

# **High Speed Rail (Crewe – Manchester)**

## **Background information and data**

### **Historic environment**

BID HE-005-0MA01

MA01: Hough to Walley's Green

Historic environment remote sensing report

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## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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# 1 Introduction

- 1.1.1 This report presents the results of analysis of remote sensing data relating to the historic environment.
- 1.1.2 Baseline data has been collected for the Proposed Scheme in relation to the Hough to Walley's Green area (MA01).
- 1.1.3 All identified heritage assets discussed in this report are shown in the Volume 5 Historic environment Map Book, Map Series HE-01, HE-02, HE-03<sup>1</sup>.
- 1.1.4 The historic environment detailed gazetteer is set out in Appendix A of the Historic environment baseline report (see Background Information and Data: BID HE-001-0MA01). It sets out Unique gazetteer identifier (UID) codes for the heritage assets considered in the baseline data; these are used for reference across all the historic environment reports and maps in the Environmental Statement (ES)<sup>2</sup> and BID reports.
- 1.1.5 The approach to assessing the archaeological potential of the landscape is outlined in the Historic environment summary gazetteer, impact assessment table and archaeological character areas report (HE-002-0MA01<sup>3</sup>). This breaks the study area down into areas of archaeological character; initially into broad Archaeological Character Areas (ACA), and then more narrowly defined Archaeological Sub-zones (ASZ).
- 1.1.6 The approach used for assessing historic landscape character (HLC) is described in the Historic landscape character areas report (HE-003-0MA01<sup>4</sup>). The approach is used to determine Historic Landscape Character Areas (HLCA). HLCA are areas of coherent or distinctive historic landscape characteristics.
- 1.1.7 Within the historic environment reporting, various reference numbers have been used to provide a unique identifier to the heritage assets, HLCA, ACA/ASZ, geophysical survey anomalies and remote sensing features identified. These unique identifiers are referenced throughout the ES, BID reports and Map Books, and in summary are as follows:

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<sup>1</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Volume 5 Historic environment Map Book*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>2</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>3</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Historic Environment, Hough to Walley's Green, Summary gazetteer, impact assessment table and archaeological character areas, Volume 5: Appendix HE-002-0MA01*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

<sup>4</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Historic Environment, Hough to Walley's Green, Historic landscape character areas, Volume 5: Appendix HE-003-0MA01*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

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- heritage assets have been given a Unique gazetteer identifier (UID), for example MA01\_0001. These have been allocated to all heritage assets within the gazetteer of heritage assets, provided in Volume 5: Appendix HE-002-0MA01 (summary gazetteer) and BID HE-001-0MA01 (detailed gazetteer);
- HLC areas have been given a unique identifier, for example MA01\_HLCA02. These have been allocated to all HLCA within the historic landscape character assessment, provided in Volume 5: Appendix HE-003-0MA01;
- archaeological character areas and archaeological sub-zones have been given a unique identifier, for example: archaeological character area MA01\_AC01; and archaeological sub zone MA01\_AC01.002. These have been allocated to all of the assessed archaeological character areas and archaeological sub-zones, provided in Volume 5: Appendix HE-002-0MA01;
- geophysical survey areas and features identified through the geophysical survey have been allocated a unique identifier, for example: geophysical survey area MA01\_GP001, and geophysical survey feature MA01\_GP001.001. These have been allocated to all of the identified geophysical survey areas and features, provided in BID HE-004-0MA01; and
- features identified through remote sensing have been allocated a unique identified, for example MA01\_RS001. These have been allocated to all of the identified remote sensing features, provided in BID HE-005-0MA01.

## 2 Remote sensing

### 2.1 Introduction

- 2.1.1 This report sets out the results of a review, and the systematic mapping, recording, analysis and interpretation of potential archaeological sites from aerial photographs and LiDAR<sup>5</sup> data within the Hough to Walley's Green area.
- 2.1.2 The remote sensing was undertaken in accordance with the guidance and standards set out in:
- the Historic England standards for aerial investigation and mapping (formerly known as the National Mapping Programme, NMP)<sup>6</sup>; and
  - the Forum on Information Standards in Heritage (FISH) vocabularies<sup>7</sup>.

### 2.2 Survey objectives

#### Aims of the survey

- 2.2.1 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 assessment of baseline conditions for the historic environment.

#### Objectives of the survey

- 2.2.2 The results of the survey have been combined with data from other archaeological assessments carried out as part of the project, such as desk-top studies and geophysical surveys in order to help analyse the archaeological potential of the Proposed Scheme.

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<sup>5</sup> LiDAR (meaning 'light detection and ranging') is a surveying method that measures distance to a target by illuminating the target with pulsed laser light and measuring the reflected pulses with a sensor; this can be used to identify archaeological earthwork evidence.

<sup>6</sup> Winton, H. (2018), *Standards for Aerial Investigation and Mapping Projects*, Historic England internal document.

<sup>7</sup> FISH (2020), *Heritage Data; Linked Data Vocabularies for Cultural Heritage*. Available online at: <https://www.heritagedata.org/blog/vocabularies-provided/>.

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## 2.3 Survey methodology

2.3.1 This section provides an overview of the survey methods. The aims and general method for the remote sensing assessment are set out in the Generic Written Scheme of Investigation (HE-006-00000<sup>8</sup>).

### Data collection

2.3.2 The data collection phase of the survey took place between April 2017 and December 2018. The following sources were consulted:

- historic aerial photographs;
- online aerial and satellite-derived images;
- HS2 vertical aerial photographs;
- Environment Agency vertical aerial photographs;
- HS2 (BLOM Aerofilms) LiDAR data;
- Environment Agency LiDAR data;
- Historic Environment Record (HER) data;
- National record of the historic environment (NRHE) data;
- National Heritage List for England (NHLE) data; and
- historic cartographic sources.

### Data processing

2.3.3 The following processing steps have been carried out on the data used in this survey:

- all spatial data was collated and generated in GIS (Geographic Information System) ArcMap 10.5 using the British National Grid (EPSG: 2770) map projection;
- both the HS2 Ltd and Environment Agency LiDAR datasets were processed using the software Relief Visualisation Toolbox (RVT 1.3) to create eight different advanced visualisation models, prior to their import into GIS ArcMap 10.5;
- the HS2 Ltd and Environment Agency vertical aerial photographic cover was already georeferenced and required no further processing; and
- selected archive aerial photographs were orthorectified (processed to accurately fit the map and terrain) using the software Aerial 5.33 prior to their import into GIS.

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<sup>8</sup> High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Generic written scheme of investigation for non-intrusive archaeological survey, Volume 5: Appendix HE-006-000000*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.



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## Data presentation

- 2.3.4 A general location plan showing the survey area is shown on Figure 1 at a scale of 1:75,000. Details of sites or features transcribed during this project are presented at a scale of 1:5,000 on Figures 2 to 5 inclusive.
- 2.3.5 When interpreting the results, several factors are taken into consideration, including the nature of archaeological features being investigated, the local conditions at the site (geology, topography etc.). The identified features are categorised by their potential origin and divided into categories that are used in the graphical interpretation of the remote sensing data:
- bank;
  - ditch;
  - levelled ridge and furrow;
  - extant ridge and furrow;
  - extent of area;
  - services;
  - structure; and
  - large cut feature.
- 2.3.6 The identified categories are subsequently discussed by the period in which they most likely originated.

## Assumptions and limitations

- 2.3.7 The results and subsequent interpretation of data from remote sensing surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by intrusive archaeological investigation of sub-surface deposits.
- 2.3.8 In some areas, the HS2 Ltd purpose-flown LiDAR and aerial orthophotography did not cover the full extent of the Proposed Scheme. This gap in coverage was entirely constrained to the built environment of Crewe, where the LiDAR data and orthophotography would be of limited benefit to the investigation, and an area of approximately 11ha of rural land to the north-east of Crewe. This is not anticipated to present a significant limitation as the area was covered by alternative sources of orthophotography and 1m resolution Environment Agency LiDAR data.
- 2.3.9 The HS2 Ltd purpose-flown LiDAR survey took place during the summer, when leaf canopies, foliage and crop growth created unfavourable conditions for the collection of bare earth points. As a result, the quality of the Digital Terrain Model (DTM) generated from this LiDAR data is of low quality for areas beneath tree cover and may not represent a true ground surface model in areas of crops or dense foliage. Where available, the use of Environment Agency LiDAR data of a lower resolution has partially mitigated this issue.

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- 2.3.10 HER, NRHE and NHLE data was obtained in 2018. Any information added to these databases after that time will not have been available as a reference during survey.
- 2.3.11 The Cambridge University Collection of Aerial Photographs (CUCAP) archive of historic aerial photographs was closed for consultation at the time of this remote sensing survey. Although a small proportion of the collection was available online, the limited nature and low resolution of the images was inadequate for aerial analysis.
- 2.3.12 Local collections of aerial photography held by the Cheshire Archaeology Planning Advisory Service (CAPAS) HER were not consulted for this remote sensing survey.
- 2.3.13 The area south of Crewe has not been surveyed as part of the Proposed Scheme, as it was previously surveyed during assessment for HS2 Phase 2a in 2017<sup>9</sup>. The remote sensing remains valid as baseline information for the current study.
- 2.3.14 The built environment of Crewe has not been assessed, as features identified by remote sensing techniques are obscured or have been removed by later historic housing and the technique does not generally elucidate additional information in such areas that cannot be obtained from historic maps.

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<sup>9</sup> High Speed Two Ltd, (2017), High Speed Two Phase 2a (West Midlands – Crewe), *Background Information and Data, CA5: South Cheshire, Cultural heritage survey reports (BID CH-004-005), Chapter 3 Remote Sensing Report*. Available online at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/628347/E162\\_BID-CH-004-005\\_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/628347/E162_BID-CH-004-005_web.pdf).

## 3 Remote sensing survey results

### 3.1 Survey location

- 3.1.1 The study area for the remote sensing survey covers only part of the Hough to Walley's Green area (MA01), which falls within Cheshire East. The area south of Crewe was not included in this study.
- 3.1.2 The study area generally comprised a 700m-wide strip centred on the route of the Proposed Scheme (350m either side). This provided a buffer to offer contextual information for all recorded sites. In total, the archaeological remote sensing survey for the Hough to Walley's Green area covered an area of 5.1km<sup>2</sup>.

### 3.2 Archaeological background

- 3.2.1 At the end of the last glaciation, the retreat of the ice sheet resulted in the deposition of tills, sands and gravels that resulted in the characteristic meres and mosses<sup>10</sup> of the Cheshire plain. Evidence of early prehistoric activity in the region is sparse, mostly consisting of isolated find spots demonstrating exploitation of the areas of wetlands, particularly north of Crewe at Coppenhall Moss and Warmingham Moss. Within the study area, the earliest evidenced human activity is represented by lithic find spots and scatters dating to the Neolithic and Bronze Age. A cropmark may represent a sub-circular settlement enclosure dating to the Iron Age or possibly later (MA01\_0167). Evidence of Roman activity appears to have had an emphasis on salt production at centres including Middlewich and Nantwich. Rural salt-working sites have been indicated by lead salt pans<sup>11</sup> south of Crewe associated with earthworks at Shavington House (MA01\_0356). The Roman road network was constructed to connect the Roman production centres including a road between Middlewich and Nantwich (Margary 700, MA02\_0001).
- 3.2.2 During the early medieval period small settlements were established. In the study area, these include Shavington, Weston, and Warmingham that may have been in existence from as early as the 8th or 9th centuries. Outside these small villages and hamlets were isolated farmsteads. Many of these were the location of manor houses for lords and survive as moated earthwork sites dating to the 12th to 14th centuries, such as Minshull Vernon moated site (MA01\_0002). Mixed subsistence farming was normal in Cheshire during the medieval period, relying on typical crops of barley, oats and rye. The earliest patterns of field systems existed from the medieval period. Examples of this can be seen in patterns of ancient fields around Shavington, south of Crewe (MA01\_HLCA01<sup>4</sup>), and around Minshull Vernon moated site (MA01\_HLCA03). Most of the land north of Crewe formed Warmingham, Leighton and Coppenhall Mosses. These were exploited for their peat for fuel during the

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<sup>10</sup> Mosses or mosslands are areas of wetland formed from peat.

<sup>11</sup> Penney, S. and Shotter, D. C. A. (1996), *An Inscribed Roman Salt-Pan from Shavington, Cheshire*, *Britannia* 27.

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medieval periods, utilising turbarry rights in moss rooms<sup>12</sup>. In the post-medieval period, agricultural improvement of land was promoted by major landholders. This led to the enclosure and drainage of the mosses north of Crewe from the 18th century (see HE-003, MA01\_HLCA03). Crewe grew rapidly from the 1840s, initially as a junction on the railway and then as an industrial centre for railway manufacturing. This led to the expansion of the town, which continued throughout the 20th century, building over what was agricultural land prior to this.

### 3.3 Survey results

- 3.3.1 The results of this survey are summarised below by period. Since the data from the visualised LiDAR and the aerial photographs are mutually supporting the results have not been separated by source.
- 3.3.2 The remote sensing survey mapped 30 individual areas, labelled from MA01\_RS001 to MA01\_RS030. These areas indicate the extent of sites, landscapes or parts of landscapes recorded. They are summarised in the gazetteer of identified features in the Hough to Walley's Green area, in Section 4 (Table 1).

#### Roman (AD 43 – 410)

- 3.3.3 The route of Roman road – Nantwich to Middlewich (Margary No. 700; MA01\_0168), was observed on LiDAR imagery (MA01\_RS030/MA01\_0168) to the south-west of Middlewich. The road is discussed in further detail in BID HE-001-0MA01. The series of wide linear earthworks, which appear to be the remains of the banked central agger<sup>13</sup>, are aligned south-west to north-east and are bisected by the West Coast Main Line (WCML). It is thought that this section would have connected Nantwich to Middlewich. Several sections appear to have been 'fossilised' as farm tracks, still in use today, such as at Sutton Hall Farm and Mill, Fields Farm and Park Hall Farm. Elsewhere, it is visible within fields as subtly extant fragments of linear banks, sometimes flanked by ditches. No linear earthworks relating to the agger were identified during geophysical survey within area MA01\_GP002 (see BID HE-004-0MA01).

#### Early medieval (410 – 1066)

- 3.3.4 No features of early medieval date have been identified. This is in part due to the lack of associative evidence (written accounts, maps etc.) that would relate the remains to this period. However, it should be noted that earlier features may have continued to be used in

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<sup>12</sup> Turbarry is the ancient right to cut turf, or peat, for fuel on a particular area of mossland known as moss rooms in Cheshire.

<sup>13</sup> Roman roads were built on a ridge or embankment of earth and stone referred to as an agger.

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this period (i.e. Roman roads), and later features may have origins in the early medieval period (i.e. some field boundaries, see below).

## Medieval (1066 – 1540)

- 3.3.5 Minshull Vernon moated site (MA01\_RS026/MA01\_0002, MA01\_439) is located partially within the remote sensing study area (Figure 4). The well-preserved earthworks are clearly visible on the LiDAR imagery, including earthwork elements that extend beyond the scheduled area. The trapezoidal island is surrounded by a central moat connected via several small channels (only one of which appears currently functional) to an outer moat or ditch. This outer moat is enclosed by a slight bank to the south and south-west. The scheduled area only extends as far as part of the fishpond (in the south-west). The overall inlet (to the south) and outlet (to the north) channels are also not covered by the scheduled area and are considered as a separate asset (MA01\_0439).
- 3.3.6 The survey recorded a short section of possible former road (MA01\_RS025/MA01\_0402) between the WCML to the west and Moss Fields Farm to the south-east. It appears to lead from Spring Farm in the south-west (see HE-005\_MA01\_Figure 4). This is faintly visible on the LiDAR imagery as almost fully-levelled linear bank and ditch earthworks crossing two fields on a north to south alignment. This may date from the medieval or post-medieval periods and is likely to have gone out of use when it was truncated by the construction of the railway.
- 3.3.7 A possible hollow way<sup>14</sup> (MA01\_RS027/MA01\_0436) is visible on LiDAR as a faintly extant east-west aligned curvilinear ditch, just north of the Minshull Vernon moated site. This comprises a sunken path within an agricultural field and remains in use as a footpath. It is noted on the Minshull Vernon tithe map<sup>15</sup> as being owned by Edward Lloyd and continues to the east as a footpath to Warmingham. Its proximity to the Minshull Vernon moated site (MA01\_0002) and continuation towards Warmingham support an earlier medieval date. However, it may date to the post-medieval period. It is likely to have gone out of use when it was truncated by the construction of the railway.
- 3.3.8 The survey recorded numerous areas of extant and levelled ridge and furrow (MA01\_RS001 to MA01\_RS022) dating from the medieval or early post-medieval periods. Ridge and furrow comprise the majority of the features identified by remote sensing. These are considered as part of the HLC in Volume 5 of the Environmental Statement, HE-003-0MA01<sup>4</sup>.
- 3.3.9 There is a concentration of areas of extant and levelled ridge and furrow within small former fields north of Crewe (MA01\_RS001 to MA01\_RS004, MA01\_RS006 to MA01\_RS017, Figures 2 and 3). This corresponds with the area of Warmingham and Coppenhall Moss (see HE-003,

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<sup>14</sup> A hollow way is a sunken lane caused by erosion due to water or the passage of livestock or humans.

<sup>15</sup> Unknown (1849), *Tithe Map of Minshull Vernon in the Parish of Middlewich in the County of Chester*, held at; Cheshire Archives and Local Studies, Ref: EDT 273/2.

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MA01\_HLCA03). The mosses were enclosed<sup>16</sup> in 1804 and 1814 respectively (see BID HE-001-0MA01). The presence of ridge and furrow may correspond with the period shortly after enclosure when the area was utilised to grow wheat before it was turned over to dairy pasture associated with cheese making<sup>17</sup>. However, the small fields are close to some of the earlier farmsteads such as Bridge Farm (MA01\_0157) and Moss Farm, Warmingham (MA01\_0178). This suggests that they may be associated with earlier utilisation for mixed arable agriculture in the medieval period. Alternatively, some of the linear fields are characteristic of moss rooms, fields used for turbarry rights, the right to cut peat. Overall, this suggests that the land was being utilised for agriculture before legal enclosure. Geophysical survey suggests that the linear features may not be ridge and furrow but are the result of modern fields or patterns of modern ploughing (see BID HE-004-0MA01).

- 3.3.10 Further north the ridge and furrow has been identified throughout the study area. There is a notable survival of ridge and furrow (MA01\_RS016) around the scheduled monument of Minshull Vernon moated site (MA01\_0002). The remainder (MA01\_RS011, MA01\_RS016 to MA01\_RS022, see Figures 4 and 5) is likely to be associated with farmsteads located at Parkfield Farm (MA01\_0169) or Park House (MA01\_0109). The area may originally have been a deer park associated with Church Minshull<sup>18</sup>, as evidenced by the 'park' place-names in properties mentioned above<sup>19</sup>. The evidence of ridge and furrow suggests that the area had been turned over to agricultural use by the later medieval or post-medieval period.
- 3.3.11 A ditched circular enclosure (MA01\_RS024, Figure 3) is visible as a very faintly extant earthwork in a field on the northern edge of Crewe. It measures approximately 11m in diameter and consists of a central depression surrounded by a circular bank and an outer ditch. This survey originally suggested this feature may be the remains of a Bronze Age round barrow. However, when viewed during the site walkover, it became clear that it is much more likely to have been a medieval or post-medieval marl pit, also identified by geophysical survey (see BID HE-004, MA01\_GP0023). These extractive pits were extremely common across this area, with many later in use as ponds.

## Post-medieval (1540 – 1901)

- 3.3.12 An area of sand extraction (MA01\_RS029, Figure 5) to the south-east of Walley's Green is visible as earthworks on the LiDAR imagery. The Minshull Vernon tithe map<sup>20</sup> recorded this

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<sup>16</sup> Enclosure, sometimes termed inclosure, was the legal process in England of consolidating (enclosing) small landholdings into larger farms.

<sup>17</sup> Leah, M. D. Wells, C. Huckerby, E. and Appleby, C. (1997), *North West Wetlands Survey 4: The Wetlands of Cheshire*, Lancaster University Archaeological Unit.

<sup>18</sup> Cheshire Archaeology and Planning Advisory Service (CAPAS) Historic Environment Record, Ref 4007.

<sup>19</sup> Harris, B. E., and Thacker, A.T. (1987), *The Victoria History of the County of Chester. (Volume 1: Physique, Prehistory, Roman, Anglo-Saxon, and Domesday)*, Oxford University Press.

<sup>20</sup> Unknown (1849), *Tithe Map of Minshull Vernon in the Parish of Middlewich in the County of Chester*, held at; Cheshire Archives and Local Studies, Ref: EDT 273/2.

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area as 'sand field'. This quarrying site likely dates from the post-medieval period, although it is possible it may alternatively have its origins in the medieval period.

3.3.13 As noted above for the medieval period, extant and levelled ridge and furrow (MA01\_RS001 to MA01\_RS022, and MA01\_RS029) may be post-medieval in date.

## 3.4 Conclusions

- 3.4.1 A total of 30 individual or grouped possible archaeological features were identified by the survey, 28 of which were not previously recorded by the HER, NRHE or NHLE. These include:
- a section of Roman road – Nantwich to Middlewich (Margary No. 700); consistent with the expansion of the Cheshire road system in the early Romano-British period;
  - features associated with the scheduled moated site of Minshull Vernon and surrounding earthworks. The transcribed extent of this feature and its associated fishponds exceed the scheduled monument boundary (MA01\_0439);
  - a section of former medieval or post-medieval road;
  - a section of medieval or post-medieval hollow way;
  - a large post-medieval wetland drainage system;
  - a circular feature consisting of a bank and outer ditch, which may have originated as a marl pit and is likely to have later been in use as a pond or watering pool for cattle; and
  - a medieval or post-medieval area of sand quarrying. Areas of glacio-lacustrine sands, deposited at the end of the last ice age created favourable geology for this industry in Cheshire, which became important in the industrial revolution.
- 3.4.2 The remaining 22 features identified were levelled or extant areas of possible ridge and furrow from medieval and post-medieval agriculture, along with the possible remains of two medieval or post-medieval field boundary banks.
- 3.4.3 The remote sensing has not uncovered evidence of prehistoric activity in the area. Evidence including Bronze Age round barrows and Iron Age enclosures are not visible. This does not mean prehistoric activity or settlement is not present. Sites in Cheshire, including Brook House Farm in Tarporley<sup>21</sup>, have demonstrated that Bronze Age and Iron Age prehistoric activity has been noted in areas of very little potential. The large area of wetland drainage known as 'moss rooms' (MA01\_0430) has been subject to geophysical survey (see BID HE-004-0MA01) and may have an earlier origin than the medieval or historic enclosure activity on the mosses.

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<sup>21</sup> Fairburn, N., Bonner, D., Carruthers, W. J., Gale, G. R., Matthews, K. J., Morris, E. and Ward, M. (2003), Birch Heath, Tarporley: *Brook House Farm, Bruen Stapleford: excavation of a 1st-millennium BC settlement*, *Journal of Chester Archaeology Society* 77, P9-57.



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- 3.4.4 The Roman road, Nantwich to Middlewich (MA01\_RS030/MA01\_0168), has been identified with greater accuracy. The section of the study area survives with its aggers, banks either side of the raised road, and represents good survival of this section of this road.
- 3.4.5 The extent of the scheduled monument of Minshull Vernon moated site (MA01\_RS026/MA01\_0002) has been identified. It has been noted that some of the water systems and the extent of the fish pond associated with the moated site have also been identified, extending beyond the scheduled boundary to the north, south and south-west (MA01\_0439).
- 3.4.6 The road (MA01\_RS025/MA01\_0402) and hollow way (MA01\_RS027/MA01\_0436) show the extent of the medieval or post-medieval rural landscape. The areas of Warmingham Moss would have had access routes to and across the moss between hamlets and small isolated farmsteads. The extent of rural agriculture in the medieval and post-medieval period is demonstrated by the ridge and furrow. Its association with several farmsteads located north of Crewe, in the study area, demonstrates a pattern of agriculture associated with isolated farmsteads. The possibility remains, that some areas of Crewe, associated with Coppenhall and Warmingham Moss were utilised for agriculture before the formal enclosure historically recorded in the 19th century.



## 4 Gazetteer of identified remote sensing features in MA01

4.1.1 The following gazetteer provides a summary of the identified features.

**Table 1: Gazetteer of identified features in MA01**

Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA01_RS001		Extant and levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Eleven areas of ridge and furrow (some of which would have originally been contiguous) are visible as both extant and levelled earthworks across fields located between Broughton Road to the east, and the WCML to the west. The areas of ridge and furrow mapped at the northern end of this group now lie beneath a recent housing development and have therefore been completely destroyed.	Figures 2 and 3	370249 357695
MA01_RS002		Extant and levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Eleven areas of ridge and furrow are visible as extant earthworks across fields to the east of Broughton Road. A further two areas, which are contiguous with two of those already identified, have been levelled and are visible as cropmarks.	Figures 2 and 3	370478 357873
MA01_RS003		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Six areas of levelled ridge and furrow are visible on historic aerial photographs as cropmarks within fields between the WCML	Figures 2 and 3	370173 357968

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					to the west, and Broughton Road to the east. Parkers Road lies to the north.		
MA01_RS004		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Nine areas of extant ridge and furrow are visible within fields to the north of Parkers Road and east of the WCML. Several of these patches would originally have been contiguous. One is truncated by the banks of what appears to be a later field boundary (MA01_RS023). This area of ridge and furrow lies to the south of an area of wetland (MA01_RS005); several of these areas appear to have had later drainage ditches cut perpendicularly across them.	Figure 3	370108 358389
MA01_RS005	MA01_0430	Extent of area	Drainage system	Post-medieval	A large area of wetland drainage and reclamation is visible on historic aerial photographs and modern LiDAR as both extant and levelled earthworks. This lies mostly on the eastern side of the WCML, with one small area (presumably originally contiguous) on the western side of the railway line. The tithe apportionment of 1840 records this area as plots named 'moss piece' and as 'waste'. The second edition Ordnance Survey county series map dated	Figure 3	369993 358627

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					1899 <sup>22</sup> shows this area as rough pasture.		
MA01_RS006		Extant and levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Both extant and levelled ridge and furrow is visible on LiDAR imagery and historic aerial photographs within enclosed agricultural ground to the north of Leighton housing estate. This lies to the west of the WCML and south of Spring Plantation.	Figure 3	369636 358565
MA01_RS007		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Sixteen areas of extant ridge and furrow are visible on LiDAR within fields to the west of the WCML and south of Spring Plantation. Several of these would have originally been contiguous but have been divided by later field boundaries. Later drainage ditches have been cut perpendicularly across the remains of some of these plots of ridge and furrow.	Figure 3	369547 358819
MA01_RS008		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Seven areas of levelled ridge and furrow are visible on historic aerial photographs as cropmarks within fields to the south of Moss Farm. An archaeological desk-based assessment (DBA) and site visit was carried out by	Figure 3	370080 358813

<sup>22</sup> Ordnance Survey (1899), *Cheshire County Series, Map Sheet XLIX*, 2nd edition, Scale 1:10,560.

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					Archaeology Wales in 2016 at Moss Farm, Crewe (this location). It noted that no previously recorded heritage assets fell within the study area of that assessment, and concluded that the likelihood of encountering unrecorded finds, features and deposits at this location is low <sup>23</sup> .		
MA01_RS009		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Twenty-six areas of extant ridge and furrow are visible on historic aerial photographs and LiDAR across fields between the WCML to the west, and Moss Farm to the east. A number of these areas, originally contiguous, have been divided by later field boundaries. A DBA was carried out at this location by Archaeology Wales <sup>23</sup> (See also MA01_RS008).	Figures 3 and 4	369873 359041
MA01_RS010		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Three areas of levelled ridge and furrow are visible as cropmarks on historic aerial photographs of 1947 and 1954. These areas lie to the west of Moss Farm and south of Warmingham Moss. They would have been a continuation of the area of ridge and furrow recorded as MA01_RS009 (though	Figures 3 and 4	369951 359624

<sup>23</sup> Archaeology Wales (2014), *Moss Farm, Crewe, Cheshire: Desk Based Assessment and Site Visit*.

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					not originally contiguous with any of those plots). A DBA was carried out at this location by Archaeology Wales <sup>23</sup> (See also MA01_RS008).		
MA01_RS011		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Ten areas of levelled ridge and furrow are visible on historic aerial photographs as cropmarks within fields between Spring Farm and Larch Wood. Many of these would originally have been contiguous but have been divided by later field boundaries. Part of the same medieval and/or post-medieval agricultural landscape as the adjacent ridge and furrow visible as extant earthworks on LiDAR imagery (MA01_RS012).	Figures 3 and 4	369252 359685
MA01_RS012		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Four areas of extant ridge and furrow are visible on LiDAR imagery within fields on the northern side of Spring Farm. Part of the same medieval and/or post-medieval agricultural landscape as the adjacent levelled ridge and furrow visible as cropmarks on historic aerial photographs (MA01_RS012).	Figures 3 and 4	369252 359312
MA01_RS013		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	A single long area of extant ridge and furrow is visible as earthworks on LiDAR, located on the southern side of Moss Fields Farm.	Figures 3 and 4	369891 359578

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA01_RS014		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Five areas of levelled ridge and furrow are visible on historic aerial photographs as cropmarks within fields between Moss Fields Farm to the south-east, and Larch Wood to the north-west.	Figure 4	369613 359880
MA01_RS015		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Four areas of ridge and furrow are faintly visible on LiDAR as extant earthworks in fields between Burnt Covert and the WCML to the east, and a gas storage site to the west. A further small area of extant ridge and furrow is also visible on the far south-eastern side of the gas storage plant.	Figure 4	369510 360257
MA01_RS016		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Four areas of ridge and furrow are visible on LiDAR as extant earthworks within fields within and adjacent to Larch Wood and Burnt Covert, on the western side of the WCML. It appears they would all originally have been contiguous, but have been divided by later field boundaries. The westernmost two areas lie adjacent to the boundary of scheduled monument list entry 1012077, Minshull Vernon moated site and fishpond (MA01_0002).	Figure 4	369105 360257

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA01_RS017		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Historic aerial photographs show nine areas of levelled ridge and furrow visible as cropmarks within fields between the Minshull Vernon moated site (MA01_0002) to the south, Parkfield to the east and Moat House Farm to the west. Remnants of a Roman road (MA01_0168) are visible as underlying earthworks through one of these plots on a north-eastern to south-western direction.	Figures 4 and 5	368871 360792
MA01_RS018		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	LiDAR imagery shows faintly extant ridge and furrow earthworks across a field between Parkfield to the east and Moat House Farm to the west. Would originally have been contiguous with the now-levelled areas of ridge and furrow recorded as MA01_RS017.	Figures 4 and 5	368871 360792
MA01_RS019		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	Seven areas of ridge and furrow are visible on historic aerial photographs as cropmarks across fields on the eastern side of the WCML. The farm named Parkend lies to the west, and Hoggins Brook is to the east. These patches of individually transcribed ridge and furrow have the appearance of mostly likely having	Figures 4 and 5	369387 360673

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					been originally contiguous (with the exception of the easternmost area) but have been subdivided by later field boundaries.		
MA01_RS020		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	An extensive area of seventeen plots of ridge and furrow are visible on LiDAR as extant earthworks across fields adjacent to Park House Farm and Park Hall Farm, on the eastern side of the WCML. Their alignment suggests many of them would have been originally contiguous, but have been divided by later field boundaries. Remnants of a Roman road (MA01_0168) are visible as underlying earthworks through one of these plots on a north-east to south-western direction.	Figures 4 and 5	369152 261245
MA01_RS021		Extant ridge and furrow	Ridge and furrow	Medieval Post-medieval	Thirteen areas of faintly extant ridge and furrow are visible on LiDAR as earthworks across fields adjacent to and to the south of Newfield Hall Farm. Remnants of a Roman road (MA01_0168) are visible as underlying earthworks through one of the southernmost of these plots on a north-eastern to south-western direction.	Figure 5	368573 361535
MA01_RS022		Levelled ridge and furrow	Ridge and furrow	Medieval Post-medieval	An area of levelled ridge and furrow is visible on historic aerial	Figure 5	368891 361697



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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					photographs as cropmarks across a large field on the south-western side of Park Hall Farm. Remnants of a Roman road (MA01_0168) are visible as underlying earthworks through this plot on a north-eastern to south-western alignment. This area of ridge and furrow is likely to have originally been contiguous with those recorded as MA01_RS021 to the south, and MA02_RS001 to the north.		
MA01_RS023		Bank	Boundary bank	Medieval Post-medieval	A possible former field boundary visible as either two parallel linear banks, or one wide linear bank cut along its length by a later drainage ditch is visible as earthworks within a field to the east of the WCML. Not recorded on historic Ordnance Survey maps.	Figure 3	369994 358227

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
MA01_RS024		Bank Ditch	Marl pit Pond	Medieval Post-medieval	A ditched circular enclosure is visible as a very faintly extant earthwork in a field on the northern edge of Crewe (to the south-east of Spring Plantation). It measures approximately 11m in diameter and consists of a central depression surrounded by a circular bank and an outer ditch. This survey originally suggested this feature may be the remains of a Bronze Age round barrow. However, when viewed in-person for a site visit as a part of this project it became clear that it is much more likely to have been a medieval or post-medieval marl pit. These extractive pits were extremely common across this area, with many later in use as ponds. This feature appears waterlogged on historic aerial photographs. No obvious opening visible. In later aerial imagery this feature is visible as positive vegetation growth.	Figure 3	369712 358692
MA01_RS025	MA01_0402	Bank Ditch	Road	Medieval Post-medieval	A section of former road is visible on LiDAR imagery as almost fully-levelled linear bank and ditch earthworks crossing two fields on a north to south direction. This may date from the medieval or post-medieval periods and is likely	Figure 4	369426 359953

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					to have gone out of use when it was truncated by the construction of the WCML railway.		
MA01_RS026	MA01_0002 MA01_0439	Bank Ditch	Bank Moat	Medieval	<p>Minshull Vernon moated site (a scheduled monument, MA01_0002) is located partially within the remote sensing study area. The well-preserved earthworks of the scheduled monument are clearly visible on the LiDAR imagery. The trapezoidal island is surrounded by a central moat connected via several small channels (only one of which appears currently functional) to an outer moat or ditch. This outer moat is enclosed by a slight bank to the south and south-west. This moat is in turn linked to a probable fishpond to the south-west.</p> <p>The scheduled area (MA01_0002) only extends as far as part of the fishpond. The overall inlet and outlet channels to the north and south-east (MA01_0439) are also not covered by the scheduled area.</p>	Figure 4	368908 360291
MA01_RS027	MA01_0436	Bank Ditch	Hollow way	Medieval Post-medieval	A possible hollow way is visible on LiDAR imagery as a faintly extant east-west aligned curvilinear ditch just north of the Minshull Vernon	Figure 4	369008 360477

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					moated site (MA01_RS026). This comprises a sunken path within an agricultural field and remains in use as a public footpath. This may date from the post-medieval period but may alternatively have earlier origins in the medieval period.		
MA01_RS028		Bank Ditch	Field boundary	Medieval Post-medieval	A field boundary ditch flanked on either side by a bank is aligned north-north-west to south-south-east. It is visible on LiDAR as extant earthworks. This boundary is recorded on the 19th century tithe map <sup>24</sup> . The ditch appears to have been truncated towards its southern end by an extractive pit (MA01_RS029). The eastern flanking bank appears to divert around the outer edge of this extractive activity, although it is possible that this is in fact the up-cast from the quarrying, and the eastern ditch had been truncated.	Figure 5	368658 361102
MA01_RS029		Large cut feature	Extractive pit	Medieval Post-medieval	An area of likely sand extraction is visible as earthworks on LiDAR imagery. This lies to the south-west of a field named 'sand field' on the 19th century	Figure 5	368684 361059

<sup>24</sup> Unknown (1849), *Tithe Map of Minshull Vernon in the Parish of Middlewich in the County of Chester*, held at; Cheshire Archives and Local Studies, Ref: EDT 273/2.

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Reference	Asset UID	Feature category	Feature type	Period	Comment	Figure	NGR
					apportionment of the Minshull Vernon tithe map <sup>24</sup> .		
MA01_RS030	MA01_0168	Bank Ditch	Road	Roman	The route of a Roman road (Nantwich to Middlewich, Margary No. 700) is visible on LiDAR imagery of fields to the south-west of Middlewich. The series of wide linear earthworks, which appear to be the remains of the banked central agger, are aligned south-west to north-east and are bisected by the WCML railway. Several sections appear to have been 'fossilised' as lanes still in use today, as at Sutton Hall Farm and Mill, Fields Farm and Park Hall Farm. Elsewhere it is visible within fields as subtly extant fragments of linear banks, sometimes flanked by ditches.	Figures 4 and 5	368862 361381

## 5 List of acronyms

5.1.1 The following acronyms in Table 2 have been used in this report.

**Table 2: List of acronyms**

Acronym	Meaning
ACA	Archaeological Character Area
ASZ	Archaeological Sub-zone
BID	Background Information and Data
CAPAS	Cheshire Archaeology Planning Advisory Service
CUCAP	Cambridge University Collection of Aerial Photographs
DBA	Desk-Based Assessment
DSM	Digital Surface Model
DTM	Digital Terrain Model
GIS	Geographical Information System
HER	historic environment record
HLC/HLCA	historic landscape character/ Historic Landscape Character Areas
LiDAR	Light Detection and Ranging
NHLE	National Heritage List for England
NMP	National Mapping Programme
NRHE	national record of the historic environment
RAF	Royal Air Force
RVT	Relief Visualisation Toolkit
WCML	West Coast Main Line

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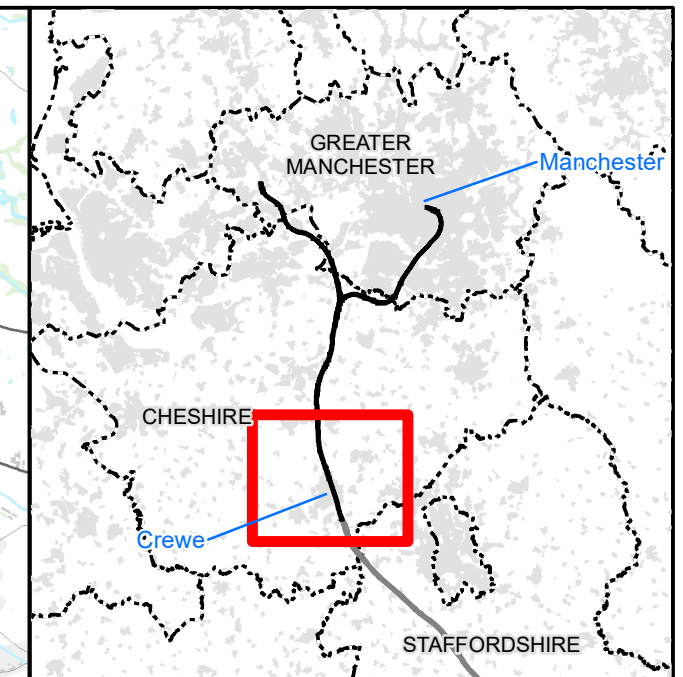
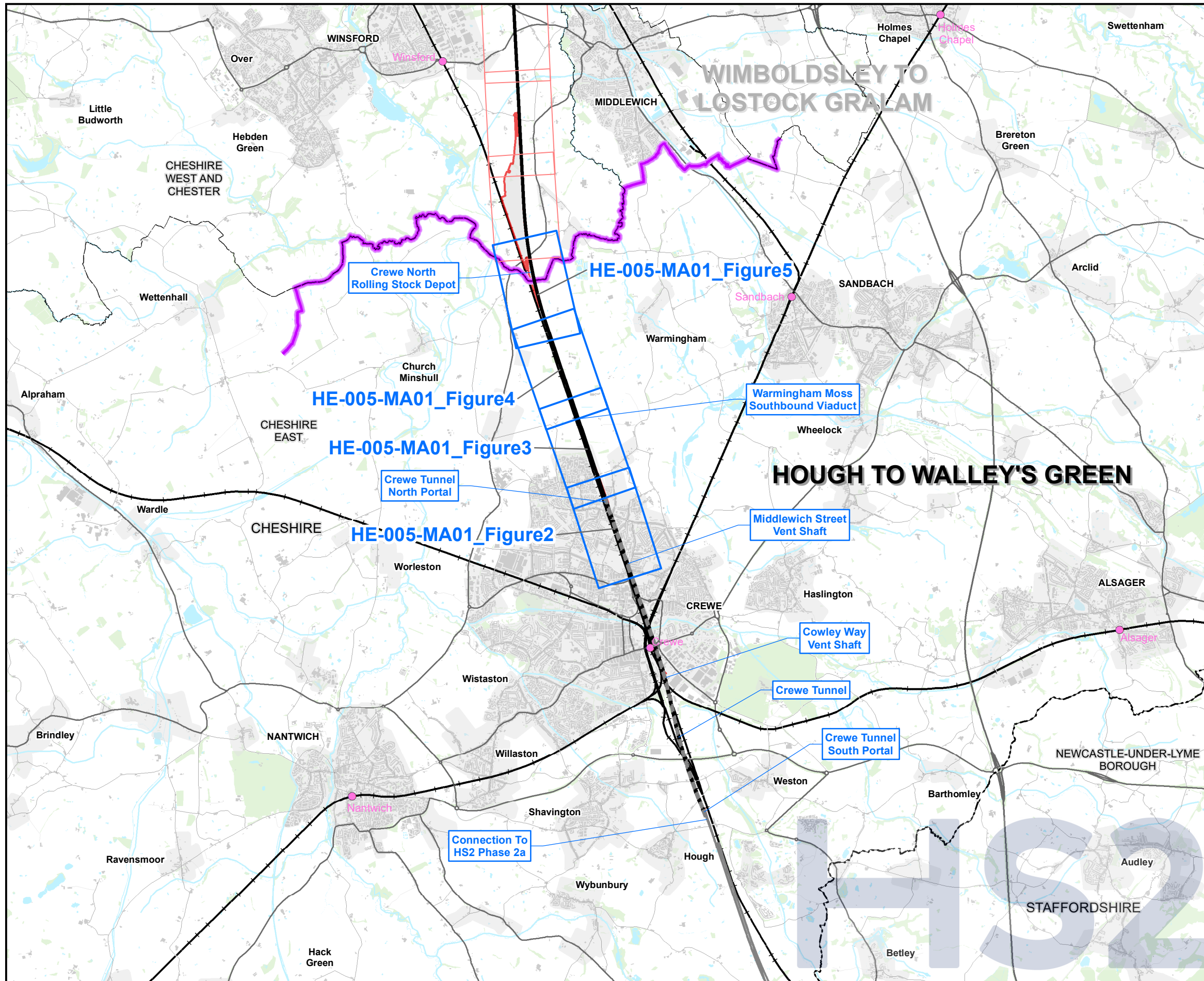
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**Map Series Information:**

These maps show the results of the remote sensing surveys in relation to the land required for the construction of the Proposed Scheme.

Main Map Legend	
Route in tunnel	Map sheets included in this community area
Route on surface	Map sheets not included in this community area
Depot, station, headhouse or portal building	Existing railway station
Community area boundary	County boundary
Existing railway station	District/Borough boundary

Map Number	HE-005_MAO1_Figure1
Map Name	Remote Sensing Survey Index map
Community Area MA01: Hough to Walley's Green	

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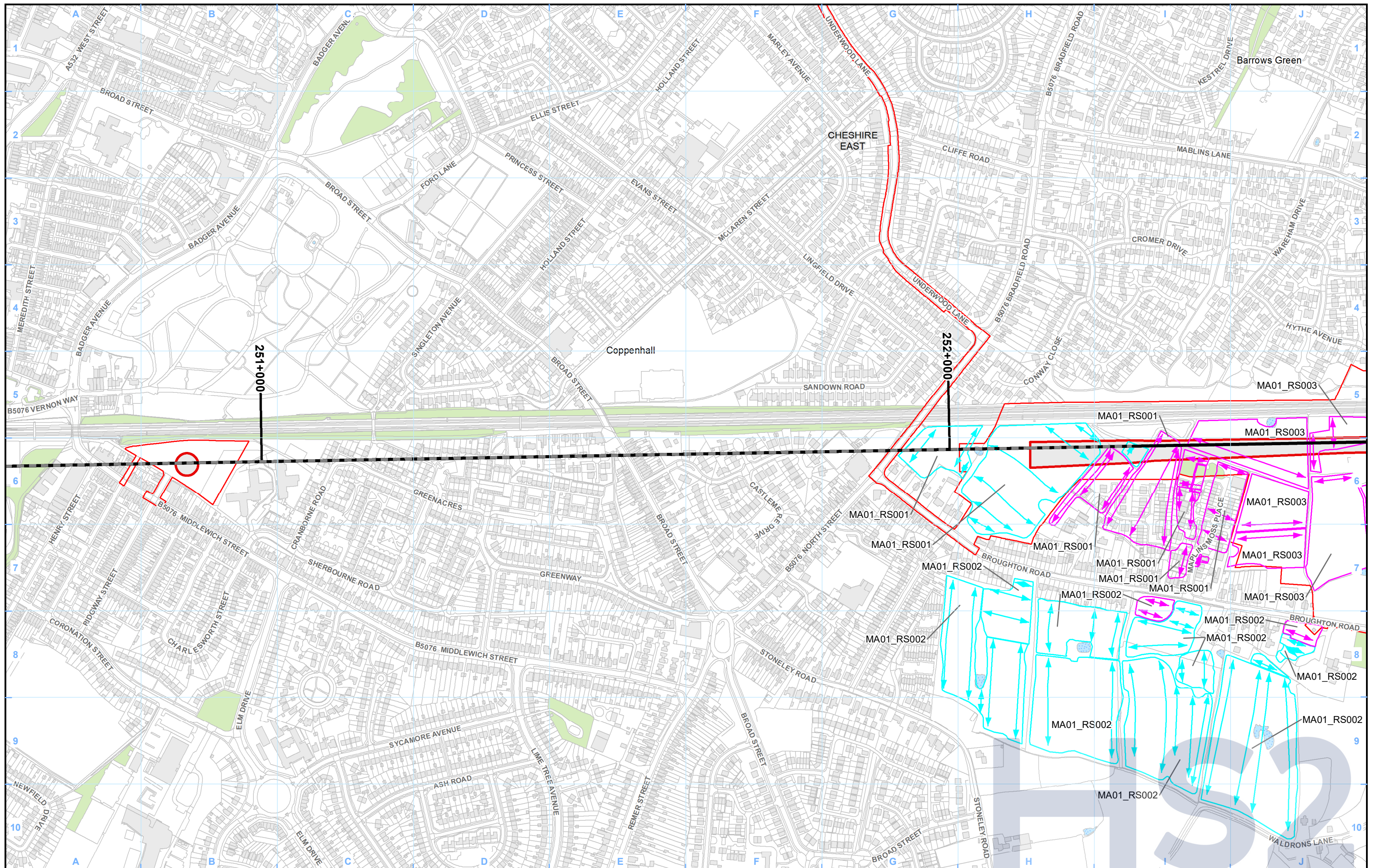
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Scale at A3: 1:75,000

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**Legend**

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|  |                                    |  |
|  |                                    |  |
|  | <b>Remote sensing feature type</b> |  |
|  |                                    |  |
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Map Number HE-005\_MA01\_Figure2

Map Name Remote Sensing Survey Interpretation

Community Area MA01:  
Hough to Walley's Green

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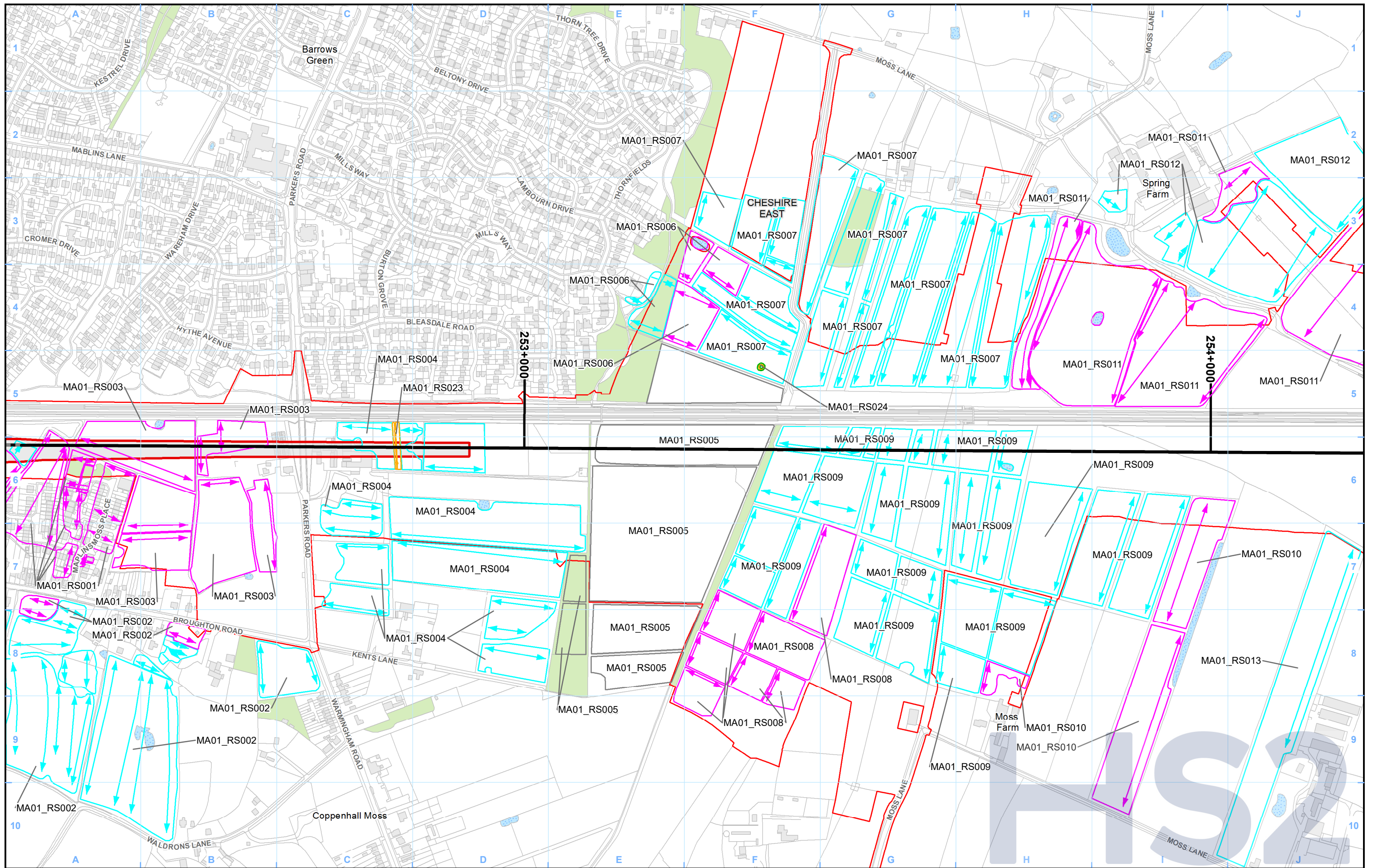
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Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Land potentially required during construction
	Community area boundary
	County boundary
	District/Borough boundary
	Watercourse
	Water body
	Bank
	Ditch
	Levelled ridge and furrow area
	Levelled ridge and furrow direction
	Extant ridge and furrow area
	Extant ridge and furrow direction
	Extent of area
	Large cut feature
	Services
	Structure
	T-hachure

Map Number HE-005\_MA01\_Figure3

Map Name Remote Sensing Survey Interpretation

Community Area MA01:  
Hough to Walley's Green

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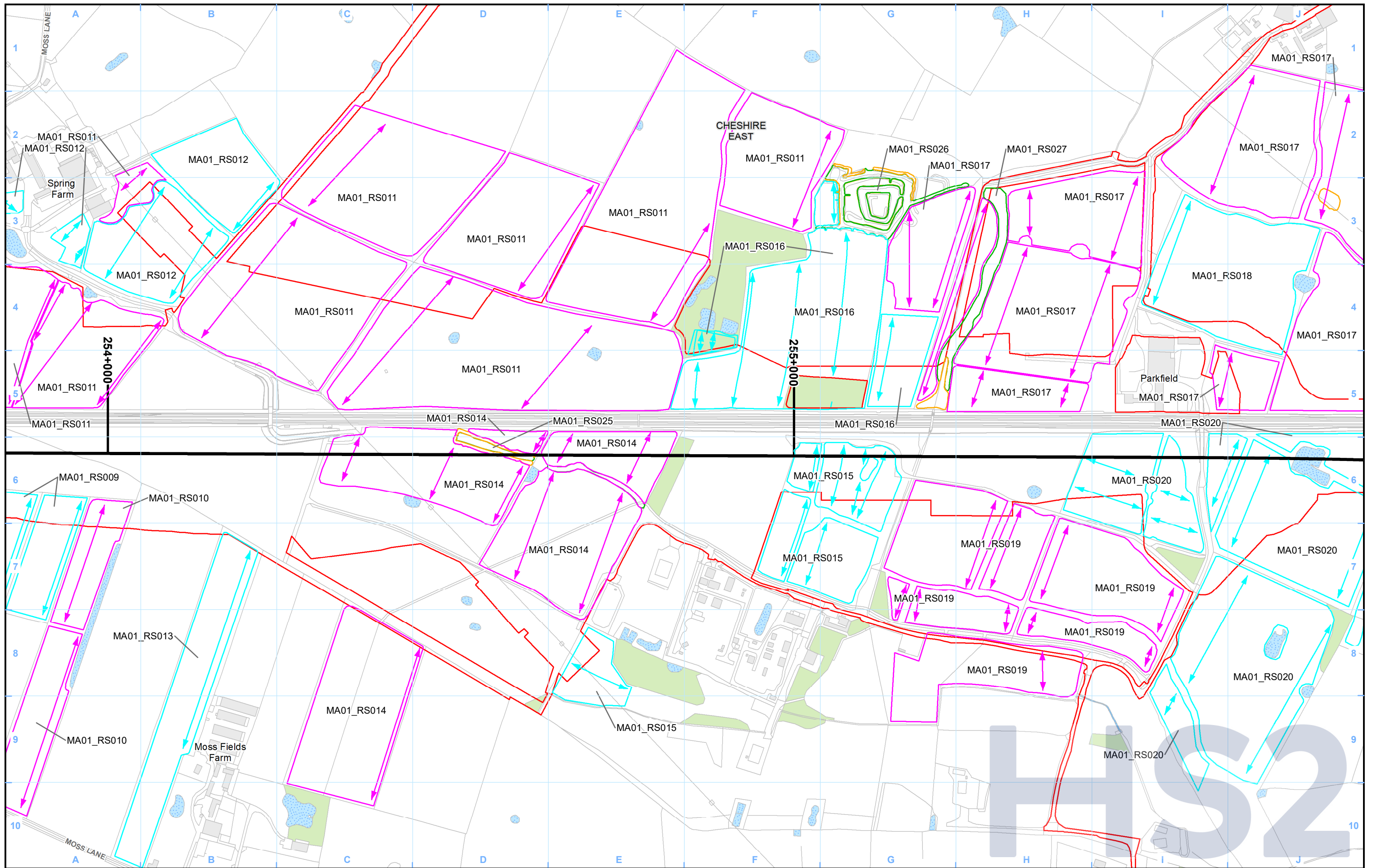
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Date: 24/09/21





Legend		
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Map Number HE-005\_MA01\_Figure4

Map Name Remote Sensing Survey Interpretation

Community Area MA01:  
Hough to Walley's Green

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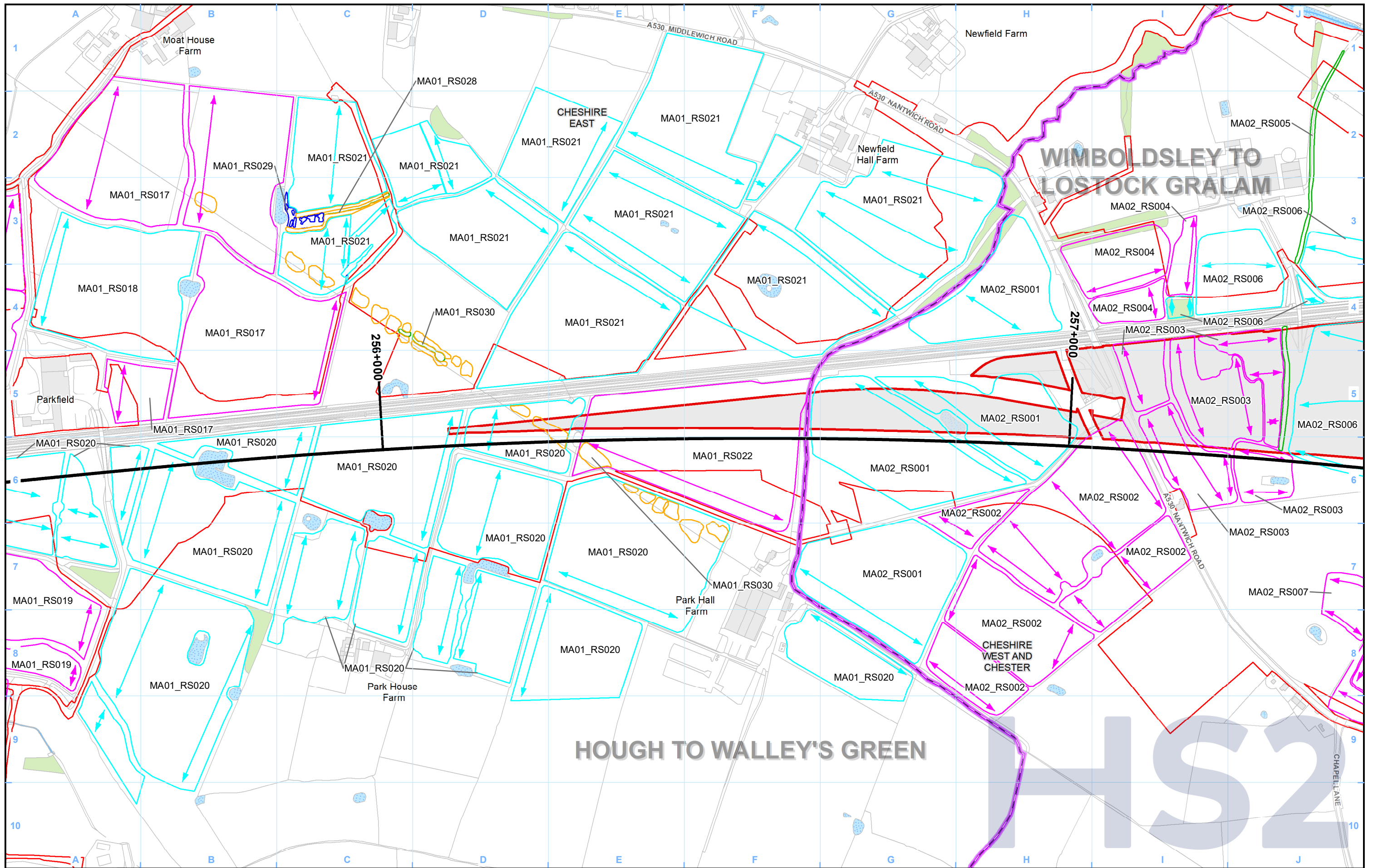
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Legend		
	<b>Remote sensing feature type</b>	

Map Number	HE-005_MA01_Figure5
Map Name	Remote Sensing Survey Interpretation
	Community Area MA01: Hough to Walley's Green

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