1EW02 Enabling Works – Area South

Project Plan for Trial Trenching of 18 inch pipe – spur, 450NB Pipeline Diversion (007) Fulmer to Haste Hill

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CSjv Review and Acceptance Decal

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2 Introduction

2.1.1 This Project Plan details proposed methodologies, techniques and deliverables for archaeological trial trenching at the Fulmer to Haste Hill 450NB HP Pipeline Diversion (007). The trial trenching addresses an area of land located either side of the HS2 rail track near Harefield (Figure 1). The pipeline diversion extends for approximately 1km and runs between two diversion tie-ins; east-west in a broken line (Figure 1). The Site does not fall under a Construction Land Requirement (CLR) in the DDBA for Colne Valley East (1D037-EDP-EV-REP-S000-000004) and does not have a CR0 number. The available area for evaluation is c.3.8ha; c. 1.9ha for the eastern section and c. 1.9ha for the western section of the run.

2.1.2 The trial trenching is required to identify the location, extent, survival and significance of any heritage assets within the Site and it will contribute to the following specific objectives:

- KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age.
- KC11: Does the high density of prehistoric settlement evidence in the Colne Valley reflect a genuine focus of activity or does it reflect a bias in the archaeological record?
- KC14: Enhance existing understanding of the Late Upper Palaeolithic- Early Mesolithic transition through investigation of Sites in the Colne Valley and other locations 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?
- KC17: What evidence is there for regionality in the mortuary rites of the Late Bronze Age and Iron Age, and how does that alter over time?
- KC19: The Romano-British period saw the beginning of a more established infrastructure network. Can we investigate the development of these routes, trackways and roads and the influence they had on landscape change?
- KC24: To what extent are the patterns of settlement, landholding and enclosure in West London and the Colne Valley in the Iron Age and Romano-British period determined by those established in the Bronze Age?
- KC34: Undertake research and investigation into medieval manorial complexes. What was their origin, development and impact on the landscape?

2.1.3 The purpose of this Project Plan is to:

- define the scope of work for evaluation trenching;
- outline the aims of the investigation and how they will contribute to the specific

objectives of the GWSI: HERDS;

- describe the methodology to be employed; and
- set out the proposed deliverables and reporting mechanisms.

3 Location and Site Background

3.1 Location

3.1.1 The trial trenching addresses an area of land located either side of the HS2 rail track near Harefield (Fig 1). The pipeline diversion extends for approximately 1km. The route passes through six fields and crosses Newyears Green Bourne (a tributary of the River Colne) at two points. The remaining area for evaluation is c.3.8ha.

3.1.2 The Site crosses through Community Forum Area 6 (CFA6) and CFA7 and therefore the route of the gas main diversion east of Harvil Road lies within archaeological character area 06-09 (semi-rural west of Breakespear Road) and the route west of Harvil Road lies in 07-01 (Eastside of the Colne Valley). The Site does not fall under a Construction Land Requirement (CLR) in the DDBA and does not have a CRo number.

3.2 Site Background

General

3.2.1 Detailed desk-based assessments (DDBAs) for the Colne Valley East (1D037-EDP-EV-REP-S000-000004) and the Colne Valley West (1D037-EDP-EV-REP-C000-000028) and Environmental Baseline assessments for CFA6 (CH-001-006, ES 3.5.2.6.4) and CFA7 (CH-001-007, ES 3.5.2.7.4) have been completed for this area. A further Geoarchaeological Desk Based Assessment (HS2-HS2-PM-TEM-000-000004) for the complete HS2 route has been prepared, covering the Colne Valley as Enhanced Study Area 1 (ECA1).

3.2.2 The Site lies in archaeological character areas 06-09 (semi-rural west of Breakspear Road) and 07-01 (Eastside of the Colne Valley). The geology and topography of both character areas is described as "predominantly underlain by a solid geology of London Clay of Eocene date overlain in parts by superficial deposits, including Head deposits and Terrace Gravel including the Harefield Terrace. The topography is gently undulating with a relatively steep slope into the Colne Valley to the west. Drainage is to the west and south into the River Colne and thence the River Thames" (ES 3.5.2.6.4 and ES 3.5.2.7.4).

3.2.3 The DDBAs outline that the underlying bedrock geology across the landscape in this area to the east of the Colne Valley consists of Palaeogene clays, silts and sands of the London Clay Formation and the Lambeth Group. Superficial deposits are mainly absent in this area apart from possible alluvial deposits further to the west towards the River Colne which could contain extensive superficial deposits of fluvial sands and gravels and fine grained alluvium of Pleistocene and Holocene date. The most western part of this area has been subject to excessive quarrying and some of the superficial deposits may have been truncated.

3.2.4 The Geoarchaeological DBA indicates that deposit modelling of the Colne Valley (ESA1) was limited due to a small amount of boreholes in this area. The deposit model created by a transect of boreholes across the area gives some guidance as to the location of the Holocene floodplain and superficial deposits across the Colne Valley; alluvial areas and the Holocene floodplain are projected further to the west of the Site, but it corroborates the potential for some superficial deposits in the Newyears Green Bourne area, which the eastern part of the Site will cut.

Prehistoric

3.2.5 The Site is expected to have little superficial geology apart from a spur of alluvium which extends from Harefield Lake no.2 eastwards towards Harvil road, following the course of the Newyears Green Bourne (DDBA, p. 20).

3.2.6 The Site's location on the edge of the river valley of the River Colne and some presence of some alluvial deposits may indeed suggest that there is more potential for Palaeolithic and Mesolithic remains than the CR00069 Site further to the east. Close to the western edge of the Site near Dews Farm evidence of Mesolithic activity was found (CVA21) and at Dews Farm Road Pit (now Harefield Lake No.2) a ring-ditch (CVA010) was recorded before being destroyed by gravel extraction.

3.2.7 The ES suggests that the Site contains known heritage assets CVA044 and RUI015 (Thames Terrace Gravels) which highlight the potential for Palaeolithic deposits (Fig 2).However, the DDBA (p. 20) indicates that the spatial extent of the 'Thames Terrace deposits' identified in the ES, and assigned to CVA044 and RUI015 does not correspond accurately with the areas of Pleistocene and Early Holocene deposits recorded by the BGS. Nonetheless, the presence of some localised alluvium could indicate a moderate potential for early prehistoric remains and palaeoenvironmental remains.

3.2.8 A strip, map and sample exercise in 2007 (Network Archaeology, 2008) approximately 600m south of the Site identified a group of cremations dating to the transitional middle to late Bronze Age, along with a spread of burnt stone and a small number of associated pits and postholes of presumed prehistoric date (RUI021). Sampling of the features on the Site indicated that palaeoenvironmental remains were exceedingly rare on the Site (Network Archaeology, 2008, p. 12).

3.2.9 Therefore, there is moderate to high potential for Palaeolithic, Mesolithic, Neolithic and early Bronze Age archaeological deposits and palaeoenvironmental remains, in particular in the western part of the Site. On the eastern part of the Site, there is moderate to high potential for Middle to Late Bronze age remains and features.

Roman

3.2.10 A Roman Road (Viatores 165) is believed to have been established between settlements at Verulamium (St. Albans) and Laleham (Fig 2, RUI012). The exact route of this road is not known, but believed to run approximately along the line of Harvil road, cutting through the Site. The Site occupies areas along each side of the road's predicted trajectory and there may be potential to pick up any associated road side finds.

3.2.11 The potential for Roman remains on the Site is expected to be low-moderate.

Early medieval

3.2.12 The DDBA indicates that few Saxon finds were made in this area. Early and Middle Saxon settlements consisted of dispersed or clustered farmstead housing a few households with additional small-scale field systems and trackways.

3.2.13 Harefield and Ruislip have their origins in the Late Saxon period and it is possible that the area surrounding these villages was used for agricultural purposes. However, it is likely that fully developed open fields did not extend across the clay lands to the east of the Site, and that this landscape supported a variety of agrarian and economic strategies, with a reliance on grazing and woodland exploitation, as well as some open field arable cultivation (DDBA, p. 41).

3.2.14 All in all, Saxon archaeology may be difficult to identify due to its dispersed and often insubstantial nature in this area. It is therefore expected that there is low-moderate potential for early medieval archaeology in this area.

Medieval-post-medieval

3.2.15 The excavation in 2007 (Network Archaeology 2008) also found some field boundary ditches with post-medieval to modern pottery and ceramic building material (CBM). The ACA's the Site is in contains several Medieval Farms and moated sites (Fig 2) such as Dews Farm to the west (CVA 022), Brackenbury Farm to the east (RUI002) and Pynchester (RUI001) further south-east of the Site.

3.2.16 LiDAR data of Dews Farm (Doc ref: 1EW03-FUS-EV-REP-CS01_CL01-0001818 map no. AC100/3_3) does not show any evidence for medieval to post-medieval ridge and furrow and site boundaries in the form of ditches on the southern area of the Site. However, it is possible that modern ploughing and development have disturbed these remnants of the medieval rural landscape.

4 Aims and Objectives

4.1 Need and Aims

4.1.1 Trial trenching is required to determine, as far as reasonably possible, the nature of the archaeological resource within the Site.

4.1.2 The objective of the investigation is to gain information about the archaeological resource in order to support an assessment of its character, extent, knowledge value and ability to contribute to Specific Objectives. The outcomes of investigations may be used to inform the requirement and strategy of further archaeological investigation. Where present the investigation will define the character, extent, quality and preservation of archaeology in order to determine its likely ability to contribute to Specific Objectives set out in the GWSI: HERDS.

4.1.3 The aims of the trial trenching are to:

- assess the extent and nature of archaeological remains within the survey boundaries;
- characterise the nature of any archaeological remains within the survey boundaries;
- assess the significance of any archaeological remains within the survey boundaries;
- assess the change to the significance of the identified heritage assets as a result of the detailed design;
- 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 3.2.

4.1.4 The Colne Valley is an area with a high potential for currently unknown buried archaeological remains; although the Site lies in the vicinity of Terrace Gravels (RUI015) associated with the River Colne, the underlying geology of the Site itself consists of Lambeth group and Seaford Chalk formation with a small strip of superficial alluvium running across the Site.

4.1.5 If present, archaeological remains are likely to date from the Bronze Age through to the post-medieval period, although earlier prehistoric remains cannot be ruled out due to some alluvial deposits present on the Site and its vicinity to the River Colne and associated Thames Terrace Gravels to the west.

4.1.6 If Palaeolithic to Neolithic remains are discovered during the evaluation in this area, further archaeological work may be required in order to contribute to KC5: "Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age" , KC11: "Does the high density of prehistoric settlement evidence in the Colne Valley reflect a genuine focus of activity or does it reflect a bias in the archaeological record?" and KC14: Enhance existing understanding of the Late Upper Palaeolithic- Early Mesolithic transition through investigation of sites in the Colne Valley and other locations along the route.

4.1.7 There is a moderate to high potential for remains associated with the Bronze Age cremation site (Fig 2, RUI021) in the Copthall Covert , which could contribute to addressing HERDS objectives 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?" and KC17:" What evidence is there for regionality in the mortuary rites of the Late Bronze Age and Iron Age, and how does that alter over time?"

4.1.8 There may be a Roman Road (Fig 2, RUI012) running across the Site following the trajectory of Harvil Road, however the precise trajectory of the former Roman road is unknown. Due to the location of the Site on each side of this suspected road, there may be low to moderate potential for the archaeological trial trenching to contribute to HERDS objective KC019: "The Romano-British period saw the beginning of a more established infrastructure network. Can we investigate the development of these routes, trackways and roads and the influence they had on landscape change?" Furthermore, any boundary ditches or other features datable t this period could provide insight into KC24: "To what extent are the patterns of settlement, landholding and enclosure in West London and the Colne Valley in the Iron Age and Romano-British period determined by those established in the Bronze Age?"

4.1.9 The Site is located in an agricultural setting and therefore features such as land boundaries and ditches may give an insight in landownership and enclosure. Moreover, the land of the Site may have been associated with one of the Manorial Farms such as Dews Farm (CVA022) and Brackenbury Farm (RUI002) in its vicinity. Any boundaries and ditches datable to the medieval-post-medieval period could have potential to contribute to HERDS objective KC34: Undertake research and investigation into medieval manorial complexes. What was their origin, development and impact on the landscape?"

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 trial trenching will create knowledge and outputs that would contribute to the following specific objectives in the following ways:

Table 1 Contribution to Specific Objectives

Specific Objective	Contribution
KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age.	Due to the potential for prehistoric settlement in the floodplain of the Colne on the western part of the Site as evidenced by CVA021 and CVA010, this trial trench evaluation may find evidence for prehistoric activity, which has potential to be modelled on the basis of further mitigation work.
KC11: Does the high density of prehistoric settlement evidence in the Colne Valley reflect a genuine focus of activity or does it reflect a bias in the archaeological record?	The trial trench evaluation will clarify the location, extent, survival, condition and significance of any heritage assets present on the Site. The results, whether positive or negative, will contribute to our understanding of prehistoric settlement distribution densities and indicate if further archaeological work could address the question of bias in the archaeological record.
KC14: Enhance existing understanding of the Late Upper Palaeolithic- Early Mesolithic transition through investigation of sites in the Colne Valley and other locations along the route.	The trial trench evaluation will provide a level of baseline data to assist in addressing this objective by identifying the potential of this area close to the river valley for Palaeolithic deposits, in formulating strategies for further investigation, and in refining the objective.
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 results of the trial trench evaluation will provide a level of baseline data to assist in addressing this objective, in formulating strategies for further investigation, and in refining the objective. If evidence for Late prehistoric settlement or landscape organisation are found, which may contribute to this Specific Objective, further work may be anticipated.
KC17: What evidence is there for regionality in the mortuary rites of the Late Bronze Age and Iron Age, and how does that alter over time?	Trial trench evaluation will clarify the location, extent, survival, condition and significance of any heritage assets present on the Site including whether there are further Bronze Age cremations as found at Copthall Covert. The results, whether positive or negative, will contribute to our understanding of prehistoric settlement distribution densities and help address the question of bias in the archaeological record.
KC19: The Romano-British period saw the beginning of a more established infrastructure network. Can we investigate the development of these routes, trackways and roads and the influence they had on landscape change?	The trial trench evaluation has the potential to clarify the route of the Roman road from Verulamium to Lelham (heritage asset RUI012). The results, whether positive or negative, will contribute to our understanding of the Roman infrastructure network and the influence it had on the landscape.
KC24: To what extent are the patterns of settlement, landholding and enclosure in West London and the Colne Valley in the Iron Age and Romano-British period determined by those established in the Bronze Age?	The results of the trial trench evaluation will provide a level of baseline data to assist in addressing this objective, in formulating strategies for further investigation, and in refining the objective. Any datable boundaries or features
KC34: Undertake research and investigation into medieval manorial complexes. What was their origin, development and impact on the landscape?	Several medieval manorial Farms are located within the ACAs (Dews Farm, Brackenbury Farm and Pynchester Farm); Land in the area may have belonged to the manorial complexes i and ditches/boundaries dated to the

	medieval period could give an indication of enclosure or land division. The DDBA indicates that the area probably had a mixed agricultural use due to areas of dense ancient woodland used for pig keeping, fields for grazing and increasingly open land for cultivation. Ditches and field boundaries could give an indication of how a field system was developed and could potentially be related to the manorial complex system. Ditches with organic material have the potential to be sampled in order to find out how the Site was cultivated.

5 Scope and Methodology

5.1 Trial Trenching Scope

5.1.1 Trial trenching 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 Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS) (HS2-HS2-EV-STR-000-000015).

5.1.2 All trial trenches will be between 1.8 and 2.1m in width. The survey will comprise excavation of 12 (no.) of 30m long trenches in each area (24 (no.) trenches in total) (Fig 3). This represents an approximate 4% sample of the available area, adequate to address the project objectives without prior geophysical survey (Figure 3). An additional 1% sample will be used as contingency in order to investigate further areas of archaeological remains.

5.1.3 All trenches are listed in Table 2. All trenches have been assigned a unique ID in accordance with the Employer's Asset Information Management System (AIMS). Trenches have been positioned to provide a representative sample of the available areas; there is no pre-existing information on potential archaeological remains on which to target trenches.

5.1.4 It is expected that the Site will be ready for excavation from December 2017.

Table 2 Schedule of Trial Trenches

AIM ID	Tr No	Tr Length	Tr Width	Max Trench Depth
	Tr001	30.00	1.80m-2.0m	To geological horizon
	Tr002	30.00	1.80m-2.0m	To geological horizon
	Tr003	30.00	1.80m-2.0m	To geological horizon

AIM ID	Tr No	Tr Length	Tr Width	Max Trench Depth
	Tr004	30.00	1.80m-2.0m	To geological horizon
	Tr005	30.00	1.80m-2.0m	To geological horizon
	Tr006	30.00	1.80m-2.0m	To geological horizon
	Tr007	30.00	1.80m-2.0m	To geological horizon
	Tr008	30.00	1.80m-2.0m	To geological horizon
	Tr009	30.00	1.80m-2.0m	To geological horizon
	Tr010	30.00	1.80m-2.0m	To geological horizon
	Tr011	30.00	1.80m-2.0m	To geological horizon
	Tr012	30.00	1.80m-2.0m	To geological horizon
	Tr013	30.00	1.80m-2.0m	To geological horizon
	Tr014	30.00	1.80m-2.0m	To geological horizon
	Tr015	30.00	1.80m-2.0m	To geological horizon
	Tr016	30.00	1.80m-2.0m	To geological horizon
	Tr017	30.00	1.80m-2.0m	To geological horizon
	Tr018	30.00	1.80m-2.0m	To geological horizon
	Tr019	30.00	1.80m-2.0m	To geological horizon
	Tr020	30.00	1.80m-2.0m	To geological horizon
	Tr021	30.00	1.80m-2.0m	To geological horizon

AIM ID	Tr No	Tr Length	Tr Width	Max Trench Depth
	Tr022	30.00	1.80m-2.0m	To geological horizon
	Tr023	30.00	1.80m-2.0m	To geological horizon
	Tr024	30.00	1.80m-2.0m	To geological horizon

5.2 Methodology

5.2.1 Tasks and activities that will be undertaken include:

Setting out

5.2.2 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.

5.2.3 Trenches shall be located to a horizontal accuracy of +/-500mm. The corner points of each trench location shall be set out with Real Time Kinematic (RTK) Global Navigation Satellite System (GNSS) equipment or other suitable automated equipment referenced from the PGMs.

5.2.4 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.

5.2.5 The Archaeological Contractor shall ensure that all 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 trench. Survey methodology and a detailed survey record shall be provided to HS2 Ltd within the survey report.

Mechanical excavation

5.2.6 Trial trenches and test pits shall be excavated to the first archaeological level. Excavation will be undertaken using a mechanical excavator with toothless ditching bucket.

5.2.7 Machining shall be carried out under the constant supervision of the Archaeological Contractor 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).

5.2.8 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, conductivity of discharge waters to ensure compliance.

5.2.9 Within alluvial sequences the 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 alluvium. The Contractor shall supervise the excavation of each test pit in such a manner so as to allow a cumulative or continuous section to be recorded.

5.2.10 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).

Fieldwork Recording

5.2.11 Archaeological recording shall be undertaken by the Contractor to the general requirements as described in the GWSI: HERDS (section 7.3). A sufficient sample of the archaeological features and deposits revealed must be sampled/or 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.

5.2.12 Archaeological recording is to include, as a minimum:

- At least one representative section at (1:10 or 1:20 scale) of each 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.

5.2.13 A 'site location plan', indicating site north shall be prepared at 1:1250. Individual '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.

5.2.14 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.

5.2.15 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 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 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.

5.2.16 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 Contractor during the course of the excavations. Spot dating shall be incorporated onto this diagram during the course of excavations.

5.2.17 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.

5.2.18 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 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.

Human Remains

5.2.19 It is possible that prehistoric cremation burials will be present on the Site. Where human remains are identified, all subsequent work must be undertaken in accordance with Schedule 20 of the High Speed Rail Act (Vol. II) and the Employer's Burial Grounds, Human Remains and Monuments Procedure (HS2-HS2-EV-PRO-0000-000008).

5.2.20 The Contractor shall confirm how the requirements set out in the Project Plan will be implemented as part of their procedure for excavating and recording human remains in the Contractor's method statement.

5.2.21 At locations known to contain human burials, or that have a high potential for the presence of human remains, provision shall be made by the Contractor for site inspection by a suitably qualified osteo-archaeologist in order to determine the age of the remains.

5.2.22 Should human remains be discovered, the Contractor shall notify the Employer immediately so that these procedures 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. Police or Coroner and the EHO will be notified as well according to Schedule 20 of the HS2 Act.

5.2.23 The Contractor will be required to cease all works at that location until further instruction is provided by the Employer. The Contractor shall undertake an initial in situ observation and assessment of the remains and shall advise the Employer of the course of action required.

5.2.24 Lifting of human skeletal remains shall be kept to the minimum which is compatible with an adequate evaluation or excavation, where the remains contribute to Specific Objectives and as required by the Project Plan.

5.2.25 Visible grave goods and other obvious artefacts, shall be recorded and lifted before the end of the working day to avoid the risk of vandalism and theft. Where this is not feasible or appropriate, the Contractor shall ensure, on liaison with the Employer that adequate site security is provided. As a minimum, this will require a 24 hour comprehensive security regime until sensitive remains have been recorded and lifted. This is a particular issue for rural sites and 'occasional burials'.

Environmental Sampling

5.2.26 It is expected that in the area east of Harvil Road located on London Clay will have low potential for environmental sampling as evidenced by previous environmental sampling as part of an archaeological strip, map and sample at the Copthill Cutting (Network Archaeology 2008). However, there may be moderate to high potential for alluvial deposits on the west of Harvil road, especially in the areas in the vicinity of Dew's Farm and the Newyears Green Bourne.

5.2.27 The Archaeological Contractor will consider environmental sampling when encountering possible organic deposits. The potential for palaeoenvironmental remains is deemed to be highest on the western part of the Site closer towards the River Colne.

5.2.28 Any alluvial or peat sequences encountered on Site will be sampled; exposed sections through the alluvial/peat material will be recorded according to standard sedimentary criteria in order to inform on the mode and environment of deposition.

5.2.29 A series of overlapping monolith tins will be taken down through the sequence to recover undisturbed columns of sediment suitable for off-site sedimentological and palaeoenvironmental assessment (i.e. pollen, diatoms, LOI, organic content, Calcium Carbonate content, Mag Sus). Bulk samples, c 20-40 litres in volume, will also be taken in association with the monolith tins. These will be taken at intervals of c 10cm (respecting any sedimentary boundaries) adjacent to the monolith tins down through the sediment profile. The bulk samples will be taken to retrieve plant macro fossils, molluscs and to recover plant material suitable for C14 dating.

5.2.30 Colluvial soils or suspected colluvial soils will be sampled by monolith tins by the same method as described in for soil micromorphology, and sedimentary analysis (i.e loi, CaCo, Mag sus) A, E, O, B soil horizons.

5.2.31 Further sampling techniques which may be used include phosphate analysis on areas that show signs of poaching in order to establish animal enclosure areas and if possible hearth areas are encountered, identified through discoloration by possible burning, or by accumulations of possible hearth stones, then samples will be taken on a closely-spaced grid from within and around the area for off-site magnetic susceptibility analysis. Associated soil horizons will be bulk sampled for palaeoenvironmental remains and also by monolith tin in order to retrieve undisturbed columns of sediment suitable for off-site analysis.

5.2.32 The selection, preparation for and methods of taking samples together with their size, presentation and processing shall be in accordance with current best practice (e.g. CIfA 2014; Campbell et al. 2011; Ayala et al. 2007).

5.2.33 The Contractor shall use ten litre plastic buckets (with lids and handles), or strong polythene bags (double bagged) secured at the neck, for the recovery of bulk 'disturbed' environmental samples. An adhesive label recording the project event code, context number and sample information shall be securely fixed to a vertical face of the bucket only or attached to the neck of the bag. Labels shall be completed with an indelible ink pen. A duplicate non-adhesive label shall be inserted within the bucket or between the polythene bags.

5.2.34 The Contractor shall be responsible for the protection of all samples and finds and for their transport (including loading and unloading) to the processing facilities or other location as agreed with Employer. 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.

5.2.35 Processing of all soil samples collected for biological assessment, or subsamples of them, should be completed within two weeks of collection. The preservation state, density and significance of material retrieved shall be assessed by the Contractor's recognised specialist. 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 shall be stored in appropriate conditions in accordance with the Contractor's method statement.

Top soil sampling

5.2.36 Top soil sampling will be done on the trenches in order to determine potential for prehistoric buried landscapes. The guidance indicates the topsoil should be sampled by excavating 20 (no.) pits of 0.5m² per ha. The evaluation area measures 3.8ha, which means that 76 top soil samples will be taken (38 on each site of Harvil Road).

5.2.37 The samples will be sieved and checked for any flints and other finds.

Geoarchaeology

5.2.38 If alluvium is encountered in parts of the Site, samples will be taken if appropriate as the results may be able to contribute to the deposit model of the Colne Valley area (see environmental sampling above). If the bottom of the alluvium is not reached within the trench, hand augers will be taken across the trench (2no. minimum) to establish the depth of the alluvial deposits and contribute to the deposit model of the Colne Valley as a whole and to add information about the extent of superficial deposits in this area.

5.2.39 Samples collected for geo-archaeological assessment should be processed promptly by the Archaeological Contractor's specialist, particularly where storage of unprocessed samples is thought likely to result in deterioration. Appropriate assessment shall be undertaken as agreed with the Employer. Where preservation in situ is a viable and desirable option, consideration shall be given to minimising the possible effects of compression and loading on the physical integrity of the Site and any hydrological or chemical impacts of the proposed construction works (Campbell et al. 2011).

Backfilling

5.2.40 The trenches shall be pumped dry (by the Contractor or Principal Contractor) 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. 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.

5.2.41 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 LS-WSI.

6 Post-investigation reporting and archiving

6.1.1 Trial trenching reports will be produced with the following structure:

- Executive Summary
- Introduction
- Summary of 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;
  - Number and dimensions of trial trenches;
- Results and observations
  - Stratigraphic report
  - Finds report
  - Environmental evidence report
  - Interpretation of results against original expectations and Specific Objectives
  - Review of evaluation strategy [where appropriate].
- Recommendations and research aims for further investigation
- Conclusions

- Statement of potential of archaeology
- Assessment of achievement (or not) of survey objectives.

- Evaluation of 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.

6.1.2 The trial trenching reports 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.

6.1.3 The following figures will be included in trial trenching reports:

- General plan (mandatory)
- Engineering design (mandatory)
- Site location
- Survey extent and 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

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

8.1.1 Trial trenching reports will be prepared and conducted by suitably qualified, experienced and competent professionals.

8.1.2 Trial trenching reports 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 Evidence of engagement

9.1.1 Historic England's advisor for the Greater London Archaeological Advisory Service (GLAAS) has been consulted on the plans and methodology for these works (meeting 31/08/2018) and was content with the methodology for the EWC works. His comments regarding the strategy for the Colne Valley has a whole were addressed through workshops (See below).

9.1.2 A meeting between the archaeological consultant for Fusion (Main Works Contractor for the Central section) and the Archaeological contractor was held (28/09/17) in collaboration with HS2's heritage team. The purpose of the meeting was to discuss the archaeology of the Colne Valley as a whole, as it is currently divided between the two sections. It was agreed that a common strategy will be drawn by the two contractors with regards to assessing the potential for Pleistocene and early Holocene deposits but also later prehistoric and historic remains through non-intrusive and intrusive works.

9.1.3 A further workshop was held with representatives from Area Central and Area South EWC with GLAAS, Historic England, London Borough of Hillingdon, and Buckinghamshire County Council on 7 November 2017 to discuss the archaeological programme across the Colne Valley and cooperation between Central and South sections regarding to archaeological strategies, with a particular focus on urgent enabling works.

9.1.4 All relevant Project Plans and results of investigations will be shared between contractors. This work will inform the scope and methodology of the next phase of works.

10 References and glossary of terms

10.1 Glossary of terms

10.1.1 The following terms have been used in this report:

- **Contractor** – the organisation undertaking the works 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.
- **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.
- **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.

10.2 References

Title	Reference
Colne Valley East Detailed Desk Based Assessment	1D037-EDP-EV-REP-S000-000004
Cultural Heritage GIS Specification	HS2-HS2-GI-SPE-000-000004

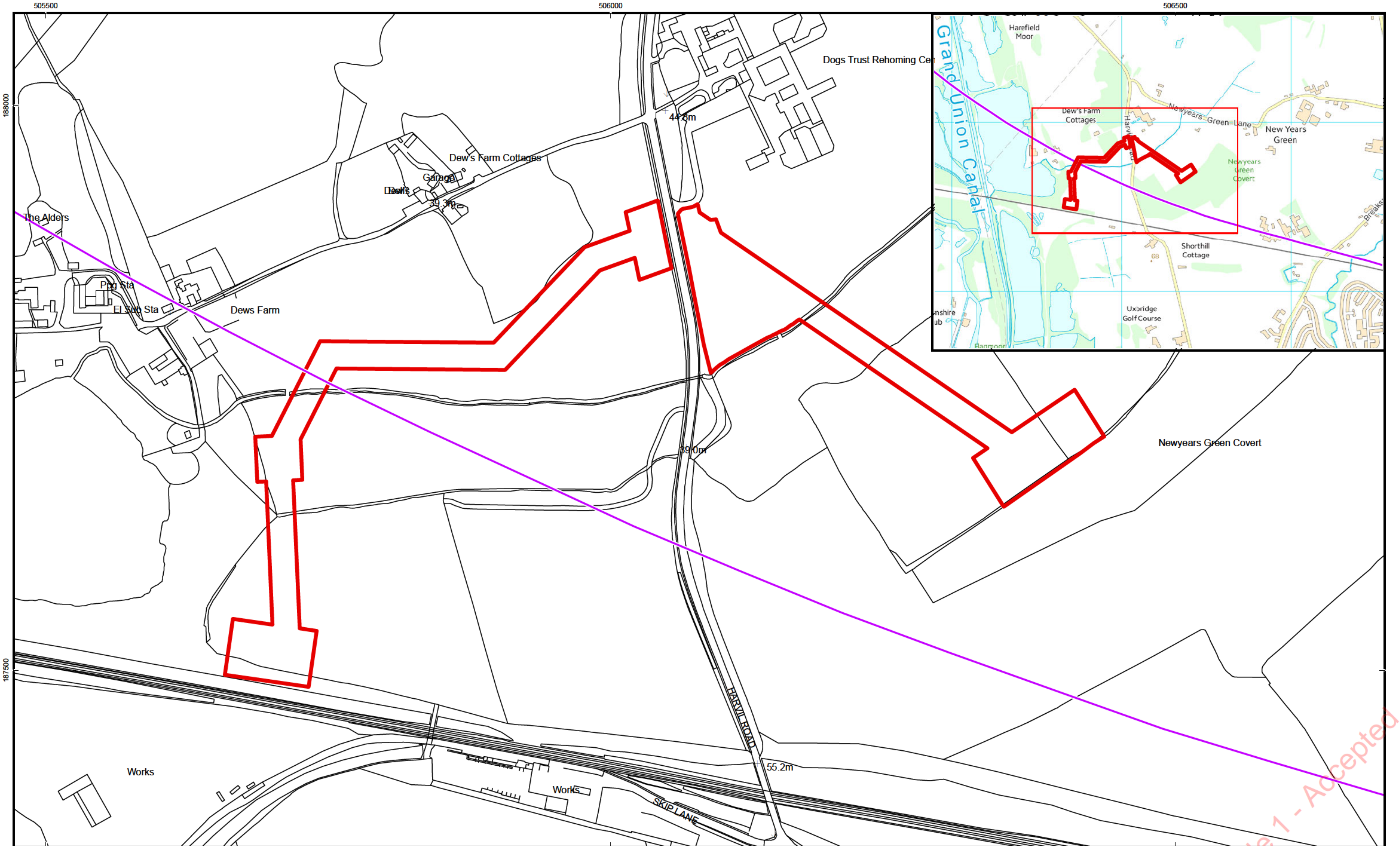
HS2 Phase One Environmental Statement and Supplementary Environmental Statements	CH-001-006, ES 3.5.2.6.4 CH-002-006, ES 3.5.2.6.5 CH-003-006, ES 3.5.2.6.6 CH-004-006, ES 3.5.2.6.7
Technical Standard – Temporary Works	HS2-HS2-CV-STD-000-000005
Technical Standard - Route wide soil resources plan	HS2-HS2-EV-STD-000-000008
Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy	HS2-HS2-EV-STR-000-000015
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
Technical Standard: Historic Environment Physical Archive Procedure	HS2-HS2-EV-STD-000-000039
Technical Standard: Historic Environment Digital Data Management and Archiving Procedure	HS2-HS2-EV-STD-000-000040
Network Archaeology, 2008, Harefield to Southall Proposed Gas Pipeline, Archaeological Controlled Strip: Ancillary Pipe Dump	HAS56/report/v2.0
Colne Valley East Detailed Desk Based Assessment	1D037-EDP-EV-REP-S000-000004

10.3 List of acronyms

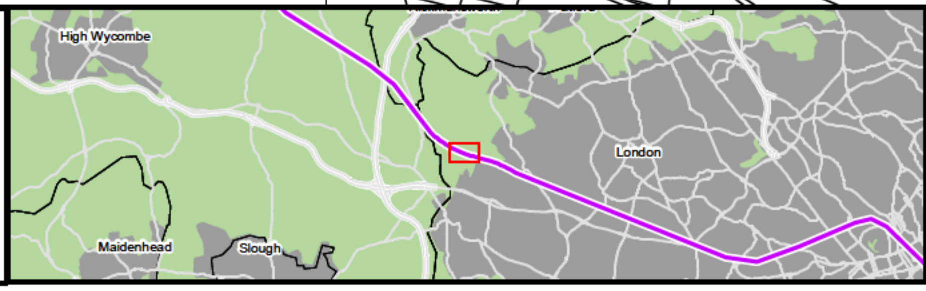
Abbreviation	Definition
AIMS	Asset Information Management System
ACA	Archaeological Character Area
ASZ	Archaeological Sub-Zone
BIM	Building Information Modelling
CIfA	Chartered Institute for Archaeologists
CIR	Construction Integrated Recording
CoCP	Code of Construction Practice
CSjv	Costain Skanska Joint Venture
DDBA	Detailed Desk Based Assessment
dWPI	Draft Work Package Instruction
EIA	Environmental Impact Assessment
ES	Environmental Statement
GIS	Geographical Information Systems

GWSI: HERDS	Genetric Written Scheme of Investigation: Historic Environment Research and Delivery Strategy
HS2	High Speed 2 Ltd
LLAU	Limits of Land to be Acquired or Used
LS-WSI	Location Specific Written Scheme of Investigation
OASIS	Online Access to the Index of archaeological investigations
PM	The Employer's Project Manager
PGM	Permanent Ground Markers
QA	Quality Assurance
TBM	Temporary Benchmark
TSA	The Survey Association
TST	Total Station Theodolite
VfM	Value for Money
WI	Works Information
WP	Work Package
WPC	Work Package Price
WPI	Work Package Instruction
WPM	Work Package Manager
WPP	Work Package Plan
WPQ	Work Package Quotation
WPS	Work Packaging Strategy

Appendix A – Figures



Legend
- HS2
- Site Extent



High Speed Two

EARLY WORKS PACKAGE
SOUTHERN SECTION-COLNE VALLEY

FIG. 1 SITE LOCATION

Internal

Scale at A3: 1:3,000

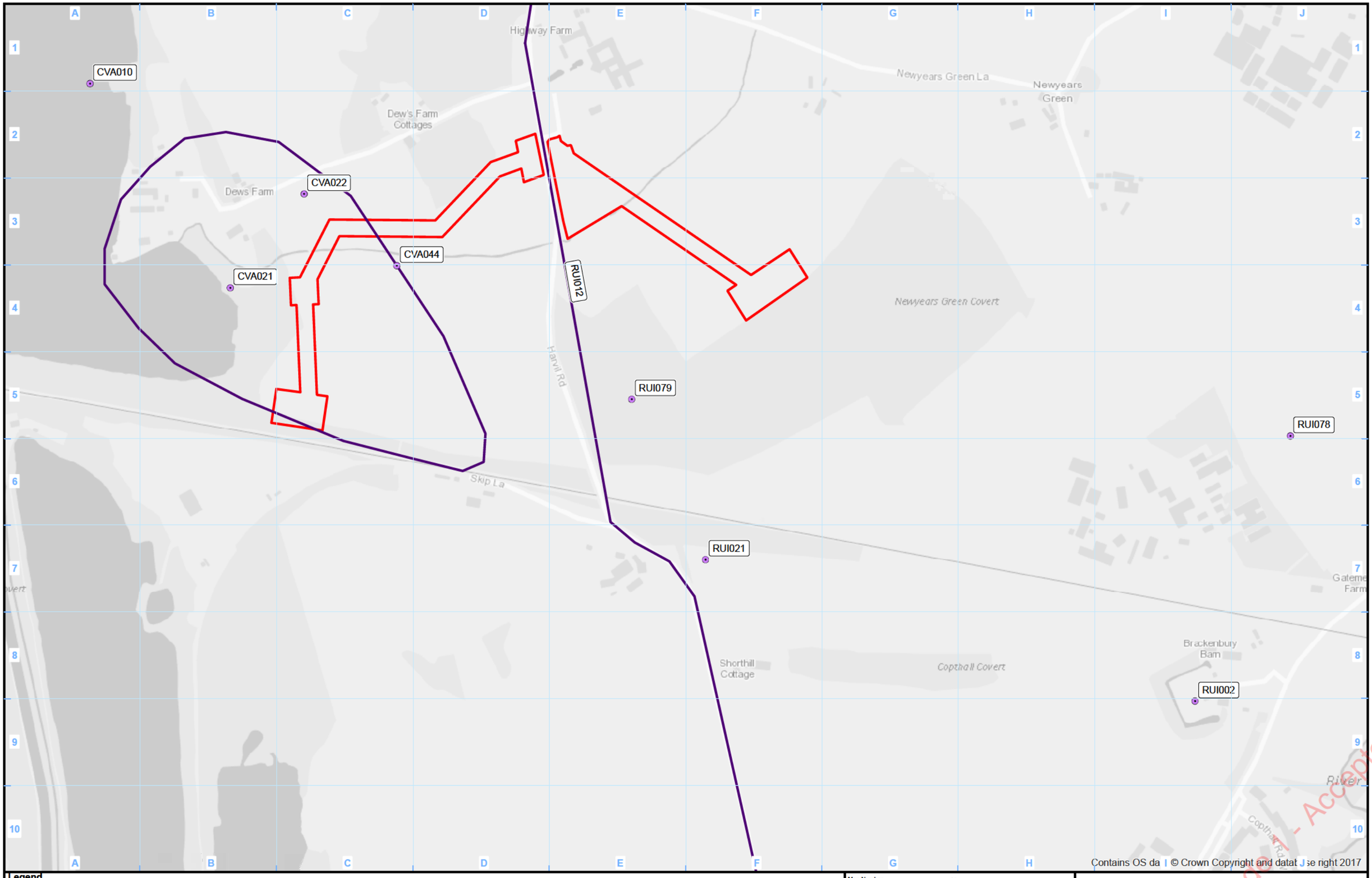
0 25 50 75 100
Meters

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

Doc Number: FIGURE 1

Date: 11/08/17

This figure forms part of report 1EW02-CSJ-PC-PLN-S002-000002 : Revision P01



Legend

- site outline
- Undesignated heritage asset
- Undesignated heritage asset
- Undesignated heritage asset

Map Number: tbc

Map Name: Figure 2 Heritage assets

Location: S2 Colne Valley

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Scale at A3: 1:5,000

0 50 100 150 200 Metres

Doc Number: 1EW02-CSJ-EV-PLN-S002-000002

Date: 07/11/17

505500 506000 506500

188000 187500

Dew's Farm Cottages
Garage
Dells
39.3m
44.6m
WB
Scrap Yar
Ppg Sta
El Sub Sta
Dews Farm
39.8m
Newye
HARVIL ROAD

Tr001 Tr002 Tr003 Tr004 Tr005 Tr006 Tr007 Tr008 Tr009 Tr010 Tr011 Tr012 Tr013 Tr014 Tr015 Tr016 Tr017 Tr018 Tr019 Tr020 Tr021 Tr022 Tr023 Tr024

Legend
- badger set
- exclusion zone around badger sett
- HS2
- 18" Trial Trenches
- Site Extent

High Speed Two

EARLY WORKS PACKAGE
SOUTHERN SECTION-COLNE VALLEY

FIG.3 18" GASPIPELINE
DIVERSION (FULNER TOHASTEHILL)

Internal

Scale at A3: 1:2,500

0 25 50 75 100
Meters

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Doc Number:1EW02-CSJ-EV-PLN-S002-000002 Date: 07-11-17