E107

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

Background Information and Data

CA2: Colwich to Yarlet

Cultural heritage survey reports (BID-CH-004-002)

July 2017

BID

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Department for Transport

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1 Introduction

1.1.1 This document presents the results of the cultural heritage surveys carried out in the Colwich to Yarlet community area (CA2) relevant to High Speed Rail (West Midlands - Crewe). Geophysical surveys and remote sensing studies have been undertaken.

1.1.2 The cultural heritage assessment is detailed in the High Speed Rail (West Midlands - Crewe) Environmental Statement (ES)[1]. Volumes 2, 3 and 4 discuss cultural heritage effects and Volume 5, Appendices sets out the following:

- a cultural heritage baseline report for each community area;
- a gazetteer of heritage assets for each community area;
- a cultural heritage impact assessment table for each community area;
- a route-wide historic landscape character report; and
- a route-wide geoarchaeology desk study report.

[1] HS2 Ltd (2017), High Speed Rail (West Midlands-Crewe) Environmental Statement. Available online at: www.gov.uk/hs2

2 Geophysical survey

2.1 Introduction

2.1.1 This document presents the results of the geophysical survey carried within the Colwich to Yarlet area. The surveyed areas are shown in Figure 1.

2.1.2 The works undertaken conform with current best practice and guidance for geophysical surveys as outlined in the Chartered Institute for Archaeologists' (CIfA) Standards and Guidance for archaeological geophysical survey[2] and Historic England's (HE; formerly English Heritage) Guidelines Geophysical Survey in Archaeological Field Evaluation[3]. For more information see the Technical Note on geophysical survey in the Environmental Impact Assessment Scope and Methodology Report (SMR) Addendum (ES Volume 5: Appendix CT-001-002).

2.1.3 Geophysical surveys of multiple areas between Fradley and Crewe were undertaken in association with environmental assessments being completed for the Scheme. This report provides the results of non-intrusive geophysical surveys on the Colwich to Yarlet area of the route of the Proposed Scheme undertaken between August 2016 and January 2017. The Colwich to Yarlet section of the route is approximately 15km.

2.1.4 The geophysical surveys undertaken were preceded by desk-based research and a remote sensing survey (described in Section 3 of this report) comprising light detection and ranging (LiDAR) survey, as well as Aerial Photographic transcription and analysis. This work was used to generate an archaeological risk model which informed the locations selected for geophysical survey. The final survey areas were in part dictated by accessibility, as well as by potential and the risk model.

2.1.5 Archaeological background presents a brief summary of the known archaeological assets within and surrounding the individual survey areas.

2.2 Survey objectives

Aims of the fieldwork

2.2.1 The aim of this survey is to establish the presence/absence, extent and character of detectable archaeological assets within the survey area, including both the testing of previously recorded sites and the identification of additional locations of archaeological potential not previously recorded.

Objectives of the fieldwork

2.2.2 The results of the surveys will be combined with data from other archaeological assessments carried out as part of the project, such as desk-top studies, Aerial Photographic transcription and LiDAR data, in order to analyse the archaeological potential of the survey locations with a view to contributing to the preparation of the ES for the Proposed Scheme; and the development of a programme of archaeological mitigation in accordance with the Code of Construction Practice (CoCP).

[2] Chartered Institute for Archaeologists (2014), *Standard and Guidance for archaeological geophysical survey*
[3] English Heritage (2008), *Geophysical Survey in Archaeological Field Evaluation*, Research and Professional Service Guideline No. 1, 2nd Edition

2.2.3 This report presents a brief description of the methodology followed, the detailed survey results and the archaeological interpretation of the geophysical data.

2.3 Methods

Introduction

2.3.1 All surveys detailed within this report adhere to the same methodology, as set out below, and conform to HE guidelines and recommendations[4].

Grid location

2.3.1 The individual survey grid nodes were established at 30m by 30m intervals using a Leica Viva Real Time Kinetic (RTK) Global Navigation Satellite System (GNSS) instrument, which is accurate to approximately 0.02m and therefore exceeds HE recommendations[5].

2.3.2 A representative sample of survey grid nodes (around 10%) were re-surveyed in the mornings, in the event they were left out in the field overnight, in order to ensure grid nodes had not become misaligned. This was undertaken along with a visual inspection of entire lines of grid nodes to ensure the survey grid remained accurate for the entire survey.

Instruments used and survey method

2.3.3 The magnetic survey was conducted using Bartington Grad-01-1000L fluxgate gradiometers, which have a vertical separation of 1m between sensors. These are positioned with horizontal separations of 1m on either a hand-held Bartington Grad-601-2 instrument carrying two gradiometers, or a Bartington cart system carrying four gradiometers. Data were collected at 0.25m intervals along transects spaced 1m apart with an effective sensitivity of 0.03 nT, in accordance with HE guidelines[6].

2.3.4 For the hand-held system, data were collected in the zigzag method with grids orientated north to south (Grid North). The first direction walked for each grid was on a northward heading. The cart system also collected data in a zigzag method north to south, but the position of readings is recorded by GPS rather than a grid system.

2.3.5 Further details of the geophysical and survey equipment and methods are provided in Annex A.

Data processing

2.3.6 Data from the survey were subject to minimal data correction processes. For hand-held data, these comprise a zero mean traverse (ZMT) function (±5 nT thresholds) applied to correct for any variation between the two Bartington sensors used, and a de-step function to account for variations in traverse position due to varying ground cover and topography. For the cart system, a smooth is applied to the data achieving a similar effect as the ZMT in the hand-held data.

2.3.7 Further details of the geophysical data processing are provided in Annex A.

[4] English Heritage (2008)
[5] English Heritage (2008)
[6] English Heritage (2008)

Data presentation

2.3.8 The processed gradiometer data were output as .png image files and georeferenced in CAD (AutoCAD Map 3D 2011); these images were exported as georeferenced .png image files (accompanied by .pgw files). The interpretation layers were digitised in CAD and the resulting interpretation layers were exported as ESRI shapefiles. The data images and interpretation shapefiles were then used to produce the final figures in GIS (ESRI ArcMap 10).

2.3.9 The gradiometer data are displayed at -2 nT[7] (white) to +3 nT (black) for the greyscale image and ±25 nT at 25 nT per cm for the XY trace plots for all hand-held collected data. Due to technical limitations XY trace plots cannot be produced for data collected by the cart systems.

Assumptions and limitations

2.3.10 Gradiometer survey will detect numerous ferrous anomalies. These are presumed to be modern in provenance and are not referred to, unless considered relevant to the archaeological interpretation. In areas with a large amount of ferrous responses, such as those covered by 'green waste', it is possible that archaeological anomalies will be masked. As such, accurate interpretation in affected areas is likely to be limited or impossible.

2.3.11 It should be noted that, in all areas, small, weakly magnetised features may produce responses that are below the detection threshold of magnetometers. It may therefore be the case that further archaeological features are present that cannot be identified through geophysical survey.

2.3.12 Best efforts are made to provide accurate analysis of the geophysical data. This includes using all available resources to inform interpretations and drawing on experience from previous surveys. However, the true date and character of anomalies can only be accurately defined by a programme of ground-truthing (such as trenching or trial pitting). Further details of the interpretation of geophysical survey results are provided in Annex B.

Sources

2.3.13 Reference numbers used within the archaeological background sections below are from the relevant county Historic Environment Record (HER) or other stated source. Records are prefixed as follows:

- national heritage list for England = NHLE (designated assets);
- SHER = Staffordshire HER;
- CHER = Cheshire HER;
- AP= Aerial Photograph; and
- LiDAR = Light Detection and Ranging.

[7] nT = a unit of magnetic density flux

2.4 CA2-894 Moreton House, Little Haywood

Site details

2.4.1 A geophysical survey was carried out over area CA2-894 Moreton House, Little Haywood, Staffordshire (centred on National Grid Reference (NGR) 402407, 322890 (Figure 2)).

2.4.2 This survey area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the presence of medieval and post medieval activity, as well as a number of unknown features, seen in the LiDAR data.

2.4.3 The area of CA2-894 comprises seven fields across the land parcel. This survey area lies to the north-east of the village of Colwich, approximately 2km north-east of the centre of the village and 5km to the north-north-west of Rugeley, Staffordshire. The limits of the geophysical survey area are defined mostly by hedgerow field boundaries. The gradiometer survey covered 4.3ha of the 13.6ha survey area, with the remaining areas to be surveyed at a later date.

2.4.4 The area surveyed lies on a south-east facing slope, the north-western border of the survey lies at approximately 119m above Ordnance Datum (AOD) and falls gradually to approximately 98m AOD at the eastern most boundary and 100m AOD at the south-eastern boundary.

2.4.5 Small overhead cables traverse the western side of the survey area. No water courses are recorded within the survey area. Internal field boundaries are formed of hedgerows and a farm tracks as well as boundary fences.

2.4.6 The solid geology is recorded as mudstone of the Mercia Mudstone Group formation across the whole area with no superficial deposits recorded[8]. The soils underlying this survey area are likely to comprise the typical stagnogleyic argillic brown earths of the Whimple 3 (572f) association[9]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.4.7 To the north of the survey area lies the Grade II Listed Moreton House, dating to the 18th century (NHLE1319886). The area around Moreton House is thought to be the potential location of the 'lost' medieval settlement of Moreton (SHERMST1642). Grange Farm, now called Moreton Grange, to the south-east of the area, dates from at least the 19th century (SHERMST21274).

2.4.8 Three depressions visible in the LiDAR data have been interpreted as possible former extraction pits (LiDAR1043, 1049, 1222). One of these is marked as an 'Old Marl Pit' on the 3rd edition Ordnance Survey maps. Another possible former quarry pit lies just to the south-west of the survey area (LiDAR1044).

[8]British Geological Survey (2015), http://www.bgs.ac.uk
[9]Soil Survey of England and Wales (1983), *Sheet 3, Soils of Midland and Western England, Ordnance Survey*: Southampton

2.4.9 Within the north-western part of the survey area lies an area of ridge and furrow identified from aerial photographs of medieval or post-medieval date (AP77, LiDAR1223). A further area of ridge and furrow has been observed to the south-east and south-west of the survey area (AP73, 75, 76, LiDAR1052, 1053).

Results

2.4.10 The gradiometer survey carried out on 22 – 23 November 2016 using hand-held systems has identified anomalies thought to relate to modern agricultural activity or natural variation as well as trends and ferrous responses.

2.4.11 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures 3 - 5). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 3).

Interpretation: agricultural

2.4.12 Regular, low magnitude (+1 – 2 nT) parallel linear anomalies have been identified across the survey area (1-894-001 – 1-894-004). 1-894-001 is aligned north-west to south-east in the centre of the survey area. This is crossed by 1-894-002 on a south-west to north-east alignment. To the north-east, 1-894-003 is aligned on a north-west to south-east alignment and in the extreme south of the data set; 1-894-004 is aligned on a south-west to north-east alignment. These anomalies are indicative of agricultural activity, such as ploughing.

Interpretation: modern service

2.4.13 Two high magnitude, dipolar linear anomalies have been identified. 1-894-005 is in the north-west of the survey area on a south-west to north-east alignment. 1-894-006 is to the further east of the survey on an east to west alignment. Anomalies of this type are indicative of modern utilities.

Interpretation: modern

2.4.14 Three areas of dipolar responses have been detected across the dataset (1-894-007 – 1-894-009). 1-894-007 runs west-north-west to east-south-east across the centre of the survey area, crossing two surviving field boundaries. Whilst this may be evidence of marl extraction, which is recorded in the surrounding area, its linear nature is more indicative of modern made ground relating to a recently removed field boundary or track way. 1-894-008 runs along a field boundary in the north-west of the area. Responses such as this are indicative of modern track ways. 1-894-009 is smaller than the other two areas of responses, and lies in the north of the survey area. This is likely to be an area of ferrous debris related to the nearby buildings.

Conclusions

2.4.15 The detailed gradiometer survey has detected no anomalies of archaeological interest within the Colwich to Yarlet area, with no clear evidence for post-medieval extraction pits or ridge and furrow. Several anomalies indicative of modern cultivation have been identified by the survey. There are also several areas indicative of made ground. However, these are also thought to be modern rather than evidence of quarrying or extraction. Further anomalies relating to modern services have been identified.

2.5 CA2 - 1275 south of Lionlodge Covert, Tixall

Site details

2.5.1 A geophysical survey was carried out over area CA2-1275 South of Lionlodge Covert, Tixall, Staffordshire (centred on NGR 398964, 323722 (Figure 6)).

2.5.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential. This is due to the proximity of recorded Iron Age and Romano-British activity, including a possible Iron Age square burial enclosure (SHERMST22162), as well as a possible trackway, field system, and pit alignment of Iron Age or Romano-British date identified from aerial photography (AP87).

2.5.3 The survey area comprises a single pasture field to the south of Lionlodge Covert, approximately 1km north-east of Tixall and 6.5km east of the centre of Stafford. The limits of the geophysical survey area are defined by a fence line to the west and north, and Great Haywood Road to the south. The gradiometer survey covered 5.6ha. This survey area is generally flat, lying at approximately 75m aOD. There are overhead cables present over the field, notably in the south-west corner of the survey area. There are no internal boundaries in the survey area.

2.5.4 The underlying geology is mapped as the Mercia Mudstone Group across the survey area with superficial river terrace deposits (terrace 1) recorded [10]. The soils underlying the area comprise of the typical brown earths of the Bromsgrove (541b) formation[11]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.5.5 Within the survey area a square ditched feature, visible as a cropmark, is thought to be a possible Iron Age square burial enclosure (SHERMST22162). The feature is also potentially associated with a number of linear cropmarks and possible enclosures recorded in the vicinity (SHERMST4272). A possible trackway, field system and pit alignment of potential Iron Age or Romano-British date have also been identified from aerial photographs (AP87), elements of which lie in the survey area.

2.5.6 The area immediately north-west of the survey area is part of Ingestre Park, a 17th century landscaped park, which was re-designed by Capability Brown in the mid 18th century (SHERMST5986). Included within this is Lionlodge Covert within which a number of possible feature have been identified from the LiDAR data, most likely thought to relate to woodland management or drainage (LiDAR1073).

2.5.7 Features visible within the LiDAR data to the south-east of the survey area are interpreted as relating to post-medieval cultivation (LiDAR1228) while linear features to the south-west are considered to be former field boundaries (LiDAR1193 1194) visible on the 1st edition Ordnance Survey map. An area of ridge and furrow to the north-east of the survey area is likely to be associated with medieval cultivation (AP92).

[10] British Geological Survey, (2015)
[11] Soil Survey of England and Wales (1983)

Results

2.5.8 The gradiometer survey carried out on 19 and 20 October 2016 using hand-held systems has not identified any anomalies of likely archaeological origin. The area appears to have been subject to 'green waste', which dominated the dataset. However, evidence of modern agricultural activity and a modern service has been identified.

2.5.9 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –7 - 9). The interpretation of the datasets highlights the presence of agricultural activity and modern services (Figure 9).

Interpretation: agricultural

2.5.10 Parallel linear anomalies have been identified aligned south-west to north-east to the east of the survey area (2-1275-001). These anomalies roughly align to the current field boundary and are likely to be agricultural in origin, possibly relating to ploughing.

2.5.11 Three trends of unknown origin have been identified, two of which extend out from the response of the modern service identified at 2-1275-002. The third is to the east of these and is curvilinear.

2.5.12 The entire survey area has a varied magnetic background. This is interpreted as being the result of green waste used as fertiliser.

Interpretation: modern services

2.5.13 A high magnitude linear anomaly (2-1275-002) aligned north-west to south-east has been identified as a modern service.

Conclusions

2.5.14 The detailed gradiometer survey has not detected any anomalies of likely archaeological origin. The possible enclosures seen as cropmarks are not identified within the dataset due to the noise caused by the green waste. Several discrete parallel linear anomalies indicative of modern ploughing activity have been identified, as have some trends of unknown origin. The remaining anomalies identified are likely to be modern in origin, relating primarily to a modern service.

2.6 CA2 - 1312 Tixall Manor Farm, Tixall

Site details

2.6.1 A geophysical survey was carried out over area CA2-1312 Tixall Manor Farm, Tixall, Staffordshire (centred on NGR 398713, 323763 (Figure 10)).

2.6.2 The area was selected for geophysical survey as it is considered to be a location with elevated archaeological potential due to the proximity of a possible salt spring and numerous cropmark features of likely Iron Age and/or Romano-British date.

2.6.3 The survey area comprises a single pasture field to the north of Hoo Mill Lane, approximately 1km north-east of Tixall and 6.5km east of the centre of Stafford. The limits of the survey area are defined by a fence line to the east, woodland to the north, and an open boundary along the south-western extent. The gradiometer survey covered 6.7ha of the 6.9ha survey area, with the remaining area consisting of

overgrown vegetation and spoil heaps. This survey area is therefore considered to be completed. This survey area is generally flat, lying at approximately 75m aOD. There are overhead cables present over the field; however these do not pass over the survey area. A watercourse is recorded along the northern boundary of the survey area. There are no internal boundaries in the survey area.

2.6.4 The solid geology is recorded as mudstone of the Mercia Mudstone Group across the whole survey area with superficial river terrace deposits (terrace 1)[12]. The soils underlying the west of this survey area are likely to comprise the typical stagnogleyic argillic brown earths of the Whimple 3 (572f) association. Whereas soils underlying the east of the survey area are likely to be typical brown earths of the Wick 1 (541r) association[13]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.6.5 A possible Iron Age square barrow has been identified within the survey area from aerial photographs, although its exact date and nature has not been confirmed (SHERMST22163). Another possible example lies to the east (SHERMST22162). Two enclosures have been identified from aerial photographs, which may also be of Iron Age or Romano-British date (SHERMST4272). These have been mapped immediately to the east of the survey area but elements and associated activity may extend into its area.

2.6.6 The area immediately to the north of the survey area is part of Ingestre New Park, a 17th century landscaped park, which was re-designed by Capability Brown in the mid 18th century (SHERMST5986).

2.6.7 Crossing the survey area are two linear features (LiDAR1193, 1194). These are likely post-medieval field boundaries and can be seen marked on the 1902 edition Ordnance Survey map. Further linear features identified in the woodland area to the north are also likely to be a combination of boundary and drainage features and are likely to date from the medieval period onwards (LiDAR1073).

Results

2.6.8 The gradiometer survey was carried out on 1 August and 17 – 18 October 2016 using held-held systems. The survey has identified anomalies of possible archaeological interest, along with numerous trends and ferrous responses.

2.6.9 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –11 - 13). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 13).

[12] British Geological Survey (2015)
[13] Soil Survey of England and Wales (1983)

Interpretation: archaeology

2.6.10 Linear anomalies in the east of the area form a broken sub-rectilinear feature (2-1312-001). The presence of both positive and negative responses suggests that this feature may comprise ditch and bank features forming an enclosure. It is possible that the anomaly relates to the Iron Age or Romano-British enclosures located to the east of the survey area but further investigation would be required to ascertain this.

2.6.11 Several discrete positive anomalies (2-1312-002) can be seen to the west of the possible enclosure feature (2-1312-001). These are indicative of pit features; however, it is not clear whether these are natural or man-made, and may be related to the known Iron Age or Romano-British activity.

2.6.12 A small number of trends have also been highlighted in the east of the surveyed area. These responses present clear variations from the background magnetic response however they are too weak to provide a definitive interpretation.

Interpretation: agricultural

2.6.13 An area of discrete, parallel linear anomalies has been detected aligned east to west in the east of the survey area. These anomalies align to the former field boundary also identified in this area (2-1312-003) and area likely to be agricultural origin, possibly ploughing.

2.6.14 Two linear anomalies have been identified, aligned north to south, through the southern portion of the dataset (2-1312-006) which likely represents a modern land drain.

2.6.15 2-1312-007 located in the north-west represents a herringbone arrangement of a modern land drainage system.

Interpretation: geological or natural

2.6.16 In the north-east of the survey area a large area of varied magnitude response was identified (2-1312-004). This has been interpreted as being of natural or geological origin. It does not correspond to any variation recorded on geological mapping of the area; however it is highly likely to be an area of localised variation in superficial geological deposits. Further areas to the west (2-1312-005) have been interpreted as natural in origin.

Interpretation: modern services

2.6.17 The strongest (+/-100 nT) anomaly is aligned to the southern boundary of the northern portion of the survey area (2-1312-008). The high magnitude of this anomaly is indicative of a modern service or drain.

Conclusions

2.6.18 The detailed gradiometer survey has not identified any anomalies of definite archaeological origin, although a small number that may be of archaeological origin have been identified. A roughly rectilinear feature which may relate to a ditch and bank with several possibly associated pit features has also been identified. There is Iron Age and Romano-Brisitish activity recorded in the area and these may, on further

investigation, be associated. There is no evidence in the data for the possible square barrow seen on aerial photography.

2.6.19 The remaining anomalies identified are likely to be modern in origin. Anomalies of uncertain origin can be seen across the north of the area surveyed; however these are too weak to interpret with confidence. An area of ploughing is also evident in the north. Utilities run through the centre of the surveyed area on a west-north-west to east-south-east and north to south alignment respectively.

2.7 CA2 - 1453 land at Upper Hanyards, Tixall

Site details

2.7.1 A geophysical survey was carried out over area CA2-1453 Upper Hanyards, Tixall, and Staffordshire (centred on NGR 396550,324562 (Figure 14)).

2.7.2 This area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to its proximity to known prehistoric activity, along with later medieval and post-medieval agricultural features.

2.7.3 The area comprises an irregular survey area, across six fields to the north-west and south-east of Upper Hanyards, Tixall, Ingestre approximately 2.2km north-west of Tixall and 4.8km east of the centre of Stafford. The limits of the survey area are defined by hedgerows and fence lines, as well as undefined survey edges across several fields. The gradiometer survey covered 5.0ha of the 42.2ha survey area.

2.7.4 The survey area is generally flat, with an area of elevated ground to the north-east. The area peaks at approximately 132m aOD and drops gradually to, approximately, 116m in the south-east and approximately 113m aOD in the south-west. To the extreme north-west of the survey area the land is at approximately 110m aOD. There are no overhead cables or water courses present within the survey area. Several internal boundaries consisting of hedgerows are noted, as well as a number of farm tracks and small pockets of woodland.

2.7.5 The underlying geology across the majority of the survey area is recorded as sandstone of the Bromsgrove Sandstone Formation, while the north-eastern edge of the area is underlain by the Merica Mudstone Group. At the very south-western edge of the survey area a band of mudstone of the Bromsgrove Sandstone Formation is mapped. No superficial deposits are recorded[14]. Soils underlying the area are likely to comprise typical brown earths of the Bromsgrove (541b) formation[15]. Such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.7.6 A Bronze Age round barrow was excavated in the late 19th century 300m to the south-west of the survey area (SHERMST855). Further prehistoric activity is noted immediately to the north-west of the area where a ring ditch feature of probable prehistoric date has been identified from aerial photographs (SHERMST4280).

[14] British Geological Survey (2015)
[15] Soil Survey of England and Wales (1983)

2.7.7 In the north-western edge of the survey area a potential Iron Age or Romano-British pit alignment has been identified from aerial photographs (AP101), which could extend into the route corridor. Field boundaries and traces of ridge and furrow suggestive of medieval and post-medieval agricultural activity have also been observed on aerial photographs extending across a large part of the survey area.

2.7.8 Two areas of sandstone quarrying are recorded within the wider area dating to the 19th century (SHERMST13075, MST13076, LiDAR2156). Other possible areas of quarrying were identified in LiDAR data situated just to the north of Hanyards Lane (LiDAR2189, 2192).

2.7.9 Several linear features were identified within the LiDAR data near Upper Hanyards (LiDAR2041, 2190, 2191) including a sinuous former field boundary, which may lie along the line of a relic watercourse (LiDAR2004).

2.7.10 To the north and north-east of the survey area is Ingestre Old Park, a 17th century landscaped park, which was re-designed by Capability Brown in the mid 18th century (SHERMST5986). This includes a Grade II listed pavilion just to the north-east of the survey area within Ingestre Wood (NHLE1242894). Adjacent to the survey area, to the south-east, is the 18th and 19th century landscape park at Tixall Hall (SHERMST5985, LiDAR2000).

2.7.11 Within the adjacent area of Ingestre Wood a number of earthworks were visible in the LiDAR data including possible former extraction pits (LiDAR2001, 2002, 2003, 2006). The boundary between the survey area lies along the parish boundary (LiDAR2005, 2007).

Results

2.7.12 The gradiometer survey carried out on 6 – 7 December 2016 using hand-held systems has identified anomalies of possible archaeological, agricultural and industrial origin, along with numerous natural trends and ferrous responses.

2.7.13 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures 15 - 17). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 17).

Interpretation: archaeology

2.7.14 To the north of the survey area, 2-1453-009 is an area of low magnitude, negative anomalies which form rectilinear and sub-circular patterns. These are commonly indicative of enclosures, which may range from prehistoric to Romano-British in origin.

2.7.15 To the north-west of the survey area, a fragmented dipolar linear anomaly was identified on a north-west to south-east alignment (2-1453-001). This feature is straight but more diffuse to the south-east. It has been interpreted as a former field boundary due to its alignment with historic land divisions but does not correspond to any historic field boundaries present on mapping. This may indicate an earlier medieval origin.

Interpretation: agricultural

2.7.16 Several areas of broadly spaced, low magnitude parallel linear anomalies have been identified across the survey area, on a variety of alignments. 2-1453-005 are aligned north-west to south-east, whilst 2-1453-006 are aligned north-east to south-west and are crossing 2-1453-005. Further to the east, 2-1453-007 are aligned north-north-west to south-south-east. These anomalies are consistent with agricultural activity, such as ploughing.

2.7.17 To the south of 2-1453-007, dipolar linear anomalies (2-1453-008) have been identified on a broadly east-north-east to west-south-west alignment. This type of anomaly is consistent with burnt or fired material such as ceramics. Due to their alignment and spacing, these anomalies have been identified as land drains.

2.7.18 Parallel to the north-eastern boundary of the surveyed area, a second dipolar, fragmented linear anomaly has been identified (2-1453-002, 2-1453-003, 2-1453-004). These anomalies correspond to a former field boundary no longer surviving but visible on historic mapping of the area (1st edition Ordnance Survey 1881-2).

Interpretation: geological or natural

2.7.19 South-east of 2-1453-009, a broad area of magnetically variable background has been identified (2-1453-010). This has also been interpreted as natural in origin and is thought to represent localised variation in the underlying superficial geology.

Interpretation: modern

2.7.20 At the extreme south-east of the survey area, a high magnitude spread of magnetically susceptible material has been identified (2-1453-011). This is believed to be the result of infilling or made ground, for example building material or waste being deposited in the topsoil, common at gateways.

Conclusions

2.7.21 The detailed gradiometer survey has not detected any anomalies of definite archaeological origin, but possible archaeology which may represent enclosures has been identified to the north. The potential enclosures may, on further investigation, relate to the prehistoric activity recorded in the surrounding area. A small number of anomalies that may have an agricultural origin have been identified and may date to the early medieval period.

2.7.22 The remaining anomalies identified are likely to be natural or modern in origin. Anomalies of uncertain origin are also recorded across the north of the area surveyed, however these are either too weak to interpret with confidence or most likely pertain to modern agricultural activity.

2.8 CA2-1739 south of Hopton Lane, Hopton

Site details

2.8.1 A geophysical survey was carried out over area CA2-1739, south of Hopton Lane, Hopton (centred on NGR 394219, 326033 (Figure 18)).

2.8.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the proximity to the village of Hopton. Ridge and furrow and medieval and post-medieval activity is also recorded in the surrounding area.

2.8.3 This survey area comprises an irregular shaped parcel of land covering areas within several fields to the south of Hopton Lane, Hopton, approximately 3.6km north-east of the centre of Stafford. The limits of the survey area are defined by hedgerow field boundaries. The gradiometer survey covered 1.8ha of the 7ha survey area, with the remaining area to be surveyed at a later date. This survey area lies across the peak of a slight incline, the centre of which peaks at 118m aOD. The east of the survey falls to approximately 110m aOD and the west to approximately 108m aOD. There are no overhead cables or water courses recorded at the survey area. Internal field boundaries consist of hedgerows.

2.8.4 The underlying geology is recorded as the Kidderminster Formation sandstone and conglomerate with no superficial deposits recorded[16]. The soils across the west of the area are likely to consist of stagnogleyic argillic brown earths of the Whimple 3 (572f) formation. The east is likely covered by typical brown earths of the Bromsgrove (541b) formation[17]. Soils derived from these parent geological materials are considered suitable for magnetometry.

Archaeological background

2.8.5 A large area of ridge and furrow has been identified in and around the survey area by the National Mapping Programme[18] (NMP) and by the aerial photographic survey (AP106) undertaken as part of this project. Areas containing several parcels of very faintly discernible ridge and furrow, subdivided by slight banks/infilled ditches have also been identified on the eastern part of the survey area by LiDAR survey (2151).

2.8.6 There are faint traces of an enclosure in the western part of the survey area, which coincides with a parcel identified by the NMP, indicating that this may be the earthwork remains of field boundaries (LiDAR2038). Within the north-eastern part of the survey area traces of possible ridge and furrow or remnants of medieval activity from Hopton have been identified by both the NMP and LiDAR survey (LiDAR2286).

2.8.7 A possible field boundary (LiDAR2039) and a possible lynchet (LiDAR2052) have been identified running north-south through the centre of the survey area. Just to the east of this a faintly visible, sinuous linear depression has been identified by both the NMP and LiDAR survey, which may demarcate the position of a former watercourse (LiDAR2152).

2.8.8 To the east of the survey area is Lowerhouse Farm along with an associated blacksmiths workshop, approximately 20m to the east (SHERMST17421, MST17422). The historic core of the settlement of Hopton, which is mentioned in the Domesday survey lies to the north-east (SHERMST2513).

[16] British Geological Survey (2015)
[17] Soil Survey of England and Wales (1983)
[18] Bax, S. (2014), *Staffordshire National Mapping Programme, Phase 1 – Eastern River Confluences*, *Aerial Survey Mapping Summary Report*, National Heritage Protection Commissions Programme: Project Number 6613, Archaeological Research Services Ltd. English Heritage

2.8.9 Several field boundaries which are depicted on the 1st edition Ordnance Survey map have subsequently been removed. The historic maps also show a pond in the south-eastern part of the survey area. Numerous other pits and ponds, some of which are labelled as old marl pits, to the south of the survey area suggest that this was probably a former extractive pit.

2.8.10 To the north of the survey area is Mount Farm (SHERMST17419) a relatively intact farmstead, which is believed to have been established prior to 1775, which was added to in the 19th century. Between the survey area and the farm an oval mound is recorded in the NMP, approximately 21m by 8m. This is of unknown origin and is not recorded in any other dataset and therefore may be related to modern agricultural practises.

Results

2.8.11 The gradiometer survey carried out on 12 December 2016 using hand-held systems has been successful in identifying anomalies likely to be of local historical interest, along with numerous other magnetic trends. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –19 - 21).

2.8.12 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 21).

Interpretation: archaeology

2.8.13 Throughout the dataset, low magnitude, parallel linear anomalies have been identified, aligned east to west (2-1739-001). These anomalies have been interpreted as evidence of ridge and furrow, which could date to the medieval or post-medieval period. There are a further two trends identified as ploughing to the south, which are highly likely to also be evidence of ridge and furrow but not enough of the anomalies are visible to be certain in this interpretation.

Interpretation: geological or natural

2.8.14 In the centre of the surveyed area, several low magnitude sinuous linear trend anomalies have been identified (2-1739-002). These anomalies have been interpreted as unidentified anomalies due to their low magnitude. However, these anomalies are likely to be natural in origin, caused by the localised build-up of magnetically susceptible sands and gravels in depressions in the underlying geology.

Interpretation: modern

2.8.15 To the south-east of the data set, there is a notable increase in the magnetic background in the survey area (2-1739-003). This is interpreted as a spread of modern debris.

Conclusions

2.8.16 The survey has identified medieval or post-medieval ridge and furrow cultivation within the area. Despite the archaeological potential, there is no visible evidence for any other medieval or post-medieval activity. Potential features considered to be natural and modern origin have also been identified.

2.9 CA2-1791 north of Lowerbridge Farm, Hopton

Site details

2.9.1 A geophysical survey was carried out over area CA2-1791, North of Lowerbridge Farm, Hopton (centred on NGR 393917, 326332 (Figure 22)).

2.9.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the presence of medieval and post-medieval activity in the surrounding area.

2.9.3 This survey area comprises an irregular shaped parcel of land covering areas within several fields to the west of Hopton, approximately 3.5km north-east of the centre of Stafford. The limits of the geophysical survey area are defined by hedgerow field boundaries. The gradiometer survey covered 4.8ha of the 5.5ha survey area, with the remaining area to be surveyed at a later date. This survey area lies on a west facing slope, the east of which peaks at approximately 155m aOD and falls to 95m aOD in the eastern fields bounding Sandon Lane. There are no overhead cables or water courses recorded at the survey area. Internal field boundaries consist of hedgerows and a number of electrical fences forming small paddocks dividing the survey area.

2.9.4 The underlying geology is recorded as the Mercia Mudstone Group with no superficial deposits[19]. The soils underlying the survey area comprise of the stagnogleyic argillic brown earths of the 572f (Whimple 3) formation[20]. Soils derived from these parent geological materials are considered suitable for magnetometry.

Archaeological background

2.9.5 Assessment of aerial photographs undertaken by the NMP[21] and as part of this project has identified probable remnants of ridge and furrow cultivation in the south of the survey area (AP106). The LiDAR survey has identified further traces of faint ridge and furrow across the rest of the area, however those contained within the northern part of the survey area are more uniform, straight and more closely spaced. This may indicate that those to the south are of older origin.

2.9.6 Part of the former route of the now dismantled Stafford and Uttoxeter Railway (SHERMST12320) is clearly evident in the LiDAR plot (LiDAR2045) running from the south-western edge of the survey area to the north east.

2.9.7 The copse situated in the east of the survey area is contained within a sub-oval depression identified by LiDAR survey (LiDAR2051). Late 19th and early 20th century Ordnance Survey maps depict a former extractive pit ('Old Marl Pits') in this location.

[19] British Geological Survey (2015)
[20] Soil Survey of England and Wales (1983)
[21] Bax (2014)

A linear feature running towards the pit has also been identified (LiDAR2047), this may represent a former trackway leading to the pit. There are several other former extractive pits identified in the vicinity of the survey area from both the LiDAR survey and on historic maps (LiDAR2050).

2.9.8 A probable late 18th century smallholding, consisting of a single outbuilding range and detached farmhouse is situated immediately to the south-east at Lowerbridge Farm, Hopton (SHERMST17418). The historic core of the settlement of Hopton, which is mentioned in the Domesday survey, lies to the north-east (SHERMST2513).

Results

2.9.9 The gradiometer survey, carried out between 10 – 12 October 2016 using hand-held systems, has been successful in identifying anomalies likely to be of archaeological interest, along with numerous trends. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –23 - 25).

2.9.10 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 25).

Interpretation: archaeology

2.9.11 An area of magnetically strong (+/-100 nT) dipolar responses (2-1791-001) runs north-east to south-west through the south-west of the area. This is the remains of the Stafford and Uttoxeter Railway (SHERMST12320).

2.9.12 A series of parallel linear anomalies aligned north-east to south-west have been identified throughout the dataset, such as those at 2-1791-002 and 2-1791-003. These are regularly spaced at approximately 7m apart and, given their regularity and consistency; these are likely remnant evidence for ridge and furrow agricultural practices.

2.9.13 A weak, positively magnetised feature has been identified in the northern fields at 2-1791-004. This feature is approximately 25m in length, aligned north-west to south-east and is approximately 2m wide. The feature likely continues at 2-1791-005 which shares its alignment and width and is a further 20m in length. It is possible this is a small ditch-like feature and may be of archaeological origin.

2.9.14 A pair of similar features has been identified at 2-1791-006. These comprise small ditch-like features aligned north-east to south-west and north-north-east to south-south-west. Both are approximately 18m in length and 2m in width with the southern of the two widening to 3m at the western end.

2.9.15 A third ditch-like feature has been identified at 2-1791-07. This is approximately 18m in length and 2.2m in width, aligned predominately north-north-east to south-south-west with a curve to south west at the western extent. This is possibly a continuation of the southern ditch-like feature at 2-1791-006.

Interpretation: agricultural

2.9.16 Evidence of modern farming practice in the form of ploughing is evident centrally and to the south of the survey area.

Interpretation: modern utilities

2.9.17 Four modern utilities have been identified within the dataset at 2-1791-008 to 2-1791-0011. 2-1791-008 is aligned north-east to south-west and traverses the centre of the dataset to the south of a field boundary. 2-1791-009 traverses north to south almost centrally within the dataset, and service 2-1791-010 traverses north-east to south-west to the west of service 2-1791-009. 2-1791-011 comprises two short utilities in the south of the area, aligned north-west to south-east and north-east to south-west.

Conclusions

2.9.18 The survey has identified the remains of the Stafford to Uttoxeter railway running through the south-west of the area, as well as areas of ridge and furrow cultivation. A number of fragmented linear features have been identified in the north-east of the dataset. These are approximately 2m in width, aligned predominantly either north to south or north-east to south-west. These features may be of archaeological origin; however, they comprise weak magnetic responses and are unclear in form. The survey has also identified several modern services across the area.

2.10 CA2-1836 Kent's Barn Farm, Hopton

Site details

2.10.1 A geophysical survey was carried out over area CA2-1836, at Kent's Barn Farm, Hopton (centred on NGR 393514, 326485 (Figure 26)).

2.10.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the presence of post-medieval agricultural and quarrying activity in the surrounding area.

2.10.3 This survey area comprises an irregular shaped parcel of land within several fields to the west of Hopton, approximately 3.5km 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 the fields. The gradiometer survey covered 30.1ha of the 38.7ha survey area, with the remaining area to be surveyed at a later date. This survey area lies on an east facing slope, the west of which peaks at approximately 114m aOD and falls to 95m aOD in the eastern fields bounding Sandon Lane. There are no overhead cables or water courses recorded at the survey area. Internal field boundaries consist of hedgerows and electrical fences forming small paddocks.

2.10.4 The underlying geology across the majority of the survey area is mapped as the Mercia Mudstone Group. A small band of superficial glaciofluvial sheet deposits are recorded at the south-eastern edge of the area[22]. The soils underlying the survey area comprise of the stagnogleyic argillic brown earths of the Whimple 3 (572f) formation[23]. Soils derived from these parent geological materials are considered suitable for magnetometry.

[22] British Geological Survey (2015)
[23] Soil Survey of England and Wales (1983)

Archaeological background

2.10.5 The survey area lies within an extensive area of post-medieval enclosure (AP122) and a number of former field boundaries, which are visible on the 1st edition Ordnance Survey map. These have been identified in the LiDAR data within and adjacent to the area (LiDAR2058, 2059, 2061, 2062). A number of small ponds or depressions have also been noted (LiDAR2063, 2064, 2065, 2066, 2070, 2074, 2268), which may relate to earlier quarrying activity. Near the south-eastern edge of the area lies the route of a former watercourse visible in the LiDAR data (LiDAR2060) and on the 1st edition Ordnance Survey map.

2.10.6 At the northern edge of the survey area is part of an area of narrow ridge and furrow. This is typically indicative of post-medieval agricultural activity. Within the wider area is the 19th century farmstead of Kent's Barn Farm (SHERMST17411)

2.10.7 The eastern boundary of the survey area is formed by Sandon Road. To the east of this is the route of the former Stafford and Uttoxeter Railway, which was constructed in the late 19th century (SHERMST12320). Areas of possible medieval and post-medieval ridge and furrow are noted either side of the former railway (LiDAR2048).

Results

2.10.8 The gradiometer survey, carried out between 3 – 26 October 2016 using a combination of hand-held and cart based systems, has been successful in identifying magnetic anomalies, primarily of agricultural origin with some of possible archaeological origin. A number of modern services and ferrous anomalies have also been identified. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –27 - 35).

2.10.9 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 29, 32 and 35).

Interpretation: archaeology

2.10.10 In the north-west (2-1836-001 to 2-1836-002) and the south (2-1836-003 to 2-1836-004) of the dataset, four areas of possible archaeology have been identified by high magnitude responses. LiDAR survey detected depressions in the ground that could be indicative of localised extraction or quarrying. Whilst these anomalies do not match the location of depressions seen in the LiDAR data, they are indicative of the responses expected from a backfilled area of historical extraction.

Interpretation: agricultural

2.10.11 Several areas of ploughing have been identified within the dataset. Linear anomalies aligned north-east to south-west at 2-1836-005 are likely to represent modern ploughing, as are those at 2-1836-006 and 2-1836-007 which are aligned north-west to south-east.

2.10.12 An area of positive linear anomalies aligned primarily north-east to south-west with adjoining north-west to south-east (2-1836-008 and 2-1836-009) linear features has been interpreted as a network of land drainage features. This is due to regularity in their alignment and spacing and their indicative magnetic responses.

2.10.13 Features identified at 2-1836-010 and 2-1836-011 have been interpreted as being former field boundaries, and are present on historic mapping. However, they have variable magnetic properties often exhibited by burnt or fired materials, suggesting that they may be the remains of a drainage system running along the boundary.

2.10.14 In the north-east and centre of the survey area, four further linear anomalies have also been interpreted as former field boundaries (2-1836-012 – 2-1836-015). 2-1836-012, aligned north-east to south-west, is visible of historic Ordnance Survey mapping of the area from 1888. 2-1836-013 to 2-1836-15 have been interpreted as field boundaries as they respect the historic land division of the surrounding fields aligning north-west to south-east.

Interpretation: geological or natural

2.10.15 To the south of the dataset, a discrete, sinuous, irregular anomaly of natural origin has been identified (2-1836-016). This anomaly is of a very low magnitude but is made visible due to the lack of variation in the magnetic background. It is caused by the localised build-up of magnetic sands and gravels in the superficial geology on slight breaks of slope.

Interpretation: modern utilities

2.10.16 Three modern utilities have been interpreted in the dataset. 2-1836-017 is aligned north to south and traverses the south-western extent of the survey area whilst 2-1836-018 and 2-1836-019 are aligned east to west and north-west to south-east respectively. They are located on the north-eastern boundary of the survey area and could be part of a wider network of pipes. 2-1836-019 appears to continue in the north-east of the area at 2-1836-020.

Interpretation: modern

2.10.17 Three further areas of disturbance fall around the approximate centre and east of the surveyed area. 2-1836-021 and 2-1836-022 align to former ponds on the earliest available historic mapping of the area (1st edition Ordnance Survey 1881). Their subsequent filling in has resulted in this high magnitude response. 2-1836-023 is not visible on available mapping as a pond, but, given the similar magnetic response, is likely to be of the same origin.

Conclusions

2.10.18 The detailed gradiometer survey has not detected any anomalies of definite archaeological interest. However, several areas of possible historic extraction have been identified. Other anomalies seen in the area are thought to predominantly be related to historic land division, modern agricultural practices and land drainage systems. Three utilities run through the surveyed area and may form part of a wider network of utilities.

2.11 CA2 - 1883 north of Newbuildings Farm, Marston

Site details

2.11.1 A geophysical survey was carried out over area CA2-1883 North of Newbuildings Farm, Marston, Staffordshire (centred on NGR 392801, 327725 (Figure 36)).

2.11.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the presence of post-medieval agricultural activity and possible mineral extraction.

2.11.3 The survey area comprises an irregular survey area across five fields to the north of Newbuildings Farm, approximately 1km south-east of Marston and 4.1km north of the centre of Stafford. The survey area is not generally defined by surviving boundaries to the north and south, however is bound to the south-east by hedge rows and pasture land. The gradiometer survey covered 6.5ha of the 18.7ha area. The survey area is generally flat, but slopes from approximately 110m aOD in the south-east to 105m aOD in the north-west. There are no overhead cables present over the field. There are several internal boundaries across the survey area.

2.11.4 The underlying geology of the survey area is mapped as the Mercia Mudstone Group with no superficial deposits recorded[24]. The soils underlying the survey area comprise of the stagnogleyic argillic brown earths of the Whimple 3 (572f) formation to the north and Salwick (572m) formation to the south[25]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.11.5 A post-medieval field system, including former field boundaries and narrow ridge and furrow, is recorded in the southern part of the survey area (LiDAR 2193-4, 2073). LiDAR data has also identified traces of ridge and furrow in the centre of the survey area (LiDAR 2077). This is partially overlain by possible former extractive pits (LiDAR2196). A small 19th century farm is recorded approximately 50m to the south of the survey area (SHER MST17408), further suggesting the agricultural nature of the surrounding area during the post-medieval period.

2.11.6 A very faint linear feature, approximately 18m in width, and visible for a distance of *c.*700m runs east to west across the centre of the survey area (LiDAR 2196). The origin of the feature is uncertain; it could represent a former trackway, road or linear boundary. However, the feature could be the footprint of the easement of a utility trench. The feature does not respect existing field boundaries, and appears to be superimposed over (and therefore post-date) the aforementioned ridge and furrow and possible extraction pit

Results

2.11.7 The gradiometer survey carried out between 26 – 30 October 2016 using hand-held systems has identified some anomalies of possible archaeological interest.

2.11.8 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –37 - 39). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 39).

[24] British Geological Survey (2015)
[25] Soil Survey of England and Wales (1983)

Interpretation: archaeology

2.11.9 Several linear anomalies have been recorded aligned south-west to north-east to the south of the survey area (2-1883-001 - 2-1883-002). In addition, two parallel linear anomalies aligned north-west to south-east have been detected just to the north (2-1883-003 and 2-1883-004). These appear to align with current field boundaries and may relate to historic field systems or enclosures.

2.11.10 Further discrete anomalies have been identified to the south-east (2-1883-005 - 2-1883-008). These have been interpreted as possible archaeology due to their elevated magnitude and alignment. These anomalies could form part of an enclosure with associated pits; however the varying magnitude and inconsistency of the anomalies make them difficult to interpret.

2.11.11 Broader spaced, parallel linear trend anomalies have been identified aligned north to south in the south-east of the survey area (2-1883-012). These are interpreted as possible evidence of ridge and furrow which may relate to medieval agricultural practice.

Interpretation: agricultural

2.11.12 Parallel linear anomalies have been detected aligning east to west (2-1883-009 and 2-1883-010) and north-east to south-west (2-1883-011) across the survey area. These anomalies have been interpreted as evidence of ploughing.

2.11.13 A linear anomaly to the north-west of 2-1883-010, aligned north-east to south-west has been interpreted as a former field boundary, visible on the earliest available Ordnance Survey mapping (1st edition Ordnance Survey 1881) (2-1883-013).

2.11.14 To the south-west of the survey area a linear anomaly aligned east to west has been interpreted as a former land drain (2-1883-014).

Interpretation: modern utilities

2.11.15 Several high magnitude, linear anomalies have been detected throughout the dataset and have been interpreted as modern utilities. 2-1883-015 aligns north-east to south-west in the north-west of the survey area. 2-1883-016, 2-1883-017 and 2-1883-018 align similarly on a north-west to south-east alignment and traverse the entire survey area. 2-1883-019 runs parallel to 2-1883-018 and 2-1883-020 is on a north to south alignment in the north of the survey area. 2-1883-021 aligns north-east to south-west across the eastern end of the survey. 2-1883-022 aligns north to south and is crossed by 2-1883-023 to the far south of the survey on an east –west alignment.

Interpretation: modern

2.11.16 A high magnitude oval anomaly has been detected towards the centre of the survey area (2-1883-024). This has been interpreted as an infilled pond visible on earlier Ordnance Survey mapping (1st edition Ordnance Survey 1881).

Conclusions

2.11.17 The detailed gradiometer survey has detected a number of anomalies that may be of archaeological origin. These include an area of linear anomalies that may form the remains of a field system or enclosure with associated pit features. Disturbance

resulting from the installation of modern services to these features make interpretation difficult. An area of possible ridge and furrow cultivation can also be seen. Furthermore, several parallel linear anomalies indicative of modern ploughing activity have been identified, as well as former field boundaries and infilled ponds visible on historic mapping.

2.11.18 The remaining anomalies identified are likely to be modern in origin, relating primarily to a network of modern utilities.

2.12 CA2 - 1962 Grove Farm, Yarlet

Site details

2.12.1 A geophysical survey was carried out over area CA2-1962 Grove Farm, Yarlet, Staffordshire (centred on NGR 391188, 328930 (Figure 40)).

2.12.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the proximity of recorded medieval and post-medieval activity with supporting LiDAR data.

2.12.3 The survey area comprises a single pasture field and farm complex on the east side of the A34, approximately 6.3km north of the centre of Stafford and 6km south of Stone. The limits of the survey area are defined by a fence line to the east and north, woodland to the north-east and south, and a fenced area surrounding the farm complex located centrally along the western extent. The gradiometer survey covered the entire 1.2ha of the survey area. This survey area is gently sloping from north to south, the northern boundary lies at approximately 140m aOD and drops to 130m aOD at the southern extent. There are no overhead cables, water courses or internal field boundaries recorded in the survey area.

2.12.4 The solid geology is recorded as the Stafford Halite Member with no superficial deposits recorded[26]. The soils across the area likely consist of typical stagnogleyic argillic brown earths of the Whimple 3 (572f) formation[27]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.12.5 The area immediately to the north of the survey area is the recorded location for the deserted medieval settlement (DMV) of Yarlet, evidenced by the earthwork remains of a hollow-way, a house platform and ridge and furrow (SHERMST3709). This was recorded in the 1086 Domesday Survey as having four villagers and four smallholders but was later depopulated and turned into a grange farm by the monks of Combermere (SHERMST1752). A possible hollow-way is noted extending southwards from the southern part of the DMV; potentially dividing just to the north of Yarlet Hill (LiDAR2145). This can be seen to correspond with an avenue of trees marked on the 1st edition Ordnance Survey map, which extends into the survey area. Possible traces of ridge and furrow are visible in the LiDAR data to the east of the area (LiDAR2146).

[26] British Geological Survey (2015)
[27] Soil Survey of England and Wales (1983)

2.12.6 Traversing the southern part of the survey area is part of a land boundary (LiDAR2134), thought to be the boundary of the former park associated with Yarlet Hall. The current building (now a school) dates to the 19th century but is located on the site of a 17th century mansion (SHERMST6423). The land boundary may be earlier still, potentially associated with a medieval or early post-medieval park. A possible banked enclosure is visible on Yarlet Hill (LiDAR2142), alternatively this could be a track way associated with possible quarrying features (LiDAR2141, 2143, 2295).

Results

2.12.7 The gradiometer survey carried out on the 30 August 2016 using hand-held systems has identified anomalies of possible archaeological interest, along with agricultural features and numerous trends and ferrous responses.

2.12.8 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –41 - 43). The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 43).

Interpretation: archaeology

2.12.9 Towards the south-west corner of the dataset there is a sub-circular trend of unknown origin (2-1962-001). This potential feature may extend outside the survey extents.

2.12.10 A small number of unidentified trends (2-1962-002) have also been highlighted in the north of the surveyed area. These could be related to agricultural activity due to having a similar alignment as the ploughing to the south-east. These responses present clear variations from the background magnetic response but are too weak to allow accurate interpretation.

Interpretation: agricultural

2.12.11 An area of parallel linear anomalies has been detected along the north-east boundary of the surveyed area. These are likely related to modern ploughing activity.

Interpretation: modern

2.12.12 In the centre of the dataset there is a strong magnetic disturbance, due to the farm buildings and equipment. To the north there is a small linear anomaly (2-1962-003) it is unclear whether this is a modern utility or drain.

Conclusions

2.12.13 The detailed gradiometer survey has not identified any anomalies that can confidently be interpreted as having an archaeological origin.

2.12.14 The majority of anomalies identified are likely to be modern in origin. Anomalies of uncertain origin can be seen across the north of the area surveyed, however these are either too weak to interpret with confidence or most likely modern. An area of ploughing is also evident in the north.

2.13 CA2-1979 west of Yarlet

Site details

2.13.1 A geophysical survey was carried out over area CA2-1979 west of Yarlet, Staffordshire (centred on NGR 390945, 329312 (Figure 44)).

2.13.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the proximity of recorded deserted medieval village and ridge and furrow with supporting LiDAR data.

2.13.3 The survey area comprises three pasture fields on the west side of the A34, approximately 5.7km north of the centre of Stafford and 5.2km south of Stone. The limits of the survey area are defined in the main by hedgerow field boundaries, with a fence line in the north-west. The gradiometer survey covered 2.1ha of the 9.2ha survey area, with the remaining area to be surveyed at a later date. This survey area is gently sloping from south to north, the southern boundary lies at approximately 146m aOD and drops to 124m aOD at the northern extent. Overhead cables traverse east to west across the area and north to south across the east of the area. No water courses are recorded in the survey area.

2.13.4 The solid geology is recorded as the Stafford Halite Member consisting of Halite stone and Mudstone, with no superficial deposits recorded[28]. The soils across the area likely consist of typical argillic pelosols of the Worcester (431) formation[29]. Soils in such geological settings have been demonstrated to produce magnetic contrasts suitable for the detection of anomalies through gradiometer survey.

Archaeological background

2.13.5 Approximately 190m to the north-west of the survey area a Bronze Age spearhead has been recovered (SHERMST762) indicating prehistoric activity within the vicinity of the survey area, although no archaeological features from this period have been identified in the immediate surrounds of the site.

2.13.6 Two linear features are apparent in the LiDAR data in the eastern part of the survey area. The first (LiDAR2140) is depicted on historic maps as a field boundary; the second is a probable former field boundary just to the north of this (LiDAR2294).

2.13.7 Earthworks associated with the deserted settlement of Yarlet (SHERMST3709, MST1752), including hollow ways, a possible house platform and ridge and furrow earthworks are situated immediately to the east of the survey area on the opposite side of the A34. This landscape park around Yarlet Hall appears to have replaced most of the village (SHERMST6423). A further hollow, which may be a similar boundary, or potentially natural, has been identified in the aerial photographs in the northern part of the site.

2.13.8 An area of ridge and furrow lies to the east of the survey area near to the deserted medieval village, which has been identified on aerial photographs (LiDAR2146, 2182-3 and2203).

[28] British Geological Survey (2015)
[29] Soil Survey of England and Wales (1983)

2.13.9 There are several probable post-medieval former extractive pits located within the southern half of the survey area and the wider area. Some remain as surviving ponds; others are identifiable on historic maps and LiDAR (LiDAR2158, 2139, 2293, 2179, 2180). A reservoir is also recorded on the 1920s Ordnance Survey map to the northwest of Hilltop farm. It is also on this map that the first buildings of hilltop farm are depicted.

Results

2.13.10 The gradiometer survey carried out on the 6 January 2017 using hand-held systems has not identified anomalies of archaeological origin, however, areas of modern agricultural features and numerous trends and ferrous responses have been identified.

2.13.11 Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –45 - 47). The interpretation of the datasets highlights the presence of modern agricultural activity and services, as well as trends (Figure 47).

Interpretation: agricultural

2.13.12 Areas of parallel linear anomalies (2-1979-001 – 2-1979-003) have been detected across the surveyed area. The anomalies at 2-1979-001 and 2-1979-002 have a wider spacing that those at 2-1979-003, suggesting that they may differ in date.

Interpretation: modern services

2.13.13 A magnetically strong (+/-100 nT) linear anomaly (2-1979-004) runs north-east to south-west across the dataset. This is indicative of a modern utility, such as a pipe or a cable.

Interpretation: modern

2.13.14 An area of magnetically strong (+/-100 nT) dipolar responses (2-1979-005) lies on the north-eastern boundary of the survey area. Whilst it is possible that this could relate to an area of post-medieval quarrying or extraction it is more likely to be related to the modern buildings lying to the north.

Conclusions

2.13.15 The detailed gradiometer survey has not detected any anomalies confidently identified as archaeological. There is no evidence that the deserted medieval village recorded to the east extended into the survey area. The anomalies detected are likely to relate to modern ploughing, a modern utility, and an area of modern disturbance.

2.14 CA2-1988 north-east of Elmhurst, Yarlet

Site details

2.14.1 A geophysical survey was carried out over area CA2-1988, north-east of Elmhurst, Yarlet (centred on NGR 390584, 329851 (Figure 48)).

2.14.2 The survey area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the presence of probable post-medieval extraction pits and field boundaries, as well as ridge and furrow in the surrounding area.

2.14.3 This survey area comprises an irregular shaped parcel of land covering areas within several fields to the west of the A34, north-east of Elmhurst, Yarlet, approximately 7.4km north of the centre of Stafford. The limits of the survey area are defined by hedgerow field boundaries. The gradiometer survey covered 6.7ha of the 18.4ha survey area, with the remaining area to be surveyed at a later date. This survey area lies on an east facing incline, the west peaks at approximately 145m aOD and falls to approximately 120m aOD in the east. There are no overhead cables or water courses recorded at the survey area. Internal field boundaries consist of hedgerows and fences.

2.14.4 The underlying geology is recorded as the Stafford Halite Member consisting of halite stone and mudstone with no superficial deposits[30]. The soils across the area likely consist of typical argillic pelosols of the Worcester (431) formation[31]. Soils derived from these parent geological materials are considered suitable for magnetometry.

Archaeological background

2.14.5 Approximately 125m to the south of the survey area a Bronze Age spearhead has been recovered (SHERMST762) indicating prehistoric activity within the vicinity of the survey area, although no archaeological features from this period have been identified in the immediate surrounds of the site.

2.14.6 Traces of ridge and furrow cultivation have been identified to the north and east of the survey area (AP129, 130).

2.14.7 There are numerous probable former extraction pits in the survey area and its vicinity. Two in the southern portion of the site are labelled as such on the 1st edition Ordnance Survey map, and have been identified in the LiDAR data (LiDAR2168-9). A further pit in the centre of the site is now a pond and in the northern part of the survey area a small pond and two earthworks (possibly the result of quarrying lie within a possible enclosure (LiDAR2172).

2.14.8 Two linear features, probably former field boundaries are in the southern part of the site (LiDAR2204-5), although these are not depicted on any of the historic maps.

2.14.9 Along the southern boundary of the survey area is a linear feature (LiDAR2134), which possibly forms the boundary of an estate/parkland surrounding Yarlet Hall, or the position of a medieval or early post-medieval park pale. However, the boundary also follows an existing watercourse, suggesting that this may be entirely natural in origin although it corresponds with an historic parish boundary for much of its length.

Results

2.14.10 The gradiometer survey carried out between 13 – 15 December 2016 using a cart based system has been successful in identifying anomalies of possible archaeological origin, along with numerous other magnetic trends. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –49 - 50).

[30] British Geological Survey (2015)
[31] Soil Survey of England and Wales (1983)

2.14.11 The interpretation of the datasets highlights the presence of potential archaeological anomalies, ferrous/burnt or fired objects, and magnetic trends (Figure 50).

Interpretation: archaeology

2.14.12 Two areas of possible archaeology have been identified by the survey. In the north of the surveyed area a low magnitude, negative, linear anomaly has been identified aligned east to west across the dataset (2-1988-001). This anomaly has been identified as possible archaeology as it does not correspond to any recorded former field boundaries visible on available mapping. The alignment however suggests it may relate to an unmapped former field boundary.

2.14.13 To the south of 2-1988-001, small positive pit-like anomalies have been identified (2-1988-002). Historic mapping shows extraction pits in the vicinity from the late-medieval period. Small anomalies like this are indicative of quarrying activity and as such have been interpreted as possible archaeology, although a natural origin is possible.

2.14.14 Throughout the dataset, low magnitude, parallel linear trend anomalies have been identified. To the south of the survey area aligned north to south (2-1988-003), to the south-east of the survey aligned north-west to south-east (2-1988-004) and south-west to north-east (2-1988-005). Due to their broad spacing and low magnitude, these anomalies have been interpreted as ridge and furrow.

Interpretation: agricultural

2.14.15 In the northern portion of the survey area, closer spaced, parallel linear trend anomalies have also been identified (2-1988-006). These are interpreted as evidence of modern agricultural activity, such as ploughing.

Interpretation: modern service

2.14.16 A large high magnitude, dipolar linear anomaly has been identified aligned south-west to north-east across the survey area (2-1988-007). This type of anomaly is indicative of a modern utility, such as a pipe or cable.

Conclusions

2.14.17 Several anomalies of possible archaeological interest have been identified by the survey. These features may relate to historic agricultural activity or post-medieval extraction pits, which are recorded in the surrounding area. Modern agricultural anomalies and utilities are also present across the dataset.

2.15 CA2-1995 west of Yarlet

Site details

2.15.1 A geophysical survey was carried out over area CA2-1995, west of Yarlet (centred on NGR 390707, 329555 (Figure 51)).

2.15.2 The area was selected for geophysical survey as it is considered to be an area with elevated archaeological potential due to the proximity of a deserted medieval village and a medieval estate boundary, as well as probable post-medieval extraction pits and field boundaries.

2.15.3 This survey area comprises an irregular shaped parcel of land covering two pasture fields west of the A34, Yarlet, approximately 6.1km north of the centre of Stafford and 4.8km south of Stone. The limits of the geophysical survey area are defined by hedgerow field boundaries and fence lines to the north, with an arbitrary boundary running through a field to the south. The gradiometer survey covered 4.3ha of the 4.5ha survey area, with a small obstruction caused by an area of woodland in the south. As such, this area of survey is considered complete. This survey area lies on a north-east facing incline, the south-west peaking at approximately 143m aOD and falling to approximately 126m aOD in the north-east. There are no overhead cables or water courses recorded at the survey area. Internal field boundaries consist of hedgerows and fences.

2.15.4 The underlying geology is recorded as the Stafford Halite Member consisting of Halite stone and Mudstone with no superficial deposits[32]. The soils across the area likely consist of typical argillic pelosols of the Worcester (431) formation[33]. Soils derived from these parent geological materials are considered suitable for magnetometry.

Archaeological background

2.15.5 Approximately 50m to the west of the survey area a Bronze Age spearhead has been recovered (SHERMST762) indicating prehistoric activity within the vicinity of the survey area, although no archaeological features from this period have been identified in the immediate surrounds of the site.

2.15.6 To the north and west of the survey area is a linear feature (LiDAR2134). These surviving land divisions possibly form the boundary of an estate/parkland surrounding Yarlet Hall. However, the 'boundaries' also follow an existing watercourse, suggesting that this arrangement of land divisions may be entirely natural in origin. The boundaries also correspond with an historic parish boundary for much of their length, being defined by a bank and ditch/watercourse.

2.15.7 Earthworks associated with the deserted settlement of Yarlet (SHERMST3709, MST1752), including hollow ways, a possible house platform and ridge and furrow earthworks are situated to the east of the survey area on the opposite side of the A34. This landscape park around Yarlet Hall appears to have replaced most of the village (SHERMST6423). A further hollow, which may be a similar boundary, or potentially natural, has been identified in the aerial photographs just to the east of the site (AP127).

2.15.8 There are several probable post-medieval former extractive pits located within the wider area. Some remain as surviving ponds; others are identifiable on historic maps and LiDAR (LiDAR2158, 2139, 2293, 2179 and 2180). One lies within the southern part of the survey area (LiDAR 2162).

Results

2.15.9 The gradiometer survey carried out on the 5 January 2017 using hand-held systems has not identified any anomalies of archaeological origin, however, areas of modern

[32] British Geological Survey (2015)
[33] Soil Survey of England and Wales (1983)

agricultural activity and natural response can be seen. Results are presented as a series of greyscale and XY plots, and archaeological interpretations, at a scale of 1:2000 (Figures –52 - 54). The interpretation of the datasets highlights the presence of modern agricultural activity and magnetic trends (Figure 54).

Interpretation: agricultural

2.15.10 In the northern portion of the survey area, closely spaced, parallel linear anomalies (2-1995-001 – 2-1995-02) have been identified on a north-east to south-west alignment. These are interpreted as evidence of modern agricultural activity, such as ploughing.

2.15.11 Several areas of weak dipolar responses (2-1995-003 – 2-1995-06) can be seen throughout the dataset. These are indicative of green waste being ploughed into the topsoil as fertiliser. Whilst this has the potential to mask weaker archaeological anomalies, the relatively diffuse response given by areas within this dataset make this unlikely.

2.15.12 Two weak positive (0.5 nT) linear anomalies (2-1995-007) have been detected running parallel on a north-west – south-east alignment in the north of the area. The weak and isolated nature of these responses suggests that they are most likely natural in origin, related to variation in soils or superficial deposits in the area, but given their regular and parallel appearance have been interpreted as trends of unknown origin.

Conclusions

2.15.13 The survey has not identified any anomalies of archaeological origin. Whilst the spread of ferrous responses across the area caused by the spreading of green waste has the potential to mask weaker archaeological anomalies, the sparse spread makes this unlikely, especially for large and strong features, such as post-medieval material extraction. The features identified that can be interpreted relate to modern ploughing, and natural variation of soils or superficial deposits.

3 Remote sensing

3.1 Introduction

3.1.1 This report outlines the results of the archaeological remote sensing survey of the Colwich to Yarlet area. The survey involved the systematic mapping, recording, analysis and interpretation of potential archaeological sites from aerial photographs, multi-spectral imagery and LiDAR data.

3.1.2 The aim was to accurately map and record the form and extent of archaeological features visible as cropmarks, soil marks, earthworks or structures in order to inform the baseline assessment of the cultural heritage resource.

3.2 Study area

3.2.1 The study area comprised a 250m buffer for LiDAR and multi-spectral data, and a 350m buffer for aerial photographic survey extending from the limits of the land required for the Proposed Scheme.

3.3 Methodology

LiDAR data

3.3.1 Airborne LiDAR data are produced by an aircraft-mounted laser linked to a differential Global Positioning System (dGPS) and an Inertial Navigation System (INS). A cloud of measurement points is taken as the aircraft flies over the landscape by firing the laser at the ground in a regular pattern and measuring the time it takes for signals to be reflected to the instrument. The resultant 'point cloud' is typically recorded at spatial resolutions of between 0.25m and 2m, with a vertical tolerance of up to 0.2m, and this can be used to generate highly detailed landscape visualisations.

3.3.2 These visualisations can be used to identify archaeological features, which are expressed in the form of localised and often subtle variations in ground profile (e.g. earthworks). This can include features that are barely, if at all perceptible at ground level.

3.3.3 Point clouds can be presented in the form of a Digital Surface Model (DSM), which includes the heights of objects such as buildings, vegetation and vehicles, as well as the terrain surface.

3.3.4 The data can also be filtered digitally to create a Digital Terrain Model (DTM), filters out objects (e.g. vegetation cover) and models the underlying ground surface.

3.3.5 The use of DTMs in archaeological prospection offers an advantage over conventional aerial photograph assessment as features can often be identified in areas of relatively dense tree or vegetation cover.

3.3.6 Where a laser pulse encounters multiple surfaces, such as a tree canopy and the ground beneath, multiple measurable reflections can be recorded. The first returned pulse represents the first surface encountered with the last return representing the final surface encountered. By filtering out all but the last returns the ground surface beneath vegetation can be represented.

3.3.7 Surface and terrain models can be processed to create shaded relief, or 'hillshade' images to visualise the LiDAR data. This process entails the casting of a simulated light source at a fixed altitude and azimuth across the landscape to create virtual shadows which emphasise variations in relief. The examination of hillshade images is particularly useful for the purposes of archaeological prospection, as features which retain some surface expression can appear more prominent when illuminated by an artificial light source.

Multi-spectral imagery

3.3.8 Multi-spectral data is gathered using an airborne sensor which is capable of detecting electromagnetic radiant energy from the ground surface in the form of reflected solar radiation or thermal radiation emitted by target objects. Data is typically collected within a number of discrete spectral bands, ranging from the visible to the longwave infra-red.

3.3.9 The resultant data can be used to generate a series of geo-referenced images within discrete regions of the electromagnetic spectrum, such as the Near-Infrared (NIR), or manipulated to generate a spectral transformation of two or more spectral bands. Subsequent examination of the multi-spectral imaging can enable the identification of archaeological features via a range of physical, chemical, biological and environmental signatures, including some which may be undetectable, or poorly resolved in visible wavelengths.

3.3.10 For example, it has long been recognised that contrasting patterns of vegetation stress or vigour can be correlated with sub-surface archaeological features. These proxy indicators have traditionally been detected via cropmarks visible on conventional aerial photography. However, wavelengths outside the visible spectrum are also sensitive to changes in vegetation health. Under certain conditions, vegetation stress and vigour responses can be expressed more clearly within these wavelengths than within visible spectra. Thus, examination of multi-spectral imaging offers the potential to improve detection rates of archaeological features over remote sensing techniques which rely solely on the narrow visible range of the electromagnetic spectrum.

Aerial photography

3.3.11 Two types of aerial photograph were used for this assessment. Vertical aerial photographs are taken for military, commercial and general-purpose survey using a camera mounted inside a modified aircraft. The aircraft is flown on a pre-planned set of overlapping flight-lines which cover the survey area completely. The camera points straight towards the ground. The vertical viewpoint provides aerial photographic coverage from a fixed scale and constant 180° angles at the centre of each frame. The overlap between the areas covered by each consecutive frame is usually 60%. This overlap between frames enables the photo interpreter to study each pair of vertical photos under a stereoscope and see the landscape in 3D.

3.3.12 The stereoscope combines the two images to allow the interpreter to see a single three-dimensional image of the ground surface. Vertical aerial photographs carry inherent distortions introduced by variations in perspective and ground height, but are essentially 'map-like' in appearance. They are generally taken for non-archaeological,

civil and military purposes and form the basic data from which most modern maps are compiled. Vertical aerial photographs are a very useful source of archaeological data, particularly in areas such as this, where features survive as earthworks

3.3.13 Oblique aerial photographs are taken using a hand held camera by an aerial archaeologist to portray features which have been identified during specialist survey. These photos are extremely useful, but contain inherent perspective distortions, which must be accounted for in rectification and mapping procedures. In this case, both vertical aerial photographs, and specialist obliques were available for interpretation. The sources of aerial photographs used for this assessment are detailed below.

3.4 Data sources

LiDAR

3.4.1 Two LiDAR datasets were acquired for the purposes of the assessment. The first of these, at 0.2m horizontal cell resolution, was acquired specifically for the purposes of informing the design and EIA process for the Proposed Scheme. The 0.2m LiDAR data was captured during a series of flights between June and July 2014 and covers an area of 500m either side of the limits of the land required for the Proposed Scheme. This does not provide full coverage of the study area.

3.4.2 The second dataset, at 2m horizontal cell resolution, was sourced from the Environment Agency's LiDAR data archive and was consulted as it provided greater coverage of the study area.

3.4.3 Both LiDAR datasets were supplied in ASCII format as a DTM, processed to create a series of hillshade images lit from the north-west, north-east, south-east and south-west. A composite shaded relief image was also created from each of the LiDAR datasets using a technique known as Principal Component Analysis (PCA). No additional processing of the LiDAR data was undertaken for the purposes of this assessment.

Multi-spectral

3.4.4 The multi-spectral data used in this assessment was acquired in tandem with the 0.2m LiDAR data. The imagery was supplied in the following spectral bands and indices: Simple Ratio Index (SR), Normalized Difference Vegetation Index (NDVI), Near Infra-Red (NIR), False Colour Infra-Red and Red-Green-Blue (RGB) (i.e. conventional imagery within the visible region of the electromagnetic spectrum). No additional processing of the multi-spectral data was undertaken for the purposes of this assessment.

Aerial photography

3.4.5 The following sources of aerial photographs and data were searched and used for this assessment:

- Historic England Archive: The Engine House, Fire Fly Avenue, Swindon. Air photo enquiry number 98516, undertaken in January 2016, identified 38 vertical aerial photographic sorties containing 376 frames taken between 1948 and 2000. Some of these frames were held as negatives, but the majority were

available in the archive as prints. In contrast to the Fradley to Colton area, only 48 oblique aerial photos were identified, which were taken between 1966 and 2010;

- Cambridge University Collection of Aerial Photographs (CUCAP): Department of Geography, University of Cambridge. This collection was closed during the timeframe of this project, however some irregular access was granted for limited periods during February and March 2016, and prior to its full closure in June 2016. The CUCAP archive contains 33 oblique aerial photographs taken between 1950 and 1979 and one stereo pair of vertical aerial photographs taken in July 1976;
- online aerial images: All timelines of ortho-rectified mosaics of vertical aerial photographs were consulted online for this assessment and used extensively between January and April 2016; and
- HE NMP provided high quality GIS-ready detailed digital mapping over most CA2, within the ongoing Staffordshire NMP[34] survey area .and was exported from AutoCAD Map to GIS as SHP files.

Others

3.4.6 The following additional sources were used to aid the identification and interpretation of features:

- records contained within the HER;
- NMP data, where available; and
- Ordnance Survey 25-inch scale (1:2,500) mapping, surveyed and published from the 1870s through to the 1920s, and six-inch (1:10,560) maps produced from the 1880s through to the 1950s.

3.5 Identification, digitisation and interpretation

LiDAR and multi-spectral

3.5.1 Features of potential archaeological interest were identified by detailed visual examination of both the multi-spectral and LiDAR imagery, in conjunction with other relevant datasets (outlined below). The 3D Analyst tool in ArcGIS 10.2.2 was used to examine changes in ground profile on the DTMs where features of potential interest were identified. Digitisation of identified features was then undertaken manually within ArcGIS 10.2.2.

3.5.2 Extant historical features within the landscape, such as field systems, ponds, roads, farms and other structures were excluded where these are recorded on current mapping. Exceptions were made where the assessment indicated that archaeological or historical landscape features might extend beyond their current mapped extents.

3.5.3 Identified features were assigned a unique numerical identifier and briefly described. The potential origin of each feature was interpreted based on a consideration of its

[34] Bax (2014)

form, landscape context and other relevant datasets, described below. Where possible, a broad date range was assigned to each feature by reference to conventionally defined archaeological periods.

Aerial photography

3.5.4 The oblique aerial photographs were sorted into individual sites, which later became the aerial photography sites listed in Annex C, then examined in detail visually, either on screen or as paper prints. The stereo pairs or runs of vertical aerial photographs were examined using a magnifying mirror stereoscope to identify detail in 3D. Single vertical images were examined visually and under 4x magnification.

3.5.5 With permission from the archives, the paper photographs were captured digitally by re-photographing them and digital photographs were captured as JPG files. These images are very numerous, and may not be reproduced or published but have been used to derived the digitised interpretative data within the GIS. All timelines which were available at Google Earth were interpreted in detail and selected portions saved as JPG file images for geo-referencing and interpretation.

3.5.6 The NMP data were checked to the original aerial photographs which were used to produce them, and its accuracy checked to geo-referenced samples of the photos which were cited as sources. Due to the high quality and accuracy of the GIS-ready Staffordshire NMP data supplied by HE, the data were incorporated to the mapping for this project, as SHP files which clearly identify their source as NMP.

3.5.7 Following selection and sorting into site areas, photographs were filed and referenced as JPG images and were geo-referenced using control points derived from the 1:2500 scale Ordnance Survey Mastermap data layer, using the Quantum GIS 2.10 referencer tool and AirPhoto 3.58. The georeferenced raster files were set as a separate layer in QGIS and digitised to project standards to create SHP files for the line and polygon data which recorded the interpretations of ditched, embanked and other features which were identified during the survey.

3.5.8 As with the multi-spectral and LiDAR surveys, the aerial photographic survey excluded surviving historical features within the landscape, such as field systems, ponds, roads, farms and other structures these are recorded on current Ordnance Survey mapping. Exceptions were made where the assessment indicated that archaeological or historical landscape features might extend beyond their current mapped extents or held some interest or significance to the survey.

3.5.9 Identified features were assigned a unique numerical identifier and briefly described within the GIS attribute tables assigned to each polygon which identified a 'site' or area of interest. As with the multi-spectral and LiDAR recording protocols, the potential origin of each feature was interpreted based on a consideration of its form, landscape context and other relevant datasets, described below. Where possible, a broad date range was assigned to each feature by reference to conventionally defined archaeological periods, or if this was not certain or possible, an 'unknown' date was assigned.

3.6 Limitations

Coverage

LiDAR and multi-spectral

3.6.1 The study area for the assessment of LiDAR and multi-spectral data was based on the land required for the Proposed Scheme.

3.6.2 The 0.2m LiDAR and multi-spectral data were collected within a 500m buffer extending from the centre of the route of the Proposed Scheme.

3.6.3 Although the 2m resolution LiDAR data was available for the majority of the study area, coverage was lacking for a section of the route approximately2.5km long between Moreton Grange and Tithebarn Covert, as well as the northernmost edge of the study area.

Aerial photographs

3.6.4 The data from the aerial photographic cover searches were converted to CSV files and integrated to the working GIS to assess the coverage of both vertical and oblique aerial photos.

3.6.5 There are less oblique aerial photos for the Colwich to Yarlet area than over the Fradley to Colton area. The obliques are not present for areas where no sites were seen during surveys, and these apparently 'blank' areas where no obliques are present may contain sub-surface features, which will only become apparent when the topsoil is disturbed or removed.

3.6.6 The Colwich to Yarlet area was covered by sorties of vertical aerial photos dating from the 1940s and 1950s, and partially covered by more locally oriented surveys since. The more recent images at Google Earth supplied full coverage of the area, and were used for this assessment in accordance with observations made by Scollar and Palmer[35].

Analysis

LiDAR and multi-spectral

3.6.7 Aside from minor gaps in the coverage of the datasets, outlined above, a number of other factors can be expected to have affected the detection rates and interpretation of archaeological features during the assessment.

3.6.8 One of the principal limitations of the assessment is that features were identified and interpreted in the absence of ground level observations. This can result in interpretation errors where localised variations in ground profile, which are of very recent or natural origin, resemble archaeological features. This issue was alleviated by comparing the LiDAR images against conventional aerial photographic imagery (i.e. within the visible region of the electromagnetic spectrum). In addition, the veracity of the survey results will be tested in the field during further stages of work.

3.6.9 There are also certain methodological limitations which are inherent to the remote sensing techniques employed during the assessment. For instance, multi-spectral

[35] Scollar, I. and Palmer, R. (2008), *Using Google Earth Imagery*, AARGnews 37, 15 - 21

imaging, unlike filtered LiDAR data, is rarely of use for identifying archaeological features within wooded environments.

3.6.10 Although shaded relief images can greatly aid visualisation of LiDAR data, no single direction of illumination can simultaneously reveal all relief features. For example, when a hillshade is lit from a single direction, any features aligned with the source of light can be hidden, since they do not cast any shadow. This technical imitation was overcome by examining a composite shaded relief image, alongside a series of hillshades illuminated from multiple directions.

3.6.11 The angle of illumination can also influence the visibility of relief features. For example, visualisation of subtle variations in relief may require low illumination elevation, which can in turn obscure detail in steeper areas of the image. As the imagery used during the assessment was illuminated from a single fixed angle, this may have influenced the detection rates of archaeological features. However, the effect of this is likely to be relatively slight, as the study area is not characterised by dramatic changes in relief.

3.6.12 The filtering process which is applied to LiDAR data when generating a DTM may not be able to entirely remove the masking effect of low-level vegetation, and can also result in some loss of detail. The latter effect was seen intermittently across the 20cm LiDAR imagery, where the filtering occasionally produced a greatly simplified geometric surface. This may have obscured some features of interest, although only within extremely localised areas.

3.6.13 The horizontal cell resolution of LiDAR data can also influence the detection rates of archaeological features. This can occur where the spacing of point measurements is sufficiently wide to conceal, or reduce the visibility of small archaeological features. However, this is unlikely to have affected the assessment due to the availability of highly detailed 20cm resolution LiDAR data.

3.6.14 It was determined that some types of feature, particularly surviving ridge and furrow landforms, were often more clearly visible on the LiDAR imagery generated from the 2m resolution data than the 20cm data. It is possible that, despite filtering, subtle changes in ground profile may have been masked by low level vegetation due to the fine granularity of the 20cm data, whereas this effect was 'evened out' in the images generated from the coarser 2m data. Consequently, the detection rates for some types of archaeological feature may have been reduced where 2m resolution LiDAR data was unavailable.

3.6.15 Multi-spectral signatures are widely used in other environmental disciplines to accurately classify and map vegetation and geology types. Unfortunately, archaeological sites and features have not been demonstrated to exhibit distinctive spectral signatures that can be used for generic detection purposes. The effectiveness of using multi-spectral data to identify archaeology can be significantly influenced by a range of factors, including the underlying geology, soil moisture content and vegetation cover. However, current understanding of the processes which determine whether and how archaeological features are expressed in the electromagnetic spectrum is incomplete. In practise, this means that it can be difficult to predict whether archaeological features will be identifiable in any given sensor.

3.6.16 Aerial photograph assessments are often based on sequences of historical imagery, which provide a series of 'snapshots' of the landscape under different conditions. In contrast, LiDAR and multi-spectral data are typically gathered at a single or series of closely spaced points in time. This can explain why features identified from aerial photographs cannot always be detected on LiDAR and multi-spectral images of the same area. For example, multi-spectral data collection may be undertaken outside of the window of opportunity where conditions are optimal for the detection of archaeological features, which as noted previously can be difficult to predict.

3.6.17 Ploughing or development may have destroyed any surface expression of archaeological features that are recognisable on historical aerial photographs. This was evidently the case at a number of locations within the study area, where examination of the LiDAR and multi-spectral data was unable to replicate the results of conventional aerial photographic surveys.

3.6.18 Much of the study area coincides with arable fields which have been subject to intensive modern agricultural techniques. As a result, the prominence of archaeological features may have been greatly reduced by ploughing across large parts of the study area. This may have resulted in a differential in the detection rate of archaeological features between fields which have been intensively ploughed, and areas which have not, such as within parks (unless extensively landscaped) or land which has predominantly been under pasture.

Aerial photographs

3.6.19 Interpretation of aerial photographs relies on visual identification of heritage assets on aerial photos as typically, the effects they have on growing crops and other vegetation, marks in soils, or as surviving features or earthworks which are more visible at times of clear low light which casts shadows.

3.6.20 It is important to note that aerial photographs usually only show part of the horizontal and vertical extent of buried and upstanding features. Their capacity to reveal features as crop marks, vegetation marks, soil marks or as the shadows cast by banks, ditches and walls, depends upon a number of environmental and agricultural factors prevalent at the time of the photographic survey. It is perfectly possible for many years' photography over one site to show nothing at all, and then for one instance of survey to reveal complex buried crop marked features. The direction of light at the time of photography, with reference to shadows cast and crop or soil marked features highlighted, can also affect the visibility of features on aerial photographs. Unlike digitally processed LiDAR and other data, the azimuth of the sun cannot be changed on a conventional aerial photo.

3.6.21 Past and present land use also presents limitations to the visibility of features. A cropped arable regime of cereals often allows the formation of crop marks, whereas grassland, unless seen in times of extreme moisture stress, can mask the appearance of buried features.

3.6.22 Aerial photographs cannot be used to detect features in heavily wooded areas in the same manner as LiDAR surveys. LiDAR may penetrate gaps in the tree canopy to provide a digital model of the ground surface beneath.

3.6.23 Aerial photographic evidence is thus limited by seasonal, agricultural, land use, meteorological, lighting and environmental factors, which affect the extent to which either buried or upstanding archaeological features and structures can be detected.

3.6.24 It is thus advantageous to examine a range of photos taken under a variety of environmental conditions to build up a comprehensive interpretation of the archaeological landscape. The visibility of archaeological features may differ from year to year and be obscured by differential depths of soil or differing types of vegetation, and individual photographs most often record only a small percentage of the actual extent of buried or upstanding features.

3.6.25 The aerial photos taken in the 1940s often recorded surviving medieval fields and provided a starting point for the assessment of erosion and attrition of features due to modern ploughing. This ability to 'see back in time' and the use of aerial photos as historic documents in places is helpful when constructing landscape histories or tracing the progress of erosion.

3.6.26 Buried features are also 'masked' in areas of unsuitable land use for site visibility or the formation of crop marks, such as woodland, scrub, unimproved pasture or alluviated areas. Medieval ploughing is visible as patterns of ridge and furrows caused by the turning of a heavy ox-drawn plough. This often masks underlying deposits on aerial imagery.

3.6.27 The remit of past oblique aerial surveys, the survey areas and the visibility of sites to the aerial surveyor can often determine the content and coverage of oblique aerial photography, which is a 'subjective' and 'target driven' activity rather than the uni-directional 'blanket' coverage achieved by vertical aerial surveys. The study area was not so well covered by both oblique surveys as the Fradley to Colton area study area, but the possibility of new discovery is still to be considered carefully, and that in aerial terms, absence of evidence may be indicative of unsuitable land use or other masking factors rather than evidence for absence of buried heritage assets. There are some specific areas where crop marks show likely Prehistoric and Roman landscapes, where the soils and geology are more favourable to the development of cropmarks over buried features, but nothing like the extent of crop marked landscapes recorded in the Trent Valley in the Fradley to Colton area study area.

3.6.28 It is also important to note that the perception of the environment and expectation of what is to be found often may limit the interpreter's openness to all features, which may be noticed and identified. This perception factor is mitigated by repeated examination of imagery taken in different years and under different conditions, and by teamwork between two or more interpreters checking the data. 'Photo fatigue' is also a factor in drop-off rates of discovery or perception of features and in this case could have been a very real limitation to consistent and accurate observation. This was mitigated by alternating activities, checking with team workers and taking adequate visual breaks particularly when using a stereoscope to see large sorties over extensive areas of land.

3.6.29 These limitations and advantages were considered carefully whilst interpreting features from aerial photographs and the interpretations are built up from

observations of many photographs, if available, over a range of instances of photography by two or more air photo analysts.

3.6.30 The study area presented a mixture of clayey substrates with some areas of glacio-fluvial drift, especially around Ingestre where conditions in some parts were suitable for the formation of crop marks over buried features.

3.7 Results

LiDAR and multi-spectral

Overview

3.7.1 A total of 298 individual features, or groups of features of possible archaeological interest were identified within the study area. The majority of these were identified on the LiDAR plots, with a smaller number also visible on the multi-spectral imagery. Very few features were visible solely on the multi-spectral imagery.

3.7.2 The features could predominantly be ascribed to one of three interpretative classes; surviving ridge and furrow, relict field boundaries or disused extractive pits. However, a number of sites and features of potentially elevated archaeological significance were also identified during the assessment.

3.7.3 Features identified during the remote sensing assessment are described in Annex C, illustrated in Figures 55 - 80, and listed in Appendix CH-002-002. The principal findings of the assessment are presented below.

Yarlet deserted medieval settlement and possible park

3.7.4 Numerous assets were identified from the LiDAR imagery in the general area of Yarlet Hall School. The school occupies the site of a probable deserted medieval settlement documented in the Domesday Survey, which later became a monastic grange (SHER MST1752).

3.7.5 These features included ridge and furrow landforms (e.g. 2136-7, 2182-3, 2203) and possible holloways (2135, 2138, and 2145). Both types of feature are shown in Figures 79 and 80. Some of these are likely to correlate with earthworks which have previously been identified in association with the former medieval settlement (SHER MST3709), and possibly the landscaped grounds attached to the 19th century house (SHER R MST6423).

3.7.6 Other features were identified in the surrounding area included several probable infilled extractive pits or ponds (e.g. 2161-3, 2139, 2293, 2184; Figure 79), a sub-circular mound of uncertain origin (2158; Figure 79), and former field boundaries (e.g. 2147, 2148, 2294, 2140; Figure 79). Several quarry pits (2295, 2141 and 2143; Figure 79) and a possible enclosure or trackway (2142; Figure 79) were also identified on Yarlet Hill, to the south of the school.

3.7.7 It was also noted that the arrangement of certain field boundaries surrounding Yarlet Hall have the appearance of forming the fossilised boundary of a medieval or post-medieval estate or park. However, no record of any such park or estate is currently recorded in the Staffordshire HER. These land divisions partially correspond with a historic parish boundary, and were clearly defined on the LiDAR imagery (2134; Figure

79). However, the land divisions also follow an existing watercourse to the south of Yarlet Hall. This might indicate that the spatial patterning of the field boundaries was influenced by the course of a natural stream, rather than the pre-existence of a park or estate

Marston shrunken medieval settlement

3.7.8 Several features of potential archaeological interest were also identified in the vicinity of Marston, a small hamlet which appears to coincide with a shrunken medieval settlement, which was probably recorded in the Domesday Survey as Mertone (SHER MST2494). Earthwork remains of possible house platforms, holloways and agricultural earthworks associated with the settlement have previously been identified to the east and west of Marston Lane. Some of these features may also have been identified during the assessment of the LiDAR data, although a number of previously unidentified features were also noted.

3.7.9 Features identified from the LiDAR data in the vicinity of Marston included numerous ridge and furrow landforms (2096, 2098, 2118-9, 2120, 2302; Figure 78), holloways or trackways (2124, 2150; Figure 78), several quarry pits or ponds (2049, 2092, 2099, 2100, 2123, 2159; Figure 78) a possible building platform (2157; Figure 77) and other surviving earthworks associated with medieval or post-medieval occupation (e.g. 2097, 2117; Figures 77 and 78).

3.7.10 Of particular note is a possible square enclosure (2105; Figure 78) with faint internal earthworks (2301; Figure 78), which was identified to the north of the late 18th century Church of St. Leonard (National List entry 1242960). The putative enclosure does not appear to have previously been recorded in the Staffordshire HER. It does not respect existing field boundaries, although its south-west corner follows the same alignment as a field boundary depicted on late 19th century Ordnance Survey maps, and respects an adjacent block of ridge and furrow. The origins of the possible enclosure and its internal earthworks are uncertain, although these features may be associated with the occupation of Marston during the medieval or post-medieval periods.

Hopton shrunken medieval settlement

3.7.11 Features associated with medieval or early post-medieval agriculture and possibly occupation were also identified in the vicinity of Hopton, a village recorded in the Domesday survey (SHER MST2513).

3.7.12 These included large areas containing ridge and furrow landforms (e.g. 2151, 2042-3, 2048, 2055, 2151; Figure 75), and several linear features which may represent former land divisions, watercourses, trackways or holloways and a possible lynchet (2039, 2040, 2047, 2052, 2054, 2152; Figure 75). At least two areas containing faint earthworks (2286-7; Figure 75) which might be related to early phases of occupation were also identified within the core of the modern village. Many of these can be correlated with features previously identified during the Staffordshire NMP[36] and recorded in the Staffordshire HER.

[36] Bax (2014)

3.7.13 Two possible square enclosures (2038 and 2144; Figure 75) were also faintly visible on the LiDAR imagery to the south of Hopton. However, the interpretation of these features as enclosures is uncertain as they also coincide with parcels of ridge and furrow bounded by earthworks, as previously identified by the NMP.

3.7.14 Possible surviving ridge and furrow landforms (2154, 2201, 2202, 2199, 2200, 2030; Figure 72) were also identified to the east of the village, to the north and south of Hopton Pools (SHER MST5333), which are thought to be former fish ponds that have been in existence since at least the late 18th century. However, some, or all of the features detected on the LiDAR imagery could be associated with post-medieval water management and drainage. Two levelled areas (2197 and 2198; Figure 72) which could represent building platforms were also evident to the south of Hopton Pools.

Ingestre Park

3.7.15 Numerous features were identified within the historical extent of Ingestre Park, a former landscape park designed by Lancelot 'Capability' Brown and laid out over an earlier deer park (Staffordshire MST5986 and MST2013), which is now partially occupied by a golf course. These appear to include features that may be are associated with the development of the landscape park, as well as traces of earlier and phases of activity

3.7.16 The boundary of the park, which partially coincides with a parish boundary that also separates Ingestre from Tixall Park, was evident in the form of a bank and ditch at a number of locations (1153, 1237, 2005, Figures 67 and 68; 2007-8, Figures 68 and 72).

3.7.17 Numerous faintly visible linear earthworks, which may represent woodland sub-divisions, ditches and trackways associated with woodland management activities, were identified on the LiDAR imagery within Ingestre Woods (2003; Figure 67). Similar linear features were also detected within the area of woodland to the east known as Lionlodge Covert (1068 and 1073; Figure 67), and to the south within Lower Berryhill (2015-23; Figure 72) and beyond the historical boundaries of Ingestre Park within Blackheath Covert and Crab Covert (2014, 2031-34; Figure 73).

3.7.18 The origin a circular mound (2012; Figure 68) within Ingestre Wood is uncertain. However, it could be a spoil heap, a barrow mound or an ornamental feature associated with the park, such as a pavilion or folly. Possible quarries or extractive pits (2001-2; Figure 68) were also identified within the area of woodland, along with linear features (2006; Figure 68), which might be traces of ridge and furrow cultivation. Further blocks of surviving ridge and furrow were also identified to the south of Ingestre Woods (1071, 1072, 1229-30, 1232; Figure 67). Several of these areas of ridge and furrow lie within the extent of the modern golf course, the establishment of which can be expected to have diminished the potential for the survival of similar earthworks elsewhere.

3.7.19 A number of linear features (1151, 1155-7, 1192; Figures 67 and 68) were also identified within the parcel of ornamental woodland to the west of the house, known as 'The Mounts'. These features correspond closely with a network of woodland paths shown on late 19th century Ordnance Survey maps.

3.7.20 Two parallel linear depressions (1231; Figure 79) were identified to the south of Ingestre Woods. These features are co-axial to the main approach to the house, and were interpreted as a possible former avenue, drive or carriage way. However, these features are not shown on late 19th or early 20th century Ordnance Survey maps. Two small rectangular features (1248-9; Figure 67) identified close to the putative drive way could be building platforms. However, these features have previously been interpreted as stack stands by the Staffordshire NMP[37]. Alternatively, it is possible that these features may be associated with earlier development of the golf course.

3.7.21 Other features identified within the former extent of the historic parkland include probable field boundaries, land divisions or drainage ditches (1152, 1154, 1158-61, 1193, 1238, 2010-1; Figures 67 and 72) and a possible extractive pit or pond (1070; Figure 67). A faint curvilinear feature of uncertain origin (1253; Figure 67) was also identified within the former extent of the park and within the modern golf course. The feature could form part of a truncated ring-ditch, although alternative interpretations are equally plausible.

Tixall Park

3.7.22 In contrast to Ingestre Park, very few features of interest were identified from the LiDAR imagery within the former landscape park and possible deer park at Tixall Hall (SHER MST5985 and MST864). As noted above, part of the parish boundary (1237; Figure 67), which also divided Ingestre and Tixall was identified in the form of linear earthwork. A faint linear feature (2000; Figure 68), which corresponds with a boundary associated with Tixall Park, as shown on late 19th century Ordnance Survey maps, was also identified to the south. However, the only features detected within the interior of the park were interpreted as probable post-medieval land divisions or field boundaries (1152 and 1236; Figure 67), and a possible extraction pit or pond (1069; Figure 67).

Ridge and furrow

3.7.23 Amongst the most common features identified during the assessment were characteristic landforms derived from medieval and/or post-medieval ridge and furrow cultivation. These included groups of selions contained within individual parcels ('furlongs', 'gores' and 'butts') and, less commonly, the surviving ploughing headlands, foreras and baulks which divided them.

3.7.24 The majority of the surviving ridge and furrow landforms identified during the assessment were spatially isolated from one another and distributed intermittently across the study area. The distribution of these landforms across the study area 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. However, as noted above, concentrations of ridge and furrow landforms were also identified in the vicinity of known medieval settlements at Yarlet, Manston and Hopton, and within the former extent of Ingestre Park.

3.7.25 These traces of ridge and furrow could frequently be correlated with features recorded in the Staffordshire HER, and/or during aerial photograph assessments undertaken as

[37] Bax (2014)

part of the Staffordshire NMP[38] and in association with the EIA for the Proposed Scheme. However, the spatial patterning of the traces of ridge and furrow identified from the LiDAR and multi-spectral data has provided some additional new evidence for the location and extent of medieval open field systems across the Colwich to Yarlet area.

Water meadows

3.7.26 The creation of water-meadows during the 17th, 18th and 19th centuries frequently gave rise to landforms, which are superficially similar to those generated by earlier ridge and furrow cultivation. However, these can often be distinguished by their riverine location, and subtle differences in morphology and layout.

3.7.27 Characteristic landforms associated with a former water meadow system (1067, 1241, 1250 and 1235; Figure 63) were identified on the LiDAR imagery across an extensive area on either side of the River Trent, to the north of Great Haywood. The features coincided approximately with an expanse of water meadows previously identified from historic mapping and aerial photography (SHER MST4657). Although the corresponding HER entry relates that the water meadows are no longer obvious above ground, individual components, including beds, drains, carriers and headers, were very prominent on the LiDAR imagery.

Field boundaries

3.7.28 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.

3.7.29 Subsequent opening out of previously enclosed fields, particularly during the 20th century, has resulted in the loss of numerous field boundaries, including many examples recorded on late 19th century and early 20th century Ordnance Survey maps.

3.7.30 Numerous linear features were evident on the LiDAR imagery, typically in the form of (often very faint) linear banks and depressions. In many instances, these features were interpreted as former field boundaries on the basis that they appeared to respect existing field systems and/or could be correlated with land divisions shown on early Ordnance Survey maps.

Extractive pits and ponds

3.7.31 Amongst the most frequently identified features were small depressions, often sub-circular in plan and typically in the range of 20-50m in diameter. These depressions were distributed throughout the study area without any obviously meaningful spatial patterning. 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.

[38] Bax (2014)

3.7.32 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. Many of the numerous ponds which exist across the rural landscape of the study area may also have originated as extractive pits. 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.

3.7.33 Where shown on early Ordnance Survey maps, these features are often labelled as 'Old Marl Pits'. Although this term may have been used generically to refer to various types of disused extractive pit, a large proportion of the features may genuinely represent former marl pits. Other pits may have been dug to quarry stone (e.g. 2156; Figure 68) or aggregates, while some may have been used to extract clay for local brick production.

3.7.34 Corresponding mounds, which might represent the spoil heaps derived from these excavations were only occasionally identified in the vicinity of the depressions. This may corroborate the suggestion that these were predominantly dug with the aim of extracting material in bulk, rather than creating hollows in the land surface for some other purpose. However, subsequent levelling by ploughing or natural processes may have significantly reduced the visibility of any former spoil heaps.

3.7.35 Extractive pits were often associated with trackways, either deliberately constructed or formed naturally through use, for the hauling away of excavated material. However, traces of such features were only very occasionally identified. These depressions rarely exhibited any other characteristics in form that might be expected of former extractive pits, such as a shallow approach or access on one side, or steeper working faces. Nevertheless, this might be readily explained by the fact that many have become substantially infilled.

3.7.36 In a few instances, the depressions identified during the assessment may have been deliberately excavated to create ponds rather than for extractive purposes, for example to provide access to water for farm animals, or for other agricultural uses. A small number of the depressions might represent former fish ponds or ornamental ponds. This is more likely in certain contexts, for example where depressions lie within the grounds of the parklands or large estates, or in the vicinity of settlements.

Other features

3.7.37 A number of faint curvilinear or circular features of possible archaeological interest were identified across the Colwich to Yarlet area, none of which are currently recorded in the Staffordshire HER. Although these might be ring ditches, barrows, or other archaeologically significant features none could not be confidently identified as such. They include a possible ring ditch (1042; Figure 57) visible on the NDVI and Simple ratio imagery approximately approximately 350m east of Moreton Grange and, as noted above, a possible truncated example (1253; Figure 67) within the modern golf course at Ingestre.

3.7.38 Several faint curvilinear features were also identified to the west of the Staffordshire Showground (2026-9, and 2155; Figure 72), and another similar feature on the edge of Hopton (2035; Figure 75). However, these features could be of modern origin.

3.7.39 Other identified features included the line of the dismantled Stafford and Uttoxeter railway (2045 and 2046; Figure 75), which remains prominent within the landscape, and several possible former trackways or access roads (2068, Figure 72; 2073, Figure 76; 2101, Figure 78).

3.7.40 Numerous other features noted during the assessment are of uncertain origin, although likely to be of negligible archaeological interest. These include the probable former sites of a number of animal feeders (e.g. 2056-7, Figure 76; 2160, Figure 77), the route of a gas pipeline from Audley to Alrewas (2195 and 2053; Figure 76), and an irregular raised level platform (1227; Figure 63) possibly formed of upcast material from the construction of the adjacent Great Haywood Marina.

3.7.41 Three rectangular features (2013; Figure 72) to the south of the Staffordshire Showground, though of probable modern date, are also of uncertain origin. These features may be the result of activities associated with the showground. However, aerial photographic evidence has indicated that this area coincides with the extent of a former military camp or depot, suggesting that the features might be related to early phases of activity associated with MoD/RAF Stafford.

3.7.42 A number of linear features which do not clearly respect existing field systems or correspond with land divisions shown on early Ordnance Survey maps were also identified (e.g. 2067, Figure 76; 2190-1, Figure 68; 2272-5 Figure 75). In many instances, the origin of these features are uncertain, although plausible interpretations include former watercourses, post-medieval field boundaries, drains and trackways or footpaths. However, some of these features could be considerably older and potentially of greater significance.

Aerial photographs

Overview

3.7.43 Features identified from aerial photographs during the remote sensing assessment are described in Annex C, illustrated in Figures 55 - 80 and listed in Appendix CH-002-002. The principal findings of the assessment are presented below.

3.7.44 The Colwich to Yarlet area has been largely mapped from aerial photographs by the Staffordshire NMP project[39], which produced a high quality and detailed GIS ready map for this area. These data were imported into the Colwich to Yarlet area GIS and all were checked in detail to the original photographs. Within the Colwich to Yarlet area some likely prehistoric sites were noted as crop marks, which are visible on the lighter glaciofluvial drift (gravel) soils near Ingestre. The Colwich to Yarlet area contains an extensive area of medieval agricultural, medieval access and settlement features, which in places overlie and may mask earlier deposits.

[39] Bax (2014)

Undated

3.7.45 A crop marked ditch (site 81; Figure 61) of uncertain origin was recorded to the north of Tithebarn covert. This feature maybe a former boundary, but its origin is uncertain.

3.7.46 A mound, of uncertain, possibly natural, origin was located at coordinates 394137,325287 to the south of MOD Stafford. This feature maybe associated with military land use, but this not proven by the aerial imagery alone.

3.7.47 Crop marked ditches of uncertain origin and date are recorded at site 112 (Figure 72), to the east of MOD Stafford at coordinates 394946,325193.

Prehistoric periods

3.7.48 Sites have been identified as likely Prehistoric origin and show as marks in crops on the freer draining soils over gravel on arable land around the modern settlement at Ingestre.

3.7.49 Site 89 (Figure 63) contains two distinct crop marked ring ditches to the northwest of Hoomhil cottage at coordinates 399323,329915. It is likely that these are the remains of eroded Bronze Age funerary monuments. Site 90 (Figure 63) is a cropmark pit alignment, which is visible to the immediate north of sites 88 and 89.

3.7.50 In the same area, 500m to the west of site 90, ditched enclosures are visible as crop marks. A single and a double ring ditch indicate the presence of a likely Bronze Age funerary landscape at 399120,324231, which cuts or is cut by a west - east aligned double pit alignment and ditches. These sites, 92, 93 and 94 (Figure 63) lie to the south of Ginders Covert near Little Ingestre. They are overlain by traces of eroded medieval fields and boundaries.

3.7.51 To the north of these sites, a further southwest - northeast oriented pit alignment is visible at site 101 (Figure 72), again as marks in crops, to the south of Berryhill at coordinates 395848,324750. Part of this feature is visible as a ditch and other ditches of unknown date at site 100 cut or are cut by the pits. Site 100 (Figure 72) is likely to be a medieval or post-medieval field system.

Iron Age/Roman periods

3.7.52 Site 87 (Figure 64) lies between Great Haywood and Lionlodge Covert, at coordinates 398939,323694. This buried ditched enclosure and associated field system was mapped from CUCAP oblique aerial photos, and is likely to pre-date the modern landscape. This feature is the buried remains of a small Iron Age/Roman farmstead which shows as a mark in crops.

3.7.53 At site 88 (Figure 63), cropmarks reveal ditched features, which indicate a possible partial enclosure, a ditched boundary and a partial curvilinear ditch. These features do not align with and likely pre-date the modern and medieval landscapes, and are dated by the NMP to the Iron Age or Roman periods. These features lie at coordinates 399363,323964, in the same area as two cropmark ring ditches to their south and a pit alignment to their north (sites 89 and 90, discussed above).

Medieval

3.7.54 The Colwich to Yarlet area was extensively farmed in the medieval period and there are widespread areas of eroded and slightly upstanding ridge and furrow.

3.7.55 Medieval settlement is evidenced by areas of earthworks and eroded earthworks, at site 120 (Figure 77) at Marston, centred on coordinates 392182, 32755. These features show boundaries and hollow ways likely associate with settlement at Marston Farm, and were heavily eroded by ploughing between 2003 and 2016.

3.7.56 At Yarlet, site 124 (Figure 80), a Deserted Medieval Village is evidenced by earthworks, which show clearly in low angled light on the Google Earth 2010 timeline. An eroded hollow way and medieval fields are also evident at this site.

3.7.57 Site 97 (Figure 66), to the west of Ingestre, is an extensive area of residual medieval and post-medieval agricultural features, hollow ways, boundaries and stack stands. A further hollow way and banks and ditches are recorded as site 110 (Figure 74) at Beacon Farm to the east of MOD Stafford.

Post-medieval

3.7.58 The post-medieval landscape is visible on aerial photographs as a series of crop marked former field boundaries, which fit in with the modern 'post enclosure' boundary systems which now form the modern rural landscape in the Colwich to Yarlet area. Areas of narrow ridge and furrow are also visible, and garden earthworks are visible at Yarlet Hall, site 125 (Figure 79).

Modern

3.7.59 Military camps and buildings are in evidence at sites 102 (Figure 69), 108 (Figure 74), 109 (Figure 73), 111 (Figure 72) and 115 (Figure 76). Site 102 comprises residual access ways, small remains of a former military camp and depot at Ingestre Park, which centres around and to the west of coordinates 397303, 3523543. An area of buildings and access ways are largely still surviving at MOD Stafford and comprise a military camp, site 108, with rifle ranges, access ways and service buildings dating back to the Second World War. Similar features are visible at site 109 to the east of MOD Stafford, which is now a business park at Stafford University. These sites are visible on 1940s vertical aerial photos taken by the RAF which record their condition when in full military use.

3.7.60 A Second World War firing range is visible as a series of small earthwork banks at site 111, coordinates 394763, 324932 to the south of Beacon Hill. A further military camp is present as a group of surviving structures at site 115, to the northwest of Hopton at coordinates 392255, 326709, near MOD Stafford.

3.8 Summary

LiDAR and multi-spectral

3.8.1 The results of the assessment were largely consistent with expectations based on the rural character of the study area. The majority of features identified during the assessment are likely to represent disused extractive pits or quarries of post-medieval date, or former field boundaries laid out, or formalised in the 18th or 19th centuries.

The former field boundaries may, in some instances, correlate with medieval land divisions.

3.8.2 The assessment also identified numerous areas containing surviving ridge and furrow landforms, including notable concentrations surrounding Yarlet Hall School, Manston and Hopton, and within the former extent of Ingestre Park. A large expanse of relict post-medieval water meadows was also identified adjacent to the River Trent, north of Great Haywood.

3.8.3 A number of sites or features of potentially elevated significance were identified within the Colwich to Yarlet area. These include the deserted medieval settlement and possible park or estate at Yarlet Hall School, the shrunken medieval settlements of Manston and Hopton, and features associated with the development of Ingestre Park. A number of possible ring-ditches were also identified, although the interpretation of these features was highly uncertain.

Aerial photographs

3.8.4 Aerial photographs taken between the 1940s and the present time show a palimpsest of buried eroded cropmark features on gravel soils around Ingestre. The actual extents of the prehistoric funerary, likely agricultural boundaries and enclosure features is unknown. Their known and visible locations are largely confined to the gravel areas within this environment.

3.8.5 The Colwich to Yarlet area was largely farmed in the medieval period, with areas of rural settlement and land use visible as residual earthworks at Marston, Yarlett and to the immediate east of modern MOD Stafford.

3.8.6 Post-medieval boundaries and narrow ridge and furrow show within the Colwich to Yarlet area on aerial photos.

3.9 Conclusions

3.9.1 A number of features have been identified both in the LiDAR and aerial photography relating to medieval deserted settlements at Yarlet Hall, Manston and Hopton, along with medieval and post-medieval agricultural features across much of the Colwich to Yarlet area. The LiDAR data in particular has also located a large number of likely former quarries or extractive pits.

3.9.2 Where there is a lack of correlation between the LiDAR and AP assessments this suggests that many of the features identified from APs no longer survive as surviving earthwork features, however, this does not preclude the below ground survival of archaeological remains.

3.9.3 There are inherent difficulties involved in transcribing and accurately locating cropmark features. Accordingly, degree of caution should be exercised in relying on position of individual features, as these may in actually fact be located some distance from location indicated.

4 References

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Annex A: Survey equipment and data processing

Survey methods and equipment

The magnetic data for this project was acquired using both a Bartington 601-2 dual magnetic gradiometer system and a non-magnetic cart system. The handheld instrument has two gradiometer assemblies fixed horizontally 1m apart allowing two traverses to be recorded simultaneously. The cart instrument has four gradiometers fixed horizontally 1m apart allowing multiple traverses to be recorded simultaneously. The gradiometers are the same, each containing two fluxgate magnetometers arranged vertically with a 1m separation, and measure the difference between the vertical components of the total magnetic field within each sensor array. This arrangement of magnetometers suppresses any diurnal or low frequency effects.

The gradiometers have an effective resolution of 0.03nT over a ±100nT range, and measurements from each sensor are logged at intervals of 0.25m.

Detailed handheld gradiometer surveys were undertaken using an accurate 20m or 30m site grid, which is achieved using a Leica Viva RTK GNSS instrument. The cart-based system relies upon accurate GPS location data which is collected using a Leica Viva system with rover and base station. The Leica Viva systems receive corrections from a network of reference stations operated by the Ordnance Survey and Leica Geosystems, allowing positions to be determined with a precision of 0.02m in real-time and therefore exceed the level of accuracy recommended by HE for geophysical surveys.

The detailed surveys consist of 20m by 20m or 30m by 30m grids, and data are collected at 0.25m intervals along traverses spaced 1m apart. These strategies give 1600 or 3600 measurements per 20m or 30m grid respectively, and are the recommended methodologies for archaeological surveys of this type.

Data may be collected with a higher sample density where complex archaeological anomalies are encountered, to aid the detection and characterisation of small and ephemeral features. Data may be collected at up to 0.125m intervals along traverses spaced up to 0.25m apart, resulting in a maximum of 28800 readings per 30m grid, exceeding that recommended by HE for characterisation surveys.

Post-processing

The magnetic data collected during the detail survey are downloaded from the Bartington cart system for processing and analysis using both commercial and in-house software. This software allows for both the data and the images to be processed in order to enhance the results for analysis; however, it should be noted that minimal data processing is conducted so as not to distort the anomalies.

The cart-based system generally requires a lesser amount of post-processing than the handheld Bartington Grad 601-2 fluxgate gradiometer instrument. This is largely because mounting the gradiometers on the cart reduces the occurrence of operator error; caused by inconsistent walking speeds and deviation in traverse position due to varying ground cover and topography.

Typical data and image processing steps for hand-held data may include:

- destripe – applying a zero mean traverse in order to remove differences caused by directional effects inherent in the magnetometer;
- destagger – shifting each traverse longitudinally by a number of readings. This corrects for operator errors and is used to enhance linear features;
- despike – filtering isolated data points that exceed the mean by a specified amount to reduce the appearance of dominant anomalous readings (generally only used for earth resistance data);
- deslope - this function is used to remove a linear trend within a data set. It is most commonly used to remove grid edge discontinuities that can result from applying zero mean traverse to a data set; and
- multiply - the multiply function multiplies the data by a negative or positive constant value. It has a variety of functions but its typical use is to normalise data that has been collected with sensors at different heights from the ground.

Typical data and image processing steps for the non-magnetic cart fitted system may include:

- smooth – applying a smooth function removes any small scale spiking or 'fuzziness', generally caused by internal system noise. This effectively 'destripes' the data and reduces the appearance of dominant anomalous readings; and
- spline interpolation – gridding the data with splines allows the application of minimum and maximum data values and reduces oscillations for potential fields such as gravity or magnetic.

Typical displays of the data used during processing and analysis:

- XY Plot (hand-held data only) – presents the data as a trace or graph line for each traverse. Each traverse is displaced down the image to produce a stacked profile effect. This type of image is useful as it shows the full range of individual anomalies; and
- greyscale – presents the data in plan view using a greyscale to indicate the relative strength of the signal at each measurement point. These plots can be produced in colour to highlight certain features but generally greyscale plots are used during analysis of the data.

Annex B: Geophysical interpretation

Interpretation categories

The interpretation methodology used by Wessex Archaeology separates the anomalies into two main categories: archaeological and unidentified responses.

The archaeological category is used for features when the form, nature and pattern of the anomaly are indicative of archaeological material. Further sources of information such as aerial photographs may also have been incorporated in providing the final interpretation. This category is further sub-divided into three groups, implying a decreasing level of confidence:

- archaeology - used when there is a clear geophysical response and anthropogenic pattern; and
- possible archaeology - used for features which give a response but which form no discernible pattern or trend.

The unidentified category is used for features when the form, nature and pattern of the anomaly are not sufficient to warrant a classification as an archaeological feature. This category is further sub-divided into:

- agricultural - used for linear trends that can be shown to relate to agricultural activity including ridge and furrow, drainage and ploughing scars;
- industrial, burnt-fired, increased magnetic response - used for areas dominated by bipolar and dipolar anomalies which may have some archaeological potential;
- uncertain origin - used for low amplitude or indistinct linear anomalies;
- ferrous - used for responses caused by ferrous material. These anomalies are likely to be of modern origin; and
- natural - used for spreads of anomalies that are considered to be geological or more discrete anomalies considered to be natural.

Finally, services such as water pipes are marked where they have been identified along with ceramic land drains.

Annex C: Sites identified by remote sensing

Table 1: LiDAR and multi-spectral sites within the Colwich to Yarlet area

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1041		COY003	Post-medieval	Sub-oval depression measuring approximately 60m by 40m. Contains a pond, may be a former quarry or extraction pit. Depression and pond depicted on 1901 Ordnance Survey map.
1042		COY001	Unknown	Circular bank feature approximately 12m in diameter with a smaller mound feature 2m in diameter immediately to the north. Located within a pasture field. Unknown origin.
1043			Post-medieval	Small sub-oval depression approximately 13m by 10m. Probable post-medieval extraction pit or pond. Located within a pasture field. Not depicted on 1901 Ordnance Survey map.
1044			Post-medieval	Small sub-oval depression approximately 14m by 10m. Probable post-medieval extraction pit or pond. Located within an arable field. Not depicted on 1901 Ordnance Survey map.
1045			Post-medieval	Small sub-oval depression approximately 21m by 15m. Probable post-medieval extraction pit or pond. Located within an arable field. Depicted as a pond on 1901 Ordnance Survey map.
1046			Post-medieval	Large irregular depression approximately 70m by 50m. Partially covered by trees on the southern half. Probable post-medieval extraction pit. Not depicted on 1902 Ordnance Survey map.
1047			Post-medieval	Small sub-oval depression approximately 18m by 10m. Probable post-medieval extraction pit or pond. Located within an arable field. Depicted as a pond on 1901 Ordnance Survey map.
1048			Post-medieval	Sub-oval depression measuring approximately 50m by 30m. Probable post-medieval extraction pit. Located in the corner of an arable field. Not on 1901 Ordnance Survey map.
1049		COY007	Post-medieval	Sub-oval depression measuring approximately 50m by 30m with steeper scarp to the north. Probable post-medieval extraction pit. Located in a small area of woodland. Depicted as a scarp on 1901 Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1050	74	COY009	Medieval/post-medieval	Small area of possible ridge and furrow cultivation aligned east-west, measuring approximately 40m squared. Located at the eastern end of field of pasture.
1051			Post-medieval	Sub-circular depression measuring approximately 45m by 40m. Probable post-medieval extraction pit. Mostly covered by trees on the western part. Located in the middle of an arable field. Depicted as a pond and area of woodland on 1901 Ordnance Survey map.
1052	75	COY005	Medieval/post-medieval	Irregular area of ridge and furrow cultivation approximately 180m by 100m situated north of Moreton Grange. Aligned north-west to south-east. Associated with [1053].
1053	76	COY005	Medieval/post-medieval	Irregular area of ridge and furrow cultivation approximately 150m by 50m situated north-east of Moreton Grange. Aligned east-west. Associated with [1052].
1061			Post-medieval	Sub-oval depression measuring approximately 75m by 30m. Probable post-medieval extraction pit. Located at the western end of Tithebarn Covert. Not shown on 1901 Ordnance Survey map.
1062			Post-medieval	Small sub-oval depression approximately 23m by 15m. Probable post-medieval extraction pit or pond. Located within an arable field. Not depicted on 1901 Ordnance Survey map.
1063			Post-medieval	Sub-oval depression approximately 30m by 20m. Probable post-medieval extraction pit or pond. Located in an arable field. Not depicted on 1901 Ordnance Survey map.
1064			Post-medieval	Sub-oval depression approximately 30m by 20m. Probable post-medieval extraction pit or pond. Located at the southern corner of an arable field. Not depicted on 1901 Ordnance Survey map.
1065			Post-medieval	Sub-oval depression approximately 30m by 25m. Probable post-medieval extraction pit or pond. Located in an arable field. Not depicted on 1901 Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1066			Post-medieval	Sub-oval depression approximately 60m by 40m. Probable post-medieval extraction pit or pond. Located at the western edge of a pasture field next to the A51. Not depicted on 1901 Ordnance Survey map.
1067	86	COY046	Post-medieval	Pasture field with partially surviving earthworks of probable post-medieval water meadows. Irregular shape approximately 260m by 210m with the River Trent to the east.
1068		COY053; COY145	Unknown	Irregular bank and ditch feature. Only visible in 2m LiDAR. Approximately 60m by 25m. Located in the north-west of Lionlodge Covert. Unknown origin, possibly modern woodland management or post-medieval parkland feature.
1069		COY066; COY149	Post-medieval	Large sub-oval depression approximately 100m by 55m. Probable post-medieval extraction pit. Depicted on 1902 Ordnance Survey map as a depression.
1070		COY053; COY145	Post-medieval	Sub-oval depression approximately 40m by 30m. Probable post-medieval extraction pit or pond. Located in modern golf course. Depicted on 1902 Ordnance Survey map as a depression.
1071		COY053; COY145	Medieval/post-medieval	Irregularly shaped area of ridge and furrow cultivation. Approximately 180m by 80m in extent. Located in modern golf course. Aligned south-west to north-east.
1072	97	COY053; COY145	Medieval/post-medieval	Irregularly shaped area of ridge and furrow cultivation. Approximately 380m by 120m in extent. Located in modern golf course. Aligned south-west to north-east.
1073		COY053; COY145	Medieval/modern	Irregularly shaped area of multiple ill-defined linear features on various alignments within Lionlodge Covert. Approximately 270m by 400m in extent. Some may be modern woodland management features, others may be drainage ditches.
1074	92	COY046	Medieval/post-medieval	Irregular parcel of ridge and furrow traces 160m by 60m. Located within a pasture field near to water meadows [1067].
1075			Post-medieval	Sub-circular feature approximately 18m by 20m. Probable post-medieval extraction pit or pond. Located in the middle of an arable field. Not depicted on 1902 Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1076			Unknown	Sub-rectangular depression approximately 60m long and 12m wide. Unknown origin or date.
1077			Medieval/post-medieval	Linear feature approximately 70m long. Former field boundary depicted on 1902 Ordnance Survey map.
1078			Medieval/post-medieval	Linear feature approximately 110m long. Former field boundary west of Hadleygate depicted on 1902 Ordnance Survey map.
1079			Medieval/post-medieval	Linear feature approximately 100m long. Former field boundary west of Hadleygate depicted on 1902 Ordnance Survey map.
1080			Medieval/post-medieval	Infilled section approximately 70m long of drainage or boundary ditch. Depicted on 1902 Ordnance Survey map. The 300m section to the south is still surviving.
1081			Medieval/post-medieval	115m linear feature, probable medieval or post-medieval field boundary. Depicted on 1902 Ordnance Survey map.
1129			Post-medieval/modern	Straight 180m long liner feature. Possible former field boundary or drainage ditch. Not on the same alignment as the current field boundaries and not depicted on the 1902 Ordnance Survey map.
1130			Post-medieval/modern	Curved linear ditch feature approximately 80m long. Probable post-medieval or modern drainage ditch, almost certainly the continuation of the surviving ditch to the east and feeding into Moreton Brook. Not depicted on the 1902 Ordnance Survey map.
1131			Unknown	Irregular linear feature approximately 110m long. Possible drainage ditch or stream. May be connected to a surviving drainage ditch to the east.
1132			Post-medieval/modern	Straight linear ditch feature approximately 60m long situated to the north of Moreton Cottage Farm. Similar to [1133] Not depicted on 1901 Ordnance Survey map. Possibly post-medieval or modern drainage.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1133			Post-medieval/modern	Straight linear ditch feature approximately 60m long situated to the north of Moreton Cottage Farm. Similar to [1132] Not depicted on 1901 Ordnance Survey map. Possibly post-medieval or modern drainage.
1134		COY009	Post-medieval/modern	Straight linear ditch feature approximately 100m long situated to the north of Moreton Cottage Farm. Runs diagonally across the field across [1132 and 1133]. Not depicted on 1901 Ordnance Survey map. Possibly post-medieval or modern drainage.
1135			Post-medieval/modern	Straight linear feature approximately 200m long. Possible drainage ditch or former field boundary. Pond or former extraction point at the eastern end. Same alignment as [1136].
1136			Post-medieval/modern	Straight linear feature approximately 75m long. Possible drainage ditch or former field boundary. Pond or former extraction point at the eastern end. Same alignment as [1135].
1147			Medieval/post-medieval	Three sided enclosure off Oldfields Lane, to the north-east of Great Haywood. Line of historic field boundary, possible medieval or post-medieval origins. With Oldfields Lane it forms a field measuring approximately 260m by 130m. Depicted on the 1902 Ordnance Survey map.
1148			Medieval/post-medieval	Linear feature approximately 120m long to the west of Little Covert. Probable medieval or post-medieval field boundary. Depicted on the 1902 Ordnance Survey map.
1149			Medieval/post-medieval	Linear feature approximately 190m long aligned east-west situated to the south-east of Farley Cottage. Probable medieval or post-medieval field boundary depicted on 1902 Ordnance Survey map.
1151		COY144	Unknown	Linear feature approximately 75m long in woodland to the west of Ingestre Hall. Unknown origin, not depicted on 1902 Ordnance Survey map.
1152		COY053; COY066; COY145; COY149	Post-medieval	Long straight linear approximately 550m long lying to the east of Trixall Park Pool. Similar alignment to current field boundary. Not depicted on 1902 Ordnance Survey map. Possible post-medieval field boundary or drain.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1153		COY053; COY145	Medieval/post-medieval	Curvilinear feature to the west of Flushing Covert approximately 220m long. Appear to follow the parish boundary depicted on the 1902 Ordnance Survey map and may represent an earlier boundary. Some parish boundaries are of considerable antiquity. This may also have been the boundary between Trixall and Ingestre Parks. Possible medieval or Post-medieval origins.
1154		COY053; COY145	Unknown	Curved linear feature approximately 320m long. Unknown origin, may relate to Ingestre Parkland or the modern golf course. Not depicted on the 1902 Ordnance Survey map.
1155		COY144	Post-medieval	Linear features corresponding with features on historic maps as the ornamental shrubbery 'The Mounts' to the south-west of Ingestre Hall on the 1902 Ordnance Survey map. Associated with [1156 and 1157].
1156		COY053; COY144	Post-medieval	Curvilinear feature approximately 220m long. Corresponds with the southern trackway depicted running through the ornamental shrubbery 'The Mounts' to the south-west of Ingestre Hall on the 1902 Ordnance Survey map. Associated with [1155 and 1157].
1157		COY144	Post-medieval	Straight linear bank feature approximately 80m long. Corresponds with a feature shown on the 1902 Ordnance Survey map as part of the ornamental shrubbery 'the Mounts' to the south-west of Ingestre Hall. Associated with [1155 and 1156].
1158		COY053; COY145	Unknown	Straight linear feature approximately 315m long. Not depicted on the 1902 Ordnance Survey map. Same alignment as [1160] south-west to north-east and may be related. Possible modern drainage for current golf course.
1159		COY053; COY145	Unknown	Straight linear feature approximately 400m long. On different alignment to nearby features [1158 and 1160]. Not depicted on the 1902 Ordnance Survey map.
1160		COY053; COY145	Unknown	Straight linear feature approximately 320m long. Not depicted on the 1902 Ordnance Survey map. Same alignment as [1158] south-west to north-east and may be related. Possible modern drainage for current golf course.
1161		COY053; COY145	Post-medieval	Curvilinear feature approximately 100m long. Connected to a current drainage ditch near the Old Rectory. Not depicted on the 1902 Ordnance Survey map. Possible post-medieval drainage.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1162		COY046	Post-medieval	Two linear ditch features approximately 180m and 250m long. Probable post-medieval field boundaries. Depicted on the 1902 Ordnance Survey map.
1163			Medieval/post-medieval	Dog-legged linear feature approximately 200m in length running between the northern edges of Little Covert and Tithebarn Covert. Depicted as a field boundary on the 1902 Ordnance Survey map. Probable medieval to post-medieval date.
1164			Medieval/post-medieval	Dog-legged linear feature approximately 160m in length. Lies to the north of Tithebarn Covert with northern end joining a surviving drainage ditch. Depicted as a field boundary on the 1901 Ordnance Survey map. Probable medieval to post-medieval date.
1165			Medieval/post-medieval	Probable medieval or post-medieval field boundary approximately 190m long. Depicted on the 1901 Ordnance Survey map.
1166			Medieval/post-medieval	Probable medieval or post-medieval field boundary approximately 60m long. Depicted on the 1901 Ordnance Survey map.
1167			Medieval/post-medieval	Probable medieval or post-medieval field boundary approximately 140m long. Depicted on the 1901 Ordnance Survey map.
1168			Medieval/post-medieval	Probable medieval or post-medieval field boundary approximately 80m long north of Tithebarn Farm. Depicted on 1902 Ordnance Survey map.
1169			Post-medieval	Remnants of a former field boundary 110m. Probably post-medieval, depicted on 1902 Ordnance Survey map.
1192		COY144	Post-medieval	Linear feature approximately 70m long to the west of 'The Mounts'. Corresponds with a track shown on the 1902 Ordnance Survey map. Probable entrance to the post-medieval ornamental shrubbery.
1193		COY054	Post-medieval	330m long kinked linear feature south of Lionlodge Covert. Probable post-medieval field boundary. Depicted on the 1902 Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1194		COY054	Post-medieval	Straight linear feature approximately 28om long. Possible post-medieval field boundary, follows the same alignment as a smaller boundary shown on the 1902 Ordnance Survey map.
1221			Unknown	Irregular shaped parcel approximately 140m by 140m at its greatest extent. Linear features fanning from the south to north. Southern part is an orchard, which is also depicted on the 1901 Ordnance Survey map. Possibly post-medieval features connected with the orchard.
1222			Post-medieval	Sub-oval probable post-medieval extractive pit 20m by 17m.
1223	77		Medieval/post-medieval	Sub-rectangular field of surviving ridge and furrow cultivation approximately 150m by 60m in size. Lies to the west of Moreton House.
1224	78		Medieval/post-medieval	Very faint surviving traces of ridge and furrow with possible field boundary to the south-east. 125m by 105m.
1225			Medieval/post-medieval	Possible traces of ridge and furrow in what is now Tithebarn Covert. Irregular shape 180m by 150m at its greatest extent. Possible medieval or post-medieval origins.
1226			Post-medieval/modern	Probable post-medieval extraction pit. Sub-oval 40m by 30m.
1227			Modern	Irregular raised platform next to the Trent and Mersey Canal. Probably constructed from the material from the construction of the nearby marina to the south. Not depicted on 1902 Ordnance Survey map.
1228			Post-medieval	An irregular area approximately 170m by 100m of probable post-medieval cultivation.
1229	97	COY053; COY145	Medieval/post-medieval	Irregular parcel approximately 150m by 100m of ridge and furrow cultivation of possible medieval or post-medieval origin. Lies to the west of Lionlodge Covert with a possible boundary or track [1238] to the west separating it from a similar parcel of ridge and furrow [1230].

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1230	97	COY053; COY145	Medieval/post-medieval	Irregular parcel approximately 180m by 110m of ridge and furrow cultivation of possible medieval or Post-medieval origin. Lies to the west of Lionlodge Covert with a possible boundary or track [1238] to the east separating it from a similar parcel of ridge and furrow [1229].
1231	97	COY053; COY145	Unknown	Two straight parallel ditches approximately 200m long and 6m apart. Possible former trackway leading towards Ingestre Hall. Not shown on historic maps.
1232	97	COY053; COY145	Medieval/post-medieval	Small sub-rectangular parcel of ridge and furrow cultivation approximately 45m by 30m. Lies to the south-west of 'The mounts' shrubbery of Ingestre Hall. Probable medieval or post-medieval origins.
1233			Medieval/post-medieval	Fragment of a medieval or post-medieval field boundary 80m long. Depicted on the 1901 Ordnance Survey map.
1234			Unknown	Two parallel linear features approximately 100m long and 10m apart. Possible trackway. Not depicted on the 1902 Ordnance Survey map.
1235			Post-medieval	Series of irregularly aligned linear ditch features between the River Trent and the Trent and Mersey Canal, covering an area about 130m long and 60m wide. Possible water meadow water management channels or drainage ditches. Probable post-medieval date.
1236		COY066; COY145; COY149	Medieval/post-medieval	Linear feature approximately 120m long. Possible former field boundary of medieval or post-medieval date. Not depicted on the 1902 Ordnance Survey map.
1237		COY053; COY145	Medieval/post-medieval	Sinuous linear feature approximately 240m long. Broadly corresponds with the parish boundary depicted on the 1902 Ordnance Survey map. May be the remnants of an earlier parish boundary.
1238		COY053; COY145	Medieval/post-medieval	Sinuous linear feature approximately 200m long. Not depicted on the 1902 Ordnance Survey map. Possible field boundary lies between two parcels of possible ridge and furrow.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
1240			Medieval	Possible former field boundary approximately 300m long. Curvilinear reverse s-shaped, indicating that it may be medieval in origin.
1241	86	COY046	Post-medieval	Irregular triangular parcel of partially surviving earthworks of water management features of either post-medieval drainage ditches or water meadow. Lies between the River Trent and the Trent and Mersey Canal.
1248	97	COY053; COY145	Unknown	Rectangular feature approximately 25m by 15m. Possible stack stand or building platform, although may be related to the modern golf course. Possibly related to [1249].
1249	97	COY053; COY145	Unknown	Rectangular feature approximately 18m by 15m. Possible stack stand or building platform, although may be related to the modern golf course. Possibly related to [1248].
1250	86	COY046	Post-medieval	Two areas of partially surviving earthworks of water management features of either post-medieval drainage ditches or water meadow extending outside of the study area. Near to Hoo Mill and the River Trent and Trent and Mersey Canal.
1253		COY053; COY145	Unknown	A sub-oval ditch feature with a linear projecting to the south-east. Truncated to the north-west by modern golf course features, remaining parts approximately 35m by 35m, with linear feature approximately 15m long. Not depicted on historic maps. Unknown date or function.
2000		COY066; COY149	Unknown, possibly post-medieval	Faint NNE-SSW aligned linear feature, approximately 400m in length. Represents a former land division of possible post-medieval date. Appears to form part of the boundary of Tixall Park on the 1887 edition six-inch Ordnance Survey map.
2001		COY065; COY144	Unknown, possibly post-medieval	Irregular depression, approximately 80m by 65m in extent. Possibly a former extractive pit situated within, and obscured by existing woodland (Ingrestre Wood; 2003). Corresponds with a depression demarcated by hachures on late 19th and early 20th century Ordnance Survey maps.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2002		COY065; COY080; COY144	Unknown, possibly post-medieval	Elongated irregular depression, approximately 80m by 65m in extent. Possibly a former extractive pit, or intercut pits situated within, and obscured by existing woodland (Ingrestre Wood; 2003). Corresponds with a series of depressions demarcated by hachures on late 19th and early 20th century Ordnance Survey maps.
2003		COY053; COY065; COY080; COY144; COY149	Unknown, possibly medieval/post-medieval	Irregular parcel of existing woodland (Ingrestre Wood), depicted as part of Ingrestre Park as by late 19th and early 20th century Ordnance Survey maps. Contains numerous faintly visible earthworks/topographical anomalies within the LiDAR plot, although these are heavily obscured by tree cover. These may include former woodbanks and/or internal sub-divisions, former and surviving trackways. Faint traces of former extractive pits and ridge and furrow may also be present; the clearest of these have been identified separately as 2001-2 and 2006, respectively.
2004			Unknown	Faint, sinuous linear depression. Approximately 410m in length, and 20m in width. Corresponds approximately with a field boundary depicted by late 19th century Ordnance Survey maps. The sinuous form of the boundary suggests that it may have followed the line of a former watercourse.
2005		COY144	Unknown, possibly medieval/post-medieval	Linear feature, defined by a bank and ditch. Corresponds with boundary of surviving woodland (Ingrestre Wood; 2003), also demarcates a historic parish boundary and (possibly) the boundary of Ingestre Park as depicted by late 19th and early 20th century Ordnance Survey maps. Continues to the west as 2007. Obscured by surviving tree cover and former extraction pits (2001-2002).
2006		COY144	Medieval/post-medieval	Narrow, sub-rectangular area containing possible surviving ridge and furrow, orientated NW-SE. Obscured by existing tree cover (Ingrestre Wood). Approximately 200m by 50m in extent. Slight 'reverse-S' shape in plan.
2007		COY144	Unknown, possibly medieval/post-medieval	Linear feature, defined by a bank and ditch. Corresponds with boundary of surviving woodland (Ingestre Wood; 2003), also demarcates a historic parish boundary and (possibly) the boundary of Ingestre Park as depicted by late 19th and early 20th century Ordnance Survey maps. Continues to the east as 2005. Obscured by surviving tree cover and former extraction pits (2001-2002).

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2008			Unknown, possibly medieval/post-medieval	E-W aligned linear anomaly, approximately 215m in length. Likely to represent a former field boundary of probable post-medieval date. Corresponds with the position of land division and parish boundary depicted by the 1889 edition six-inch Ordnance Survey map.
2009			Unknown, possibly medieval/post-medieval	E-W aligned linear anomaly, of at least 500m in length (extends beyond extent of LiDAR Coverage, to the E). May represent a former field boundary of possible post-medieval date.
2010			Unknown, possibly post-medieval	Very faint N-S linear feature. Possibly represents a former field boundary. Approximately 65m in length.
2011			Unknown, possibly post-medieval	Very faint N-S linear feature. Possibly represents a former field boundary. Approximately 45m in length.
2012		COY065; COY144	Unknown, possibly prehistoric or post-medieval	Circular mound, approximately 20m in diameter. Contained within, and obscured by woodland (Ingrestre Wood). The feature is respected by a boundary recorded by Ordnance Survey mapping from the late 19th century, through to present day. Although the origin of the feature is uncertain, it is possibly a prehistoric funerary monument (i.e. a late Neolithic or Bronze Age barrow). Alternatively, the feature could be of more recent origin; possibly a spoil heap associated with the adjacent quarry pits (2001 and 2002), or a feature associated with the development of the Ingrestre Hall estate.
2013	?102		Modern	Group of three rectangular features, likely derived from modern activity associated with the Staffordshire Showground, which is located immediately to the north. Alternatively, these features could be derived from an earlier phase of activity associated with MoD/RAF Stafford.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2014		COY082	Unknown, possibly medieval/post-medieval	Large parcel of surviving woodland, comprising Blackheath Covert and Crab Covert. Contains a number of linear and sinuous or dendritic depressions and banks, some of which correspond with surviving trackways and/or trackways depicted by late 19th and early 20th century Ordnance Survey maps. Other examples may relate to former watercourses and internal sub-divisions or wood banks. The clearest of these internal features have been transcribed separately (2031-2034).
2015			Unknown, possibly medieval/post-medieval	Extant woodland parcel ('Lower Berryhill'), which contains numerous faint linear features (the clearest of these have been transcribed as 2016-2023), which might represent former/surviving trackways or other features, all of which are heavily obscured.
2016			Unknown	One of a series of linear anomalies within surviving woodland (Lower Berryhill) possibly correlated with a surviving or former trackway or internal woodland boundary.
2017			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2018			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2019			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2020			Unknown	One of a series of faint linear anomalies within extant woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2021			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2022			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2023			Unknown	One of a series of faint linear anomalies within surviving woodland (Lower Berryhill; 2015), possibly correlated with a surviving or former trackway or internal woodland boundary.
2024			Post-medieval	Faint N-S linear depression. Probably represents a former trackway leading north from Brickhouse Farm, as depicted by the 1889 edition six-inch Ordnance Survey map. Approximately 250m long and 7m wide.
2025			Medieval/post-medieval	Possible traces of surviving ridge and furrow, orientated NNE-SSW. Contained within, and obscured by existing woodland (Weetman's Plantation). Approximately 120m by 85m in extent.
2026			Unknown, probably modern	One of a number of very faint curvilinear anomalies (with 2027, 2028, 2029 and 2155) Although possibly of archaeological interest, it may be more likely that these features are the result of wheel rutting associated with recent agricultural activities.
2027			Unknown, probably modern	One of a number of very faint curvilinear anomalies (with 2026, 2028, 2029 and 2155) Although possibly of archaeological interest, it may be more likely that these features are the result of wheel rutting associated with recent agricultural activities.
2028			Unknown, probably modern	One of a number of very faint curvilinear anomalies (with 2026, 2027, 2029 and 2155) Although possibly of archaeological interest, it may be more likely that these features are the result of wheel rutting associated with recent agricultural activities.
2029			Unknown, probably modern	One of a number of very faint curvilinear anomalies (with 2026, 2027, 2028 and 2155) Although possibly of archaeological interest, it may be more likely that these features are the result of wheel rutting associated with recent agricultural activities.
2030		COY091	Unknown	Narrow sub-rectangular enclosure, approximately 80m by 35m in extent. Orientated N-S. Defined by a very slight bank, approximately 4m in width.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2031		COY082	Unknown, possibly medieval/post-medieval	E-W linear feature possibly formed of a slight bank and ditch. Contained within and obscured by surviving woodland (Blackheath Covert). Possibly represents a former internal boundary or trackway within the woodland.
2032		COY082	Unknown	Dendritic pattern of sinuous linear depressions. Likely to represent a network of former watercourses. Contained within and obscured by surviving woodland (Blackheath Covert).
2033		COY082	Unknown, possibly medieval/post-medieval	E-W linear feature possibly formed of a slight bank and ditch. Contained within and obscured by surviving woodland (Blackheath Covert). Possibly represents a former internal boundary or trackway within the woodland.
2034		COY082	Unknown, possibly post-medieval	NNE-SSW aligned linear. Contained within and obscured by surviving woodland (Blackheath Covert). Corresponds with the position of a trackway shown on late 19th and early 20th century Ordnance Survey maps.
2035			Unknown, possibly modern	Very faint curvilinear anomaly formed of two concentric depressions set approximately 2m apart, with a projected diameter of approximately 18-20m. Origin uncertain. May be of archaeological interest, although more likely to be the result of wheel rutting associated with recent agricultural activities.
2036		COY104	Post-medieval	Very faint linear feature aligned NNE-SSW. Approximately 185m in length. Corresponds with the position of a former field boundary depicted by the 1889 edition six-inch Ordnance Survey map.
2037		COY104	Post-medieval	Very faint linear feature aligned E-W. Approximately 210m in length. Corresponds with the position of a former field boundary depicted by the 1889 edition six-inch Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2038	106	COY104	Unknown, possibly medieval	Very faint sub-rectangular feature, approximately 70m by 70m in extent. May represent an enclosure defined by an in-filled ditch. May be associated with a similar feature (2144) located approximately 70m to the south. Corresponding NMP data indicates that this putative enclosure coincides with a parcel of ridge and furrow, bounded by earthworks.
2039		COY104	Unknown, possibly post-medieval	Very faint N-S linear feature, approximately 100m in length. Possibly represents a former field boundary.
2040			Unknown, possibly post-medieval	Sinuous, narrow linear depression possibly indicating the position of a former watercourse/drainage channel or land division depicted by the 1889 edition six-inch Ordnance Survey map. Aligned approximately N-S. Partially coincides with/runs immediately to the west of the boundary of modern residential area, and an existing trackway or footpath.
2041			Unknown, possibly post-medieval	Very faint linear feature, which probably corresponds with the position of a former field boundary shown on late 19th century Ordnance Survey maps.
2042	106	COY105	Medieval/post-medieval	Area containing several contiguous parcels of possible ridge and furrow. Approximately 300m by 230m in extent. Most clearly defined in the central part of the transcribed area. Orientated NNE-SSW, NNW-SSE and WNW-ESE.
2043	106	COY106	Medieval/post-medieval	Irregular area containing faint traces of possible ridge and furrow. Approximately 120m by 90m in extent. Orientated ENE-WSW.
2045		COY110	Modern	Part of the former route of the (now dismantled) Stafford and Uttoxeter Railway is clearly evident in the LiDAR data.
2046		COY110	Modern	Part of the former route of the (now dismantled) Stafford and Uttoxeter Railway is clearly evident in the LiDAR data.
.2047		COY106	Unknown, possibly post-medieval	Faint WNW-ESE aligned linear feature, possibly representing a former trackway associated with an extraction pit to the north-west. Approximately 70m in length. Appears to overlie possible surviving ridge and furrow (2043).

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2048		COY107	Medieval/post-medieval	Area containing traces of several contiguous parcels of ridge and furrow, subdivided by boundaries (at least one of which corresponds with a former boundary shown of late 19th century Ordnance Survey maps). Predominantly aligned E-W. The ridge and furrow is bisected by the route of a dismantled railway line. Approximately 170m by 135m in extent. Very faintly defined. Those contained within the northern part of the area are more uniform, straight and more closely spaced (approximately 5m apart) than those to the south.
2049		COY130; COY135	Unknown, possibly post-medieval	Faint sub-rectangular depression adjacent to the churchyard of the Church of St Leonard in Marston, and at the corner of two adjoining fields. Origin uncertain, possibly a former extraction pit.
2050			Unknown, possibly post-medieval	Sub-oval depression, approximately 35m by 30m in extent. Heavily obscured by existing vegetation cover (coincides with a small stand of trees at the edge of an agricultural field), and not clearly defined within the filtered LiDAR data. Late 19th and early 20th century Ordnance Survey maps depict a former extractive pit ('Old Marl Pits') in this location.
2051			Unknown, possibly post-medieval	Sub-oval depression, approximately 65m by 40m in extent. Heavily obscured by existing vegetation cover (coincides with a small stand of trees at the edge of an agricultural field), and not clearly defined within the filtered LiDAR data. Late 19th and early 20th century Ordnance Survey maps depict a former extractive pit ('Old Marl Pits') in this location. Also coincides with a small pond, recorded on current Ordnance Survey mapping.
2052		COY103; COY104	Unknown, possibly post-medieval	Possible lynchet, evident as a slight break of slope within a large agricultural field. Aligned NNW-SSE, and visible for a distance of 130m. Corresponds approximately with the position of a former field boundary depicted by the 1889 edition six-inch Ordnance Survey map.
2053			Unknown, possibly modern	Very faint linear feature, visible for approximately 700m and approximately 15m in width. Could represent the position of a former trackway, road or linear boundary. However, the visible feature could be the footprint of the easement of a modern utilities trench (corresponds approximately with the route of a gas pipeline between Audley and Alrewas). Possibly continues to the west as 2195.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2054			Unknown	Faint N-S linear anomaly, approximately 80m in length, within an existing pasture field. May relate to a former field boundary.
2055	106		Medieval/post-medieval	Area containing faint traces of possible ridge and furrow. Approximately 60m by 40m in extent. Orientated NNE-SSW.
2056			Unknown, possibly modern	Group of four circular features of approximately 8m diameter, sited at the edge of a large field. The origin of the features is unclear, although it is possible that they represent the positions of former animal feeding stations, or may relate to other forms of modern agricultural activity.
2057			Unknown, possibly modern	Slight sub-oval depression, with raised interior, approximately 10m by 8m. Located at the SW corner of a pasture field. The origin of the feature is unclear, although it could represent the position of a former animal feeding station / water trough, or may derive from other forms of modern agricultural activity.
2058	122		Post-medieval	Slight linear bank, aligned NNE-SSW and approximately 140m long. Corresponds with the position of a former field boundary shown on the 1889 edition six-inch Ordnance Survey map.
2059	122		Post-medieval	Very slight linear bank aligned NNE-SSW and approximately 140m long. Corresponds with the position of a former field boundary shown on the 1889 edition six-inch Ordnance Survey map.
2060			Unknown, possibly post-medieval	Sinuous linear depression, approximately 500m in length and 4m in width. Corresponds with the position of a former watercourse, as depicted by early 20th century Ordnance Survey mapping.
2061	122		Post-medieval	Very faint linear feature, approximately 300m long and aligned WNW-ESE. Corresponds with the position of a former field boundary shown on the 1889 edition six-inch Ordnance Survey map.
2062	122		Post-medieval	Very faint linear feature, approximately 200m long and aligned NNE-SSW. Corresponds with the position of a former field boundary shown on the 1889 edition six-inch Ordnance Survey map.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2063			Post-medieval	Sub-rectangular depression, approximately 30m by 12m. Corresponds with the position of a pond shown on the 1889 edition six-inch Ordnance Survey map. May originally have been an extraction pit.
2064			Post-medieval	Sub-oval depression, approximately 35m by 23m. Likely to represent a former pond or extraction pit.
2065			Post-medieval	Sub-oval depression, approximately 45m by 35m. Likely to represent a former pond or extraction pit.
2066			Post-medieval	Sub-oval depression, approximately 36m by 30m. Likely to represent a former pond or extraction pit.
2067			Unknown	Poorly defined, slightly sinuous NNW-SSE linear depression. A more pronounced, narrow depression is visible at the eastern edge of the feature. Visible for a distance of at least 500m, approximately 13m wide. Possibly represents a former trackway.
2068	106	COY095	Unknown	Very faint linear feature, approximately 250m in length. Origin uncertain could represent a former trackway leading from/towards 2069.
2069	106	COY095	Unknown	Sub-rectangular platform or enclosure, approximately 20m by 20m, at corner of field. Possibly represents a building platform or a former extraction pit, though may be related to agricultural activity.
2070			Post-medieval	Sub-oval depression, approximately 32m by 22m. Possibly represents a former pond or extraction pit.
2071	?116		Post-medieval	Faintly defined WNW-ESE linear feature possibly represents a former field boundary.
2072	?116		Post-medieval	Faintly defined WNW-ESE linear feature possibly represents a former field boundary.
2073			Unknown, possibly post-medieval	Linear feature, which corresponds with the position of a former road/trackway recorded by late 19th century Ordnance Survey mapping.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2074		COY118	Unknown, possibly post-medieval	Irregular depression, approximately 70m by 22m in extent. Likely to represent a former pond or extraction pit(s).
2075		COY119	Unknown, possibly post-medieval	Pronounced sub-rectangular depression, approximately 40m by 40m in extent. Visible on early Ordnance Survey maps. Now partially obscured by tree cover. Likely to represent a former extraction pit.
2076			Unknown, possibly post-medieval	Pronounced depression at corner of field, 50m by 40m in extent. Corresponds with the position of a former extraction pit ('Old Marl Pit'), depicted by late 19th and early 20th century Ordnance Survey maps.
2077		COY121	Medieval/post-medieval	Possible traces of surviving NNW-SSE ridge and furrow contained within an area 265m by 180m in extent.
2078			Unknown, possibly post-medieval	Slightly irregular, but pronounced depression at the edge of a field. Approximately 55m by 30m in extent. Likely to represent a former pond or quarry pit.
2079		COY127	Unknown, possibly post-medieval	Slightly irregular depression, approximately 50m by 27m in extent. Likely to represent a former pond or quarry pit.
2080		COY125	Medieval/post-medieval	Possible traces of surviving N-S ridge and furrow contained within an area 220m by 150m in extent. The northern and southern limits of the area are demarcated by slight banks.
2081	?117	COY124	Unknown, possibly post-medieval	Shallow linear bank and depression, aligned N-S and approximately 115m in length. Likely to represent a former field boundary.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2082		COY125	Unknown, possibly post-medieval	Poorly defined, sinuous linear depression. Possibly represents a former field boundary, trackway or watercourse. Continues to the west as 2083.
2083		COY125	Unknown, possibly post-medieval	Linear bank and depression. Possibly represents a former field boundary, trackway or watercourse. Continues to the east as 2082.
2084	118		Medieval/post-medieval	Area containing possible surviving ridge and furrow, approximately 110m by 80m in extent. Poorly defined. Very narrow and straight, orientated E-W. Set within existing pasture.
2085		COY128	Unknown, possibly post-medieval	Poorly defined linear feature. Corresponds with the position of a former land division depicted by the 1887 edition six-inch Ordnance Survey map.
2086		COY128	Unknown, possibly post-medieval	Poorly defined linear feature, which probably represents a former field boundary.
2087			Unknown, possibly post-medieval	Faint sub-oval depression, approximately 24m by 16m. Possibly a former extraction pit or pond.
2088	123	COY129	Unknown, possibly post-medieval	Sub-circular depression, approximately 50m in diameter. Likely to represent a former extraction pit or pond.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2089	123	COY129	Unknown, possibly post-medieval	Sub-circular depression, approximately 55m in diameter. Likely to represent a former extraction pit or pond.
2090	123	COY129	Unknown, possibly post-medieval	Sub-circular depression, approximately 43m in diameter. Likely to represent a former extraction pit or pond.
2091	120	COY130	Unknown, possibly post-medieval	Sub rectangular depression, approximately 40m by 30m. Possibly a former pond or extraction pit.
2092		COY130	Unknown, possibly post-medieval	Sub rectangular depression, approximately 26m by 20m. Possibly a former pond or extraction pit.
2093	123	COY129	Unknown, possibly post-medieval	NE-SW aligned linear bank. Likely to represent a former field boundary. Intersects with possible extraction pit/pond 2088.
2094		COY130	Unknown	Steep/pronounced scarp. Though possibly the result of human activity, the origin of the topographical feature is not apparent.
2095		COY130	Unknown, possibly post-medieval	Faint linear feature, consisting of a slight raised bank and depression. Orientated NNE-SSW. Possibly represents a former field boundary.
2096	120	COY130; COY131; COY132	Medieval/post-medieval	Extensive fossilised field system, containing numerous contiguous parcels of faintly defined ridge and furrow, subdivided by slight banks.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2097	120	COY130	Unknown, possibly medieval/post-medieval	Area of irregular topography, possibly including traces of surviving ridge and furrow, but very poorly defined. May signal the presence of features associated with medieval/post-medieval occupation of Marston.
2098		COY135	Unknown, possibly medieval/post-medieval	Linear feature composed on a slight bank and infilled ditch. Corresponds with the position of a former field boundary depicted by late 19th century Ordnance Survey mapping. Could partially define the northern edge of a parcel of ridge and furrow (2302) and may represent a former ploughing headland.
2099		COY135	Unknown, possibly post-medieval	Small, slightly irregular sub-oval depression, 30m by 16m in extent. Corresponds with a former pond depicted by late 19th century Ordnance Survey mapping. Could represent a former extraction pit or pond.
2100		COY135	Unknown, possibly post-medieval	Sub-oval depression, 34m by 25m in extent. Corresponds with a former pond depicted by late 19th century Ordnance Survey mapping. Could represent a former extraction pit or pond.
2101		COY134; COY135	Unknown, possibly post-medieval	N-S aligned linear feature formed of a slight bank. Corresponds approximately with part of former road or trackway, leading from Marston New Farm (now Grange Farm), as depicted by late 19th century Ordnance Survey maps. Visible for a distance of approximately 60m.
2102		COY135	Unknown, possibly post-medieval	Clear sub-oval depression, approximately 40m by 30m in extent. Likely to represent a former extraction pit or pond.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2103		COY134	Unknown, possibly post-medieval	Clear sub-oval depression, approximately 30m by 23m in extent. Likely to represent a former extraction pit or pond. A short and narrow depression, which might represent a former watercourse or trackway, joins the northern edge of the feature.
2104		COY134	Unknown, possibly post-medieval	Clear sub-rectangular depression, approximately 27m by 27m in extent. Likely to represent a former extraction pit or pond.
2105		COY130; COY135	Unknown, possibly medieval/post-medieval	Linear feature formed of a slight bank and depression. Appears to form three sides of an enclosure, which could pre-date the surrounding (enclosure period?) field systems. The enclosure may have been related to St Mary's Church, which lies immediately to the south, or be related the medieval occupation of Marston. The topography within the interior of the enclosure (2301) is slightly irregular, although it is not clear how/ if these irregularities relate to archaeologically significant features.
2106		COY130; COY135	Unknown, possibly post-medieval	Clear sub-oval depression, approximately 47m by 31m in extent. Likely to represent a former extraction pit or pond.
2107			Unknown, probably post-medieval	Irregular depression, approximately 100m by 45m in extent. Likely to represent a former extraction pit/quarry. Depicted by early Ordnance Survey mapping as a tree lined depression containing a small structure, accessed by a trackway.
2108			Unknown, probably medieval/post-medieval	Faintly defined NNE-SSW linear bank, approximately 330m in length. Possibly represents a former field boundary or lynchet. Co-axial to relict ridge and furrow (2116), existing land divisions and other possible former field boundaries 2111-2115. Not depicted on early Ordnance Survey mapping.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2109			Unknown, probably post-medieval	Faintly defined, sinuous linear feature possibly represents a former boundary, trackway or watercourse. May represent a continuation of 2110, to the NNW. Not depicted on early Ordnance Survey mapping.
2110		COY148	Unknown, probably post-medieval	Faintly defined, sinuous linear feature possibly represents a former boundary, trackway or watercourse. May represent a continuation of 2109 to the SSE. Not depicted on early Ordnance Survey mapping.
2111			Unknown, probably medieval/post-medieval	Very faintly defined WNW-ESE linear feature. Probably represents a former field boundary. Co-axial to relict ridge and furrow (2116), existing land divisions and other possible former field boundaries (2108, 2112-2115). Not depicted on early Ordnance Survey mapping.
2112			Unknown, probably post-medieval	Very faintly defined WNW-ESE linear feature. Probably represents a former field boundary. Co-axial to parcels of ridge and furrow (2116), existing land divisions and other possible former field boundaries (2108, 2111, 2113-2115). Not depicted on early Ordnance Survey mapping.
2113			Unknown, probably medieval/post-medieval	Very faintly defined WNW-ESE linear feature. Probably represents a former field boundary Co-axial to adjacent parcels of ridge and furrow (2116), existing land divisions and other possible former field boundaries 2108, 2111-2112, 2114-2115. Not depicted on early Ordnance Survey mapping.
2114			Unknown, probably medieval/post-medieval	Very faintly defined WNW-ESE linear feature. Probably represents a former field boundary Co-axial to adjacent parcels of ridge and furrow (2116), existing land divisions and other possible former field boundaries 2108, 2111-2113, 2115. Not depicted on early Ordnance Survey mapping.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2115			Unknown, probably medieval/post-medieval	Very faintly defined WNW-ESE linear feature. Probably represents a former field boundary Co-axial to adjacent parcels of ridge and furrow (2116), existing land divisions and other possible former field boundaries 2108, 2111-2114. Not depicted on early Ordnance Survey mapping.
2116		COY130	Medieval/post-medieval	Area containing several parcels of possible, faintly defined ridge and furrow, Approximately 365m by 200m in extent. Aligned N-S and E-W.
2117		COY130	Medieval/post-medieval	Pronounced break of slope. Possibly corresponds with the edge of a platform/levelled area or an enclosure.
2118	120	COY130	Medieval/post-medieval	Approximately sub-rectangular parcel of land containing traces of possible ridge and furrow aligned NNE-SSW. Slightly sinuous in form. Approximately 90m by 65m in extent. Very faint traces of ridge and furrow possibly also extend to the west, although these features may be the result of modern ploughing. Approximately 200m by 165m in extent.
2119	120	COY130	Medieval/post-medieval	Sub-rectangular parcel of land containing traces of possible ridge and furrow aligned WNW-ESE. Approximately 90m by 65m in extent.
2120	120	COY130	Medieval/post-medieval	Small parcel of land containing traces of possible ridge and furrow aligned WNW-ESE. Poorly defined. Approximately 57m by 37m in extent.
2121		COY130	Post-medieval	Very poorly defined sub-rectangular enclosure within the corner of a field. Corresponds with the location of a former copse or orchard, depicted by late 19th and early 20th century Ordnance Survey maps. Approximately 75m by 50m.
2122		COY130	Unknown, probably post-medieval	Sinuous linear depression. Represents a former watercourse, which presumably joined an existing pond with a drainage channel.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2123		COY130	Unknown, probably post-medieval	Clear sub-oval depression, approximately 36m by 28m in extent. Likely to represent a former extraction pit or pond.
2124		COY130; COY131	Unknown, possibly medieval/post-medieval	Clearly defined linear depression. May represent an earlier route of the adjacent road (Yarlet Lane).
2125		COY131	Unknown, possibly post-medieval	Sub-oval depression, approximately 25m by 25m in extent. Likely to represent a former extraction pit or pond.
2126		COY134	Unknown, possibly post-medieval	Short linear bank. Corresponds approximately with a former land division associated with Marston New Farm (now Grange Farm), as depicted by late 19th century Ordnance Survey maps.
2127			Unknown, possibly post-medieval	Sub-circular depression, approximately 30m by 30m in extent. Likely to represent a former extraction pit or pond.
2128			Unknown, possibly post-medieval	Sub-oval depression, approximately 45m by 40m in extent. Likely to represent a former extraction pit or pond.
2129			Unknown, possibly post-medieval	Sub-circular depression, approximately 30m by 30m in extent. Likely to represent a former extraction pit or pond.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2130			Unknown, possibly post-medieval	Sub-oval depression, approximately 45m by 35m in extent. Likely to represent a former extraction pit or pond.
2131			Unknown, possibly post-medieval	Sub-oval depression, approximately 57m by 38m in extent. Likely to represent a former extraction pit or pond.
2132			Unknown, possibly post-medieval	Sub-oval depression, approximately 36m by 30m in extent. Likely to represent a former extraction pit or pond.
2133			Unknown, possibly post-medieval	Sub-oval depression, approximately 40m by 32m in extent. Likely to represent a former extraction pit or pond.
2134		COY137; COY140; COY141; COY142	Medieval/post-medieval	Extant land divisions, possibly forming the boundary of an estate/parkland surrounding Yarlet Hall (now a school), or the position of a medieval or early post-medieval park pale. However, the 'boundaries' also follow an existing watercourse, suggesting that this arrangement of land divisions may be entirely natural in origin. Corresponds with an historic parish boundary for much of its length. Clearly defined on the LiDAR plot, although obscured by hedgerows. Much of the 'boundary' is defined by a bank and ditch/watercourse.
2135	124	COY137; COY140	Medieval/post-medieval	Pronounced N-S aligned linear depression, possibly forming part of a holloway associated with medieval - post-medieval occupation. Contained within the grounds of Yarlet Hall. Approximately 15m wide. Visible for a distance of approximately 80m. Extends beyond coverage of LiDAR plot to the north. Runs parallel and immediately adjacent to another possible holloway; 2138.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2136	124	COY137; COY140	Medieval/post-medieval	L-shaped parcel of land containing surviving N-S ridge and furrow, contained within the grounds of Yarlet Hall. Appears to include two separate parcels of ridge and furrow. Covers an area approximately 150m by 150m in extent.
2137	124	COY140; COY142	Medieval/post-medieval	Area containing at two parcels of surviving ridge and furrow, aligned E-W and N-S. Contained within the grounds of Yarlet Hall. Approximately 105m by 85m in extent.
2138	124	COY137; COY140	Medieval/post-medieval	Irregular N-S aligned linear depression, possibly forming part of a holloway associated with medieval - post-medieval occupation. Contained within the grounds of Yarlet Hall. Runs immediately adjacent to another possible holloway; 2135.
2139		COY142	Unknown, possibly post-medieval	Sub-oval depression, approximately 40m by 40m in extent. Likely to represent a former extraction pit or a pond (possibly a fish pond, or ornamental pond?). Corresponds with a feature depicted as a small copse by late 19th and early 20th century Ordnance Survey mapping.
2140		COY142	Unknown, possibly post-medieval	Clearly defined NE-SW aligned linear depression. Corresponds with the position of a former field boundary/ land division recorded by late 19th century Ordnance Survey maps.
2141		COY138; COY142	Unknown, possibly post-medieval	Clearly defined sub-rectangular depression cut into the side of Yarlet Hill. Now obscured by tree cover. Likely to be the result of extraction/quarrying. Approximately 46m by 40m in extent.
2142		COY138; COY142	Unknown	Possible enclosure bank and ditch on Yarlet Hill. Alternatively, could represent a trackway around the summit of the small hill. Now obscured by tree cover.
2143		COY138; COY142	Unknown, possibly post-medieval	Pair of sub-rectangular depressions on Yarlet Hill. Now obscured by tree cover. Likely to represent a pair of intercut extraction pits.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2144	106	COY104	Unknown, possibly medieval	Possible sub-rectangular enclosure, with a possible (unidentifiable) linear feature extending to the south from its south-western corner. Very faintly defined. Corresponding NMP data indicates that this putative enclosure coincides with a parcel of ridge and furrow, bounded by earthworks.
2145	125	COY138; COY142	Unknown, possibly medieval/post-medieval	Series of very faint linear depressions contained within the grounds of Yarlet Hall. These features might represent a southward continuation of the possible holloway(s) identified to the north (2138/2135). The southern part of the feature corresponds approximately with a field boundary depicted by late 19th century Ordnance Survey maps.
2146		COY142	Unknown, possibly medieval/post-medieval	Area containing possible surviving NNW-SSE ridge and furrow. However, these features could derive from recent ploughing. Similar features (not transcribed) are faintly evident within adjoining fields, although these typically coincide more closely with the direction of modern ploughing visible on satellite imagery. 340m by 240m in extent.
2147		COY142	Unknown	Faintly defined curvilinear bank and depression, contained within the grounds of Yarlet Hall. Possibly represents the position of a former land division, trackway or watercourse.
2148		COY142	Unknown, possibly post-medieval	Very faint linear feature, which probably represents the position of a former land division or field boundary.
2149			Unknown, possibly post-medieval	Sub-oval depression, approximately 60m by 40m in extent. Likely to represent a former extraction pit or pond.
2150	120	COY130	Unknown	Short, slightly irregular linear depression. Very faintly defined. Possibly represents a former watercourse or trackway.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2151	106	COY103	Unknown, possibly medieval/post-medieval	Area containing possible very faintly discernible traces of N-S ridge and furrow. However, these features could derive from recent ploughing. Approximately 135m by 130m in extent.
2152		COY103	Unknown	Faintly visible, sinuous linear depression. May demarcate the position of a former watercourse.
2153	118	COY128	Medieval/post-medieval	Area containing possible, very faintly discernible traces of NE-SW ridge and furrow. Approximately 570m by 180m in extent.
2154	106	COY094	Medieval/post-medieval	Area containing several parcels of very faintly discernible ridge and furrow, subdivided by slight banks/infilled ditches. Alternatively, these features could relate to post-medieval water management or drainage. Orientated NNW-SSE and E-W.
2155			Unknown, possibly modern	One of a number of very faint curvilinear anomalies (with 2026, 2027, 2028, and 2029) Although these could be of archaeological interest, it is possible that these features are derived from modern agricultural activity or wheel rutting.
2156		COY078	Unknown, possibly post-medieval	Depression possibly derived from extraction/quarrying activity, partially defined to the west by a scarp. Contains a flat area representing a possible sub-rectangular enclosure or platform, with a bank at the northern edge. Situated to the south of Upper Hanyards Farm. Corresponds with the position of a small enclosure and 'Old Quarry' depicted by late 19th and early 20th century Ordnance Survey maps.
2157		COY130	Unknown, possibly post-medieval	Poorly defined sub-rectangular feature, approximately 30m by 25m. Appears to be superimposed over an area of ridge and furrow (2118). Possibly represents a former building platform.
2158		COY142	Unknown	Very faint / slight sub-circular mound, raised area or platform. Approximately 90m in diameter. The eastern edge of the feature is obscured by vegetation. Origin uncertain. Located within the grounds of Yarlet Hall.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2159		COY130	Unknown, possibly post-medieval	Irregular depression, possibly representing former extractive pits or a pond. Approximately 45m by 35m in extent.
2160		COY130	Unknown, possibly modern	Clearly defined small circular feature, 7m in diameter, superimposed over an area of possible ridge and furrow. Likely to represent the location of a former animal feed station or other agricultural feature.
2161		COY142	Unknown, possibly post-medieval	Irregular depression, likely to represent a former extractive pit or a pond (possibly a fish pond, or ornamental pond?). Approximately 50m by 45m in extent.
2162		COY142	Unknown, possibly post-medieval	Sub-circular depression, approximately 45m in diameter. Likely to represent a former extraction pit or a pond (possibly a fish pond, or ornamental pond?).
2163		COY142	Unknown, possibly post-medieval	Sub-circular depression, approximately 35m in diameter. Likely to represent a former extraction pit or a pond (possibly a fish pond, or ornamental pond?).
2164	126	COY141; COY142	Unknown, possibly post-medieval	Slightly sinuous linear bank and possible infilled ditch. Possibly represents a former land division. Alternatively, the feature could indicate the position of a former trackway/hollow way or watercourse.
2167			Unknown, possibly post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit or pond.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2173			Post-medieval/modern	Small sub-circular or square platform, approximately 2.5m in diameter. Poorly defined within the filtered LiDAR plot. Corresponds approximately with the position of a trigonometrical station depicted by late 19th and early 20th century Ordnance Survey maps.
2174			Unknown	Slight scarp or break of slope, marked as 'Peasley Bank' on late 19th and early 20th century Ordnance Survey maps. May be entirely natural in origin, though could be the result of extraction/quarrying.
2177			Unknown, probably post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit or pond.
2178			Unknown, probably post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit or pond.
2179			Unknown, probably post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit or pond.
2180			Unknown, probably post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit or pond.
2181		COY142	Unknown, probably post-medieval	Small sub-oval depression situated within an area containing numerous 'Old Clay Pits', 'Old Marl Pits' and 'Sand Pits', as depicted by late 19th and early 20th century Ordnance Survey maps. Likely to represent a former extraction pit, though could be an infilled pond (possibly a fish pond or ornamental pond).
2182	126	COY141; COY142	Medieval/post-medieval	Area containing possible faint traces of surviving ridge and furrow. Orientated N-S. Located within the grounds of Yarlet Hall. Approximately 50m by 30m in extent.

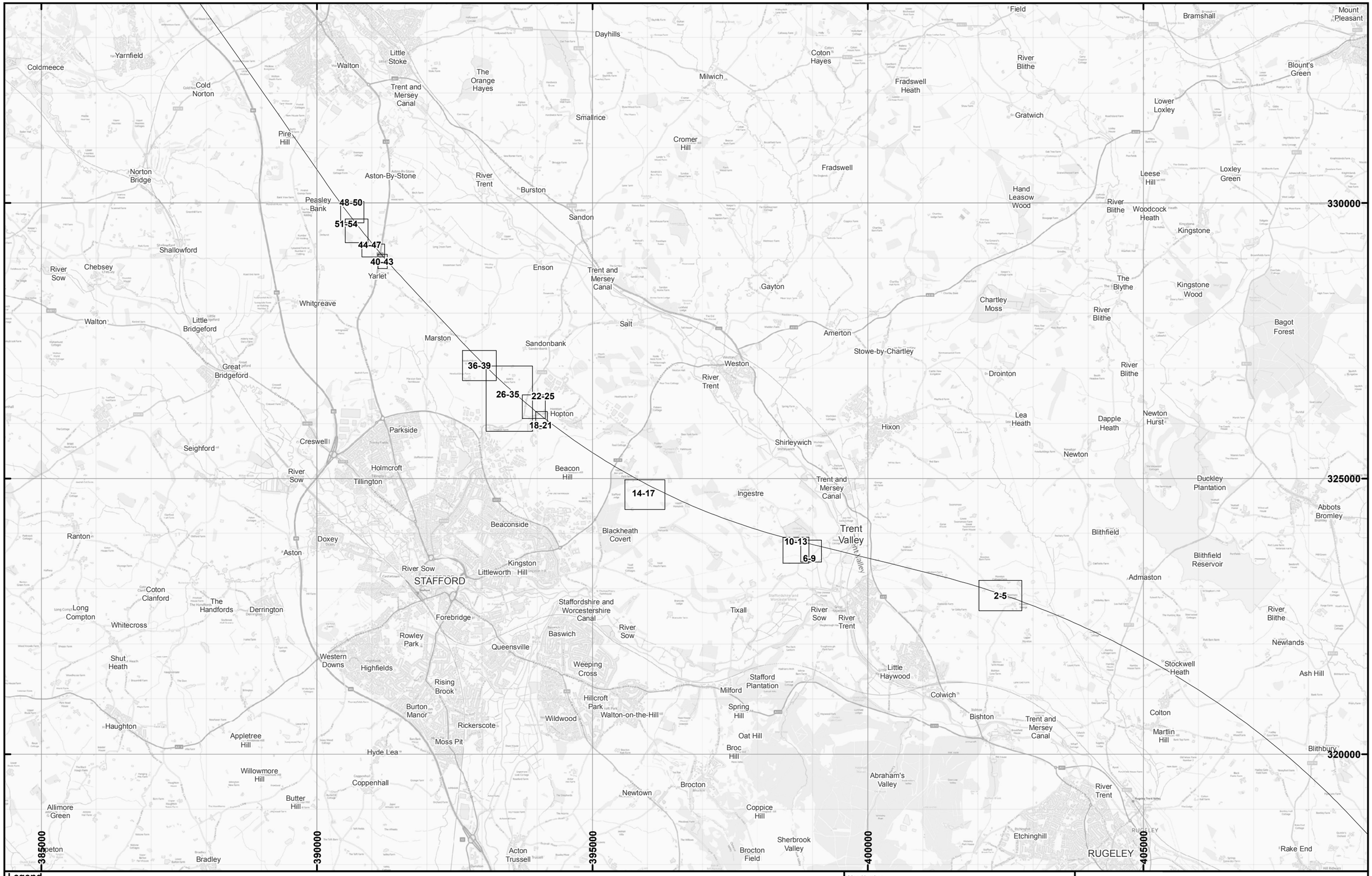
LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2183	126	COY141; COY142	Medieval/post-medieval	Area containing possible faint traces of surviving ridge and furrow. Orientated NNE-SSW. Located within the grounds of Yarlet Hall. Approximately 90m by 30m in extent.
2184		COY142	Unknown, probably post-medieval	Small sub-oval depression, likely to represent a former extraction pit or pond. One of several features depicted in this area by late 19th and early 20th century Ordnance Survey maps and labelled as a 'Clay Pit' or 'Old Marl Pit'., though could be an infilled pond (possibly a fish pond or ornamental pond).
2189			Unknown, probably post-medieval	Faintly defined sub-rectangular area of irregular topography within an existing agricultural field. Approximately 115m by 95m in extent. Corresponds approximately with the position of a former extractive pit depicted by late 19th and early 20th century Ordnance Survey maps ('Old Marl Pit').
2190		COY079; COY144	Unknown	Very faint L-shaped feature, which defines a gentle levelling of a natural slope, or possibly a levelled bank. ENE-WSW section measures approximately 223m in length, and NNW-SSE section measures approximately 130m in length. May represent a former field boundary / lynchet or an enclosure. The feature is very diffuse, although it appears to be up to approximately 20m in width. May be associated with 2191.
2191			Unknown	Very faint linear feature, approximately 200m in length, which defines a gentle levelling of a natural slope, or possibly a levelled bank. The feature is very diffuse, although it appears to be up to approximately 20m in width. May have been associated with 2190, and possibly represents the northern boundary of an enclosure or former field. Partially corresponds with the position of a field boundary shown on late 19th century Ordnance Survey maps.
2192			Unknown, probably post-medieval	Very faint sub-circular depression, approximately 45m in diameter. May represent a former pond or extraction pit.
2193	?116		Unknown, probably post-medieval	Very faint / slight NNE-SSW linear bank. Approximately 225m in length. Corresponds with the position of a former land division/Field boundary depicted by late 19th century Ordnance Survey maps

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2194		COY118	Unknown, probably post-medieval	Very faint / slight E-W linear bank. Approximately 17om in length. Corresponds with the position of a former land division/Field boundary depicted by late 19th century Ordnance Survey maps.
2195		COY121	Modern	Very faint linear feature. Approximately 18m in width, and visible for a distance of approximately7oom. Possibly a continuation of a similar feature to the east; 2053. The origin of the feature is uncertain; it could represent a former trackway, road or linear boundary. However, the feature could be the footprint of the easement for of a utility trench (corresponds approximately with the route of a gas pipeline between Audley and Alrewas). The feature does not respect existing field boundaries, and appears to be superimposed over (and therefore post-date) a parcel of probable ridge and furrow (2077) and a possible extraction pit (2196).
2196		COY121	Unknown, possibly post-medieval	Irregular depression, approximately 9om by 5om in extent. Possibly represents a former extraction pit or pond. Superimposed over an area of probable ridge and furrow (2077), and in turn traversed by faint linear feature (2195).
2197			Unknown	Small sub-rectangular feature, defined by a slight bank, which encloses a slight raised platform. Approximately 3om by 3om in extent. Situated immediately adjacent to a similar, slightly larger feature (2198). Possibly represents a former building platform.
2198			Unknown	Small sub-rectangular feature, defined by a slight bank, which encloses a slight raised platform. Approximately 45m by 35m in extent. Situated immediately adjacent to a similar, slightly smaller feature (2198). Possibly represents a former building platform.
2199			Unknown, probably post-medieval	Linear depression, orientated NNW-SSE. Approximately 7om by 5m. May represent a former drainage channel/water management feature associated with Hopton Pools (situated immediately to the north).
2200		COY092	Unknown, probably post-medieval	Linear depression, orientated NW-SE. Approximately 5om by 5m. May represent a former drainage channel/water management feature associated with Hopton Pools (situated immediately to the north).

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2201	113	COY092	Medieval/post-medieval	Irregular parcel of land containing traces of possible ridge and furrow. Approximately 130m by 60m in extent. Slightly sinuous in form. Aligned NNW-SSE. Alternatively, may represent the vestiges of post-medieval water management/drainage.
2202		COY092	Medieval/post-medieval	Irregular parcel of land containing traces of possible ridge and furrow. Approximately 185m by 135m in extent. Slightly sinuous in form. Aligned N-S. Alternatively, may represent the vestiges of post-medieval water management/drainage.
2203	126	COY141; COY142	Medieval/post-medieval	Area containing possible faint traces of surviving ridge and furrow. Orientated E-W. Located within the grounds of Yarlet Hall. Approximately 80m by 37m in extent.
2268			Unknown, possibly post-medieval	Irregular depression. Corresponds with the position of a pond shown on late 19th and early 20th century Ordnance Survey maps. Possibly represents a former extraction pit.
2269			Unknown, possibly post-medieval	Irregular depression. Corresponds with the position of an 'Old Marl Pit' and a pond shown on late 19th and early 20th century Ordnance Survey maps. A series of possible trackways appear to lead from the former extraction pit to the south-west, beyond the limits of the 250m survey area.
2270			Unknown	Sinuous linear depression. Possibly represents a former watercourse. Orientated approximately NE-SW and visible for a distance of approximately 250m.
2271			Unknown, possibly post-medieval	ENE-WSW aligned linear depression. Probably represents a former field boundary or the position of a former drain, which once connected existing watercourses to the east and west. Possibly associated with 2272.
2272			Unknown, possibly post-medieval	NNW-SSE aligned linear depression. Possibly represents the position of a former drain, which once connected 2271 with existing watercourses to the east and west, or a former field boundary.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2273			Unknown	Very faint linear depression, which possibly represents three sides of an enclosure ditch.
2274			Unknown	Very faint L-shaped linear depression, which possibly defines two sides of an enclosure ditch. The topography within the interior of the possible enclosure is slightly irregular, although it is not possible to clearly define any individual features in this area.
2275			Unknown, possibly post-medieval	Very faint ENE-WSW linear variation in topography. Possibly represents a former land division or drainage channel associated with 2271 and 2272. It is unclear if the western end of the feature is a continuation of the E-W section of 2274, or a separate feature.
2286	106; COY102		Unknown, possibly medieval/post-medieval	Sub-rectangular parcel of land containing numerous faint earthworks, which may derive from the medieval and/or post-medieval occupation of Hopton. Approximately 100m by 50m in extent.
2287	106	COY096	Unknown, possibly medieval/post-medieval	Sub-rectangular parcel of land containing numerous faint earthworks, which may derive from the medieval and/or post-medieval occupation of Hopton. Approximately 110m by 65m in extent. The area is traversed from NW-SE by a surviving path or trackway, which is depicted by late 19th century Ordnance Survey maps.
2293		COY142	Unknown, possibly post-medieval	Area containing a series of irregular depressions, now largely obscured by tree cover. Likely to represent a group of intercut extraction pits.
2294		COY142	Unknown	Very faint, sinuous linear feature. Possibly represents a former land division or watercourse, the line of which continues to the east as a surviving land division.
2295		COY138; COY142	Unknown, possibly post-medieval	Sub-circular depression, approximately 40m in diameter. Now obscured by tree cover. Possibly represents a former extractive pit or a pond.

LiDAR and multi-spectral site ID	Aerial photography site ID	Gazetteer ID	Period	Description
2301	120	COY130; COY135	Unknown, possibly medieval/post-medieval	Area of irregular topography contained within the extents of possible enclosure 2105. May signal the presence of buried features and/or slight earthworks associated with the medieval/post-medieval occupation of Marston.
2302		COY135	Unknown, possibly medieval/post-medieval	Area containing very faint traces of possible ridge and furrow. Slightly sinuous in form, orientated NNE-SSW. Approximately 140m by 90m in extent. Topographical anomaly 2098, located along the northern edge of this area, may represent the northern edge of this parcel of ridge and furrow.
2312			Unknown, probably medieval/post-medieval	Faintly defined WNW-ESE linear feature. Probably represents a former field boundary. Co-axial to adjacent parcels of ridge and furrow (2116), existing land divisions and other possible former field boundaries 2108, 2111-2115. Not depicted on early Ordnance Survey mapping.



Legend

—— HS2 Phase 2a centre line

Map Number

Figure 1

Map Name

CA2 Surveyed Areas - Geophysics

Community Area: 2

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

Scale at A3: 1:62,500

0 625 1,250 1,875 2,500 Metres

Doc Number: C861-ARP-EV-MAP-WE01-000001

Date: 24/05/17

Moreton Barn Farm

MORETON LANE

323500

Ford

A51

Little Haywood

Colwich

Bishton

Blithfield

Moreton Cottage Farm

Moreton House

Moreton Farm

323000

Wind Turbine

Moreton Grange

Stockwell Heath

Moreton Brook

322500

Far Coley Farm

402000

402500

403000

403500

Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 2

Map Name: CA2-894 Site location

Community Area: 2-894

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-MAP-WS02-000003

Date: 21/04/17

323100
323000
322900
322800
322700

402100
402200
402300
402400
402500
402600
402700
402800

+3nT
-2nT

Moreton Grange

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 3

Map Name
CA2-894 Greyscale plot

Community Area:
2-894

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-MAP-WS02-000003

Date: 21/04/17

323100
323000
322900
322800
322700
402100
402200
402300
402400
402500
402600
402700
402800
Moreton Grange
+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 4

Map Name
CA2-894 XY Trace

Community Area:
2-894

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-MAP-WS02-000003

Date: 21/04/17

323100
323000
322900
322800
322700
402100
402200
402300
402400
402500
402600
402700
402800
1-894-005
1-894-008
1-894-001
1-894-009
1-894-003
1-894-002
1-894-006
1-894-007
1-894-004
Moreton Grange

Legend

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

Map Number: Figure 5

Map Name: CA2-894 Interpretation

Community Area: 2-894

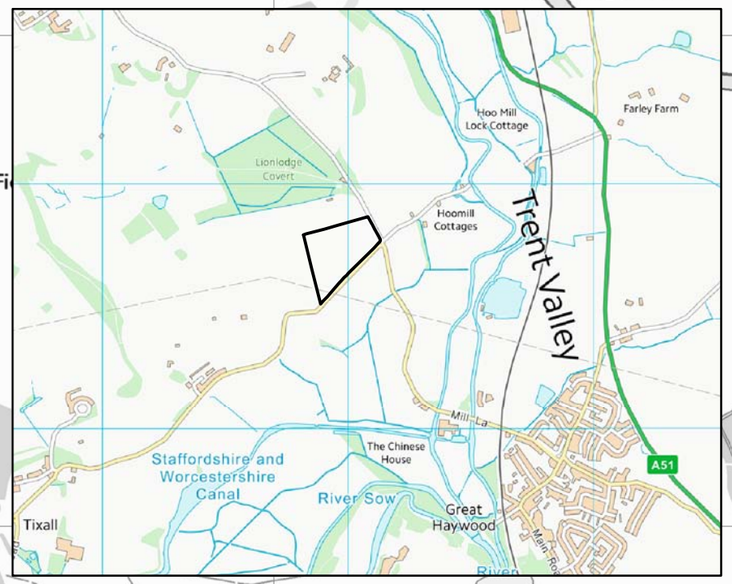
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Ingestre

Little Ingestre

Thatchholme Covert

The Dower House

Ginders Covert

Farley Bridge

Farley Farm

Farley Croft

A51

HOOMILL LANE

Hoomill Bridge

Farley Cottage

Lionlodge Covert

Lion Lodges

Hoo Mill

Hoomill Cottages

Flushing Covert

Bricklawn Covert

Tixall Manor Farm

Middle Bridge

River Trent

Trent and Mersey Canal

Great Haywood Marina

Tixall Farm

COURT

TIXALL

Canal Side Farm

Great Haywood

NURSERY WAY

Wharf Bridge

The Mill Wks

MILL LANE

Tixall Mews

Avonda

324500

324000

323500

323000

398000

398500

399000

399500

400000

Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 6

Map Name: CA2-1275 Site location

Community Area: 2-1275

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

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

398700
398800
398900
399000
399100
399200
399300

323900
323800
323700
323600
323500

Hoomill
Cottages

+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 7

Map Name
CA2-1275 Greyscale plot

Community Area:
2-1275

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-MAP-WS02-000003

Date: 21/04/17

398700
398800
398900
399000
399100
399200
399300

323900
323800
323700
323600
323500

Hoomill
Cottages

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 8

Map Name
CA2-1275 XY Trace

Community Area:
2-1275

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-MAP-WS02-000003

Date: 21/04/17

398700
398800
398900
399000
399100
399200
399300

323900
323800
323700
323600
323500

Hoomill
Cottages

2-1275-001

2-1275-002

Legend

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

Map Number
Figure 9

Map Name
CA2-1275 Interpretation

Community Area:
2-1275

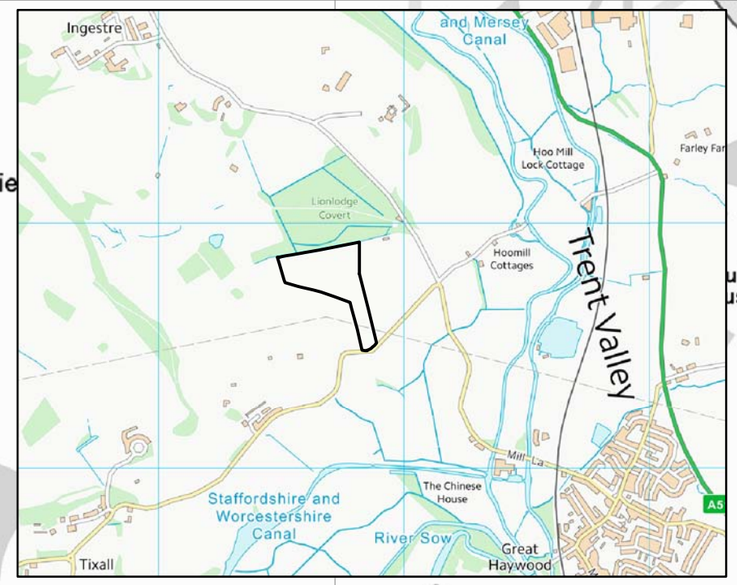
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Little Ingestre

Thatchholme Covert

The Dower House

Ginders Covert

Lionlodge Covert

Lion Lodges

Hoomill Cottages

Hoo Mill

Flushing Covert

Bricklawn Covert

Tixall Manor Farm

Tixall Farm

Middle Bridge

Great Haywood Marina

River Trent

Mersey Canal

324500

324000

323500

398000

398500

399000

399500

Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 10

Map Name: CA2-1312 Site location

Community Area: 2-1312

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

Scale at A3: 1:5,000

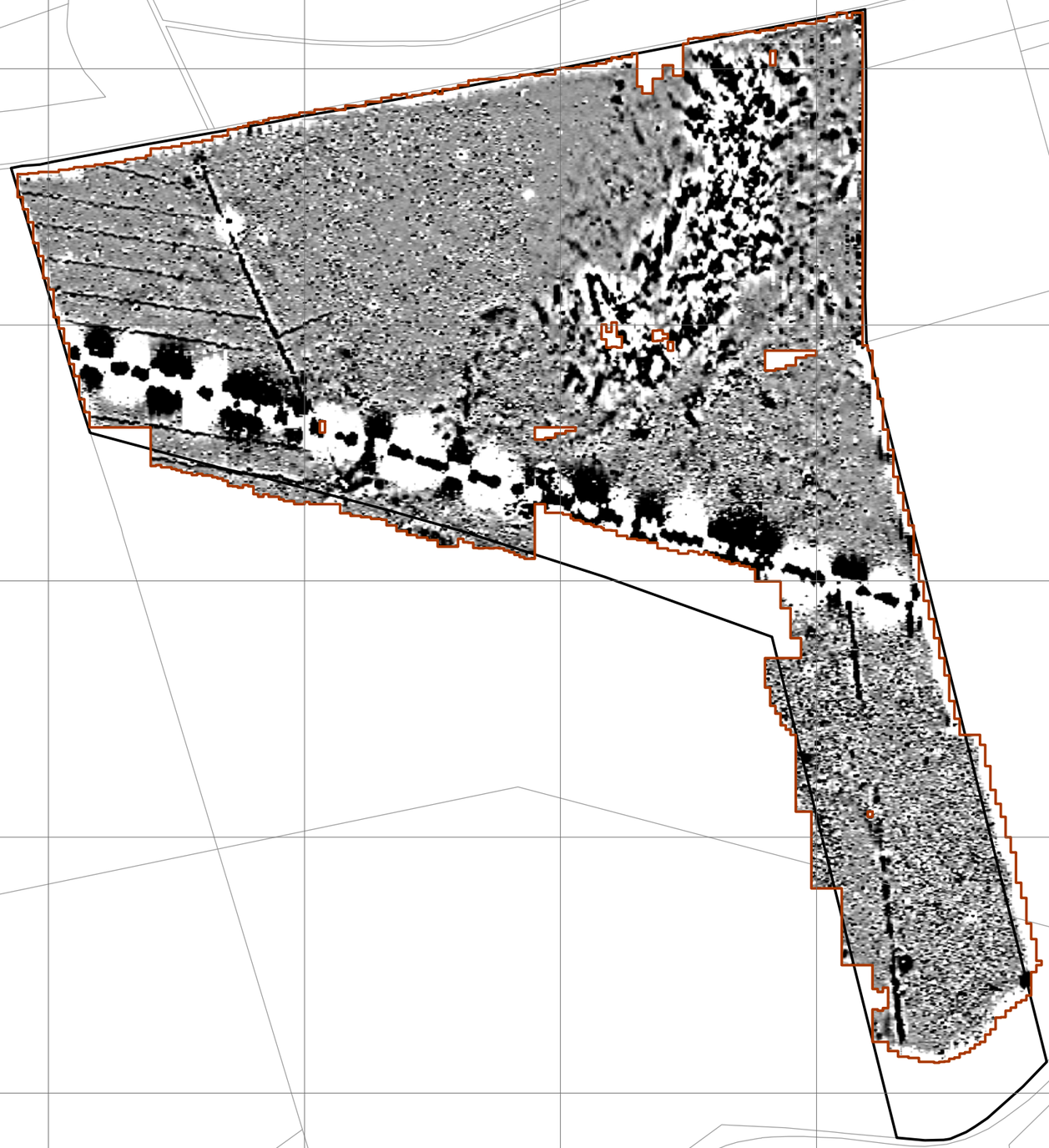
0 50 100 150 200 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

398400
398500
398600
398700
398800
398900
399000
399100

323900
323800
323700
323600
323500



+3nT

-2nT

Legend

Site boundary

Detail Survey Extents

Map Number: Figure 11

Map Name: CA2-1312 Greyscale plot

Community Area: 2-1312

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-MAP-WS02-000003

Date: 21/04/17

398400
398500
398600
398700
398800
398900
399000
399100
323900
323800
323700
323600
323500

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 12

Map Name
CA2-1312 XY Trace

Community Area:
2-1312

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-MAP-WS02-000003

Date: 21/04/17

398400
398500
398600
398700
398800
398900
399000
399100
323900
323800
323700
323600
323500

2-1312-004
2-1312-007
2-1312-003
2-1312-008
2-1312-002
2-1312-001
2-1312-005
2-1312-006

Legend

- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ploughing
- Agriculture - Drain
- Ferrous
- Natural
- Pipe, Modern Service
- Former Field Boundary

Map Number
Figure 13

Map Name
CA2-1312 Interpretation

Community Area:
2-1312

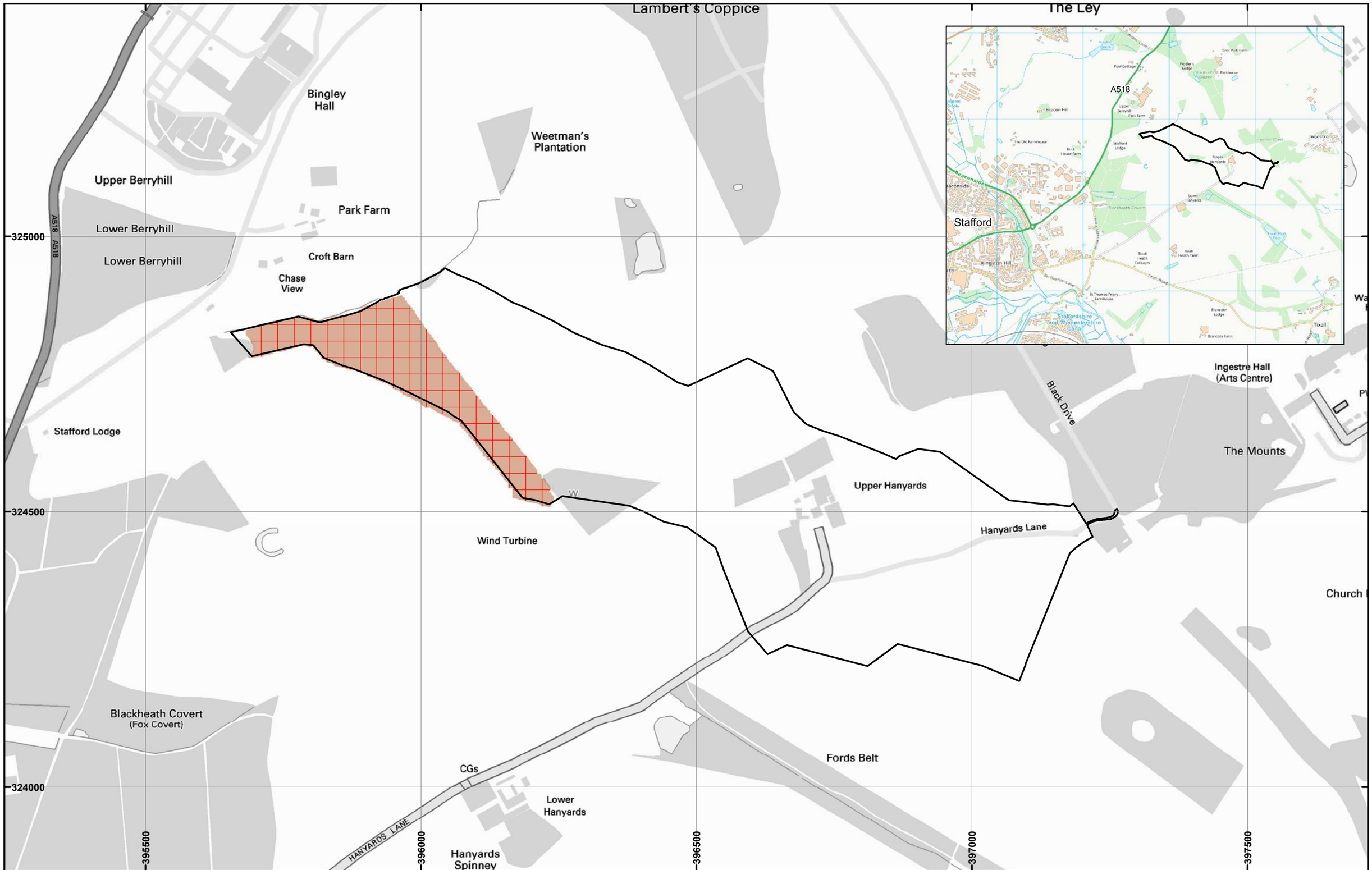
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 14

Map Name: CA2-1453 Site location

Community Area: 2-1453

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

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

395600
395700
395800
395900
396000
396100
396200
396300

324900
324800
324700
324600
324500

+3nT

-2nT

Legend

Site boundary

Detail Survey Extents

Map Number

Figure 15

Map Name

CA2-1453 Greyscale plot

Community Area:
2-1453

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-MAP-WS02-000003

Date: 21/04/17

395600
395700
395800
395900
396000
396100
396200
396300

324900
324800
324700
324600
324500

+25nT

-25nT

Legend

Site boundary

Detail Survey Extents

Map Number

Figure 16

Map Name

CA2-1453 XY Trace

Community Area:
2-1453

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-MAP-WS02-000003

Date: 21/04/17

395600
395700
395800
395900
396000
396100
396200
396300

324900
324800
324700
324600
324500

2-1453-005
2-1453-006
2-1453-001
2-1453-007
2-1453-009
2-1453-002
2-1453-008
2-1453-003
2-1453-010
2-1453-004
2-1453-011

Legend

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

Map Number
Figure 17

Map Name
CA2-1453 Interpretation

Community Area:
2-1453

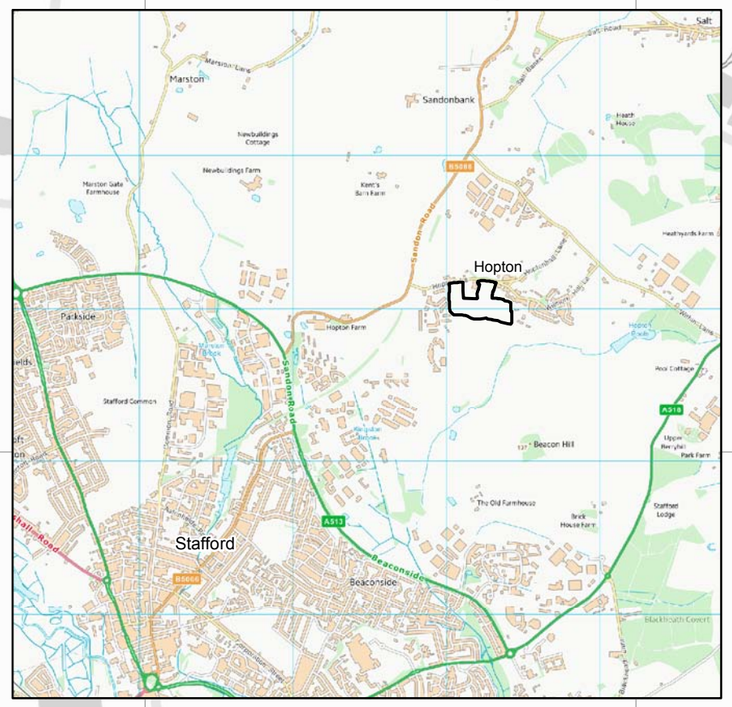
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 18

Map Name: CA2-1739 Site location

Community Area: 2-1739

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

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

393800
393900
394000
394100
394200
394300
394400
394500
326200
326100
326000
325900
325800
Hopton
+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 19

Map Name
CA2-1739 Greyscale plot

Community Area:
2-1739

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-MAP-WS02-000003

Date: 21/04/17

393800
393900
394000
394100
394200
394300
394400
394500

326200
326100
326000
325900
325800

Hopton

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 20

Map Name
CA2-1739 XY Trace

Community Area:
2-1739

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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-MAP-WS02-000003

Date: 21/04/17

393800
393900
394000
394100
394200
394300
394400
394500
326200
326100
326000
325900
325800
Hopton
2-1739-001
2-1739-002
2-1739-003

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous

Map Number
Figure 21

Map Name
CA2-1739 Interpretation

Community Area:
2-1739

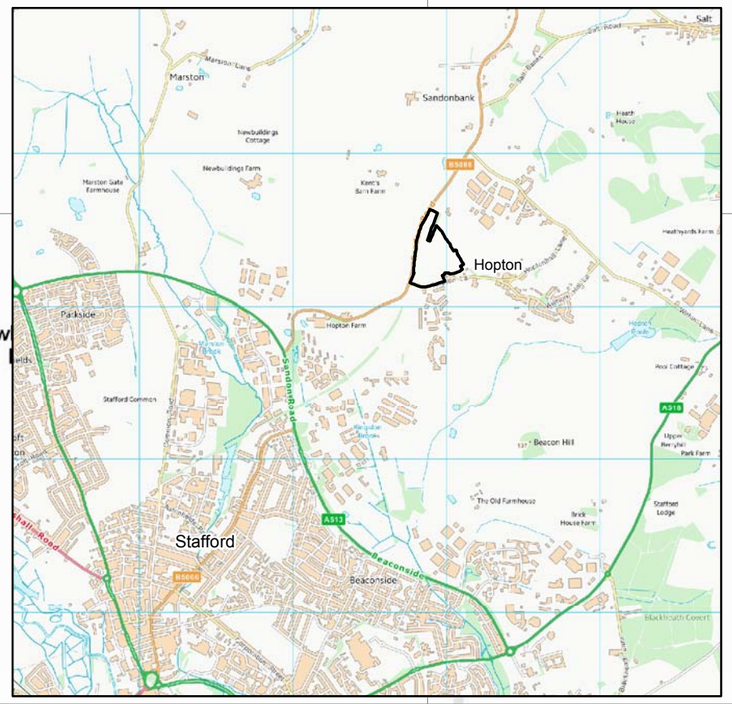
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 22

Map Name: CA2-1791 Site location

Community Area: 2-1791

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

393600
393700
393800
393900
394000
394100
394200
394300

326500
326400
326300
326200
326100

+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 23

Map Name
CA2-1791 Greyscale plot

Community Area:
2-1791

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-MAP-WS02-000003

Date: 21/04/17

393600
393700
393800
393900
394000
394100
394200
394300

326500
326400
326300
326200
326100

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 24

Map Name
CA2-1791 XY Trace

Community Area:
2-1791

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-MAP-WS02-000003

Date: 21/04/17

393600
393700
393800
393900
394000
394100
394200
394300

326500
326400
326300
326200
326100

2-1791-004
2-1791-007
2-1791-006
2-1791-005
2-1791-008
2-1791-002
2-1791-001
2-1791-010
2-1791-009
2-1791-011
2-1791-003

Legend

- Site boundary
- Detail Survey Extents
- Archaeology
- Possible Archaeology
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Ferrous
- Pipe, Modern Service
- Former Field Boundary

Map Number
Figure 25

Map Name
CA2-1791 Interpretation

Community Area:
2-1791

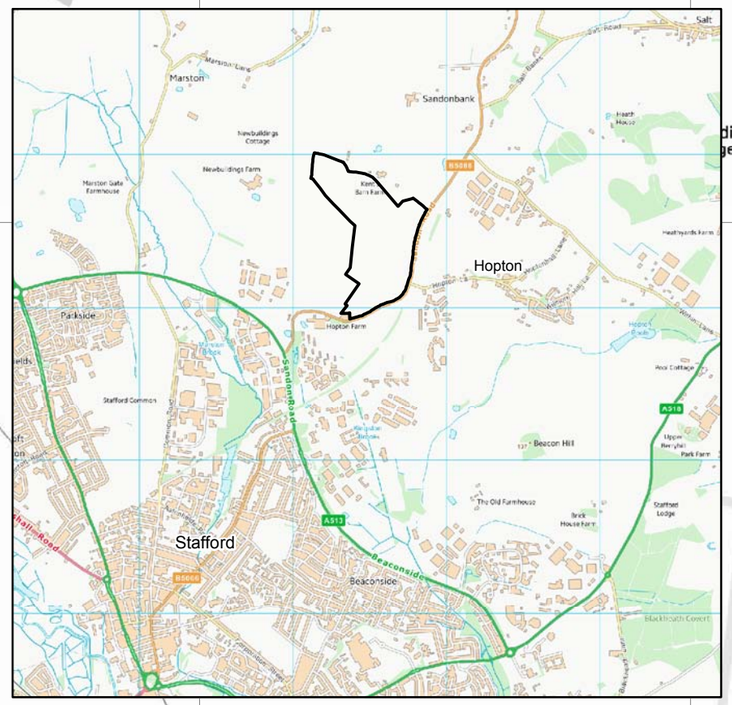
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 26

Map Name: CA2-1836 Site location

Community Area: 2-1836

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

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

393000
393100
393200
393300
393400
393500
393600
393700
326900
326800
326700
326600
Kent's
Barn Far
+3nT
-2nT

Legend

Detail Survey Extents
Site boundary

Map Number
Figure 27

Map Name
CA2-1836 Greyscale plot (north)

Community Area:
2-1836

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-MAP-WS02-000003

Date: 21/04/17

393000
393100
393200
393300
393400
393500
393600
393700
326900
326800
326700
326600
+25nT
-25nT
Kent's
Barn Far

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 28

Map Name
CA2-1836 XY Trace
(north)

Community Area:
2-1836

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-MAP-WS02-000003

Date: 21/04/17

393000
393100
393200
393300
393400
393500
393600
393700
326900
326800
326700
326600
2-1836-001
2-1836-019
2-1836-018
2-1836-002
2-1836-015
2-1836-021
Kent's
Barn Far

Legend

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

Map Number
Figure 29

Map Name
CA2-1836 Interpretation (north)

Community Area:
2-1836

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-MAP-WS02-000003

Date: 21/04/17

393300
393400
393500
393600
393700
393800
393900
394000
326700
326600
326500
326400
326300
+3nT
-2nT

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 30

Map Name: CA2-1836 Greyscale plot (central)

Community Area: 2-1836

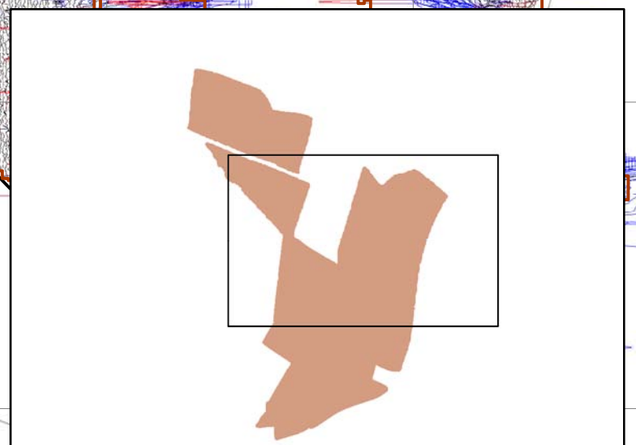
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



393300
393400
393500
393600
393700
393800
393900
394000
326700
326600
326500
326400
326300

+25nT
-25nT

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 31

Map Name: CA2-1836 XY Trace (central)

Community Area: 2-1836

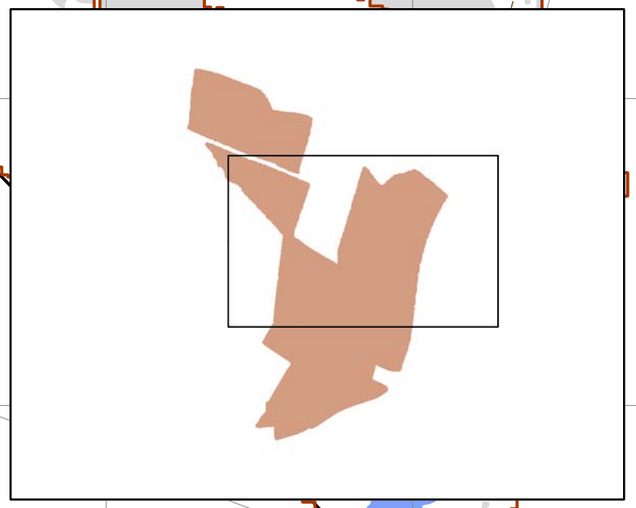
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



393300 393400 393500 393600 393700 393800 393900 394000

326700 326600 326500 326400 326300

2-1836-020
2-1836-015
2-1836-021
2-1836-005
2-1836-014
2-1836-011
2-1836-012
2-1836-022
2-1836-017
2-1836-006
2-1836-013
2-1836-010
2-1836-023

Legend

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

Map Number
Figure 32

Map Name
CA2-1836 Interpretation (central)

Community Area:
2-1836

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-MAP-WS02-000003

Date: 21/04/17

393100
393200
393300
393400
393500
393600
393700
393800
326300
326200
326100
326000
325900
+3nT
-2nT
Hopton Farm

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 33

Map Name
CA2-1836 Greyscale plot (south)

Community Area:
2-1836

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-MAP-WS02-000003

Date: 21/04/17

393100
393200
393300
393400
393500
393600
393700
393800
326300
326200
326100
326000
325900
Hopton Farm
+25nT
-25nT

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 34

Map Name: CA2-1836 XY Trace (south)

Community Area: 2-1836

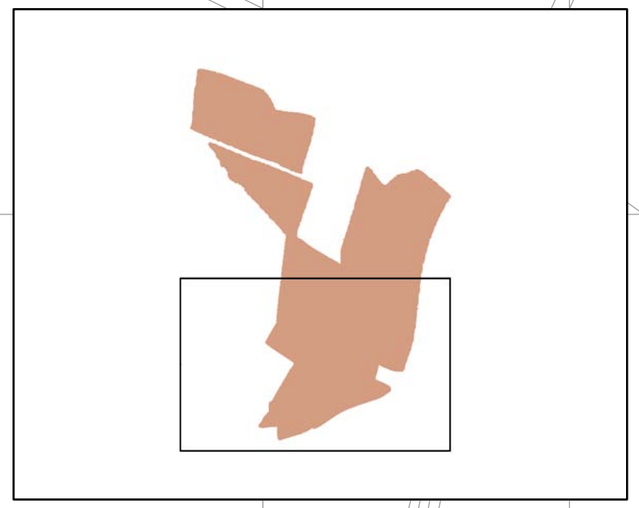
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



393100
393200
393300
393400
393500
393600
393700
393800
326300
326200
326100
326000
325900

2-1836-012
2-1836-022
2-1836-017
2-1836-006
2-1836-013
2-1836-010
2-1836-023
2-1836-003
2-1836-004
2-1836-008
2-1836-009
2-1836-007
2-1836-016
Hopton Farm

Legend

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

Map Number
Figure 35

Map Name
CA2-1836 Interpretation (south)

Community Area:
2-1836

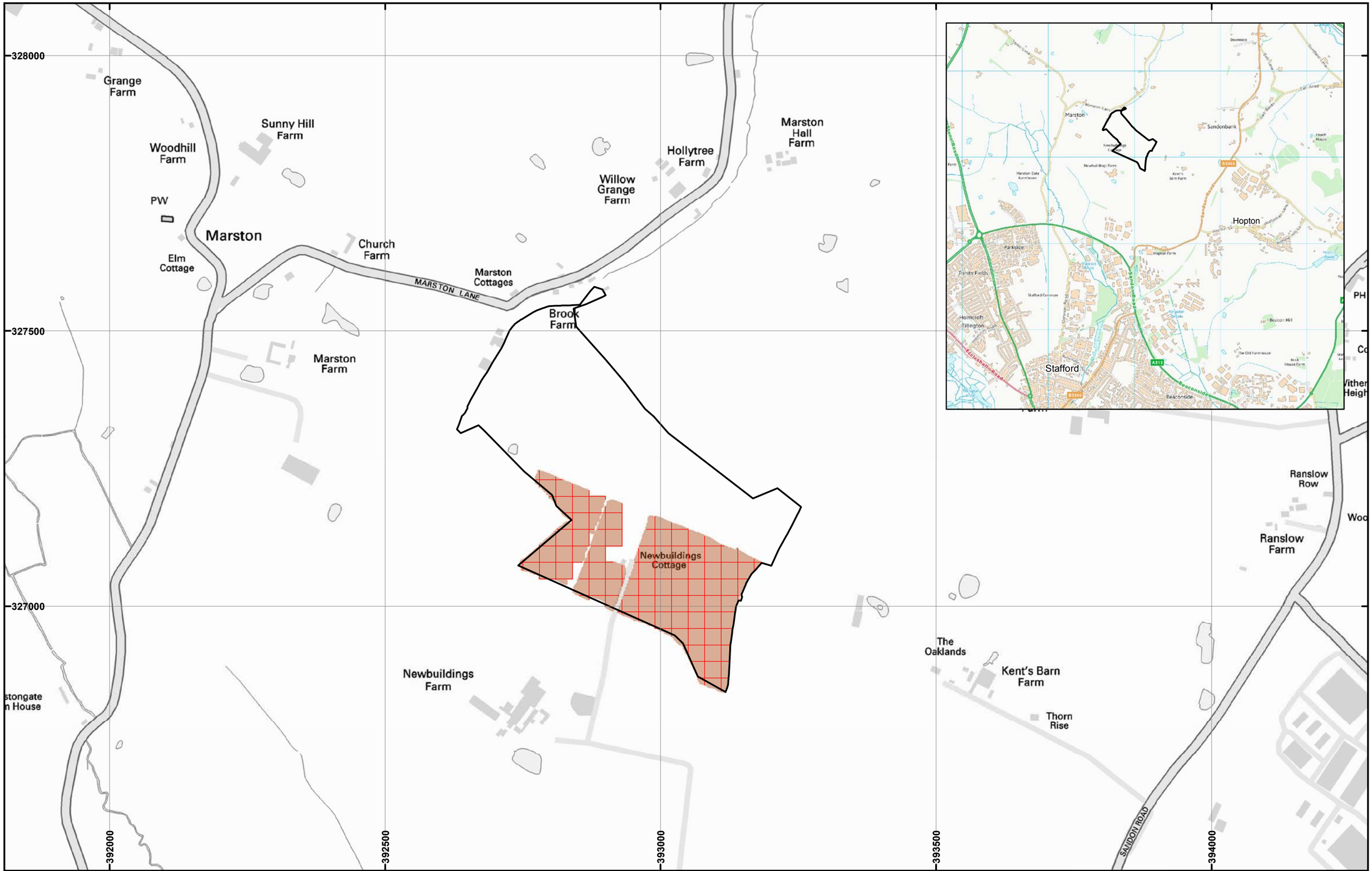
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number	Figure 36
Map Name	CA2-1883 Site location
	Community Area: CA2-1883

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

Scale at A3: 1:6,250

0 60 120 180 240 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

392600
392700
392800
392900
393000
393100
393200
393300
327200
327100
327000
326900
326800
Newbuildings Cottage
Newbuildings Farm
+3nT
-2nT

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 37

Map Name: CA2-1883 Greyscale plot

Community Area: 2-1883

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-MAP-WS02-000003

Date: 21/04/17

392600
392700
392800
392900
393000
393100
393200
393300
327200
327100
327000
326900
326800
Newbuildings Cottage
Newbuildings Farm
+25nT
-25nT

Legend

- Site boundary
- Detail Survey Extents

Map Number: Figure 38

Map Name: CA2-1883 XY Trace

Community Area: 2-1883

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-MAP-WS02-000003

Date: 21/04/17

392600
392700
392800
392900
393000
393100
393200
393300
327200
327100
327000
326900
326800
2-1883-015
2-1883-016
2-1883-014
2-1883-017
2-1883-013
2-1883-024
2-1883-020
2-1883-010
2-1883-025
2-1883-011
2-1883-019
2-1883-018
2-1883-002
2-1883-003
2-1883-004
2-1883-021
2-1883-009
2-1883-001
2-1883-005
2-1883-012
2-1883-008
2-1883-007
2-1883-022
2-1883-006
2-1883-023
Newbuildings Cottage
Newbuildings Farm

Legend

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

Map Number
Figure 39

Map Name
CA2-1883 Interpretation

Community Area:
2-1883

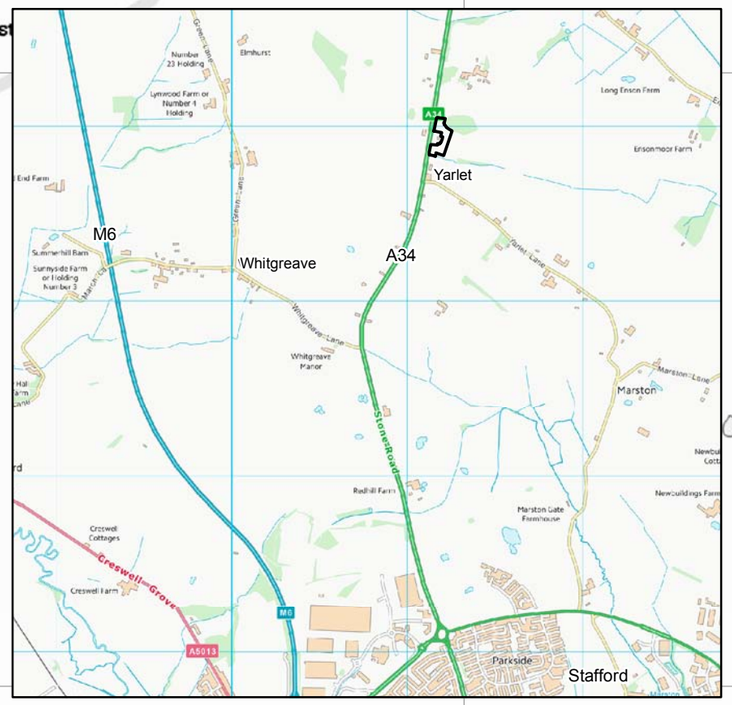
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 40

Map Name: CA2-1962 Site location

Community Area: 2-1962

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

390800
390900
391000
391100
391200
391300
391400
391500
329100
329000
328900
328800
328700

+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 41

Map Name
CA2-1962 Greyscale plot

Community Area:
2-1962

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-MAP-WS02-000003

Date: 21/04/17

390800
390900
391000
391100
391200
391300
391400
391500
329100
329000
328900
328800
328700

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 42

Map Name
CA2-1962 XY Trace

Community Area:
2-1962

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-MAP-WS02-000003

Date: 21/04/17

390800
390900
391000
391100
391200
391300
391400
391500
329100
329000
328900
328800
328700

2-1962-002
2-1962-003
2-1962-001

Legend

- Site boundary
- Detail Survey Extents
- Uncertain Origin
- Industrial, Burnt-Fired, Increased Magnetic Response
- Agriculture - Ploughing
- Ferrous

Map Number
Figure 43

Map Name
CA2-1962 Interpretation

Community Area:
2-1962

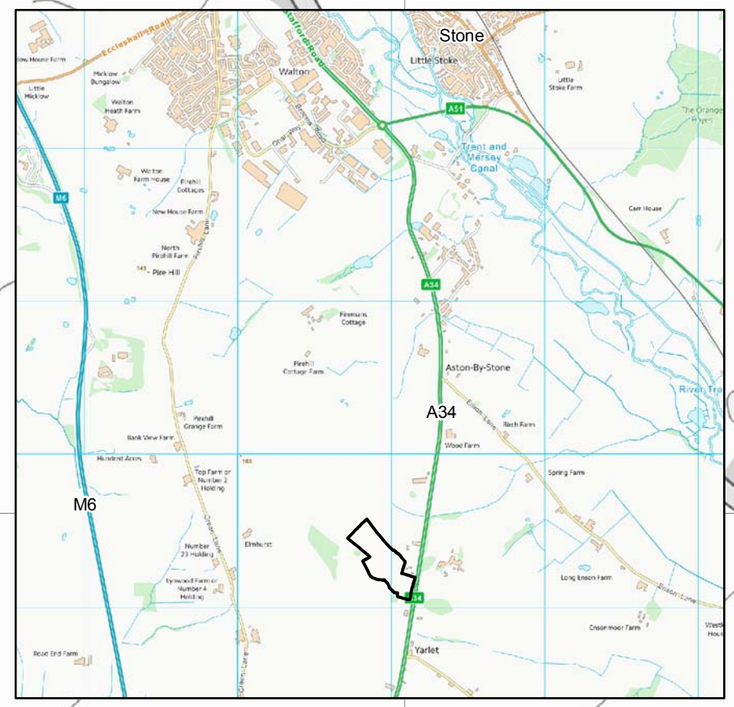
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



The Bungalow
Newhouse Farm
Glencoe
329500
New Plantation
Yarlet Bank Farm
Pav
Yarlet Hall Cottages
School
PW
Yarlet Hall Farm
Middlebank Farm
Yarlet Hall Lodge
The Grove
Yarlet Hill
329000
Hilltop Farm
Grove Farm
Yarlet
Yarlet Wood
PH
390500
391000
391500
392000

Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 44

Map Name: CA2-1979 Site location

Community Area: 2-1979

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-MAP-WS02-000003

Date: 21/04/17

390700
390800
390900
391000
391100
391200
391300
391400
329300
329200
329100
329000
328900
+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 45

Map Name
CA2-1979 Greyscale plot

Community Area:
2-1979

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-MAP-WS02-000003

Date: 21/04/17

390700
390800
390900
391000
391100
391200
391300
391400

329300
329200
329100
329000
328900

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 46

Map Name
CA2-1979 XY Trace

Community Area:
2-1979

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-MAP-WS02-000003

Date: 21/04/17

390700
390800
390900
391000
391100
391200
391300
391400
329300
329200
329100
329000
328900
2-1979-001
2-1979-002
2-1979-003
2-1979-004
2-1979-005

Legend

- Site boundary
- Detail Survey Extents
- Agriculture - Ploughing
- Industrial, Burnt-Fired, Increased Magnetic Response
- Ferrous
- Pipe, Modern Service

Map Number
Figure 47

Map Name
CA2-1979 Interpretation

Community Area:
2-1979

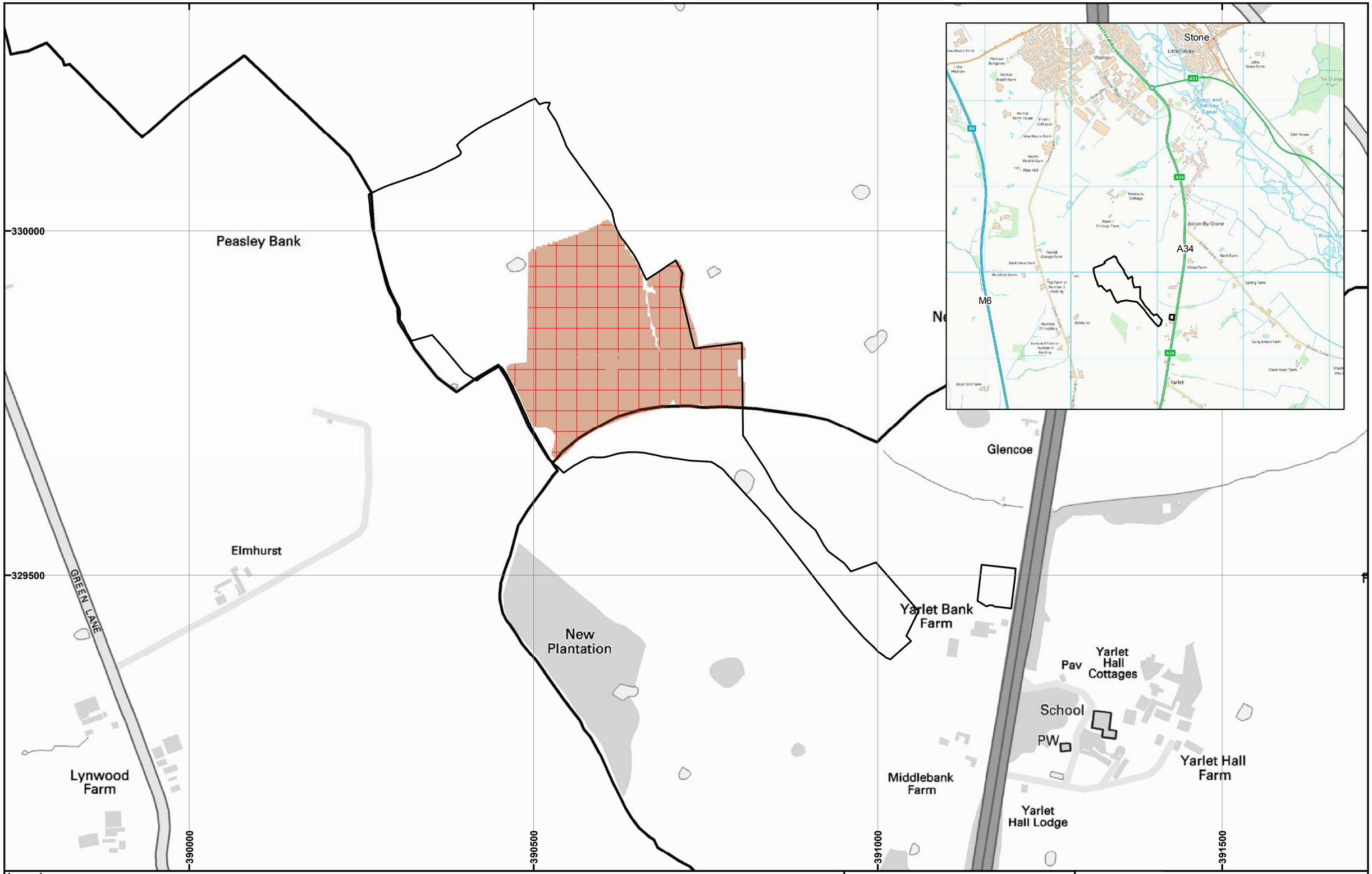
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- CA boundary
- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 48

Map Name: CA2-1988 Site location

Community Area: 2-1988

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17

390300
390400
390500
390600
390700
390800
390900
391000

330000
329900
329800
329700
329600

+3nT
-2nT

Legend

- CA boundary
- Site boundary
- Detail Survey Extents

Map Number
Figure 49

Map Name
CA2-1988 Greyscale plot

Community Area:
2-1988

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-MAP-WS02-000003

Date: 21/04/17

390300
390400
390500
390600
390700
390800
390900
391000
330000
329900
329800
329700
329600
2-1988-007
2-1988-001
2-1988-002
2-1988-006
2-1988-005
2-1988-004
2-1988-003

Legend

- CA boundary
- Site boundary
- Detail Survey Extents
- Possible Archaeology
- Uncertain Origin
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Natural
- Ferrous
- Pipe, Modern Service

Map Number
Figure 50

Map Name
CA2-1988 Interpretation

Community Area:
2-1988

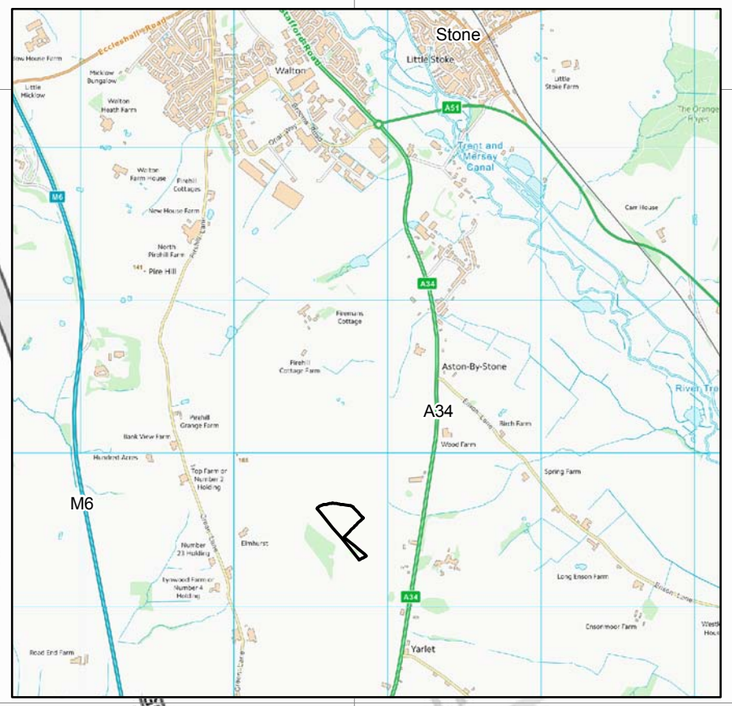
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Wood Farm
A34
330000
The Bungalow
Newhouse Farm
Glencoe
329500
Yarlet Bank Farm
New Plantation
Pav
Yarlet Hall Cottages
School
PW
Yarlet Hall Farm
Middlebank Farm
Yarlet Hall Lodge
The Grove
Yarlet Hill
329000
Hilltop Farm
Grove Farm
Yarlet
Lynwood Farm
Meadow Farm
390000
390500
391000
391500

Legend

- Site boundary
- Detail Survey Extents
- Survey grid divisions

Map Number: Figure 51

Map Name: CA2-1995 Site location

Community Area: 2-1995

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-MAP-WS02-000003

Date: 21/04/17

390400
390500
390600
390700
390800
390900
391000
391100

329700
329600
329500
329400
329300

+3nT
-2nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 52

Map Name
CA2-1995 Greyscale plot

Community Area:
2-1995

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-MAP-WS02-000003

Date: 21/04/17

390400
390500
390600
390700
390800
390900
391000
391100

329700
329600
329500
329400
329300

+25nT
-25nT

Legend

Site boundary
Detail Survey Extents

Map Number
Figure 53

Map Name
CA2-1995 XY Trace

Community Area:
2-1995

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-MAP-WS02-000003

Date: 21/04/17

390400
390500
390600
390700
390800
390900
391000
391100
329700
329600
329500
329400
329300
2-1995-003
2-1995-004
2-1995-001
2-1995-007
2-1995-005
2-1995-002
2-1995-006

Legend

- Site boundary
- Detail Survey Extents
- Agriculture - Ploughing
- Industrial, Burnt-Fired, Increased Magnetic Response
- Uncertain Origin
- Ferrous

Map Number
Figure 54

Map Name
CA2-1995 Interpretation

Community Area:
2-1995

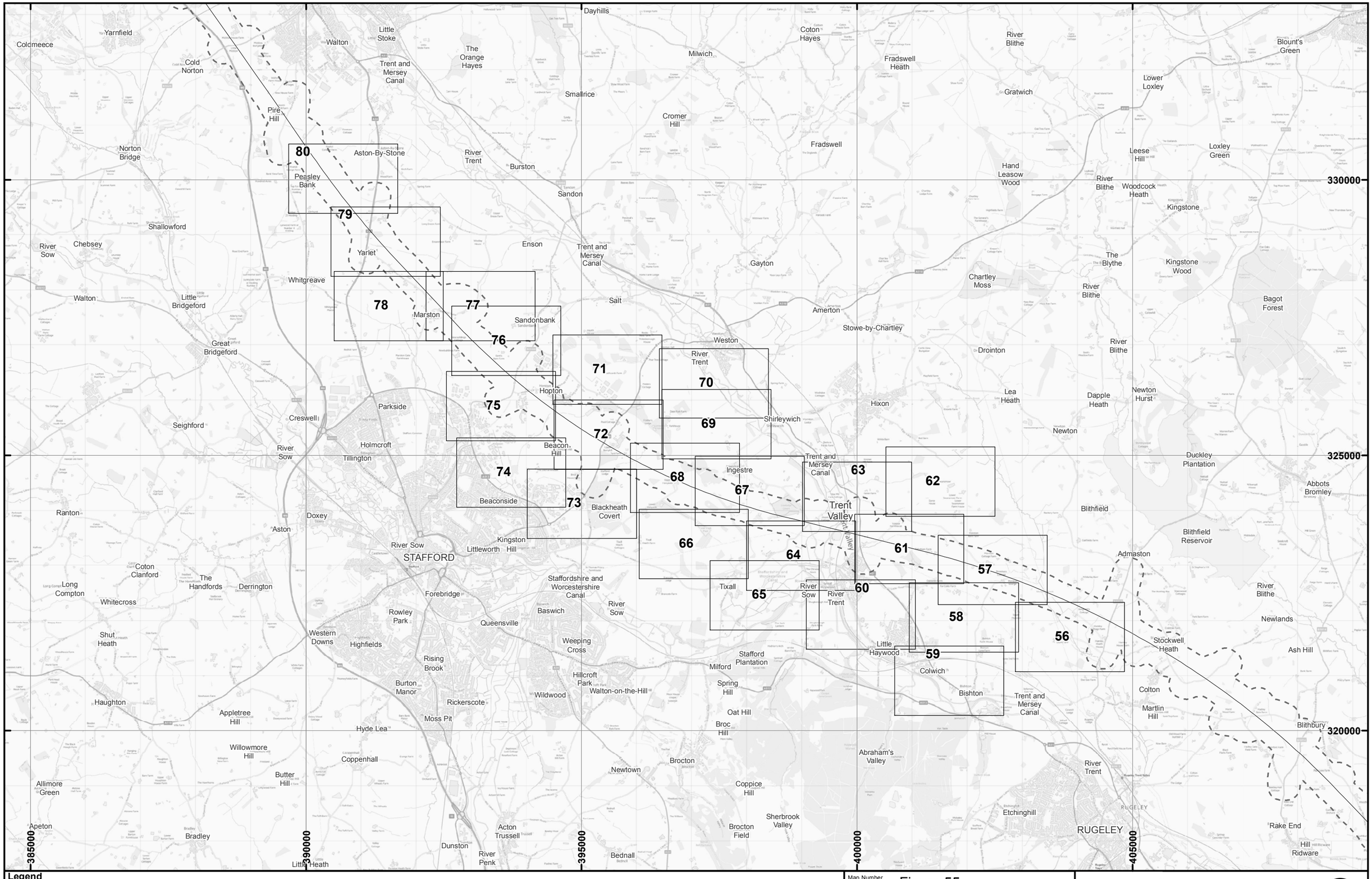
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:2,000

0 20 40 60 80
Metres

Doc Number: C861-ARP-EV-MAP-WS02-000003

Date: 21/04/17



Legend

- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line

Map Number: Figure 55

Map Name: CA2 Remote Sensing Map Index

Community Area: 2

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

Scale at A3: 1:62,500

0 625 1,250 1,875 2,500 Metres

Doc Number: C861-ARP-EV-MAP-WE01-000001

Date: 24/05/17

403000

322000

COY002

COY003

72

73

70

1139

1126

1142

1143

1138

1039

1056

201+200

201+100

201+000

65

1247

1170

1057

66

64

200+900

200+800

200+700

200+600

200+500

200+400

200+300

200+200

200+100

62

61

63

1031

FRC176

1033

1032

1207

1037

1036

1119

1029

1030

1124

1122

1120

1121

1123

59

60

57

FRC132

FRC126

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number: Figure 56

Map Name: Remote Sensing Survey Data CA2 (Map 1)

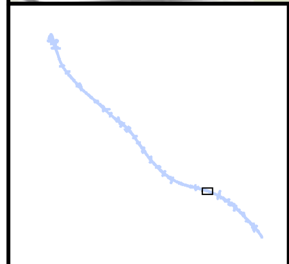
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

Land required for the Proposed Scheme

LiDAR/multi-spectral study area

HS2 Phase 2a centre line

Gazetteer entry with overlapping features

NMP

Bank

Ditch

Extent of feature

Ridge and furrow

Structure

Monument polygon

AP

Bank

Ditch

Possible feature

Structure

Monument polygon

LiDAR/multi-spectral

Polygons

Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 57

Map Name

Remote Sensing Survey Data CA2 (Map 2)

Community Area:
02

hs2

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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:

Date: 25/05/17

401000

402000

322000

1135

72

COY003

COY002

72

COY003

73

73

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 58

Map Name

Remote Sensing Survey Data
CA2 (Map 3)

Community Area:
02

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:

Date: 25/05/17

401000

402000

321000

73

73

73

73

FRC008

Legend

Land required for the Proposed Scheme

LiDAR/multi-spectral study area

HS2 Phase 2a centre line

Gazetteer entry with overlapping features

NMP

Bank

Ditch

Extent of feature

Ridge and furrow

Structure

Monument polygon

AP

Bank

Ditch

Possible feature

Structure

Monument polygon

LiDAR/multi-spectral

Polygons

Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 59

Map Name

Remote Sensing Survey Data
CA2 (Map 4)

Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17

400000

401000

322000

COY046

86

82

73

73

Legend

Land required for the Proposed Scheme

LiDAR/multi-spectral study area

HS2 Phase 2a centre line

Gazetteer entry with overlapping features

NMP

Bank

Ditch

Extent of feature

Ridge and furrow

Structure

Monument polygon

AP

Bank

Ditch

Possible feature

Structure

Monument polygon

LiDAR/multi-spectral

Polygons

Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 60

Map Name

Remote Sensing Survey Data
CA2 (Map 5)

Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17

400000

401000

323000

1076
1240
121
1234
1075
1065
1077
80
79
1079
1164
81
1080
1226
1163
1148
1147
1047
83
1168
1063
1062
1064
1061
1078
1225
1224
78
1165
1167
82
1081
1233
1166
1169
1048
1045
1046
73
73
73

205+200
205+100
205+000
204+900
204+800
204+700
204+600
204+500
204+400
204+300
204+200
204+100
204+000
203+900
203+800
203+700
203+600
203+500
203+400
203+300

Legend

- Land require for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 61

Map Name
Remote Sensing Survey Data
CA2 (Map 6)

Community Area:
02

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:

Date: 25/05/17

401000

402000

325000

324000

121

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 62

Map Name

Remote Sensing Survey Data
CA2 (Map 7)

Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17

400000

324000

COY145

119

COY048

93

94

91

COY047

1250

90

1241

FRC008

92

COY145

COY045

88

89

86

COY046

1067

1074

COY054

87

206+200

206+100

206+000

205+800

205+800

205+700

205+600

1228

1235

83

1227

1066

1149

121

1076

1240

1234

1075

80

79

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number: Figure 63

Map Name: Remote Sensing Survey Data CA2 (Map 8)

Community Area: 02

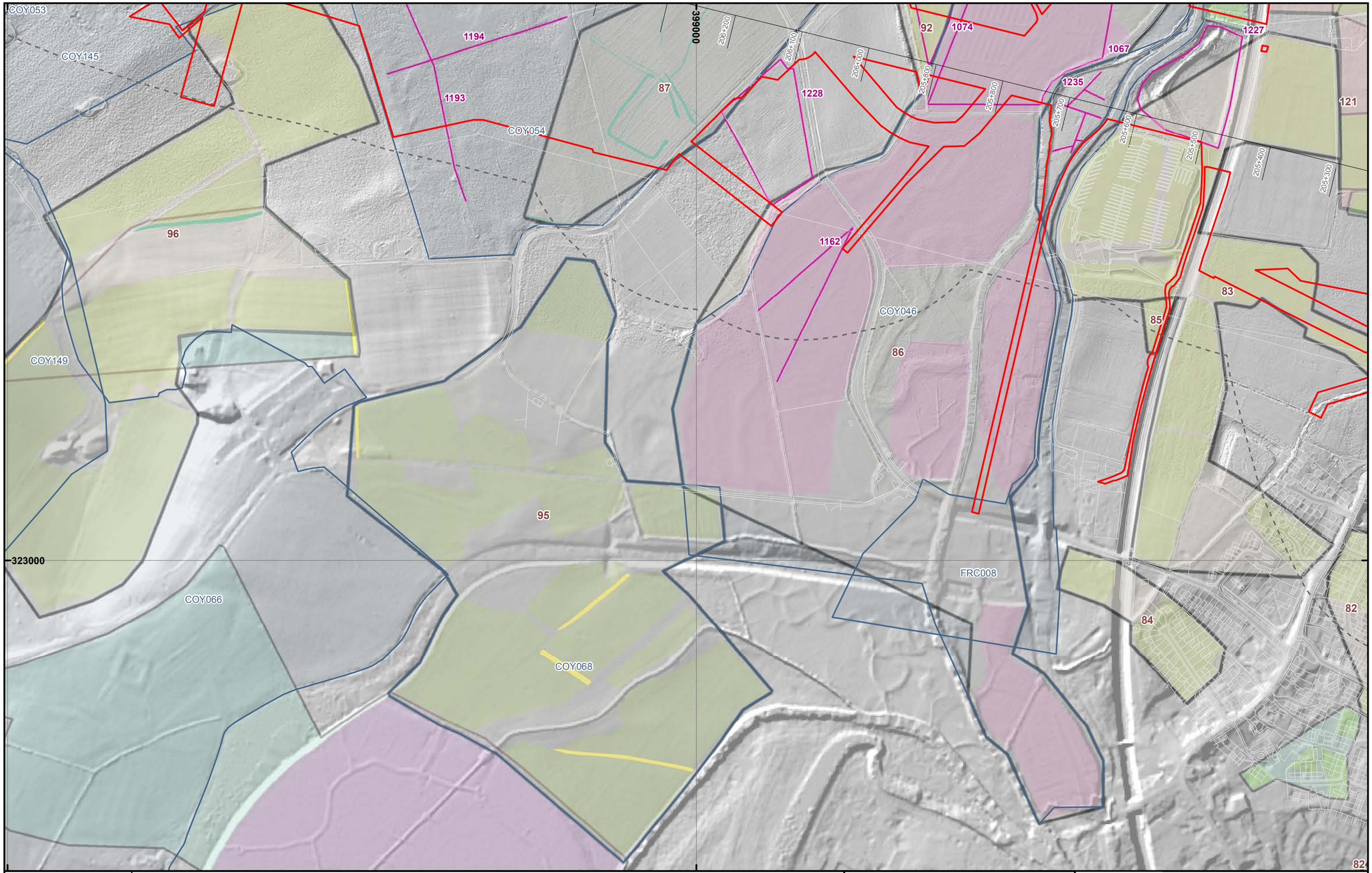
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow

- Structure
- Monument polygon

AP
- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons

- Lines

Feature labelling
42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 64

Map Name: Remote Sensing Survey Data CA2 (Map 9)

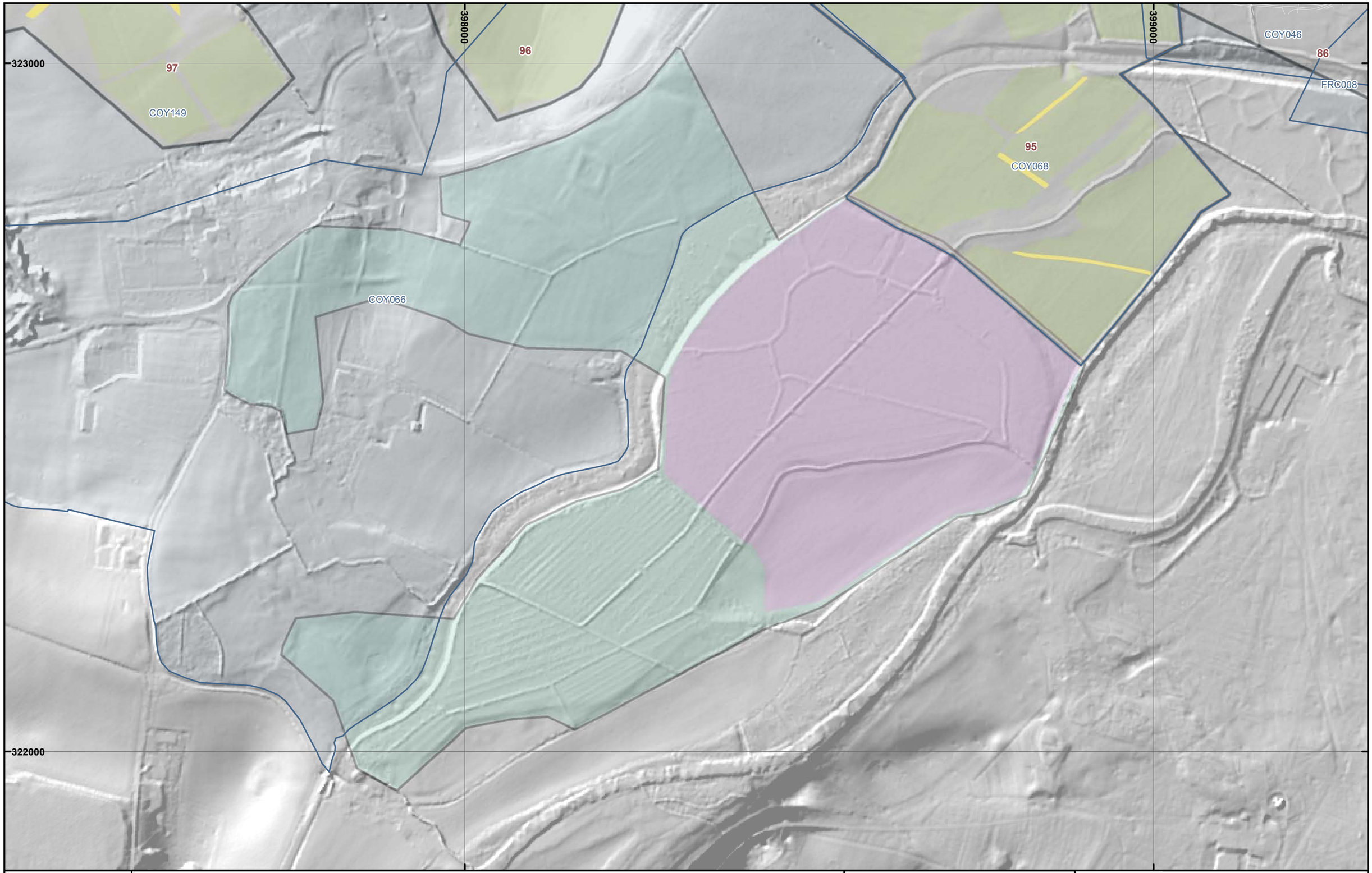
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 65

Map Name: Remote Sensing Survey Data CA2 (Map 10)

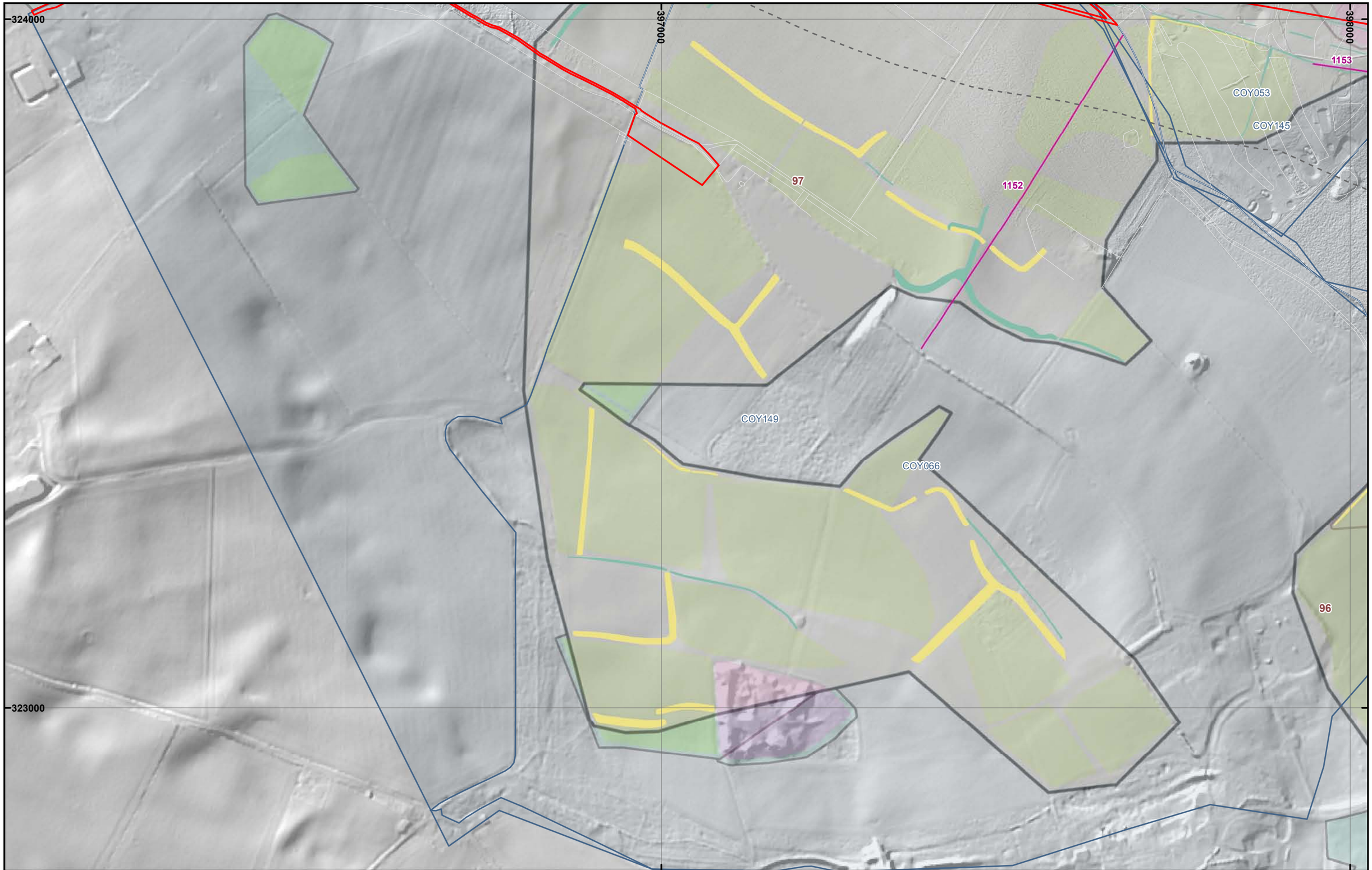
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 66

Map Name
Remote Sensing Survey Data
CA2 (Map 11)

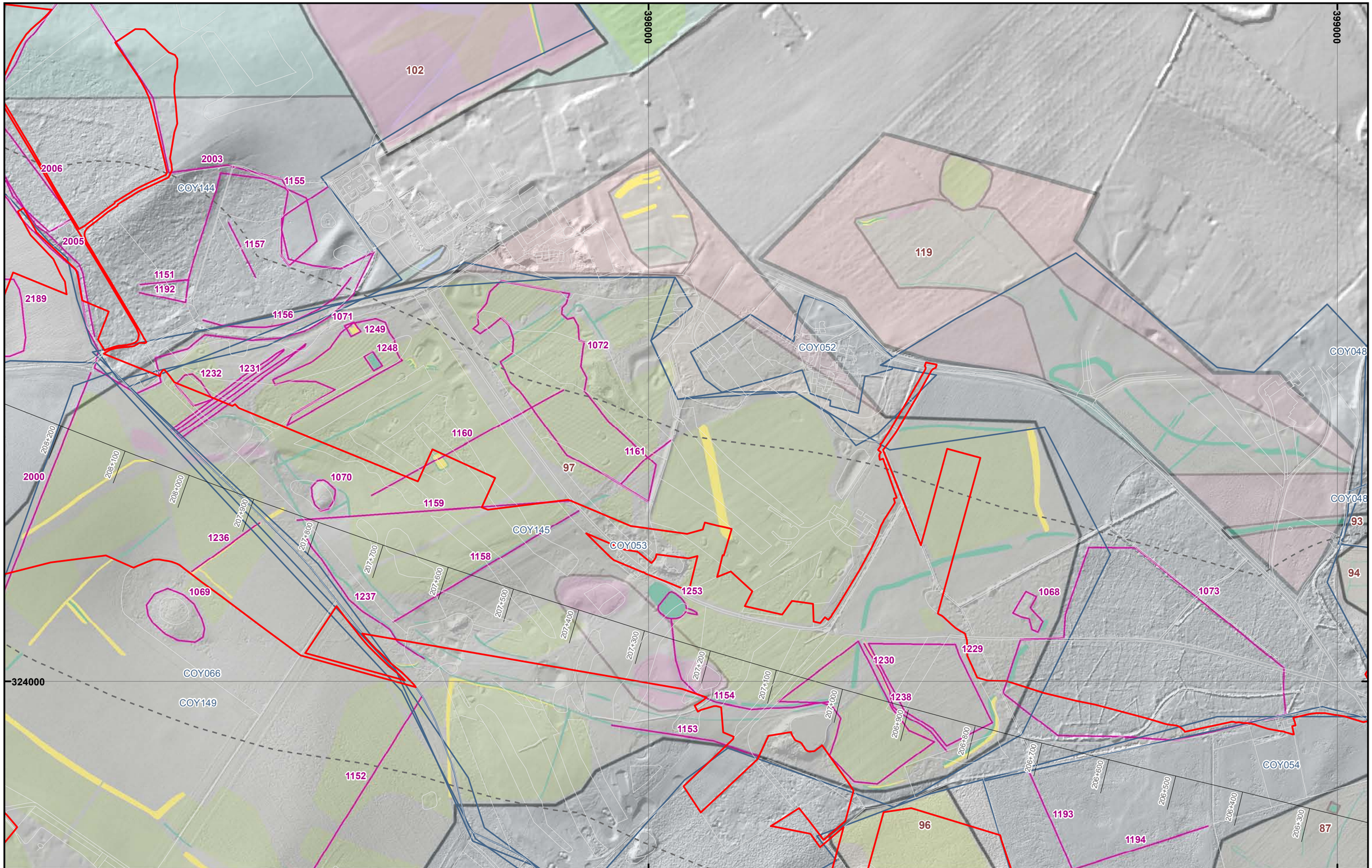
Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 67

Map Name
Remote Sensing Survey Data
CA2 (Map 12)

Community Area:
02

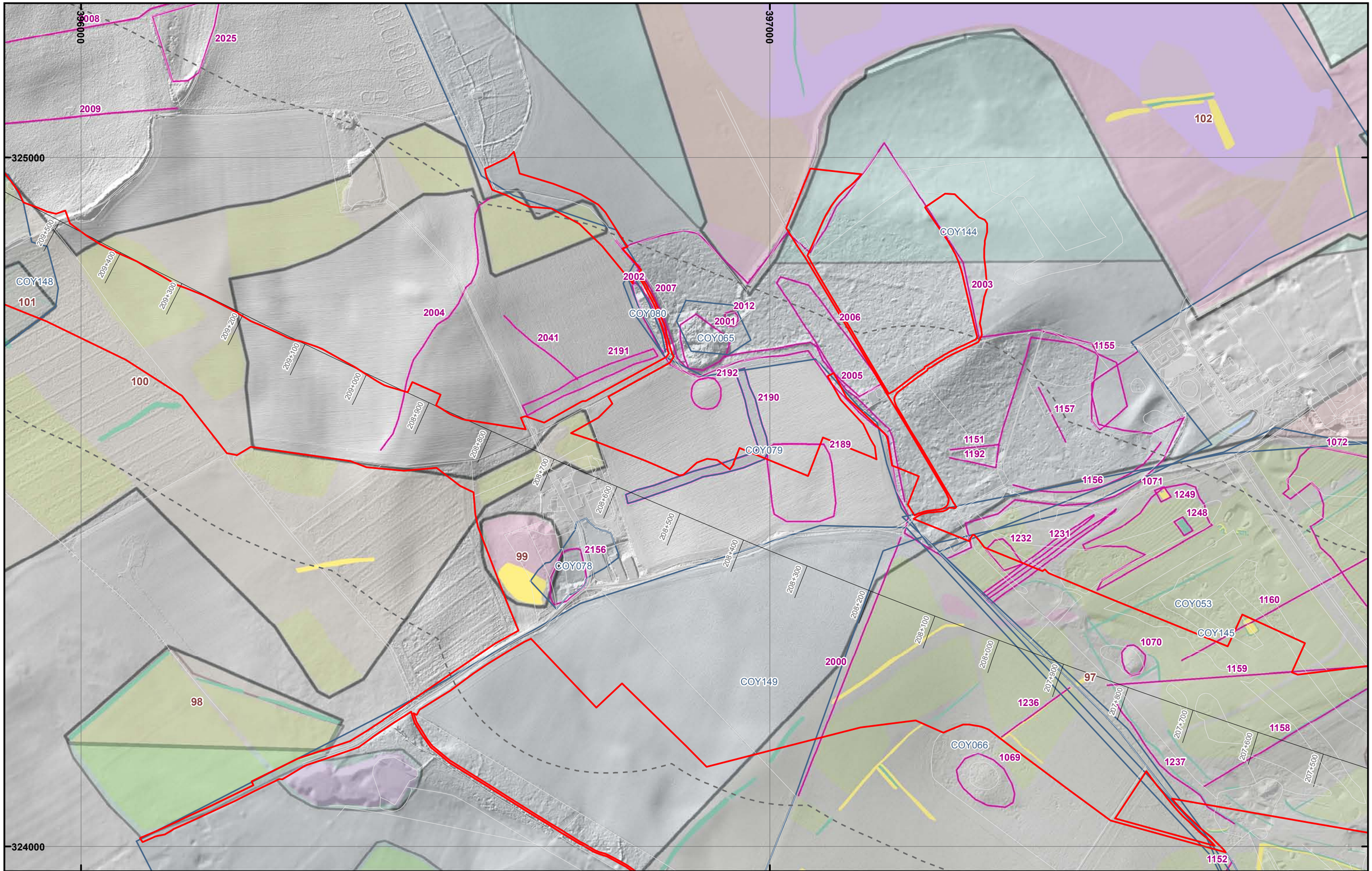
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 68

Map Name: Remote Sensing Survey Data

CA2 (Map 13)

Community Area: 02

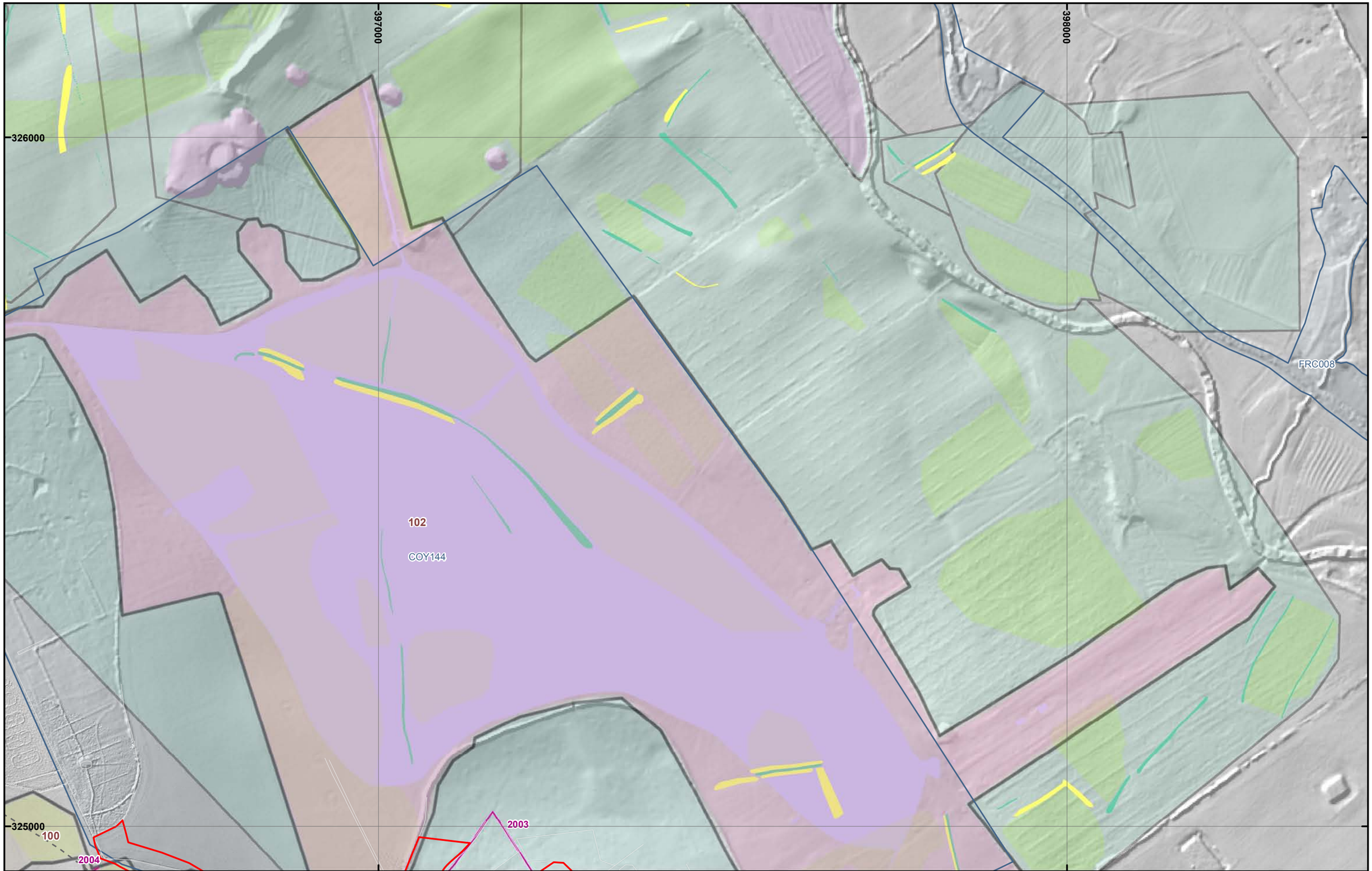
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 69

Map Name
Remote Sensing Survey Data
CA2 (Map 14)

Community Area:
02

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:

Date: 25/05/17

397000

398000

COY110

FRC008

326000

COY144

102

102

FRC008

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 70

Map Name

Remote Sensing Survey Data
CA2 (Map 15)

Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17

395000

396000

327000

115

2035

114

326000

106

2154

COY094

COY100

COY144

Legend

Land required for the Proposed Scheme

LiDAR/multi-spectral study area

HS2 Phase 2a centre line

Gazetteer entry with overlapping features

NMP

Bank

Ditch

Extent of feature

Ridge and furrow

Structure

Monument polygon

AP

Bank

Ditch

Possible feature

Structure

Monument polygon

LiDAR/multi-spectral

Polygons

Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 71

Map Name

Remote Sensing Survey Data
CA2 (Map 16)

Community Area:
02

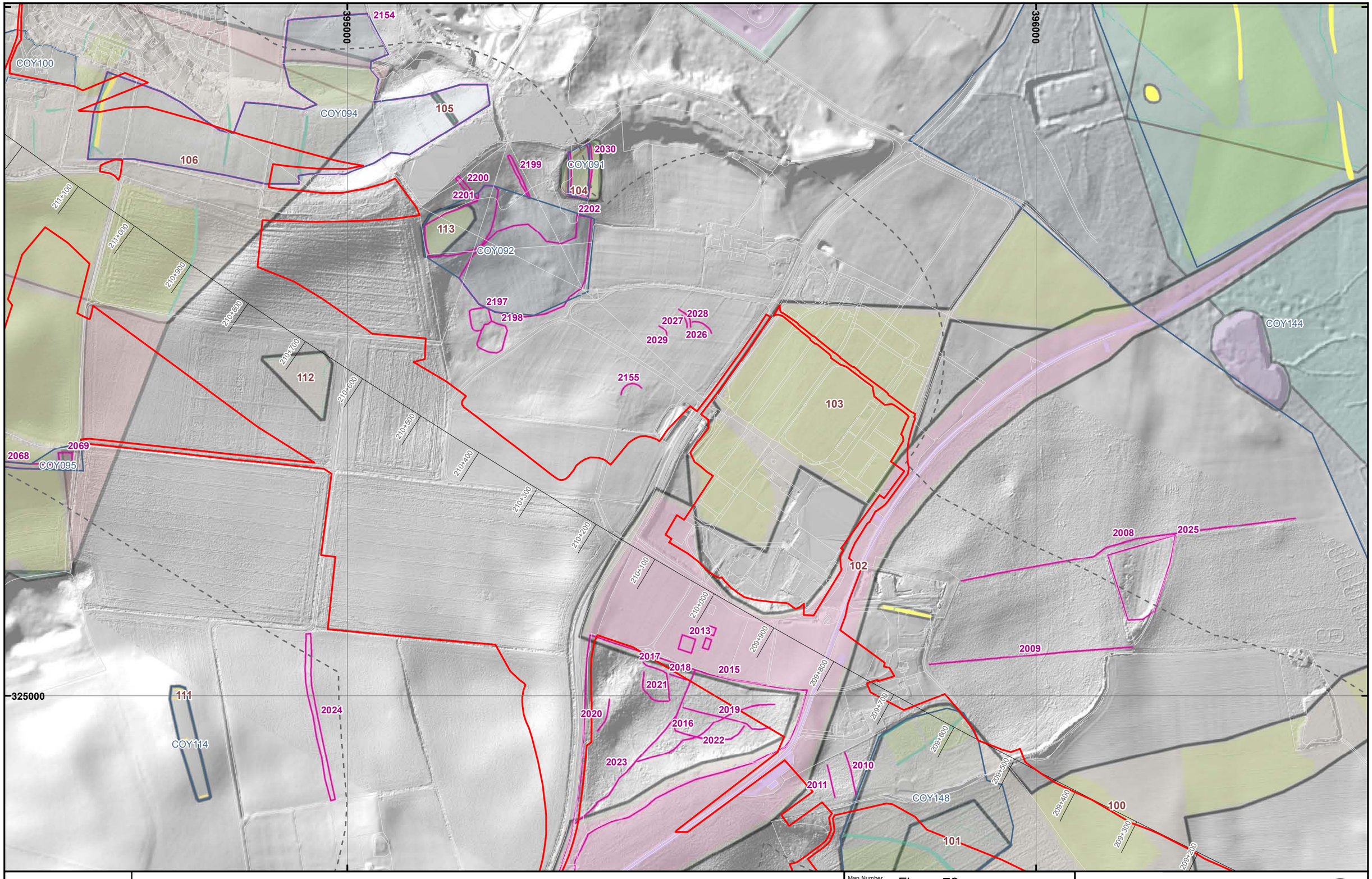
Registered in England. Registration number 06791686.
Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow

- Structure
- Monument polygon

AP
- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons

- Lines

Feature labelling
42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 72

Map Name: Remote Sensing Survey Data CA2 (Map 17)

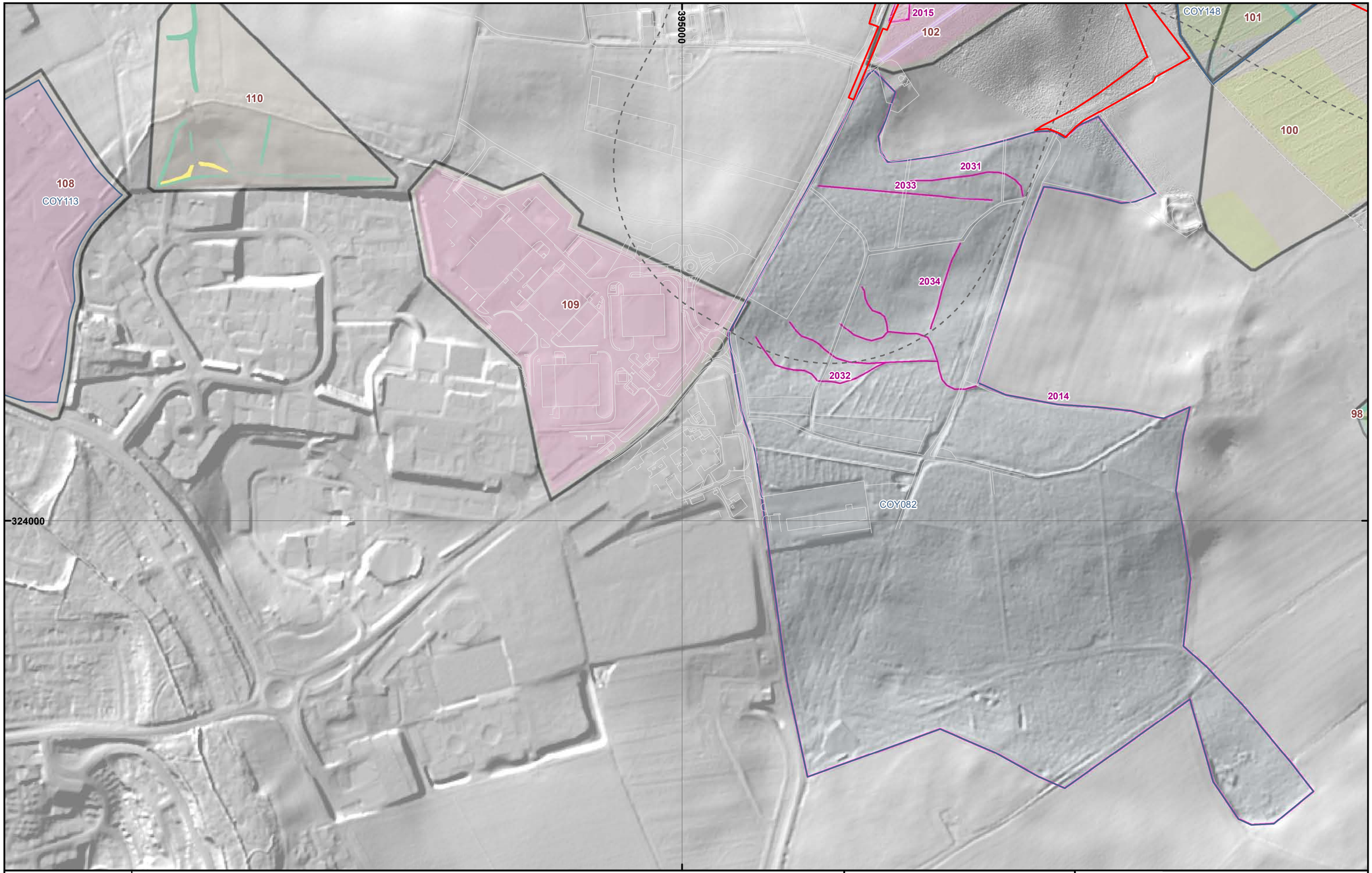
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 73

Map Name: Remote Sensing Survey Data CA2 (Map 18)

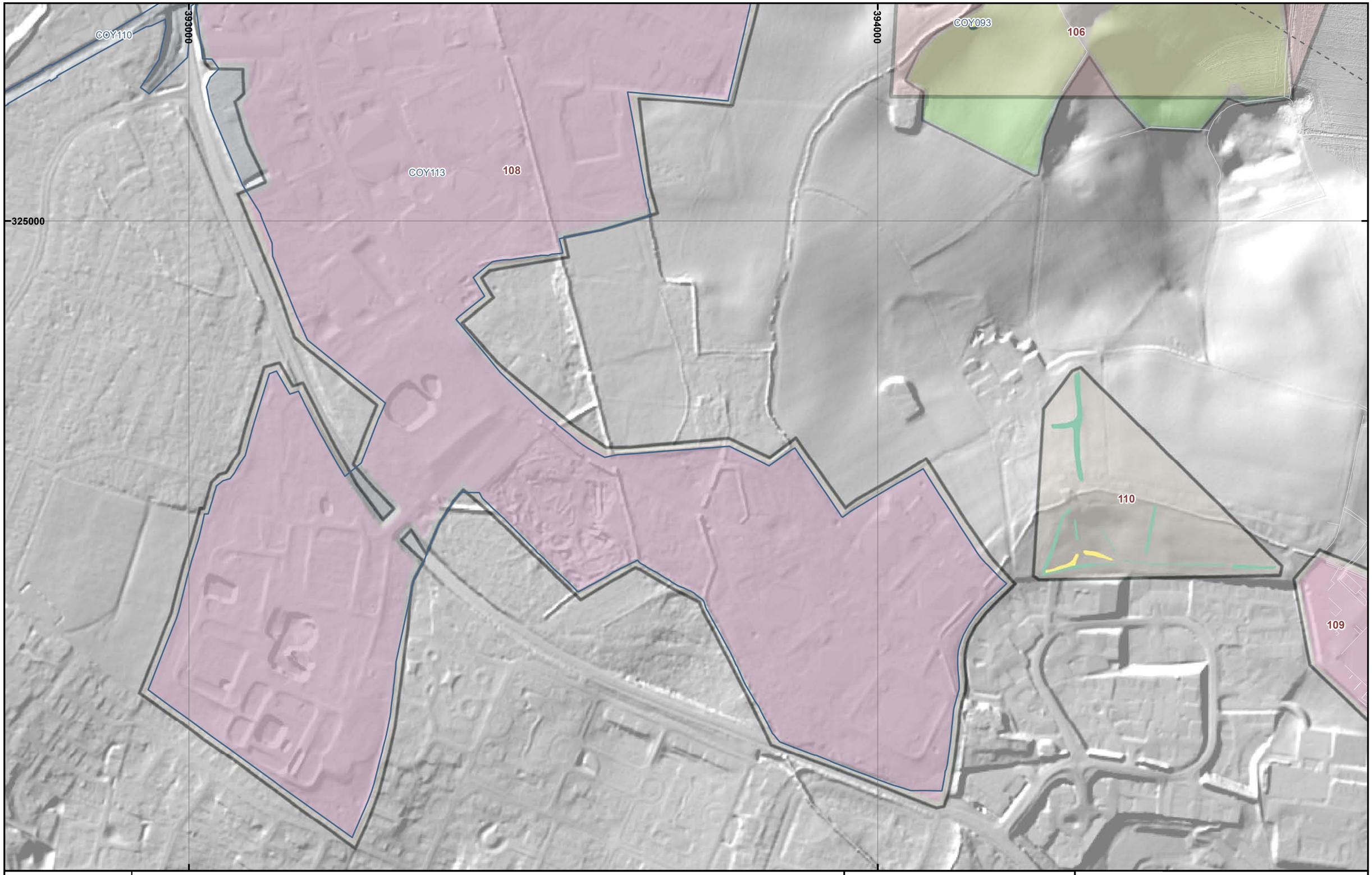
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 74

Map Name
Remote Sensing Survey Data
CA2 (Map 19)

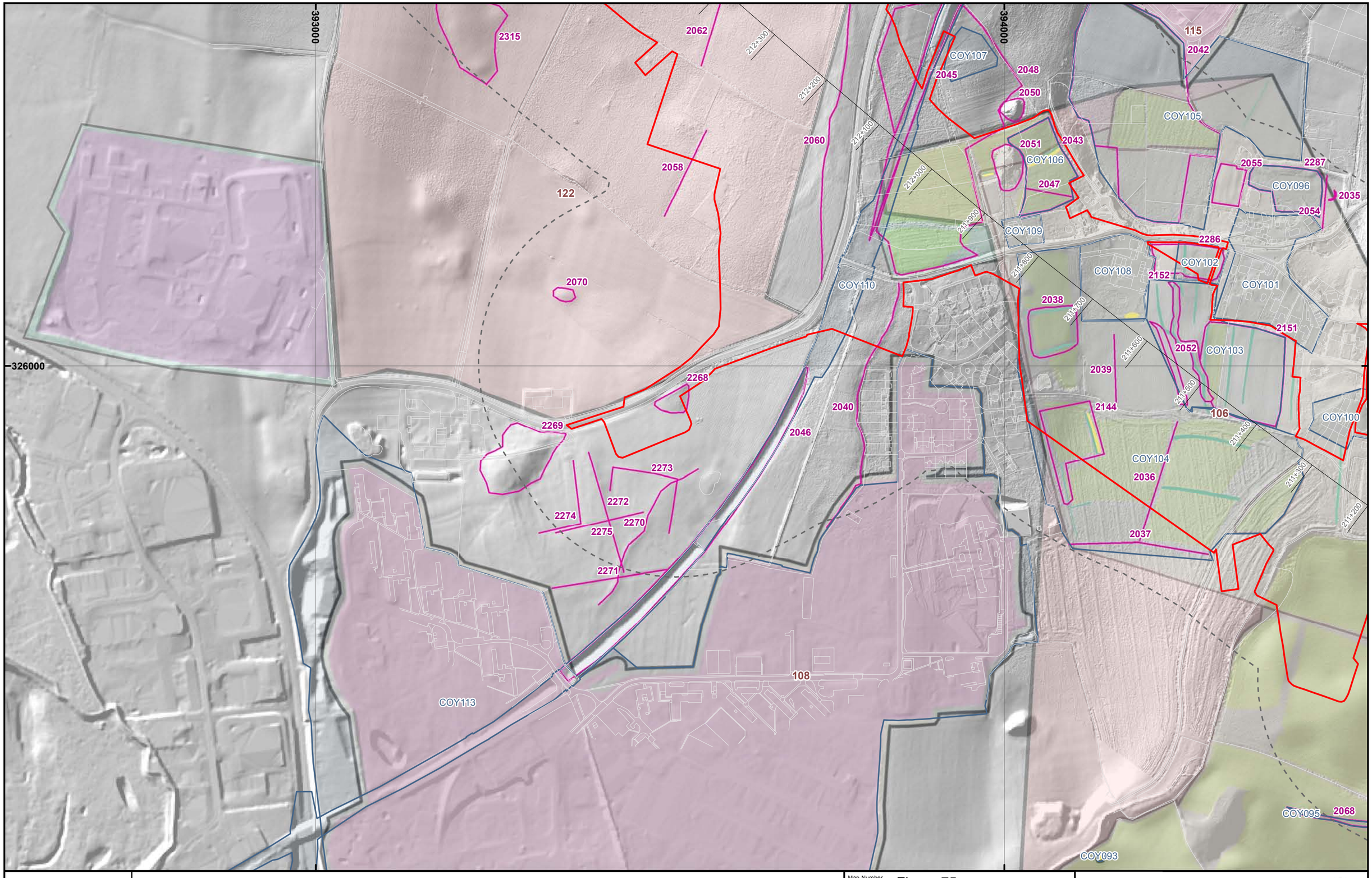
Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200
Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP

- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP

- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral

- Polygons
- Lines

Feature labelling

42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 75

Map Name
Remote Sensing Survey Data
CA2 (Map 20)

Community Area:
02

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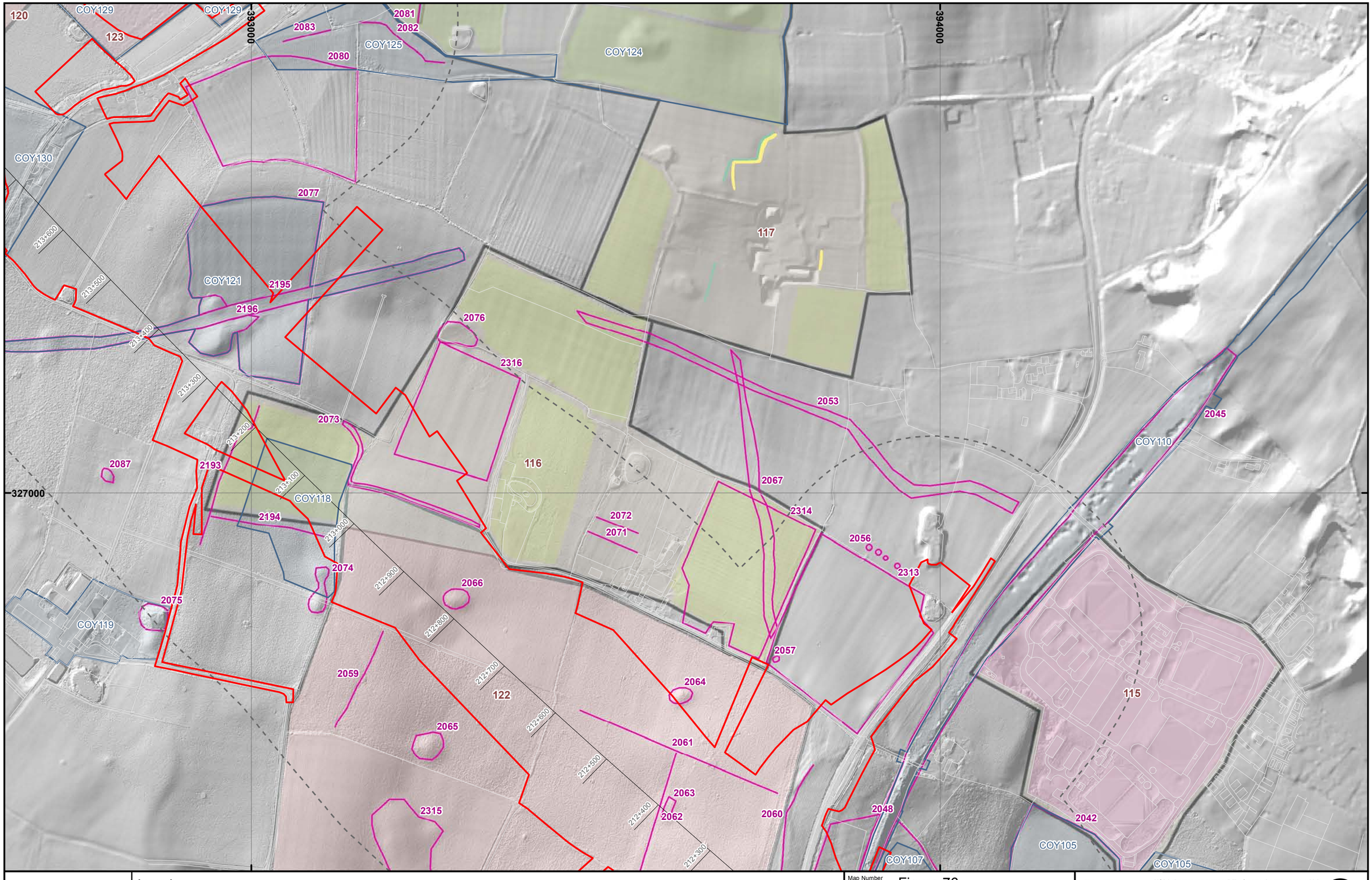
Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow

- Structure
- Monument polygon

AP
- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons

- Lines

Feature labelling
42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number
Figure 76

Map Name
Remote Sensing Survey Data
CA2 (Map 21)

Community Area:
02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17

393000

394000

328000

2114
2113
2108
2115
2111
2116
2089
2153
2090
2086
2085
COY128
2084
2088
118
COY124
2093
123
2078
COY129
2079
COY127
2105
2301
117
2081
COY125
2119
2117
2160
2083
2082
2150
2080
2159
2122
2120
2091
2097
2092
2094
COY130
2077
2121
120
2118
2157
2195
2095
2196
COY121
2076
116
2316
2053
2067
2073
2193

214+300
214+200
214+100
214+000
213+900
213+800
213+700
213+600
213+500
213+400
213+300
213+200

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow

- Structure
- Monument polygon

AP
- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons

- Lines

Feature labelling
42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 77

Map Name: Remote Sensing Survey Data CA2 (Map 22)

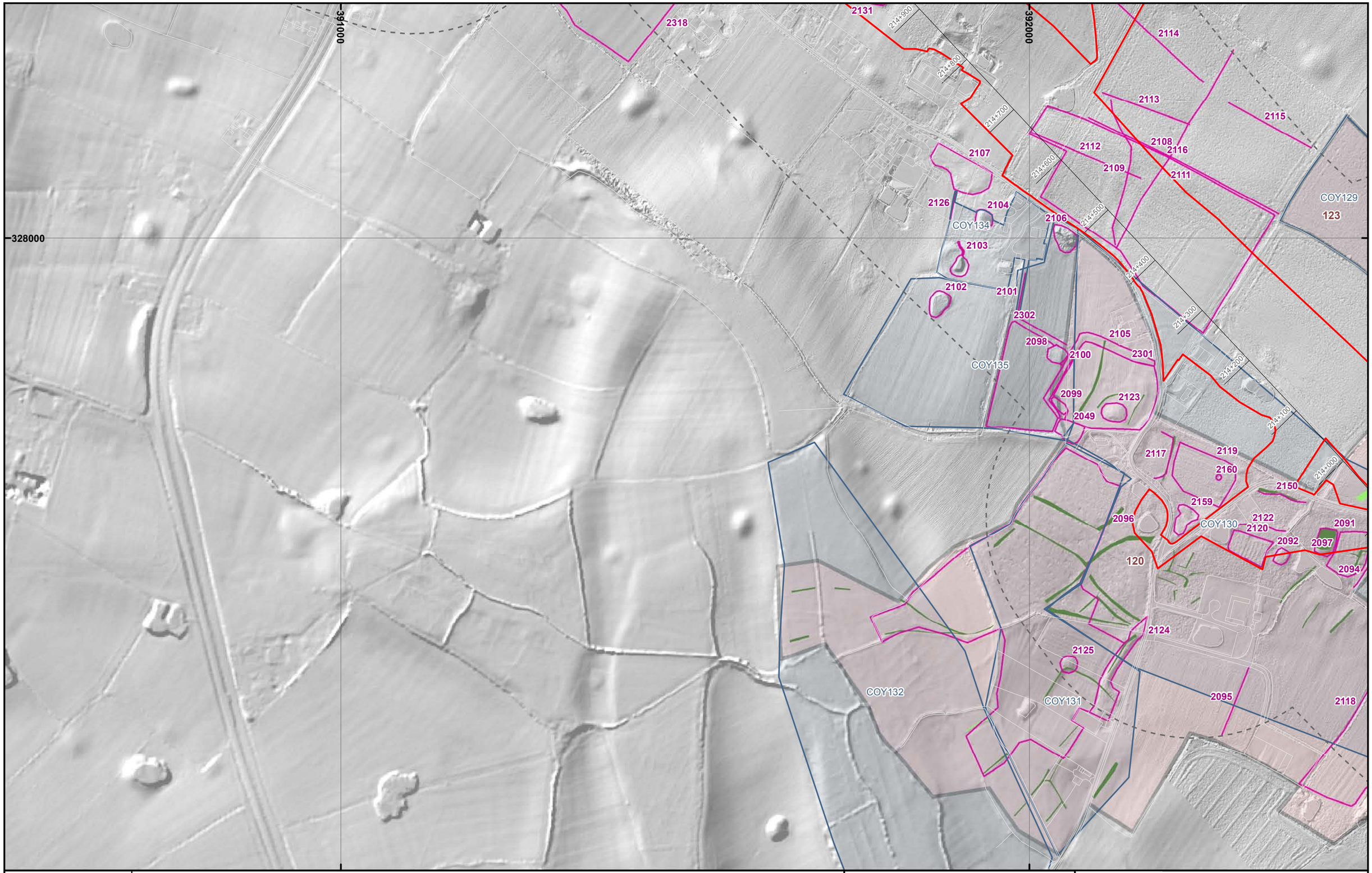
Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17



Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow

- Structure
- Monument polygon

AP
- Bank
- Ditch

- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons

- Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number: Figure 78

Map Name: Remote Sensing Survey Data CA2 (Map 23)

Community Area: 02

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17

Legend

Land required for the Proposed Scheme

LiDAR/multi-spectral study area

HS2 Phase 2a centre line

Gazetteer entry with overlapping features

NMP

Bank

Ditch

Extent of feature

Ridge and furrow

Structure

Monument polygon

AP

Bank

Ditch

Possible feature

Structure

Monument polygon

LiDAR/multi-spectral

Polygons

Lines

Feature labelling

42 = AP/NMP

FRC001 = Gazetteer

1102 = Remote Sensing

Map Number

Figure 79

Map Name

Remote Sensing Survey Data
CA2 (Map 24)

Community Area:
02

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Scale at A3: 1:5,000

0 50 100 150 200

Metres

Doc Number:

Date: 25/05/17

Legend

- Land required for the Proposed Scheme
- LiDAR/multi-spectral study area
- HS2 Phase 2a centre line
- Gazetteer entry with overlapping features

NMP
- Bank
- Ditch
- Extent of feature
- Ridge and furrow
- Structure
- Monument polygon

AP
- Bank
- Ditch
- Possible feature
- Structure
- Monument polygon

LiDAR/multi-spectral
- Polygons
- Lines

Feature labelling
42 = AP/NMP
FRC001 = Gazetteer
1102 = Remote Sensing

Map Number: Figure 80

Map Name: Remote Sensing Survey Data CA2 (Map 25)

Community Area: 02

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Registered office: Eland House, Bressenden Place, London SW1E 5DU.

Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number:

Date: 25/05/17

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