbology

- 327 Gazetteer
- 3188 LiDAR/Multi-Spec
- 171 AP

Map Number: Figure 75

Map Name: AP2 Remote Sensing Survey Data CA1

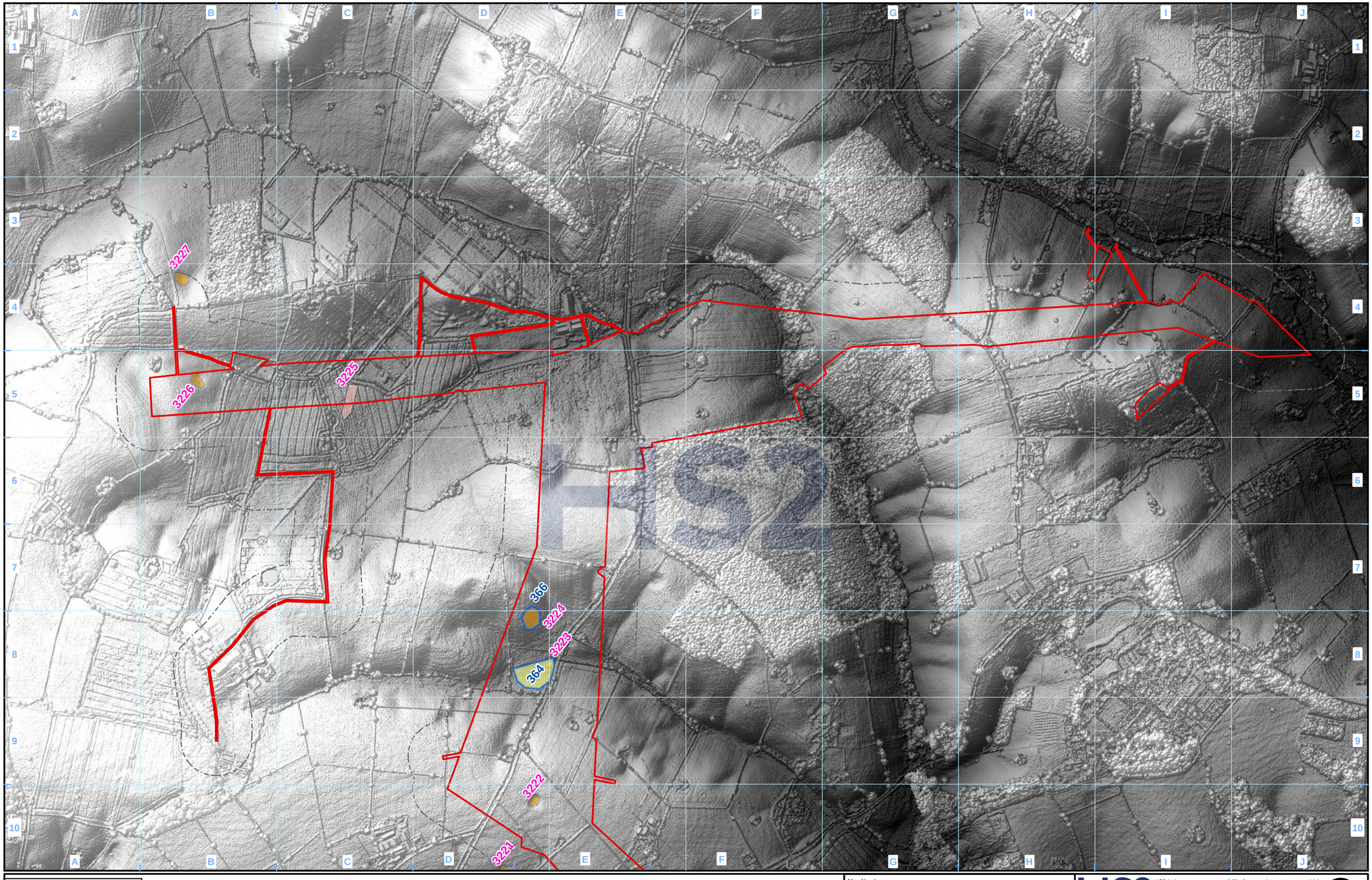
Remote Sensing Survey

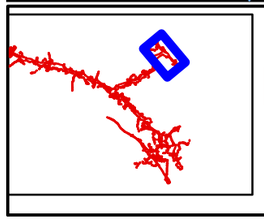
Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number:

Date: 23/01/19





Legend

- Land required for the Proposed Scheme
- Remote Sensing Study Area
- Gazetteer entry
- Bank
- Enclosure
- Former field boundary
- Pit
- Possible feature
- Ridge and furrow

Label Symbology

- 327 Gazetteer
- 3188 LiDAR/Multi-Spec
- 171 AP

Map Number: Figure 76

Map Name: AP2 Remote Sensing Survey Data CA1

Remote Sensing Survey

Scale at A3: 1:10,000

0 100 200 300 400 Metres

Doc Number:

Date: 23/01/19