1EW03 - Enabling Works Central

AWH Route-wide Project Plan for Woodland Evaluation

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1 Executive Summary

1.1.1 This Project Plan details the proposed methodologies, techniques and deliverables for an archaeological evaluation of woodland areas within Sections C2 and C3 of HS2 Phase 1 Central Route (Figure 1).

1.1.2 The evaluation will comprise:

- woodland survey;
- test pitting; and
- trial trenching.

1.1.3 The evaluation will investigate woodland history and pre-woodland land use potential of six areas of woodland (hereafter referred to as 'the Site(s)') within HS2 Phase 1 Central Route. These areas have been specifically selected as elements of woodland, ancient or otherwise, which are proposed for removal as part of the HS2 Central scheme. Themes to be explored include lifespan of woodland, woodland management and agricultural/industrial activities and evidence of landscape change. It may also be possible to recover evidence of pre-woodland human activity, which would enable a greater understanding of the development and use of the surrounding landscape.

1.1.4 The woodland evaluation will comprise a number of tasks, within two main phases:

- Phase 1, prior to woodland clearance; and
- Phase 2, investigations following woodland clearance.

1.1.5 The woodlands have different histories, some being relatively recent with clear evidence of pre-woodland land use determined from historic mapping and LiDAR surveys. Others, classed as 'Ancient Woodland', have persisted since c. 1600 in England and have been relatively undisturbed by human development. The woodland evaluation covered by this Project Plan encompasses six parcels of land measuring 10.06ha in total (Figure 1):

- C21022 Jones Hill Wood, Buckinghamshire (Figure 2a);
- C25071 Widmore Farm, Oxfordshire (Figure 2b);
- C30027 Halse Copse Farm, Northamptonshire (Figure 2c);
- C30031 Fox Covert, Whitfield, Northamptonshire (Figure 2d);
- C32030 Windmill Hill Spinney, Warwickshire (Figure 2e); and
- C32033 Fox Covert, Northamptonshire (GLB211, Figure 2f).

1.1.6 Seven parcels of Ancient Woodland are located along the HS2 Central scheme route, in addition to other parcels of woodland that are not designated. The six woodland areas comprising the Site (3no. Ancient Woodland sites, 3no. other) are spread across four Community Forum Areas (CFA10,14-16) and four counties (Buckinghamshire, Oxfordshire, Northamptonshire and Warwickshire) and were selected for inclusion within this Project Plan as they are proposed for removal/translocation. The evidence suggests there is a potential for the Sites to contain as yet unknown archaeological remains of prehistoric/Roman, medieval and post-medieval date. These are likely to be associated with agricultural and less likely settlement activity, and with medieval and post-medieval woodland management.

1.1.7 The woodland evaluation is required to identify the presence of woodland bank features, rides and other features that may be recorded and investigated as part of fieldwork which will also retrieve any artefactual evidence that may be present in the absence of geophysical surveys, which are inappropriate in these locations. More generally, the evaluation will aim to identify location, extent, survival and significance of any heritage assets of archaeological interest within the Sites (Figure 2a-f) and will contribute to the following specific GWSI: Historic Environment Research and Delivery Strategy (HERDS) objectives:

- CE 1: Marking and communicating the changes to landscapes and environments.
- KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age.
- KC9: Does a lack of visibility of Neolithic and Bronze Age monuments reflect genuine area distinctiveness, or is this due to variation in geology or investigative techniques?
- KC23: Identify evidence for late Roman occupation and attempt to identify any continuity in settlement patterns between the end of the Romano-British period and the Early Medieval period.
- KC30: Identify the location and form of Early and Middle Saxon settlement and investigate evidence for land use in the period.
- KC31: Identify the location of Middle to Late Saxon settlement, explore processes of settlement nucleation and understand the development of associated field types and agricultural regimes.
- KC34: Undertake research and investigation into medieval manorial complexes. What was their origin, development and impact on the landscape?
- KC35: Investigate the impacts on rural communities of social and economic shocks in the mid-14th century and thereafter and their contribution to settlement desertion.
- KC36: How were medieval and later woodlands managed and exploited and what evidence do they preserve for earlier land use?

- KC40: Identify patterns of change within medieval rural settlement from the 11th to mid-14th century.
- KC49: Ground truth and develop multispectral and LiDAR prospection techniques.

1.1.8 The purpose of this Project Plan is to:

- define the scope of work for woodland investigation;
- outline the aims of the investigations and how they will contribute to the specific objectives of the GWSI: HERDS;
- describe the methodology to be employed across the Sites; and
- set out the proposed deliverables and reporting mechanisms.

2 Scheme Design Element Impacts

The Sites are required to enable the construction of the rail alignment formation, Windmill Hill Cutting, Heave Cutting, Boddington Cutting, Barton to Mixbury Cutting, temporary stockpile areas, mitigation landscape and hedgerow planting. The location for the woodland evaluation has been selected to address construction programme risk to land required for the proposed development.

3 Location / Site Background

3.1 Introduction

3.1.1 This Route-Wide Project Plan considers six woodland sites which are to be crossed by the central section of HS2 Phase 1 route. The selected woodlands have different development history, some established relatively recently and comprising clear evidence of pre-woodland land use (determined from historic mapping and LiDAR surveys). Three of the selected woodland sites (C21022, C30027 and C32033) are classed, wholly or in part, as 'Ancient Woodland'. Ancient Woodland is defined as an area that has been wooded continuously since at least 1600 AD and includes both ancient and more recent trees, with felling and clearance a periodic part of the woodland cycle. Provided the area has remained woodland, Ancient Woodland does not therefore have to contain ancient trees (Sansum & Bannister 2018). The Natural England Ancient Woodlands (England) inventory identifies over 52,000 Ancient Woodland sites in England. It identifies Ancient Woodland using the presence or absence of woods from old maps, information about the wood's name, shape, internal boundaries, location relative to other features, ground survey, and aerial photography (Natural England 2019).

3.1.2 Archaeology within woodlands is less understood than archaeology of the open agricultural or even the urban landscapes. Because of the tree canopy, even large features are hidden from

air photographic surveys, while a general lack of access also plays a part. As a result, important archaeological features in woodlands have rarely been mapped or recorded. Light Detecting And Ranging (LiDAR) technology allows for obstacles such as tree canopies to be 'removed' digitally, revealing earthworks and other features beneath (Historic England 2018c). Woodlands that have been surveyed prove that historically important features have survived where similar features have been destroyed or degraded elsewhere by ploughing or other activities (WAP 2019). Any increase in our knowledge can contribute greatly to our understanding of past land use and land use change. The aim of the investigations detailed in this project plan is to broaden the level of knowledge and understanding of woodlands within the Proposed Scheme, including their social and economic history.

3.1.3 Some woods have been planted within living memory, but many woods have a long and diverse history[1]. Given the reliance on timber in prehistoric times, woodland management may have had a priority over early agricultural concerns. During the medieval period, woods were managed intensively to produce timber and underwood. Many were privately owned, though some had common rights. These wooded commons were especially important to rural communities since they provided wood-pasture for cattle and sheep and pannage for pigs, as well as coppiced underwood for building, fencing, fuel and charcoal. Underwood was traditionally distinguished from timber both in practice and in law, by which it was precisely defined. It consisted of the poles from coppicing and pollarding, as well as small suckers and the branches from felled trees.

3.1.4 Common rights were strictly regulated, and frequently the landowner retained ownership of the valuable timber. By the 13th century, wood-pasture appears to have been in general decline, either through the conversion of woods for other uses, as a consequence of over-grazing, or through simple neglect. Some wood-pasture was converted to agricultural use, a process known as 'assarting', while in other places the pastures were appropriated by the landowner to become parks or coppices. This transition can generally be viewed alongside regional population growth, as more agricultural land was required to feed them. Population size and fluctuations may, therefore, be inferred to some extent by the local presence and management of woodland.

3.1.5 During the post-medieval period the woodlands became inextricably linked to the industrial economic cycle. Oak woodlands were particularly susceptible to fluctuations in industries such as shipbuilding and tanning, although the experience of the former likely affected woodland closer to shipyards and key transport links. Traces of past woodsmanship can still be found throughout old woodland. Trackways, earth banks, field boundaries, stands where charcoal used to be made, the presence or absence of certain plants and invertebrates, the soil profile and structure, the variety of tree species and their age, even the particular shape of individual trees are all clues to the antiquity and past management of woods. With the demise of

[1] The following paragraphs draw upon WAP 2019

traditional woodsmanship, many woods have fallen into neglect as their primary economic importance has lessened.

3.1.6 The project considers six woodland areas (the Sites), which are spread across four Community Forum Areas and four counties (Figure 1, 2a-f). This section provides an overview of each of the Sites, its archaeological background and potential, in order to understand the likelihood to encounter evidence of pre-woodland activity and any archaeological features associated with the exploitation and management. The scope for selection covered the HS2 Central route from Wendover Dean in Buckinghamshire to Southam in Warwickshire. Woodland sites selected for inclusion in this Project Plan are proposed for removal and have not been investigated by previous works associated with HS2. Several areas of woodland along this section of the scheme, both ancient woodland and otherwise, have been scoped out, as summarised below:

- Ancient woodland:
  - Decoypond Wood, Buckinghamshire – included within a separate Project Plan (1EW03-FUS-EV-REP-CS06_CL09-002547);
  - Woodland north of Decoypond Wood, Buckinghamshire – negative results from LiDAR survey;
  - Mossycorner Spinney, Oxon – no potential identified by surrounding surveys (1EW03-FUS-EV-REP-CS06_CL22-007795; trial trench evaluation report forthcoming);
- Non ancient woodland:
  - Woodland south of Hartley Farm, Kingsash, Buckinghamshire – shown on Ordnance Survey 1:25,000 mapping but woodland not present on aerial photography;
  - Woodland around Mossycorner Spinney, Oxfordshire - no potential identified by surrounding surveys (1EW03-FUS-EV-REP-CS06_CL22-007795; trial trench evaluation report forthcoming);
  - Woodland north-east of Thorpe Mandeville, Northamptonshire – included within a separate Project Plan (1EW03-FUS-EV-REP-CS07_CL26-008117);
  - Osierbed Spinney, Trafford Bridge, Northamptonshire – other intrusive surveys scheduled for immediate environs (1EW03-FUS-EV-REP-CS07_CL26-02512; others forthcoming);
  - Calves Close Spinney, Chipping Warden, Northamptonshire – minimal impacts on woodland, immediate environs included in separate Project Plan (1EW03-FUS-EV-REP-CS07_CL13-004398); and
  - Woodland at Chapel Bank Cottage, Radbourn, Warwickshire - included within a separate Project Plan (1EW03-FUS-EV-REP-CS07_CL23-007797).

3.1.7 The information presented below has been derived from numerous sources, including:

- the Environmental Statement, prepared in 2013 (ES 3.5.2.10.4-7, 3.5.2.14.4-7, 3.5.2.15.4-7, 3.5.2.16.4-7);
- Buckinghamshire, Oxfordshire, Northamptonshire and Warwickshire Historic Environment Records (HER) data updated in May 2019, and
- The results of the surveys undertaken within the Sites and in their environs, i.e. primarily LiDAR surveys undertaken as part of the ES (Figure 4a-f), geoarchaeological surveys undertaken in adjacent areas (C252-ETM-EV-REP-020-000221_P02, 1EW03-FUS-EV-REP-CS03_CL05-008027, 1EW03-FUS-EV-REP-CS06_CL21-000001, 1EW03-FUS-EV-REP-CS07_CL12-007821, 1EW03-FUS-EV-REP-CS07_CL12-037130, 1EW03-FUS-EV-REP-CS07_CL14-007768, 1EW03-FUS-EV-REP-CS07_CL24-007768, 1EW03-FUS-EV-REP-CS07-001583, 1EW03-FUS-EV-REP-CS07_CL12-001955, 1EW03-FUS-EV-REP-CS07_CL14-001956, Site 1348/54 report no. TBC, 1EW03-FUS-EV-REP-CS07_CL14-009411, ES 3.5.2.16.7; Figure 5a-f)) as well as nearby intrusive archaeological investigations (1EW03-FUS-EV-REP-CS06_CL21-007808, 1EW03-FUS-EV-REP-CS07_CL12-037127; 1EW03-FUS-EV-REP-CS07_CL12-007281, 1EW03-FUS-EV-REP-CS07_CL24-007292; 1EW03-FUS-EV-REP-CS07_CL12-007818; Figure 5a-f).

3.1.8 The sections below also draw upon the results of archival research undertaken in Oxfordshire, Buckinghamshire, Northamptonshire and Warwickshire record offices and local history libraries (Archives 2019), further historic maps available from previous HS2 studies and online, and additional analysis of the LiDAR data undertaken for the purpose of identifying any additional features of archaeological and historical landscape potential within woodland areas. Elements of this research were undertaken specifically for the preparation of this Project Plan (i.e. record office research), while others were drawn from the wider corpus of results from other studies undertaken along the HS2 Central route.

3.1.9 The baseline information is also supported by the observations made during site walkovers undertaken on 4-6 November 2019 and 16 December 2019 by the COPA team, and the *Contractor*'s HERDS design manager, engineer and arboriculturalist. These walkovers sought to identify woodland archaeological remains including living and dead trees and their remnants; stones, structures and ruins; surface material scatters; earthworks such as banks and ditches, and platforms and pits; and, the vegetation itself. No earthwork features additional to those identified through the analysis of remote sensing survey results and the enhanced LiDAR data (data taken from the ES and processed by COPA for the purposes of this Project Plan) have been identified during the site visits. However, the discussion presented below provides additional observations on the known earthworks where relevant, as are notes taken from verbal observations made by the *Contractor*'s arboriculturalist (no specialist written report has been prepared).

3.1.10 The sources listed above recorded multiple assets within the environs of the Site (Figures 3-6, Plates within the text, Appendix 4) but only those of direct relevance to the development and potential of the Site are discussed in this report. Additional information can be found in the referenced sources.

3.1.11 Where no archaeological data is held for areas with direct association with the Sites, the model for assessment and investigation of no data (blank) areas has been applied (1EW03-FUS-EV-REP-C000-009810). This model characterises the potential for archaeological remains of identified low visibility using landscape identifiers and factors, often associated principally with the early prehistoric (Mesolithic & Neolithic) and early medieval periods poorly evidenced in comparison to other periods.

3.2 C21022 Jones Hill Wood

Site Location

3.2.1 The woodland area is located within CFA10 Dunsmore, Wendover and Halton in the county of Buckinghamshire, and in the historic parish of Wendover (NGR centre 488715 204367). It measures 0.69ha and lies between Bowood Lane to the south and Durham and Strawberry Hill Farms to the north, c. 670m east of the A413 London Road and approximately 4km south of the historic centre of Wendover. The Site forms part of Ancient and Semi-natural Woodland which measures in total c. 1.84ha (the Site equates to 37.5% of the Ancient Woodland).

3.2.2 Whilst access to the woodland was allowed and Woodland Trust Permission was obtained, access to the adjacent fields, through which the woodland is accessed, was denied by the owners for the purposes of the preliminary site walkover during the preparation of the Project Plan. As such, the scheme design has been informed by the background information collected previously and during the preparation of the Project Plan. The full and final scope of works will be determined following a site walkover prior to on-site investigations (and at such point when full access is granted).

3.2.3 The Site is located on an eastern slope of a dry valley, with the highest point at c. 202m aOD in the south-eastern corner, sloping down to c. 188m aOD at the northern tip of the Site. The Site is surrounded by agricultural fields, with the remaining area of the Ancient Woodland to the north and east.

3.2.4 The Site is a specific Archaeological Sub-zone (ASZ) 10-08 Jones' Hill Wood, defined as comprising a managed ancient and semi-natural woodland. No artefacts or features have previously been recorded within the ASZ. However, other Ancient Woodlands are known to retain earthwork and buried remains of activities associated with woodland management and occupation through the medieval and post-medieval periods.

3.2.5 To the east the Site lies ASZ 10-07 Land around Strawberry Hill Farm. The area is situated on the valley shoulder, within landscape dominated by the 20th-century prairie fields, formerly

pre-18th century enclosure. To the west and south, the Site is surrounded by ASZ 10-09 Land around Durham Farm and to the north-east. The research undertaken as part of the ES has recorded few archaeological assets, with the exception of a 19th-century pit. Both ASZ lie on the periphery of an extensive area of metal detected fields at Wendoverdean Farm in which multi-period finds of Bronze Age, Iron Age, Roman, medieval and post-medieval date have been recovered.

Previous Investigations

3.2.6 The Site has been subject to remote sensing survey (ES 3.5.2.10.7), which has recorded identified archaeological features and concentrations of features with the prefix "J" followed by a unique number, within the final report. The results of the survey place the Site within a medieval agricultural landscape evidenced by remains of ridge and furrow agriculture, (e.g. J23-24, J26) and former post-medieval boundaries depicted on historic OS maps (e.g. J10-11). The area to the north-west and to the south of the Site has been subject to geophysical surveys. To the north-west of the Site, a survey undertaken in support of the ES at Durham Farm (site CS040, C252-ETM-EV-REP-020-000221_P02) uncovered the remains of ridge and furrow. Immediately to the south, geophysical survey undertaken within pre-18th-century enclosure fields (site 1348/54, report no. TBC) recorded predominantly natural soil and geological variations, but no anomalies of probable or possible archaeological origins have been identified. Further south, another geophysical survey (1EW03-FUS-EV-REP-CS03_CL05-008027) uncovered mainly similar variations in natural geology. However, a group of linear responses positioned at right-angles to each other, probably reflecting parts of small enclosures, were recorded c. 550m south of the Site.

Site stratigraphy

3.2.7 The British Geological Survey (BGS 2019) indicates that the underlying solid geology within the Site is undifferentiated Lewes Nodular Chalk Formation and Seaford Chalk Formation. Superficial geology is generally absent from the Site with the exception of a small area at its south-eastern corner which lies at the edge of Clay-with-Flints Formation. These deposits formed in the Quaternary and are characterised by unsorted sediment with flint gravel in a sandy mud matrix derived by dissolution of chalk below.

Prehistoric and Roman

3.2.8 The nearest and most significant prehistoric feature in the immediate landscape is a scheduled section of Buckinghamshire's Grim's Ditch earthwork (List Entry 1021198), c. 800m south of the Site (not illustrated). The Buckinghamshire section is thought to have served as a territorial boundary, separating, and perhaps enclosing, organised groups of land and settlement. It may also have been an agricultural boundary, denoting grazing areas and impeding the movement (or theft) of stock. Excavations undertaken to date have provided only limited dating evidence. Pottery recovered from the fill of the ditch indicates that it was in existence in the Iron Age. LiDAR and geophysical surveys provided tentative evidence that the course of the ditch may continue north-east towards Rushmoor Wood, c. 380m south-east

of the Site (HER MBC447-450, 462, 469). However, otherwise, the evidence of prehistoric activity in the vicinity of the Site is absent.

3.2.9 Similarly, only a single discovery of a Roman-period silver coin has been made by metal detector to the northeast of Dutchlands Farm (DWH023) c. 430m south-west of the Site. In the wider landscape, HER indicates a possible Roman villa site on the summit of Cobbler's Hill (MBC3079), c. 1.8km south-west of the Site which may, therefore, have been in the posited villa's hinterland.

Early medieval and later

3.2.10 The archaeological evidence of medieval date in the immediate landscape of the Site is equally scarce and derived mostly from the results of remote sensing surveys which recorded levelled ridge and furrow remains in the fields surrounding the Site (J23-24), still extant in 1985 but absent by the time of the 2012 LiDAR capture. Only two small fields comprising extant ridge and furrow have been recorded around Wendover Dean Farm and Durham Farm to the north of the Site (J25-26). Several faint ploughed-out field boundaries of medieval or early post-medieval date (not depicted on historical OS maps) have been identified to the south and north of the Site (J06, 10-11). Moreover, several of the extant hedges depicted in the 1796 Wendover Enclosure map may have their topographic origins in the medieval period (DWH009-010,027, 034-035).

3.2.11 The Site lies in the southern part of an area comprising several quite coherent elements of pre-18th-century irregular enclosure which lie on the upper eastern flank of the Misbourne Valley. This component of Buckinghamshire's historic landscape comprises predominantly irregular enclosure of medieval or early post-medieval date and is extensive in the Chiltern District. The identified landscape component includes an element of the irregularly shaped assarted enclosure which may well have been enclosed and cleared of woodland for the purposes of farming at the same time as surrounding land enclosures were occurring. It is quite possible that many elements of the historic landscape (identified pre-18th-century irregular enclosures) could, in fact, have originated as assarts. There are no clear dates for the initial creation of most of the assarted enclosures but they are thought to have originated mostly in the medieval period, particularly in the 12th and 13th centuries during the so-called 'land hunger' in England where the growth in population led to greater demand for arable land. These elements of pre-18th-century enclosure are likely to represent the expanding agricultural hinterland of medieval and post-medieval settlements such as The Lee (DWH022) and outlying hamlets and farmsteads. Evidence of former ridge and furrow, now ploughed out, may indicate that some if not all of these elements of irregular enclosure may be of slightly later date (e.g. J24 and J26 noted above). This landscape component has reasonably robust historical coherence and legibility, and as such contributes to the value of settlements such as The Lee which already have a surviving medieval character. It also sets other of the smaller, more ill-defined hamlets such as Hunt's Green, Wendover Dean and Kingsash in a similarly defined historic landscape. It contributes to an understanding of how the agricultural

hinterland on the valley flanks was managed during the medieval period and into the post-medieval period.

3.2.12 The Site is classified as Ancient Woodland which indicates its origins reach back at least to 1600s. The Wendover Enclosure map (Plate 1) indicates that at that time Jones Hill Wood extended further to the north-east than presently. This former boundary is still faintly visible in the LiDAR imagery (Figure 4a). In the Wendover Tithe map (1841), the woodland was still depicted in its larger extent, and the map shows further divisions of the fields enclosed in 1796 immediately south of the Site (Plate 2) – these boundaries, now absent, are also faintly visible in the LiDAR imagery.

3.2.13 By the time of the 1st edition OS map of 1878 (Figure 6a) Jones Hill Wood was reduced to the current extent and the fields to the south have been again amalgamated. The map also shows in the eastern part of the woodland an 'Old Chalk Pit'. However, the pit, still shown in the same extent on the next OS map of 1898, appears to be smaller than what the LiDAR imagery indicates (J09, Figure 4a). It is possible, given the name 'Old Chalk Pit', that the quarry had been more extensive prior to the OS mapping, but it may also be that the extractive activity was resumed at some point after 1898. A north-south footpath crossing the woodland, presumably providing access to the quarry, is also shown in the 1878 map but is absent in the subsequent edition – which potentially supports the first hypothesis. The section of the footpath is still well represented on the LiDAR imagery to the north of the Site but becomes vaguer within the site itself.

3.2.14 The Site has not been visited at the time of writing. However, additional analysis of the LiDAR imagery indicates very faint remains of possible linear features aligned east-west in the northern part of the Site (Figure 4a). They may potentially be continuation of faint ridge and furrow recorded around the Site, but it is likely that they may represent LiDAR processing artefacts (i.e. errors in the representation of information, introduced by the involved equipment or technique). Another faint linear, this time aligned north-south is also visible at the northernmost tip of the Site. It is parallel to the extant western boundary of the woodland and may potentially represent evidence of variations of its extent. The LiDAR also indicates that the southern boundary of the woodland depicted in the historic mapping is well preserved as an extant bank, however, the data is insufficient to determine whether it represents a single or more phases of the woodland's development.

Previous disturbance

3.2.15 The Site has been woodland from at least the post-medieval period onwards, although LiDAR imagery indicates the presence of several linear anomalies, some of which may be the traces of earlier, pre-1600, agriculture. The historic mapping and remote sensing results indicate the presence of a large chalk quarry at the north-eastern boundary of the Site, existing at least from the late 19th century. The extractive activities, or perhaps prospection, may have extended into the Site on a smaller scale, as indicated by several depressions recorded by LiDAR. It is unclear whether the area was deliberately (re)planted. A number of badger setts

identified within the Site and near its boundaries may have impacted upon any archaeological features that may be present within the Site. The extent of the setts is unknown at present, but although they can cover relatively large areas, the impacts are likely to be localised to chambers and tunnels. Consequently, other than localised impacts from the posited extractive practices and animal burrows, any impacts upon the potential archaeological remains that may be present within the Site are likely to be confined to rooting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance.

Specific aims

3.2.16 The aims for Phase 1 investigations at Jones Hill Wood are to:

- Establish the date of the Ancient Woodland using a dendrochronological sample;
- Establish the potential for medieval agricultural features to be present;
- Confirm the nature of the east-west aligned anomalies detected by LiDAR survey; and
- Define the extent of post-medieval quarrying.

3.2.17 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities of Jones Hill Wood.

3.3 C25071 Widmore Farm

Site Location

3.3.1 The woodland area is located within CFA14 Newton Purcell to Brackley in the county of Oxfordshire and in the historic parish of Finmere (NGR centre 462565 232083), with the historic parish boundary between Finmere and Shelswell located alongside the southern boundary of the Site. It measures 2.68ha and lies along a disused embankment of the Great Central Railway, between the A421 to the north and the A4421 to the south, approximately 300m south-east of Widmore Farm and 1.5km south-west of Finmere. The Site occupies part of Grassy Plantation and is not classified as Ancient Woodland.

3.3.2 Most of the Site lies within ASZ 14-07 Mixbury Plateau (Widmore Farm) with a historic landscape dominated by modified parliamentary enclosure. The ASZ is characterised by scattered enclosures visible on aerial photography. It has been deemed as a reasonably good location for early activity, especially on margins of till deposits. It is immediately adjacent to the activity identified at Finmere Quarry (NPB019) with ring ditches and other enclosures visible on aerial photographs on the west side of an old railway line to the south of Widmore Farm.

3.3.3 The eastern boundary of the Site straddles ASZ 14-02 Great Central Railway, constructed in 1899 and closed in 1966. Archaeological remains pre-dating late 19th-century are likely to have

been removed/severely truncated by railway construction, but railway remains are still likely to survive.

3.3.4 The topography of the Site is level, lying at c. 121m aOD across its extent.

Previous Investigations

3.3.5 The Site has been subject to remote sensing survey (ES 3.5.2.14.7) which places the Site within a medieval agricultural landscape evidenced by remains of ridge and furrow agriculture recorded primarily to the south, but also extant within the southern part of the Site itself (e.g. N06-N12, N71). Area immediately to the south of the Site was subject to a geophysical survey (sites C25039 and C25058, 1EW03-FUS-EV-REP-CS06_CL21-000001). No definitive archaeological remains have been identified. However, weak positive trends in Field 12G (c. 170m south of the Site) could be agricultural or relate to the ridge and furrow remains they are situated amongst. In Field 12F (c. 400m south-east of the Site), weak trends are suggestive of small enclosures but are not defined well enough to make a confident interpretation. Given the presence of the Roman Road immediately south of the surveyed area, it is possible the trends could have an archaeological origin. Field 12P, c. 220m south of the Site, produced anomalies which may be associated with a former boundary and possible trackway. No boundaries are visible on historical mapping in this location, so it is suggested that this boundary predates available cartographic sources. However, it is not clear from the associated ploughing trends to the north what age the boundary could be. Nearer the Site, in Field 12Q several curvilinear and linear trends of unknown origin may be a combination of agricultural trends. Across the survey area, there is ample evidence of a former ridge and furrow regime.

3.3.6 An area immediately adjacent to the western boundary of the Site was subject to trial trench evaluation (1EW03-FUS-EV-REP-CS06_CL21-007808). It followed on from a geophysical survey (NA 2006) undertaken in the same location, which however was low-resolution and did not provide useful information with regards to potential archaeological features. The archaeological features were mostly localised within the central area of the site. The features located centrally relate to depression, clearly visible in the landscape, which is the possible location of a sandpit, visible on historical maps (Figure 6b, Plate 5). The recorded features were most likely of the same origin, relating to the 19th-20th century sandpits and associated landscaping and management.

3.3.7 An area of the Finmere Quarry, immediately to the east and north-east of the Site has been subject to a number of geophysical and archaeological investigations, including geophysical survey (NA 2006, NA 2010), trial trench evaluations (TVAS 2002-2013) and excavation (Hart et al.2010) which identified Bronze Age settlement activity and possibly part of a Bronze Age urnfield as well as activity of Iron Age and Roman date.

Site stratigraphy

3.3.8 The British Geological Survey (BGS 2019) indicates that the Site lies on the boundary between two underlying solid geology units. To the north, these are comprised of White Limestone

Formation. To the south are interbedded mudstone and limestone deposits of Forest Marble Formation. Both geological units were formed in the Bathonian age (168.3-166.1Ma) in shallow carbonate seas of the Jurassic period.

3.3.9 Similar north-south geological dichotomy is reflected in the drift deposits. The northern part of the Site overlies mid-Pleistocene Glacofluvial Deposits of sand and gravel formed between the Cromerian and Ipswichian stages by the accumulation of outwash deposits from melting ice.

Prehistoric to Roman

3.3.10 Prehistoric activity in the vicinity of the Site is represented by remains discovered as part of investigations at Finmere Quarry/Foxley Fields (NPB019, whose extent recorded in the ES covers the northern part of the Site, Figure 3b). Early prehistoric evidence discovered there includes small numbers of Mesolithic and Neolithic flints, although not in quantities that suggest the presence of significant activity. Nevertheless, it highlights the potential of the Site to contain artefactual evidence of these early periods.

3.3.11 Several pits with charcoal fills and two pits containing cremations inside collared urns dating to the Early Bronze Age were discovered c. 280m north-east of the Site (MOX12716; Hart et al. 2010). These may belong to a more extensive cemetery and could be associated with a nearby barrow, although traces of such a structure have not been uncovered. The features thought to date to the Bronze Age in the preceding evaluation (Walker 1993) were demonstrated in the excavation to date to the Iron Age (Hart et al 2010).

3.3.12 A multiphase settlement dating to the Middle and Late Iron Age comprising nine roundhouses, pits and two enclosures was excavated 300m to the north of the Site (MOX24814, MOX4796; Hart et al. 2010). This settlement ran adjacent and broadly parallel to the line of the Great Central Railway and appears to extend beyond the limit of excavation. The full extent of this settlement is not known. Another area of Late Iron Age settlement was excavated c. 1km to the north-east of the Site (Grundon 1999), demonstrating the suitability of the area for wider Iron Age activity.

3.3.13 A pair of parallel ditches that were stratigraphically later than the Iron Age activity and morphologically similar to Roman trackways were found to the north of the Site (NPB019; Hart et al. 2010). Although these were not dated, a Roman date is possible. Limited Roman evidence was obtained during excavations c. 1km to the north-west of the Site, demonstrating the predominantly late Iron Age settlement continued into the Roman period (Grundon 1999).

3.3.14 The Roman road from Alcester to Towcester passes 560m to the south-east of the Site (NPB006; Margary Route 160).

3.3.15 The no data (blank) area model (1EW03-FUS-EV-REP-C000-009810) has identified an area to the immediate south of the Widmore Farm Site as suitable for test pitting, with the potential to identify evidence of early prehistoric (Mesolithic & Neolithic) activity.

Medieval

3.3.16 Features dating to the medieval period in the vicinity of the Site are limited to evidence of agricultural activity and landscape organisation. Ridge and furrow remains have been recorded in the southern part of the Site, and also to the south and north-west (NPB093, N06, 08-12, 71; Figure 4b).

3.3.17 The parish boundaries of Finmere, Newton Purcell with Shelswell, and Mixbury converge to the west of the Site (NPB033–35). The boundary between Newton Purcell with Shelswell and Barton Hartshorn, which also forms the county boundary between Oxfordshire and Buckinghamshire, is located to the south-east of the Site (NPB002). These elements of landscape division might date at least as early as the medieval period.

Post-medieval

3.3.18 Newton Purcell was subject to enclosure soon after 1679 (NPB094). This is of historic interest due to the relatively early date of the landscape alteration, and its good historic legibility and coherence.

3.3.19 Two nearby historic hedgerows lie on parish boundaries (NPB001, NPB035), including one immediately to the south-east of the Site. Three buildings of historic interest have been identified in the Environmental Statement (ES) and are visible on early OS maps (NPB004– 5, NPB009), and Widmore Farmhouse (MOX140038), c. 310m to the north-west of the Site, dates to the early 19th century and is Grade II listed (List entry 1369779).

3.3.20 The Great Central Line, opened in 1899, passes along the eastern boundary of the Site (NPB003). Now dismantled, this will form the line of HS2. Apart from the line itself, the Victorian railway appears to have little altered the surrounding landscape; the railway cuts through Grassy Plantation, leaving its north-eastern corner separated from the bulk of the woodland but otherwise the effect is minimal.

3.3.21 Historic maps indicate that the northern part of the Site was wooded as part of Grassy and Finmere Plantation at least from mid-19th-century (Finmere tithe map of 1841, Plate 5). At that time the Site occupied two fields: wooded Barn Ground (now Grassy Plantation) in the north and arable Ling Wood South field to the south – which may indicate that it may have been reclaimed relatively recently prior to tithe apportionment. The later historical OS maps show only three appreciable changes to the landscape in the vicinity of the Site in the last 140 years. This includes the construction of the Great Central Railway which also seems to have resulted by 1923 in woodland formation within the south-western corner of Ling Wood South Field it severed; the reduction of the size of Finmere Plantation between 1923 and 1977, converting former areas of woodland into fields; and the initiation of gravel extraction at

Finmere Quarry in 1993. Apart from these events, the area around the Site appears to have remained rural.

3.3.22 Additional analysis of the LiDAR imagery and site visit have not identified any significant features that have not been recorded previously. Of note may be, however, a series of linear features which are perpendicular to the railway line in the northern part of the Site – their origin is uncertain, but they may potentially be associated with the construction and operation of the railway (Plate 4).

Previous disturbance

3.3.23 The southern part of the Site was in agricultural use until the early 1920s and most likely from the medieval period given the presence of well-preserved ridge and furrow remains. The northern part was woodland at least from the mid-19th century. Consequently, any impacts upon the potential archaeological remains that may be present within the Site are likely to be confined to ploughing and rooting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance. Only along the eastern boundary of the Site, which lies within the footprint of the Great Central Line embankment, archaeological remains – other than those associated with the railway – are likely to have been removed or severely truncated.

Specific aims

3.3.24 The aims for Phase 1 investigations at Widmore Farm are to:

- Confirm or amend the provisional mid-19th century date for the woodland using a dendrochronological sample;
- Examine the potential for residual artefactual remains dating to the Mesolithic and Neolithic periods;
- Investigate the potential for further evidence of Iron Age settlement, as recorded nearby at Finmere Quarry;
- Establish the potential for medieval agricultural features to be present; and
- Define the extent of impacts resulting from the construction of the Great Central Railway.

3.3.25 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities of woodland at Widmore Farm.

3.4 C30027 Halse Copse Farm

Site Location

3.4.1 The woodland area is located within CFA15 Greatworth to Lower Boddington in the county of Northamptonshire and in the historic parish of Brackley St Peter (NGR centre 457383 241481).

It measures 1.88ha and lies c. 800m east of Halse Copse Farm, between the B4525 to the north, Radstone Road to the east and Halse Road to the south-west. The northern c. 0.25ha of the Site is classified as Ancient Semi-natural Woodland which in its entirety measures c. 5.81ha (

3.4.2 Plate 6) (c. 4% of the Ancient Woodland is located within the Site).

3.4.3 The topography of the Site is slightly undulating, occupying the upper part of a south-facing slope of a shallow valley of an unnamed tributary of the River Ouse. The highest point of the Site is located at its northern tip, at c. 160m aOD, sloping gently to c. 152m aOD along its southern boundary.

3.4.4 Most of the Site lies within ASZ 15-02 Halse Copse South which is designated as Ancient Woodland potentially forming part of Salcey/Whittlewood Forest. Known archaeological remains within this ASZ comprise potential woodland features such as wood banks (GLB010).

3.4.5 The western and southern boundaries of the Site encroach on ASZ 15-01 Greatworth parkland boundary, an area whose historic landscape is characterised by an enclosure with survival of possible medieval park pale. It may have lain within Salcey/Whittlewood Forest. The area has been identified in the ES as a potential medieval park pale and known cropmark site (GLB007). The line of the pale itself (GLB003) is conjectural, based on the layout of present field boundaries. As such, it is possible that this feature may once have run through the Site, although no physical or documentary evidence is available to suggest this.

Previous investigations

3.4.6 The Site has been subject to remote sensing survey (ES 3.5.2.15.7) which places the Site within a medieval agricultural landscape evidenced by abundant remains of ridge and furrow agriculture recorded to the east north and west, but also extant within the Site itself (e.g. O01-O05). Fields immediately to the west and south of the Site were subject to a geophysical survey (1EW03-FUS-EV-REP-CS07_CL12-007821). The survey provided evidence of ridge and furrow cultivation patterns but there were no clear indications of further activity of archaeological interest. Several linear and discrete anomalies recorded predominantly to the south of the Site have uncertain origin but are more likely to have natural or modern explanations. Evidence of field boundaries and land drains indicate the area's largely agricultural past.

3.4.7 An area c. 260m to the north-west of the Site was subject to trial trench evaluation (1EW03-FUS-EV-REP-CS07_CL12-007281). The investigation did not uncover any archaeological remains. This may have been caused by modern ploughing which may have truncated archaeological features. Prior to evaluation, the area was subject to a geophysical survey, but this produced inconclusive results due to widespread magnetic disturbance caused by the use of green manure on the field which contained a high amount of ferric objects.

3.4.8 Another trial trench evaluation took place c. 300m north-east of the Site (1EW03-FUS-EV-REP-CS07_CL12-007818). Again, the results were limited, with only medieval or post-medieval furrows and small gullies being recorded, although redeposited Roman finds were discovered within one of the furrows. Altogether seven furrows were identified along with a post-medieval or modern field ditch.

Site stratigraphy

3.4.9 The British Geological Survey (BGS 2019) indicates that the Site overlies the solid geology of Blisworth Limestone Formation. It comprises biogenic and detrital deposits, generally comprising carbonate material (coral, shell fragments), forming beds and locally reefs in shallow seas of the Bathonian age (168.3-166.1Ma). The superficial geology within the Site comprises Oadby Member, glacial till deposit formed by the action of ice and meltwater during the Anglian stage (478-424Ka) which was the most extreme glaciation during the last 2 million years.

Prehistoric to Roman

3.4.10 Scarce evidence for pre-medieval activity within the immediate landscape is represented by cropmarks of enclosures which suggest the presence of a late prehistoric (i.e. Bronze Age or Iron Age) and/or Romano-British settlement (GLB007) c. 160m south of the Site. The identified features comprise a sub-circular enclosure to the north-west and a much smaller trapezoidal enclosure to the south-east. No dating evidence has been recovered from this area, however. There are likely to be other features not visible as cropmarks present between and around the enclosures. Unfortunately, no geophysical surveys have been undertaken in this area to verify these observations. More cropmarks of circular enclosures potentially indicating late prehistoric settlement activity have been recorded c. 500m to the south the Site (NPB090). This tentative evidence may suggest that the Site may have been located in the hinterland of late prehistoric and/or Romano-British settlements.

3.4.11 Further afield, to the north and north-west of the Site the evidence for prehistoric and Roman activity is better represented. Several scatters of Late Neolithic or Early Bronze Age flints have been recorded c. 1.4km (MNN3395) and c. 1.7km west from the Site (MNN18303-4, MNN26354). This evidence has been used to attribute a Late Neolithic/Bronze Age date to several cropmarks c. 1.5km west from the Site, possibly indicating a small settlement with an eastern boundary feature (MNN4148, MNN124337). Bronze Age activity has been speculated from a circular cropmark recorded c. 2km north-west from the Site (GLB213), however, this may alternatively be a horse exercising ring. Fieldwalking undertaken at this location (ES 3.5.2.15.7 Site OU0AB) encountered 45 pieces of prehistoric flint, including a Mesolithic/Neolithic core fragment, several Neolithic core fragments and a complete Bronze Age core. The wider assemblage of worked flint was not attributable to any particular prehistoric period.

3.4.12 Undated rectilinear and curvilinear enclosures, and boundary features, identified by geophysical survey and cropmark examination to the immediate south of Greatworth Hall, c.

1.3km north-west from the Site, likely represent prehistoric settlement activity (1EW03-FUES-EV-REP-CS07_CL12-009410). Similar, though more ephemeral, features are identifiable to the south and south-east of these and may represent associated field systems or possibly a small farmstead closer to the Site (c. 1.4km, GLB214). These features appeared to be overlain by later ridge and furrow and may conceivably be related to either or both the Bronze Age and Iron Age. A cropmark of a possible Iron Age/Roman enclosure of roundhouse has been recorded nearby, c. 1.5km north from the Site (MNN141642).

3.4.13 The Site does not lie within close proximity of known areas of Roman settlement or close to any known roads. The as-yet undated settlement activity c. 1.3km to the north-west of the Site, to the south of Greatworth Hall (EW03-FUS-EV-REP-CS07_CL12-009410), may feasibly hold evidence of continued settlement from the late prehistoric into the Roman period. The undocumented cinerary urns encountered to the east of Greatworth in the 17th/18th century (c. 1.9km north-west of the Site, GLB028) may also represent associated Romano-British settlement activity. Several artefacts of Roman date were recovered from a disturbed gully during trial trench evaluation at Halse Copse East, c. 300m north-east of the Site, comprising a small quantity of 2nd-3rd century AD pottery and a hobnail (1EW03-FUS-EV-REP-CS07_CL12-007818).

3.4.14 Further scatters of Romano-British pottery have been encountered c. 1.4km (MNN3398) and c. 1.7km west from the Site (MNN18310), and c. 2.2km to the north-west (MNN18302). Additional small scatters of Roman pottery have been recorded within the environs of Greatworth (RCHME 1982). The evidence has so far been unable to indicate a potential focus of Roman activity within the nearby landscape, although the recent geophysical survey results at Greatworth Hall may provide this detail.

3.4.15 The no data (blank) area model (1EW03-FUS-EV-REP-C000-009810) has identified an area slightly south from the Halse Copse Site as suitable areas for test pitting, with the potential to identify evidence of early prehistoric (Mesolithic & Neolithic) activity.

Medieval and later

3.4.16 Ample evidence of ridge and furrow remains around the Site (O01,05,05, GLB215, GLB008) implies that in the medieval period it was located in a rural landscape in the hinterland of Halse, which is a medieval shrunken settlement. Indeed, the results of the LiDAR analysis undertaken as part of the ES indicate the presence of ridge and furrow remains within the Site itself and across most of the woodland in which it is located (O04), including the north-eastern portion of Ancient Woodland. However, these anomalies are more regular, straight and shallower when compared to e.g. ridge and furrow remains recorded beyond woodland to the west (e.g.O01). It is, therefore, possible that features identified by ES within the Site as evidence of medieval agricultural regime may by and large be post-medieval plantation furrows, or plantation drainage features (Plate 7). The latter interpretation has been favoured by the arboriculturalist present during the site walkover. Immediately to the north-east of the Site are remains of irregularly shaped partially-degraded remains of a former boundary bank

beneath the trees. Medieval or post-medieval ridge and furrow also visible on the LiDAR appears to cut through the top of the bank. The feature may have continued to the north-east, although this area is obscured by an extant track marked on the 1st Edition OS map of 1884 as a field boundary (Figure 6c).

3.4.17 Remote sensing survey also indicates that some extractive industries may have taken place in the medieval and post-medieval periods c. 170m south of the Site (O02) where shallow sub-oval depression not recorded on historic OS maps has been identified. This may be a possible former extractive pit, although it may alternatively be a natural feature such as a doline, given that the bedrock is limestone.

3.4.18 The woodland of Halse Copse South (GLB010) could be a surviving section of the former medieval hunting forest of Whittlewood/Salcey Forest and lies close to the potential eastern pale of the medieval parkland at Greatworth (GLB003). The pale is a land boundary specific to an estate, woodland etc. marking the extent of the medieval hunting park at Greatworth. The pale appears to be partially preserved in the layout of modern field boundaries especially in the southern section around Halse and the curving boundary of Worlidge. The pale also encompasses Park Lodge near Greatworth. The northern section has been disrupted by construction of Northampton and Banbury Junction Railway (GLB024). The area encompassed by the pale is now almost entirely a post-1634 enclosure landscape of arable fields with some pasture. The pale demarcates a hill edge/ridge location which is typical of medieval hunting parks and the section near Worlidge at least has an exterior ditch with internal wood/hedge bank.

3.4.19 Tithe map of St Peter Brackley (including Halse) indicates that in the mid-19th century most of the Site occupies parts of arable fields named Coppice Ground (47, Plate 8) and Upper Wild (57, Plate 8) where two barn buildings and associated yard were located in the south-eastern corner of the Site. Only the northernmost section of the Site was located within woodland parcel called Little Wood (46, Plate 8). Historical OS mapping suggests that it was not until the last decade of the 19th century when the remaining area of the Site, as well as another field to the east, had been planted with trees. The woodland at that time was also extended to the north, almost reaching Stuchbury Barn (now Bungalow Farm), c. 890m to the north of the Site. By the time of the 1925 OS map, most of the woodland to the north of the Site had been cleared, leaving two discrete areas of Halse Copse Wood (North and South) present today. The above conclusions drawn from the cartographic material may be confirmed by the findings of the arboriculturalist present during the site visit. The northernmost section of the site located within the ancient woodland has evidence of old coppiced ash trees dating back c. 200 years. In the remainder of the Site to the south, such old trees are absent and are dominated by trees characteristic of a timber plantation with oldest specimens being c. 75-100 years old.

3.4.20 No features other than those identified by the analysis of the LiDAR imagery have been identified during the site visit.

Previous disturbance

3.4.21 The Site has been occupied by woodland at least from the late 19th century, with the exception of the northernmost part which being located within Ancient Woodland, is likely to have been wooded from c. 1600. With that exception, the Site has throughout most of its history been in arable use and most previous impacts on archaeological resource that may be present within would have originated from ploughing and planting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance.

Specific aims

3.4.22 The aims for Phase 1 investigations at Halse Copse are to:

- Establish the date of the Ancient Woodland and confirm that of the later plantation using a dendrochronological sample;
- Investigate the potential for late prehistoric and/or Roman features;
- Explore the potential for evidence of the medieval park pale; and
- Establish the potential for medieval agricultural features to be present.

3.4.23 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities at Halse Copse.

3.5 C30031 Fox Covert Whitfield

Site Location

3.5.1 The woodland area is located within CFA14 Newton Purcell to Brackley in the county of Northamptonshire at the south-eastern boundary of the historic parish of Radstone (NGR centre 459403 239482). It measures 1.12ha and lies c. 870m north-east of the outskirts of Brackley in a triangular area occupied by arable fields and pasture formed by the A43 to the south-east, Radstone Road to the west and an unnamed road to the north. The Site is not classified as Ancient Woodland, although it lies 30m south-west from an area of Ancient and Semi-Natural Woodland.

3.5.2 The topography of the Site is flat, sloping slightly to the south-east from c. 147m aOD at the north-western boundary of the Site to c. 140m aOD at its southern extreme.

3.5.3 The Site lies within ASZ 14-27 Radstone Plateau at Fox Covert. The area occupies the top of a south-facing slope overlooking the valley of the River Great Ouse. Historically, the landscape is dominated by a modified parliamentary enclosure. The topographic characteristics of the area on a local exposure of limestone makes this a good location for archaeological remains. This is confirmed by the almost uninterrupted belt of discoveries extending north from Brackley and along the A43. This area has not been developed and the overall archaeological survival is likely to be high.

Previous investigations

3.5.4 The Site and its environs have been subject to remote sensing survey undertaken as part of the ES (ES 3.5.2.14.7) which places the Site within a medieval agricultural landscape evidenced by remains of ridge and furrow agriculture recorded to the north-west, within the environs of the deserted medieval village of Radstone (e.g. N50, 54). A series of linear banks along a slope c. 570m south-east of the Site likely represent strip lynchets (N45), while other extant banks scattered throughout the surrounding landscape may represent former field boundaries (N61, 64) and a windmill mound (N51).

3.5.5 Area immediately to the north-west of the Site was subject to a geophysical survey (1EW03-FUS-EV-REP-CS07_CL12-037130). The survey covered c. 33.7ha of arable and pastoral farmland. Evidence of ridge and furrow and modern plough effects have been mapped, along with land drains and old field boundaries, but no other features of archaeological origin have been identified.

3.5.6 Geophysical survey immediately to the north of the Site (1EW03-FUS-EV-REP-CS07_CL12-001955) has identified a field system of possible prehistoric origin, overlaid by ridge and furrow cultivation.

3.5.7 Another geophysical survey was undertaken in support of the ES (site GO0AF) in fields located to the south-east and south of the Site. The investigations uncovered a large group of anomalies c. 400m south of the Site (NBP073) indicative of a Romano-British settlement. This complex is apparently defined by a ditch and contains two large rectilinear enclosures, as well as several smaller enclosures, subdivisions and pits. While the majority of these anomalies are clearly archaeological in nature and indicative of a prehistoric settlement, the shorter linear and pit-like responses within the enclosure complex have been placed in the 'Possible Archaeology' category, reflecting the lesser degree of confidence in their interpretation. Immediately south-east of the Site the results of the survey indicated the presence of only two linear features which may be related to a Romano-British site posited to exist further south. Geophysical survey in this former area was followed by trial trench evaluation (1EW03-FUS-EV-REP-CS07_CL12-037127). However, with the exception of a single ditch, there were no archaeological features present in the trial trenches. Most anomalies identified by the geophysical survey were shown to be associated with variations in the geological substrate.

Site stratigraphy

3.5.8 The British Geological Survey (BGS 2019) indicates that the Site overlies the same solid and drift geological units as C30027 Halse Copse Farm (see above).

Prehistoric

3.5.9 There are no securely dated prehistoric remains known within the Site, although relatively substantial evidence for such activity can be found to the south-west, near to Northampton roundabout on the A43 Brackley bypass (NPB073 and NPB074, c. 370m from the Site). These include Bronze Age finds, but mostly relate to an Iron Age settlement characterised by

numerous roundhouses, postholes, ditches, and pits, some that were stone lined. These remains are known through aerial photography and trial-trench evaluation, and activity is thought to extend from the early Iron Age to the 1st century AD. Another Iron Age settlement is located c. 760m south-west of the Site (NPB083).

3.5.10 Immediately to the north of the Site a geophysical survey has uncovered remains of an undated, albeit most likely late prehistoric, field system (1EW03-FUS-EV-REP-CS07_CL12-001955). No evidence for an associated settlement has been uncovered, however, a section of strongly magnetically enhanced fill within one of the features ([3]) may hint at a presence of non-natural material which could include soil heated within the environs of a settlement.

3.5.11 Several cropmarks exist on land immediately north-east of the Site (NPB077), and these may continue further north (NPB085). Most of these appear to be field boundaries, although one may be a mill mound (ENN4500). These features lie near to where Romano-British and medieval pottery has been recovered during fieldwalking around Fox Covert and may date to these periods, however, prehistoric origins should not be ruled out (MNN25428; MNN2028; MNN32057; MNN140322).

3.5.12 A series of wide linear banks are visible as slightly extant earthworks across two fields c. 500m south-east of the Site, opposite the A43 (N45; NPB100). These features lie parallel to each other and are closely spaced, following the contours of the slope. They appear to be lynchets rather than field boundaries and although they remain undated, they seem likely to be prehistoric based on their morphology.

Roman

3.5.13 There may have been a small Roman town or roadside settlement at the nearby Brackley overlooking a crossing of the River Great Ouse (c. 2km south of the Site) and much Romano-British material has been recovered from within the town and to the south around Evenley.

3.5.14 Excavations associated with the widening of the A43 uncovered the eastern periphery of a possible Romano-British temple complex (NPB073) near Sundale located c. 360m south of the Site (Mudd 2007). The discoveries included a temple enclosure as well as other settlement remains and possibly part of the associated field system. The aforementioned geophysical survey revealed a large and complex group of anomalies, which are likely to be associated with the prehistoric and Romano-British activity. It is possible that, given the shape of the smaller enclosures identified in the surveyed area, they represent further remains of the possible temple complex. Unstratified Roman finds uncovered in the area include pottery and metalwork, as well as possible funerary activity (ENN4496; MNN18093–4). A possible Roman cemetery is also known 1km to the north-east of the Site (NPB072).

Medieval and post-medieval

3.5.15 The parish boundary between Whitfield and Radstone, which may date back to the medieval period, crosses the southern part of the Site and follows its north-western boundary

(NPB078). A historically important hedgerow recorded in the 1797 enclosure map also follows part of this boundary (NPB082).

3.5.16 Other evidence for medieval activity within the area is scarce and similarly tentative. The geophysical survey around the Site recorded areas of ridge and furrow to the south, partially overlying the Romano-British site, and there are signs of plough marks recorded to the south-east of the Site. Extensive remains of ridge and furrow have also been recorded immediately north-west of the Site by remote sensing survey (N54). This may suggest that the Site was being used as farmland, probably from at least the medieval period onwards.

3.5.17 Intriguingly, the additional analysis of LiDAR imagery and a site visit suggest the presence of parallel linear features within the Site itself. Although they may be remains of ridge and furrow, it is not impossible that they could also represent woodland planting furrows. Indeed, the Whitfield Enclosure map of 1797 (Plate 10) indicates that the Site was located within a large, as yet seemingly unenclosed arable or perhaps pasture field. This is indicated by the presence of a T-shaped structure, perhaps a barn, c. 120m north-east of the Site, visible as an earthwork anomaly on LiDAR imagery. Intriguingly the posited structure would have been located in an area designated as Ancient Woodland (Figure 3), which itself is not shown on the enclosure map.

3.5.18 The area of the existing woodland (including the Site) is depicted on the 1st edition OS map of 1884 (Figure 6d) in the extent unchanged to this day. The construction of the Great Eastern Railway in 1899 to the west of the Site (NPB075), appears to have had very little impact on the rural character and the agricultural landscape of the Site's environs which have changed little in the past 140 years.

Previous disturbance

3.5.19 The cartographic evidence indicates that probably until as late as the 1880s the Site was in agricultural use being planted only around the time of the 1st edition OS mapping. A badger sett identified within the Site may have impacted upon any archaeological features that may be present within the Site. The extent of the sett is unknown at present, but although it can cover a relatively large area, the impacts are likely to be localised to chambers and tunnels. Consequently, other than localised impacts from animal burrows, most previous impacts on archaeological resource that may be present within the Site would have originated from ploughing, planting and rooting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance.

Specific aims

3.5.20 The aims for Phase 1 investigations at Fox Covert Whitfield are to:

- Establish the date of the woodland using a dendrochronological sample;
- Investigate the potential for a continuation of the possible late prehistoric field system as recorded nearby;

- Explore the potential for Roman features/artefacts associated with that recorded nearby at Sundale;
- Establish the date and nature of linear earthworks identified within the woodland; and
- Investigate potential for features/artefacts associated with the parish boundary.

3.5.21 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities at Fox Covert Whitfield.

3.6 C32030 Windmill Hill Spinney

Site Location

3.6.1 The woodland area is located within CFA16 Ladbroke and Southam in the county of Warwickshire in the historic parish of Ladbroke (NGR centre 442524 259279). It measures 2.35ha and lies equidistant (c. 450m) to the outskirts of Ladbroke to the west and Ladbroke Hill Farm to the east. The Site is not classified as Ancient Woodland.

3.6.2 The Site is located on a north-facing slope of Windmill Hill, immediately north of and north-west of the ridgeline. The topography of the Site is heavily undulating. Along its southern boundary, the Site reaches the elevation of c. 122m aOD sloping sharply down to c. 100m aOD to the north.

3.6.3 The Site lies within ASZ 16-11 Ladbroke: Windmill Hill/ Lady Hill/ Ladbroke Hill. The area is dominated by a low chain of hills running north-east to south-west, with moderately steep slopes occupied by agricultural, mainly arable fields, with woodland on top of Windmill Hill, in which the Site is located.

3.6.4 While the ES recorded no known archaeological remains earlier than well-known remnants of ploughed out medieval field systems and post-medieval agriculture with associated farmsteads, the recent HS2 investigations revealed evidence of prehistoric activity on the slopes of Lady Hill (see below). Moreover, the hilltop position at Windmill Hill summit may have been attractive for settlement and/or a defended site in the past. Potential for unknown buried late prehistoric/Roman/early medieval archaeology has been identified by the ES within the area.

Previous investigations

3.6.5 The Site has been subject to remote sensing survey (ES 3.5.2.16.7) which places the Site within a medieval agricultural landscape evidenced by abundant remains of ridge and furrow agriculture recorded in the fields surrounding the Site from the North, west and south (e.g. WA16.36-37). Within Windmill Hill Spinney and the Site, the survey identified a number of irregular linear features of uncertain origin (WA16.40, see below).

3.6.6 The area around the Site has been subject to several geophysical surveys. Fields to the south-east of the Site were surveyed as part of the ES (site CN004). Although the area immediately

adjacent to the Site produced only anomalies identified as the remains of medieval ridge and furrow, c. 280m south-east of the Site was a series of complex enclosures. Only the edge of the complex was investigated in this survey, and it was unclear whether the small enclosures of most likely prehistoric date had an agricultural or a domestic function, but the complex is clearly of archaeological interest.

3.6.7 A subsequent geophysical survey (1EW03-FUS-EV-REP-CS07_CL23-007769), extending further south-east, uncovered the south-easterly continuation of this posited settlement and a large system of field enclosures consisting of long linear and curvilinear boundary trends, including possible trackways or avenues.

3.6.8 In the immediate surroundings of the Site, to the east, north and south another survey (1EW03-FUS-EV-REP-CS07_CL24-007768) uncovered no trends of a definitive archaeological nature. However, a number of recorded anomalies are likely to be of a possible archaeological origin. Immediately to the north-west of the Site, they comprised a possible archaeological field system including a trackway and an enclosure. It may be associated with a possible archaeological settlement characterised by a number of circular enclosures or roundhouses alongside linear and curvilinear trends further north-west, c. 750m from the Site. Other trends, indicative of archaeological remains but perhaps more likely to be the result of agricultural or natural variations in the ground, have been observed to the east of the Site. Ridge and furrow ploughing trends were recorded across the surveyed area implying that it has been extensively farmed in the past, at least from the medieval period onwards.

3.6.9 Area immediately to the west of the Site was also investigated through a geophysical survey (1EW03-FUS-EV-REP-CS07-001583) which uncovered good evidence for medieval and post-medieval land use, with evidence of perhaps two episodes of re-organisation, one potentially within the medieval period. However, no convincing magnetic evidence for prehistoric activity has been identified. A subsequent monitoring of the excavation of 11 mitigation ponds and evaluation comprising 8 trial trenches, have uncovered within this area (1EW03-FUS-EV-REP-CS07_CL24-007292) undated, but presumably medieval, remains of ridge and furrow agriculture and a post-medieval field boundary recorded on historic OS maps. Of the eight trenches excavated, only two revealed features which corresponded with the anomalies recorded in the geophysical survey.

Site stratigraphy

3.6.10 The British Geological Survey (BGS 2019) indicates that most of the Site overlies the bedrock of Charmouth Mudstone Formation, comprising interbedded sequences of sedimentary mudstone deposits formed in shallow Jurassic seas (199-182Ma). Along the southern boundary of the Site at the ridge of Windmill Hill, the solid geology comprises an outcrop of limestone of the Charmouth Mudstone Formation formed in the same epoch in similar marine conditions, however comprising biogenic deposits of fine-grained sediments, with carbonate material (coral, shell fragments).

3.6.11 The BGS does not identify any drift or superficial geology within the Site.

Prehistoric

3.6.12 There is little previously known evidence of early prehistoric (Palaeolithic, Mesolithic & Neolithic) activity within the Site or its environs. Traditionally, the topographic and geological character of the area would indicate a limited potential for early prehistoric use, as, due to difficult to work, heavy soils, wooded conditions may have prevailed. However, the lack of finds may be the effect of limited large-scale development (and associated investigations) as more recent research suggests. Claylands, such as those in which the Site lies, may have some potential for Mesolithic activity (Garwood 2011). Specifically, such evidence is likely to be present within the buried alluvium along the Upper Itchen and its tributaries – however, no such deposits are known within the Site or its environs.

3.6.13 Although later prehistoric periods (Bronze Age & Iron Age) are better represented in Warwickshire, no known heritage assets datable to these periods are known within the Site or its vicinity. However, given the presence of Bronze Age remains in the western part of the Itchen valley, it is possible that similar remains have not been identified within the Site and its environs through a lack of previous research rather than an actual absence of remains in this location. It is not impossible that the circular enclosure identified by a geophysical survey south of the Site may represent a barrow and the earliest of the identified settlement may date to this period.

3.6.14 Most features identified through geophysical and hyperspectral surveys immediately south of the Site (LBS102) may date to the Iron Age and/or Romano-British period. The features comprised linear and curvilinear boundary trends, including possible trackways, avenues and enclosures. It is possible that these anomalies may represent two phases of activity. A circular anomaly, which could relate to a roundhouse or a ditched enclosure, has also been identified. Although geophysical data is difficult to date, it is suggested that of the two phases of activity visible across the Site, one phase is likely to be Iron Age/Romano-British, the other could date to the early-medieval or medieval periods due to the regularity of some of the enclosures and structures. A group of weaker anomalies, whose alignment diverges from the two main phases, could represent an even older settlement, perhaps predating the posited Iron Age/Roman phase.

3.6.15 The no data (blank) area model (1EW03-FUS-EV-REP-C000-009810) has identified areas to the immediate north and south of Windmill Hill Spinney as suitable areas for fieldwalking, with the potential to identify evidence of early prehistoric (Mesolithic & Neolithic) activity.

Roman

3.6.16 Although a coin hoard (HER MWA10066) and a brooch (HER MWA7524) found at Ladbroke indicate that there was Romano-British settlement near the village, there are no firmly dated heritage assets that relate to the Romano-British period within the Site and its immediate vicinity. Nevertheless, the features on southern slopes of Windmill Hill (LBS102) and their southerly continuation discussed above may by and large date to this period. The features have been putatively dated to the Iron Age/Romano-British period on morphological grounds,

as the features identified from geophysical survey data look very similar to excavated examples of settlement enclosures of these periods elsewhere in Warwickshire (e.g. Long Lawford, Salford Priors, Hampton Lucy and Sherbourne).

Medieval and later

3.6.17 There are no heritage assets recorded within the Site end its environs that have been dated with any certainty to the early medieval period, however, as discussed above, some of the geophysical anomalies identified nearby may be of early medieval/medieval date given their regularity.

3.6.18 During the medieval period settlement was focussed on the nucleated village of Ladbroke (LBS048) c. 900m west of the Site. Ladbroke dates to the medieval and post-medieval periods, although it is known to have Anglo-Saxon origins. The place-name evidence indicates that although the settlement was focused on the nucleated settlement at Ladbroke during this period there was a dispersed settlement in the south and west of the parish. Indeed, there are extensive areas of surviving medieval ridge and furrow within the Site's vicinity (LBS044, LBS045, LBS046 and LBS49), and the extensive and well-preserved areas of ridge and furrow around Ladbroke have been highlighted by Historic England as being of particular importance (Hall 2001). Remains of ridge and furrow have been recorded primarily to the south, west and north-west of the Site (WA16.36-37) and further west and south (surrounding the medieval village of Ladbroke).

3.6.19 The landscape around Ladbroke and surrounding the Site has remained largely rural up to the present day. The landscape has been defined primarily by the post-medieval enclosed fields dotted with a number of post-medieval buildings, including the Bungalow (LBS042) and an agricultural shed (LBS043). The enclosed landscape surrounding Ladbroke has seen limited modifications during the modern period, with the most notable change represented by the construction of the Ladbroke bypass road which cut through the ridge and furrow to the east of the village core. The remote sensing has also recorded a number of post-medieval and still existing ponds to the south of the Site (WA16.32 and WA16.38).

3.6.20 The 1639 map of the manor of Ladbroke indicates that the Site was located at the northern extent of a single large field called simply 'Mill Hill' (Plate 12). However, the map does not depict woodland within this location and may imply that up until this point the area may have been under cultivation. This possibility is quite intriguing given that the Windmill Hill Spinney in which the Site is located is dominated by a series of parallel linear features forming irregular platforms or terraces identified in LiDAR imagery (WA16.40) and during the site visit. Their function and origin are unclear and it is not impossible that they are natural features resulting from the erosion of a steep slope. However, a site walkover has identified in a number of instances the presence of stones at the leading edges of these platforms which may imply deliberate terracing at some point in the past.

3.6.21 The first map showing the area of the Site as wooded is the 1838 Tithe map of the parish of Ladbroke (Plate 13), which indicates that woodland was confined to a much smaller area than

presently. Historical OS maps show that the extent of the spinney remained unchanged until the early 1970s when the area to the south-west of the original woodland appears to have been planted and assumed the form and extent visible today.

Previous disturbance

3.6.22 There is some tentative evidence to suggest that the Site may have been in agricultural use until the mid-19th century, although the extant linear features forming irregular platforms or terraces which may be associated with deliberate landscaping, may also be of natural origin. The northern part of the Site has been woodland at least from the mid-19th century, with the remainder planted in the 1970s. Consequently, most previous impacts on archaeological resource that may be present within would have originated from ploughing, planting, and rooting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance.

Specific aims

3.6.23 The aims for Phase 1 investigations at Windmill Hill Spinney are to:

- Establish the date of the woodland using a dendrochronological sample;
- Explore the potential for Mesolithic, Neolithic & Bronze Age evidence;
- Investigate the potential for a continuation of Iron Age/Roman features as identified to the immediate south;
- Establish the potential for medieval agricultural features to be present; and
- Confirm the nature of the linear features detected by LiDAR survey and visual inspection.

3.6.24 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities at Windmill Hill Spinney.

3.7 C32033 Fox Covert

Site Location

3.7.1 The woodland area is located at the northern boundary of CFA15 Greatworth to Lower Boddington in the county of Northamptonshire and in the historic parish of Lower Boddington (NGR centre 446235 253548). It measures 1.34ha and lies equidistant (c. 1.3km) to the Wormleighton to the west and Upper Boddington to the east, adjacent to an unnamed road linking both villages. The Site, which measures 1.34ha forms part of Ancient Semi-natural Woodland (covering a total area of c. 3.27ha - the Site equates to c. 40% of the Ancient Woodland).

3.7.2 The Site lies at the foot of a relatively prominent hill, although its topography is flat with a shallow south-westerly slope. The highest point of the Site is located at its north-eastern boundary at c. 144m aOD and its lowest lies at its southernmost extreme at c. 139m aOD.

3.7.3 The Site lies at the north-western boundary of ASZ 15-33 Undulating Lias lowland. The area is gently undulating but trending towards south-easterly slope overlooking Highfurlong Brook. Historically, the landscape is defined by a modified enclosure with some later field amalgamation and very good survival of ridge and furrow. The area is relatively poorly drained but with good south-easterly aspect overlooking Cherwell tributary, which makes this a relatively good locality for past activity, as tentatively evidenced by the presence of cropmark sites near Three Shires (GLB202 and 208) and Fox Covert (GLB211) (see below).

Previous investigations

3.7.4 The Site has been subject to remote sensing survey (ES 3.5.2.15.7) which places the Site within a medieval agricultural landscape evidenced by abundant remains of ridge and furrow agriculture recorded in the fields surrounding the Site (e.g. O84-87, WA16.9). A series of furrows has also been recorded within the Site (WA16.6) although different alignment and narrower spacing may indicate that they are associated with plantation rather than medieval agriculture. Similar features seem to have extended beyond the western boundary of the Site, now under agriculture. The survey has also identified three interlinked ponds, one of which located within the Site at its south-western boundary.

3.7.5 Although the nature of the Site has prevented non-intrusive surveys other than remote sensing to be undertaken as part of the ES, the area surrounding it was subject to several geophysical surveys. Fields immediately to the west, south and south-east and further to the south-east were subject to a substantial geophysical survey (1EW03-FUS-EV-REP-CS07_CL14-007768) over an area of c. 19.52ha. No trends of a definitive archaeological nature were identified although a number of anomalies are likely to be archaeological in origin. Trends of a possible archaeological nature have been identified mainly to the south-east, including the remains of two possible settlements, with anomalies located closest to the Site being recorded c. 540m away. Given the presence of a former Roman road running directly next to these fields, as well as the presence of known archaeology in Lower Boddington to the south-east of the surveyed area, it is highly likely that a number of these trends are archaeological in origin. Ridge and furrow ploughing trends can be seen in all of the datasets throughout the surveyed site.

3.7.6 To the north-west of the Site, another geophysical survey (1EW03-FUS-EV-REP-CS07_CL14-009411) conducted over approximately 55.6 ha of arable farmland produced evidence of later prehistoric settlement activity. Many uncertain anomalies recorded across the area may have archaeological, agricultural or natural origins. Ridge and furrow, former field boundaries and land drains are also visible in the data.

3.7.7 The most recent geophysical survey (1EW03-FUS-EV-REP-CS07_CL14-001956) undertaken along the north-western boundary of the Site uncovered no features of archaeological

interest other than the evidence of ridge and furrow cultivation, which is partly evident as topographic variation within the field.

Site stratigraphy

3.7.8 The British Geological Survey (BGS 2019) indicates that the Site overlies the bedrock of Charmouth Mudstone Formation, comprising interbedded sequences of sedimentary mudstone deposits formed in shallow Jurassic seas (199-182Ma). There are no superficial (drift) deposits recorded within the Site.

Prehistoric and Roman

3.7.9 A geophysical survey (1EW03-FUS-EV-REP-CS07_CL14-007768) uncovered c. 900m south-east of the Site remains including a probable late prehistoric settlement. It comprised a number of square enclosures or houses and a possible roundhouse, as well as linear trends suggestive of a boundary or trackway around which the posited settlement remains appear to be arranged.

3.7.10 A cluster of possible small roundhouses have been identified nearer the Site, c. 540m to the south-east, however, the magnetic strength of these anomalies is very weak. The posited roundhouses are small (5m diameter), often surrounding a smaller internal circular anomaly. To the east, the survey recorded more faint curvilinear trends which could be archaeological in origin. To the north-west of these features were the remains of a broad linear trend aligned north-east to south-west. The trend follows the same alignment as surrounding ridge and furrow trends and could relate to a former field boundary, although none are visible in this location on historical mapping and may perhaps also be an older boundary associated with the posited settlement.

3.7.11 Geophysical survey undertaken to the north-west of the Site (1EW03-FUS-EV-REP-CS07_CL14-009411) uncovered a large rectangular enclosure with entrance from the west and internal divisions, just 240m from the Site's boundary. The enclosure is located within an area of further settlement activity, comprising enclosures, a series of ditches and areas of enhanced response potentially representing a build-up of cultural layers. The rectangular enclosure corresponds with the location of undated cropmarks (LBS003) identified by the ES.

3.7.12 Cropmarks of linear features and possible enclosures recorded c. 290m south-west of the Site (GLB208) suggest the presence there of another possible late prehistoric and/or later settlement.

3.7.13 The ES and Northampton HER record cropmarks of a curvilinear enclosure (GLB211) and possibly other features at Fox Covert, which are deemed likely to have originated in the late prehistoric and Roman periods. However, other than an outline of a possible trackway shown by HER c. 160m north of the Site (MNN123265), there is little detailed information about the nature of these posited features. No detail has been captured by the remote sensing surveys undertaken as part of the ES. Additional analysis of the LiDAR imagery indicates that the feature referred to in the ES is a large oval feature which – it has been proposed - may reflect a

large late prehistoric structure or remains of a Civil War encampment, although multidirectional hillshade analysis indicates that the feature may be a raised footpath circumnavigating the Ancient Woodland. A Site walkover seems to confirm this latter interpretation, although due to dense undergrowth present across the Site, a possibility that the footpath follows the outline of an earlier raised feature cannot be completely discounted (Plate 15-Plate 16).

Medieval and post-medieval

3.7.14 The Site lies at the junction of three parishes and two county boundaries. The Site's western boundary follows the parish boundary between two parishes in Northamptonshire Upper Boddington (where the Site is located) and Stoneton, immediately to the west (GLB210). The county boundary between Northamptonshire (Upper Boddington) and Warwickshire (Wormleighton) is immediately to the south-west (GLB184). To the north-west is a section of a field boundary between Wormleighton and Stoneton (LBS010), once the Warwickshire/Northamptonshire county boundary. The boundary between Upper Boddington and Claydon, Oxfordshire lies c. 1.1km to the south-west. These boundaries were likely established by the medieval period and are in part followed by extant hedgerows. To the south-west of the Site, the boundary is evident as a large extant bank, although the age and origin of this feature are currently unclear. No parish boundary line is understood to have passed through the Site, although features and/or deposits associated with the adjacent Wormleighton/Stoneton and Warwickshire/Northamptonshire boundary may be present.

3.7.15 The south-western boundary of the Site is formed by Welsh Lane (GLB115), which follows the line of former medieval and post-medieval cattle drovers' route forming part of a drovers' way from North Wales to London. The route may follow an earlier Saxon route-way linking the burhs of Buckingham and Warwick, which itself may follow the line of a Roman road and possibly the line of a route established by the Iron Age. It is possible that late prehistoric and Romano-British activity within the nearby landscape may be concentrated close to the line of this route.

3.7.16 The route crosses the Cherwell at Trafford Bridge (GLB132, c. 8km south-east of the Site), adjacent to the Romano-British and likely Iron Age settlement near Blackgrounds (GLB138/144). The route may have been used by rebel forces marching to fight at the Battle of Edgcote and was almost certainly the route by which rebel reinforcements arrived. The road, therefore, forms an integral part of the landscape of Edgcote Battlefield (GLB108c. 8km south-east of the Site). In addition to this, the Welsh Lane forms an integral element within the Lower Boddington landscape (GLB228, c. 2km south-east of the Site). The Welsh Lane, therefore, serves as a link that binds a number of historic landscape components together and gives coherence to this part of the landscape of the Cherwell headwaters with a time depth that probably extends back to at least the Roman period.

3.7.17 The area surrounding the Site has been extensively farmed throughout history, at least from the medieval period as evidenced by well-preserved remains of ridge and furrow cultivation

(GLB206, LBS002) identified around the Site by remote sensing (WA16.9, O86-87), and all geophysical surveys undertaken in the area surrounding the Site. It is also probable that a number of the uncertain trends visible in the geophysical datasets will relate to medieval activities.

3.7.18 Linear features of unknown date are visible as cropmarks on aerial photographs (LBS006). They are situated 200m west of Berryhill Plantation and c. 330m north-west of the Site. The asset may possibly be associated with Stoneton deserted medieval settlement c. 560m north of the Site (LBS007, not illustrated) or may be agricultural in origin. The village of Stoneton is recorded in the Domesday Book but disappears from documentary records from the early 14th century. It was probably abandoned for sheep grazing sometime in the 15th/16th centuries. The surviving earthworks are concentrated in a grassed field to the south of a moated enclosure now occupied by the late 18th century Stoneton Manor (LBS008, not illustrated). Earthworks are also visible to east of Leisure Drive running up the slope towards Berryhill Farm. The HER describes this site as including village house platforms, fishponds, a mill, and a possible chapel site. Earthworks were once more extensive to west, towards the Oxford Canal, and north as evidenced by the aerial photography.

3.7.19 Fox Covert, in which the Site is located is designated as Ancient Woodland, which indicates that it dates back to the 17th century. It is, therefore, difficult to determine whether it may have been in some ways associated with the Stoneton village and/or Stoneton manor in the medieval period (cf. ES 3.5.2.16.4, p.20). In the late Saxon period there were two manors associated with Boddington and it is possible that these developed into Upper and Lower Boddington in the later medieval period. It is therefore possible that the woodland of the Fox Covert may have been associated with one of these settlements as well. The name itself, recorded on the 1st edition OS map indicates that at some point the woodland was used for game management together with Lodge Spinney located c. 400m to the north-east. By 1900 the two areas of woodland have been enhanced by the planting of Berryhill Plantation between the two.

3.7.20 Within the Site, the presence of a large pond (WA16.7) near its south-western boundary indicates that the woodland has been managed, although the feature is not depicted on any of the available historical maps and is likely to be relatively recent. The LiDAR imagery indicates the presence of furrows aligned NE-SW, but narrower than the adjacent ridge and furrow observed in a field to the west. The features may, therefore, be plantation furrows rather than reflective of medieval agricultural regime. Nevertheless, the additional LiDAR imagery analysis indicates the presence of two linear features parallel to the south-western boundary of the Site. These may be the remains of agricultural ridge and furrow visible to the north-west. But it is also likely that the features may represent the former boundaries of the woodland or perhaps features reflective of the development of the Welsh Road. This interpretation may be supported by the observations made during the site visit. The parallel linear features are still very pronounced, despite the dense undergrowth and more characteristic of bank and ditch features, rather than ridge and furrow. Moreover, a line of

coppiced ash trees, provisionally dated by the arboriculturalist present during the visit as being 200-400 years old, follows the line of the southern of the two bank features. This may be indicative of a former boundary of the woodland which would have been set further back from the current alignment of Welsh Road and may reflect historical undulations of this ancient communication route (Plate 17). The north-western boundary of the Site coincides with the parish boundary between Wormleighton and Upper Boddington represented by a bank and ditch.

3.7.21 The location of the Site in woodland at an important road to London, near a road junction and at the convergence of well-established boundaries, would make it a perfect place for establishing a local Home Guard defensive strongpoint – possible mortar/machine gun nest etc. – during WW2. The limitations of LiDAR imagery make identification of such features difficult. Moreover, dense undergrowth present across the Site during the site walkover may have also obscured the more ephemeral features. Consequently, even though the presence of any such features could not be verified, but the potential for their existence within the Site should be considered. Two pillboxes have been recorded along the Oxford Canal c. 1.2km and 2.8km north of the Site and a machine gun along the same road at Aston le Walls c. 4.3km to the south-east. The defensive features may be associated with a defensive perimeter surrounding the battle headquarters at Appletree and Chipping Warden Airfield.

Previous disturbance

3.7.22 The Site is designated as Ancient Woodland and it is probable that it has been since c. 1600. However, the presence of linear features, some of which may represent ridge and furrow, indicate that it may have been under cultivation in the medieval period and perhaps earlier. Consequently, most previous impacts on archaeological resource that may be present within would have originated from ploughing, planting, and rooting. Any damage from rooting would primarily affect upper horizons while deeper features are likely to be subject to more limited disturbance.

Specific aims

3.7.23 The aims for Phase 1 investigations at Fox Covert Lower Boddington are to:

- Establish the date of the Ancient Woodland using a dendrochronological sample;
- Explore the potential for late prehistoric features/artefacts and an association with contemporary settlement evidence identified nearby;
- Examine the northern flank of Welsh Lane for evidence to better understand its origins and development;
- Investigate potential for features/artefacts associated with parish/county boundaries;
- Establish the potential for medieval agricultural features to be present;
- Establish the potential for Second World War defensive features to be present; and

- Confirm and characterise the sub-circular feature identified within the Ancient Woodland.

3.7.24 The results of this objective-led approach will contribute to the establishment of a chronology of the historic use and activities at Fox Covert Lower Boddington.

4 Aims and Specific Objectives

4.1 Need and Aims

4.1.1 The general aims of the woodland evaluation are to determine, as far as reasonably possible, the nature of the archaeological resource within the Sites, including remains associated with activity prior to the establishment of woodland as well as finds and features related to the exploitation and management of the woodland resource. More specifically, the woodland evaluation is required to identify the presence of woodland bank features, rides and other features that may be recorded and investigated as part of fieldwork which will also retrieve any artefactual evidence that may be present in the absence of geophysical surveys, which are inappropriate in these locations. The evidence suggests there is a potential for the Sites to contain as yet unknown archaeological remains of prehistoric/Roman, medieval and post-medieval dates. In three instances, the woodland Site boundaries correspond with historic parish boundaries.

4.1.2 The objective of the investigation is to identify the extent and character of any surviving archaeological remains within the Site and to inform an archaeological resource assessment of its knowledge value and ability to contribute to Specific Objectives. The outcomes of the investigation will be used to inform the requirement and strategy of further archaeological investigation. Where present, the investigation will define the character, extent, quality, preservation and significance of the archaeology in order to determine its potential to contribute to Specific Objectives set out in the GWSI: HERDS.

4.1.3 The aims of the woodland evaluation are:

- to confirm the presence/absence, extent and depth of any surviving archaeological remains within the Site;
- to determine the nature, date, condition, state of preservation, complexity and significance of any archaeological remains;
- to determine the likely range, quality and quantity of artefactual and environmental evidence present;
- suggest measures, if appropriate and feasible, for further archaeological investigation to mitigate identified significant impacts; and
- contribute to the delivery of GWSI: HERDS Specific Objectives as specified in Section 4.2.

4.2 Contribution to Specific Objectives

4.2.1 Through delivery of the works set out in Section 5 and through addressing the aims set out in 4.1, the woodland evaluation will create knowledge and outputs that would contribute to the following specific objectives in the following ways:

Table 1 Contribution to HERDS Objectives

Specific Objective	Contribution
CE 1: Marking and communicating the changes to landscapes and environments.	The broad scope of the route-wide Project Plan enables a wider view of the historic development of landscapes along the HS2 Central scheme. Utilisation of methods such as aerial photography, remote sensing and map regression interpretation enables a deeper understanding of past uses and activities within landscapes and how these are preserved in the archaeological and historical records.
KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age.	Examples of Mesolithic, Neolithic and Bronze Age flintwork have been recovered within the wider environs of several of the Sites, indicative of some degree of early prehistoric presence (C25071, C30027, C32030). Should further evidence be encountered within the Site, this would contribute to our understanding of early prehistoric populations, activities and settlement along the route.
KC9: Does a lack of visibility of Neolithic and Bronze Age monuments reflect genuine area distinctiveness, or is this due to variation in geology or investigative techniques?	A small number of confirmed and putative Bronze Age monuments have been recorded within the environs of the Sites. Although no such remains are suggested to lay within the Sites, the confirmation or disproving of this could contribute to our understanding of the distribution of these monuments along the route.
KC15: Can we identify regional patterns in the in the form and location of Late Bronze Age and Iron Age settlements across the route, and are there associated differences in landscape organisation and enclosure?	The potential for the presence of archaeological features and finds dated to the later prehistoric periods has been identified, to a varying degree, within the individual woodland parcels comprising the Site. The investigations proposed within these areas have therefore the potential to inform this objective.
KC23: Identify evidence for late Roman occupation and attempt to identify any continuity in settlement patterns between the end of the Romano-British period and the Early Medieval period.	The Roman/Migration period transition and early medieval period comprises one of the most poorly evidenced and least understood eras of British history. Some landscape features formed during the Roman period, such as roads such as Welsh Road, have been proven to have continued in use into the medieval period and beyond, providing boundary markers for later field systems and estates. Buried Roman field systems are often encountered during archaeological investigations and are relatively well-understood. By comparison, the rare phenomena of tracing Roman elements in extant field systems or the contribution of Roman forms to later layouts is poorly recognised. The Late Saxon period saw the stabilisation of English society
KC30: Identify the location and form of Early and Middle Saxon settlement and investigate evidence for land use in the period.	
KC31: Identify the location of Middle to Late Saxon settlement, explore processes of settlement nucleation and understand the development of associated field types and agricultural regimes.	

Specific Objective	Contribution
KC35: Investigate the impacts on rural communities of social and economic shocks in the mid-14th century and thereafter and their contribution to settlement desertion	after the amalgamation of several kingdoms and the expulsion of Scandinavian warlords in northern and eastern regions. Numerous settlements and administrative parishes were established at this time, a process possibly beginning in the Middle Saxon period, many of which remain into the present. Evidence relating to the age of parish boundaries may contribute to our understanding of the development of these settlements and how the landscape was divided. It is possible that evidence for pre-afforestation may be encountered, indicating other uses of the landscape during the medieval period. Afforestation may show how local industry developed and also patterns of settlement. Three of the woodlands are situated alongside historic parish boundaries and the investigation of any historic boundary features which may be preserved within the woodland could provide evidence for land use and land divisions during the early medieval and medieval periods. Although the individual histories of the parcels comprising the Site differ, all have been wooded at least from the late 19th century and therefore are likely to have escaped impacts associated with modern deep ploughing. Consequently, they have the potential to comprise relatively undisturbed archaeological remains whose investigation can contribute to these objectives.
KC40: Identify patterns of change within medieval rural settlement from the 11th to mid-14th century	
KC34: Undertake research and investigation into medieval manorial complexes. What was their origin, development and impact on the landscape?	The Site comprises parcels of land (C32030, C32033) which were located within the land potentially associated with manorial complexes of Stoneton and Ladbroke Manors. Woodland evaluation in these areas is likely to provide evidence historical use of the land for agriculture, woodland planting and exploitation and potential changes in the landscape.
KC36: How were medieval and later woodlands managed and exploited and what evidence do they preserve for earlier land use?	The Site comprises areas of Ancient Woodland whose history may reach back to the medieval period. Features associated with the medieval and later management of the woodland, such as remains associated with charcoal burning or potash manufacture, coppicing and pollarding, and game management might be present within the Site.
KC49: Ground truth and develop multispectral and LiDAR prospection techniques.	The woodland evaluation has the potential to provide artefactual and ecofactual evidence to assist in addressing this objective in relation to the features identified within the Site and its environs through the examination of LiDAR imagery.

5 Scope and Methodology

5.1 Woodland Evaluation Scope

5.1.1 The woodland evaluation will be undertaken in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

5.1.2 In addition to these, the historic landscape survey will be informed by the guidance to be found in Historic England's U*nderstanding the Archaeology of Landscapes: A Guide to Good Recording Practice* (2nd Edition) (Historic England 2017) and the *Highway Agency's Assessing the Effect of Road Schemes on Historic Landscape Character* (Highways Agency 2007).

5.1.3 Direction on the recording methodology can also be found in the following Historic England guidance: *Understanding Place, Historic Area Assessments: Principles and Practice* (Historic England 2010) which sets out the principles and guidance for historic area assessments; *Where on earth are we?* (Historic England 2015d) which details the use of GNSS in field survey; *Traversing the Past* (Historic England 2016) on the use of the total station theodolites (TST) in landscape archaeology; and *The Light Fantastic* (Historic England 2018c) on the use of LiDAR in archaeological survey.

5.1.4 The woodland evaluation will be conducted by employing a phased approach comprising:

- Phase 1: Prior to Woodland Clearance:
  - Topographical survey;
  - Detailed woodland survey;
  - Test pits sampling features identified through LiDAR analysis and site visits; and
  - Historic Landscape Interpretation, including statements of significance in accordance with HS2 Technical Standards on historic landscape investigations (HS2-HS2-EV-STD-000-000035) and GWSI: HERDS objectives.
- Phase 2: Following woodland clearance. May comprise one or more of the following:
  - Archaeological monitoring;
  - Fieldwalking; and
  - Trial trench evaluation.

5.1.5 The results of Phase 1 investigations will confirm the requirement for and inform the final scope of Phase 2, which will be undertaken, if required, following the woodland clearance and when ecological constraints identified in Appendix 1 have been addressed.

5.1.6 Prior to the Phase 1 intrusive works, the *Archaeological Contractor* will assess the environmental risks associated with undertaking works in woodland and consult with the *Contractor* on the scheme. The topographical survey will provide an accurate record of the topography of the Site and precisely map the form and extent of features identified by LiDAR imagery, and any additional features that may be present but where not identified by remote sensing and during site visits due to dense undergrowth and vegetation cover. Detailed woodland survey will be undertaken by a specialist consultant to identify ancient woodland vascular plant indicators, tree shape while also recording any surface and buried archaeology which may have been obscured by vegetation at the time of the site visits to further inform on the history and current ecological/historical value of the Site. Test pitting, in absence of geophysical surveys, will aim to better identify at an early stage the archaeological potential of the Site, and sample features identified on LiDAR, during site visits, by topographical and detail woodland surveys and to inform further works on the features. The woodland areas will then be interpreted with a Level 2 Survey (Historic England 2017) which will make use of the information contained in the ES, baseline comprising archival research and site visit conclusions presented in this Project Plan, topographical survey, detailed woodland survey and test pit sampling.

5.1.7 Phase 2 surveys will be undertaken should the results of the previous investigations indicate that additional evaluation or other investigations are needed to contribute to HERDS specific objectives. This may take a form of artefact recovery survey should further intrusive archaeological works be deemed not suitable. Alternatively, although the scope of ancient woodland translocation and mitigation has not been detailed the time of writing, it is anticipated that the works will include, following vegetation clearance, all topsoil to be removed down to natural geology. Archaeological monitoring of these works may provide an appropriate and an effective way, should additional evaluation be needed, to contribute to HERDS specific objectives. Finally, a trial trench evaluation may be employed in Phase 2 should further archaeological intrusive works be deemed necessary to better identify the woodland and archaeological features and address HERDS objectives. A provisional trenching strategy is laid out within Table 4, subject to change following Phase 1 surveys (the Change Control process would be implemented, if required, and agreed by the *Contractor* and the *Employer*).

5.1.8 Any Phase 2 works will only be carried out using the methods determined by, and following approval by, the *Contractor*.

5.2 Methodology

5.2.1 Tasks and activities that will be undertaken include:

Phase 1 Surveys

Detailed Topographic Survey

5.2.2 Detailed topographic survey shall be undertaken by *the Archaeological Contractor* utilising terrestrial laser scanning to the general requirements as described in the GWSI: HERDS. There should also be consideration of the implementation of a concurrent UAV photogrammetric survey to achieve the stated aims.

5.2.3 Detailed topographic survey will provide an accurate record of the topography of a site and precisely map the location of features that can then be the subject of subsequent recording actions such as evaluation trenching. The topographic survey will be undertaken in accordance with Historic England's guidance *3D Laser Scanning for Heritage* (Historic England 2018a) and the Royal Institute of Chartered Surveyors (RICS) *Guidelines for the use of GNSS in Surveying and Mapping* (RICS 2010).

5.2.4 However, variables such as vegetation cover and scale of the survey need to be considered when deciding on the most appropriate field survey methodology and equipment. Due to the wooded nature, under-storey shrubs and ground cover of the Sites observed during the site walkovers, many are likely to be unsuitable for laser-scanning and may instead require a combination of digital and analogue techniques.

5.2.5 A combination of a survey-grade Global Satellite Navigation Survey System (GNSS) receiver and a Total Station (TST) may be more appropriate or a TST which offers a direct interface with a survey-grade GNSS receiver to enable the two techniques to be interchangeable depending on satellite reception.

5.2.6 A GNSS receiver connected to the Ordnance Survey's GNSS correction network (OSNet) service should be used to establish the location of control points relative to the Ordnance Survey National Grid (Historic England 2015d). These points should then be used as appropriate to locate a baseline set up along a woodland transect or a closed traverse of survey stations using a TST (Historic England 2016, 19-20) in order to capture detail using the TST. To successfully merge GNSS and TST data, the same feature code library should be used on both devices.

5.2.7 Where dense vegetation precludes the use of digital survey techniques by restricting the field of view, detailed survey may be completed using standard tape and offset techniques (Historic England 2018b, 7-15), from a baseline referencing temporary control pegs located with the TST and/or GNSS. Hand-drawn plans should be scanned and georeferenced into the GIS environment and digitised in order to produce compatible graphical output.

5.2.8 Recording of individual earthworks will vary according to the level of special interest of the feature and its probable relationship to archaeological remains. Earthworks of little or no significance shall be annotated on a site plan. Detailed drawings and interpretive analysis of important earthworks revealed during the survey will also be required to fulfil the aims and

objectives of the investigation as defined here. Individual earthworks will be photographed as well as mapped.

5.2.9 The photographic record will be in digital format, resulting in high-resolution TIFF (uncompressed) images. Photographs will illustrate both the detail and context of the earthworks. In addition, the *Archaeological Contractor* shall take appropriate record photographs to illustrate work in progress. All photographic records will include information detailing: site name and number/code, date, context, scale and orientation. A selection of progress photos of publication-quality must be submitted with the weekly progress report.

Survey Control

5.2.10 To ensure adequate site cover, inter-visible survey markers and points of reference will be established at a reasonable proximity to the perimeter of the survey area and the detail to be mapped.

5.2.11 If HS2 Project Engineer's Primary Control network and Secondary control for the work package has been established near the survey area then Tertiary control points should be set up as required and kept on a register.

5.2.12 Permanent and temporary survey control stations will be established according to good survey practice. Permanent stations should be one of the following type, in order of preference:

- marker or type as agreed by the *Employer*;
- earth anchor;
- stainless steel nail (e.g. PK nail); or
- cut mark or punch mark.

5.2.13 The type of marker used for temporary stations can be any of the following, depending upon the above criteria:

- wooden peg or stake
- stainless steel nail (e.g. PK Nail) or hilti nail; or
- cut mark or punch mark.

5.2.14 The OS co-ordinates of the survey stations will be established using GNSS, with an expected accuracy of +/- 20 mm.

5.2.15 All horizontal and vertical control shall be derived directly or indirectly from the OS Net.

5.2.16 At least two network RTK stations will be observed on a site and if they are required as ROs for total station observations, then there will be sufficient distance between them for a 'strong' bearing control.

5.2.17 GNSS observations should be made in accordance with the TSA guidance notes using at least two periods of three minute observations separated by at least 20 minutes.

5.2.18 Observations will be pre-planned so that each window of observations can be made under different satellite configurations.

5.2.19 A survey control coordinate register will be created from the measured control points.

5.2.20 A Daily Survey Log will be maintained which will include GNSS observations of control points used in the survey at the start and end of each day's survey.

5.2.21 When using a TST, a minimum of 3 known points are to be observed in any geometric resection.

5.2.22 Traverse calculations will be recorded on the Daily Survey Log.

5.2.23 Double run spirit levelling shall be undertaken between control points once levels have been derived from GNSS.

5.2.24 Any scan location will be set up either on the established control points or resected from established control points to maximise data coverage and minimise the number of setups needed.

5.2.25 A point distribution of 5mm will be required to record a level of detail sufficient to enable subsequent detailed drafting and analysis to take place. It is recommended that any areas of fine detail are also rescanned at a higher resolution to ensure that the data is sufficient for interpretation and digitising.

Data Processing

5.2.26 Scanning datasets will be processed into a 3D point cloud from which linework drawings and 3D models can be derived. It should also be capable of delivery as an E57 or LAS dataset for use in Esri ArcGIS.

5.2.27 All extraneous data will be cleaned from the point cloud dataset prior to delivery.

5.2.28 Deliverables shall include:

- A 2D topographic linework plan of the site at an appropriate scale (depends how large the site is but 1:200 is not uncommon, derived from the topographic data, whether captured by TLS, GNSS, TST or digitised hand-drawn plans;
- A 2D contour map of the site at a similar scale;
- A vertically exaggerated isometric visualisation may be useful, when combined with different illumination directions this may prove useful in identifying subtle landscape features;
- A Digital 3D Terrain Model GeoTIFF derived from the TLS or GNSS/TST data for use in

GIS;

- A Digital Terrain Model Triangulated irregular network (TIN); and
- A registered, unified and cleaned point cloud in E57 or LAS format (colour – RGB values).

5.2.29 Symbology to be utilised for all interpretive mapping will be as indicated in Historic England's *Understanding the Archaeology of Landscapes* (Historic England 2017). Scaling of plans will be agreed with the employer but should be at least 1:2,250 or preferably larger. Particularly complex areas of the site can be depicted as larger scale insets, the location of which is clearly defined.

5.2.30 Profiles should also be produced where necessary to enhance the understanding of the behaviour of the ground surface. These should be drawn at a larger scale than the plans, typically 1:250 and exaggeration of the vertical axis should not be utilised. The location of all profiles must be accurately indicated on the mapping.

Detailed Woodland Survey

5.2.31 Detailed woodland survey will be undertaken in accordance with the guidelines set out in the Woodland Trust guidance on field surveys for ancient woodlands (Woodland Trust 2009). The documentary research and site walkovers undertaken for the purpose of this Project Plan have identified archaeological features which may be associated with woodland management as well as those indicative of pre-woodland land use. The comments made by the *Contractor*'s arboriculturalist have helped to inform the historical woodland management. This potential has been summarised in Section 3.

5.2.32 Detailed woodland survey will be guided by an appropriately experienced dendrochronologist and undertaken to accurately evaluate this potential by conducting a detailed record and mapping of all veteran, ancient and worked trees to provide evidence of woodland continuity and history of woodland management in line with Woodland Trust guidance (Woodland Trust 2009). The dendrochronologist may supply expertise to other aspects of the survey on the basis of the findings of their visits.

5.2.33 Moreover, the detailed woodland survey will focus on ancient woodland flora indicators to help determine the Site's antiquity and management history, including:

- Ancient woodland ground flora indicators - vascular plants and other species;
- Species which are indicative of the woodland history, for example dense cover of bluebells is often associated with soil stripping for charcoal production, planted non-native species can indicate that the site was managed by the Victorians as a park;
- Species which may indicate woodland archaeology, for example moss covered areas are often associated with shallow soils over rocks (these may relate to building remains).

5.2.34 Ground flora survey will be undertaken in the form of a quadrat survey, comprising 20m x 20m quadrats covering each woodland area. This approach provides an objective way of collecting data to allow for:

- comparisons of surveyed and known areas;
- intense recording, likely to pick up difficult species;
- spatially precise information to be generated so it is easier to link to other spatial data;
- accurate change detection;
- individual plots which can be assigned to growth stage/ vegetation type/ origin; and
- a valid statistical analysis.

5.2.35 Surveying woodland for evidence of ancient woodland requires specific knowledge of both woodland ecology and archaeology. Different types of field evidence require different sets of expertise, often important evidence can be overlooked by inexperienced surveyors. Woodland surveying requires specialist knowledge and training which is often not covered by formal archaeological and ecological training. Therefore, the *Archaeological Contractor* should consider the training and expertise of surveyors when reviewing the findings of the survey. When surveys are undertaken outside the optimal survey periods (cf. Woodland Trust 2009) key indicators are often not visible and the results of such surveys must be treated as tentative.

Dendrochronology

5.2.36 Prior to or during the felling phase at the Site, an opportunity is presented to acquire a sample of dendrochronological data. An almost complete tree-ring chronology for England is available, reaching back to the Neolithic. Dendrochronological data can also be used to calibrate other dating methods, such as radiocarbon dating, along with climate and palaeo-environmental studies (EH 2004).

5.2.37 Dendrochronology concerns the comparison of tree-rings from a sample to a known growth pattern, influenced by environmental and climatic factors, and calibrated to an established timeline. This timeline has been produced by combining tree-ring chronologies from successively older years using samples of the same tree species. The processed 'tree-ring curve' graphical data is cross-referenced with this timeline to provide an accurate and precise date.

5.2.38 The below draft methodology for selecting and sampling dendrochronological data has been taken from the Historic England guidance (EH 2004). The *Archaeological Contractor* shall ensure that an appropriate element of the LS-WSI covers this methodology in greater detail and that samples are chosen and taken by appropriately qualified staff.

Limitations

5.2.39 As when using any dating method, dendrochronology has certain limitations. Firstly, this process is dependent on precise comparison and understanding of the data and should be undertaken by an experienced dendrochronologist. Secondly, not all samples will be suitable to date. The specialist provided by the *Archaeological Contractor* shall decide where samples shall be taken within each woodland to provide a suitable sample size.

5.2.40 A further drawback for dendrochronological methods arises with the uncertainty of felling date and use date, typically encountered during dating of structural timbers. In the particular circumstances of the woodland surveys detailed within this Project Plan, the felling date shall be known and remove this degree of uncertainty.

Methodology

5.2.41 The Historic England guidance (2004) principally concerns the sampling of timbers from standing structures and waterlogged wood recovered from archaeological contexts. The final methodology used during the Phase 1 woodland surveys will be laid out by the *Archaeological Contractor* within the LW-WSI and be approved and monitored by an appropriately qualified dendrochronology specialist.

5.2.42 Sampling of living trees is typically undertaken using a Swedish increment corer, extracting a core sample with a diameter of 5mm. The woodlands across the scope of this Project Plan are proposed for felling. Accordingly, it is anticipated that samples of trunk cross-sections may be examined at an appropriate stage of the felling process. An appropriate number of samples will be examined, as determined by the specialist, to provide an average sample specific to key species and areas of the Site. Key areas will be defined within the LS-WSI by the *Archaeological Contractor* and specialist, chosen for their potential to address the area-specific questions detailed in Section 3.

5.2.43 Sample specimens will be physically marked, and their geospatial location recorded prior to removal. Samples may be removed from the Site for closer analysis once felled.

5.2.44 Following the analysis of the samples, the dendrochronology specialist shall prepare an assessment with recommendations for further analysis.

Test Pitting Scope

5.2.45 The test pitting will be undertaken in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

5.2.46 As this phase of the investigation will be undertaken within extant woodland prior to clearance, test pitting across the Sites will comprise 40 No. test pits measuring 2m (l) x 1m (w) excavated by hand to natural geology. The final dimensions and the location of the test pits may need to be altered as a result the constraints encountered on Site or to better answer the research questions. Any such changes will be made by prior agreement with the *Contractor*.

5.2.47 Trial pit sizes and locations have been selected individually, using reconnaissance information gathered during the course of the ES, additional analysis of LiDAR imagery and site visits. This evidence-led approach also draws on site-specific and local topographical and geological information, historical mapping evidence and known areas of past human activity within the immediate vicinity.

5.2.48 The locations of test pits 006-015, 020-040 been surveyed during site visits were surveyed using Collector for Arc GIS mobile app. The locations have been targeted on features identified from LiDAR imagery and confirmed on-site in locations relatively clear of vegetation. Locations of the remaining test pits have been based on LiDAR imagery only since at the time of writing the Site C21022 Jones Hill Wood was inaccessible and no GPS connection could be achieved during a site walkover in parcel C30031 Fox Covert Whitfield.

5.2.49 In all cases, the *Archaeological Contractor* will confirm the final location of each test pit on site in consultation with the *Contractor*'s arboriculturalist to avoid impact on the trees and their root systems.

5.2.50 Any archaeological finds recovered during the course of the test pitting shall be recorded and plotted on plans of the relevant test pit according to historical period.

5.2.51 If necessary, an additional contingency of up to 4m² per Site, equating to c. 2m (l) by 2m (w) of additional test pit, will be excavated to further investigate and characterise significant or unexpected remains should they be encountered during the evaluation (i.e. if remains indicative of extensive pre-woodland occupation are identified or to target additional features revealed in the topographic survey). Any contingency trenching will only be carried out following approval by the *Contractor*.

5.2.52 The suggested test pits locations are shown on Figure 9a-f. All test pits are listed in Table 2 and have been assigned a unique ID in accordance with the Employer's Asset Information Management System (AIMS). The test pits have been positioned to avoid the identified constraints.

Table 2 Schedule of test pits

AIM ID.	Test pit No.	Length	Width	Max Depth	Objectives/ Comments
	001	2	1	To natural geology	C21022 Jones Hill Wood – located in a seemingly 'featureless' part of woodland
	002	2	1	To natural geology	C21022 Jones Hill Wood – located in the location of a former footpath/track potentially associated with a quarry depicted in 1887 OS map and faintly visible on LiDAR
	003	2	1	To natural geology	C21022 Jones Hill Wood – located on the edge of earthwork visible on LiDAR, not depicted on historical mapping

	004	2	1	To natural geology	C21022 Jones Hill Wood – located on the edge of earthwork visible on LiDAR, not depicted on historical mapping
	005	2	1	To natural geology	C21022 Jones Hill Wood – located on a former boundary of the woodland depicted on Wendover Tithe map and potentially on 1795 enclosure map
	006	2	1	To natural geology	C25071 Widmore Hill Farm – located at the northern boundary of the woodland
	007	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on one of the narrow linear E-W features crossing the northern part of the Site, possible planting or ridge and furrow feature
	008	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature perpendicular to the disused railway embankment, possible boundary/drainage feature
	009	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature perpendicular to the disused railway embankment, possible boundary/drainage feature
	010	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on one of the narrow linear E-W features crossing the northern part of the Site, possible planting or ridge and furrow feature
	011	2	1	To natural geology	C25071 Widmore Hill Farm – located at the northern extent of ridge and furrow features identified by LiDAR imagery
	012	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on one of the widely spaced ridge and furrow remains identified in the southern part of the Site by LiDAR imagery
	013	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on one of the widely spaced ridge and furrow remains identified in the southern part of the Site by LiDAR imagery
	014	2	1	To natural geology	C25071 Widmore Hill Farm – located at the edge of a possible former boundary
	015	2	1	To natural geology	C25071 Widmore Hill Farm – targeted on one of the widely spaced ridge and furrow remains identified in the southern part of the Site by LiDAR imagery
	016	2	1	To natural geology	C30031 Fox Covert Whitfield – targeted on a possible ridge and furrow feature

	017	2	1	To natural geology	C30031 Fox Covert Whitfield – targeted on a possible ridge and furrow feature
	018	2	1	To natural geology	C30031 Fox Covert Whitfield – targeted on a possible ridge and furrow feature
	019	2	1	To natural geology	C30031 Fox Covert Whitfield – targeted on a possible ridge and furrow feature
	020	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible ridge and furrow/planting furrow
	021	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible ridge and furrow/planting furrow
	022	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible extension of a potentially medieval boundary seen to the north-east on LiDAR
	023	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible ridge and furrow/planting furrow
	024	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible ridge and furrow/planting furrow
	025	2	1	To natural geology	C30027 Halse Copse Farm – Targeted on a possible ridge and furrow/planting furrow
	026	2	1	To natural geology	C32033 Fox Covert – targeted on a linear feature parallel to Welsh Road, possible ridge and furrow or former road(side) feature
	027	2	1	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	028	2	1	To natural geology	C32033 Fox Covert – targeted on a linear feature parallel to Welsh Road, possible ridge and furrow or former road(side) feature
	029	2	1	To natural geology	C32033 Fox Covert – targeted on a linear feature parallel to Welsh Road, possible ridge and furrow or former road(side) feature
	030	2	1	To natural geology	C32033 Fox Covert – targeted on a linear feature parallel to Welsh Road, possible ridge and furrow or former road(side) feature
	031	2	1	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	032	2	1	To natural geology	C32033 Fox Covert – located within a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War

					defences/footpath. Also targeted on a faint NW-SE aligned linear feature, poss. ridge and furrow
	033	2	1	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	034	2	1	To natural geology	C32033 Fox Covert – targeted on a faint NW-SE aligned linear feature, poss. ridge and furrow
	035	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a former woodland boundary depicted in historic mapping (1639 Ladbroke manor and parish map) seen as a faint feature on LiDAR
	036	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a former woodland boundary depicted in historic mapping (1639 Ladbroke manor and parish map) seen as a faint feature on LiDAR
	037	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a possible terrace feature identified by LiDAR
	038	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a former woodland boundary depicted in historic mapping (1639 Ladbroke manor and parish map) seen as a faint feature on LiDAR
	039	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a former woodland boundary depicted in historic mapping (1639 Ladbroke manor and parish map) seen as a faint feature on LiDAR
	040	2	1	To natural geology	C32030 Windmill Hill Spinney – targeted on a possible terrace feature identified by LiDAR

5.2.53 All test pits are located within extant woodland areas, three of which are designated as Ancient Woodland. In all cases, the *Archaeological Contractor* will apply utmost care to cause minimal disturbance to encountered root systems of the nearby trees, in consultation with and following advice from the Woodland Trust and the *Contractor's* arboriculturalist, as appropriate. The *Archaeological Contractor* will ensure that the topsoil, subsoil, and other uprisings are stored separately. The excavation of the topsoil will be undertaken in a manner ensuring minimal damage to the cohesion of the topsoil material.

5.2.54 The works will directly impinge on the Ancient Woodland as the features to be examined lie within it. The staff undertaking the work will be briefed regarding minimal impact - i.e. ensuring work is confined to the targeted locations and that other disturbance of the woodland (damage to branches etc) does not occur. These issues will be addressed in the daily morning briefings and in toolbox talks, on site.

5.2.55 During the works the site boundary will be demarcated so that there will be a clear separation from the work area and the rest of the Ancient Woodland, so that staff/visitors do not accidentally stray into the rest of the woodland and disturb/damage it.

5.2.56 All work will be undertaken by hand. No vehicles (plant or personal) will enter the woodland. The woodland will be accessed by foot and all hand tools will be brought in and out by the same means.

5.2.57 The staff welfare and tool storage facility will be located outside of the woodland.

5.2.58 Works will be undertaken in accordance with British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction*.

5.2.59 Tasks and activities that will be undertaken during test pitting (as detailed below in Section: Fieldwork Methodology) include:

- Setting Out and Recording
- Artefact Collection
- Hand Excavation
- Fieldwork Recording
- Human Remains
- Environmental Sampling
- Metallic Objects and Residues
- Preservation of Archaeological Remains
- Backfilling

Historic Landscape Interpretation

5.2.60 The methodology outlined in Historic England's guidance *Understanding the Archaeology of Landscape* (Historic England 2017) will be applied to analyse and interpret the results of the desk-based research undertaken hitherto, detailed topographic and woodland surveys, test pit investigation, and photographic survey and aerial photogrammetry to satisfy the requirements of a Level 2 Survey.

5.2.61 A Level 2 Survey will provide a descriptive record of the Site that is both metrically accurate and analytical, depicting the landscape in the context of the identified earthworks/features. If achievable, this will include analysis of the development of and changes to the identified features. A clear distinction will be made between observed and interpreted data to allow later re-interpretation.

5.2.62 The record will chart the historic development of the earthworks and provide a clear statement of significance in line with Historic England's guidance *Conservation Principles* (Historic England 2008a). Significance as will, therefore, be categorised as being derived from evidential, historical, aesthetic and communal values.

5.2.63 Table 3 (adapted from Highways Agency 2007) is the thesaurus that provides the standard historic landscape terminology to ensure consistency with other Project Plans.

Table 3 Glossary of historic landscape terms to be used

Authenticity	The condition of assets where the constituents and their arrangement are as originally intended.
Capacity to Absorb Change	The capacity of an historic landscape character unit to be altered without fundamentally altering its historic character.
Coherence	The integration and interrelationships (temporal, spatial or functional) of aspects and values of historic landscape character.
Component	Larger agglomerations of parcels such as dispersed settlements or straight sided field systems. These combine to form historic landscape types
Conservation	The process of managing change to sustain the significance of inherited historic assets, for current and future use and enjoyment
Cultural Association	Significant reference to or representation of an historic landscape in literature, art, poetry, song etc i.e. the creation of values in an area of landscape by activities, depictions etc.
Distinctiveness	The combination of characteristics (in this context historic ones) that allow one area to be distinguished from another.
Element	The smallest item(s) of an historic landscape that contributes to its significance. Examples include a hedge, lawn, specimen plant, house, meadow or open field, fence, wall, earthwork, pond or pool, bollard, orchard etc. They combine to form parcels.
Fragility	Measure of the ability of a historic landscape character type to accept change (see sensitivity)
Fragmentation	The process of disaggregating historic landscape types into components separated by non-significant later elements.
Historic Landscape	Historic landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (European Landscape Convention, Council of Europe 2000). Historic landscape is defined by perceptions that emphasise the evidence of past human activities in the present landscape.
Historic Landscape Characterisation (HLC)	The process of identifying the predominant historic character of the present landscape and reaching an understanding of how it came about
Historic Landscape Region	A very large tract of land, typically multi-county, formed from an agglomeration of Historic Landscape Sub-regions

Historic Landscape Sub-Region	A large tract of land, typically countywide, formed from an agglomeration of Historic Landscape Zones. Agglomerated these form Historic Landscape Regions.
Historic Landscape Character Type	Distinctive and repeated combinations of components defining generic historic landscapes such as Ancient Woodland or parliamentary enclosure. Agglomerated these form Historic Landscape Zones.
Historic Landscape Character Unit	An interchangeable term to describe a sub-region, zone or character type
Historic Landscape Character Zone	Characteristic combinations of character types such as anciently enclosed land or moorland and rough grazing which can be combined to form a sub-region.
Integrity	Where the various aspects of an area's character can be perceived as forming a more or less consistent whole, e.g. (but not exclusively) deriving from one period, or reflecting one set of historic processes.
Legibility	The degree to which (and the manner in which) the past can be seen, appreciated and understood in the landscape. Legibility is perceptual, relying on the ability to 'read' the historic significance of surviving landscape features.
Maintenance	Routine work necessary to keep the fabric of historic assets in their existing condition, preventing or inhibiting the development of decay, but not involving repair.
Parcel	Elements combined to produce, for example, farmsteads or field. These combine to form components
Preservation	Actions to halt or slow the deterioration of assets that would otherwise continue. It entails the avoidance, as far as possible, of physical interference, so that original materials are retained intact and untouched in situ (a special case – "preservation by record"– refers to the removal of the asset, reporting analysis publication of the results by archaeologists). Preservation can be achieved through maintenance or repair.
Rarity	The frequency of occurrence of a particular set of attributes. Although all historic landscapes are by definition unique, certain character types may be repeated within a region or nationally giving rise to a measure of rarity.
Sensitivity	The extent to which a historic landscape can absorb change of a particular type and scale without unacceptable adverse effects on its character
Time-depth	The survival of features from periods of the past. Greatest time depth is attributed to historic landscapes where features of many periods are represented; less time-depth where fewer are discernible.

Phase 2 Surveys

5.2.64 Phase 2 surveys will be undertaken at the commencement of woodland clearance and the results of Phase 1 will inform the scope of works which may be required to contribute to a more thorough understanding of each site. Some or all of the following may be required, depending

on site conditions, potential and groundworks, and, where possible, shall be coordinated with the timing of other on-site activities.

Archaeological Monitoring (watching brief) Scope

5.2.65 Archaeological Monitoring will be undertaken during site clearance (felling) in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for historic environment investigations. (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

5.2.66 The *Principal Contractor* undertaking the woodland clearance and soil translocation works will provide technical services and attendances to the *Archaeological Contractor* to allow the archaeological investigations to be carried out safely. These will include:

- all spatial setting out will be implemented by the *Principal Contractor*;
- The *Principal Contractor* to ensure all site staff are competent and aware of risks (e.g. CSCS cards);
- The *Principal Contractor* will report regularly to the *Archaeological Contractor* any hazards such as contact with plant/machinery, trips, falls, zoning of site activities to prevent unnecessary overlap of working areas;
- The *Principal Contractor* to set the minimum PPE to be worn at all times to include Hi-Visibility clothing, Hard Hats, site safety boots, safety glasses, gloves;
- The *Principal Contractor* to provide Welfare for hygiene etc. with facilities to include washing facilities;
- The *Principal Contractor* will manage the risk and status of any live services and update the *Archaeological Contractor* on these risks;
- The *Principal Contractor* to approve the *Archaeological Contractor*'s Method Statements and Risk Assessments to be approved in writing by the prior to working;
- The *Principal Contractor* to define the *Archaeological Contractor*'s working route towards proposed location of plant. Ensure dedicated pedestrian routes away from arc of machine working;
- The *Principal Contractor* to employ a banksman during all ground reduction with heavy plant;
- Should any material be excavated that is deemed to be contaminated or potentially contaminated it shall be investigated, controlled (e.g. placed separately from clean material) and removed from the site in accordance with *Principal Contractor*'s environmental protection requirements (as set out in their Environmental Management Plan).

5.2.67 *Archaeological Contractor*'s responsibilities will include:

- The *Archaeological Contractor* will be working under and reporting to the *Principal Contractor* and to *Contractor* working on behalf of the *Employer*;
- The *Archaeological Contractor* will review and comply with the *Principal Contractor*'s Construction Phase Plan under the CDM Regulations 2015;
- The *Archaeological Contractor*'s Risk Assessments and Health and Safety Plans will be prepared as well as method statements, site-specific risk assessments to be approved by the *Principal Contractor* before the start of site works;
- The *Archaeological Contractor*'s Safety Audits, Safety Inspections, Reporting of Accidents will be defined in the LS-WSI and Method Statement (MS) Risk Assessment (RA) and submitted to the *Contractor* and then the *Principal Contractor* for approval before the start of site works.

5.2.68 Tasks and activities that will be undertaken include:

- Setting Out and Recording
- Monitoring of Mechanical Excavation
- Surface Cleaning
- Hand Excavation
- Fieldwork Recording
- Human Remains
- Environmental Sampling
- Metallic Objects and Residues
- Preservation of Archaeological Remains

Fieldwalking Survey Scope

5.2.69 The fieldwalking (artefact collection) survey will be undertaken in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015). This will be undertaken following the felling of woodland and only within Sites that have not previously been subjected to fieldwalking surveys.

5.2.70 Tasks and activities that will be undertaken include:

- Setting Out and Recording
- Artefact Recovery Survey

- Human Remains
- Metallic Objects and Residues

Trial Trench Evaluation Scope

5.2.71 The trial trench evaluation will be undertaken in accordance with specific guidance produced by HS2, namely the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

5.2.72 The trial trench evaluation (Figures 9a-e, Table 4) will comprise up to 45 No. trenches measuring 20m (l) x c. 1.8m (w) and 1No. 50m (l) x c. 1.8m (w) (actual trench width will be dictated by the machine bucket width).

5.2.73 The trench sizes and locations have been selected individually, using reconnaissance information gathered during the course of the ES, additional analysis of LiDAR imagery and site visits. This evidence-led approach also draws on site-specific and local topographical and geological information, historical mapping evidence and known areas of past human activity within the immediate vicinity. The need for and final number and locations of the trenches will be determined depending on the results of Phase 1 surveys. Any changes to the scope presented here will be carried out following approval by the *Contractor*.

5.2.74 If necessary, an additional contingency of up to 200m2, equating to c. 5 No. trenches measuring 20m (l) by c. 1.8m (w) across all Sites, will be excavated to further investigate and characterise significant or unexpected remains should they be encountered during the trial trench evaluation. Any contingency trenching will only be carried out following approval by the *Contractor*.

5.2.75 No trial trenching is proposed to be undertaken within C32030 Windmill Hill Spinney since steep slopes and heavily undulating topography make this area unsuitable for safe deployment of machine excavators, as confirmed with the *Contractor*'s engineer during the site visit. As an alternative approach, a phase of Construction Integrated Recording (CIR) is proposed for this Site (see below).

5.2.76 All trial trenches listed in Table 4 have been assigned a unique ID in accordance with the *Employer*'s Asset Information Management System (AIMS). Given that the excavation of trial trenches is intended to take place after woodland clearance and following appropriate ecological mitigation works, the constraints identified presently have not been taken into consideration and the trenches were placed to provide appropriate coverage of the available evaluation area and to target features and areas with a potential to address the research questions.

Table 4 Schedule of trial trenches

AIM ID.	Trial Trench No.	Length	Width	Max Depth	Objectives/ Comments
	001	20	1.8	To natural geology	C21022 Jones Hill Wood – located across a short-lived boundary at to the south of the woodland depicted on Wendover Tithe map but not on 1795 enclosure map, or later 1878 OS map. Still visible as a faint earthwork on LiDAR
	002	20	1.8	To natural geology	C21022 Jones Hill Wood – located across at the southern boundary of the woodland and intended to capture variations in its southerly extent
	003	50	1.8	To natural geology	C21022 Jones Hill Wood – located across at the eastern boundary of the woodland and intended to capture variations in its extent, namely reduction of its size between the time of Wendover tithe map and the 1st edition OS
	004	20	1.8	To natural geology	C21022 Jones Hill Wood – located on the edge of earthwork visible on LiDAR , not depicted on historical mapping
	005	20	1.8	To natural geology	C21022 Jones Hill Wood – located on a faint E-W aligned linear feature visible on LiDAR , not depicted on historical mapping, and potentially reflecting former ridge and furrow
	006	20	1.8	To natural geology	C21022 Jones Hill Wood – located across a former western boundary of the woodland depicted on Wendover Tithe map and potentially on 1795 enclosure map
	007	20	1.8	To natural geology	C21022 Jones Hill Wood – located across a series of faint E-W aligned linear features visible on LiDAR , not depicted on historical mapping, and potentially reflecting former ridge and furrow
	008	20	1.8	To natural geology	C21022 Jones Hill Wood – located across the western boundary of the woodland and across a parallel N-S feature visible on LiDAR series, not depicted on historical mapping, and potentially reflecting the former extent of the woodland.
	009	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on the southern boundary of a field depicted on Finmere Tithe map, but no longer present after the formation of the Great Central Railway. The boundary represented a parish boundary which may have moved south to the current location. The trench is designed to capture both. The investigation offers an opportunity to

					investigate the parish boundary, in line with specific methodology.
	010	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a no longer extant boundary formed following the construction of the Great Central Railway, visible on LiDAR imagery only
	011	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on an area of ridge and furrow remains identified in the southern part of the Site by LiDAR imagery
	012	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on an area of ridge and furrow remains identified in the southern part of the Site by LiDAR imagery
	013	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a boundary preceding the construction of Great Central Railway and on the disused embankment to the level of impacts caused by railway construction.
	014	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature perpendicular to the disused railway embankment, possible boundary/drainage feature
	015	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature perpendicular to the disused railway embankment, possible boundary/drainage feature
	016	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature, possible former boundary/drainage feature
	017	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a linear feature, possible former boundary/drainage feature
	018	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a seemingly 'blank' area of narrowly spaced (panting?) furrows
	019	20	1.8	To natural geology	C25071 Widmore Hill Farm – targeted on a seemingly 'blank' area of narrowly spaced (panting?) furrows
	020	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features and woodland/parish boundary
	021	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on woodland/parish boundary

	022	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features
	023	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features and woodland boundary
	024	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features
	025	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features
	026	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features and woodland/parish boundary. The investigation offers an opportunity to investigate the parish boundary, in line with specific methodology.
	027	20	1.8	To natural geology	C30031 Fox Covert Whitfield – targeted on possible ridge and furrow features
	028	20	1.8	To natural geology	C30027 Halse Copse Farm – Targeted on an area occupied by two barns represented on Halse tithe map
	029	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on woodland boundary
	030	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on woodland boundary
	031	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on possible ridge and furrow features
	032	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on a possible extension of a potentially medieval boundary seen to the north-east on LiDAR
	033	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on a possible extension of a potentially medieval boundary seen to the north-east on LiDAR
	034	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on woodland boundary
	035	20	1.8	To natural geology	C30027 Halse Copse Farm – targeted on possible ridge and furrow features
	036	20	1.8	To natural geology	C30027 Halse Copse Farm – located in an Ancient Woodland area
	037	20	1.8	To natural geology	C30027 Halse Copse Farm – located in an Ancient Woodland area
	038	20	1.8	To natural geology	C32033 Fox Covert – targeted on woodland boundary

	039	20	1.8	To natural geology	C32033 Fox Covert – targeted on a series of linear features parallel to Welsh Road, possible ridge and furrow or former road(side) features
	040	20	1.8	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	041	20	1.8	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	042	20	1.8	To natural geology	C32033 Fox Covert – located in the interior of a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	043	20	1.8	To natural geology	C32033 Fox Covert – targeted on a large sub-circular feature identified by LiDAR imagery, posited prehistoric enclosure/Civil War defences/footpath
	044	20	1.8	To natural geology	C32033 Fox Covert – targeted on woodland boundary which correlates with parish and county boundary. The investigation offers an opportunity to investigate the parish and county boundary, in line with specific methodology.
	045	20	1.8	To natural geology	C32033 Fox Covert – targeted on flank of Welsh Road

5.2.77 Tasks and activities that will be undertaken during trial trench evaluation, as detailed in section Fieldwork Methodology below, include:

- Setting Out and Recording
- Artefact Collection
- Mechanical Excavation
- Hand Excavation
- Fieldwork Recording
- Human Remains
- Environmental Sampling
- Metallic Objects and Residues
- Preservation of Archaeological Remains
- Backfilling

Construction Integrated Recording Scope

5.2.78 Site C32030 Windmill Hill Spinney has been identified as inappropriate for trial trench evaluation in consideration of its steep topography. As an alternative measure, it is proposed that a phase of Construction Integrated Recording (CIR) is undertaken by the *Archaeological Contractor* during construction related works within this Site.

5.2.79 The CIR will be undertaken in accordance with specific guidance produced by HS2, in particular the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

Fieldwork methodology

5.2.80 The tasks and activities listed below will be relevant to Test Pitting and Trial Trenching surveys detailed above.

Setting Out and Recording

5.2.81 All spatial setting out and recording shall be in accordance with The Ordnance Survey National Grid and Ordnance Survey Newlyn Datum (ODN) as defined by the OS Active GNSS network and use of a Virtual reference system. A minimum of three Permanent Ground Markers (PGM) shall be created using this system for each trench or group of geographically related trenches. The OS coordinates of the survey station shall be established using GNSS with an expected accuracy of +/- 20mm.

5.2.82 Test pits, trial trenches and fieldwalking transects (as appropriate) shall be located to a horizontal accuracy of +/-500mm. The corner points of each trench/test pit location and southern points of each transect shall be set out with Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) equipment or other suitable automated equipment referenced from the PGMs.

5.2.83 Surface heights shall be recorded using RTK GNSS and related to PGMs. Ordnance Survey Bench Marks (OSBM) are not to be used. Levelling accuracy shall be within 10 mmÖk: where 'k' is the total distance levelled in kilometres.

5.2.84 The *Archaeological Contractor* shall ensure that all test pits and trial trench or excavation limits, and significant archaeology detail are surveyed 'as dug' in relation to the project grid before leaving the site. Ground-level height data shall be recorded for each test pit/trench. For fieldwalking transects the *Archaeological Contractor* shall include details of their surveying methodology within the *Contractor*'s method statement including the setting out of the grid and how they intend to provide the project grid co-ordinates to HS2 with the survey report. Survey methodology and a detailed survey record shall be provided to HS2 Ltd within the survey report.

Artefact Recovery Survey

5.2.85 The artefact recovery survey will be undertaken in accordance with the employer's Technical Note for Fieldwalking Survey (C250-ARP-EV-NOT-000-000805) and CIfA guidelines.

5.2.86 A series of transects aligned along the long axis of the Site will be established according to the setting out above at 10m intervals. Transects will be located and identified by numeric 12 figure NGR denoting the southern end of each transect. This interval is to ensure that potentially low concentrations of small numbers of earlier Mesolithic to Early Bronze Age artefacts will be identified within the ploughsoil.

5.2.87 The survey team will walk the length of each transect observing a 2m wide corridor to either side of each transect for the purposes of artefact collection.

5.2.88 The length of each transect will be sub-divided into 10m stints. Each stint will be numbered from one onwards for each transect commencing at the southern end. Artefacts recovered from each stint will be bagged together, the bags being marked with the Site code, transect NGR identifier and the stint number.

5.2.89 Artefacts or concentrations of artefacts considered by the survey team to be of special interest may be individually located or mapped utilising GPS TST. Detailed fieldwalking at greater resolution may also be required where significant concentrations of artefacts are identified. More detailed resolution can be achieved by:

- Fieldwalking of transects spaced at 5m intervals with 5m stints; or
- Intensive fieldwalking on a 10m grid basis.

5.2.90 It is envisaged that the former will be utilised for dense surface scatters and the latter only used where concentrations are relatively sparse. Where these methods are deployed the Archaeological Contractor will record where they were deployed in all subsequent reporting.

5.2.91 The extent of any more intensive surveys will be determined by the extent and character of the identified artefact concentration. The principal aim of any more intensive surveys will be to determine the boundaries of scatters and to delineate the distribution of artefact classes within these boundaries.

5.2.92 All artefacts will be collected, with the exception of any materials that can positively be identifies as modern (post 1900). Concentrations of materials such as slag, stone and tile may be sampled only; but their extent accurately surveyed with GPS.

5.2.93 During the survey pro-forma recording sheets will be utilised to record the details of each field walk. These will record:

- Land-use/field conditions;
- Ground/earthwork visibility (including any noticeable changes in soil colouration); and

- Fieldwalking personnel.

5.2.94 The Archaeological Contractor will comply fully with the provisions of the Treasure Act 1996 and the Code of Practice referred to therein.

5.2.95 In the event that potentially significant artefact scatters of Mesolithic through early Neolithic date are identified, the Archaeological Contractor will inform the Contractor's Historic Environment Manager. The Contractor's Historic Environment Manager will, in consultation with the Employer, assess how the discovery might contribute to the research objectives of the GWSI:HERDS and whether any change to the investigation strategy is required, in accordance with the procedure for unexpected or significant discoveries.

5.2.96 A photographic record of the artefact collection survey will be kept including as found pictures of significant finds with their immediate context. The photographic record will be in digital format, resulting in high resolution TIFF (uncompressed) images. All photographic records will include information detailing: site name and number/code, date, transect, stint, scale and orientation. A selection of progress photos of publication quality must be submitted with the weekly progress report.

5.2.97 The archaeological contractor shall be responsible for the protection of all artefacts and for their transport (including loading and unloading) to the processing facilities or other location as agreed with the Contractor's *Historic Environment Manager* and *Employer*. Artefacts shall be protected at all times from temperatures below 5°c and above 25°c and from wetting and drying out due to weather exposure.

Artefact Collection

5.2.98 Prior to the excavation of each test pit and trial trench, the *Archaeological Contractor* will sample the topsoil/ploughsoil for the recovery of artefacts.

5.2.99 One sample location will be tested at each test pit for a total of 40 sample locations. Two sample locations will be tested at each trial trench location for a total of 90 sample locations. Each sample can be recovered using a shovel or mechanical excavator fitted with a toothless ditching bucket (excavated in spits) and placed on an adjacent board or tarpaulin/ geotextile.

5.2.100 Samples are to be equivalent in volume to a 0.5m by 0.5m test pit which will be machine excavated (where practical) and the appropriate pro-rata volume of plough-/topsoil will be dry hand-sieved. The volume sieved for each test pit will correspond to the pro-rata volume of a 0.5m by 0.5m test pit, of a depth corresponding to the particular plough-/topsoil depth at each test pit location. Soil samples should then be sieved or screened through ¼" or 6mm wire mesh to recover artefacts. Samples may be sieved on-site or retained for immediate sieving off-site.

5.2.101 In the event of encountering substantial quantities of archaeological artefactual evidence during the test pit phase, an amended trenching strategy may be employed to better understand the factors behind the evidence. Any trial trench amendments would be discussed

with the *Contractor* and a change control process (see Section 9) would be implemented if required.

Mechanical Excavation

5.2.102 Trial trenches shall be excavated to the first archaeological horizon or natural geology, whichever is encountered first. Excavation will be undertaken using a mechanical excavator with toothless ditching bucket.

5.2.103 In the unlikely event that modern foundations are encountered, and where it is clear that modern foundations have truncated certain archaeological levels, they should be removed to assess lower archaeological levels. The *Archaeological Contractor* shall take all reasonable care to ensure that any damage to archaeological deposits is limited as far as practicable. If significant damage is likely to occur the work shall be suspended and the *Contractor's* Historic Environment Manager informed so that a technical solution can be agreed.

5.2.104 Machining shall be carried out under the constant supervision of a suitably qualified archaeologist to excavate the ground in spits. The *Archaeological Contractor* shall use their professional judgement to determine the appropriate depth of each spit. Any variations to the excavation methodology shall be at the discretion of the *Archaeological Contractor* and recorded in writing for inclusion in the final report. Each spit shall be examined carefully to assist the recovery of any archaeologically significant artefacts and thus to determine when to cease machining. It is the responsibility of the *Archaeological Contractor* to ensure that the finished surface is machined to a suitably 'clean' state in order to identify, define and investigate any exposed archaeological deposits. If the surface is not sufficiently clean, hand cleaning of the surface will be required. Machine excavation will comply with the *Employer*'s Technical Standard - Route wide soil resources plan (HS2-HS2-EV-STD-000-000008).

5.2.105 Metal detectors will be used by experienced staff to scan for metallic finds during the excavation of key archaeological features or deposits. The spoil from each trench will also be subject to a metal detector survey, with any finds recorded on the relevant trench sheet.

5.2.106 The *Archaeological Contractor* shall ensure that water is discharged and excavated material from archaeological excavations are stored in accordance with the *Contractor's* environmental protection requirements (as set out in the package Works Information and their Environmental Management Plan) and any relevant consents for the worksite. The *Contractor* shall monitor discharge rates and, if necessary, the conductivity of discharge waters to ensure compliance.

5.2.107 In areas where deep stratigraphy is encountered, such as alluvial sequences, each intervention shall be excavated to the base of the stratigraphic sequence, and shall be appropriately stored and kept free of water to allow 'person entry' to the excavations i.e. to allow the *Archaeological Contractor* to undertake investigation and recording to fulfil the aims of the work. The *Archaeological Contractor* will ensure that all works undertaken in deep stratigraphy will comply with the *Employer's* Technical Standard – Temporary Works (HS2-HS2-CV-STD-

000-000005). When recording deep stratigraphic sequences, the *Archaeological Contractor* shall pay particular attention to establishing the vertical extent of layers of archaeological potential and shall be aware that horizons of cultural activity may be interdigitated with horizons of sterile sediments. The *Archaeological Contractor* shall supervise the excavation in such a manner so as to allow a cumulative or continuous section to be recorded.

5.2.108 Should any material be excavated that is deemed to be contaminated or potentially contaminated it shall be investigated, controlled (e.g. placed separately from clean material) and removed from the site in accordance with the *Contractor's* environmental protection requirements (as set out in their Environmental Management Plan).

Monitoring of Mechanical Excavation

5.2.109 The *Archaeological Contractor* shall undertake monitoring of all areas of ground disturbance associated with *Principal Contractor*'s works.

5.2.110 All mechanical excavation will be undertaken using a toothless ditching bucket, except where the nature of the ground is such that an alternative bucket or means of breaking out prior to excavation is required.

5.2.111 If the ground reduction undertaken by the *Principal Contractor* does not require the full removal of the overburden and the nature of the subsequent works will not damage any underlying potential archaeological remains (through such things as compaction etc.) then no further archaeological intervention will be required. If the subsequent works are deemed by the *Archaeological Contractor* to potentially have an impact on underlying remains, then the *Archaeological Contractor* will direct the machine further to remove any remaining subsoil until the archaeological horizon is achieved and made clean.

5.2.112 If the ground reduction undertaken by the *Principal Contractor* does require the full removal of the overburden, the *Archaeological Contractor* will direct the *Principal Contractor* to remove the overburden in controlled spits until the archaeological surface is exposed. Work then will halt to allow the *Archaeological Contractor* to identify, define and investigate any exposed archaeological deposits. The *Principal Contractor* will comply with the requests of the *Archaeological Contractor* in order to achieve this. If the surface is not sufficiently clean, hand cleaning of the surface will be required. Machine excavation will comply with the *Employer*'s Technical Standard - Route wide soil resources plan (HS2-HS2-EV-STD-000-000008).

5.2.113 All archaeological work areas will be clearly demarked to prevent the *Principal Contractor* from entering or running over the area. These limitations will remain in place until otherwise instructed by the *Archaeological Contractor*.

5.2.114 The topsoil (and subsoil if required) stripping strategy will be implemented by the *Principal Contractor*. Excavated soil will be handled and moved to storage areas through a combination of mechanical excavator(s) fitted with toothless buckets and dumper(s).

5.2.115 It is anticipated that excavated soil will be managed by the *Principal Contractor* in accordance with *Contractor*'s Technical Standard - Route wide soil resources plan (HS2-HS2-EV-STD000-000008).

5.2.116 Where archaeological features of a fragile or sensitive nature have been identified, the *Principal Contractor* will restrict the pedestrian access with temporary fencing and signage, where appropriate.

5.2.117 No machinery (or vehicles) will be allowed to track over stripped areas until express permission is granted by the Lead Supervising Archaeologist of the *Archaeological Contractor* following their sign-off and release by the *Contractor*.

Surface Cleaning

5.2.118 Where necessary, stripped surfaces will be cleaned by hand, using trowels or hoes.

5.2.119 Wherever possible spoil arising during hand-cleaning will be stockpiled beyond the limits of excavation; where those limits are too distant to make off-site storage practicable, spoil will be stored in areas of natural geology away from any archaeological features.

5.2.120 The stripped surface in the immediate vicinity of features will be kept clean and free of loose spoil until excavation of the area is complete and signed off.

Hand Excavation

5.2.121 Archaeological hand excavation and recording shall be undertaken by the *Archaeological Contractor* to the general requirements as described in the GWSI: HERDS and the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035; section 4.14 and 4.17). The sufficient sample strategy will be guided by the CIfA Standard and guidance for archaeological field evaluation (2014), as well as, where applicable, Local Planning Authority guidance documents, and will be detailed in the *Archaeological Contractor's* LS-WSI. The *Archaeological Contractor* will ensure that a sufficient sample of the features and deposits encountered will be sampled/fully excavated to allow the resolution of the aims and objectives of the work. Structures, features, or finds which might reasonably be considered to merit preservation in-situ shall not be unduly damaged.

5.2.122 Where areas of extensive archaeological stratification are encountered, the horizontal and vertical extent of archaeological stratification shall be assessed by the *Archaeological Contractor* through the implementation of an appropriate strategy including, either the excavation of features cut into horizontal stratification, limited test pitting or auguring. The aim shall be to recover suitable stratigraphic, finds and environmental samples from the full, intended depth of the trench, as far as is practicable. The exact methodology may need to be determined by the *Contractor* during the excavation of individual trenches and agreed with the *Employer*.

5.2.123 All investigation of archaeological levels will usually be by hand, with cleaning, examination and recording both in plan and section.

5.2.124 Within significant archaeological levels, the minimum number and proportion of features required to meet the aims of the evaluation will be hand excavated. Pits and postholes will usually be subject to a 50% sample by volume, at sufficient frequency to characterise the archaeological activity across the Site. Linear features will be sectioned as appropriate. More complex features such as those associated with funerary activity will usually be subject to 100% hand excavation. The sample volume of features may be increased, in some circumstances, should the archaeological content or value of a feature warrant further investigation at the evaluation stage, following agreement with the *Contractor*.

5.2.125 It is not necessarily the intention that all test pits/trial trenches will be fully excavated to natural stratigraphy, but the depth of archaeological deposits across the Site will be assessed. The stratigraphy of a representative sample of the test pits/evaluation trenches will be recorded even where no archaeological deposits have been identified. Any excavation, both by machine and by hand, will be undertaken with a view to avoiding damage to any archaeological features or deposits, which appear to be worthy of preservation in situ.

5.2.126 Where deposits are investigated and found to be undated, and where these have the potential to be of archaeological significance (e.g. of earlier prehistoric or early medieval date, or any other deposit types notable for artefactual scarcity) appropriate soil samples should be taken for artefact and ecofact recovery. The soil should be hand excavated and 40L retained for processing by water flotation to recover environmental remains (e.g. charred seeds or charcoal) that could be used for radiocarbon dating. The remaining soil should then be sieved or screened through ¼" or 6mm wire mesh to recover artefacts. Samples can be sieved on-site or retained for immediate sieving off-site.

5.2.127 In order to protect any waterlogged remains during the works, the *Archaeological Contractor* may identify a requirement for trial excavations to be allowed to refill with water overnight. In such cases, the *Archaeological Contractor* shall ensure that any hazards to staff or 3rd parties are minimised.

Methodology for Construction Integrated Recording (CIR)

5.2.128 Construction Integrated Recording of Site C32030 Windmill Hill Spinney shall be undertaken by the *Archaeological Contractor* to the general requirements as described in the GWSI: HERDS.

5.2.129 Within the CIR area (C32030), the *Principal Contractor* will strip the overburden using a 360-degree excavator and toothless ditching bucket under the archaeological supervision of the *Archaeological Contractor*. This area may be amended to reflect the construction impacts (through agreement with the *Contractor*).

5.2.130 The *Principal Contractor* will limit their tracking of vehicles and plant within areas specified in the LS-WSI and/or as instructed by the *Employer*. The *Principal Contractor* will facilitate mapping and sampling of deposits by the *Archaeological Contractor* through use of agreed plant, a site share agreement and careful liaison between the *Principal Contractor* and their supply chain.

5.2.131 The works to be carried out by the *Archaeological Contractor* shall consist of:

- Archaeological monitoring ('observation') following the progress of topsoil stippling for the MWC construction compound by the *Archaeological Contractor*. Allowance must be made by the *Principal Contractor* for investigation of archaeological remains (especially associated with the Roman enclosure) and remains of quaternary geological importance, if identified; and
- Investigation of archaeology and remains of quaternary geological importance undertaken by the *Archaeological Contractor*.

5.2.132 The *Archaeological Contractor*'s team shall consist of appropriately experienced archaeologists commensurate with the scale and nature of the *Principal Contractor's* works. The team shall undertake the observation and any required investigation such as they may reasonably be able to undertake and shall be commensurate with the scale and programme of the *Principal Contractor's* works. The *Archaeological Contractor*'s teams shall be advised where necessary by specialists, as appropriate and as agreed with the *Contractor*.

5.2.133 The *Archaeological Contractor* shall record the following observations on a daily basis. The record shall consist of, as a minimum:

- The site/trench codes as defined in the *Employer's* AIMS;
- the chainage/location of the area observed;
- the date(s) of the observation;
- personnel employed on site;
- a description of the construction works observed;
- the works (sub) contractor and personnel undertaking and supervising the construction activity;
- depths and extents of excavation works observed;
- measure of confidence that any archaeological remains would have been observed and reasons;
- the areas and horizons (both those containing archaeological or remains of quaternary geological importance and those which do not) unaffected by construction activity (with special reference to archaeological sites identified for preservation in

situ);

- the reasons why any particular area of the works was not observed, and noting those areas not subject to disturbance from construction;
- location and description of any archaeological remains; and
- location and description of any modern remains.

5.2.134 An appropriate sample, as specified in Table 5 below, shall be excavated from cut features and other archaeological remains of importance. Sampling of cut features shall include feature inter-sections to establish relative chronologies. Spoil tips will be surface inspected for artefacts and metal detected. The extent of sampling shall be determined by the *Archaeological Contractor* in liaison with the *Employer*, through the Project Plan, but may, for instance, include the sample excavation of a selected number of deposits (both layers and negative, cut features), recording of structural remains, drawn sections and profiles, and/or be aimed at recovering sufficient information to determine function, form, and date. Any specific variations from this specification shall be indicated in the LS-WSI.

Table 5 Sample of archaeological features to be excavated (CIR)

Type	Description	Proportion of feature to be excavated
Linear features (main body)	Agricultural	10%
Linear features (main body)	Non-structural settlement, industrial, funerary	10%
Linear features (main body)	Structural settlement, industrial, funerary	100%
Linear features (bends, termini)	All types	100%
Linear features	large "enclosure" ditch	10% to full depth
Discrete features	Pits, postholes	50% (100% for pits and postholes likely associated with prehistoric or Roman activity)
Discrete features	Large pits	50% (by area) to full depth (higher proportion of up to 100% may be required for remains likely associated with prehistoric/Roman settlement activity)
Deep features	Wells, water pits	50%
Post-fast structures	Fences, buildings	100%
Stone, masonry structures	Walls, buildings	50%

Stone, masonry structures	Surfaces	25%
Other structures	Ovens, kilns, hearths	100%
Funerary	Human, animal	100%
Layers	Agricultural, settlement	Under the discrete judgement of the *Archaeological Contractor*
Discrete special deposits	Settlement, industrial, funerary (e.g. middens, industrial waste, pyre deposits)	100%
Intersections	All types of features and deposits	Typically, 50% of each intersection

5.2.135 Every effort shall be made to establish the presence or absence of archaeological deposits by establishing the absolute ordnance datum (AOD) for the height of significant deposits, including the depth of modern intrusions, key stratigraphic components and natural deposits.

5.2.136 During monitoring, excavation will be undertaken using a mechanical excavator with toothless ditching bucket, except where the nature of the ground is such that an alternative bucket or means of breaking out prior to excavation is required (and the *Employer* has agreed an alternative method) – although bearing in mind the Site is within agricultural land, this alternative is unlikely to be required in this instance. It is the responsibility of the *Archaeological Contractor* to ensure that the finished surface is machined to a suitably 'clean' state in order to identify, define and investigate any exposed archaeological deposits. If the surface is not sufficiently clean, hand cleaning of the surface will be required (see Surface Cleaning, above).

5.2.137 The requirement for construction integrated recording may impose constraints on, or require changes to, the *Principal Contractor's* method of working to enable the archaeological investigation to take place alongside construction works. The *Principal Contractor* shall make allowance in their activity programme for the completion of any CIR exercises as set out in the Project Plans and LS-WSI. Additional responsibilities of the *Principal Contractor* and of the *Archaeological Contractor* with regard to CIR are listed in Appendix 1.

Fieldwork Recording

5.2.138 Archaeological recording is to include, at a minimum:

- At least one representative section at (1:10 or 1:20 scale) of each test pit/evaluation trench, from ground level to the base of the excavation;
- the written record of individual context descriptions on appropriate pro-forma;
- plans at appropriate scales (1:10, 1:20 or 1:50);
- single context planning should be used only if appropriate;
- photographs and other appropriate drawn and written records; and ·

- other sections, including the half-sections of individual layers or features, shall be drawn as appropriate to 1:10 or 1:20.

5.2.139 A 'site location plan', indicating site north shall be prepared at 1:1250. Individual 'test pit/trench plans' at 1:200 (or 1:100) shall be prepared which show the location of archaeology investigated in relation to the investigation area. The location of site plans will be identified using OSGB co-ordinates.

5.2.140 Section drawings shall be located on the relevant plan and OSGB co-ordinates recorded. The locations of the PGM bench markers used and any site TBM shall also be indicated.

5.2.141 A record of the full extent in plan of all archaeological deposits as revealed in the investigation shall be made. These plans will normally be based on digital survey data (digital planning methods shall be agreed in advance with the *Contractor's* Historic Environment Manager and the *Employer*) supplemented where appropriate by hand-drawn records on polyester-based drawing film (at a scale of 1:10 or 1:20 unless otherwise agreed with the *Contractor's* Historic Environment Manager and the *Employer*). All hand-drawn information shall be digitised (or preferably generated digitally in the first instance), and final deliverables will be supplied in an Esri format and adhere to standards set out in the *Employer's* Cultural Heritage GIS Standard (HS2-HS2-GI-SPE-000-000004). Single context planning shall be used where complex stratigraphy is encountered.

5.2.142 A 'Harris matrix' stratification diagram shall be employed to record stratigraphic relationships (Harris et al. 1993) where appropriate. This record shall be compiled and fully checked by the *Archaeological Contractor* during the course of the excavations. Spot dating shall be incorporated onto this diagram.

5.2.143 Recording of structural evidence revealed below ground level will vary according to the level of special interest of the structure and its relationship to archaeological remains. Structures of little or no significance shall be noted on a site plan. Detailed drawings of important features revealed in investigations may be required in accordance with the aims and objectives of the investigation as defined in the Project Plan.

5.2.144 The photographic record will be in digital format, resulting in high-resolution TIFF (uncompressed) images. Photographs will illustrate both the detail and context of the principal archaeological features discovered. In addition, the *Archaeological Contractor* shall take appropriate record photographs to illustrate work in progress. All photographic records will include information detailing: site name and number/code, date, context, scale and orientation. A selection of progress photos of publication-quality must be submitted with the weekly progress report. A selection of progress photos of publication-quality must be submitted with the weekly progress report.

Human Remains

5.2.145 Where human remains are identified, all subsequent work must be undertaken in accordance with the *Employer*'s Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008) and Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035 section 3.18 Methodology for archaeological excavation of human burials). The Sites are located adjacent to prehistoric/Roman settlement remains historic roads and boundaries. It is, therefore, possible that human remains, including inhumation and cremation burials, may be encountered during fieldwork. Should human remains be discovered, the *Archaeological Contractor* shall notify the *Contractor's* Historic Environment Manager immediately, who will notify the *Employer* so that the procedures set out in the *Employer*'s Human remains and monuments procedure (HS2-HS2-EV-PRO-0000-000008) can be implemented. This notification may be initially made personally or by telephone but shall be confirmed in writing (including email) within 24 hours of discovery.

5.2.146 In the event that human remains are identified, the *Archaeological Contractor* will cease all works at that location until further instruction is provided by the *Employer* and communicated by the *Contractor's* Historic Environment Manager. The *Archaeological Contractor* shall undertake an initial in situ observation and assessment of the remains and shall advise the *Contractor's* Historic Environment Manager of the course of action required. The *Contractor's* Historic Environment Manager will then notify the *Employer*.

Environmental Sampling

5.2.147 In line with the *Employer*'s Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV0STD-000-000035) an initial sampling strategy is set out below for the Site. This strategy is based on the existing information about the Site, gathered from non-intrusive surveys and the HERDS objectives outlined in Table 1. A Sampling Strategy Proforma Sheet (Appendix 9) will be included by the *Archaeological Contractor* in the Location Specific Written Scheme of Investigation (LS-WSI) and completed throughout the fieldwork as required to help tailor the sampling strategy.

5.2.148 This sample strategy, along with the HERDS objectives outlined in Table 1, identify the key elements that should, where present, be sampled during the evaluation. However, the strategy will need to be reviewed throughout the on-site work and, where unexpected features or deposits are identified, revised accordingly to take these into account.

5.2.149 The purpose of sampling at the evaluation stage is to identify the range of environmental materials present on site, their preservation, significance and distribution.

5.2.150 The Site has the potential for features associated with prehistoric/Roman activity as well as with medieval and post-medieval archaeological remains, which could include enclosures, land boundaries, trackways, and ridge and furrow earthworks as identified in Section 3.2. Sampling will, therefore, target the following, where present, as a minimum:

- Prehistoric and Roman features: potentially including pits, postholes, gullies, ditches,

earthworks, field systems, structural remains, funerary activity, etc;

- Medieval and post-medieval features: potentially including pits' postholes, ditches, ridge & furrow earthworks (extant or levelled), evidence of industry (i.e. charcoal burning), etc;
- Deposits representing the main phases of activity on site (to assess whether there are changes in rates of deposition or material survival over time);
- Features associated with historic parish boundaries (where present); and
- Deposits that may require radiocarbon dating.

5.2.151 Sampling will not only just target charcoal rich or wet deposits, but will be undertaken on those features outlined above, taking into account advice from the *Contractor's* environmental archaeologist. This will ensure that samples are recovered from a representative range of contexts, which adequately characterise past activities on site and allow an assessment to be made of the extent to which they help address palaeoenvironmental and palaeoeconomic questions.

5.2.152 Boundary ditches and other linear features such as watercourses or channels as well as ponds can preserve important evidence about the ancient environment, although regular cleaning may limit this potential. If discovered, the presence of organic deposits may, however, provide material suitable for radiocarbon dating, plant macrofossil and pollen analysis, which could be used to investigate woodland history and landscape development. Molluscan sequences may also be preserved in ditch and channel fills, as well as buried surfaces and banks where the soils are calcareous (e.g. C21022 Jones Hill Wood), and these too will have potential for landscape reconstruction.

5.2.153 Undated features will be assessed for their potential to answer specific questions prior to sampling.

5.2.154 A wide range of proven dating techniques are available, as summarised in HS2-HS2-EV-STD - 000-000035, but for this project the principal method of dating is likely to be a combination of radiocarbon dating, dendrochronology and artefactual dating, although Optically Stimulated Luminescence (OSL) dating may be required for dating deeper ditch fill sequences, field terraces, buried surfaces and banks where in-situ organic remains and artefacts are not preserved. Advice on dating (e.g. techniques, resolution issues, as well as the number of dates required to answer the archaeological questions), will be sought from the Historic England dating team.

5.2.155 A Project Plan for Route-Wide Parish Boundary Evaluation is currently being completed (1EW03-FUS-EV-REP-C000-009807) detailing the methodologies for the investigation, environmental sampling and scientific dating of historic parish boundary features. If remains associated with the historic parish boundary ae encountered during the evaluation, the *Archaeological Contractor* will agree an appropriate sampling methodology with the

Contractor. Methodologies proposed within the Route-Wide Parish Boundary Project Plan may be applicable to Trenches 9, 26 and 44, and may include scientific dating methods (i.e. Optically Stimulated Luminescence profiling and dating and radiocarbon dating, cf. Appendix 2 and 3).

5.2.156 Any features selected for OSL dating will be chosen on the basis of potential archaeological or historical significance, presence of an intact sediment sequence (i.e. minimal/no historical or modern disturbance) and ease of access to the section and associated sediments.

5.2.157 Where possible a Specialist will undertake a site visit in order to perform on-site measurements and the OSL sampling itself (see Appendix 2). Where this is not possible, samples may be taken by the Contractor using a methodology provided by the Specialist, using bespoke sampling tubes with associated samples taken in pots which will be used to correct for background radiation in the OSL sample.

5.2.158 Wherever possible, buried soils and deep sediment sequences will be inspected and recorded on-site by a recognised geoarchaeologist, since field inspection may provide sufficient data for understanding site formation processes. Following inspection, buried land surfaces, or turf-lines sealed beneath or within banks (where they survive) will be sampled by monolith/kubiena and column samples (following HS2-HS2-EV0STD-000-000035).

5.2.159 Where unexpected deposits or features are identified during the evaluation which are not covered in the initial sampling strategy above, the need for sampling will be assessed in terms of the specific objectives (both those in Table 1 as well as the remaining HERDS objectives), the sampling strategy will be updated and the features will be sampled accordingly.

5.2.160 All samples will be taken to address a specific question. The purpose of the sample, and the question it has been taken to address will be recorded on the *Archaeological Contractor's* sample record sheet.

5.2.161 Bulk samples will be taken from single contexts using ten litre plastic buckets (with lids and handles), or strong polythene bags (double bagged) secured at the neck, for the recovery of 'disturbed' environmental material. Labelling will follow guidance set out in the Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035).

5.2.162 For non-waterlogged deposits, bulk sample size will normally be in the range of 40-60 litres. Where contexts have a volume of less than that stated above, then 100% of the context will be sampled. Each bulk sample will only contain sediment derived from a single context. Where waterlogged deposits are encountered, sample sizes will usually be in the range of 10-20 litres, which is suitable for the recovery of macrofossils from these contexts. Samples shall be protected at all times from temperatures below 5°C and above 25°C and from wetting and drying out due to weather exposure.

5.2.163 Where clearly stratified bank deposits, ditch fills, buried land surfaces/turf lines, house floors or other buried surfaces are encountered, following a geoarchaeological assessment appropriately sized monolith or kubiena boxes may be used for the recovery of 'undisturbed' monolith samples for soil investigations (e.g. thin-section micromorphology) and/or to sub-sample for microfossils (e.g. pollen and spores, diatoms, ostracods) from a freshly cleaned section.

5.2.164 Where longer sequences are available for sampling and preservation conditions are suitable, contiguous column samples will be collected at appropriate intervals (e.g. every 5 or 10cm avoiding context boundaries) for the retrieval of macrofossils (e.g. molluscs and/or waterlogged plant remains and insects). The individual subsamples will be of 1-10kg, depending on the nature of the deposit and the category of material to be retrieved). Further guidance on specialist samples is provided in the Technical Standard Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035 – Sections 4.21.22-26).

5.2.165 Processing of all soil samples collected for biological assessment, or subsamples of them, should be completed within two weeks of collection.

5.2.166 Bulk samples will be processed by water flotation using meshes of 0.5mm for the heavy residue and 0.25mm for the flot. The dried residues will be sorted and any bones or artefacts extracted together with any larger fragments of charcoal. The residues will be scanned with a magnet for the recovery of metalworking evidence such as hammerscale. Flots will be scanned using a low-power stereo microscope.

5.2.167 Column samples and other specialist samples will be sub-sampled and processed following specialist guidance.

5.2.168 The preservation state, density and significance of material retrieved shall be assessed by the *Archaeological Contractor's* recognised specialist.

5.2.169 Special consideration shall be given to any evidence for recent changes in preservation conditions that may have been caused by alterations in the site environment. Unprocessed sub-samples, soil monoliths/ kubiena samples and OSL samples shall be stored in appropriate conditions in accordance with the *Archaeological Contractor's* method statement.

Metallic Objects and Residues

5.2.170 Where works are intended to address Specific Objectives, or any further objectives identified during the course of the investigation, relating to industrial activity and there is evidence for industrial activity, macroscopic technological residues (or a sample of them) shall be collected by hand. Separate samples (c. 10ml) shall be collected for micro-slags (hammer-scale and spherical droplets). Reference should be made to the guidance on Archaeometallurgy (Historic England guidance, 2015). Assessment of any technological residues shall be undertaken. Assessment of finds assemblages shall, where appropriate to the Specific Objectives being addressed, include x-radiography of all iron objects (after initial screening to

exclude obviously recent debris) and, where appropriate, nonferrous artefacts (including all coins). Where necessary, active stabilisation/consolidation shall be carried out to ensure the long-term survival of the material, but with due consideration to possible future investigations.

Preservation of Archaeological Remains

5.2.171 Where preservation has been identified as an option for areas of the Site, or it becomes clear during the evaluation that certain parts of the Site might be retained in situ within the scheme design, the *Archaeological Contractor* will ensure that suitable samples are taken to assess the state of preservation (as set out in Historic England guidance on preserving archaeological remains). Where it is proposed that waterlogged deposits are preserved, discussion should be held with the *Contractor* about initiating a water environment study. If preservation is considered to be a viable and desirable option, the areas proposed should be excluded from further plant/vehicle movement, to minimise the possible effects of compression and loading on the physical integrity of the Site. Thought should also be given to whether the proposed construction works will have any short or long term hydrogeological or chemical impacts on the archaeological remains.

Backfilling

5.2.172 Test pits and trial trenches shall only be backfilled following approval of the *Contractor*. The trenches shall be pumped dry (by the *Archaeological Contractor* under a permit to pump as per the *Contractor's* procedure) and any necessary protection measures for archaeological remains (in addition to those for below-ground infrastructure, services or utilities) shall be completed prior to backfilling. Backfilling shall be undertaken in layers of 250mm whilst being adequately compacted. Trenches and test pits shall be reinstated with arising, comprising subsoil first then topsoil (i.e. reverse order of excavation).

5.2.173 Generally, all backfill material shall consist of non-toxic, uncontaminated, non-putrescible, natural and inert material which shall be compacted and (if necessary) tested (dynamic compaction test or other) in accordance with a specification provided by the *Contractor*. Surface conditions shall be reinstated to the required standard.

5.2.174 The *Contractor* shall ensure, in liaison with the *Employer* that adequate protection is provided for any archaeological remains. Any specific archaeological requirements relating to backfilling including use of materials to mark excavated depth, such as geotextiles, shall be specified by the *Contractor* in the LSWSI.

6 Post-investigation reporting and archiving

6.1 Document deadlines

6.1.1 The *Archaeological Contractor* shall provide the documents listed below on the given deadlines following the completion of each Phase of works. All documents will comply with the requirements detailed in the Specification for Historic Environment Investigations (HS2-HS2-EV-STD-000-000035). To comply with HS2 digital archiving and project specifications, individual reports will be required for the separate pieces of work (Phase 1 and Phase 2).

Interim Report – 2 No. reports

- Phase 1 – Standard Interim report (2 weeks following completion of all on-site works, i.e. topographic and woodland survey and test-pitting)
- Phase 2 – Standard Interim report (2 weeks following completion of all on-site works, i.e. trial trenching/monitoring or fieldwalking)

Survey Report – 2 No. reports

- Phase 1 – Survey report (4 weeks following completion of all on-site works, i.e. topographic and woodland survey and test-pitting)
- Phase 2 – Survey report (4 weeks following completion of all on-site works, i.e. trial trenching/monitoring or fieldwalking)

Fieldwork Report – 2 No. reports

- Phase 1 – Fieldwork and historic landscape survey report (10 weeks following completion of all on-site works, i.e. topographic and woodland survey and test-pitting)
- Phase 2 – Fieldwork report (10 weeks following completion of all on-site works, i.e. trial trenching/monitoring or fieldwalking)

Summary Report – 2 No. reports

- Phase 1 – Summary report (12 weeks following completion of all on-site works, i.e. topographic and woodland survey and test-pitting)
- Phase 2 – Summary report (12 weeks following completion of all on-site works, i.e. trial trenching/monitoring or fieldwalking)

Digital Deliverable – 2 No. deliverables

- Phase 1 – digital deliverables (12 weeks following completion of all on-site works, i.e. topographic and woodland survey and test-pitting)

- Phase 2 – digital deliverables (12 weeks following completion of all on-site works, i.e. trial trenching/monitoring or fieldwalking)

6.2 Interim report

6.2.1 The *Archaeological Contractor* shall submit an interim statement to HS2 Ltd within two weeks of completion of the evaluation. The interim statement will be consistent with the requirements detailed in the Specification for historic environment investigations (Document no. HS2-HS2-EV-STD-000-000035) and will provide HS2 with the information necessary to inform design decisions relating to:

a. the next stage of archaeological works (if required) and

b. engineering design.

6.2.2 Interim reports are only used to inform decision-making on further works in programme-critical areas and when confidence in the geophysical survey/trial trenching results indicate that the Site has no significant archaeological potential. It is preferable that all decisions for further works are based on the full factual fieldwork reports.

6.3 Survey Report

6.3.1 A survey report will include a written and graphic survey report for the works upon completion of fieldwork as an appendix to the Fieldwork Report. Evidence shall be provided for check measurements and results of levelling for establishment of TBMs. Unless otherwise agreed, the survey report shall be submitted by the *Archaeological Contractor* to the *Contractor* and *Employer* within four weeks of completion of fieldwork.

6.3.2 The *Archaeological Contractor* shall prepare and submit site area outlines and levels in accordance with the *Employer's Cultural Heritage GIS Standard* (HS2-HS2-GI-STD-000-000010) and BIM requirements. Each drawing shall identify the relevant event code and sub-site division, if applicable.

6.4 Fieldwork Report

6.4.1 The following elements are required for each phase:

- Phase 1 – an overarching Historic Landscape Report, containing:
  - Historic landscape survey report (incorporating results of the DDBA, topographic survey and historic landscape interpretation); and
  - Intrusive fieldwork report (test-pitting)
- Phase 2 – intrusive fieldwork report (evaluation)

Historic Landscape Survey Report

6.4.2 The deliverables of the full Historic Landscape Survey Report can be distilled into the following:

- Type and classification of the features surveyed and their probable period interpreted utilising the FISH Thesaurus;
- A summary of salient features;
- A concise description of the Site and the features it contains including information on plan, form, dimensions, area and probable function and age of individual features as well as discussion of any perceptible developmental sequencing/chronology and evidence for past land use;
- A detailed description of the Site expanding on the information described above with full analysis and interpretation linked to supporting evidence;
- Consideration of the topographical setting of the Site and its landscape relationship with other associated sites, landscapes and historic buildings within its environment;
- The potential for further survey and recommendations for which techniques could be applied to further enhance understanding of the site and place it within its historical context;
- An assessment of the local, regional and national significance of any identified earthworks with regard to their origin, purpose, form and status. Its academic context;
- A record of the survey techniques utilised to compile the completed record
- A diagrammatic plan showing the location and extent of the identified features;
- A metrically accurate plan of the features at no more than 1:1000 to 1:2,500 showing the form of the features in association with their surrounding landscape. This should allow the relationship with topographic features (such as watercourses, routeways and field boundaries etc); both modern and historic;
- Profiles illustrating salient vertical and horizontal differences in ground surface; the location and orientation of which are to be accurately mapped;
- Interpretive diagrams showing any perceived successions of development accompanied by an unaltered copy of the survey from which the interpretation has been derived alongside full referencing to any other sources used;
- The potential use of interpretive reconstruction drawings should be considered where relevant and useful in achieving the aims of the project;

- Copies of historic maps, aerial (or other) photographs used and LiDAR imagery utilised to help interpret the survey data within its historic landscape context.

6.4.3 The Historic Landscape Survey Report will be produced with the following structure:

- Non-technical Summary
- Introduction
- Summary of the project's background (including the Specific Objectives addressed)
- Assumptions and limitations
- Description and illustration of the site location
- Previous work(s) relevant to the archaeology of the site (e.g. DDBA, previous surveys)
- Geology and topography of the site
- Specific Objectives and Aims
- Scope and Methodology, to include:
  - Date(s) of fieldwork;
- Results and observations
  - Interpretation of results against original expectations and Specific Objectives
  - Review of survey strategy [where appropriate].
- Recommendations and research aims for further investigation
- Conclusion
  - Statement of potential of archaeology
  - Assessment of achievement (or not) of survey objectives.
- Evaluation of survey methodology employed and results obtained (i.e. a confidence rating)
- Publication and dissemination proposals, including archive deposition
- References to all primary and secondary sources consulted.
- Appendices to include illustrations, contextual summary by trench, finds reports, environmental reports, site matrices [where appropriate] and full definitions of the interpretation terms used in the report.

6.4.4 The historic landscape survey report will contain figures accompanied by supporting text. All figures within the report shall be on the same paper size, where appropriate. All categories of

anomaly identified will be labelled with the appropriate assigned number code on the figures, which will be referred to in the text document.

Fieldwalking report

6.4.5 The fieldwalking report will be produced within 12 weeks of completion of fieldwork, compliant with the following structure:

- Non-technical summary;
- Introduction;
- Summary of the project's background (including the Specific Objectives addressed);
- Description and illustration of the site location;
- Previous work(s) relevant to the archaeology of the site (e.g. previous surveys);
- Geology and topography of the site;
- Specific Objectives and Aims;
- Methodology of site-based and off-site work;
- Results and observations, including quantitative report, stratigraphic report and any constraints on site;
- Assessment and interpretation of results against original expectations and objectives and, where appropriate, a review of evaluation strategy;
- Statement of potential archaeology;
- Conclusions and recommendations for appropriate archaeological investigation strategy or post-excavation assessment in light of Specific Objectives;
- Considerations of the results and conclusions within the wider context;
- Evaluation of methodology employed and results obtained (i.e. a confidence rating);
- Publication and dissemination proposals (in addition to fieldwork report);
- Archive deposition;
- Bibliography;
- Acknowledgements;
- OASIS/HER form;
- Site matrices, where appropriate;
- Specialist assessment or analysis reports where undertaken;

- Illustrations, including location plans with scale and grid co-ordinates;

6.4.6 The fieldwalking report will contain figures accompanied by supporting text. All figures within the report shall be on the same paper size, where appropriate. All categories of anomaly identified will be labelled with the appropriate assigned number code on the figures, which will be referred to in the text document.

6.4.7 The following figures will be included:

- General plan (mandatory)
- Engineering design (mandatory)
- Selected photographs of representative and/or significant features and finds

6.4.8 Additionally, the report will include an OS map at a scale of 1:25,000 or 1:50,000, showing the site location in its wider context.

6.4.9 A 'site location plan' shall be prepared at a maximum scale of 1:1250 which will show the location of artefact recovery in relation to the investigation area. The location of site plans will be identified using OSGB co-ordinates.

6.4.10 The location of each transect and stint will be accurately recorded on thus plan by the Archaeological Contractor to enable the spatial distribution and density of recovered artefactual material to be captured by artefact type. Densities of each artefact type (and if possible, period) will be mapped in GIS to illustrate the following four quantums of recovery:

- 1-5 relevant artefacts (small circle);
- 6-10 relevant artefacts (larger circle);
- 10-50 relevant artefacts (large circle); and
- 50-100+ relevant artefacts (largest circle).

6.4.11 With regard to Digital Archival Material including OASIS/Historic Environment Record summary sheets, the *Archaeological Contractor* will provide the required data, metadata and digital material as specified in the Historic Environment Digital Data Management and Archiving Procedure (C262-ARP-EVSPE-000-000003).

Intrusive fieldwork report

6.4.12 The C01 fieldwork report will be produced within 12 weeks of completion of fieldwork, compliant with the following structure:

- Non-technical summary;
- Introduction;
- Summary of the project's background (including the Specific Objectives addressed);

- Description and illustration of the site location;
- Previous work(s) relevant to the archaeology of the site (e.g. previous surveys);
- Geology and topography of the site;
- Specific Objectives and Aims;
- Methodology of site-based and off-site work;
- Results and observations, including quantitative report, stratigraphic report and any constraints on site;
- Assessment and interpretation of results against original expectations and objectives and, where appropriate, a review of evaluation strategy;
- Statement of potential archaeology;
- Conclusions and recommendations for appropriate archaeological investigation strategy or post-excavation assessment in light of Specific Objectives;
- Considerations of the results and conclusions within the wider context;
- Evaluation of methodology employed and results obtained (i.e. a confidence rating);
- Publication and dissemination proposals (in addition to fieldwork report);
- Archive deposition;
- Bibliography;
- Acknowledgements;
- OASIS/HER form;
- Site matrices, where appropriate;
- Specialist assessment or analysis reports where undertaken;
- Illustrations, including location plans with scale and grid co-ordinates;

6.4.13 The intrusive fieldwork report will contain figures accompanied by supporting text. All figures within the report shall be on the same paper size, where appropriate. All categories of anomaly identified will be labelled with the appropriate assigned number code on the figures, which will be referred to in the text document.

6.4.14 The following figures will be included:

- General plan (mandatory)
- Engineering design (mandatory)

- Site location
- Survey extent and test pit/trial trench locations
- Survey results to include plans and sections of archaeological features, deposits and sequences
- Selected photographs of representative and/or significant features and finds

6.4.15 With regard to Digital Archival Material including OASIS/Historic Environment Record summary sheets, the *Archaeological Contractor* will provide the required data, metadata and digital material as specified in the Historic Environment Digital Data Management and Archiving Procedure (C262-ARP-EVSPE-000-000003).

6.5 Archaeological Summary Report

6.5.1 A short summary report of no more than 500 words (the Summary Report) for the works shall be prepared by the *Archaeological Contractor* for submission to the *Contractor* for subsequent publication within an appropriate journal or publication outlet specified by the *Employer*.

6.5.2 The *Archaeological Contractor* shall submit the draft summary report to the *Contractor* for approval within 14 weeks of the completion date of the fieldwork event. The *Contractor* will review the draft summary report and then issue it to the *Employer* for comment and approval. The *Archaeological Contractor* shall allow two weeks in the programme of works for *Contractor* and *Employer* to provide comments.

6.5.3 The *Archaeological Contractor* shall include any amendments required by the *Contractor* and *Employer* in the final Summary Report which shall be submitted within one week of receiving comments on the draft report.

6.6 GIS Deliverables

6.6.1 GIS Deliverables will be provided to the *Contractor* for approval within 14 weeks of the completion date of the fieldwork. The specific requirements of this deliverable are provided by HS2 in the Technical Standard Specification for historic environment investigations (HS2-HS2-EV-STD-000-000035) and the GWSI: HERDS (HS2-HS2-EV-STR-000-000015).

7 Information Management

7.1.1 GIS deliverables will be provided in accordance with the *Employer's* Cultural Heritage GIS Specification (HS2-HS2-GI-SPE-000-000004). CAD files will be GIS compatible and follow standards set out in the same Specification. Figures may be produced using CAD but final deliverables must be supplied in GIS format.

7.1.2 Mapping and spatial data deliverables will conform to the *Employer's* GIS Standards as set out in HS2-HS2-GI-STD-000-000002 and other associated referenced documents.

7.1.3 The *Employer's* standard template for reports (HS2-HS2-PM-TEM-000-000004) will be used.

8 Quality Assurance Processes

All archaeological works will be delivered in accordance with the *Contractor's* AWH Quality Plan (ref. 1EW03-FUS-QY-PLN-C000-001658). The trial trenching report will be prepared and conducted by suitably qualified, experienced and competent professionals.

Trial trenching report will be checked and then reviewed by senior qualified, experienced and competent professionals prior to issue to the *Employer* for acceptance. Final reports, following comments, will be checked and reviewed again prior to issue.

9 Change Control

9.1.1 During the course of the archaeological investigation, unexpected, complex or undated archaeological remains may be encountered. In order to inform the decision-making process and to minimise delays to the enabling works construction programme, it may be necessary to implement a contingency or vary the methodology or extent of the archaeological investigation.

9.1.2 The GWSI: HERDS establishes the need to manage unexpected discoveries and regularly review ongoing fieldwork events (Sections 7.6.5 and 7.6.17; Document no.: HS2-HS2-EV-STR-000-000015). In order to promote rapid decision making and to minimise delays a clearly defined change control process will be followed. This change control process will enable:

- rapid decision making during historic environment investigations;
- the implementation of contingencies;
- the variation of methodologies being used on site;
- the localised extension of investigation areas: and
- the rapid implementation of mitigation measures.

9.1.3 The change control process will also enable effective cost control while minimising the risk to the enabling works programme.

9.1.4 The change control process will be recorded using the proforma Historic Environment Fieldwork Change Control Acceptance Sheet at Appendix 4 of this project plan and will comprise the following steps:

1. The *Archaeological Contractor* will:
   - prepare an interim summary of the investigation results noting key features or elements of the archaeological remains or structure;

- provide a proposal for the variation to the works or methodologies; and
- suggest any new or existing HERDS objectives to which the variation may provide opportunities for knowledge gain;

2. The interim summary will be submitted to the *Contractor*'s Historic Environment Manager who will disseminate the results and arrange a meeting on site with the *Employer*'s Historic Environment Manager and local authority (stakeholder) archaeologist;
3. At the site meeting all parties will:
   - review the nature, extent and significance of the archaeological remains;
   - review and agree the proposed variation to the works; and
   - signify their endorsement or approval of the variation by signing the Historic Environment Fieldwork Change Control Acceptance Form.
   - Following agreement with the Fusion commercial team a work instruction will be issued to the subcontractor via the Fusion Package Manager.
4. Following the site meeting the *Contractor* will submit a copy of the completed the Historic Environment Fieldwork Change Control Acceptance Form to the *Employer* via eB.
5. Where the rapid implementation of mitigation measures is required the *Contractor* will, prior to completion of the ongoing archaeological investigation:
   - prepare a new Project Plan detailing the aims, HERDS objectives and specification of the archaeological mitigation and submit it to the *Employer* for acceptance;
   - Request a new site code from the *Employer*; and
   - Update and resubmit the existing LSWSI to include the archaeological mitigation works.

10 Evidence of engagement

10.1.1 In the course of the preparation of this Project Plan, an IDR was held on 31 October 2019 between COPA, the *Contractor* and Historic England (Chris Welch and Jim Williams) (apologies were received from the local planning authority archaeological advisors). In the meeting, the initial results of the background research in relation to the woodland sites was discussed and strategy presented in this Project Plan was agreed in consideration of the archaeological potential, on site constraints and the construction programme.

10.1.2 Full project plan was provided for comment to stakeholders (including Historic England advisors local planning authority advisors at Buckinghamshire, Oxfordshire,

Northamptonshire and Warwickshire) and responses received from Historic England, Warwickshire CC and Buckinghamshire CC have been taken into account in this project plan (no responses were provided by other advisors).

10.1.3 Historic England advisors (Chris Welch and Jim Williams) provided a number of comments or suggestions, which have been addressed as appropriate throughout the project plan. In particular, the use of dendrochronology was suggested and this has now been incorporated into the proposed methodology. Moreover, an additional trench was added within C32033 as requested.

10.1.4 Anna Stocks at Warwickshire CC responded with a number of queries relating to the proposed surveys. The project plan provides clarifications in response to these queries, and in particular, a programme of Construction Integrated Recording was added to the Windmill Hill site C32030.

10.1.5 Phil Markham at Buckinghamshire CC commented on the potential for the inclusion of Trench 3 at Jones Hill Wood C21022 within the scope of environmental sampling suggested for parish boundaries, however, this site is not located along the parish boundary. As requested, a clarification has been added to Table 4, highlighting those trenches which have the potential to target parish boundaries.

11 Community engagement proposals

Local history, including the origins, development and management of historic woodland sites, may be of interest to the wider public, especially to local history interest groups or bodies researching woodland history. Every effort should be made by the *Archaeological Contractor* to propose and implement, with the approval of the *Employer*, a programme of community engagement. This could include but should not be limited to: school visits, talks to local interest groups, and finds handling experiences. The results of the investigations will be disseminated to the wider public in due course, as appropriate (details to be provided by the *Archaeological Contractor*).

12 LSWSI strategy and structure

Location Specific Written Scheme of Investigation will be prepared by the *Archaeological Contractor* for approval, along with the Risk Assessment Method Statement (RAMS), prior to commencing the works. The LS-WSI will be prepared in line with the relevant Employer's specifications and Fusion Project Plan and LSWSI Contents Structure (Document no. 1EW03-FUS-EV-SPE-C000-008268).

The LSWSI will include the following sections:

- Executive summary;
- Site location, extent and condition;

- Summary overview of the Project Plan that is delivered under the LSWSI;
- The *Archaeological Contractor's* Programme: a detailed programme (including schedule of dates and a detailed Gantt chart baseline programme – for onsite works and post-excavation reporting);
- *Archaeological Contractor's* Topic Specific Method Statements. This will specify the methods and sampling strategy for fieldwork hand-excavation and recording, in line with the guidance documents referred to in section 5 of this Project Plan: Hand Excavation and Fieldwork Recording;
- *Archaeological Contractor's* Health, Safety and Environment Management and RAMS;
- *Archaeological Contractor's* Interface and Communication Plan;
- *Archaeological Contractor's* site Monitoring and Engagement;
- *Archaeological Contractor's* Quality Assurance Processes and plan;
- *Archaeological Contractor's* resource plan;
- *Archaeological Contractor*'s site Management Plan;
- *Archaeological Contractor's* Safe Method of Working;
- References and glossary of terms; and
- Figures (as relevant).

13 References

13.1 References

Title	Reference
Archival research Buckinghamshire Record Office (Aylesbury): • Ma/222/1 Title Plan of Wendover Dean Farm • D-BM/T/119 Map of the whole parish of Wendover • IR/26 Wendover Inclosure Award and Map • IR/50 Bottendon Hill (Wendover) Inclosure • Martins Manor court roll and court papers • PR169/27/4 Hamlet of Shipton Lee Tithe Map 1842 Northampton Record Office • Map/3630 Whitfield Inclosure Map • Map/4266-1 illustrating part of Whitfield • Upper Boddington Inclosure Act • Upper Boddington Manor Rentals • Whitfield, Northamptonshire Map/4939 • Paulerspury, Whittlebury, Silverstone, Lillingstone Dayrell, Whitfield, Abthorpe, Towcester, Tiffield, Northamptonshire. Map/4266-1 1831	Archives 2019

Warwick Record Office • Plan of Wormleighton Estate 1734 • Plan of Wormleighton Estate 1779 • Plan of Wormleighton Estate 1856 • Z0358 Ladbroke 1639 • Survey of estate in Ladbroke, Southam, Harbury and Chapel Ascote 1775 Oxfordshire History Centre • Finmere, enclosure by private agreement 1667 CP102 CP102/H/1 and CP102/H/2	
British Geological Survey, Geology of Britain viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html	BGS Online 2019
Brunning, R and Watson, J 2010 Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood. Historic England guidance	Brunning and Watson 2010
Campbell, G, Moffett, L and Straker, V 2011 Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and recovery to Post-excavation (2nd ed.). Historic England guidance	Campbell et al. 2011
CIfA 2014 Standard and guidance for archaeological field evaluation. Chartered Institute for Archaeologists	CIfA 2014
English Heritage, June 2004, Dendrochronology. Guidelines on producing and interpreting dendrochronoglogical dates	EH 2004
Fusion AWH Quality Plan	1EW03-FUS-QY-PLN-C000-001658
Fusion Construction Phase Health and Safety Plan	1EW03-FUS-HS-PLN-C000-000053
Fusion Incident & Emergency Preparedness Plan	1EW03-FUS-HS-PLN-C000-000001
Fusion Project Plan and LSWSI Contents Structure. Adjustment to align with delivery	1EW03-FUS-EV-SPE-C000-008268
Fusion Standard for Accident and Incident Investigation and Reporting	SH2 STD1
Garwood, P. (2011), The earlier prehistory of the west midlands. In Watt, S., ed. The Archaeology of the West Midlands: A Framework for Research. Oxbow Books: Oxford.	Garwood 2011
Geoarchaeological Desk Based Assessment (GDBA): review of the geoarchaeological potential of High Speed Two Phase One	1D037-EDP-EV-REP-000-000031
Great Crested Newt Unexpected Finds Method Statement	1EW03-FUS-EV-MST-C000-000014
Hall, D., (2001), Turning the Plough: Midland open fields: landscape character and proposals for management, English Heritage, Swindon.	Hall 2001
Harris, E C 1989 Principles of Archaeological Stratigraphy (2nd ed.) Academic Press	Harris 1989

Hart, J., Kenyon, D. and Mudd, A. (et al), (2010), Excavation of early Bronze Age Cremations and a Later Iron Age Settlement at Finmere Quarry, North-East Oxfordshire, Oxoniensia LXXV, Oxford.	Hart et al. 2010
Hey, G and Lacey, M 2001 Evaluation of archaeological decision-making processes and sampling strategies. Kent County Council	Hey and Lacey 2001
High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 1: Code of Construction Practice	CS755 02/17
High Speed Rail (London-West Midlands) Environmental Minimum Requirements Annex 3: Heritage Memorandum	CS755 02/17
Highways Agency 2007 Assessing the Effect of Road Schemes on Historic Landscape Character	Highways Agency 2007
Historic England 2008a Conservation Principles	Historic England 2008a
Historic England 2010 Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood. Historic England	Historic England 2010a
Historic England 2011 Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and recovery to Post-excavation (2nd ed.). Historic England	Historic England 2011
Historic England 2012 Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation. Historic England	Historic England 2012
Historic England 2014 Animal Bones and Archaeology: Guidelines for Best Practice. Historic England	Historic England 2014
Historic England 2015a Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide	Historic England 2015a
Historic England 2015b Management of research projects in the historic environment (and associated guides and planning notes)	Historic England 2015b
Historic England 2015c Geoarchaeology: Using earth sciences to understand the archaeological record	Historic England 2015c
Historic England 2015d Where on earth are we?	Historic England 2015d
Historic England 2016 Traversing the Past: The Total Station Theodolite in Archaeological Landscape Survey	Historic England 2016
Historic England 2017 Understanding the Archaeology of Landscapes: A Guide to Good Recording Practice (2nd Edition)	Historic England 2017

Historic England 2018a 3D Laser Scanning for Heritage (2nd Edition)	Historic England 2018a
Historic England 2018b Graphical and Plane Table Survey of Archaeological Earthworks: Good Practice Guidance.	Historic England 2018b
Historic England 2018c The Light Fantastic	Historic England 2018c
HS2 (AC320/4) Wormleighton, and Church Farm (Oxford Canal South & North Embankment), Warwickshire	1EW03-FUS-EV-REP-CS07_CL14-009411
HS2 1EW03 – Enabling Works Contract Ancient Woodland Translocation Feasibility Study – Fox Covert	1EW03-FUS-EV-REP-CS07-004381
HS2 1EW03 - Enabling Works Central AWH – Fieldwork Report for Trial Trench Evaluation at Widmore Farm, Barton to Mixbury Cutting (AC250/16) 1C18WIDTT	1EW03-FUS-EV-REP-CS06_CL21-007808
HS2 1EW03 AWH Interim Statement Report for Geophysical Magnetometer Survey at Windmill Hill Spinney and Starbold Farm, Ladbroke Cutting; West Southam, Southam Embankment; Hill Farm, Southam Cutting; and Thorpe Bridge, Leamington Road Embankment, Warwickshire (AC320/6)	1EW03-FUS-EV-REP-CS07_CL24-007839
HS2 1EW03 – Enabling Works Central AWH Final Report for Geophysical Magnetometer Survey at Mossycorner Lane, Mixbury Cutting and Barton to Mixbury Cutting, Oxfordshire (AC250/13)	1EW03-FUS-EV-REP-CS06_CL22-007795
HS2 1EW03 Enabling Works Central AWH Final Report for Geophysical Magnetometer Survey at Windmill Hill Spinney and Starbold Farm, Ladbroke Cutting; West Southam, Southam Embankment; Hill Farm, Southam Cutting; and Thorpe Bridge, Leamington Road Embankment, Warwickshire (AC320/6)	1EW03-FUS-EV-REP-CS07_CL24-007768
HS2 1EW03 Enabling Works Central AWH Geophysical Survey Report at North of Radstone (Brackley North Cutting) and Halse Copse Farm (Greatworth South Cutting), Northamptonshire (AC300/2)	1EW03-FUS-EV-REP-CS07_CL12-007821
HS2 1EW03 Enabling Works Central AWH Historic Environment Archaeological Trial Trench Evaluation at East of Ilett's Farm, Brackley South Cutting, Northamptonshire (AC300/9)	1EW03-FUS-EV-REP-CS07_CL12-037127
HS2 1EW03 Enabling Works Central AWHb Final Report for Geophysical Magnetometer Survey at Barton Hartshorn, Barton to Mixbury Cutting, Buckinghamshire and Oxfordshire (AC250/12)	1EW03-FUS-EV-REP-CS06_CL21-000001
HS2 1EW03- Enabling Works Central AWH Project Plan for Historic Landscape Study and Setting Recording Thorpe Mandeville Northamptonshire	1EW03-FUS-EV-REP-CS07_CL26-008117

HS2 1EW03 Enabling Works Central AWHb Final Report for Geophysical Magnetometer Survey at (AC300/1) North of Ilett's Farm, Radstone Road Compound, Hall Farm, East of Ilett's Farm, A43 West (Brackley South Cutting) and Versions Farm (Turweston Viaduct), Buckinghamshire and Northamptonshire	1EW03-FUS-EV-REP-CS07_CL12-037130
HS2 1EW03 Enabling Works Central AWHb Final Report for Geophysical Magnetometer Survey at Spella House, Lower Boddington Cutting, Sheep Wash, Boddington Cutting and Lower Boddington, Lower Boddington Embankment, Northamptonshire and Warwickshire (AC320/3)	1EW03-FUS-EV-REP-CS07_CL14-007768
HS2 1EW03 – Enabling Works Central AWHf – Project Plan for assessment and investigation of no-data (blank) areas	1EW03-FUS-EV-REP-C000-009810
HS2 1EW03 – Enabling Works Central AWHf Project Plan for a Trial Trench Evaluation at Culworth Road Northamptonshire AC310	1EW03-FUS-EV-REP-CS07_CL13-004398
HS2 1EW03 – Enabling Works Central AWHf Project Plan for a Trial Trench Evaluation at Lower Radbourne DMV Warwickshire AC320	1EW03-FUS-EV-REP-CS07_CL23-007797
HS2 Central - NIT2 Final Report for Geophysical Magnetometer Survey at Windmill Hill Spinney and Starbold Farm, Ladbroke Cutting; West Southam, Southam Embankment; Hill Farm, Southam Cutting; and Thorpe Bridge, Leamington Road Embankment, Warwickshire (AC320/6)	1EW03-FUS-EV-REP-CS07_CL24-007768
HS2 Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004
HS2 Cultural Heritage GIS Standard	HS2-HS2-GI-STD-000-000002
HS2 *Employer's* Technical Standard - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
HS2 *Employer's* Technical Standard – Temporary Works	HS2-HS2-CV-STD-000-000005
HS2 Enabling Works Information WI0200 General Constraints	1E001-HS2-PR-ITT-000-000098
HS2 Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
HS2 Geophysical Survey Report - Rural South - Buckinghamshire - 2015-2016	C252-ETM-EV-REP-020-000221_P02
HS2 Historic Environment Digital Data Management and Archiving Procedure	C262-ARP-EVSPE-000-000003
HS2 Human remains and monuments procedure	HS2-HS2-EV-PRO-0000-000008
HS2 Ltd, 2015. Heritage Risk Model Phase 1 Review 2014 - Volume I	C253-ATK-EV-REP-000-000002

HS2 Phase 1 Central Section, Archaeological Works, Halse Copse East, Site Code 1C17HCETT Trial Trench Report	1EW03-FUS-EV-REP-CS07_CL12-007818
HS2 Phase 1 Central Section, Archaeological Works, Halse Copse South (1C17HALTT) Trial Trench Report	1EW03-FUS-EV-REP-CS07_CL12-007281
HS2 Phase 1 Central Section, Archaeological Works, North of Field Cottage, Southam, Warwickshire, Site Code 1C18NFCAR, Fieldwork Report	1EW03-FUS-EV-REP-CS07_CL24-007835
HS2 Phase 1 Central Section, Geophysical Survey Report Trafford Bridge Farm, Northants – Site Code 1C17TRFMG	1EW03-FUS-EV-REP-CS07_CL26-002512
HS2 Phase 1 Central Section, Geophysical Survey Report for Windmill Hill Spinney, Warwickshire (CRO1080) – Site Code 1C17WMHMG	1EW03-FUS-EV-REP-CS07-001583
HS2 Phase 1 EWC Central Geophysical Survey Report for Fox Covert (CR01063), Northants, Site Code C17FOXMG	1EW03-FUS-EV-REP-CS07_CL12-001955
HS2 Phase 1 EWC Central Geophysical Survey Report for Fox Covert (Glyn Davies Wood - CR01073), Warwickshire, Site Code C17STLMG	1EW03-FUS-EV-REP-CS07_CL14-001956
HS2 Phase 1 EWC Central Geophysical Survey Report for North of Field Cottage (1083), Warks, Site Code 1C17NFCMG	1EW03-FUS-EV-REP-CS07_CL24-002684
HS2 Phase 1 EWC Central Geophysical Survey Report for South Heath Cutting, Buckinghamshire	1EW03-FUS-EV-REP-CS03_CL05-008027
HS2 Phase One Environmental Statement and Supplementary Environmental Statements	ES 3.5.2.10.4-6 ES 3.5.2.14.4-6 ES 3.5.2.15.4-6 ES 3.5.2.16.4-6
HS2 Project Plan for a Historic Landscape Survey at Decoypond Wood, Calvert Cutting, Buckinghamshire (AC250/15)	1EW03-FUS-EV-REP-CS06_CL09-002547
HS2 Standard Template for Reports	HS2-HS2-PM-TEM-000-000004
HS2 Technical Standard Specification for Historic Environment Investigations	HS2-HS2-EV-STD-000-000035
HS2 Technical Standard: - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
HS2 Technical Standard: – Temporary Works	HS2-HS2-CV-STD-000-000005
HS2 Technical Standard: Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004

HS2 Technical Standard: Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
HS2 Technical Standard: Historic Environment Digital Data Management and Archiving Procedure	HS2-HS2-EV-STD-000-000040
HS2 Technical Standard: Historic Environment Physical Archive Procedure	HS2-HS2-EV-STD-000-000039
HS2 Technical Standard: Specification for historic environment investigations	HS2-HS2-EV-STD-000-000035
HS2 Technical Standard: Specification for Project Plans and Location Specific Written Scheme of Investigations	HS2-HS2-EV-STD-000-000036
Karsten, A, Graham, K, Jones, J, Mould, Q and Walton-Rogers, P 2012 Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation. Historic England	Karsten et al. 2012
Natural England 2019 Ancient Woodland Inventory https://naturalengland-defra.opendata.arcgis.com/datasets/ancient-woodland-england	Natural England 2019
Northamptonshire Archaeology 2006 A Geophysical Survey for Finmere Quarry Extension, Finmere, Oxfordshire, February 2006, unpublished client report	NA 2006
Royal Institute of Chartered Surveyors 2010 Guidelines for the use of GNSS in Surveying and Mapping	RICS 2010
Sansum, P. & Bannister, N.R. 2018 A Handbook for updating the Ancient Woodland Inventory for England. Natural England Commissioned Reports NECR248	Sansum & Bannister 2018
Woodland Archaeology Project (2019?) Woodland Archaeology Handbook. Woodland Archaeology in the North Wessex Downs Area of Outstanding Natural Beauty. Our woodland heritage. http://www.northwessexdowns.org.uk/publications-resources.html	WAP 2019
Woodland Trust 2009 Field Surveys for Ancient Woodlands: Issues and Approaches. A Report to the Woodland Trust By Hallam Environmental Consultants Ltd., Biodiversity and Landscape History Research Institute and Geography, Tourism and Environment Change Research Unit, Sheffield Hallam University	Woodland Trust 2009
Northamptonshire Archaeology 2010 Archaeological geophysical survey on land to the north of Finmere Quarry, Finmere, Oxfordshire, May and November 2010, unpublished client report	NA 2010

TVAS 2002 Land north-east of Foxley Fields Farm, Finmere, Oxfordshire: An Archaeological Watching Brief, unpublished client report	TVAS 2002
TVAS 2008 Finmere Quarry Extension, Field 7, Finmere, Oxfordshire. An Archaeological Evaluation, unpublished client report	TVAS 2008
TVAS 2010 Finmere Quarry Northern Extension, Banbury Road, Finmere, Oxfordshire. An Archaeological Fieldwalking Survey, unpublished client report	TVAS 2010
TVAS 2013 Finmere Quarry Extension, Banbury Road, Finmere, Oxfordshire. Archaeological Evaluation, unpublished client report	TVAS 2013

13.2 List of acronyms

AIMS	Asset Information Management System
ANA	Archaeological Notification Area
ASZ	Archaeological Sub-Zone
BGS	British Geological Survey
CCB	Consolidated Construction Boundary
CFA	Community Forum Area
CIfA	Chartered Institute for Archaeologists
DDBA	Detailed Desk Based Assessment
ES	Environmental Statement
GIS	Geographical Information Systems
GWSI: HERDS	Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy
HER	Historic Environment Record
LSWSI	Location Specific Written Scheme of Investigation
NGR	National Grid Reference
PDF	Portable Document Format
QA	Quality Assurance

14 Figures

The following figures are included in this Project Plan:

- Figure 1 Project Plan scope overview
- Figure 2a Site Location C21022 Jones Hill Wood
- Figure 2b Site Location C25071 Widmore Farm
- Figure 2c Site Location C30027 Halse Copse Farm

- Figure 2d Site Location C30031 Fox Covert Whitfield
- Figure 2e Site Location C32030 Windmill Hill Spinney
- Figure 2f Site Location C32033 Fox Covert
- Figure 3a Heritage Assets C21022 Jones Hill Wood
- Figure 3b Heritage Assets C25071 Widmore Farm
- Figure 3c Heritage Assets C30027 Halse Copse Farm
- Figure 3d Heritage Assets C30031 Fox Covert Whitfield
- Figure 3e Heritage Assets C32030 Windmill Hill Spinney
- Figure 3f Heritage Assets C32033 Fox Covert
- Figure 4a LIDAR survey and remote sensing interpretation C21022 Jones Hill Wood
- Figure 4b LIDAR survey and remote sensing interpretation C25071 Widmore Farm
- Figure 4c LIDAR survey and remote sensing interpretation C30027 Halse Copse Farm
- Figure 4d LIDAR survey and remote sensing interpretation C30031 Fox Covert Whitfield
- Figure 4e LIDAR survey and remote sensing interpretation C32030 Windmill Hill Spinney
- Figure 4f LIDAR survey and remote sensing interpretation C32033 Fox Covert
- Figure 5a Previous investigations C21022 Jones Hill Wood
- Figure 5b Previous investigations C25071 Widmore Farm
- Figure 5c Previous investigations C30027 Halse Copse Farm
- Figure 5d Previous investigations C30031 Fox Covert Whitfield
- Figure 5e Previous investigations C32030 Windmill Hill Spinney
- Figure 5f Previous investigations C32033 Fox Covert
- Figure 6a 1st edition Ordnance Survey map C21022 Jones Hill Wood
- Figure 6b 1st edition Ordnance Survey map C25071 Widmore Farm
- Figure 6c 1st edition Ordnance Survey map C30027 Halse Copse Farm

- Figure 6d 1st edition Ordnance Survey map C30031 Fox Covert Whitfield
- Figure 6e 1st edition Ordnance Survey map C32030 Windmill Hill Spinney
- Figure 6f 1st edition Ordnance Survey map C32033 Fox Covert
- Figure 7a Ecological constraints C21022 Jones Hill Wood
- Figure 7b Ecological constraints C25071 Widmore Farm
- Figure 7c Ecological constraints C30027 Halse Copse Farm
- Figure 7d Ecological constraints C30031 Fox Covert Whitfield
- Figure 7e Ecological constraints C32030 Windmill Hill Spinney
- Figure 7f Ecological constraints C32033 Fox Covert
- Figure 8a Utilities constraints C21022 Jones Hill Wood
- Figure 8b Utilities constraints C25071 Widmore Farm
- Figure 8c Utilities constraints C30027 Halse Copse Farm
- Figure 8d Utilities constraints C30031 Fox Covert Whitfield
- Figure 8e Utilities constraints C32030 Windmill Hill Spinney
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- Figure 9b Scheme design C25071 Widmore Farm
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- Figure 9e Scheme design C32030 Windmill Hill Spinney
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15 Glossary of terms

The following terms have been used in this report:

Archaeological Contractor – the organisation undertaking the specific historic environment works for the *Contractor*.

Contractor – Fusion; the organisation undertaking the Enabling Works for Area Central on behalf of the *Employer*.

Detailed Desk Based Assessment (DDBA) – analytical document that builds on the information gathered previously in the Environmental Statement to address particular issues, questions or uncertainties within a given area. It may be developed to provide a more detailed understanding of the resource in an area to inform design development or construction programming.

Employer – HS2 Ltd, the organisation responsible for delivery of HS2 Phase One Scheme and all terms and conditions, policies, procedures, and payments

Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS) – the framework for delivering all historic environment investigations undertaken as part of the HS2 Phase 1 programme.

Location – a specific HS2 worksite or group of worksites that are being addressed as a combine historic environment investigation programme of assessment, evaluation and investigation.

Location Specific Written Scheme of Investigation (LSWSI) – specification document assembling one or more Project Plans within an area of land defined primarily for construction programme purposes. The LSWSIs will be agreed with the Project Manager and would provide a costed and programmed approach to delivering outcomes.

Project Plans – specification document for each specific package of activity (e.g. a survey, desk based assessment, excavation, recoding project). The plans would respond to the Specific Objectives set out in the GWSI: HERDS and be delivered within an agreed budget.

Works – the specific historic environment assessment, evaluation or investigation works at each location.

Appendices

Appendix 1: Site Information prepared by the design consultant for the sub-contractor

Site Access

Site visits were undertaken on 4-6 November 2019 and 16 December 2019 (to Ancient Woodland Sites, following permission from the Woodland Trust), in mostly clear weather conditions. In addition to inspection of the woodland sites, access points within the Consolidated Construction Boundary (CCB) were noted, along with any other relevant factors which may affect access to the Sites (Figure 2a-f) or undertaking of the investigations. It should be noted that due to landowner refusal to cross their land, access was not possible to C21022.

The *Archaeological Contractor* will satisfy themselves that the access points are suitable and safe prior to the start of the woodland evaluation and will undertake all due care when accessing the Site from either the public highways or private tracks. The method for and controls placed on Site access/egress will be set out in the *Archaeological Contractor*'s Method Statement and will comply with the *Contractor's* Construction Phase Health and Safety Plan.

Prior to the start of the woodland evaluation, the *Archaeological Contractor* will attend a pre-works site meeting with the *Contractor*. The purpose of this meeting will be to allow the *Archaeological Contractor* to confirm the access points, ground conditions, site-specific hazards and to agree to the location for the welfare facilities and the safe storage of plant and materials.

Information on site-specific undertaking and assurances, land access arrangements, site-specific arrangements and site logistics and traffic management will be provided by the *Contractor*.

The access details and constraints were identified on the basis of information available at the time of the preparation of this Project Plan, and the site visits undertaken. It is considered that these will be applicable for surveys undertaken as part of Phase 1, prior to woodland clearance. It is anticipated that following woodland clearance, the landscape, access routes and constraints will be much altered and therefore a detailed review of the access will need to be undertaken by the *Archaeological Contractor*, in liaison with the *Contractor*. Especially, site access for any mechanical excavators, if applicable, will need to be discussed and compound locations will need to be agreed (in the case of the trial trench evaluation as part of Phase 2). It is the responsibility of the *Archaeological Contractor* to discuss the access with the *Contractor* and conduct a review of the services including new searches before works commence for each of the phases.

Constraints

Several of the constraints listed below include existing services and ecological constraints this information has been prepared from data provided by the *Contractor*, including the information held on gViewer and Fusion Ecology Database platforms. The clearance buffers/exclusion zones listed below are based on the information available at the time of the preparation of the Project Plan. It is the responsibility of the

Archaeological Contractor to conduct a review of the services including new searches before works commence and to ensure that any clearance buffers for any services recorded and subsequently identified in the new search are in accordance with the guidance: Safe Working in the Vicinity of Buried and Overhead Services Standard (Fusion 2019; ref. SH6 STD1).

Survey data indicates there is a low potential for unexploded ordnance (UXO) on the Sites.

Site-specific constraints/hazards are illustrated by Figures 7a-f & 8a-f and discussed in more detail in subsequent sections. The appropriate procedures are detailed below:

- Great Crested Newts. *Contractor*'s ecologist will need to be present during the intrusive works to conduct a fingertip search. In order to protect GCN against being trapped in the trial pits and trenches, access ramps should be excavated at the ends of the nearby trial pits/trenches and each will be checked for newts daily prior to starting work. In the event that GCN are encountered, appropriate procedures, defined within the Great Crested Newt Unexpected Finds Method Statement (doc. No. 1EW03-FUS-EV-MST-C000-000014) will be followed, with any work carried out by accredited agents (under the licence issued to HS2 by Natural England).
- Bat roosting sites. The *Archaeological Contractor* should seek advice from the *Contractor*'s ecologist on the potential of bats on the Site, however the works proposed to be undertaken within the affected woodland sites, prior to wholesale clearance, will not require individual tree removal or the use of machinery.
- Reptiles. For works affecting reptiles (on sites where potential for reptile habitat has been identified), an appropriate method statement will be required, and the *Archaeological Contractor* will liaise with the *Contractor*'s ecologist to ensure appropriate procedures are followed.
- Badger. Where badger setts are identified, the test-pitting scheme design takes account of the identified badger setts, and a 30m exclusion zone has been created around them which will need to be visibly demarcated on site. In order to protect badgers against falling into test pits, fencing will need to be erected and ramps left overnight within each location. Each test pit will also need to be checked for badgers daily prior to starting work.
- Overhead and buried services. Given that the Sites comprise areas of woodland, no overhead or buried utilities have been identified within each parcel's footprint or immediate vicinity that may have affected the proposed investigations. However, this is based on the information held at the time of the preparation of the Project Plan and it is the responsibility of the *Archaeological Contractor* to conduct a review of the services including new searches before works commence and to ensure that any clearance buffers for any services recorded and subsequently identified in the new search are in accordance with the guidance: Safe Working in the Vicinity of Buried and Overhead Services Standard (Fusion 2019; ref. SH6 STD1).

- Footpaths. Public footpaths are present within several Sites. The footpaths within the Site will be fenced off 1m either side of the path to maintain a safe route for pedestrians. Care will be taken when manoeuvring vehicles in and out of the Site in the vicinity of footpaths (during the trial trenching stage). In situations where trenches cross the footpaths, appropriate procedures will need to be followed when excavating the test/pit trench (or the trench to be split in two, either side of the footpath buffer, or relocated).
- Watercourses. A buffer of 8m will be established from the watercourses or other bodies of water in which no excavation or spoil storage will be undertaken. The buffer has been taken into account in trench design and will need to be visibly demarcated on site. Where necessary, permission to excavate within 8m of the watercourse will be sought under exemption of Schedule 33.
- Vegetation. All test pits are located within extant woodland areas, three of which are designated as Ancient Woodland. Utmost care will need to be exercised to cause minimal disturbance to encountered root systems of the nearby trees, in consultation with and following advice from the Woodland Trust and the *Contractor's* arboriculturalist. The staff will be briefed regarding minimal impact (in induction, daily briefings and toolbox talks) - i.e. ensuring work is confined to the targeted locations and that other disturbance of the woodland (damage to branches etc) does not occur. During the works, the Site boundary will be demarcated, separating the Site from the remainder of the Ancient Woodland (where applicable), so that staff/visitors do not stray and disturb/damage the woodland. For investigations within/in vicinity of Ancient Woodland sites, appropriate procedures should be followed (in terms of notification/permissions/engagement with Woodland Trust, as required; see Appendix 7 for Woodland Trust Engagement form).

The constraints above reflect the available information and site conditions at the time of the preparation of the Project Plan and will be applicable to the Phase 1 site surveys. It is considered that following woodland clearance, many of the site constraints will be removed (vegetation, ecological constraints) and new may become applicable. As such, specific constraints and access (including for machinery) for Phase 2 trial trench evaluation are not covered within the Project Plan. The *Archaeological Contractor* will need to review the access and constraints with the *Contractor* following woodland clearance and safety measures will need to be appropriately identified within RAMS.

C21022 Jones Hill Wood (Figures 7a and 8a)

Access:

- The woodland can be accessed from the eastern leg of Bowood Lane c. 300m west of its junction with King's Lane (NB, access unconfirmed as access to the Site was not granted).

Constraints:

- Bat roosts (trees) identified within Site.
- Badger setts (multiple) and buffers within the Site.
- Vegetation.

C25071 Widmore Farm (Figures 7b and 8b)

Access:

- The woodland can be accessed from the north using a farm track leading to Widmore Farm from the A421, and along the disused railway embankment.

Constraints:

- Reptiles (immediately east of the Site).
- Footpath (crosses the southern part of the Site).
- Vegetation.

C30027 Halse Copse Farm (Figures 7c and 8c)

Access:

- The woodland can be accessed through a CCB spur of land following the southern bank of an unnamed tributary of the River Great Ouse, where it is spanned by an unnamed road between Radstone and Helmdon.

Constraints:

- Bat roosts (trees) identified within Site.
- Reptiles (within the Site).
- Footpaths (several cross the proposed access route).
- Vegetation.

C30031 Fox Covert Whitfield (Figures 7d and 8d)

Access:

- The woodland can be accessed through PROW bridleway skirting along the north-western boundary of the Site and leading from an unnamed road between Briary House and Radstone.

Constraints:

- Bat roosts (trees) identified within Site.
- Badger sett and buffer within the Site.

- Reptiles (within the Site).
- Footpaths (alongside the access to the Site and to the west).
- Buried water main along the road from which access is to be gained (will not be affected by Phase 1 works).
- Vegetation.

C32030 Windmill Hill Spinney (Figures 7e and 8e)

Access:

- The woodland can be accessed from a hard-surface farm track leading to Ladbroke Hill Farm from Ladbroke Lane off Ladbroke Bypass (the A423).

Constraints:

- Bat roosts (trees) identified within Site.
- Great Crested Newts (clipping the western and southern edges of the Site).
- Reptiles (within the Site).
- Footpath (alongside the southern boundary of the Site).
- Vegetation.
- Topography: steep topography prevents machine excavation (site excluded from Phase 2).

C32033 Fox Covert (Figure 7f)

Access:

- The woodland can be accessed through a locked gate directly from Welsh Lane, between Wormleighton and Lower Boddington.

Constraints:

- Great Crested Newts (within the Site).
- Bat roosts (trees) identified within Site.
- Reptiles (identified immediately south of the Site and unlikely to be affected).
- Watercourses: water channel to the south and ponds to the west of the Site and within the south-western corner of the Site (8m buffer applied and taken into account in scheme design).
- Vegetation.

Other considerations

Principal Contractor requirements (for CIR)

The *Principal Contractor* may be required to provide the following, depending on site conditions, within the CIR area C31039 (in advance of and during the CIR works):

- Locating and making safe any live services or hazardous substances (above or below ground): preliminary services searches should be carried out by the *Principal Contractor* via the statutory undertakers etc, plus on-site inspection and testing where required.
- Where there is reason to believe from previous uses that the ground may be contaminated, the *Principal Contractor* should make arrangements for advance, inspection, sampling, resting and where necessary specialist remediation.
- The results of such surveys should be forwarded to the *Archaeological Contractor* prior to commencement on site. Any identified hazards will be addressed in the health and safety planning.
- Any unexpected hazards encountered during the investigations will also need to be made safe by the *Principal Contractor* before archaeological fieldwork may continue. In the event of the accidental disruption of a live service by archaeologists or sub-contractors under archaeological supervision the archaeological supervisor will inform both their project manager and the *Principal Contractor* and, when appropriate, call the relevant emergency number.
- Development of a safe method of working: archaeologists will not be able to work within excavations whilst attendances (such as installing temporary support or removing spoil) are taking place, and when demolition, construction or heavy plant activity occurs adjacent or overhead.
- Safety barriers between archaeological work areas and construction work, in particular during ground reduction.
- Accreditation and supervision of operatives, plant and equipment, including supply of sufficient qualified banksmen to control plant movements.
- It is not anticipated that temporary support to excavations, where deeper than 1.2m will be required.
- Where hoists are used in shored shafts less than 4m x 4m size the archaeological contractor's staff will leave the shaft before hoisting of buckets takes place. Beyond a depth of 3m within such shafts gas monitoring equipment will be required to ensure appropriate air quality for those working there.
- Technical advice to be available if required re: protection of adjacent streets and

buildings, removal of obstructions, depth of excavation, live services etc. providing safe access to the site and the specified archaeological investigation areas via separately identified pedestrian routes, signing, safety guard-rails, secure ladders etc. This includes segregating these areas from any vehicles and plant operating nearby e.g. via a robust physical barrier.

- Adequate ventilation and protection from noise, fumes and dust where plant is in use, especially within standing buildings.
- Site accommodation and welfare facilities with electricity and water. To include furnished main base cabin as work space; separate male/female changing areas, toilets and washing facilities; plus additional steel cabin for storing tools and finds.
- General site security including hoardings, gateway, warning notices, etc; to create a secure site perimeter, sufficient to prevent unauthorised access. If the *Principal Contractor* has retained security guards, it is recommended that the archaeological investigation areas be added to their schedule for regular patrols, particularly out of hours.
- Specific site security: it may be necessary to separately secure individual archaeological trenches via a physical barrier (such as Heras fencing) e.g. if there are public areas nearby or human remains are encountered.
- In adverse weather the *Principal Contractor* to provide the *Archaeological Contractor* with use of Youngmans boards or similar. Adverse conditions may require use of electrical equipment powered by generators (e.g. pumps, temporary lighting etc), with accompanying associated risks for electrocution etc.
- Surface sweep (e.g. CAT scan) to be undertaken prior to excavation by *Principal Contractor* and banksman to be employed to watch for possible buried services/utilities.

Summary of the Principal Contractor responsibilities (for CIR)

The *Principal Contractor* will provide technical services and attendances to the *Archaeological Contractor* to allow the archaeological investigations to be carried out safely. These will include:

- All spatial setting out will be implemented by the *Principal Contractor*;
- *Principal Contractor* to ensure all site staff are competent and aware of risks (e.g. CSCS cards);
- *Principal Contractor* will report regularly to the *Archaeological Contractor* any hazards such as contact with plant/machinery, trips, falls, zoning of site activities to prevent unnecessary overlap of working areas;
- *Principal Contractor* to set the minimum PPE to be worn at all times to include Hi-

Visibility clothing, Hard Hats, site safety boots, safety glasses, gloves;

- *Principal Contractor* to provide Welfare for hygiene etc. with facilities to include washing facilities;
- *Principal Contractor* will manage the risk and status of any live services and update the *Archaeological Contractor* on these risks;
- *Principal Contactor* to approve the *Archaeological Contractor's* Method Statements and Risk Assessments to be approved in writing by the prior to working;
- *Principal Contractor* to define the *Archaeological Contractor's* working route towards proposed location of plant. Ensure dedicated pedestrian routes away from arc of machine working;
- *Principal Contractor* to employ a banksman during all ground reduction with heavy plant.
- Should any material be excavated that is deemed to be contaminated or potentially contaminated it shall be investigated, controlled (e.g. placed separately from clean material) and removed from the site in accordance with *Principal Contractor's* environmental protection (as set out in their Environmental Management Plan).

Summary of the Archaeological Contractor pre-project responsibilities (for CIR)

The *Archaeological Contractor* will be working under and reporting to the *Principal Contractor* and to the *Contractor* working on behalf of the *Employer*. The *Archaeological Contractor* will review and comply with the *Principal Contractor's* Construction Phase Plan under the CDM Regulations 2015.

Archaeological Contractor's risk assessments and Health and Safety Plans will be prepared as well as method statements, site-specific risk assessments to be approved by the Princ*ipal Contractor* before the start of site works.

Archaeological Contractor's Safety Audits, Safety Inspections, Reporting of Accidents to be defined in the LS-WSI and Method Statement (MS) Risk Assessment (RA) and submitted to the *Contractor* and then the *Principal Contractor* before the start of site works for approval.

Site security requirements

Following site set-up, the woodland evaluation will be conducted in accordance with the information provided in the Project Plan and LSWSI and the safe methods of work described in the *Archaeological Contractor's* Risk Assessment and Method Statement.

All staff involved in the fieldwork should be CSCS qualified to a minimum standard as an 'Operative'. Staff CVs will include CSCS qualifications.

All site personnel will be provided with the *Archaeological Contractor's* Risk Assessment and will familiarise themselves with the following:

- Site emergency and evacuation procedures;
- The Site's health and safety coordinator;
- The first aiders; and
- The location of the nearest hospital and doctor's surgery.

The *Archaeological Contractor* shall take precautions to ensure that all plant and materials are securely stored within the limits of the Site. Particular care should be taken to lock welfare and site accommodation when not occupied and for the plant to be fitted with lockable screens and fuel caps.

Plant will be stored overnight adjacent to the welfare units and within a locked Heras fenced compound. The *Contractor* will provide manned 24hour security and will install CCTV cameras within the site compound.

Temporary Works

It is anticipated that test pits and trial trenches excavated within the Site will be shallow and that they will not require temporary works. However, should the access to deep excavation be deemed necessary in prior consultation with the *Contractor's* Historic Environment Manager, and a need for temporary works identified, works will cease at that location, and the trench will be temporarily backfilled. The *Contractor* will assess the requirement for temporary works and will be responsible for their design, installation and maintenance.

Temporary works will be co-ordinated by the *Contractor's* Temporary Works Co-ordinator (TWC) who will be responsible for ensuring that the planning, erection, use, maintenance and dismantling of temporary works is undertaken in line with the *Contractor's* temporary works process and as agreed with the relevant Temporary Works Manager (TWM). A temporary works schedule produced at tender stage will be reviewed and updated at regular intervals.

All temporary works will be designed and installed in accordance with the *Employer*'s Technical Standard for Temporary Works (Document No. HS2-HS2-CV-STD-000-000005), the *Contractor's* IMS and Construction Phase Health and Safety Plan.

Site Monitoring and Engagement

Requirements for site monitoring and engagement with HS2, Historic England and LPA advisors will be agreed with the *Contractor's* Historic Environment Manager and discussed in detail by the *Archaeological Contractor* in the LSWSI.

Facilities and attendances

Prior to the start of the archaeological evaluation the *Archaeological Contractor* shall prepare and submit a draft Health and Safety Plan and Risk Assessment and Method Statement (RAMS) for the works to the *Contractor* for review and approval. The *Archaeological Contractor's* Method Statement will clearly identify the methods and processes that will be implemented to fulfil the aims, objectives and requirements of the Project Plan and this LSWSI. The Method Statement will be prepared in liaison with the *Contractor*, taking

account of the *Contractor's* Area Wide HERDS Environmental Management Plan and other relevant site information provided by them and requirements for the works set out in the Works Information (e.g. relating to health and safety, security, engineering design requirements and attendances). This will include the *Archaeological Contractor's* requirements and specification for services and facilities and attendances required to be supplied by the *Contractor* or the *Employer*.

Site Specific Undertaking and Assurances

Site-specific U&As (undertaking and assurances) will be provided by the *Contractor*, with reference to WPP U & A register. Local community and general public arrangements, including effects on Neighbouring properties and businesses, and any mitigation measures required to be implemented by the *Archaeological Contractor* will be defined.

Designer's risk assessment summary

The abovementioned hazards and site constraints, identified on the basis of information available at the time of the preparation of this Project Plan, have been considered in the design and appropriate mitigation measures have been proposed. It is the responsibility of the *Archaeological Contractor* to conduct a review of the services including new searches before works commence.

Appendix 2: Procedures for Optically Stimulated Luminescence profiling and dating (OSL-PD) sampling and analysis

The following methodology for Optically Stimulated Luminescence profiling and dating sampling and analysis (Revision 1) has been provided courtesy of Dr Tim Kinnaird and Professor Sam Turner of Newcastle University. Luminescence methods have been applied to dating Quaternary sediments for more than 20 years, determining an enclosure age for sediments whose prior luminescence signals have been depleted by exposure to daylight during transport and deposition.

The specific objective comprises the collection of sediment samples from agricultural terraces, field boundaries and earthworks for optically stimulated luminescence profiling and dating (OSL-PD).

OSL-PD method outline

1. Sections to be cut to the depth of the natural substrate;
2. Sections to be recorded using standard archaeological procedures;
3. Cleaning of the exposed sections to be undertaken under a dark cover;
4. Small quantities of sediment (5-10g) to be collected at regular intervals (normally <10 cm) through the sediment stratigraphy, for immediate analysis using portable OSL equipment;
5. Recovery of parallel sediment samples from each of the profile positions for preliminary laboratory characterization. (Collection in small copper tubes, measuring 2.5 x 3 cm, to ensure that the samples remained light-safe);
6. Real-time creation of luminescence-depth profiles for the sections investigated, and interpretation in light of the archaeology and sedimentology; identification of key horizons for dating;
7. Select dating samples on the basis of the field profiles and their potential archaeological significance;
8. Collection of sediment samples for dating purposes by driving 4cm diameter stainless steel tubes, measuring 12cm in length, into the exposed section face;
9. Laboratory analyses following established protocols (see 'Detailed method');
10. Examine luminescence behaviour and explore apparent dose (absorbed dose, Gy) and sensitivity (luminescence per unit dose, counts per Gy) distributions through the investigated sediment stratigraphy;
11. Subject dating samples to quartz OSL single aliquot regenerative dose protocol, coupled with dose-rate determinations by high-resolution gamma spectrometry ('Detailed method');

12. Interpret constructional sequences of earthworks informed by the juxtaposition of the proxy luminescence data obtained in the field, with the apparent dose and sensitivity distributions generated in the laboratory, and the quartz OSL sediment ages;

13. Final reporting to cover sampling, sample preparation and analysis, results, interpretation.

Detailed method

Site selection

Sites should be identified and selected based on their potential to yield sediments suitable for dating.

OSL sampling and profiling in the field

After site selection, sections should be cut through/into the identified earthworks (or small test-pits opened), to permit access to the sediment stratigraphy for OSL-PD, including samples for field and lab analysis.

Luminescence stratigraphy should be generated using the methodologies equivalent to those described by Kinnaird et al. (2017a, b) - which allows for the calculation of signal intensities and depletion indices – and discussed in relation to the archaeology and geomorphology. Thus informed, the sediment stratigraphy should be sampled for dating purposes, and the sections or test-pits backfilled as required.

Procedure

1. Cut section through target feature and record using standard archaeological methods;

2. Clean section, cutting back by at least 30 cm into the sediment face to remove any materials exposed to daylight; cover section immediately with black opaque tarpaulins to prevent further exposure; further cleaning should be undertaken under the dark cover using safelight;

3. From the top of the section, collect 4-5 grams of bulk sediment at regular intervals downprofile (at 5 to 10 cm spacings, with tighter resolution sampling around stratigraphic boundaries); sediment can be sampled directly into plastic Petri-dishes, sealed with tape, and placed into zip-lock sample bags.

- Petri-dishes and sample bags should be labelled individually;

- Samples should be placed in black opaque bags for storage and transport.

4. When sampling is complete, remove dark cover and describe and document sediment stratigraphy; record depths for each profiling sampling taken from a common datum; record contextual information for all samples, considering:

- depth of overburden, aspect, drainage, length of time the section has been exposed, i.e. a natural face or a cut section, soil profile, sedimentology, archaeology etc.

5. Bulk samples can be measured directly with portable OSL equipment; IRSL and OSL signal intensities, IRSL and OSL depletion indices and IRSL:OSL ratios should be calculated for all samples following Kinnaird et al. (2017a, b); this proxy data can be used to generate luminescence stratigraphy / and relative chronologies.

6. Examine luminescence stratigraphy relative to the sedimentology and archaeology of the section; use proxy luminescence data to make informed decisions on where to sample for quantitative dating, considering:

- net signal intensities – a proxy for age in well-bleached sediment; depletion ratios - an indicator of sample transparency, coupled with information about whether a sample contains an inherited or in situ signal;

- magnitude and range in net signal intensities - and the implications that this has for the chronology of the section;

- stratigraphic progressions and breaks in net signal intensities and the implications that this has for site formation processes.

7. Collect samples for full quantitative dating by driving 4.5 cm Ø stainless steel tubes into the cleaned sediment face; these are then extracted and immediately sealed with duct tape, and stored in individual sample bags;

- Bulk material from within 30 cm of the dating position should be collected for additional dosimetry measurements, considering that all units in proximity to the dating position will contribute to the gamma dose rate that the sample received;

- Record in situ gamma dose rate measurements at the positions of all dating samples.

8. Photograph sampled section and back-fill if/as required.

OSL profiling and full OSL dating analyses in the laboratory

A sub-set of samples will be taken forward to laboratory calibrated screening OSL measurements based on their potential. Mineral preparation procedures similar to those used by Burbidge et al. (2007) and Kinnaird et al. (2017a, b) will be used to extract HF-etched 'quartz' from each of the profiled samples. Paired aliquots of 'quartz' will be subjected to a simplified four-step SAR procedure (with repeat and zero doses) to obtain estimates of stored dose (Gy) and sensitivity (counts per Gy; table S1), and assess apparent dose and sensitivity.

Sample preparation

Sample preparation must be undertaken under safe light conditions at luminescence laboratories. Equivalent dose determinations and dose rate determinations are to be made at specialist labs.

Mineral Preparation of Quartz

Standard mineral preparation procedures as routinely used in OSL dating to be used to extract sandsized quartz from each sample (cf. Kinnaird et al., 2017). Quartz to be extracted from the portion of each sample which had not been exposed to sunlight since burial. Samples to be wet-sieved to obtain the 90-250 µm size fraction, then treated in 1M hydrochloric acid (HCl) for 10 minutes, followed by 40% Hydrofluoric acid (HF) for 40 minutes, and a further treatment in 1 M HCl for 10 minutes. HF-etched fractions density separated in LST heavy liquids at concentrations of 2.64 and 2.74 gcm^{-3}, to obtain concentrates of feldspar (< 2.64 gcm^{-3}), quartz (2.64-2.74 gcm^{-3}) and heavy minerals (>2.74 gcm^{-3}).

Equivalent dose determinations

Equivalent doses to be determined using a single-aliquot regenerative dose (SAR) method (Kinnaird et al., 2017a,b; Murray and Wintle, 2000), which allows for an independent estimate of De to be generated for each aliquot measured. Reject aliquots from further analysis if they fail sensitivity checks (based on test dose response), SAR acceptance criteria checks, or had significant IRSL response coupled with anomalous luminescence behaviour. Examine the distributions in equivalent dose values, for those aliquots which satisfied the SAR selection criteria, using Kernel Density Estimate (KDE) plots and Abanico plotting methods.

Dose rate determinations

Dose rates to the HF-etched quartz to be determined by emission counting, such as alpha or beta counting, or gamma spectrometry or by chemical methods, such as inductively coupled mass spectrometry or neutron activation analysis.

References

BURBIDGE, C.I., SANDERSON, D.C.W., HOUSLEY, R.A. & ALLSWORTH, J.P. 2007. Survey of Palaeolithic sites by luminescence profiling, a case study from Eastern Europe. *Quaternary Geochronology* 2: 296-302.

KINNAIRD, T., DAWSON, T.C., SANDERSON, D., HAMILTON, D., CRESSWELL, A. & RENNELL, R. 2017a. Chronostratigraphy of an eroding complex Atlantic Round House, Baile Sear, Scotland. *Journal of Coastal and Island Archaeology*, DOI: 10.1080/15564894.2017.1368744

KINNAIRD, T., BOLÒS, J., TURNER, A. & TURNER, S. 2017b. Optically-stimulated luminescence profiling and dating of historic agricultural terraces in Catalonia (Spain). *Journal of Archaeological Science* 78, 66–77. doi: 10.1016/j.jas.2016.11.003

MURRAY, A. S. & WINTLE, A. G. 2000. Luminescence dating of quartz using an improved single-aliquot regenerative-dose protocol. *Radiation Measurements* 32: 57-73.

SANDERSON, D.C.W. & MURPHY, S. 2010. Using simple portable OSL measurements and laboratory characterisation to help understand complex and heterogeneous sediment sequences for luminescence dating. *Quaternary Geochronology* 5, 299-305.

TURNER, S., J. BOLÒS AND T. KINNAIRD, 2018. Changes and continuities in a Mediterranean landscape: a new interdisciplinary approach to understanding historic character in western Catalonia *Landscape Research* 43(7), 922-938. doi: 10.1080/01426397.2017.1386778

Appendix 3: Procedures for Radiocarbon sampling and dating

Radiocarbon dating is the most widely used dating technique in archaeology, but the suitability of deposits for dating depends not only on the presence of organic remains that can be dated (such as charcoal or bone) but also on the security of context. This is likely to be a problem when aiming to date boundaries, since the likelihood of small amounts of charcoal or other organic material being residual or intrusive within a deposit is high, particularly where hedges and trees are situated on or close to the feature, due to root penetration. Most dates will be obtained using Accelerator Mass Spectrometry (AMS) but because of the potentially small size of samples particular caution needs to be taken to avoid selecting material that may be either residual or intrusive.

The most suitable deposits to target for dating, to provide a TPQ for construction, will be from an in-situ soil or features sealed beneath a bank or other earthwork. A TAQ for construction may be provided from suitable material recovered from the lower (primary) fills of ditches, particularly if waterlogged deposits representing naturally accumulating silt are discovered.

Where suitable deposits are present, samples for radiocarbon dating may be recovered from soil samples taken from a freshly cleaned section or surface and processed by water flotation or wet-sieving, avoiding the use of chemicals. Sample treatment (e.g. weight, packaging) will follow guidance provided by the selected dating laboratory.

Material suitable for dating will be short-lived entities such as charred or waterlogged seeds (avoiding aquatics/semi-aquatics), wood or charcoal from short-lived trees/shrubs or sapwood. Bone would also be suitable, particularly if articulated. Where possible, submission of two independent short-lived entities from a single sample will enable the statistical consistency to be determined (i.e. whether samples could be of the same actual age) using the method described in Ward and Wilson (1978) which will provide greater certainty.

In highly organic sediments or peat where suitable macrofossils cannot be recovered radiocarbon determinations may be obtained on paired humic and humin fractions of sediments after consultation with an appropriate scientific dating Specialist.

Since the potential of soil samples to provide suitable material for radiocarbon dating may not be clear during excavation, OSL sampling on site may also be required.

Samples for radiocarbon dating will be submitted for Accelerator Mass Spectrometry (AMS), using a laboratory that maintains a continuous programs of internal quality control in addition to participation in international inter-comparisons (Scott et al 2010).

Bibliography

Scott, E. M, Cook G, and Naysmith, P, 2010 The fifth international radiocarbon intercomparison (VIRI): an assessment of laboratory performance in stage 3, *Radiocarbon*, 53, 859–65

Ward, G.K. & S.R. Wilson, 1978. Procedures for comparing and combining radiocarbon age determinations: a critique, *Archaeometry* 20, 19–31

Appendix 4: Plates and pre-Ordnance Survey maps

Plate 1 Wendover Enclosure map 1795 showing Site C21022 Jones Hill Wood

Plate 2 Wendover Tithe map 1841 showing Site C21022 Jones Hill Wood

Plate 3 View towards the central part of Site C25071 Widmore Farm (view to SW)

Plate 4 Image showing dense vegetation and an example of linear features recorded within Site C25071 Widmore Farm (view to NW, TP11)

Plate 5 Finmere Tithe map 1841 showing Site C25071 Widmore Farm

Plate 6 Image showing dense vegetation in the area of the Ancient Woodland recorded within Site C30027 Halse Copse Farm (view to S, TP25)

Plate 7 Image showing dense vegetation and an example of linear features recorded within Site C30027 Halse Copse Farm (view to W, TP20)

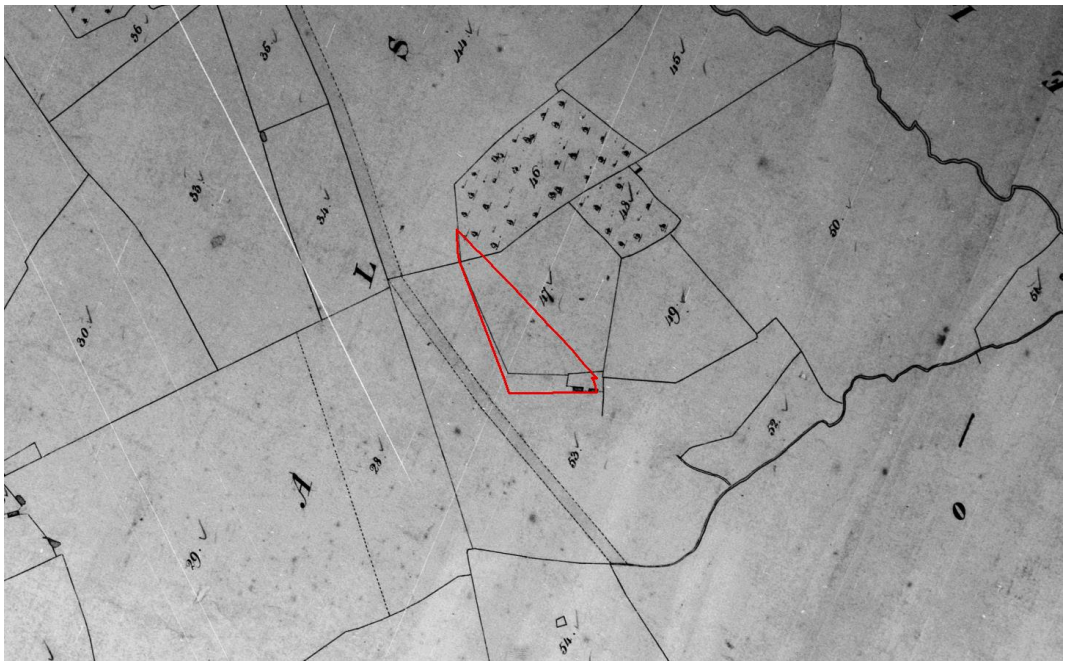

Plate 8 St Peter Brackley Tithe map 1839 showing Site C30027 Halse Copse Farm

Plate 9 Image showing dense vegetation and an example of linear features recorded within Site C30031 Fox Covert Whitfield (view to N, TP16)

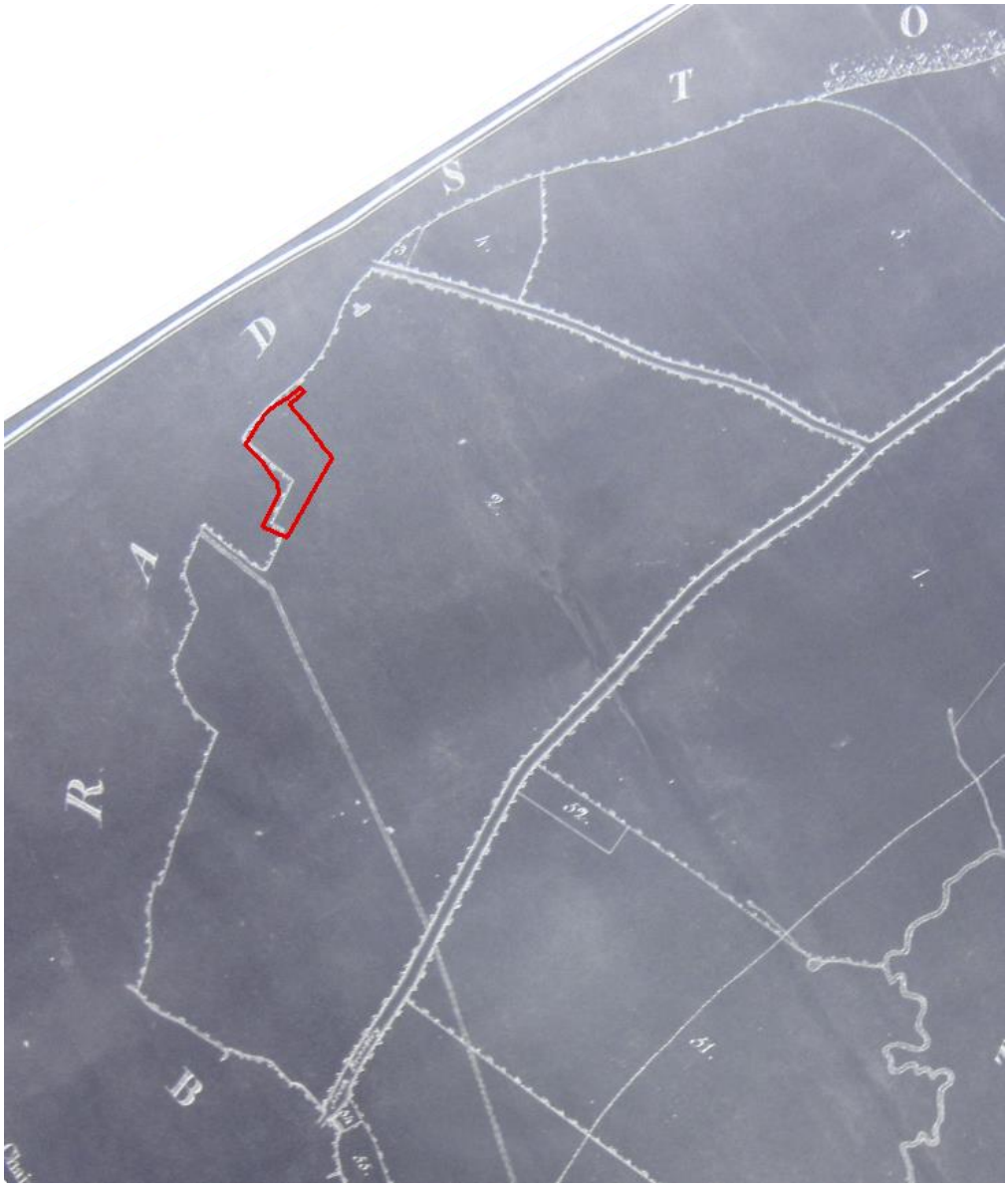

Plate 10 Whitfield Enclosure map 1797 showing Site C30031 Fox Covert Whitfield

Plate 11 Image showing dense vegetation and an example of possible terracing recorded within Site C30030 Windmill Hill Spinney (view to NE, TP40)

Plate 12 Ladbroke manor and parish map 1639 showing Site C32030 Windmill Hill Spinney

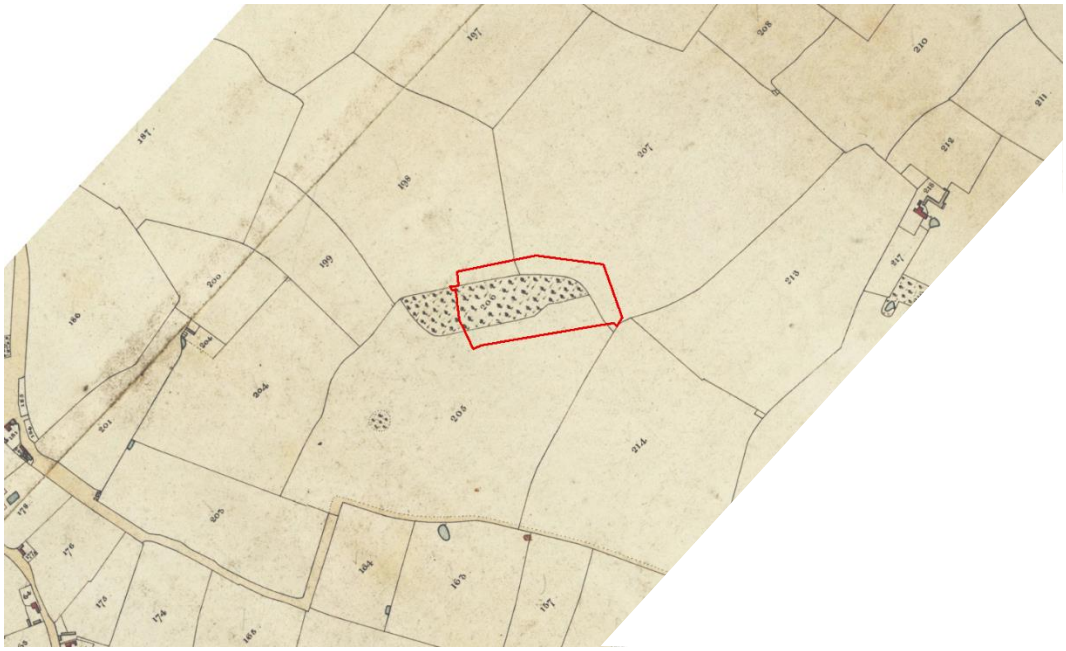

Plate 13 Ladbroke Tithe map 1838 showing Site C32030 Windmill Hill Spinney

Plate 14 Image showing the entrance to the Site C32033 Fox Covert (view to E)

Plate 15 Raised footpath north of entrance (view to N)

Plate 16 Raised footpath/possible archaeological feature (TP33, view to NW)

Plate 17 Image showing dense vegetation in the area of the liner features parallel to Welsh Road (TP29, view to SW)

Appendix 5: The Change Control Proforma

Historic Environment Fieldwork Change Control Acceptance Sheet	
Site Code:	
Site Name:	
Historic Environment Investigation Type:	
Contractor:	
Project Plan Doc. No.:	
LSWSI Doc. No.:	
Summary of Results	
Fieldwork Director:	Date:
Description of Proposed Change:	

Drawing / Sketch:

Change type: (Delete as applicable)	Implementation of Contingency	Variation of Methodology	Rapid Investigation	Extension of Investigation Area

Proposed HERDS Objectives:

Compiled by: (*Archaeological Contractor*)	Name	Date	Signature
Checked by: (*Contractor*)	Name	Date	Signature
Consultation with: (Stakeholder Archaeologist)	Name	Date	Signature
Approved by: (HS2 Historic Environment)	Name	Date	Signature

Appendix 6: Fieldwork sign off sheet

<table>
<tr><td colspan="5">Historic Environment Fieldwork Sign-off Sheet</td></tr>
<tr><td>Work Package Reference</td><td colspan="4"></td></tr>
<tr><td>Historic Environment Investigation Type</td><td colspan="4"></td></tr>
<tr><td>Contractor</td><td colspan="4"></td></tr>
<tr><td>Fieldwork Conducted by (Site Director)</td><td colspan="2"></td><td>Dates</td><td></td></tr>
<tr><td colspan="5">Summary of Results</td></tr>
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<tr><td rowspan="2">Approved by</td><td>Name</td><td>Date</td><td colspan="2">Signature</td></tr>
<tr><td></td><td></td><td colspan="2"></td></tr>
</table>

Appendix 7: Decision record notice (DRN)

Site Details			
Sector and Work Package:			
Site Code:			
GIS_UID			
Field Based Planning IDs			
EWC Site Name			
DES / Main Asset:			
NGR (site centre):			
Site size (ha)			
Survey Type:			
Summary the scheme impacts:			
Baseline Evidence	**Yes**	**No**	**Details**
Did the HS2 Phase 1 ES identify known heritage assets within the site?	☐	☐	
Did the PSC geophysical survey identify probable or possible archaeology?	☐	☐	

Is there any remote sensing data (NMP/LiDAR/hyperspectral/APs) which identify possible heritage assets?	☐	☐	
Is the site located within an Archaeological Notification Area?	☐	☐	
HERDS objectives identified in the Project Plan	☐	☐	
Survey/Fieldwork Results	**Yes**	**No**	**Details**
Has the fieldwork confirmed the presence/absence of known heritage assets?	☐	☐	
Has the AWH geophysical survey shown any positive anomalies which are considered probable archaeology?	☐	☐	
Has the geophysical survey shown any positive anomalies which are considered to be possible archaeology?	☐	☐	
Has intrusive fieldwork identified previously unknown heritage assets?	☐	☐	
Do the geology maps indicate there is alluvium or colluvium over the study area?	☐	☐	
Does the GI or trial trenching confirm the presence of alluvium or colluvium?	☐	☐	
Are there any other significant landscape features within the study area and may	☐	☐	

indicate high potential for undiscovered remains?			
Summary overview of fieldwork results:			
If an intrusive evaluation what was the sample resolution?			
Fieldwork Report Document No.			
HERDS Assessment	**Yes**	**No**	**Details**
Did the fieldwork/survey contribute to, or, fulfil the HERDS objectives set out in the Project Plan?	☐	☐	
Is there potential for further knowledge creation contributing to existing HERDS objectives?	☐	☐	
Is there potential for knowledge creation requiring a **new** HERDS objective?	☐	☐	
Has stakeholder notification/engagement with HE & the LPA been undertaken (where applicable)?	☐	☐	
Recommendation:	**Yes**	**No**	**Details**
Is further historic environment investigation recommended?	☐	☐	
Type of fieldwork/technique Recommended:			
Recommended HERDS objectives:			

Possible new HERDS objective:			
Assessed by: (Contractor)	Name:	Date	Signature
Approved by (HS2 Historic Environment)	Name:	Date	Signature

Appendix 8: Woodland Trust Engagement

Form completed by	
Date	

Sector	
Package	
Ancient Woodland Name(s)	
Type of works	Include any pre-surveys etc required
Start date	
End date	
Subcontractor	Insert who will be undertaking the works
Distance of works from Ancient Woodland (nearest point)	If within ancient woodland state "within" or provide nearest distance of works from the woodland boundary
Where are the works taking place?	General description of the location. Include grid references. The mitigation site/haul road etc. is within 100m of Name of Ancient Woodland Ancient Woodland, as shown on the General Location Plan below. (include location plan)
What works are taking place?	Detail of the works to be undertaken and include drawings where relevant
Measures being implemented wrt ancient woodland	Details how the ancient woodland will be protected. E.g. The works do not impinge on the ancient woodlands.

	During the works the site boundary will be demarcated and fenced off so that there will be a physical barrier separating the ancient woodland from the mitigation site. Work will not be completed within 1m of the edge of tree canopies. Heras fencing with appropriate signage will be installed around the ancient woodlands to prevent any accidental incursion or physical damage. **Works will be undertaken in accordance with British Standard** BS5837:2012 **Trees** in Relation to Design, Demolition and **Construction.**
Notes (if applicable)	

General Location Plan:
Basic general location plan showing the location of the works, access routes and the ancient woodland.

Appendix 9: Sampling Strategy Proforma Sheet

Why take bulk samples? Bulk samples provide information on a range of environmental proxies and the deposits in which they are found. Typically, these samples are taken for preserved seeds and charcoal but can also include; small mammal bones and fragments of larger bones; fish and bird bones; molluscs; hammerscale and other evidence of industrial processes; small finds. Evidence from bulk samples can indicate where particular domestic or industrial processes were taking place or highlight locations where disposal of different materials occurred.

What sort of sampling should I be doing? At the evaluation stage, collection, processing and assessment of bulk samples helps to characterise the site. One key bit of information that comes from the samples relates to the archaeological preservation conditions, which need to be understood in order to define a strategy at the excavation phase.

The analysis of samples from the evaluation and subsequent archaeological recording (excavation) phase provides many of the key details about what was happening on a given side, including types of food eaten, the local environment and how spaces were used and managed over time.

What is a sampling strategy? The strategy is the thing that sets out the why, where, what, how and when in relation to sampling. Sampling should be targeted and focused. It should be based on sound understanding of the nature of comparable archaeological remains both locally and regionally. It also needs to be flexible; allowing for an iterative approach as new information may be brought to bear as the project develops. In the strictest sense every context could be sampled for a range of environmental proxies. However, by developing a strategy that focuses on the likely remains to be preserved, and the ability of this material to provide pertinent archaeological information, this allows for targeted, site specific, and relevant samples to be taken. The strategy thus sets out a framework to guide the taking of samples.

- Why – samples should be taken to address a specific question, for example help address a HERDS objective, to recover dating evidence or to understand an aspect of the site and how it might have changed over time.
- What – what features are you actually going to sample to address those questions? On what types of deposits will the sampling focus? Will other types of sample be required, such as specialist samples, for example horizontally gridded areas sampled for hammerscale distribution, or vertical monolith tins for pollen?[2]
- Where – some locations on site may be better suited to addressing specific questions than others. The strategy is likely to vary across an area or with regard to different feature types. Importantly a sampling strategy also highlights where unproductive

[2] Most bulk samples should be 40-60ltrs (or the maximum recoverable if the feature has a smaller volume) and should all be fully processed within 2 weeks of being taken. This allows results to inform future planning for additional fieldwork (at the evaluation stage) or feedback to site to guide further potential samples (in an excavation). There may be situations where smaller samples are appropriate, for example if the deposits are waterlogged and particularly rich. Advice from internal specialists should always be sought in these situations and any changes recorded within this template

deposits might be present and focuses resources away from these features.

- How – deposits such as a basal fill of a ditch might require a larger area of the ditch to be exposed so that sufficient material for the sample can be recovered. When sampling a larger context, a scatter approach should be used to ensure any variability in the fill of the context is captured within the samples (this variability is a reason why it is good practice to process all of the sample taken, rather than to sub-sample at the processing stage).
- When – at what stage in the work will the samples be taken? In some instances, a few early samples processed rapidly can help to refine the strategy later in the programme, particularly on large and complex sites. This iterative approach, if integrated with the fieldwork, further helps refine and focus project resources.

Key elements of sampling strategy from PP

An initial sampling strategy was produced for the Project Plan. Key parts should be summarised here.

Archaeological Contractor's detailed sampling strategy for LS-WSI on basis of project plan and knowledge of the site

Based on the initial sampling strategy and background information (including geophysical survey / trial trenching), what additional observations would you make based on past experience of this type of site; the local geology / topography; from other similar sites in the vicinity.

This section should be complied by the *Archaeological Contractor's* project managers and specialist teams.

Pre-ex / post soil removal revision / additions to the sampling strategy

Even sites that seem to be well-characterised by geophysical survey / trial trenching often exhibit greater variation once the topsoil is removed. Based on an initial site visit by the *Archaeological Contractor's* specialists or dialogue between them and the site project manager, are there additional questions arising from the pre-ex strip and plan and what samples might be required to address them.

Which samples might be fast-tracked to help gain a good understanding of the site and help further refine the strategy?

Mid-point sample strategy review (where appropriate depending on length of work and complexity of site)

This section should be updated following discussion by the *Employer*, stakeholders, the *Contractor* and the *Archaeological Contractor's* on site. Areas that might be covered relate to the following:

What information has been gathered from samples processed to date?

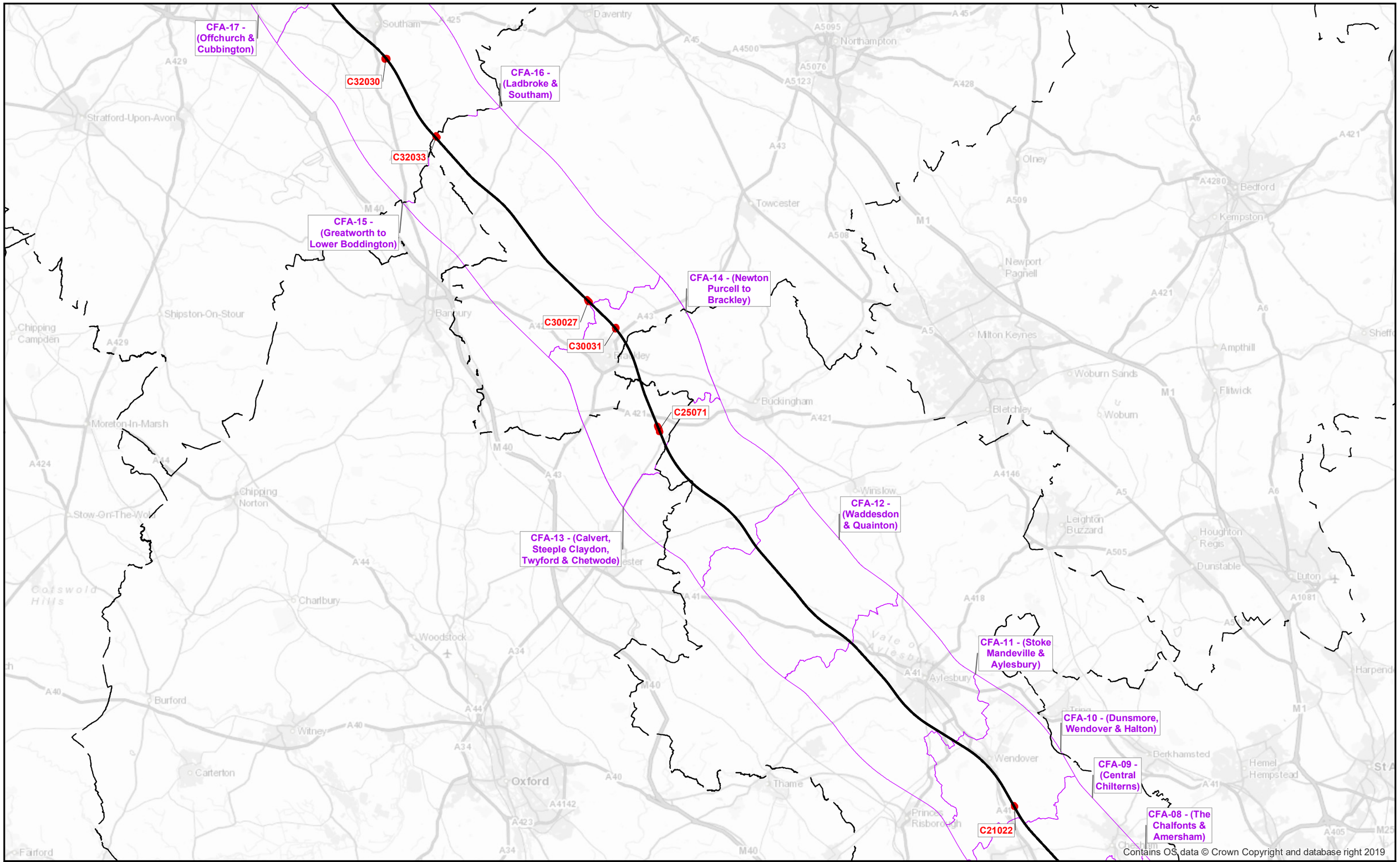
What other questions have arisen during the excavation that sampling might address; what are they and what changes are needed to the strategy; what additional samples are required?

Do any specialist samples need to be taken on site? If so, what, by whom and when? How will these samples address the specific objectives?

Final additions / amendments to sampling strategy

This section should be completed by the *Archaeological Contractor* and their specialists towards the end of the fieldwork, to ensure that all elements of the strategy, including any changes implemented after the mid-stage review are properly captured.

Appropriate reference to the on-site sample register should also be given here so that a full list of samples and the purpose for which they were taken can be easily viewed.



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Community Forum boundaries
- County boundary

High Speed Two

Fig. 1
Project plan scope overview

Internal

HS2

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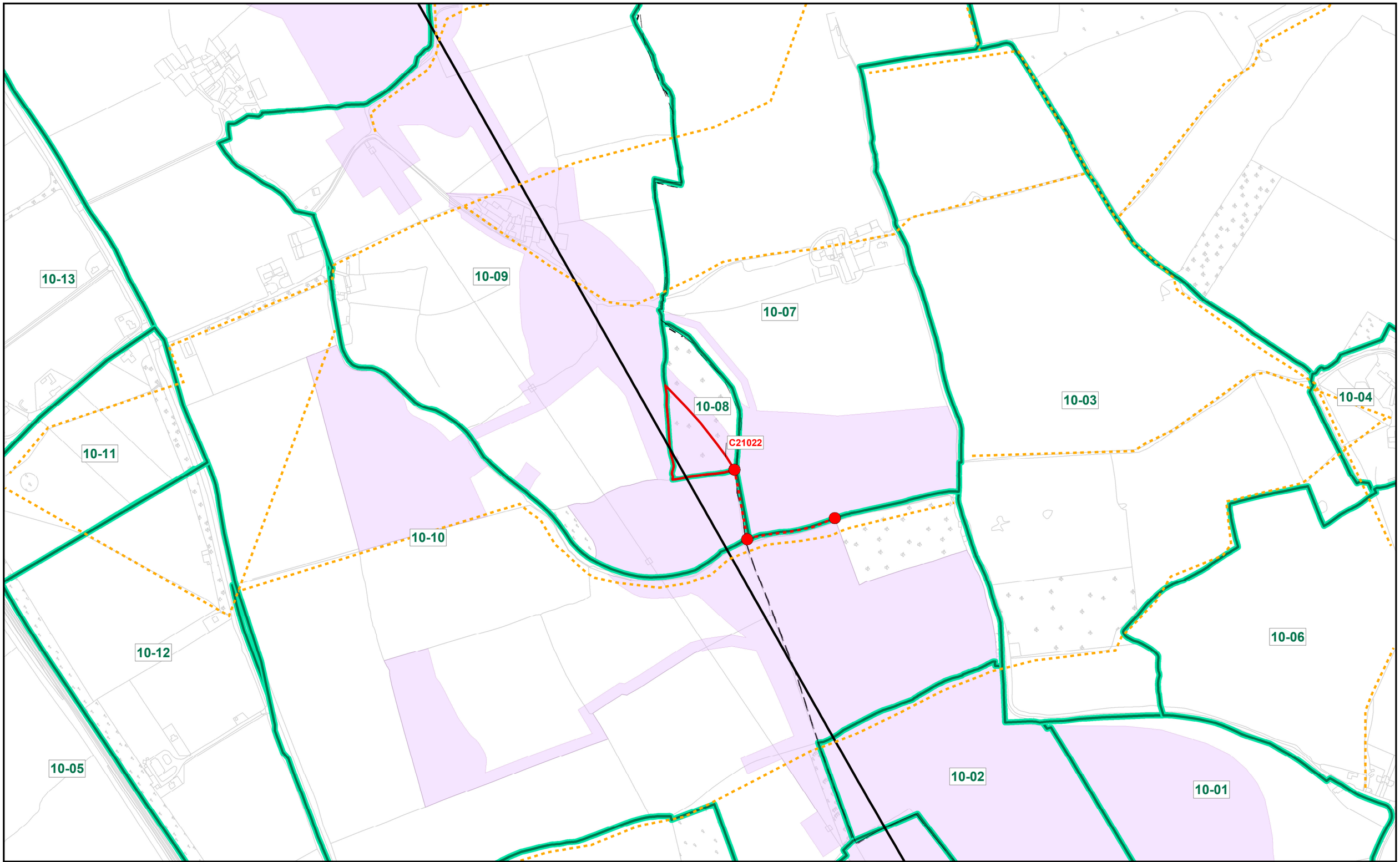

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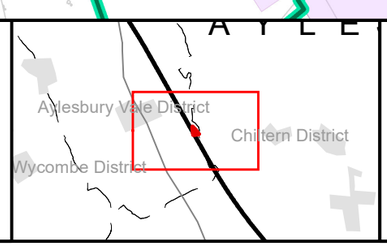
- Site
- Access Point
- Woodland Access
- CXXX Fusion Site GIS ID No.
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Public Right Of Way



High Speed Two

Fig. 2a
Jones Hill Wood
Site location

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

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C25071
14-03
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14-01

Legend

- Route
- Site
- Access Point
- Woodland Access
- Public Right Of Way
- CXXX Fusion Site GIS ID No.
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Community Forum boundaries
- Watercourse
- Waterbody

South Northamptonshire District
Cherwell District
Aylesbury Vale District

High Speed Two

Fig. 2b
Widmore Farm
Site location

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

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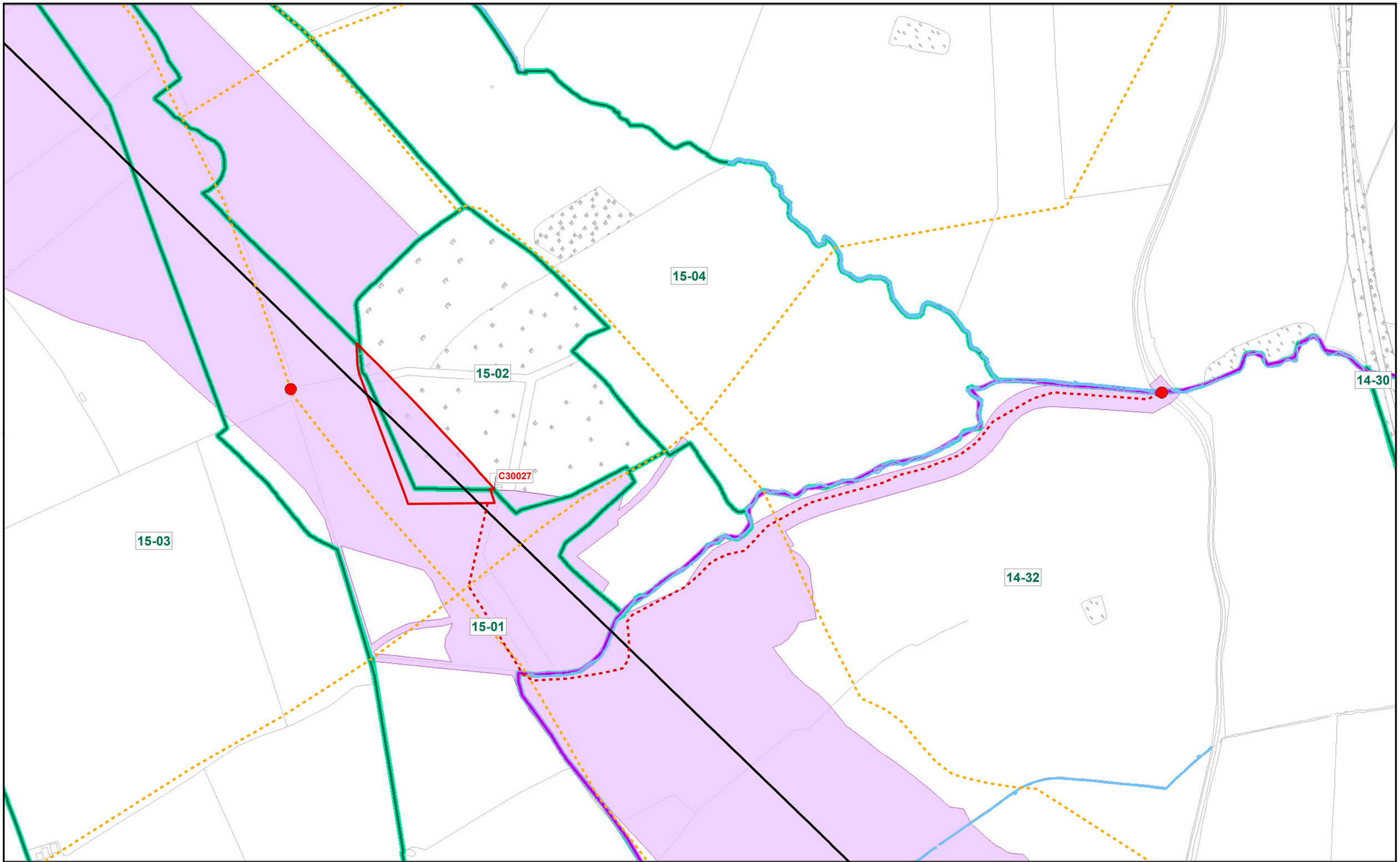
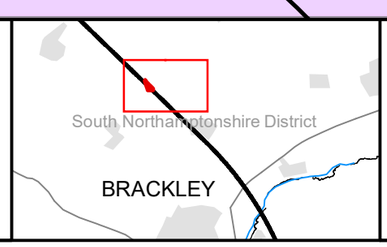


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Woodland access point
- Woodland access line
- Public Right of Way
- Community Forum boundaries
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Watercourse



High Speed Two

Fig 2c:
Halse Copse Farm
Site location

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

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14-27
C30031
14-26
14-25
14-23

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Woodland access point
- Woodland access line
- Public Right of Way
- Community Forum boundaries
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Watercourse

South Northamptonshire District

BRACKLEY

High Speed Two

Fig 2d:
Fox Covert Whitfield
Site location

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

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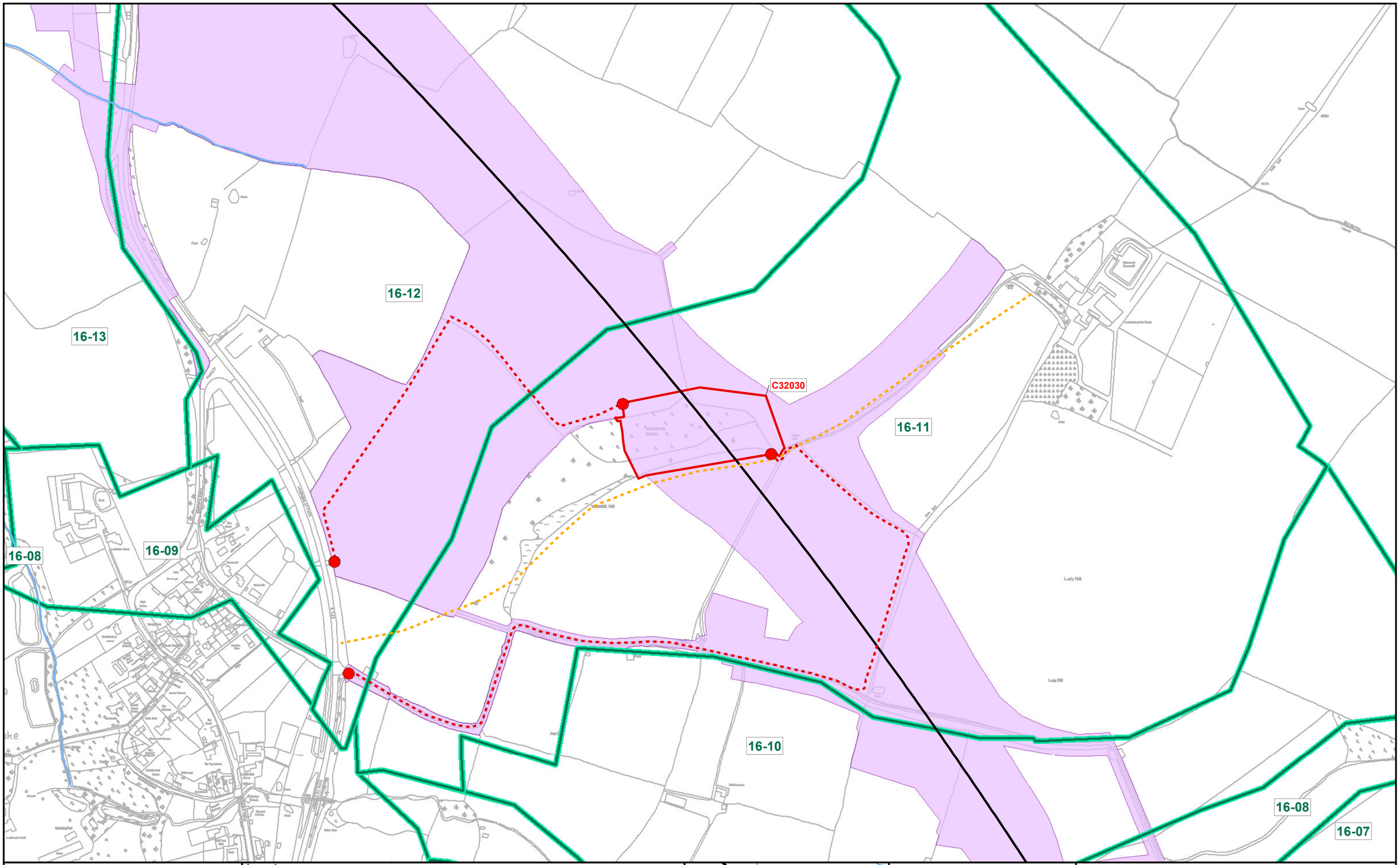

Legend

- Route
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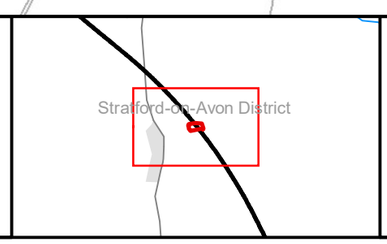
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Watercourse
- Public right of way
- Access Point
- Woodland Access



High Speed Two

Fig. 2e
Windmill Hill Spinney
Site location

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

Scale at A3: 1:5,000

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Meters

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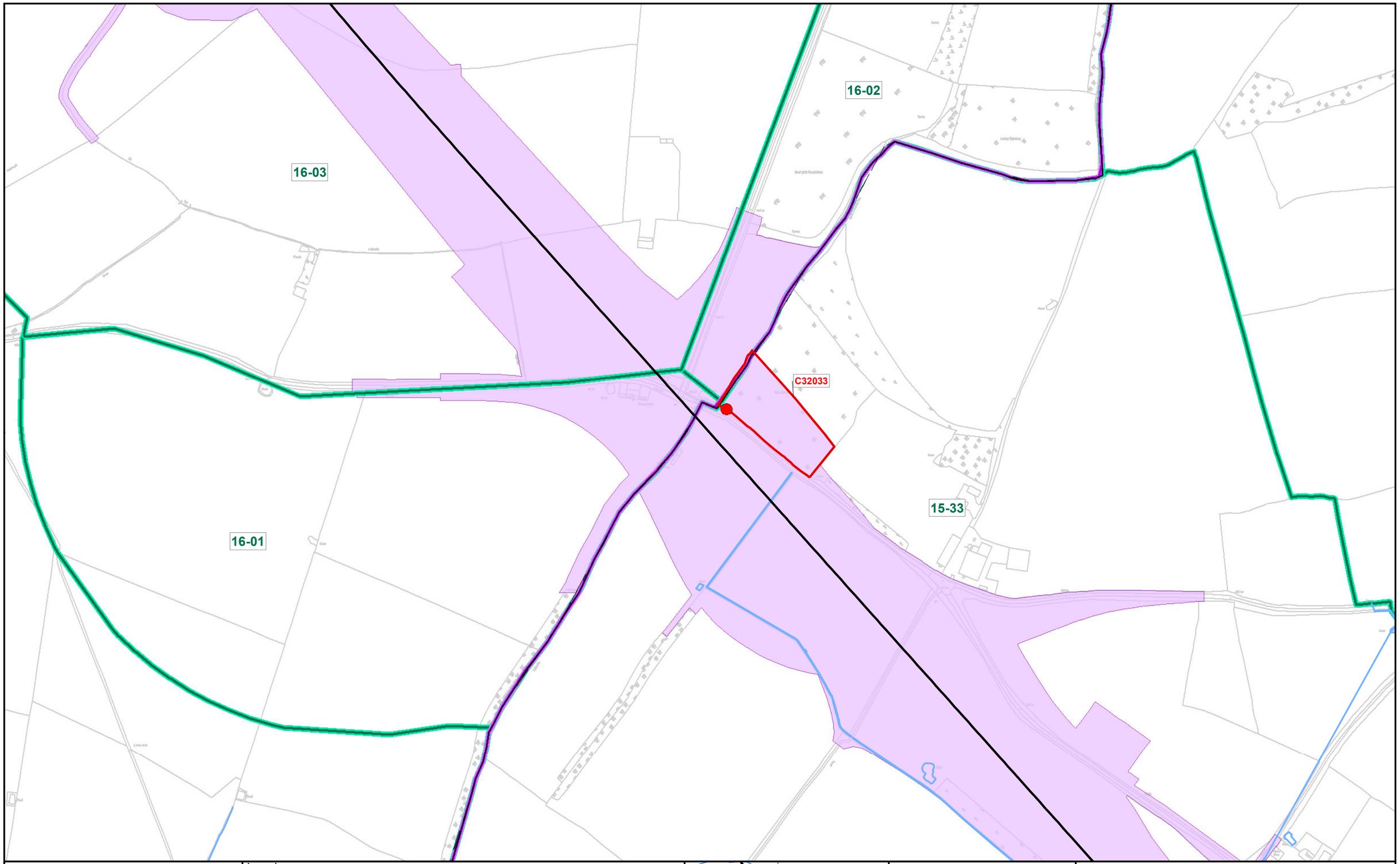

Legend

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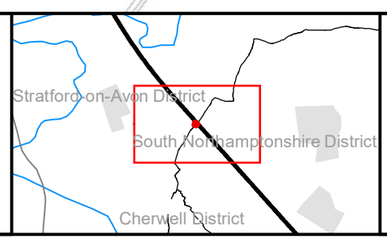
- Archaeological Character Sub Zones
- Consolidated Construction Boundary
- Community Forum boundaries
- Watercourse
- Access Point



High Speed Two

Fig. 2f
Fox Covert
Site location

Community Forum Area (CFA15/16): Greatworth to Lower Boddington & Ladbroke & Southam

Internal

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CC077
MBC3079

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Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Grade I Listed Building
- Grade II Listed Building
- Non Designated Assets_pt
- Non Designated Assets_ln
- Non Designated Assets
- Bucks HER
- Scheduled monument
- Important hedgerows
- Route specific parishes ancient 2018
- Ancient woodland

Aylesbury Vale District
Chiltern District
Wycombe District

High Speed Two

Fig. 3a
Jones Hill Wood
Heritage assets

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

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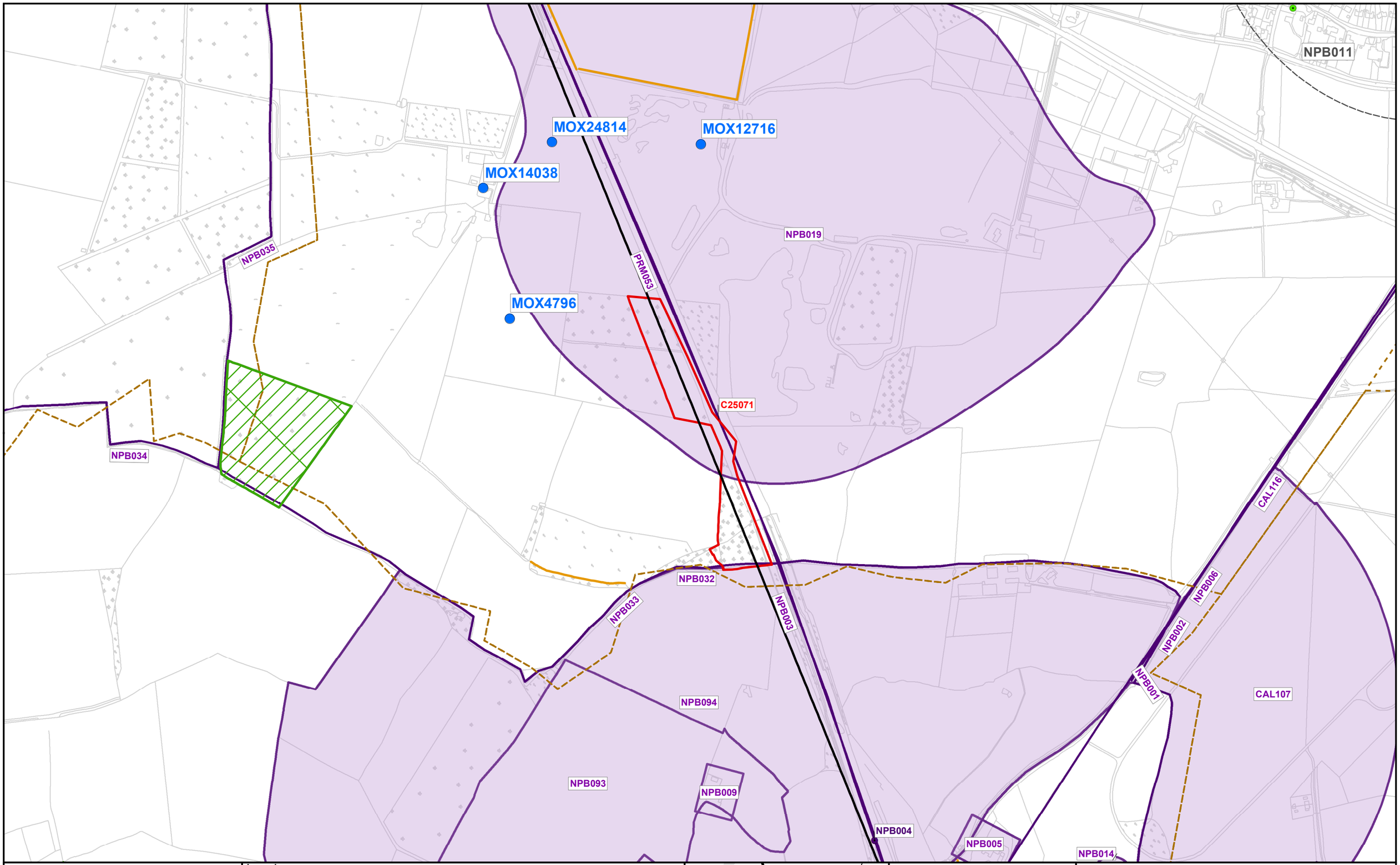

Legend

- Route
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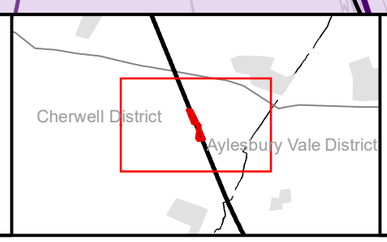
- Non Designated Assets
- Important hedgerows
- Route specific parishes ancient 2018
- Ancient Woodland



High Speed Two

Fig. 3b
Widmore Farm
Heritage assets

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Scale at A3: 1:6,000

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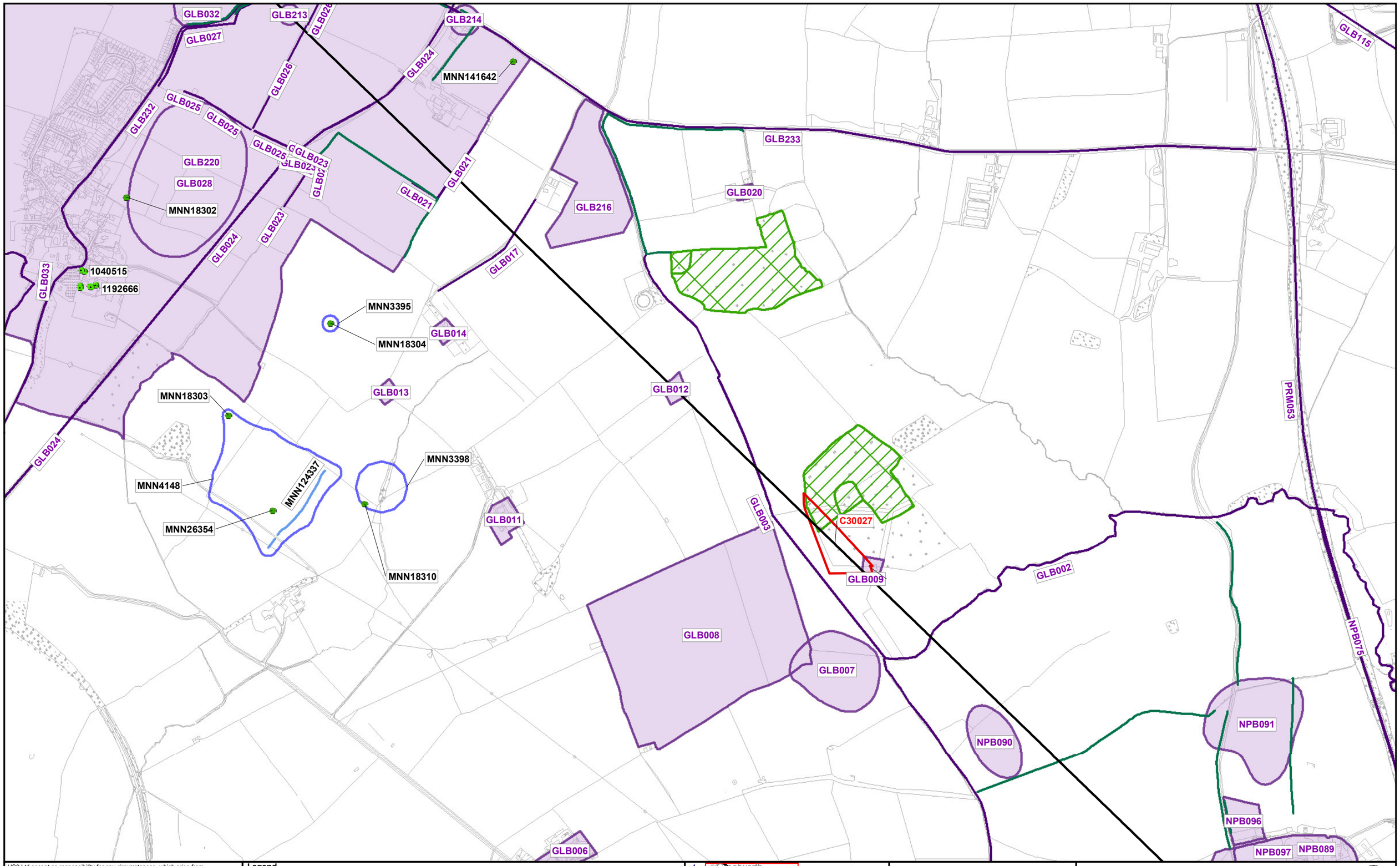
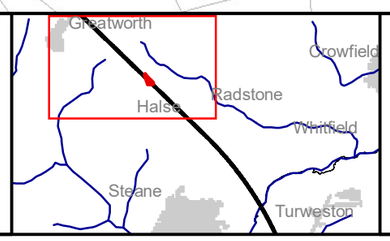
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 09/12/19



Legend

- Route
- Site
- Grade II Listed Building
- Non Designated Assets
- Non Designated Assets
- Non Designated Assets
- Monuments Points
- Important hedgerows
- Ancient woodland



High Speed Two

Fig 3c:
Halse Copse Farm
Heritage assets

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

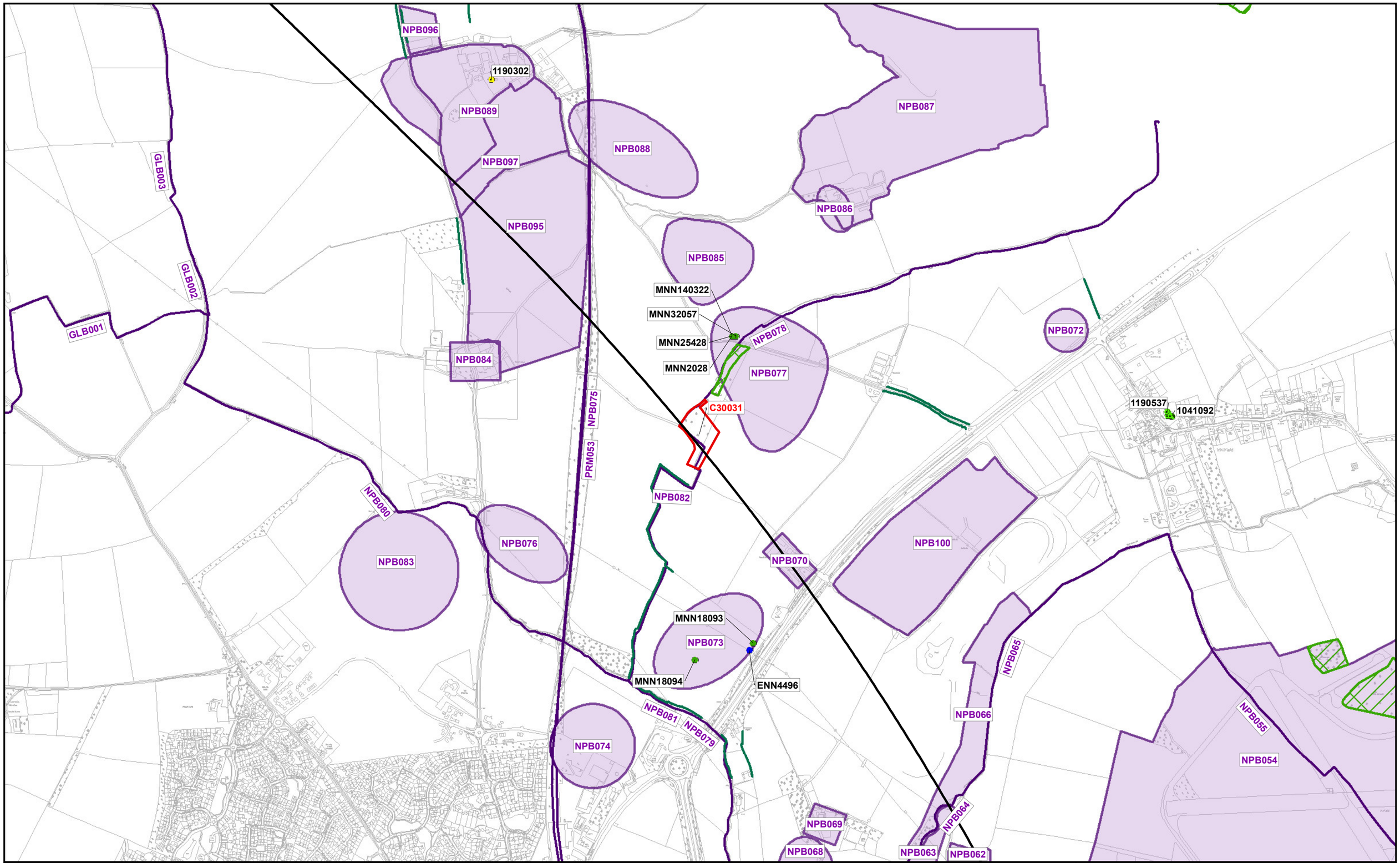
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:10,000

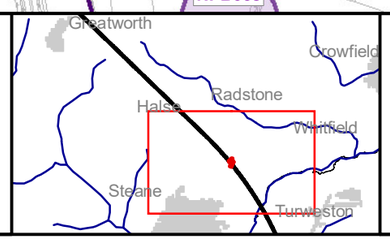
0 100 200 300 400
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19



Legend

- Route
- Site
- Grade I Listed Building
- Grade II Listed Building
- Non Designated Assets
- Non Designated Assets
- Non Designated Assets
- Events Points
- Monuments Points
- Important hedgerows
- Ancient woodland



High Speed Two

Fig 3d:
Fox Covert Whitfield
Heritage assets

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:10,000

0 100 200 300 400
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

MWA19532
MWA6218
LBS047
LBS058
LBS049
MWA930
MWA9049
C253
C253
MWA19533
LBS100
C32030
MWA933
LBS102
MWA928
MWA19533
LBS046
LBS042
MWA8568

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Important hedgerows
- Route specific parishes ancient 2018
- Grade II Listed Building
- 02) Heritage Assets Gazetteer ID group (Phase 1 ES)
- Warcs HER
- Warcs HER
- Non Designated Assets

Stratford-on-Avon District

High Speed Two

Fig. 3e
Windmill Hill Spinney
Heritage assets

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

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Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

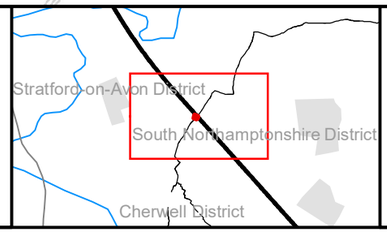
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 14/11/19

LBS105
LBS009
LBS007
MWA6793
LBS006
MWA29626
LBS005
MWA7258
GLB210
MWA1318
LBS010
LBS004
LBS010
LBS011
LBS002
MNN123265
GLB209
LBS003
C253
C253
GLB211
C32033
MWA19537
GLB184
GLB115
GLB205
GLB206
LBS104
GLB204

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Non Designated Assets
- Non Designated Assets
- Important hedgerows
- Route specific parishes ancient 2018
- Ancient Woodland
- HER
- HER



High Speed Two

Fig. 3f
Fox Covert
Heritage assets

Community Forum Area (CFA15/16): Greatworth to Lower Boddington & Ladbroke & Southam

Internal

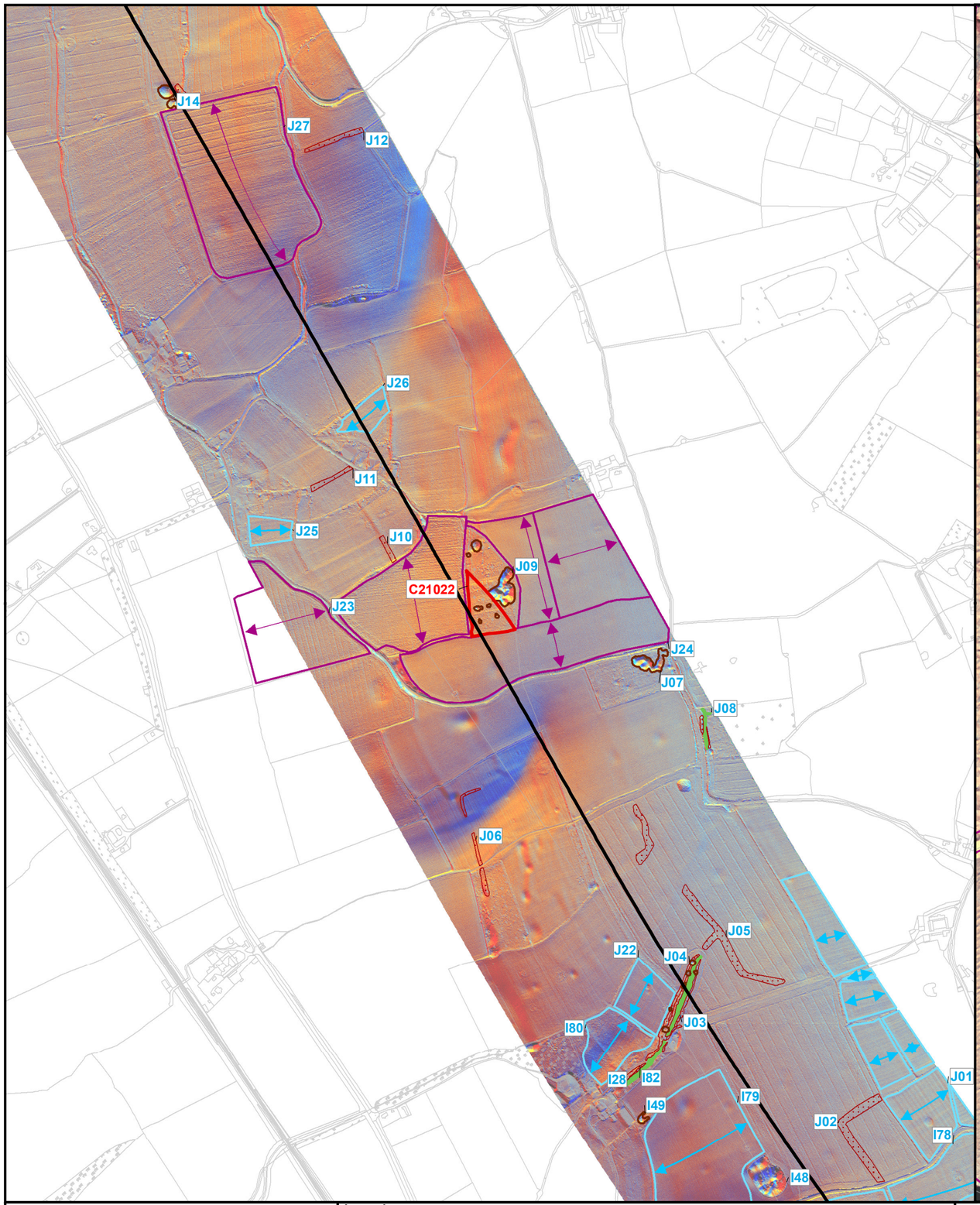
HS2

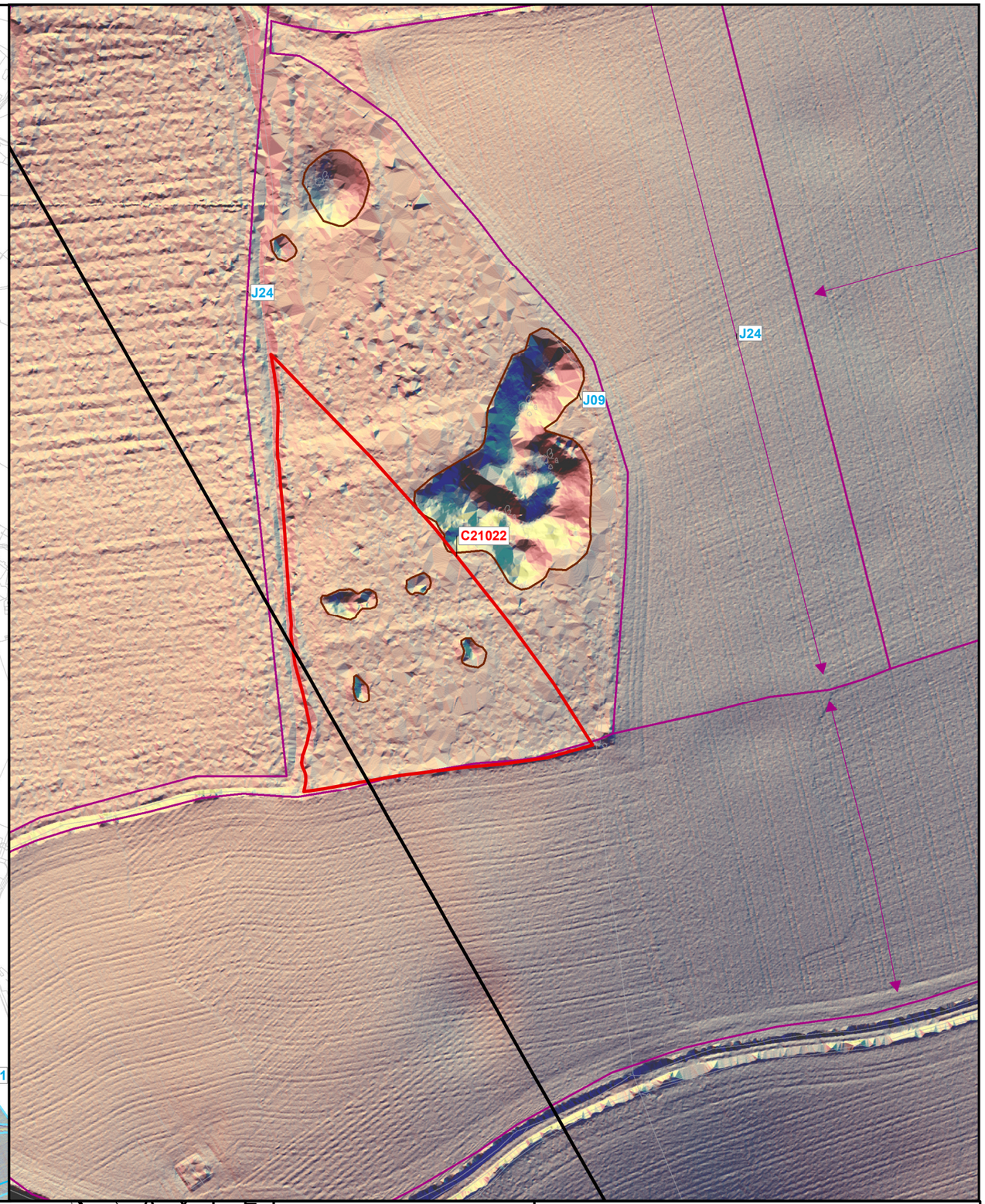
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,501

0 56.25 112.5 168.75 225
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 19/12/19





Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Aerial Photography Interpretation

- Extant R&F
- Levelled R&F
- Bank
- Large cut feature
- Extant ridge and furrow outline
- Levelled ridge and furrow outline
- Ditch

High Speed Two

Fig. 4a
Jones Hill Wood
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA10): Dunsmore, Wendover & Halton
Internal

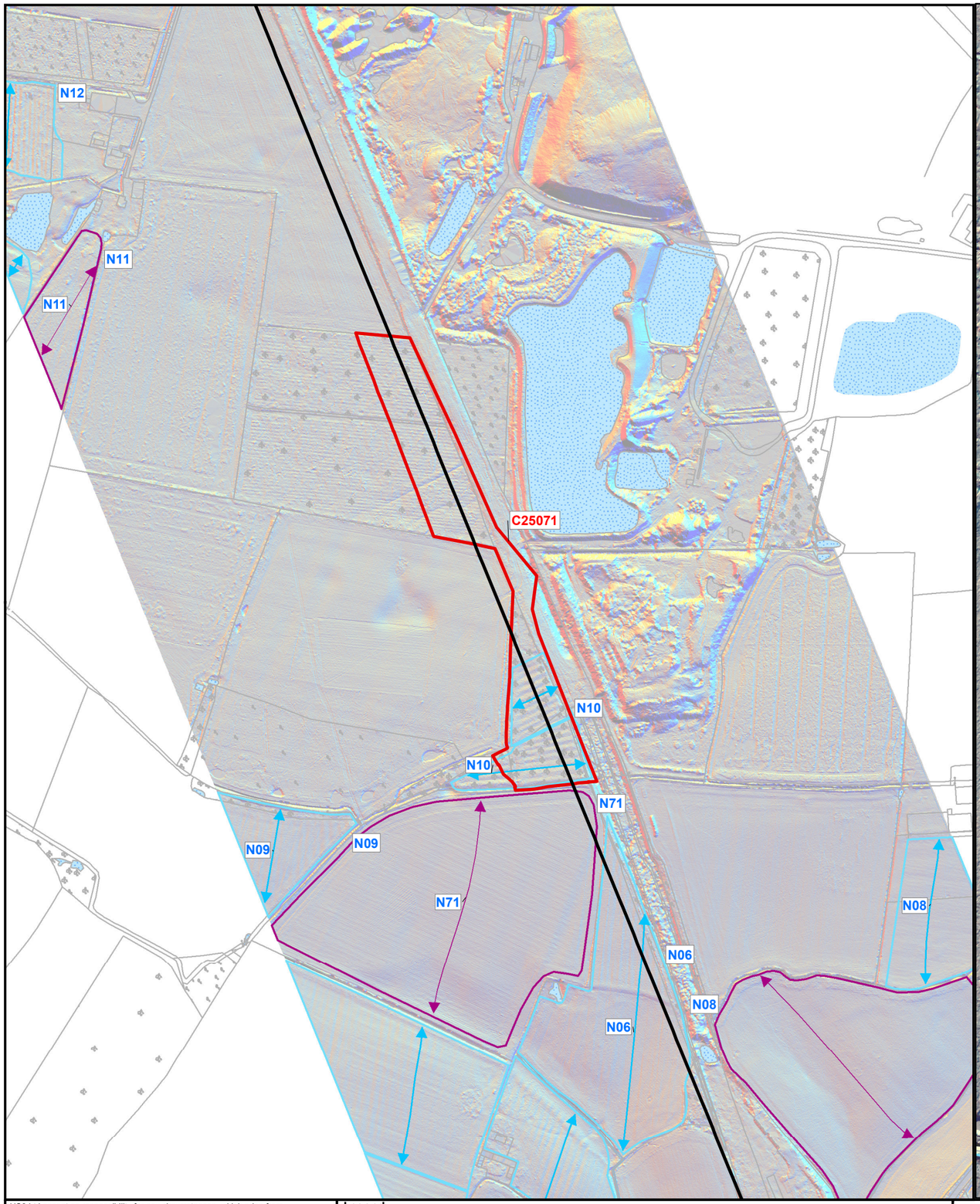
HS2

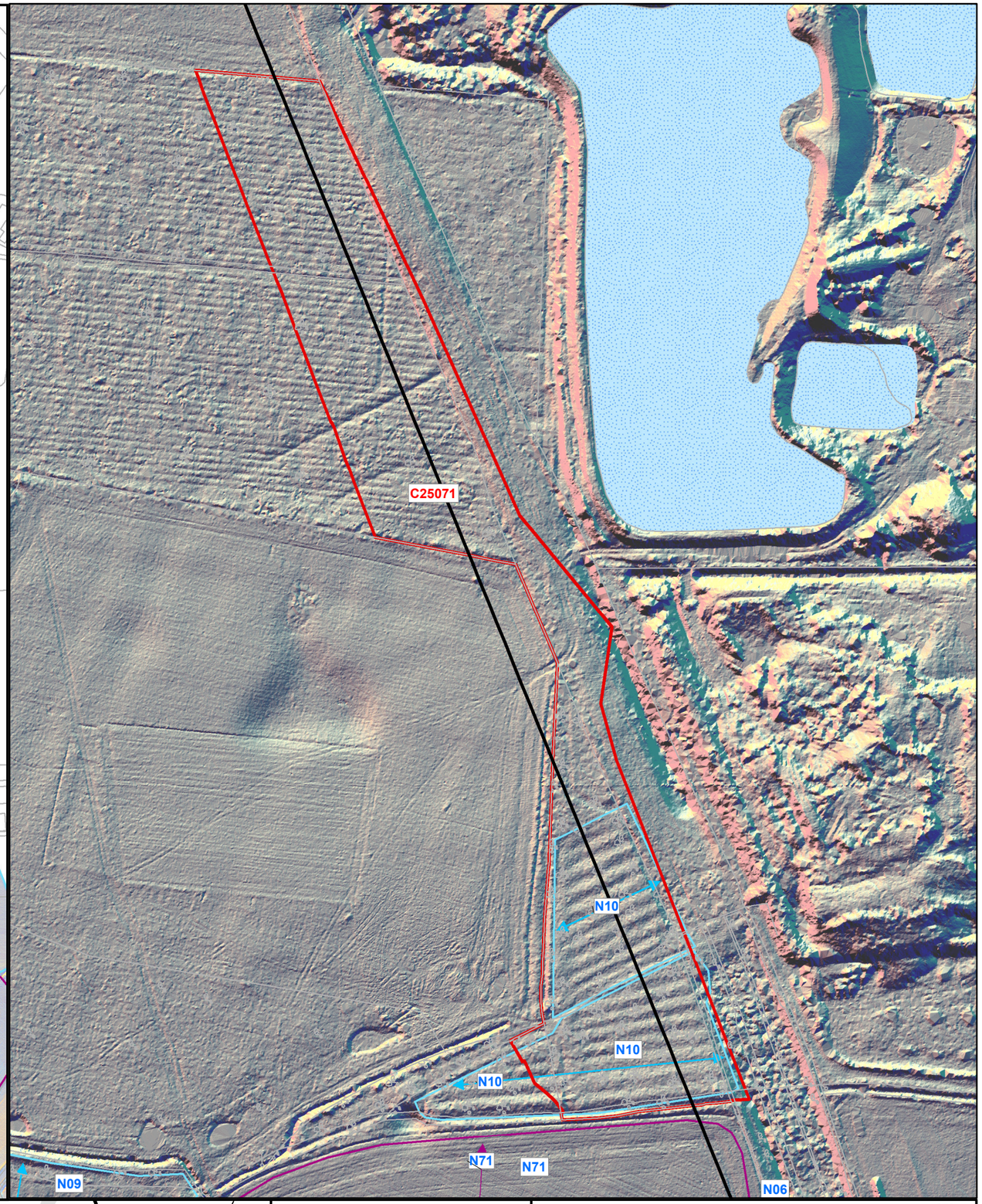
Scale at A3: 1:1,500

0 100 200 300 400
Meters

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 11/12/19



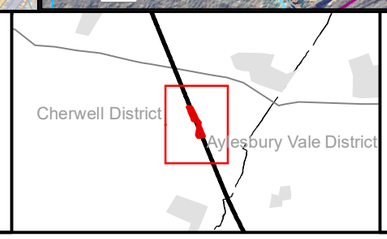


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

AP Interpretation
- Extant R&F
- Levelled R&F

AP Interpretation
- Extant ridge and furrow outline
- Levelled ridge and furrow outline



High Speed Two

Fig. 4b
Widmore Farm
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA14):
Newton Purcel to Brackley
Internal

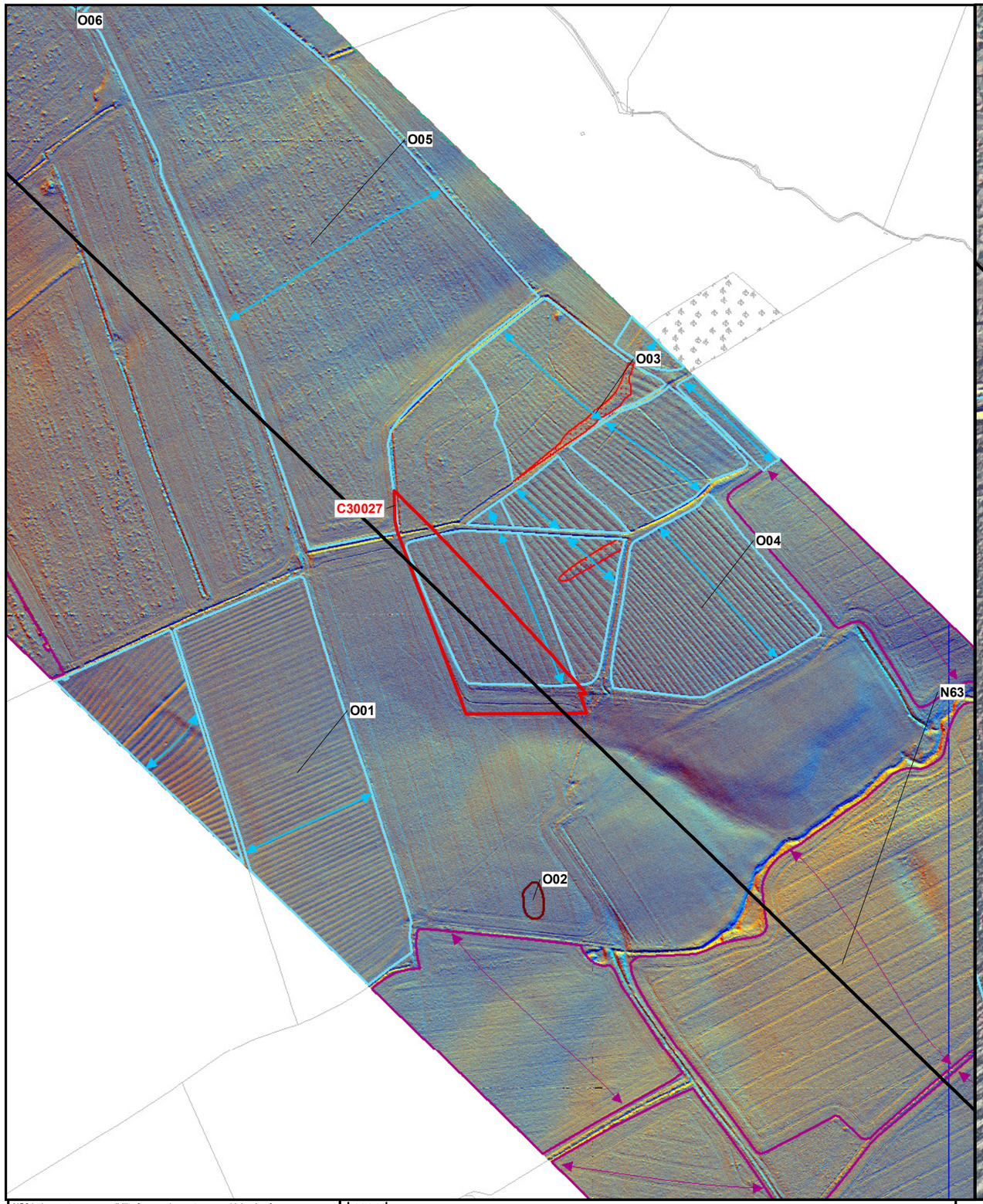
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 09/12/19

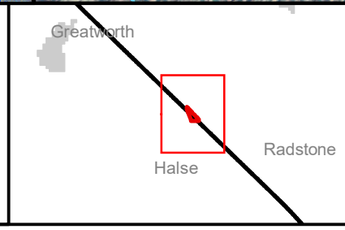


Legend

- Route
- Site

Aerial Photography Interpretation

- Bank
- Ditch
- Extant R&F
- Levelled R&F
- T-Hachure
- Bank
- Ditch
- Large cut feature
- Extant ridge and furrow outline
- Levelled ridge and furrow outline



High Speed Two

Fig 4c:
Halse Copse Farm
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

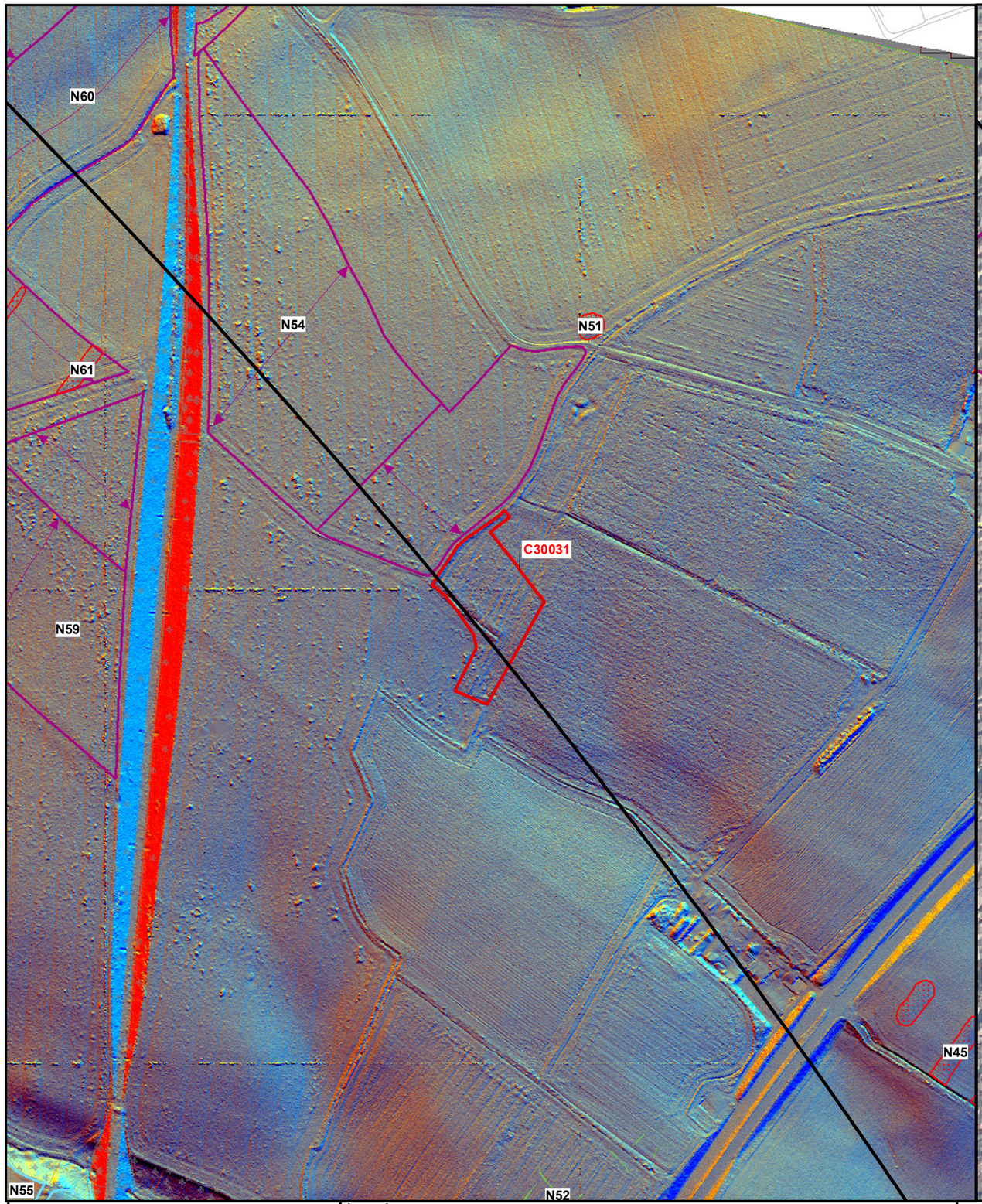
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,500

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19



Legend

- Route
- Site

Aerial Photography Interpretation

- Bank
- Ditch
- Extant R&F
- Levelled R&F
- T-Hachure
- Bank
- Ditch
- Large cut feature
- Extant ridge and furrow outline
- Levelled ridge and furrow outline

High Speed Two

Fig 4d:
Fox Covert Whitfield
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

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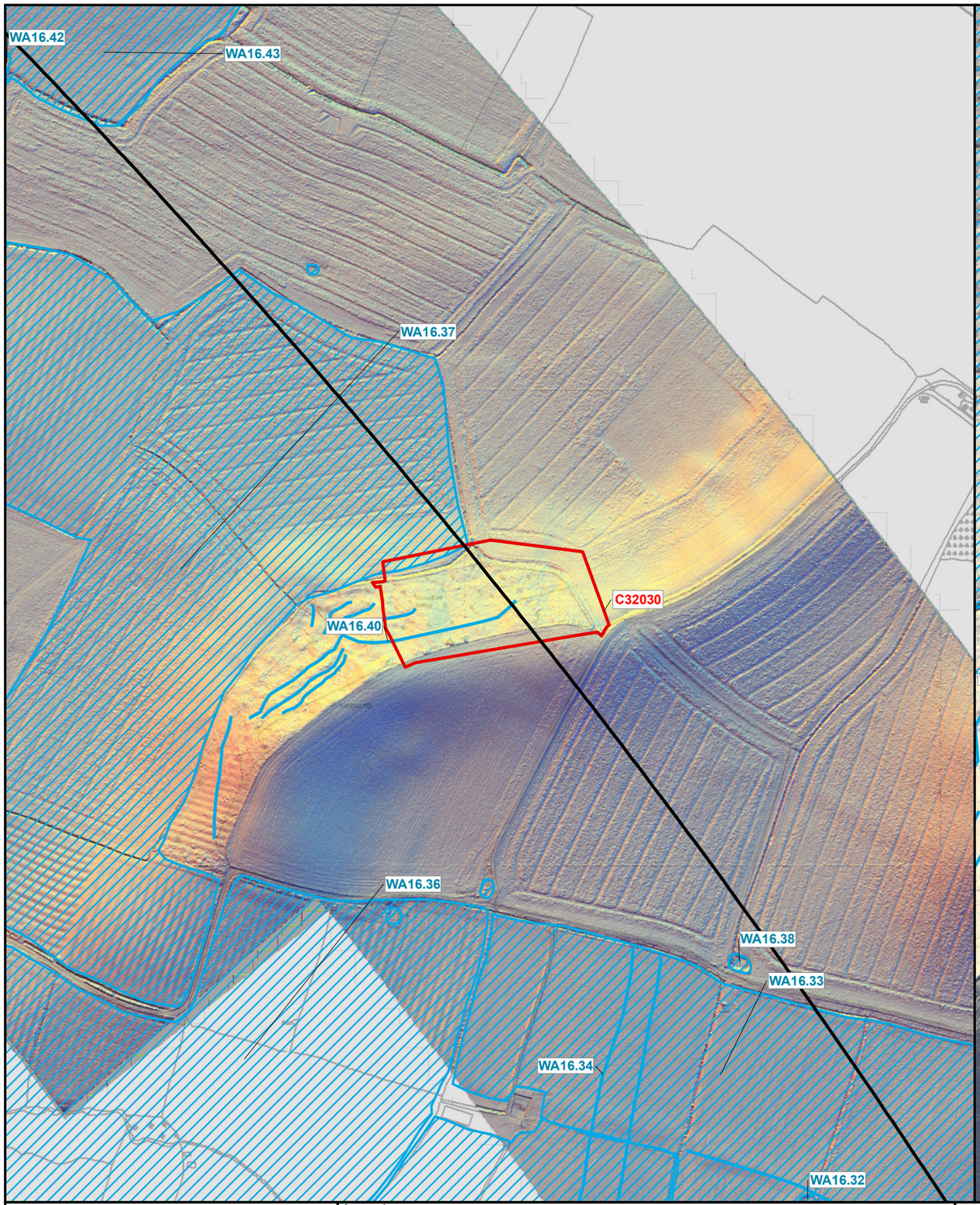
Scale at A3: 1:1,500

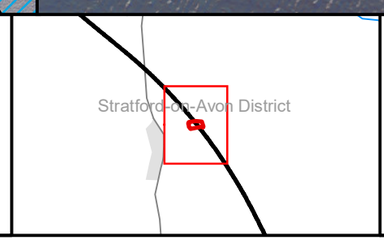
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Remote sensing interpretation
- Remote sensing interpretation



High Speed Two

Fig. 4e
Windmill Hill Spinney
Lidar and remote sensing results

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

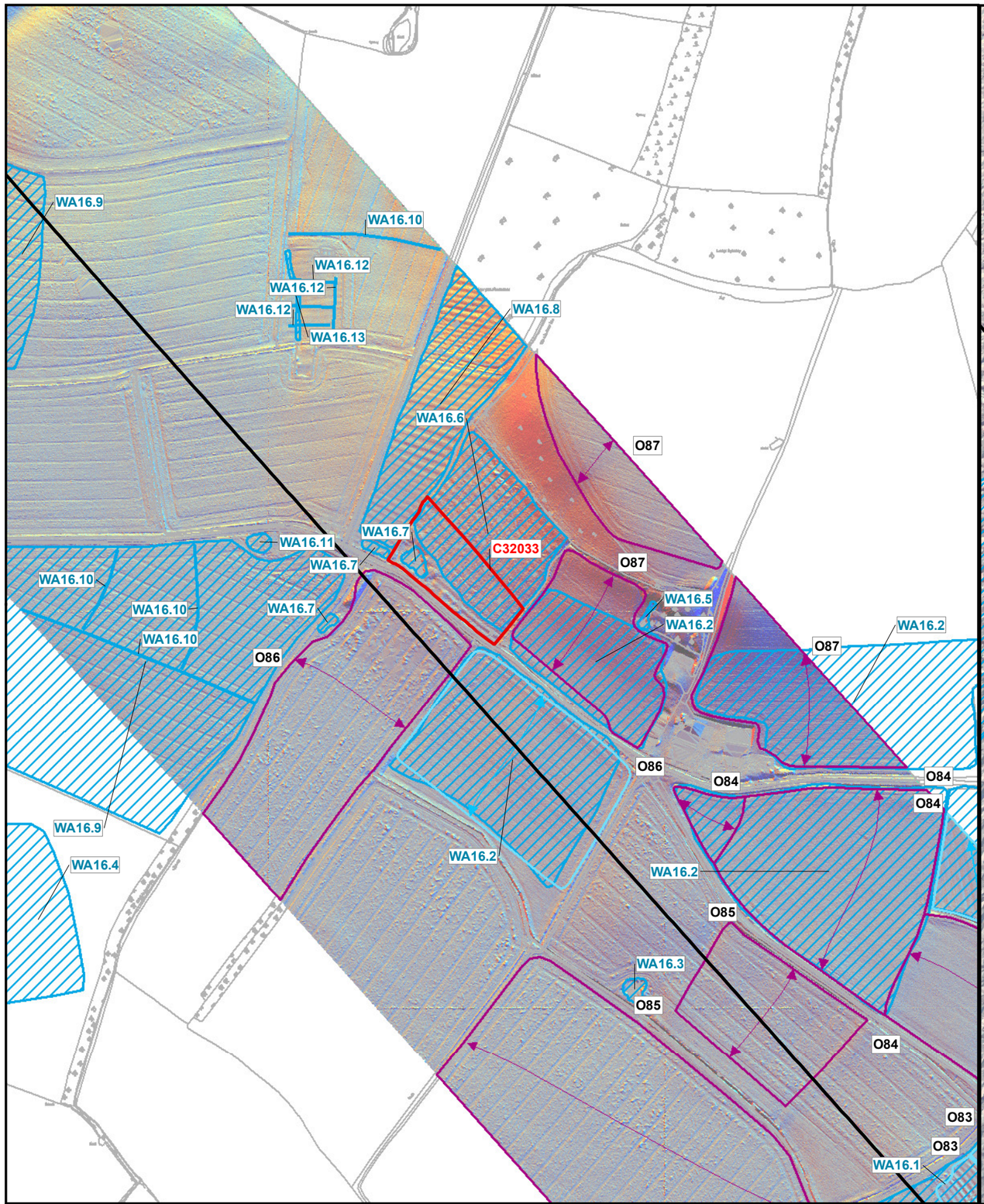
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,500

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 17/12/19

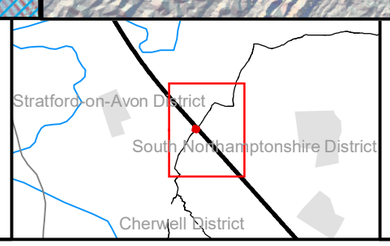


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Remote sensing interpretation
- Remote sensing interpretation

Aerial Photography Interpretation

- Extant R&F
- Levelled R&F
- Extant ridge and furrow outline
- Levelled ridge and furrow outline



High Speed Two

Fig. 4f
Fox Covert
LiDAR survey and remote sensing interpretation

Community Forum Area (CFA15/16): Greatworth to Lower Boddington & Ladbroke & Southam
Internal

HS2

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Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:2,000

0 60 120 180 240
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 19/12/19

C21022

1a

1b

1c

Geophysics key (Magnitiude)

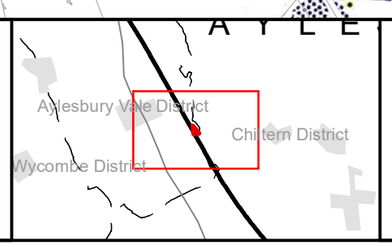
- Archaeology Possible (Strong)
- Archaeology Possible (Trend)
- Agricultural (Spread)
- Agricultural (Trend)
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Spread)
- Natural (Trend)
- Undetermined (Strong)
- Undetermined (Trend)
- Ferrous (Dipolar)
- Ferrous (Spread)/Magnetic Dis
- Service

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Geophysical survey area

Geophysics Survey Results

- Archaeology
- Ferrous
- Plough Mark
- Pipe
- Ridge and Furrow
- Trend
- Ferrous
- Geophysics Survey Results
- Natural



High Speed Two

Fig. 5a
Jones Hill Wood
Previous investigations

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

HS2

Scale at A3: 1:5,000

0 50 100 150 200
Meters

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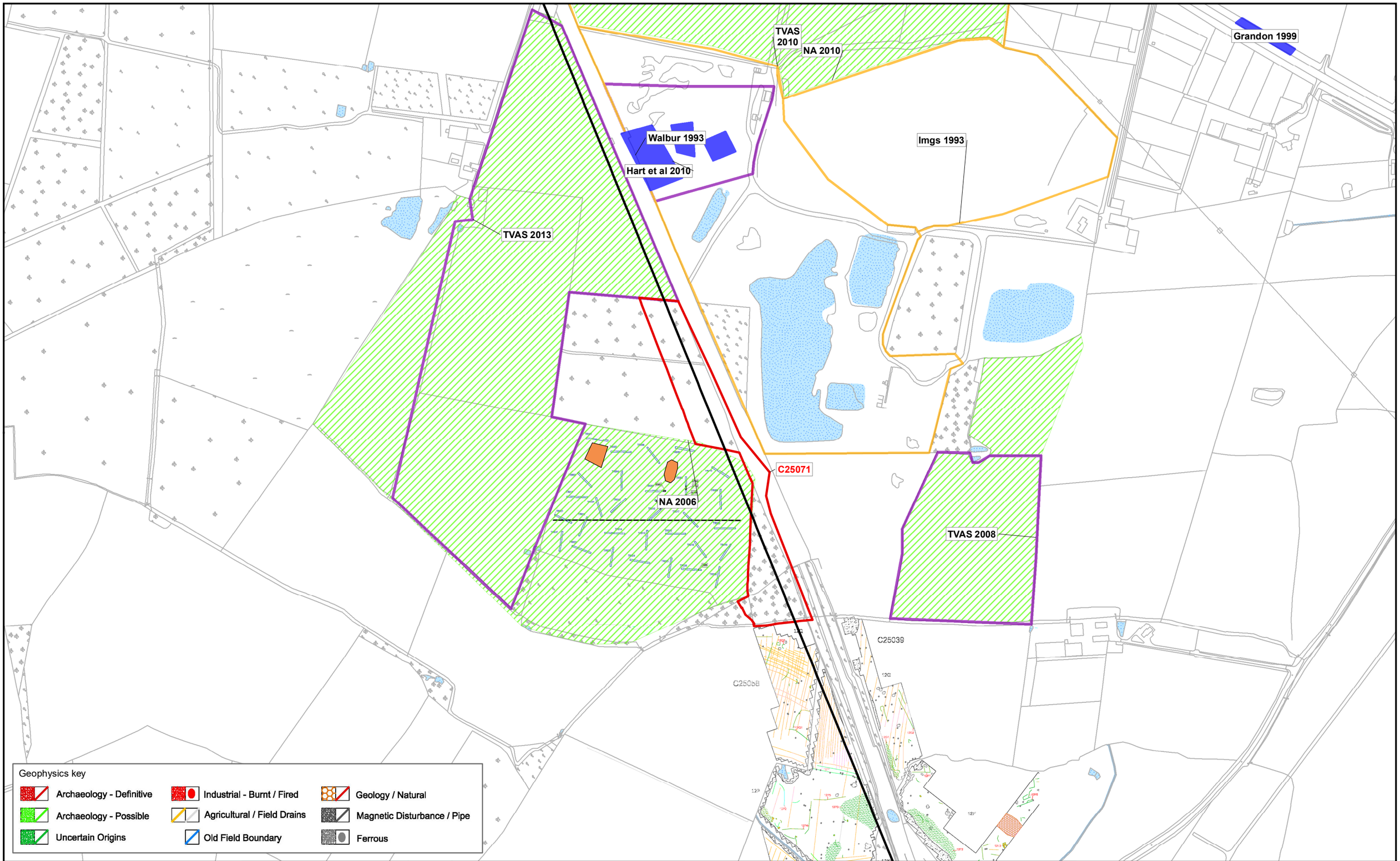
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 10/12/19

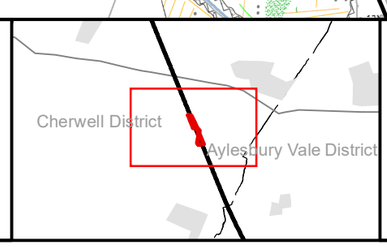


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Quarry Pits

Previous investigations

- Evaluation
- Excavation
- Fieldwalking
- Geophysics
- Trench location
- Archaeological feature



High Speed Two

Fig. 5b
Windmore Farm
Previous investigations

Community Forum Area (CFA14):
Newton Purcel to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 09/12/19

2
3
4
5
7
8
9
10
11
12
13
C30027
Halse Copse (SUMO 2019)
Halse Copse (SUMO 2019)
Radstone

Geophysics key (Fusion 2019) - Halse Copse

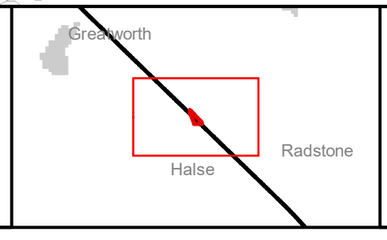
- Archaeology (discrete / zone / trend*) *trend = very weak response
- Possible Archaeology (discrete / enhanced response / trend*) *trend = very weak response
- Industrial, Burnt-Fired
- Old Field Boundary
- Agriculture - Ridge & Furrow
- Agriculture - ploughing
- Agriculture - Drain
- Natural
- Uncertain Origin (discrete / zone / trend*) *trend = very weak response
- Pipe
- Ferrous (discrete / zone)
- Former gravel pit (corroborated)

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Geophysics survey areas
- Drain
- Ridge and Furrow
- Ferrous

Previous evaluation

- Halse Copse South TT
- Halse Copse East TT
- Evaluation trench
- Modern
- Archaeological feature
- Furrow



High Speed Two

Fig. 5c
Halse Copse Farm
Previous investigations

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

HS2

Registered in England. Registration number 06791686.
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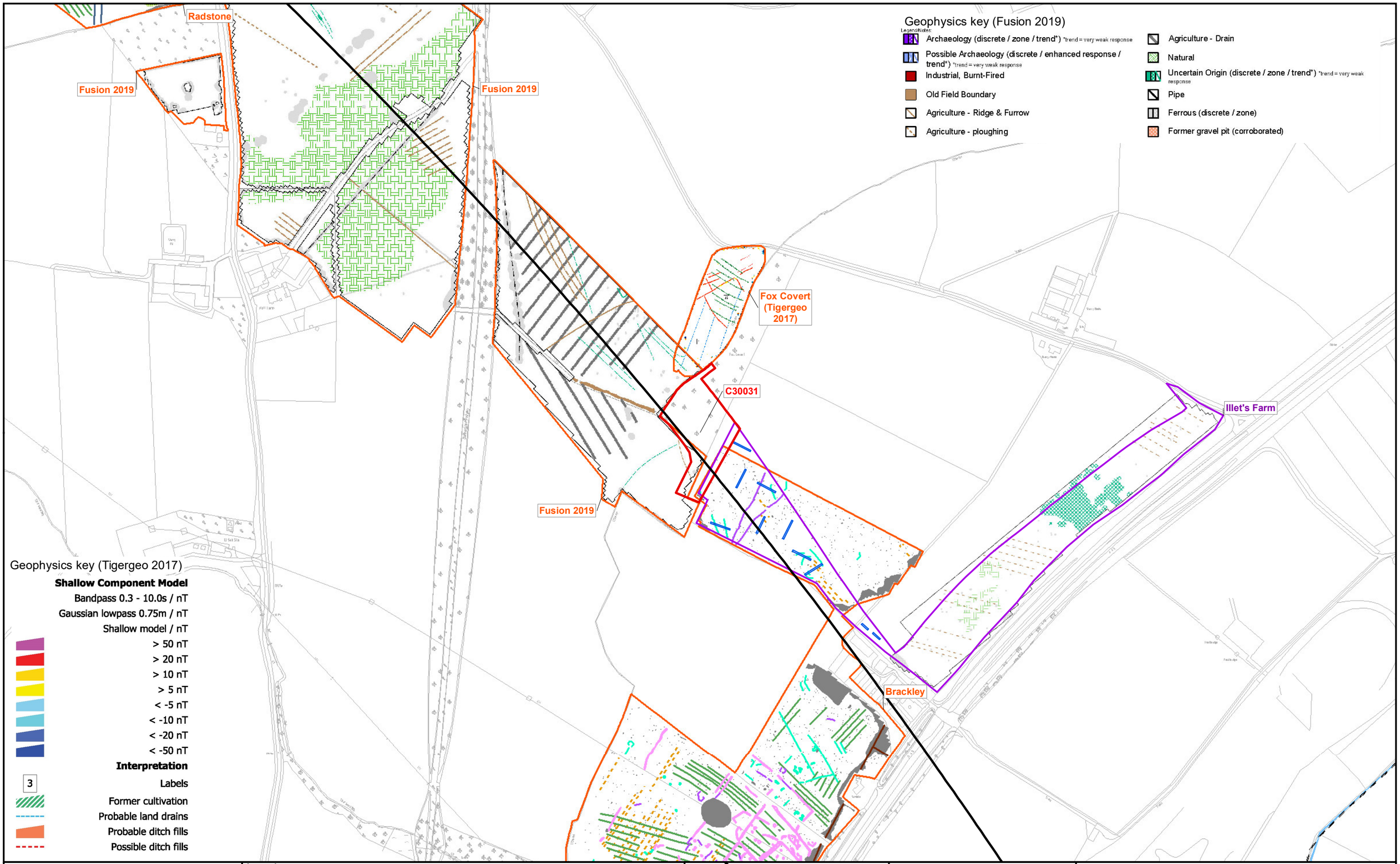
Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

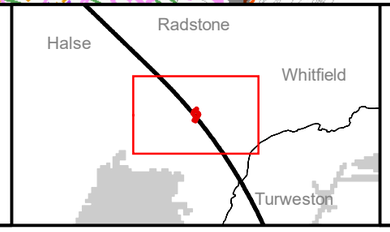


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- Geophysics survey areas
- Archaeology
- Drain
- Plough Mark
- Pipe
- Ridge and Furrow
- Trend
- Uncertain
- Archaeology
- Ferrous
- Geophysics Survey Results

Previous evaluation

- Evaluation trench
- Modern
- Archaeological feature
- Illets Farm



High Speed Two

Fig. 5d
Previous investigations

Community Forum Area (CFA14): Newton Purcell to Brackley and CFA 15: Greatworth to Lower Boddington

Internal

HS2

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Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

Connect Archaeology

- Archaeology - Definitive
- Archaeology - Possible
- Uncertain Origins
- Industrial - Burnt / Fired
- Agricultural / Field Drains
- Old Field Boundary
- Geology / Natural
- Magnetic Disturbance / Pipe
- Ferrous

Wessex Archaeology

- Archaeology
- Archaeology (very weak response)
- Possible Archaeology
- Possible Archaeology (very weak response)
- Industrial, Burnt-Fired, Increased Magnetic Response
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Natural
- Uncertain Origin
- Pipe, Modern Service
- Ferrous

TigerGeo

- >50nT/m
- >20nT/m
- >10nT/m
- >5nT/m
- <-5nT/m
- <-10nT/m
- <-20nT/m
- <-50nT/m
- Cultivation ridge and furrow
- Known former boundaries
- Land Drains line
- Linear Fills line
- Linear Fills

TigerGeo (2018)
Connect Archaeology (2019)
Wessex Archaeology (2013)
C32030
Tr.001
Tr.002
Tr.003
Tr.004
Tr.005
Tr.006
Tr.007
Tr.008
Pond1
Pond2
Pond3
Pond4
Pond5
Pond6
Pond7
Pond8
Pond9
Pond10
Pond11
Pond12
Windmill Hill Spinney
Wilmcote Hill
Lady Hill
LADBROKE BY PASS
A 4233
LADBROKE HILL LANE
Cattle Grid
Pond
Path (old)

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Evaluation trench
- Watching Brief
- Geophysical survey extent

Stratford-on-Avon District

High Speed Two

Fig. 5e
Windmill Hill Spinney
Previous investigations

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:3,000

0 30 60 90 120
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/12/19

C32033

3K

3H

Magnetic 1m Pseudogradient
Bandpassed 0.3 - 10.0s / nT
Gaussian lowpass 0.75m / nT
Pseudogradient conversion / nT/m
> 50 nT/m
> 20 nT/m
> 5 nT/m
< -5 nT/m
< -20 nT/m
< -50 nT/m

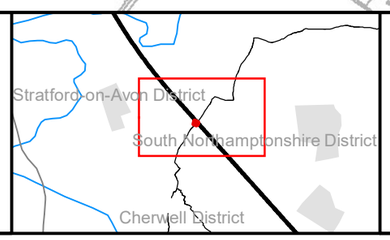
Interpretation
2 Labels
Former cultivation
Possible ditch fill

Archaeology (discrete / zone / trend*) *trend = very weak response
Possible Archaeology (discrete / enhanced response / trend*) *trend = very weak response
Industrial, Burnt-Fired
Old Field Boundary
Agriculture - Ridge & Furrow
Agriculture - ploughing
Agriculture - Drain
Natural
Uncertain Origin (discrete / zone / trend*) *trend = very weak response
Pipe
Ferrous (discrete / zone)

Legend

Route
Site
CXXX Fusion Site GIS ID No.

Archaeology - Definitive
Archaeology - Possible
Uncertain Origins
Industrial - Burnt / Fired
Agricultural / Field Drains
Old Field Boundary
Geology / Natural
Magnetic Disturbance / Pipe
Ferrous



High Speed Two

Fig. 5f
Fox Covert
Previous investigations

Community Forum Area (CFA15/16):
Greatworth to Lower Boddington & Ladbroke & Southam
Internal

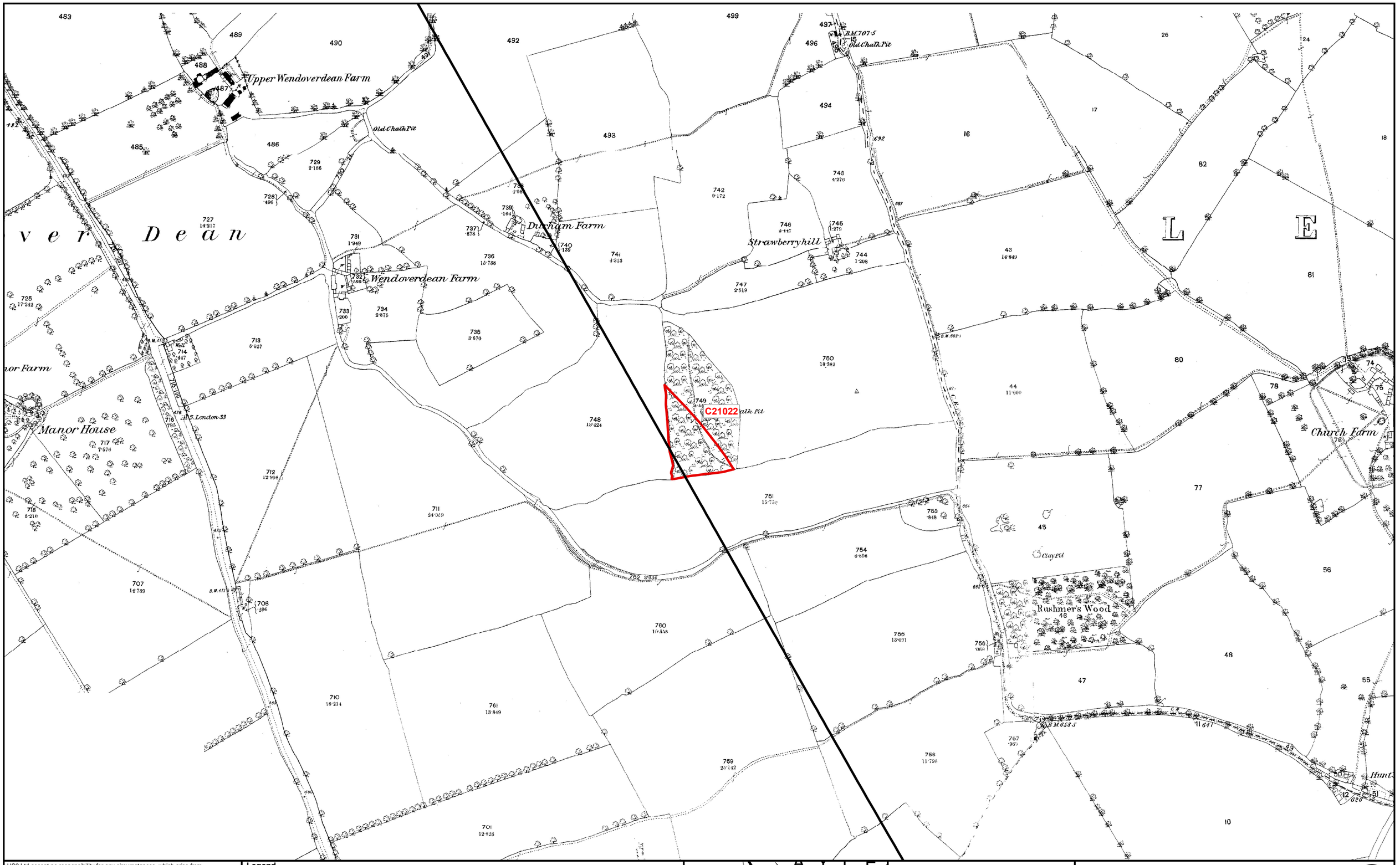
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 10/12/19



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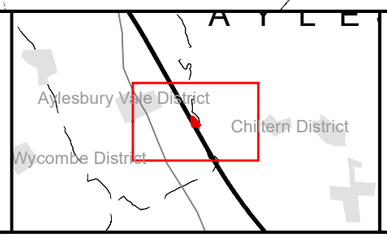
Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6a
Jones Hill Wood
Historic mapping Ordnance Survey 1878

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

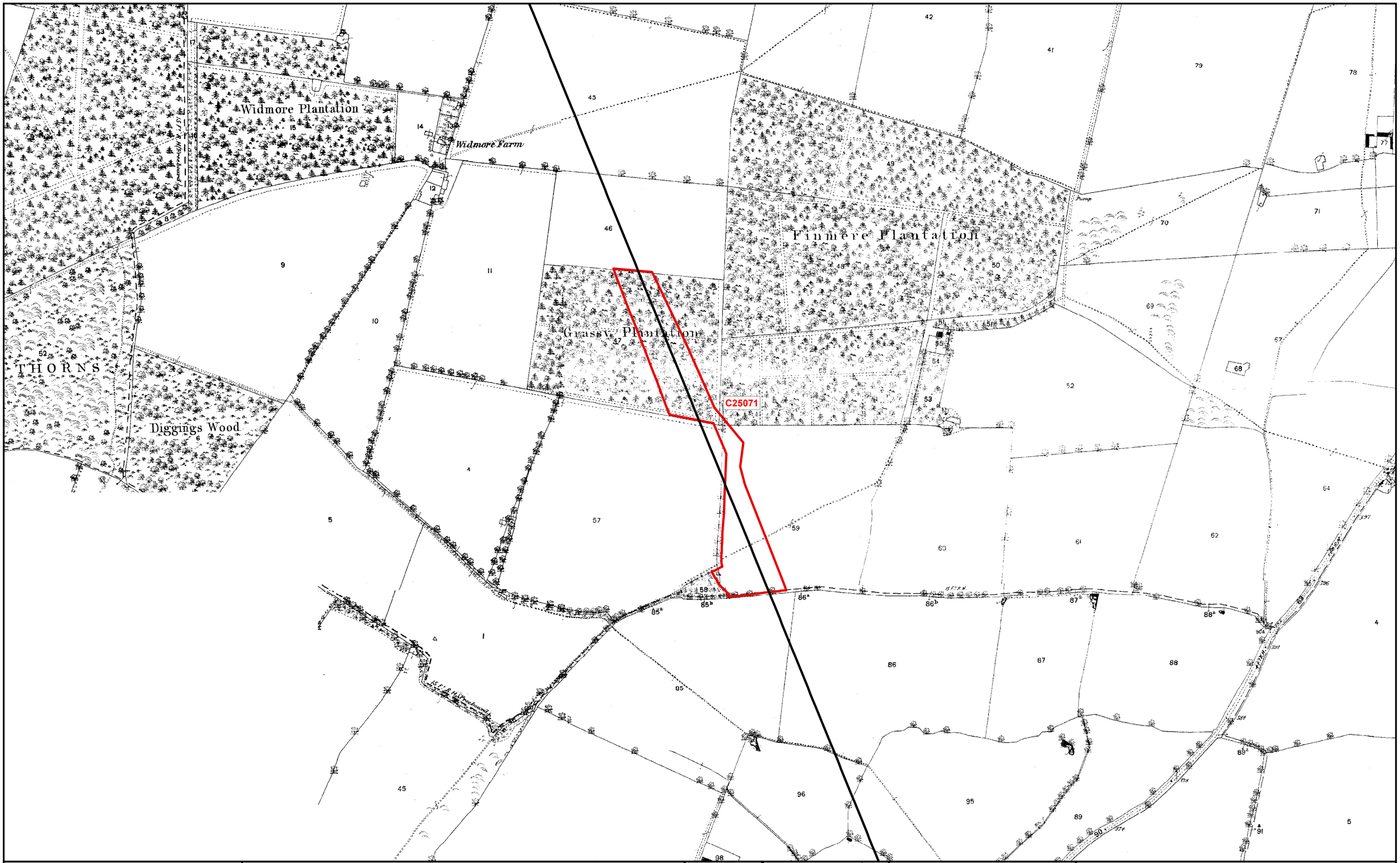
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

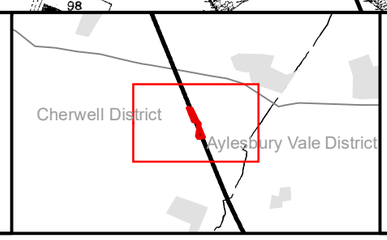
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/11/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6b
Windmore Farm
Historic mapping Ordnance Survey 1885

Community Forum Area (CFA14):
Newton Purcel to Brackley

Internal

HS2

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Scale at A3: 1:5,000

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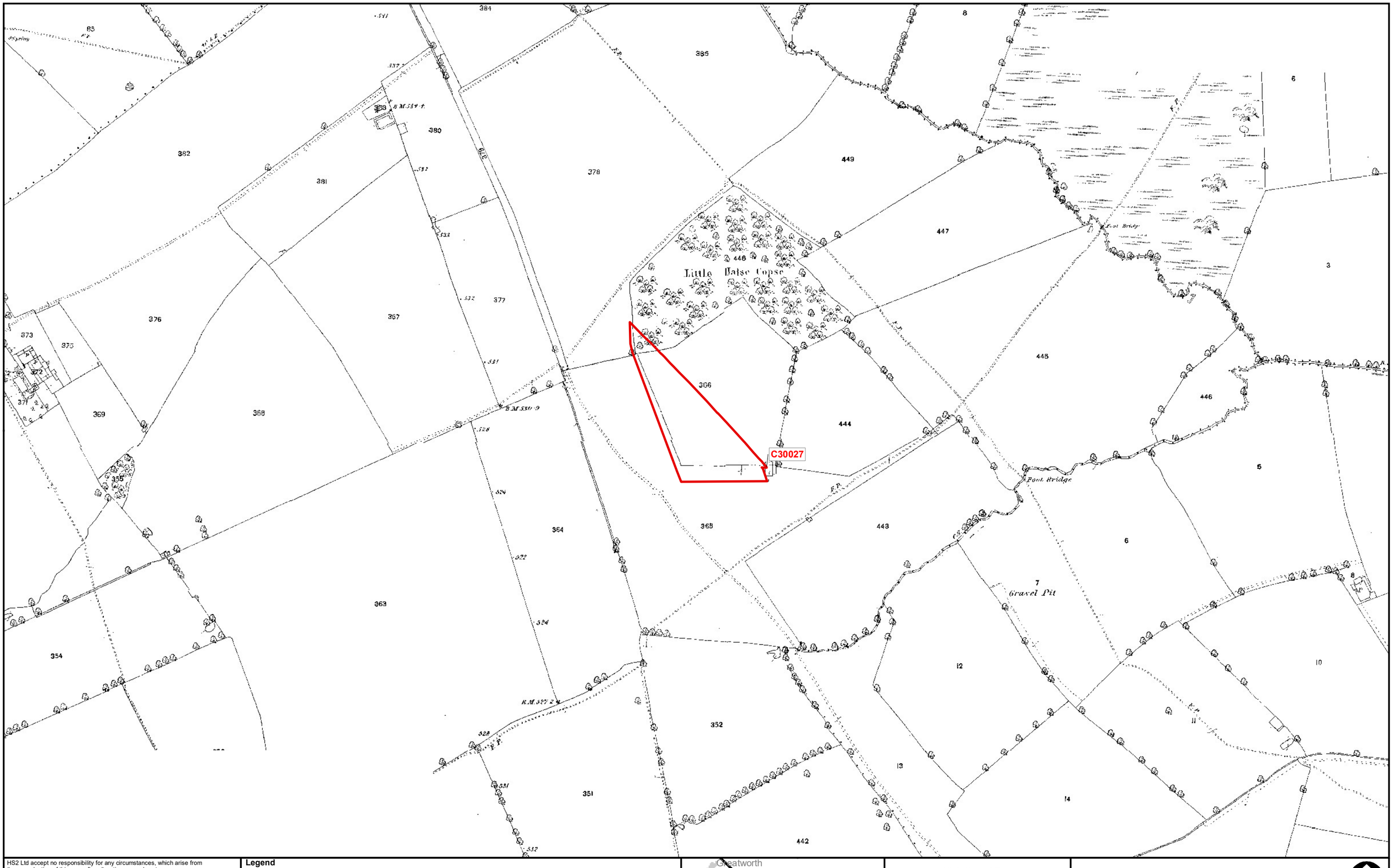
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 13/11/19



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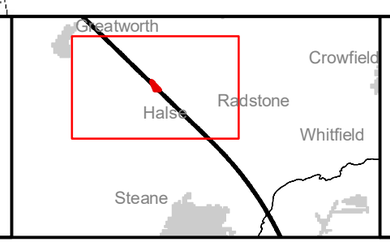
Legend

Site



High Speed Two

Fig 6c:
Halse Copse Farm
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

HS2

Scale at A3: 1:5,000

0 50 100 150 200
Meters

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Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

C30031

Hill Farm

Old Gravel Pit

Spring

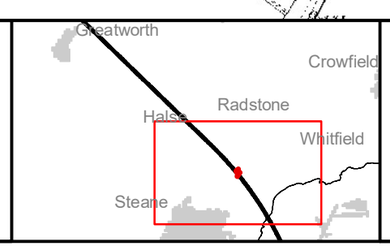
W H I T

B.M.418 Guide Post

M.S. BRACKLEY 7 TOWCESTER 9

Legend

Site



High Speed Two

Fig 6d:
Fox Covert Whitfield
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

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Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

C32030

Windmill Hill Spinney

Ladbroke Hill Farm

Windmill Hill

Lady Hill

L A D B R O K E

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Stratford-on-Avon District

High Speed Two

Fig. 6e
Windmill Hill Spinney
Historic mapping Ordnance Survey 1887

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

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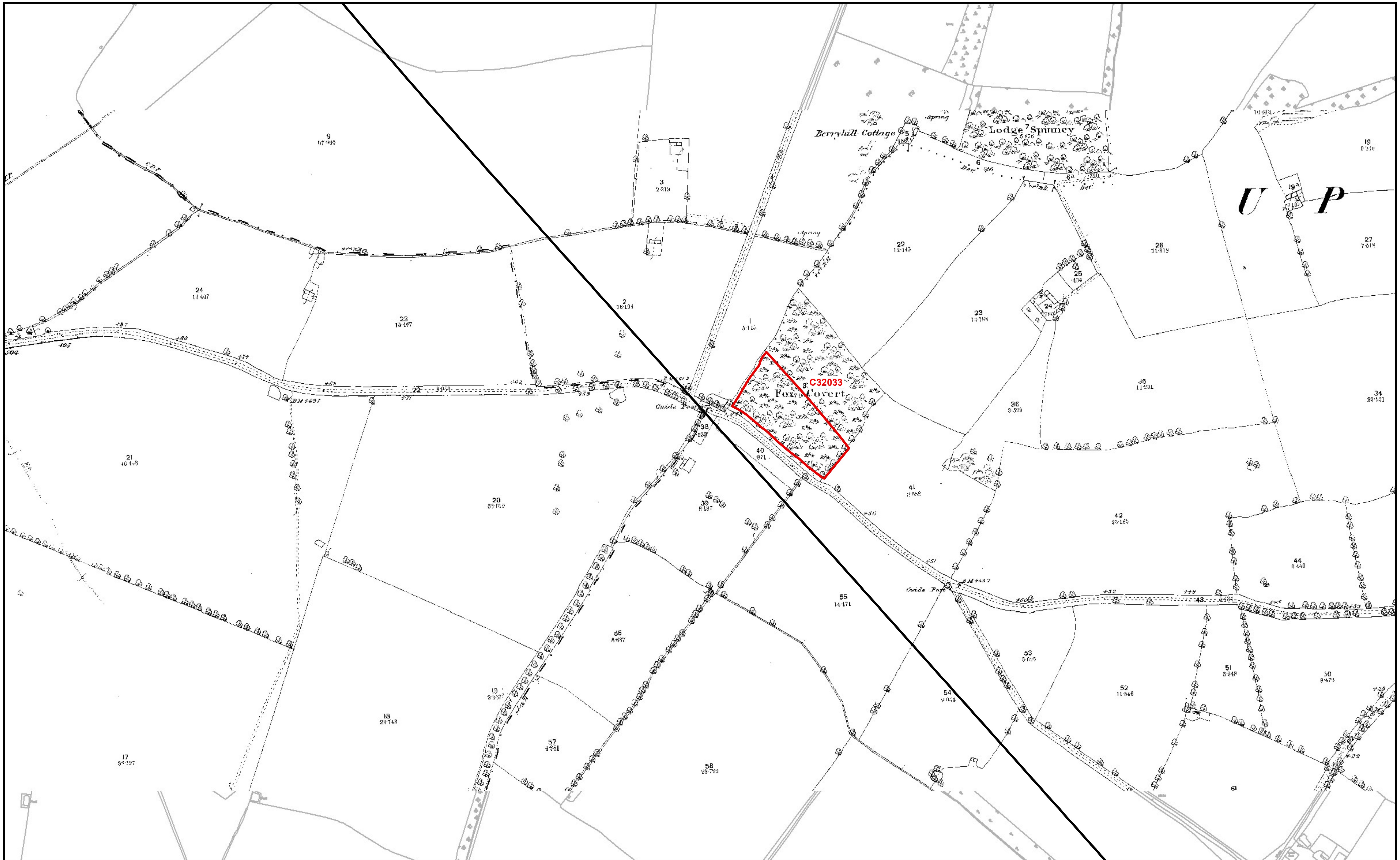
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

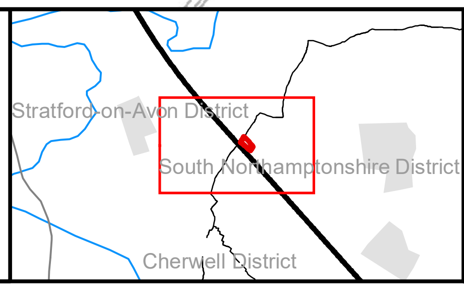
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 17/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6f
Fox Covert
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA15/16): Greatworth to Lower Boddington & Ladbroke & Southam
Internal

HS2

Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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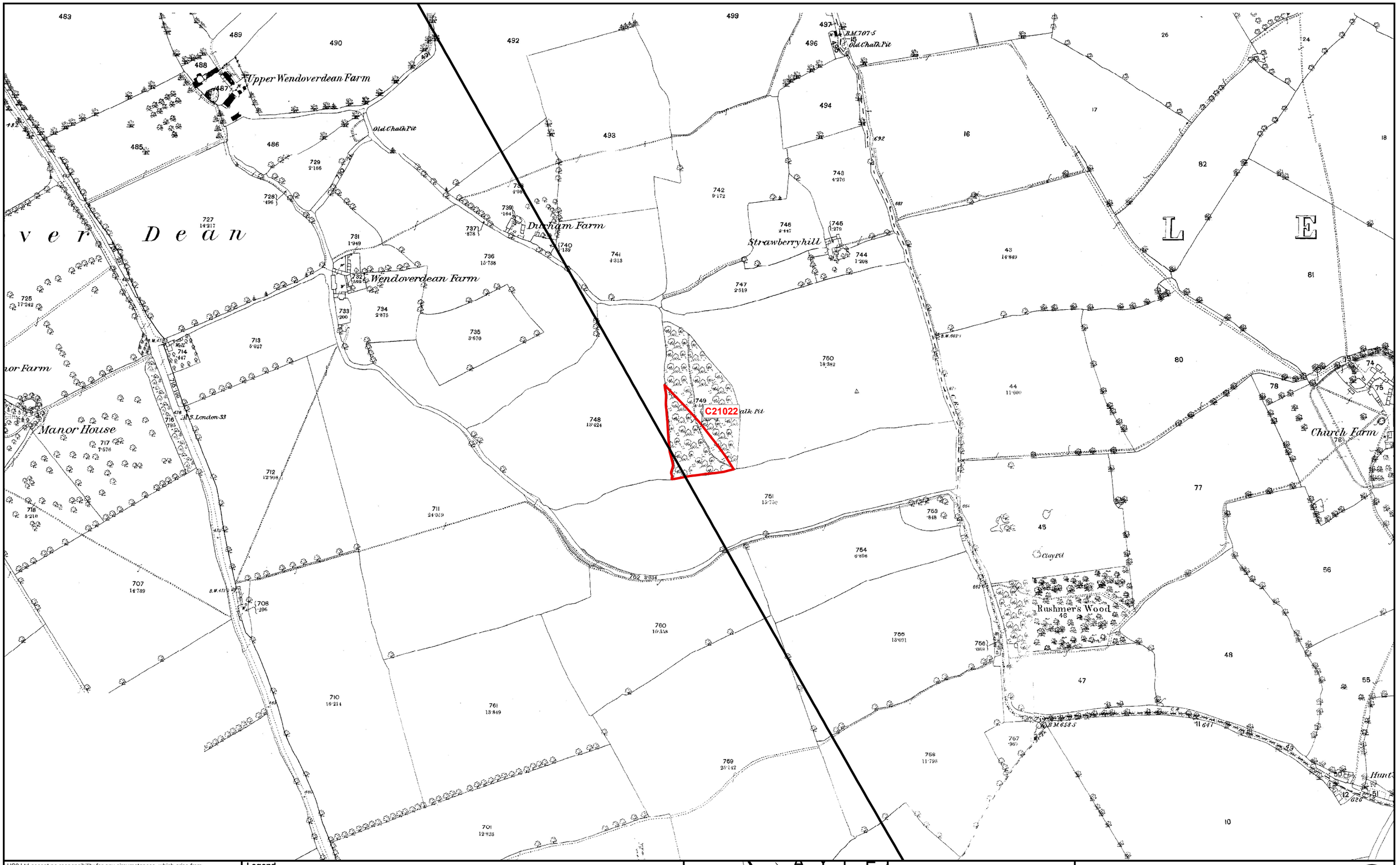
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 19/12/19



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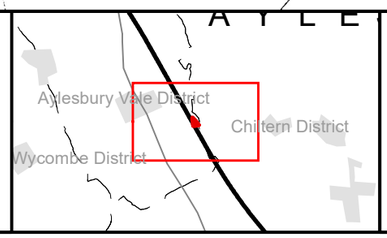
Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6a
Jones Hill Wood
Historic mapping Ordnance Survey 1878

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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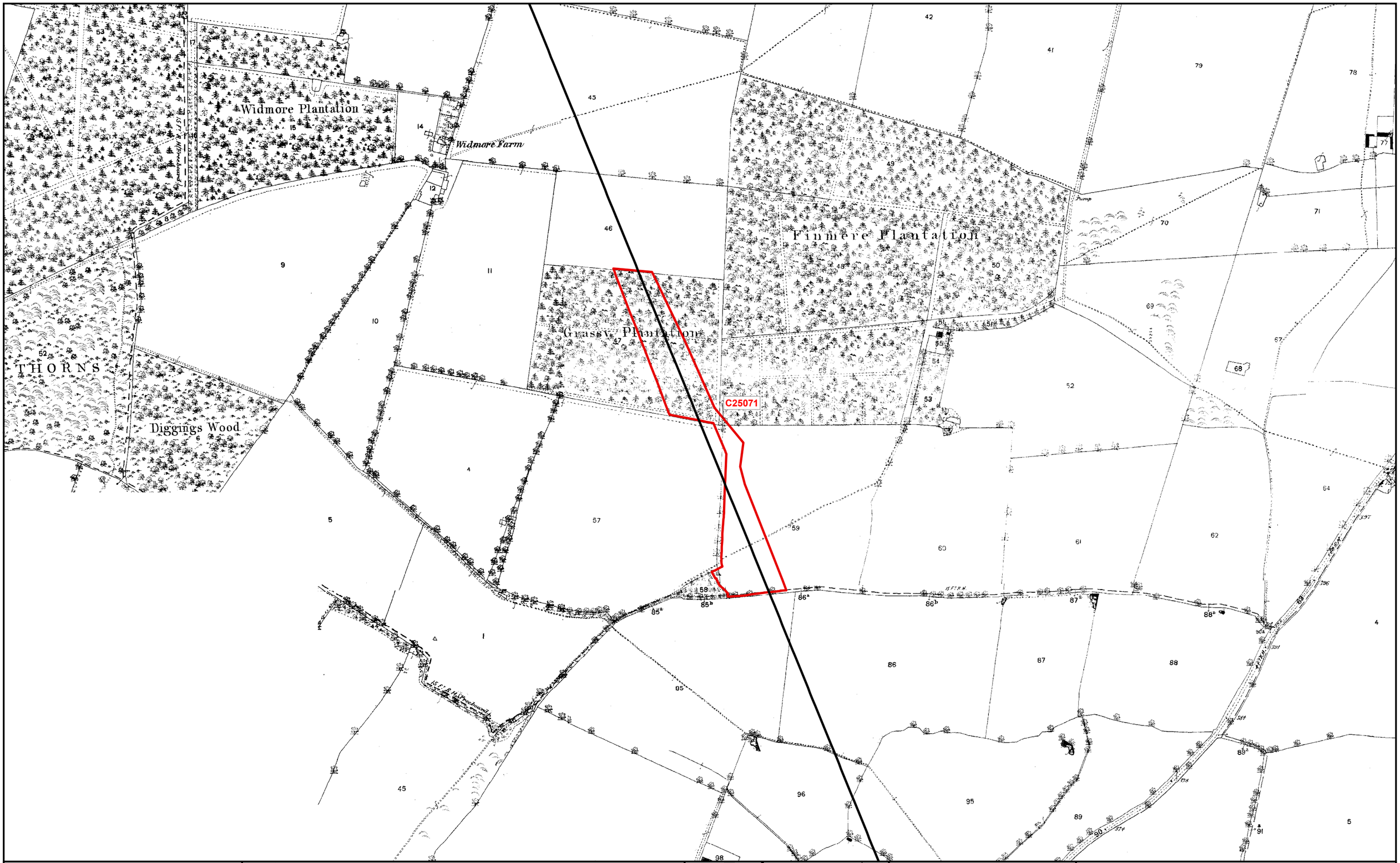
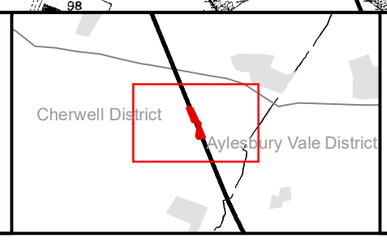
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/11/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6b
Windmore Farm
Historic mapping Ordnance Survey 1885

Community Forum Area (CFA14):
Newton Purcel to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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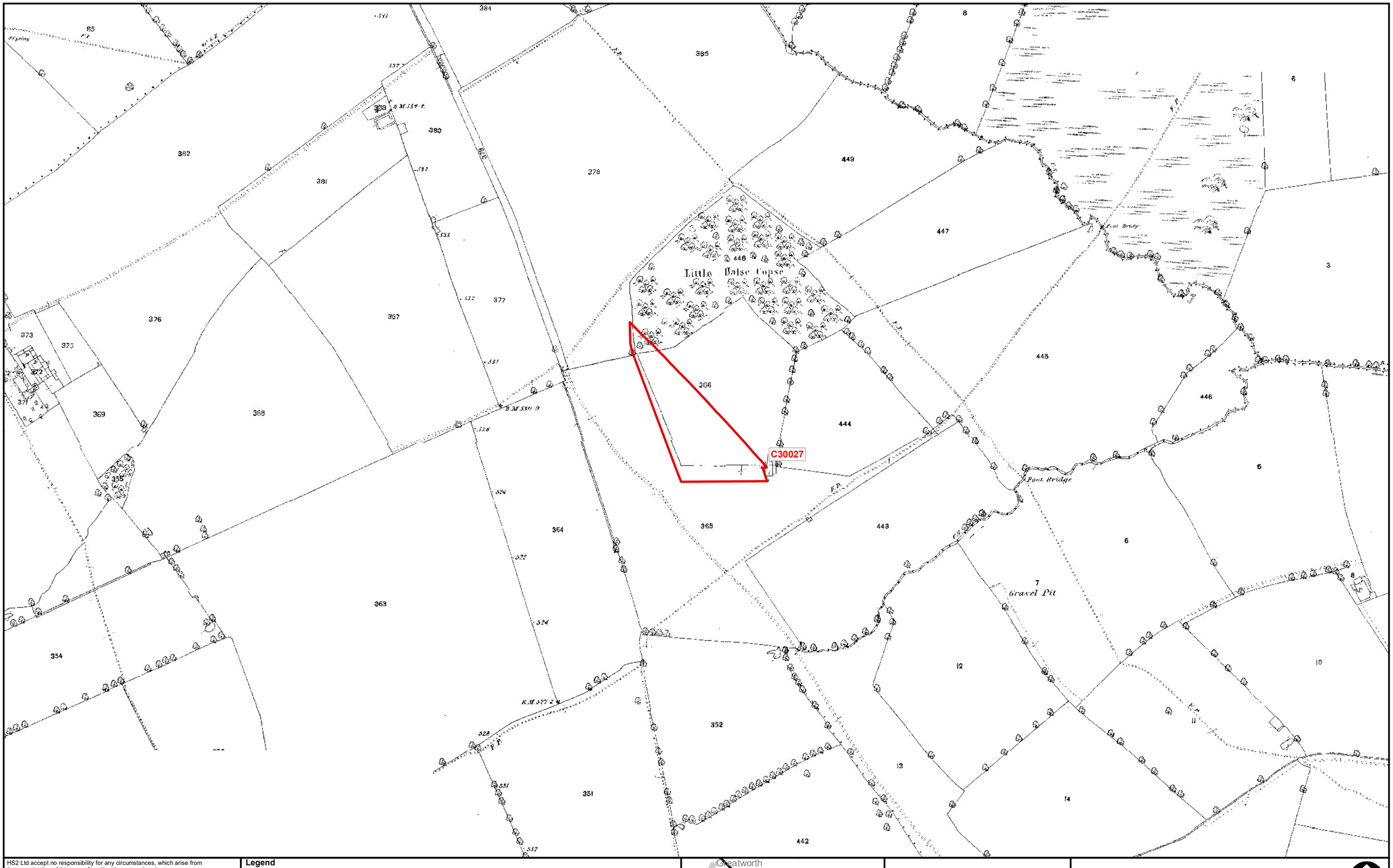
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 13/11/19



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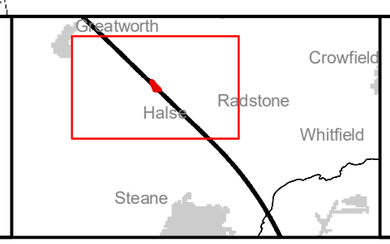
Legend

Site



High Speed Two

Fig 6c:
Halse Copse Farm
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

HS2

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

C30031

Hill Farm

Old Gravel Pit

Spring

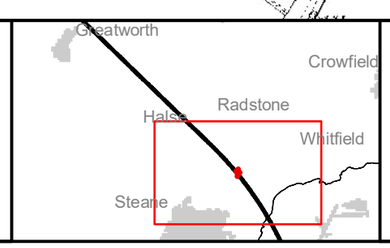
W H I T

B.M.418 Guide Post

M.S. BRACKLEY 7 TOWCESTER 9

Legend

Site



High Speed Two

Fig 6d:
Fox Covert Whitfield
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
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Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

C32030

Windmill Hill Spinney

Ladbroke Hill Farm

Windmill Hill

Lady Hill

L A D B R O K E

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Stratford-on-Avon District

High Speed Two

Fig. 6e
Windmill Hill Spinney
Historic mapping Ordnance Survey 1887

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

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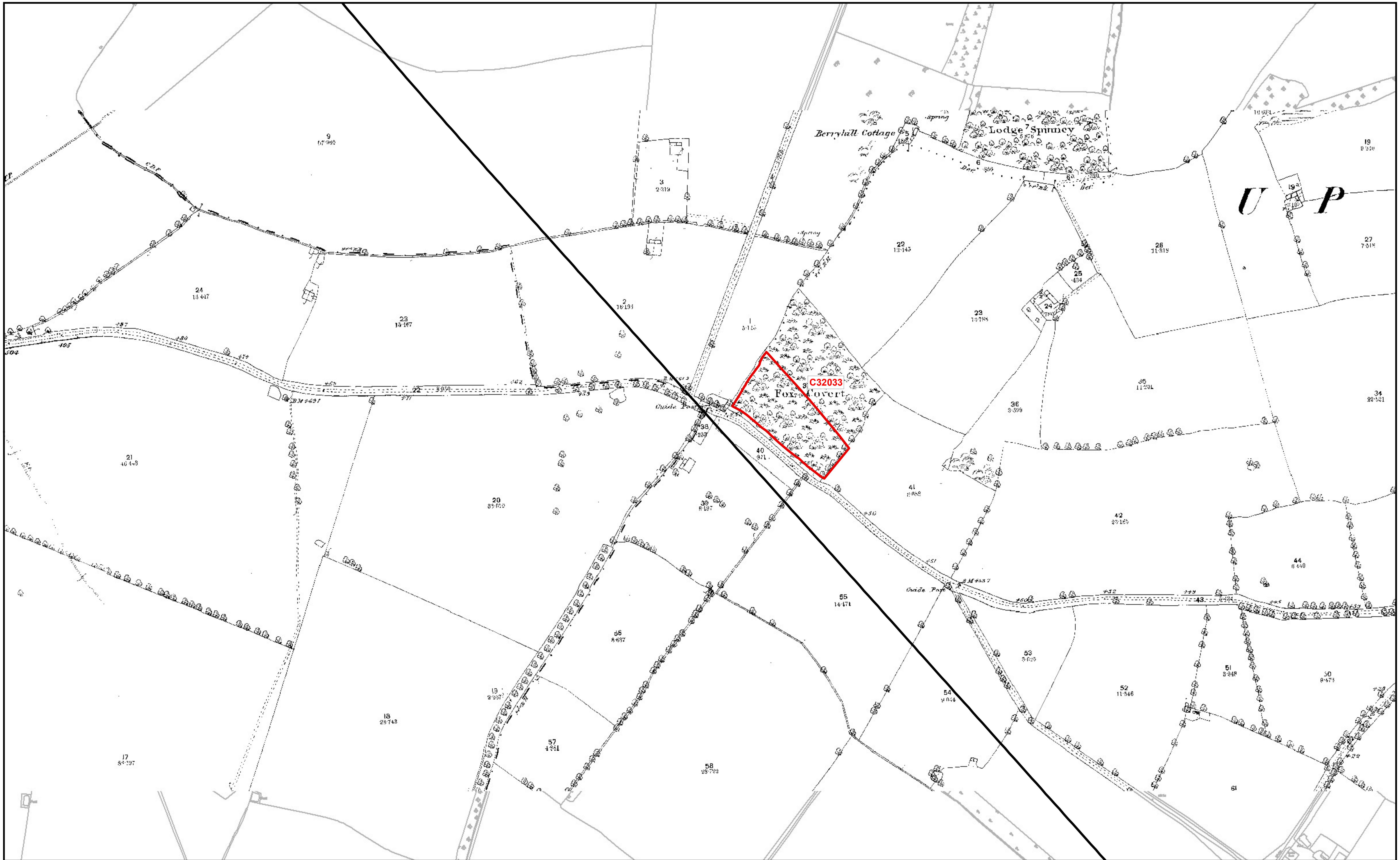
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

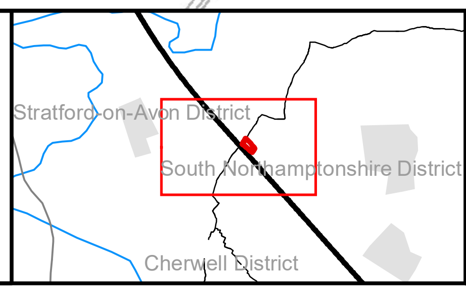
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 17/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.



High Speed Two

Fig. 6f
Fox Covert
Historic mapping Ordnance Survey 1884

Community Forum Area (CFA15/16):
Greatworth to Lower Boddington & Ladbroke & Southam

Internal

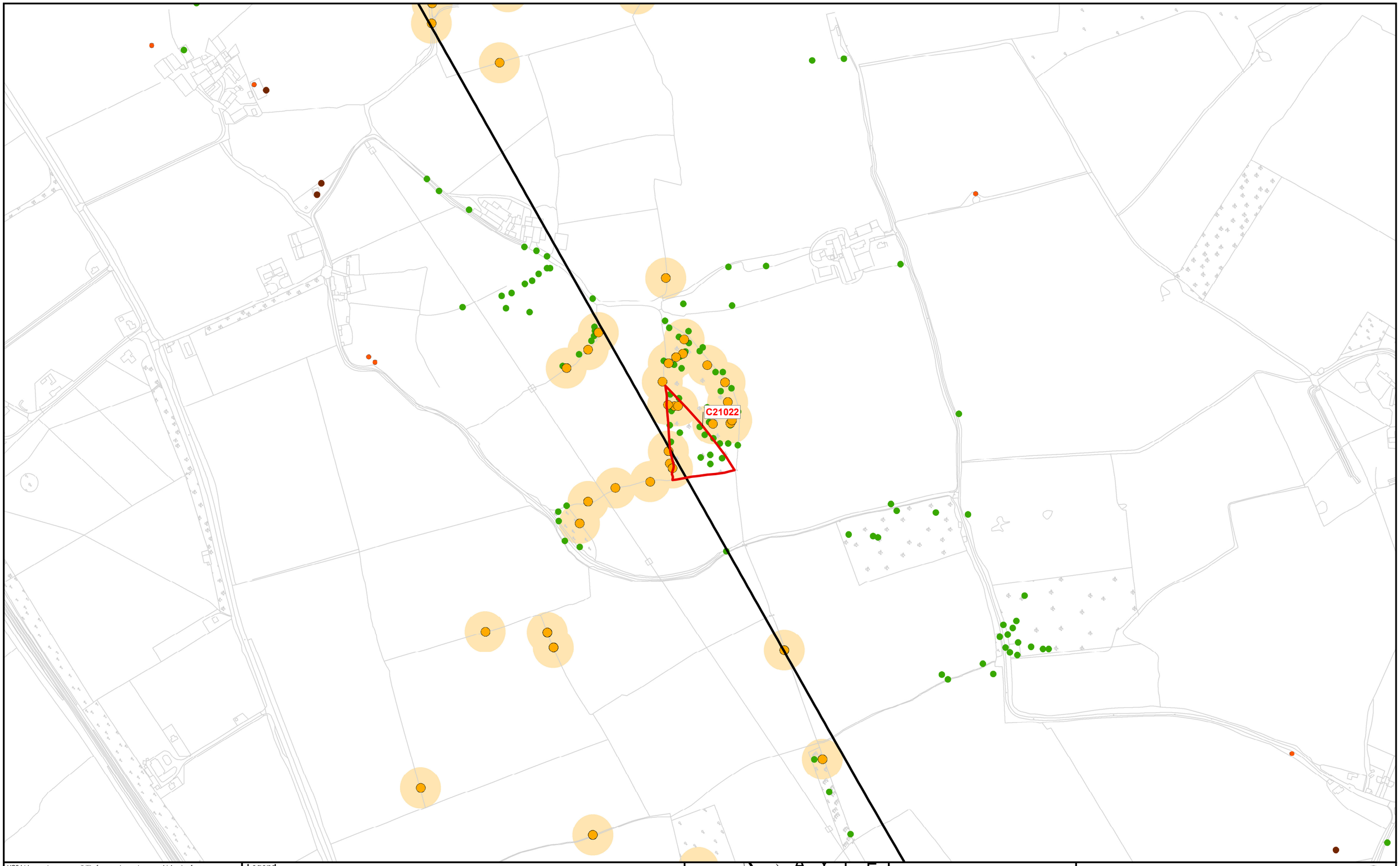
HS2

Registered in England. Registration number 06791686. Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 19/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Badger sett
- Badger sett 30m buffer
- Barn owls
- Bat roosts (buildings)
- Bat roosts (trees)

High Speed Two

Fig. 7a
Jones Hill Wood
Ecological constraints

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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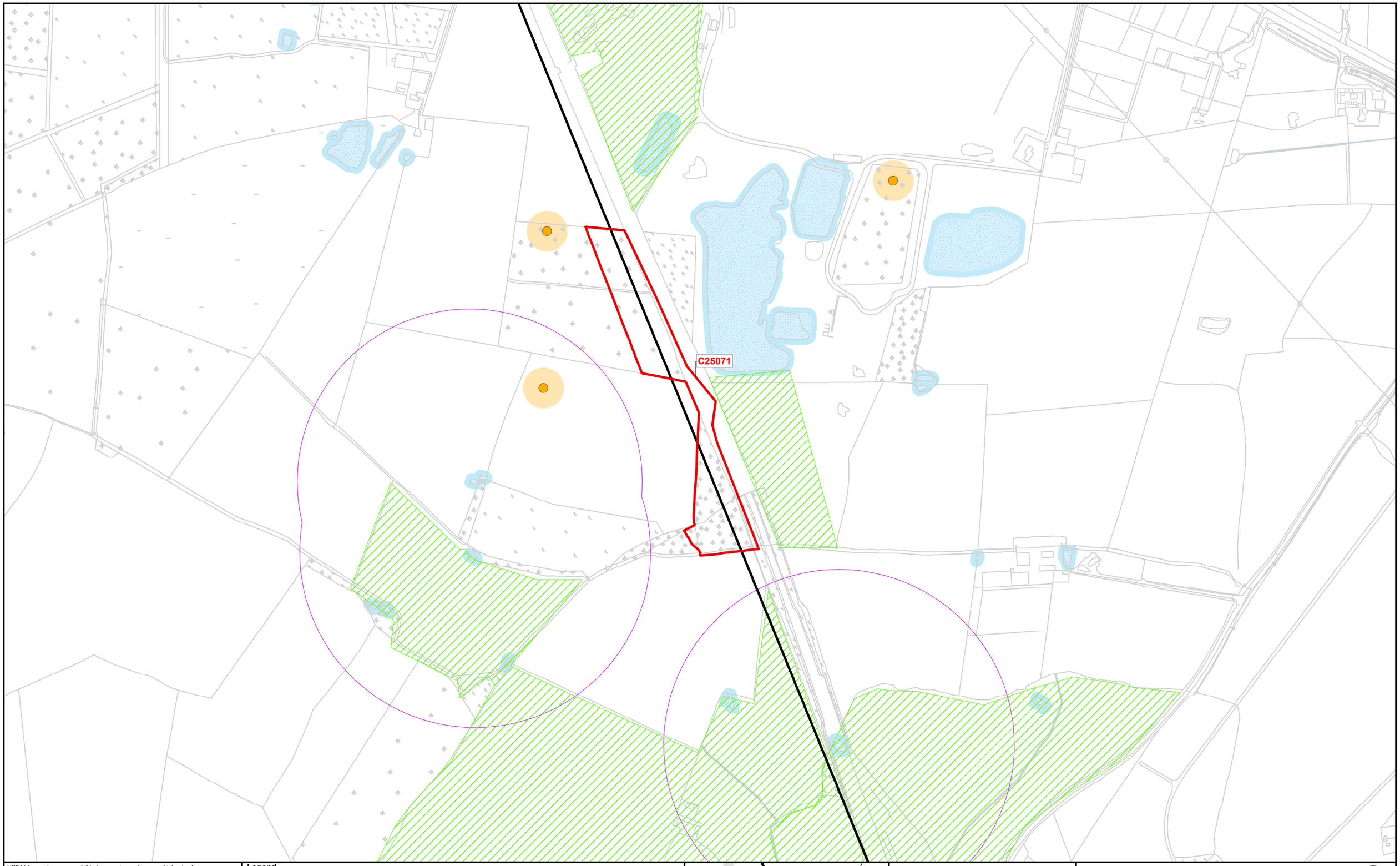
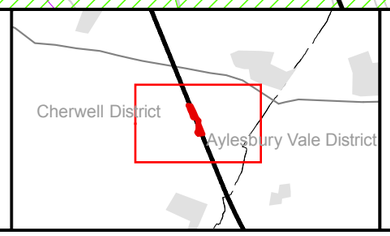
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 19/11/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Reptiles present
- Great Crested Newt population
- Waterbody
- Waterbody 8m buffer
- Badger sett
- Badger sett 30m buffer



High Speed Two

Fig. 7b
Widmore Farm
Ecological constraints

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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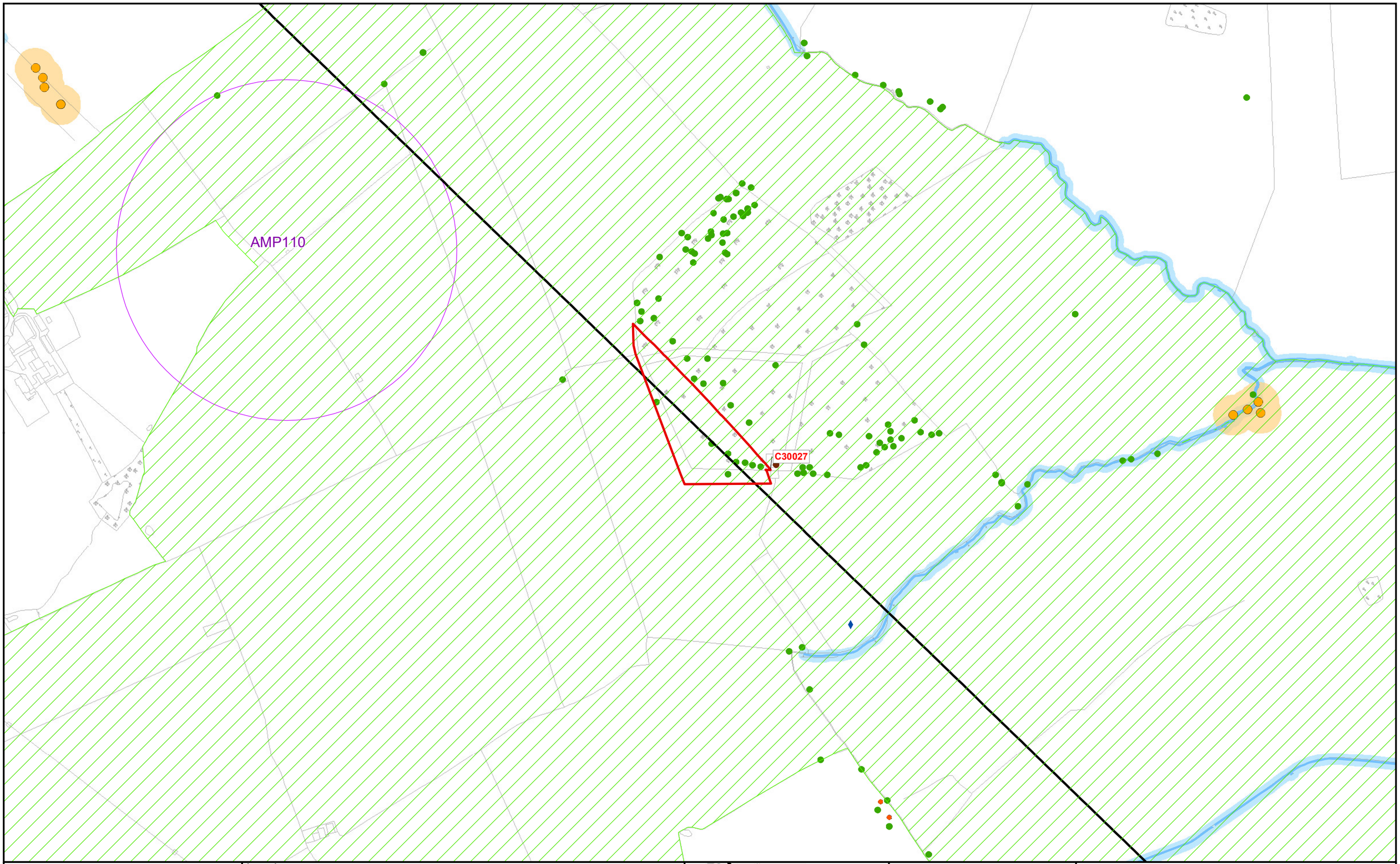
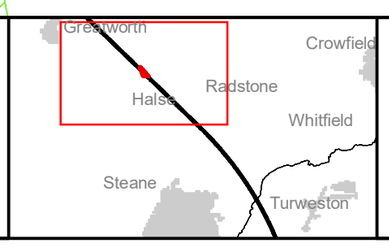
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 08/11/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- watercourse buffer (8m)
- Barn owls
- Potential otter holt location
- Bat roosts (buildings)
- Bat roosts (trees)
- Badger sett
- Badger sett buffer (30m)
- GCNs
- Reptiles present



High Speed Two

Fig 7c:
Halse Copse Farm
Ecological constraints

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

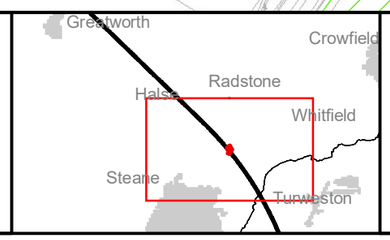
Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

C30031

AMP106

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- watercourse buffer (8m)
- Bat roosts (buildings)
- Bat roosts (trees)
- Badger sett
- Badger sett buffer (30m)
- GCNs
- Reptiles present



High Speed Two

Fig 7d:
Fox Covert Whitfield
Ecological constraints

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

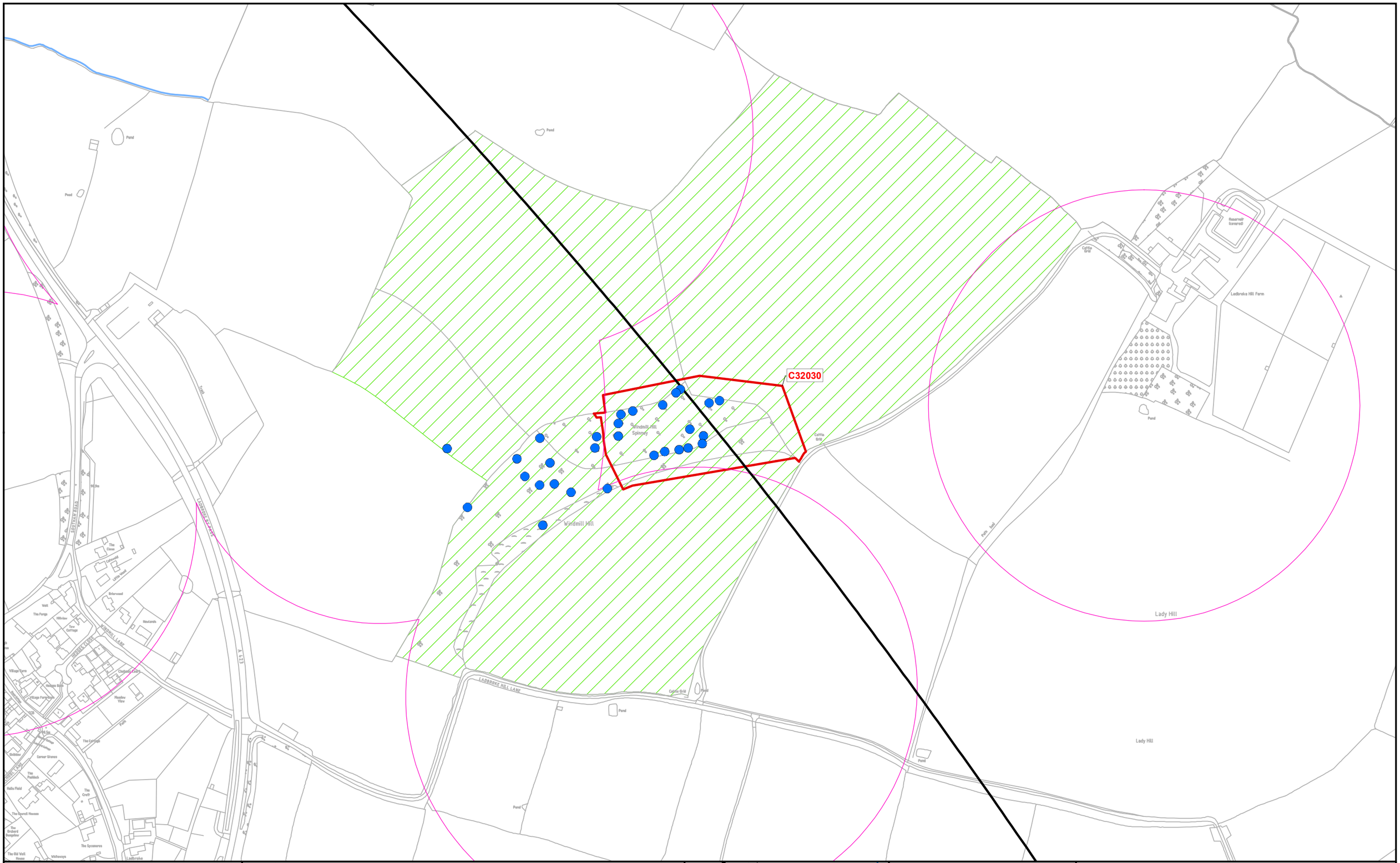
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Watercourse
- Confirmed bat roost (trees)
- Great Crested Newt population
- Watercourse
- Reptiles present

Stratford-on-Avon District

High Speed Two

Fig. 7e
Windmill Hill Spinney
Ecological Constraints

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:4,000

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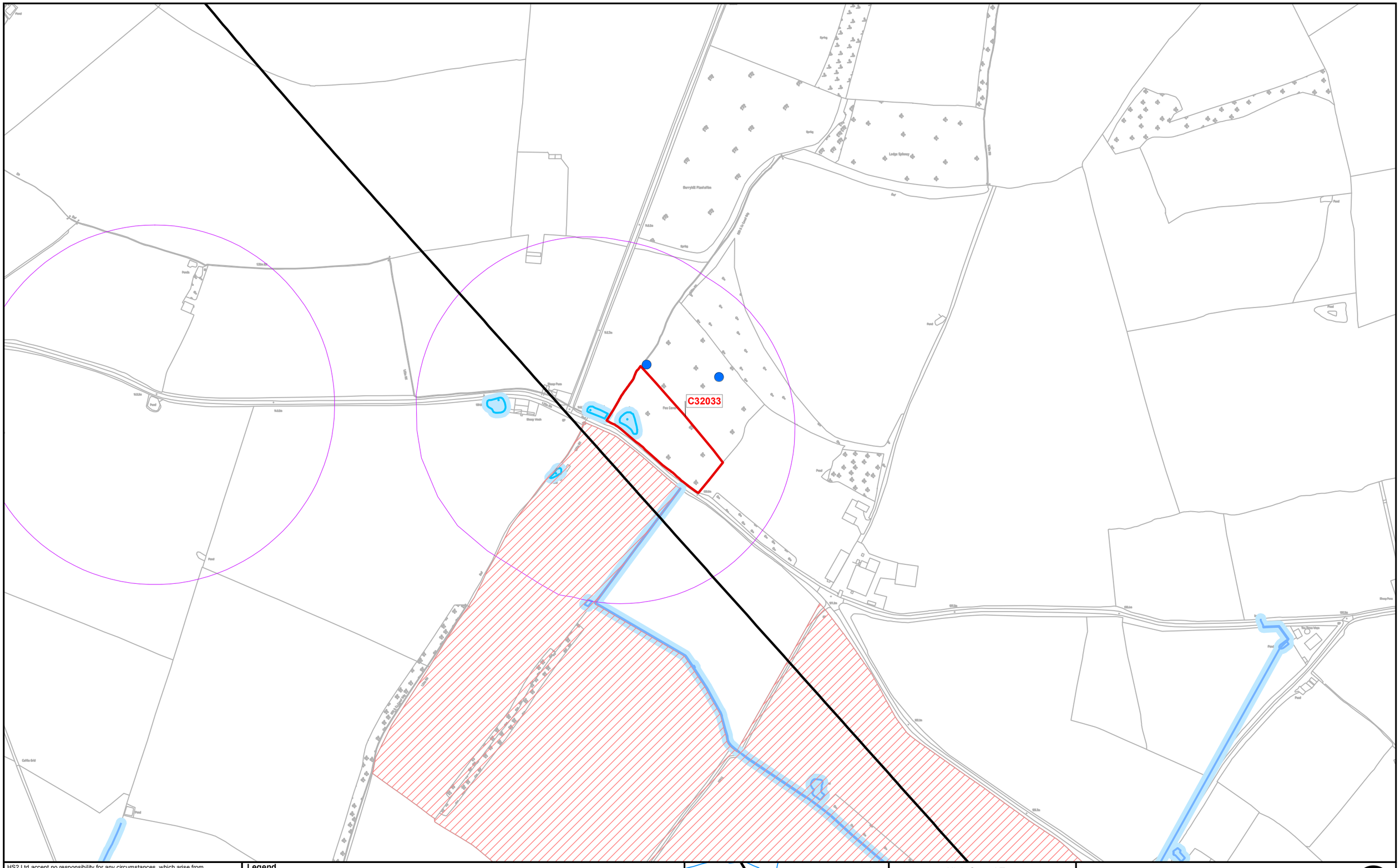
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 17/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Confirmed bat roost (trees)
- reptiles present
- Great Crested Newt population
- pond
- watercourse
- watercourse/waterbody 8m buffer

High Speed Two

Fig. 7f
Fox Covert
Ecological constraints

Community Forum Area (CFA15/16):
Greatworth to Lower Boddington & Ladbroke & Southam
Internal

HS2

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Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 13/05/20

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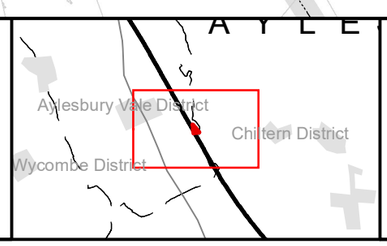
Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- OHP
- Telecom
- Water main
- OHP buffer 10m
- Telecom buffer 10m
- Water main buffer 5m



High Speed Two

Fig. 8a
Jones Hill Wood
Utilities constraints

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 10/12/19

TP6
TR18
TR19
TP7
TR16
TR17
TP8
TR15
TP9
TR13
TP10
C25071
TR12
TP11
TP12
TR11
TP13
TP14
TR10
TR9
TP15

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Phase 1

- Proposed Test Pit Location

Phase 2

- Proposed Trench Location
- OHP
- Telecom
- OHP buffer 10m
- Telecom buffer 10m

South Northamptonshire District
Cherwell District
Aylesbury Vale District

High Speed Two

Fig. 8b
Widmore Farm
Utilities constraints

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

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Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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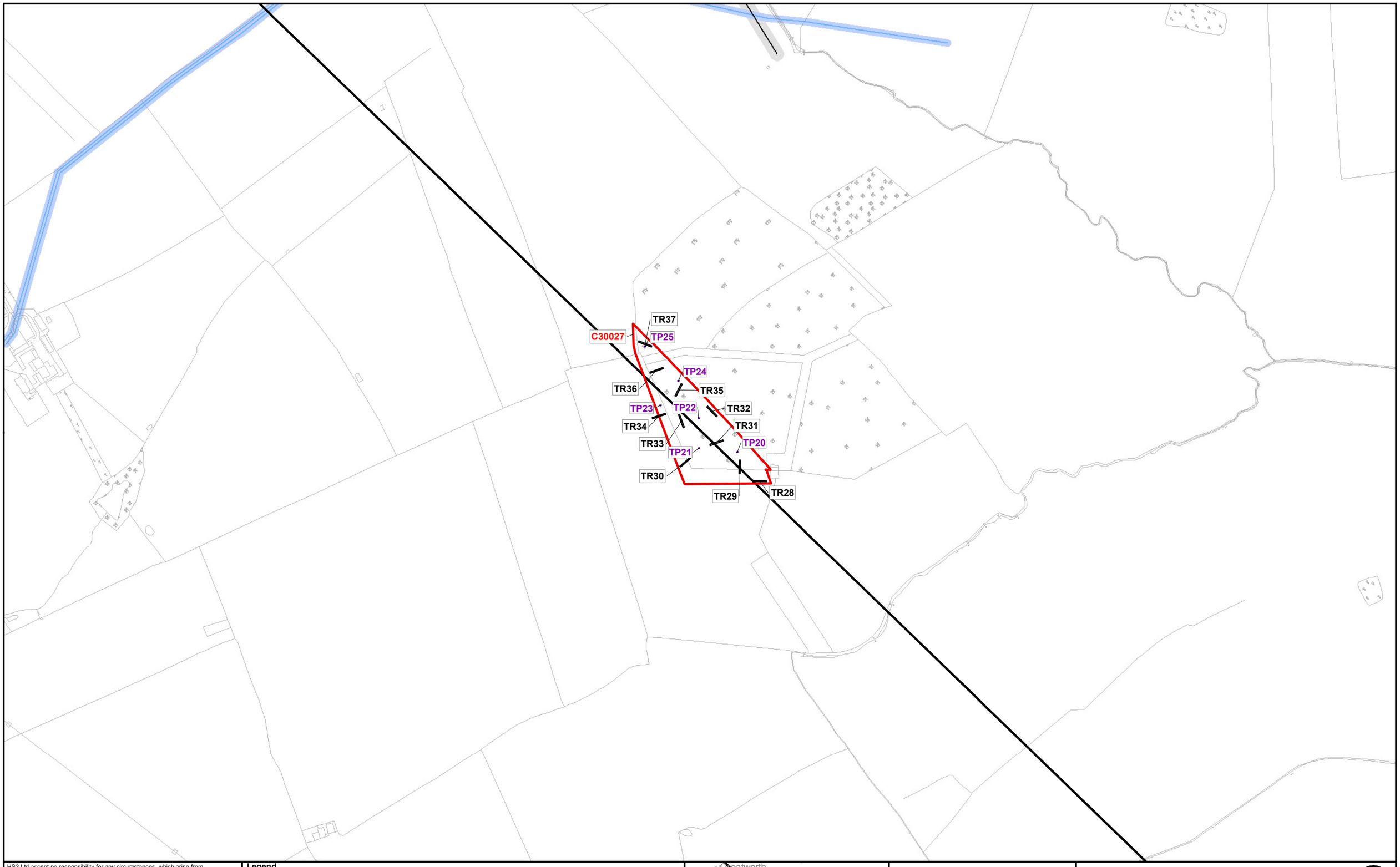
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 09/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- OHP
- Water main
- OHP (10m buffer)
- Water main (5m buffer)
- Proposed Test Pit Location
- Proposed Trench Location

High Speed Two

Fig 8c:
Halse Copse Farm
Utilities constraints

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

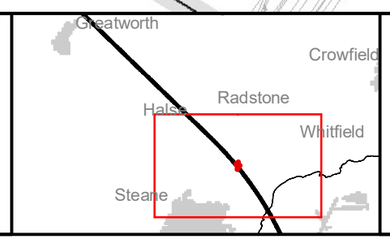
0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/12/19

TR27
C30031
TR26
TP16
TP17
TP18
TP19
TR23
TR24
TR22
TR21
TR20

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- OHP
- Telecoms
- Water main
- OHP (10m buffer)
- Telecoms (10m buffer)
- Water main (5m buffer)
- Proposed Test Pit Location
- Proposed Trench Location



High Speed Two

Fig 8d:
Fox Covert Whitfield
Utilities constraints

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

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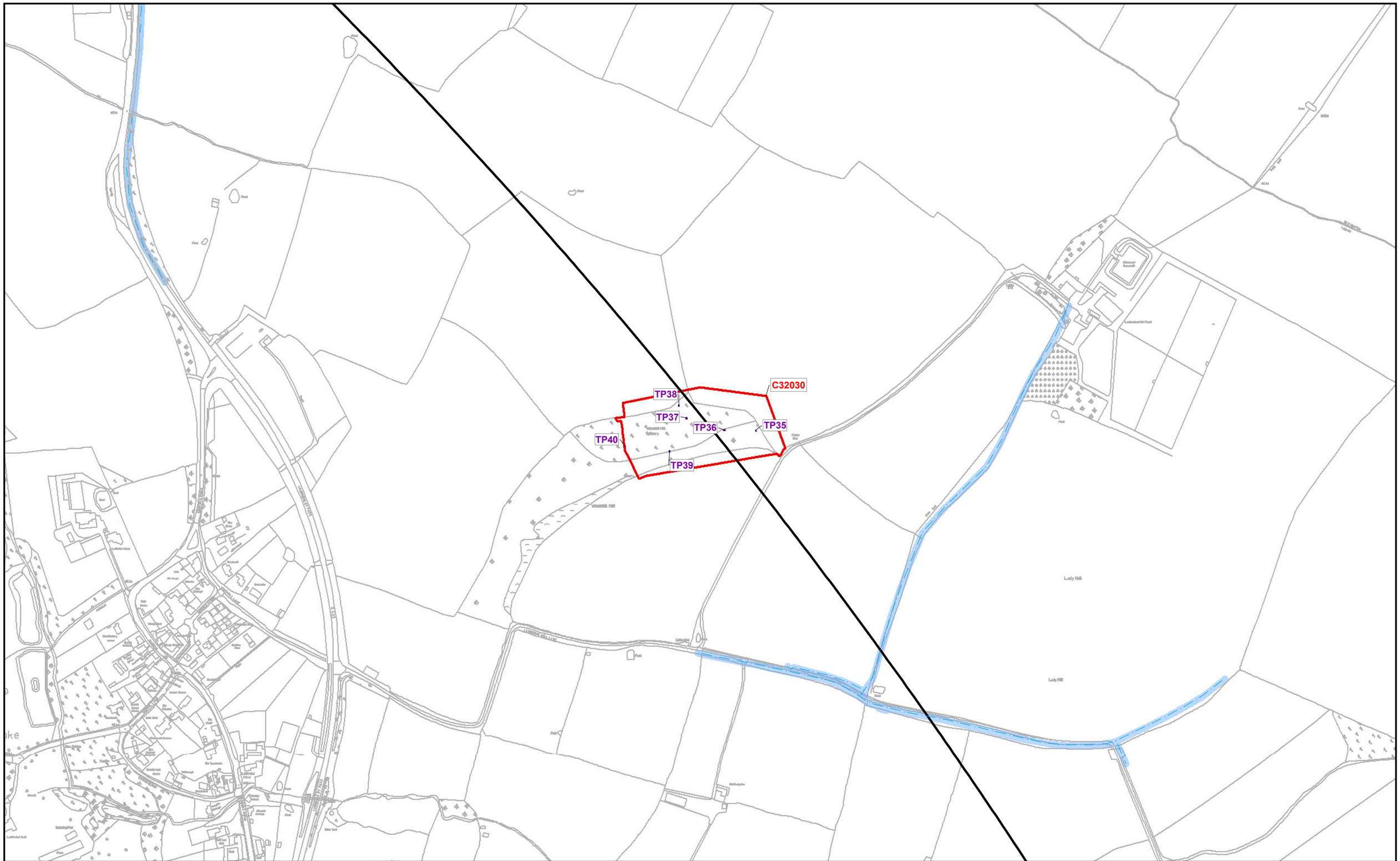
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

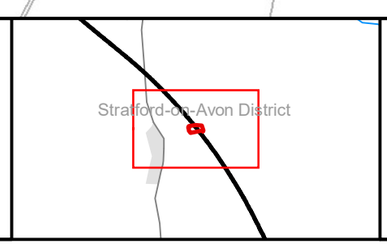


Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Water main
- 5m buffer

Phase 1

- Proposed Test Pit Location



High Speed Two

Fig. 8e
Windmill Hill Spinney
Utilities constraints

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:5,000

0 50 100 150 200
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/12/19

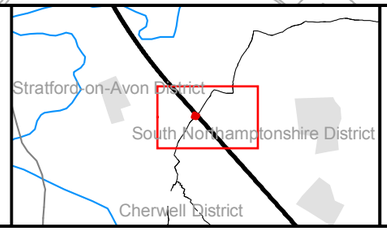
C32033
TP34
TR44
TP33
TR43
TR42
TP32
TP31
TR41
TR40
TR45
TP28
TP27
TP30
TR39
TR38
TP29
TP26

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Phase 2

- Proposed Trench Location
- MV_OH
- MV_OH 10m buffer
- Telecoms
- Telecoms 10m buffer



High Speed Two

Fig. 8f
Fox Covert
Utility Constraints

Community Forum Area (CFA15/16):
Greatworth to Lower Boddington &
Ladbroke & Southam
Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:4,000

0 40 80 120 160
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 13/05/20

Geophysics key (Magnitiude)

- Archaeology Possible (Strong)
- Archaeology Possible (Trend)
- Agricultural (Spread)
- Agricultural (Trend)
- Industrial/Modern (Spread)
- Natural (Strong)
- Natural (Weak)
- Natural (Spread)
- Natural (Trend)
- Undetermined (Strong)
- Undetermined (Trend)
- Ferrous (Dipolar)
- Ferrous (Spread)/Magnetic Dis
- Service

J09
J24
J24
TR8
TR7
TP5
C21022
TP4
TR5
TR6
TP3
TR4
TP2
TR3
TP1
TR2
TR1

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.

Phase 1

- Proposed Test Pit Location

Phase 2

- Proposed Trench Location
- Constraints
- Geophysical survey area

Geophysics Survey Results

- Ferrous
- Ferrous

Aerial Photography Interpretation

- Levelled R&F
- Large cut feature
- Levelled ridge and furrow outline

Aylesbury Vale District
Chiltern District
Wycombe District

High Speed Two

Fig. 9a
Jones Hill Wood
Scheme design

Community Forum Area (CFA10):
Dunsmore, Wendover & Halton

Internal

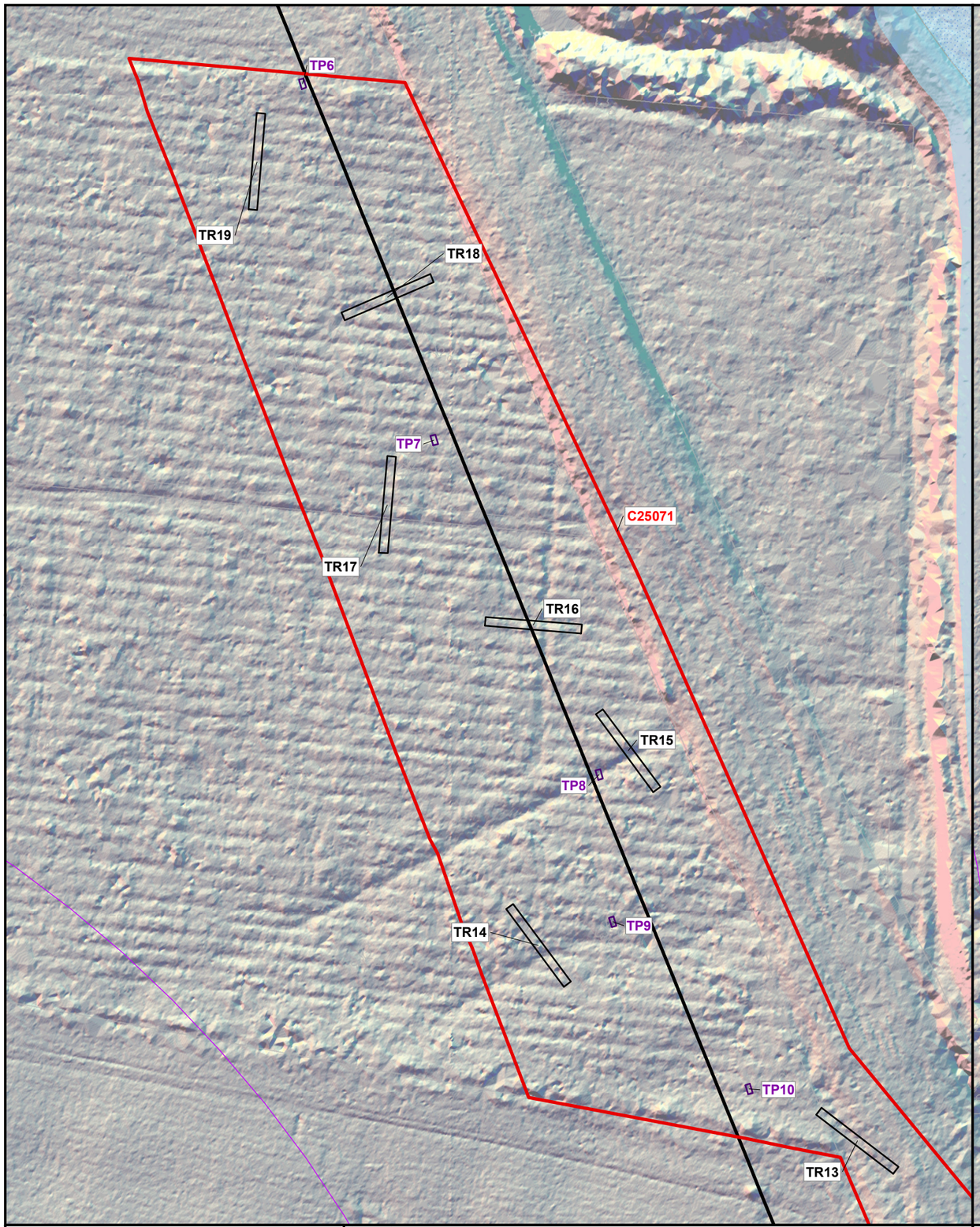
HS2

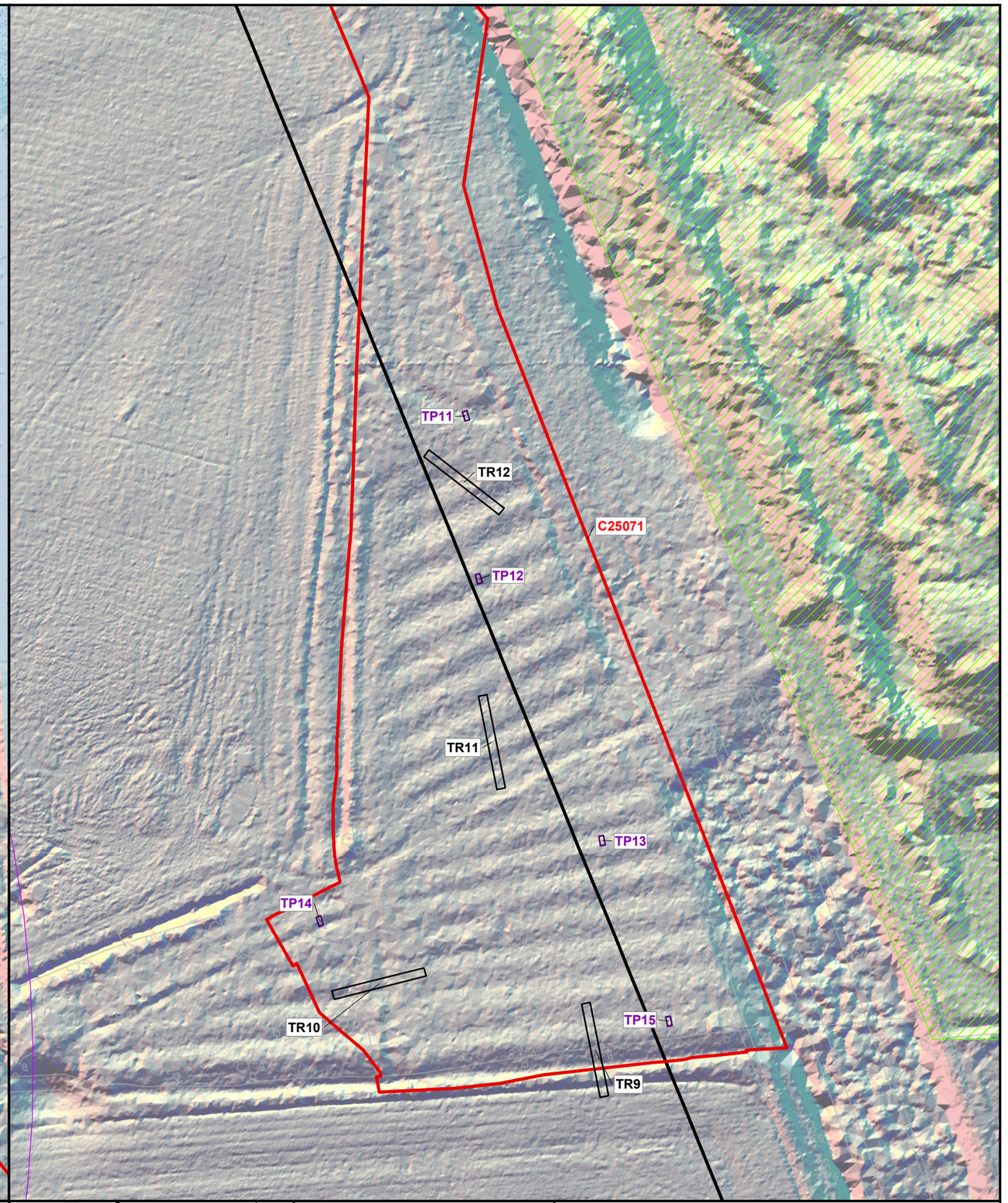
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:750

0 7.5 15 22.5 30
Meters

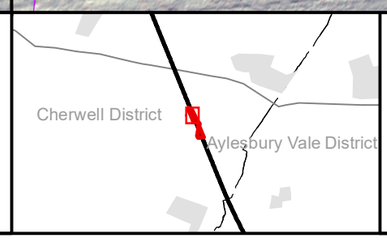
Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 11/12/19





Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Proposed Test Pit Location
- Proposed Trench Location
- Great Crested Newt population
- Waterbody
- Waterbody 8m buffer



High Speed Two

Fig. 9b
Widmore Farm
Scheme design

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

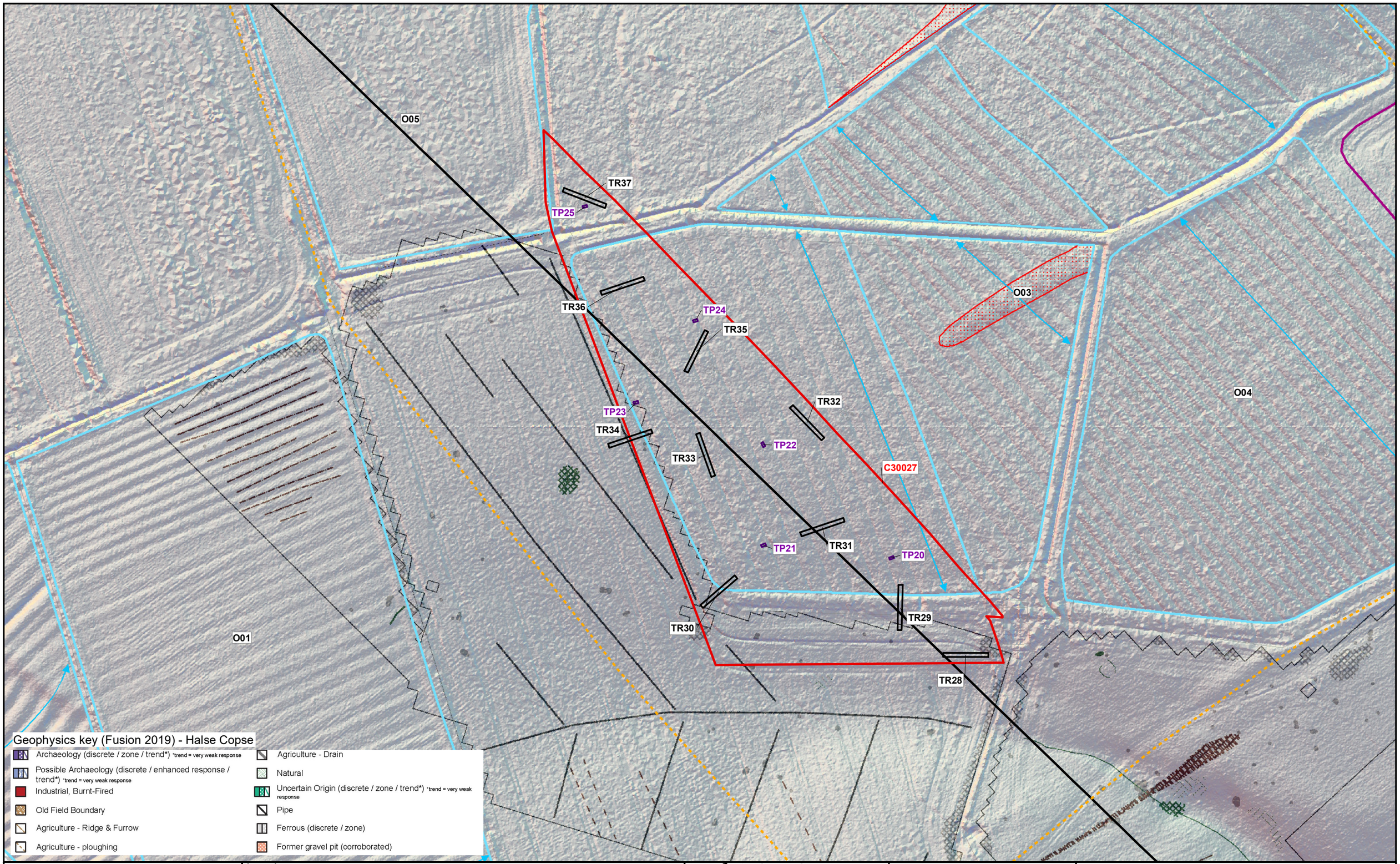
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,000

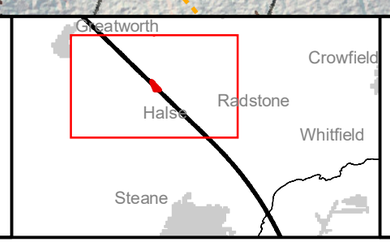
0 10 20 30 40
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 09/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Public Right of Way
- Constraints
- Proposed Test Pit Location
- Proposed Trench Location



High Speed Two

Fig 9c:
Halse Copse Farm
Scheme design

Community Forum Area (CFA15):
Greatworth to Lower Boddington

Internal

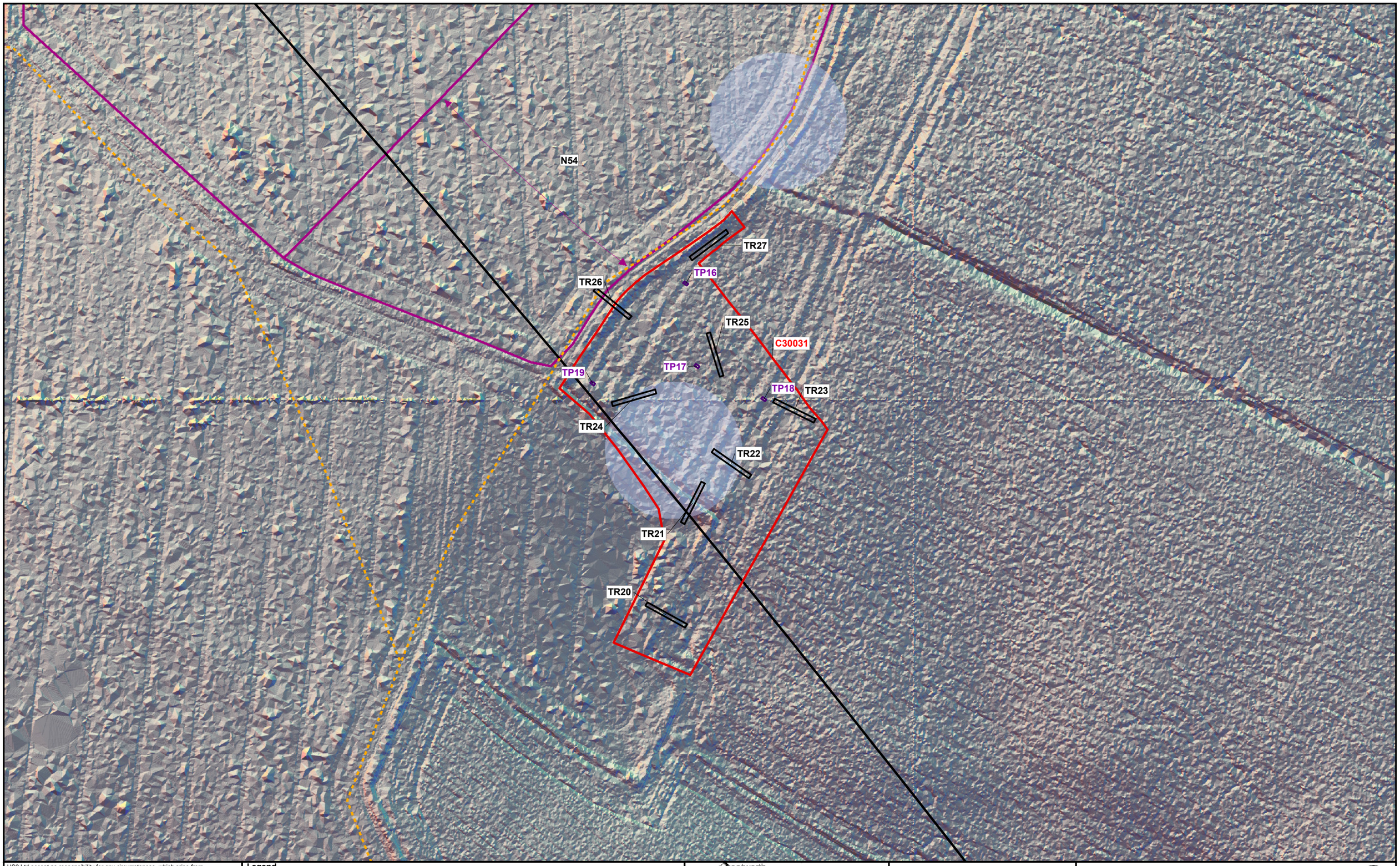
HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,500

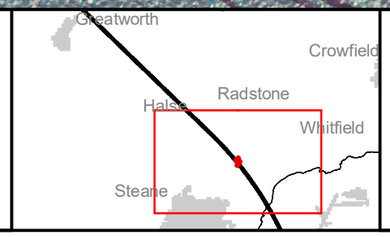
0 15 30 45 60
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Public Right of Way
- Constraints
- Proposed Test Pit Location
- Proposed Trench Location



High Speed Two

Fig 9d:
Fox Covert Whitfield
Scheme design

Community Forum Area (CFA14):
Newton Purcell to Brackley

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,500

0 15 30 45 60
Meters

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 16/12/19

Connect Archaeology

- Archaeology - Definitive
- Archaeology - Possible
- Uncertain Origins
- Industrial - Burnt / Fired
- Agricultural / Field Drains
- Old Field Boundary
- Geology / Natural
- Magnetic Disturbance / Pipe
- Ferrous

Wessex Archaeology

- Archaeology
- Archaeology (very weak response)
- Possible Archaeology
- Possible Archaeology (very weak response)
- Industrial, Burnt-Fired, Increased Magnetic Response
- Agriculture - Ridge & Furrow
- Agriculture - Ploughing
- Agriculture - Drain
- Natural
- Uncertain Origin
- Pipe, Modern Service
- Ferrous

TigerGeo

- >50nT/m
- >20nT/m
- >10nT/m
- >5nT/m
- <-5nT/m
- <-10nT/m
- <-20nT/m
- <-50nT/m
- Cultivation ridge and furrow
- Known former boundaries
- Land Drains line
- Linear Fills line
- Linear Fills

Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Remote sensing interpretation
- Remote sensing interpretation

Previous excavations

- Evaluation trench

Phase 1

- Proposed Test Pit Location

Stratford-on-Avon District

High Speed Two

FIG. 9e
Windmill Hill Spinney
Scheme Design

Community Forum Area (CFA16):
Ladbroke & Southam

Internal

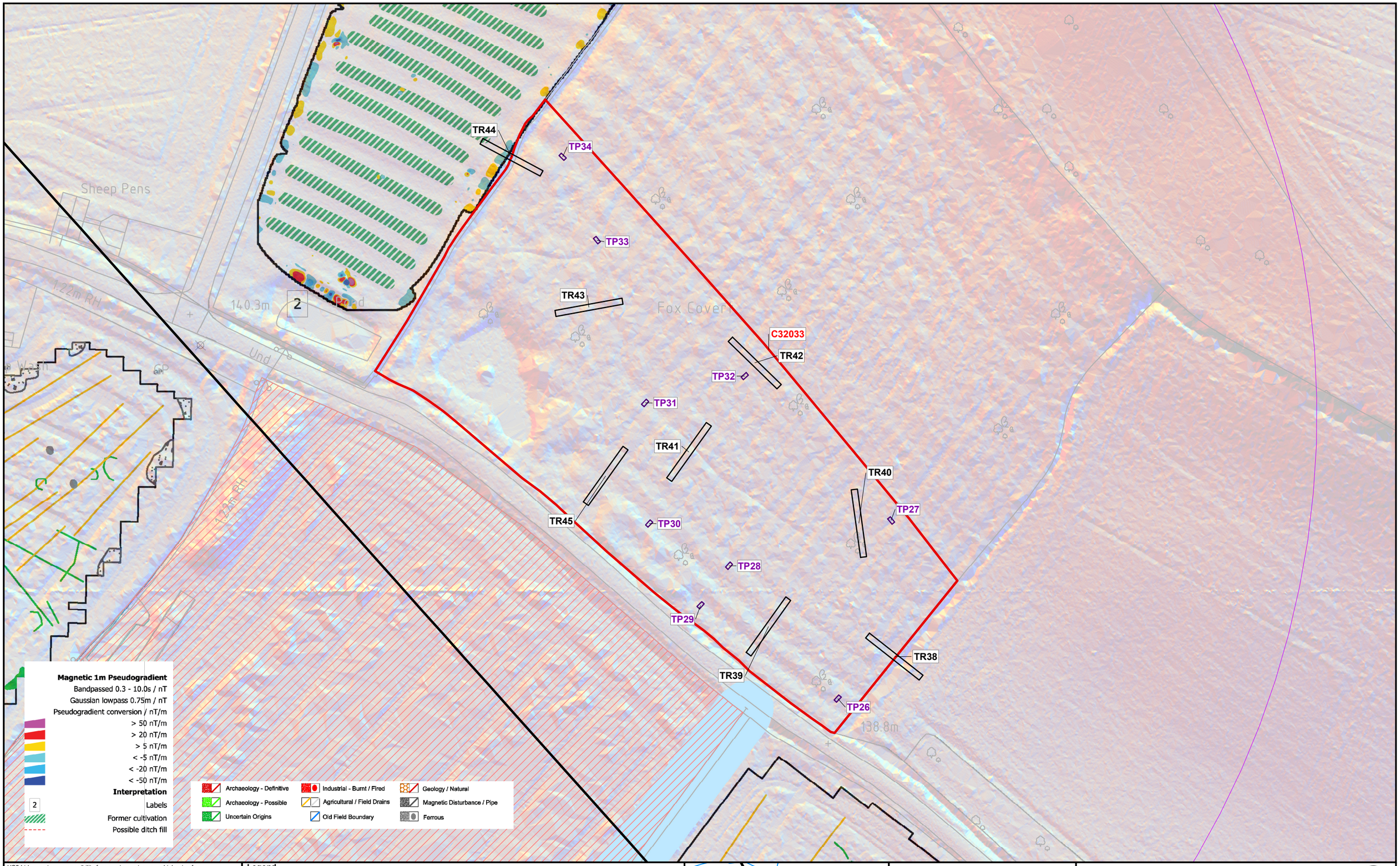
HS2

Scale at A3: 1:1,500

0 15 30 45 60 Meters

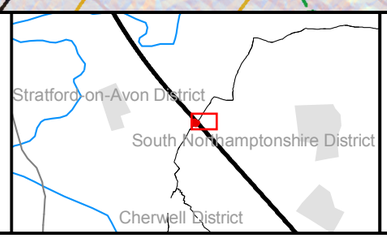
Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Doc Number: 1EW03-FUS-GI-MAP-C000-000035 **Date:** 18/12/19



Legend

- Route
- Site
- CXXX Fusion Site GIS ID No.
- Great Crested Newt population
- reptiles present
- watercourse 8m buffer



High Speed Two

Fig. 9f
Fox Covert
Design scheme

Community Forum Area (CFA15/16): Greatworth to Lower Boddington & Ladbroke & Southam

Internal

HS2

Registered in England. Registration number 06791686.
Registered office: 2 Snowhill, Queensway, Birmingham B4 6GA.

Scale at A3: 1:1,000

0 10 20 30 40
Meters

Doc Number: 1EW03-FUS-EV-MAP-C000-000008 **Date:** 18/12/19