
Historic Environment Research and Delivery Strategy

Phase One

August 2017



Historic mapping, LiDAR and aerial photo of Coleshill Park and Hall



Department for Transport

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Note on Terminology

Throughout this document the following terms are used:

Employer: This refers to HS2 Ltd.

Contractor: This refers to a company or organisation contracted by the *Employer* to deliver specific works.

Nominated Undertaker: This refers to the organisation or organisations that will be appointed by the Secretary of State to design, construct, operate and maintain High Speed Rail (London – West Midlands). Unless otherwise stated this Nominated Undertaker for the purposes of this document is the *Employer*.

1 Introduction

1.1 The Generic WSI: Historic Environment Research and Delivery Strategy

- 1.1.1 This document forms the *Employer's* High Speed Two (HS2) Phase One Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS), the production of which fulfils the commitment set out in the Heritage Memorandum¹. The GWSI: HERDS covers all aspects of the historic environment including built heritage, archaeology and the historic landscape.
- 1.1.2 The GWSI: HERDS establishes the objectives for historic environment works, which are implemented through the Phase One technical standards and procedures set out in the Project Requirement Specification (PRS). The GWSI: HERDS sets out the project mechanisms for designing works, undertaking evaluation, delivering investigations, undertaking post-excavation assessment, and archive deposition that will be adopted for the design and construction of Phase One of HS2. The approach to analysis and dissemination of results will be developed as the project progresses. It presents a clear statement of objectives, standards and structure for the planning and implementation of historic environment works.
- 1.1.3 It is the lead delivery document for all aspects of historic environment work associated with HS2 Phase One.

1.2 Need for the GWSI: HERDS

- 1.2.1 Phase One of HS2 presents an unprecedented opportunity to explore our past through the country's largest ever linear infrastructure project. In terms of comparisons with other schemes it is worth noting that High Speed 1 was c.67 miles (108km) – under half the length of Phase One of HS2. The Phase One route extends across the grain of the landscape of southern and central England through varying geologies, topographies and regions. The nature of its design means that it tends to avoid topographic extremes and heavily built up areas, excepting Birmingham and London where it offers opportunities for the investigation and study of the post-Medieval urban landscape of these two metropolises.
- 1.2.2 The scheme presents a generational opportunity for significant knowledge creation and the testing of differing interpretative concepts and methodological techniques. Investigations arising from the HS2 historic environment investigation programme should be able to answer key questions about prehistory and history, the ways in which we study and investigate that past, and the ways in which we construct our understanding about that past. The route runs through a range of different geologies and topographies and will encounter a diversity of archaeological, built heritage and historic landscape features that, with investigation, has the potential to further our understanding of the past.

¹ Heritage Memorandum, one of the Environmental Minimum Requirements.

- 1.2.3 These opportunities however cannot be addressed and sought in a vacuum. Phase One of HS2 has to be delivered within a predefined and robust budget; and within a determined programme. These facts apply as equally to the implementation of the historic environment investigations as they do to the construction of the scheme.
- 1.2.4 It is also the case that the Phase One HS2 historic environment investigation programme needs to deliver clear benefits for communities along the route, stakeholders and the wider public. All works therefore have to be grounded in the need to deliver public benefit, in a cost-effective manner and within the confines of a construction programme. Delivering maximum knowledge and clear public benefit from a defined budget and within a defined timeframe is a central tenet of the *Employer's* approach to the investigation of the historic environment along the route.
- 1.2.5 The *Employer* has identified that the most appropriate way to fulfil the commitments set out in the Heritage Memorandum (refer to Section 1.5.19 for further information on the environmental minimum requirements) address the historic environment along the route is to develop a scheme-wide Generic Written Scheme of Investigation: Historic Environment Research and Delivery Strategy (GWSI: HERDS). This establishes priorities for investigation and knowledge creation, forms a framework for decision making at all stages of the investigation process and will ensure that the maximum public benefit is achieved; all within the wider scheme construction process. This integrated objective-led approach will enable the *Employer* and *Contractor* to address the complexities and scale of the scheme while delivering real and substantial public benefit.

1.3 Key aspects of the GWSI: HERDS

- 1.3.1 The GWSI: HERDS represents an evolution of existing and recent approaches to the design and delivery of historic environment works associated with major infrastructure projects. The GWSI: HERDS is focused on outcomes, it is being developed to ensure that the delivery of Phase One of HS2 provides real and substantive public benefits. In terms of the historic environment these benefits and outcomes lie in the fields of *knowledge creation, engagement with people* and the *creation of a lasting archival and skills legacy*.
- 1.3.2 At its heart, the GWSI: HERDS seeks to step away from an approach that merely records archaeological and other historic environment features because they are present within the footprint of a development; instead it seeks to define the purpose for such activities to ensure that all investigations provide tangible knowledge and other benefits. The GWSI: HERDS does not include an allowance for recording for recording's sake; 'preservation by record' is not a concept inherent to the GWSI: HERDS; a more accurate description of the GWSI: HERDS philosophy would be 'investigation with purpose'.
- 1.3.3 The *Contractor* shall be cognisant of the following aspects and characteristics during the delivery of the GWSI: HERDS:
- **knowledge creation, not information gathering:** all investigatory work undertaken by the *Contractor* shall support defined objectives in terms of creating knowledge relating to archaeology and history;

- **collaboration:** the sheer scale of Phase One of HS2 and the number of *Contractor* organisations delivering the historic environment investigation programme means that a collaborative approach is required. Although an individual *Contractor's* activities will be confined to a particular works package, the *Contractor* must recognise that all such activities form part of a wider programme of research, engagement and legacy building. The *Contractor* cannot work in isolation and all activities shall be designed and delivered in a collaborative, collegiate manner;
- **information sharing:** the expansive linear nature of the HS2 Phase One works and the timeframe under which works will be undertaken make it essential that all information generated by the *Contractor* relating to historic environment activities is rapidly available to the *Employer* and other *Contractors* involved in the design and delivery of work programmes along the route. A culture of sharing information, knowledge and even resources will therefore be required. The *Contractor* will be responsible for the submission of required deliverables that facilitates their sharing;
- **innovation:** the *Contractor* shall seek to develop new techniques, new ways of thinking and new approaches to all aspects of historic environment works. Wider engagement with the public, academia and other audiences shall also be sought by the *Contractor*, within the frameworks of the community engagement and skills, employment and education works information. A central aim of the approach is to develop new skills and new ways of working that can enhance delivery of historic works for HS2 Phase One and other major infrastructure projects across the UK;
- **not just excavation:** GWSI: HERDS is about far more than the excavation, recording and analysis of archaeological sites or the recording of buildings and landscapes. Its headline objectives and its underpinning ethos places considerable value and emphasis on developing skills, engaging with communities and inspiring future generations. While knowledge creation is a central tenet of the GWSI: HERDS, these other areas carry very considerable emphasis and weight and must too be addressed by the *Contractor*; and
- **prioritisation by outcome:** clearly, as with all major schemes involving extensive land take, there will be 'unexpected' discoveries, when for example investigations uncover remains of a different form and character to originally expected; when dismantling a building reveals something unusual, or when other construction activities encounter remains. The *Contractor's* response to such situations will be based on the objectives and priorities of GWSI: HERDS². If the investigation of the remains can contribute to the knowledge creation objectives being pursued at the location, or indeed other objectives, then the *Contractor* will design works to address those objectives. Where this is not the case then the *Contractor* and *Employer* will review the need for any further investigation to determine whether it leads to new objectives that could make a meaningful contribution; if not, further investigatory works would not be undertaken.

² Where remains of 'national importance' are identified a clear procedure has been established (see Section 7.6).

1.4 Scope and limitations of the GWSI: HERDS

- 1.4.1 The GWSI: HERDS provides the strategic framework for the design and delivery of all historic environment works associated with Phase One of HS2 by the *Contractor* (refer to Section 2).
- 1.4.2 It is also important to note that the *Employer* will update the GWSI: HERDS as and when needed to reflect the outcomes of historic environment works along the route. The GWSI: HERDS is designed to be used in a digital workspace (not as a linear printed document).
- 1.4.3 As new knowledge emerges from the historic environment investigation programme, the *Contractor* is required to submit regular updates to augment and develop the resource assessment and to collaborate with the *Employer* and contribute to the development and/or revision of specific objectives as the programme of works progresses (refer to Section 2).
- 1.4.4 This means that objectives and priorities may change as the project progresses; the inclusion of an objective in this version of GWSI: HERDS does not mean that it will remain as an objective for the GWSI: HERDS throughout the lifetime of the project.

1.5 Legislation and policy background

The High Speed Rail (London – West Midlands) Act

- 1.5.1 The High Speed Rail (London – West Midlands) Bill was introduced to the House of Commons on 25 November 2013. The Bill was accompanied by an Environmental Statement, which presents the outcomes of the studies carried out as part of the environmental impact assessment (EIA). Royal Assent was granted in February 2017 resulting in the Act.
- 1.5.2 The Act disapplies various legislative provisions (See Clauses to the Act: 25-28). Matters relating to listed buildings are set out in Schedule 18: Listed Buildings. Matters relating to ancient monuments and burial grounds are set out in Schedules 19 and 20, respectively. A non-technical explanation of the arrangements contained within these schedules is set out below along with further information on the alternative provisions that have been made where legislation has been disapplied.

Schedule 18: Listed Buildings

- 1.5.3 Schedule 18: Listed Buildings, modifies the application of the Planning (Listed Buildings and Conservation Areas) Act 1990 and will disapply the listed building consents process in relation to those listed buildings to be affected by Phase One works and for the works specified in column 3 of Table 1; if there are no words in column 3 then the building is to be demolished. For those listed buildings specified in Table 1 of Schedule 18 to the Act, it is proposed that the Secretary of State will require the *Employer* to enter into Heritage Agreements with the Local Planning Authority (LPA), The Historic Buildings and Monuments Commission for England (The Commission, Historic England (HE), formerly English Heritage).
- 1.5.4 These agreements will provide a similar level of information as is usually required for Listed Building Consent. In the language of an Agreement, the works will be termed 'the works details'. Where appropriate it will set out how the works in the works specification will be undertaken. Where appropriate the Agreement will detail what construction works are specifically required on or at the listed building to construct HS2. It will detail the investigative strategies and archaeological building recording methods that are required before and during

construction, together with any necessary protection and monitoring measures. The *Employer* will liaise with the LPA and where necessary HE during the preparation of both the methodology for the construction works and the specification for historic building recording works. It is a requirement of a Heritage Agreement, that a heritage method statement for the works specified within the Agreement will be submitted to the LPA (and where necessary HE) for their approval.

Schedule 18: Listed Buildings

Paragraph 1	<p>Disapplies certain sections of the Planning (Listed Buildings and Conservation Areas) Act 1990 ('the 1990 Act') in respect of Phase One works for the demolition, alteration or extension of those listed buildings specified in table 1 of schedule 18.</p> <p>It is proposed (in the Heritage Memorandum) that for those buildings identified in Table 1 of Schedule 18 that an agreement will be made with the local planning authority (and where relevant The Commission) regarding the site specific arrangements in respect of HS2 Phase One works which would be of a type that would normally require listed building consent. The heritage agreement will ensure that appropriate mitigation and safeguarding measures are in place.</p>
Paragraph 2	<p>Disapplies certain sections of the Planning (Listed Buildings and Conservation Areas) Act 1990 ('the 1990 Act') in respect of Phase One works for those buildings specified in Table 2 of Schedule 18 to be altered or extended for heritage or monitoring purposes.</p> <p>It is proposed (in the Heritage Memorandum) that an agreement will be made with the local planning authority (and where relevant The Commission) regarding the site specific arrangements for listed buildings identified in Table 2 in respect of HS2 Phase One works which would be of a type that would normally require listed building consent. The heritage agreement will ensure that appropriate mitigation and safeguarding measures are in place.</p>
Paragraph 3	<p>Disapplies Section 59 of the 1990 Act, damage to listed buildings, in respect of works authorised by the Act.</p>
Paragraph 6	<p>Provides for anyone authorised by The Commission or the LPA to enter land to inspect, or observe the carrying out of works as appropriate. However, this right is not to be exercised if the nominated undertaker considers that it is not safe to do so, and any person exercising the right will have to comply with directions from the nominated undertaker³ in respect of compliance with health and safety requirements.</p>
Paragraph 7 and paragraph 8	<p>Requires prior notification to The Commission of the demolition of a listed building, works should not commence until after a period of eight weeks has expired following notification and that during that period opportunity should be given for the recording of the building.</p>

Schedule 19: Ancient Monuments

- 1.5.5 Schedule 19 of the Act concerns changes to the legislation relating to ancient monuments, namely the Ancient Monuments and Archaeological Areas Act 1979. The 1979 Act has been modified to allow the construction of Phase One. The Act removes the restrictions on activities which may injure or disfigure the scheduled monument in question and allows powers of access to the monument to undertake HS2 construction works authorised by the

³ In this case the nominated undertaker is the *Employer*.

Act. Instead of the usual requirement to seek Scheduled Monument Consent from the Department of Cultural, Media and Sport (DCMS), an alternative regime will apply.

- 1.5.6 This alternative regime requires that a Heritage Agreement be entered into between the nominated undertaker⁴ and Historic England (HE). The agreement will provide a similar level of information as is usually required for Scheduled Monument Consent. It will set out what works are specifically required on or at the scheduled monument to construct HS2. It will detail the archaeological methods (for example, investigation and recording) that are required before and during construction, together with any necessary protection and monitoring measures. The nominated undertaker will liaise with HE during the preparation of the methodology for the construction and archaeological works.
- 1.5.7 It is proposed that under a Heritage Agreement, method statements for works affecting scheduled monuments will be submitted to DCMS/Department for Transport (DfT) for approval, meeting a works specification set out in the agreement, and for consultation with HE. The method statements will describe how the works will be undertaken. If the Secretary of State considers, having regard to HE's opinion, that the particulars of the works submitted should not be approved, or that further field investigation is required, they may refuse consent or specify amendments or requirements.
- 1.5.8 Schedule 19 also modifies the application of the National Heritage Act 1983. The power of entry conferred by Section 36(1) of the 1983 Act is only to be exercisable in relation to the land used, or intended to for use, for or in connection with the Phase One works with the consent of the nominated undertaker, such consent not to be unreasonably withheld.

Schedule 19: Ancient Monuments

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| Paragraph 1 | <p>Disapplies certain sections of the Ancient Monuments and Archaeological Areas Act 1979 ('the 1979 Act') in respect of Phase One works. Most notably those relating to powers of entry and the requirement to secure consent for any works affecting a scheduled monument.</p> <p>It is proposed (in the Heritage Memorandum) that an agreement will be made with Historic England (formerly English Heritage) and the DCMS regarding the site specific arrangements for scheduled monuments in respect of HS2 Phase One works that would usually be of a type that would normally require scheduled monument consent. This Heritage Agreement will ensure that appropriate mitigation and safeguarding measures are in place.</p> |
| Paragraph 2 | <p>Modifies the application of the National Heritage Act 1983 to the Phase One works in relation to powers of entry (to obtain information about ancient monuments and historic buildings for the purposes of the records kept by the Historic Buildings and Monuments Commission for England ('The Commission' i.e. Historic England) under Section 36 (Records: powers of entry) of the 1983 Act. Access will require consent from the nominated undertaker, such consent not to be unreasonably withheld, but will be subject to compliance with any reasonable requirements or conditions imposed for reasons of health and safety or for the purpose of preventing interference with or delay to the works.</p> |

⁴ Nominated Undertaker refers to the organisation or organisations that will be appointed by the Secretary of State to design, construct, operate and maintain High Speed Rail (London – West Midlands).

Paragraph 4	Provides for anyone authorised by Historic England to enter land at any reasonable time on which a scheduled monument is situated to observe or advise on the Phase One works as appropriate. However, this right is not to be exercised if the nominated undertaker considers that it is not safe to do so, and any person exercising the right will have to comply with directions from the nominated undertaker in respect of compliance with health and safety requirements.
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Schedule 20: Burial Grounds

- 1.5.9 Schedule 20: Burial Grounds, provides a regime for the removal of human remains and related funerary monuments.
- 1.5.10 Schedule 20 will disapply existing legislation in relation to any human remains and burial monuments, notably burial grounds required to be physically affected by the HS2 Phase One works. The Act will disapply the various legislative provisions to enable specified construction activities to be carried out. The disapplication is conditional on the removal and re-interment or cremation of those remains in accordance with a bespoke regime set out in Schedule 20 to the Act, which is designed to ensure that any such remains and monuments are dealt with in an appropriate manner. Where burial has occurred over 100 years ago, the nature and extent of archaeological investigation of burial grounds will be determined in discussion with Historic England, the relevant local authority archaeological officer or in Greater London, the Greater London Archaeological Advisory Service (GLAAS) and, where applicable, the appropriate religious authority and Commonwealth War Graves Commission.
- 1.5.11 The *Employer* has prepared a project specific 'Burial Grounds, Human Remains and Monuments Procedure' to implement the legal requirements of the Act.

Schedule 20: Burial Grounds

Paragraph 1	Requires the nominated undertaker to publish and display notice of the intention to remove any human remains or monuments before any such removal, and sets out what such a notice should contain including an explanation that a personal representative or relative may within 56 days apply for a licence to remove the remains and monument themselves. No notice is required in cases where the Secretary of State has notified the nominated undertaker that the Secretary of State is satisfied that the remains were buried more than 100 years ago and that no relative or representative of the deceased is likely to object. Nor is a notice required in cases where the nominated undertaker already holds a licence to remove human remains under Section 25 of the Burial Act 1857.
Paragraph 2	Sets out the circumstances in which the nominated undertaker must, upon written application by a relative or personal representative of the deceased, issue a licence to authorise the removal and reburial or cremation of the remains. The reasonable costs of removal and reburial must be paid by the nominated undertaker.
Paragraphs 3 and 4	Allow the nominated undertaker to remove human remains where no written application for a licence by a relative or personal representative is received, or where a licence has been issued but the remains have not been removed within 28 days. In cases where the Secretary of State has not given a notification under paragraph 1, the remains must, within two months, be buried in a place set apart for the purposes of burial or cremated in a crematorium. Where the Secretary of State has given a notification under paragraph 1, the period of two months is extended to 12 months, or such longer period as the Secretary of State may direct, to enable archaeological or other studies to be carried out where appropriate. In addition, the Secretary of State may dispense with the requirement to bury or cremate the remains but instead authorise them to be dealt with in some other manner (such as being kept in a museum). Provision is made under paragraphs 3(3) and

(4) and 4(3) and (4) for cases where a question as to an applicant's entitlement to be granted a licence has been referred to a court but has not yet been determined.

Paragraph 5 Applies where the nominated undertaker already holds a licence to remove remains under Section 25 of the Burial Act 1857. In such a case the nominated undertaker may remove the remains but is subject to the same requirements as under paragraph 3 to bury them, cremate them or, where the Secretary of State is satisfied that the remains were buried more than 100 years ago and so directs, to deal with them in another manner specified by the Secretary of State.

Paragraph 6 Sets out the arrangements to apply to the removal of any monument associated with human remains removed under the Schedule. Where a licence has been issued to the relative or personal representative of the deceased, the licensee may also remove any monument to the deceased, re-erect it elsewhere or dispose of it. The reasonable costs of doing so must be paid by the nominated undertaker.

Paragraph 7 Allows the nominated undertaker, where human remains have been removed by the nominated undertaker under the Schedule, also to remove any monument to the deceased. Where remains have been removed under a licence but a monument to the deceased has not been removed within 28 days, the monument may be removed by the nominated undertaker. The nominated undertaker can also remove any monument to a deceased person whose remains have been removed under a licence under Section 25 of the Burial Act 1857 which is not removed by the licensee. Monuments which are removed by the nominated undertaker may be re-erected at the place where the remains are reburied or removed to some other appropriate place. If that is not done, they are to be broken up and defaced to prevent inappropriate use.

Paragraph 8 Sets out the records required to be kept by the nominated undertaker as respects human remains or monuments removed under the Schedule. Records as to the removal of remains must be provided to the Registrar General within two months of their removal and records of the removal of a monument must be provided both to the Registrar General and to the relevant local authority. In the case of remains where the Secretary of State has given a notification under paragraph 1 the period of two months is extended to 12 months, or such longer period as the Secretary of State may direct, to enable archaeological or other studies to be carried out where appropriate.

Paragraph 9 Requires the nominated undertaker, in removing remains or monuments, to comply with any reasonable request of a relative or personal representative of the deceased to whom a licence has been granted under the Schedule. This is intended to apply to cases where a licence has been issued to a relative or personal representative but, because the right to remove the remains or monument has not been exercised, the nominated undertaker does so. Provision is made for cases where more than one licence has been granted under the Schedule.

1.5.12 Unless a piece of legislation is expressly or impliedly disapplied or modified by the High Speed Rail (London – West Midlands) Act it will continue to apply as normal to the design and construction of HS2 Phase One, for example, the Treasure Act 1996 remains in place.

Provisions outside of the High Speed Rail (London – West Midlands) Act

1.5.13 In addition to the controls provided for in the Act itself, there are a number of other mechanisms that will support the control of construction impacts.

1.5.14 The overall framework within which investigation will be undertaken is set out in the Environmental Minimum Requirements (EMRs) for HS2. The EMRs set out the environmental and sustainability commitments that the *Employer* and *Contractor* will be required to comply with in constructing the scheme, including mechanisms by which the *Employer* and *Contractor* will engage with communities and other key stakeholders and implement environmental and

sustainability management measures designed to protect communities and the environment during detailed design development and construction.

1.5.15 The EMRs comprise:

- General Principles setting out the approach on particular aspects of the Proposed Scheme;
- Planning Memorandum;
- Heritage Memorandum;
- Environmental Memorandum;
- Code of Construction Practice (CoCP); and
- Undertakings and Assurances.

1.5.16 Undertakings and Assurances have been given to petitioners and to Parliament during the passage of the hybrid Act.

1.5.17 The term 'undertaking' is used to describe either a promise given to Parliament (a breach of which would be addressed through recourse to Parliament) or, a bilateral or multilateral commitment which has effect as a legally binding contract (enforceable by the courts). This will include commitments expressed as formal agreements and undertakings given in consideration of withdrawal of a petition that have effect as a legal contract.

1.5.18 The term 'assurance' is used to describe any other unilateral commitment given directly to Petitioners or affected parties which is not a legally binding contract enforceable by the courts, but is made binding on the nominated undertaker by being included on the register. Enforcement is through the Secretary of State, who is answerable to Parliament for securing compliance.

Heritage Memorandum

1.5.19 The Heritage Memorandum presents the Secretary of State's commitment to the historic environment (including heritage assets and their setting). The Memorandum sets out how the historic environment will be addressed during the design and construction of Phase One of HS2 and includes reference to the production of a GWSI: HERDS. The Heritage Memorandum has been established in consultation with Historic England and local authorities through the HS2 Heritage sub-group⁵ to the Planning Forum. The key provisions of the Heritage Memorandum in relation to historic environment works are set out below.

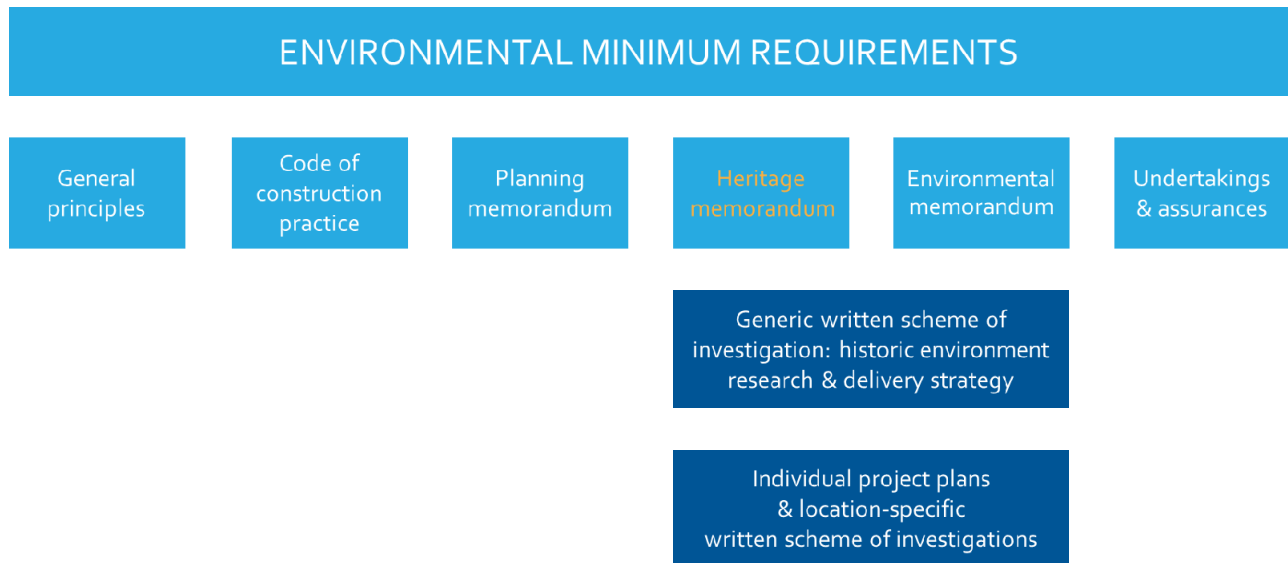
- *The nominated undertaker will develop an integrated programme to deliver the heritage investigation and recording works outlined in the Environmental Statement and as developed during the detailed design process. The investigation and recording works will seek to advance our understanding of the past. The programme will set out the key stages of investigation and recording: Detailed desk-based assessment; Field evaluation (to inform location specific investigation and recording); Location specific investigation and recording; and Archaeological*

⁵ The HS2 Heritage sub-group provides the framework for effective engagement and information sharing with Historic England and local authorities on high level technical matters.

and Built Heritage post-excavation (assessment, analysis, reporting and archiving). Para 4.5.1

- *The heritage investigation programme will be fully integrated with the overall construction programme and that integration will be continuously reviewed to ensure that appropriate time is allowed for investigation works without undue impact on the construction timetable. The management of construction is set out in the CoCP. Para 4.5.2*
- *Before enabling works and construction works begin, the archaeological research undertaken for the Environmental Statement will be reviewed. Where required, for the purposes of delivering investigation and recording additional detailed desk-based assessment and/or field evaluation will be carried out and this will inform the development of location specific investigation and recording works (a location specific Written Scheme of Investigation (WSI)). These documents will be developed in consultation with Historic England and the relevant local authority and will follow the objectives set out in the GWSI: HERDS. Para 4.6.2*
- *Works may include the protection and preservation of assets in-situ, investigation and recording in advance of enabling and construction works, and/or the implementation of investigation and recording during enabling and construction works. It may be preferable in some instances to preserve heritage assets where they are found, which may be achieved through design. Para 4.6.3*
- *The location specific WSIs will include individual project plans for specific activities and a programme for heritage work. Where appropriate, the programme will show time periods and sequence of activities as an integrated part of the enabling and construction works programme. Para 4.6.4*
- *Once heritage investigations are complete, then the records generated and the artefacts and samples collected will be assessed and analysed. The results of that work will be published via a range of media and approaches to this work will be developed with Historic England and the relevant local authority. The nominated undertaker recognises the need to deposit the HS2 archaeological and built heritage archive appropriately and is committed to working with Historic England and local authorities to identify suitable repository/ies to enable the deposition of the artefacts and records generated by the HS2 heritage works. The nominated undertaker will deposit the HS2 historic environment archive in an appropriate repository or repositories. Para 4.6.5*

Figure 1: Policy framework relating to the Generic WSI: HERDS



1.5.20 In addition, a series of Information Papers⁶ provide important information on the approaches which define the hybrid Act and Environmental Statement documentation. The following Information Papers provide for Archaeology and Burial Grounds:

- Information Paper E8 Archaeology⁷; and
- Information Paper E12 Burial Grounds⁸.

⁶ Information papers provide important information to those outside the project and also provide a non-technical, accessible and user-friendly guide to HS2 policies and strategies, which define the deposited hybrid Bill and Environmental Statement documentation.

⁷ Information Paper E8: Archaeology. http://assets.hs2.org.uk/sites/default/files/hb_pdf/E8-%20Archaeology_o.pdf

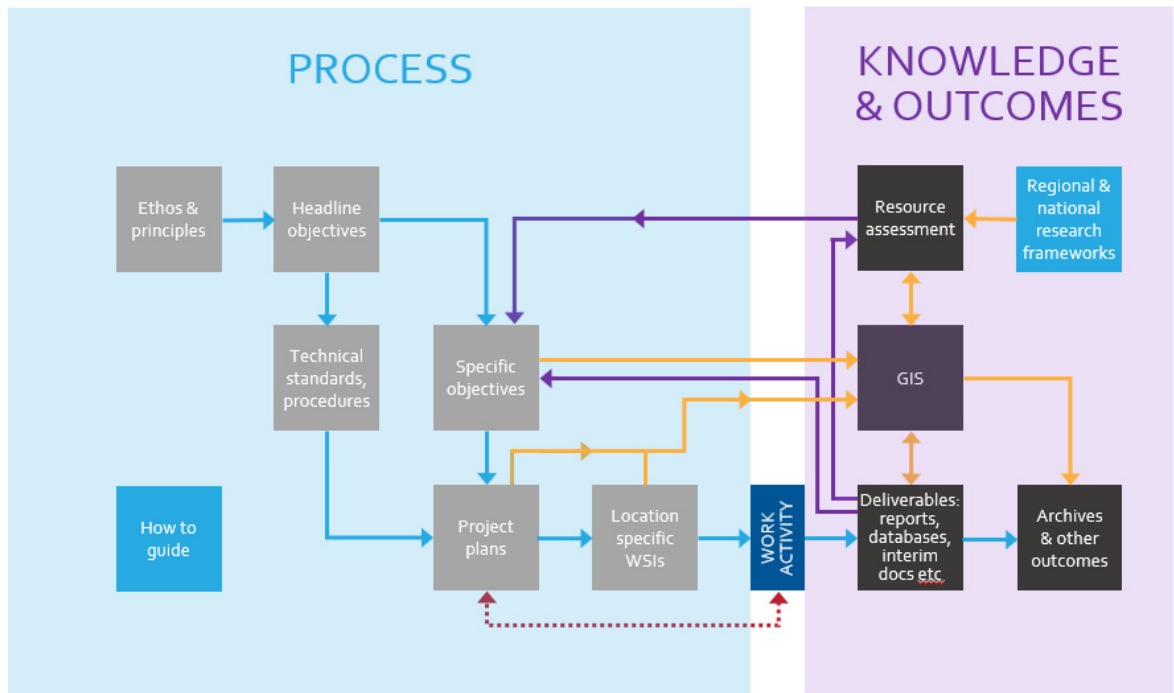
⁸ Information Paper E12: Burial Grounds. http://assets.hs2.org.uk/sites/default/files/hb_pdf/E12%20-%20Burial%20Grounds.pdf

2 Structure of the GWSI: HERDS

2.1.1.1 The *Contractor* is responsible for the design and delivery of all required works within the framework of objectives provided by GWSI: HERDS, and the technical standards and procedures set out in the PRS (see Section 8).

2.1.1.2 **Error! Reference source not found.** outlines the key aspects of the GWSI: HERDS and illustrates the *Employer's* and *Contractor's* responsibilities.

Figure 2: Structure of HERDS



→ Process
 - - - - - → Secondary process
 → Information flow
 → Feedback loop

2.1.1.3 The following describes each element in the above structure:

- ethos and principles – These set out the *Employer's* underlying drivers and principles that have guided the development of the GWSI: HERDS and will continue to guide its development and implementation. See Section 3 for further details;
- headline objectives – These seven key overarching objectives developed by the *Employer* form the building blocks of the GWSI: HERDS and provide a clear sense of direction and purpose for the delivery of the strategy by the *Contractor*. The headline objectives cover the full range of issues addressed by the GWSI: HERDS including knowledge creation, archive and legacy, community involvement, budget and programme. See Section 4 for further details;
- Technical standards and procedures – To ensure consistency and quality across all works, the *Employer* has developed a suite of technical standards and procedures (known as the HS2 Phase One Project Requirement Specification) to be implemented by the *Contractor* in the execution of the works. See Section 8 for further details;

- specific objectives – These form the core of the GWSI: HERDS. They have been developed by the *Employer* and respond to the headline objectives and work with the strategies, specifications and procedures to guide the *Contractor* in the development of project plans and location specific written schemes of investigation (LSWSIs). The specific objectives address knowledge creation, skills, employment and education, and community engagement. The specific objectives are all geospatially referenced and designed to be accessed both spatially and thematically. They have been developed to provide the *Contractor* with sufficient detail to guide implementation without preventing innovation and creativity in the project plans. See Section 6 for further details;
- project plans – For each specific package of activity e.g. a geophysical survey, a building recording survey, archaeological excavation or palaeo-environmental sampling scheme, the *Contractor* will prepare a project plan for agreement with the *Employer*. The project plans will be prepared in response to the specific objectives of the GWSI: HERDS and be delivered by the *Contractor* within the agreed budget and programme;
- location specific WSIs – The *Contractor* will assemble one or more project plans within LSWSIs for areas of land that will largely be defined to meet construction needs. The LSWSIs will be agreed with the *Employer*;
- regional and national research assessments – The *Employer* has reviewed existing research assessments during the development of GWSI: HERDS to identify potential themes and areas for investigation. The *Employer* will update these as and when the relevant regional and national research assessments are updated. See Section 5.2 for further details;
- resource assessment – The *Employer* has undertaken an initial assessment of the known resource within and around the route corridor to inform the development of the specific objectives. This is summarised in Section 5, with further details in Section 6. As the *Contractor* completes their required deliverables (e.g. project plans, LSWSIs, GIS and other reporting) this information will be fed into the resource assessment by the *Contractor* throughout the duration of the works via Progress, Interim and/or the Fieldwork reporting (as agreed with the *Employer*). The purpose of this is to ensure that there is regular feedback to enable informed decision making as the project progresses and the refinement of specific objectives to reflect the increase in knowledge and understanding; and
- Geographical Information System (GIS) – The *Employer* will develop a GIS to be the primary repository and portal for all data arising from the delivery of historic environment works. The GIS will be the primary means of accessing information relating to the historic environment and work along the route. The *Employer* will further develop the GIS and associated BIM requirements for use by the *Contractor*.

3 Ethos and principles

3.1 Key principles and ethos

3.1.1 HS2 is a project of national standing and is promoted by government to address major economic, social and long-term environmental issues in the UK. Its delivery requires innovation and a clear focus on achieving the stated aim of the project to be a catalyst for growth. To achieve its stated aims it must achieve a balance between social, economic and environmental outcomes and must respond to the communities it serves and passes through.

3.1.2 In this broad context all activities undertaken by the *Contractor* in relation to the historic environment along the route will:

- deliver the commitments set out in the hybrid Act, Environmental Minimum Requirements, notably the Heritage Memorandum;
- engage with and involve local communities around the route;
- create knowledge about our shared past that delivers public understanding of that past;
- ensure that the costs/effort associated with delivery are proportionate to the public value of the historic environment resource;
- be innovative and challenging in nature, helping refine and develop new techniques and philosophies in the historic environment sector;
- provide permanent physical and digital archival resources as well as temporary outputs which address the needs of a broad range of audiences;
- provide employment and training opportunities to help develop a skilled workforce;
- establish new benchmarks for quality, innovation and engagement;
- be an exemplar for future major infrastructure projects in the UK and internationally; and
- be delivered on time and within the scheme budget.

3.1.3 The GWSI: HERDS provides an approach that differs in some respects from historic environment works associated with other past major infrastructure schemes in the UK. It is arguable that historically, historic environment investigations associated with the management of the impact of construction have created significant bodies of information of questionable value⁹. Many schemes pursued a standard 'preservation by record' philosophy that reflects the 'rescue' oriented practices from the 1990s and early 2000s. Often this was driven by the programme and procurement approach that left little room for a reflection regarding the objectives and outcomes of the historic environment work. This applies equally

⁹ For example the Rural Settlement of Roman Britain project (<http://www.reading.ac.uk/archaeology/research/roman-rural-settlement>) identified that many partial investigations of sites revealed little or any useful information and that the absence of typical outputs such as site plans prevented categorisation and reduced the value of any interpretations.

to below-ground archaeological investigations and the investigation and recording of standing buildings and areas of historic landscape.

- 3.1.4 This form of approach also tended to result in a considerable archive of material and data being created by investigative works. This form of approach when applied to a project of the geographical scale of Phase One of HS2 could result in vast body of material and data being created. This would require curation and storage on a scale that current facilities are unlikely to be able to address. Additionally, it is questionable whether such a large volume of potentially low value material would be of interest and value to current or future researchers. The sheer physical scale of HS2 Phase One means there has to be a prioritisation of what knowledge is created and therefore what archaeological, built heritage and historic landscape resources are investigated. It also means that there will need to be innovative and sector challenging ways of dealing with the material that is recovered through the investigations.
- 3.1.5 Given the importance of Phase One of HS2 and the resources that will be required regarding the historic environment, it is imperative that it delivers demonstrable public benefit and value. To achieve this the works will focus on:

Creating knowledge, not information

- 3.1.6 Investigatory works will be aimed at answering questions about the past, about how we study the past¹⁰ and about how we should address the past in the future – the works will not record buildings, archaeological remains and landscapes for the sake of recording them before they are removed if that recording would not address identified questions¹¹.

Involving people

- 3.1.7 Delivering government objectives for HS2 will require a broadening of engagement to a range of audiences, including local communities (including traditionally uninterested audiences); national, regional and local amenity societies; academic institutions; and professional practitioners. Involving people is also about involving all layers of professional practitioners, and others, involved in delivering the works in decision making around what is addressed and how questions are answered in the field and how all aspects of the work are delivered. While involvement and decision making will be structured and accountable this will not prevent active discussion and debate around the delivery of work packages and activities.

Establishing a lasting legacy

- 3.1.8 The creation of a valuable project legacy and a physical and digital archive is an integral part of the lasting legacy of the programme of historic environment programme. Creating this

¹⁰ All historic environment practice and research is underpinned by a theoretical basis of some form. There have been many developments, particularly in archaeological theory, over the last 20 years that have not been fully explored within the context of professional practice, particularly on large infrastructure projects. There is a real need for innovation associated with exploring theory as to how we study the past in the field as well as addressing practical and data-driven/high-tech techniques.

¹¹ Examples of current research projects, the questions and themes arising from which may contribute to the strategy include:

- The English Landscapes and Identities project (<http://www.arch.ox.ac.uk/englishlandscapes-introduction.html>) which aims to examine long-term settlement change from the first nucleated settlements of the Middle Bronze Age through to emerging medieval landscapes at the time of the Domesday survey;
- The rural settlement of Roman Britain project (<http://www.reading.ac.uk/archaeology/research/roman-rural-settlement>) which is examining themes of settlement regionalism, change in settlement forms and frequency over time, the consumption of material culture and the economic and social context of rural settlement; and
- The social context of prehistoric non-ferrous metalworking in Britain project (<http://www.bristol.ac.uk/arts/research/projects/the-social-context-of-technology-non-ferrous-metalworking-in-later-prehistoric-northwest-europe>) which aims to understand the social significance of metalworking across regions and across time through an examination of the context of metalworking activities.

archival legacy will require a consistent data-driven approach to the production, management and delivery of archival information and will need the material to be structured such that it can be efficiently shared and reused. It should also help cost planning along the route and any future phases of HS2.

- 3.1.9 Beyond the archive there is also a need to understand the legacy of the project in terms of, for example, the audiences it inspires, the jobs created, skills developed in the sector. The legacy needs to be more than boxes of 'things', pieces of paper and megabytes of data if it is going to have demonstrable public value.

4 **Headline objectives**

4.1 **Introduction**

- 4.1.1 The headline objectives have been established by the *Employer* and are the key overarching objectives of the GWSI: HERDS. They form the basic building blocks of the strategy and support the communication of the aims of the GWSI: HERDS. From these headline objectives, more detailed specific objectives have been established (see Section 6) alongside clear strategies, specifications and procedures for all works (see Section 8).
- 4.1.2 The *Contractor* shall comply with the headline objectives throughout the design, implementation and delivery of all aspects of the historic environment works.
- 4.1.3 The headline objectives cover the full range of issues addressed by the GWSI: HERDS including knowledge creation, archive and legacy, community involvement, and budget and programme. They are relatively broad in nature but at the same time they provide a clear sense of direction and purpose for the GWSI: HERDS.
- 4.1.4 Each objective has a clearly identified focus in terms of knowledge, legacy and involvement.

4.2 **Objectives**

Headline objective 01: Works will address key current and emerging research questions in British archaeology and history

Focus: knowledge and legacy

- 4.2.1 Knowledge creation is a central tenet of the *Employer's* approach to the resourcing and delivery of the GWSI: HERDS. It is therefore essential that the public benefit of the programme is realised by contributing to and exploring key research themes in British archaeology and history. The scale of the scheme and its orientation as a corridor across broad regional topographies and geologies offers the opportunity to explore patterns in the development of the historic environment and cultural change across both wide geographical areas and significant timescales.
- 4.2.2 To realise these benefits, and to reduce investment in limited value works, it is essential that investigations are designed to focus on key research themes that can be addressed in an integrated manner along the route. Recognising research potential within specific landscape, historical, architectural or archaeological contexts is, therefore, key to contributing to a targeted strategy focusing upon advancing understanding, rather than perpetuating existing knowledge through recording heritage assets that may have little research value.

Headline objective 02: Delivery of the works will inspire the next generation of historic environment professionals and stimulate the development of skills in the sector, leaving a legacy of trained professionals and high quality, sustainable training practice

Focus: legacy and involvement

- 4.2.3 Over the last six to eight years there has been a decline in numbers of practising historic environment professionals in the UK, largely due to the global recession and declining uptake

of university places (particularly in archaeology). The reduction in numbers is an issue for the delivery of archaeological and other historic environment projects across the UK, particularly where these relate to major infrastructure schemes. In this environment, the delivery of the HS2 Phase One historic environment works offers the potential to create new jobs in the sector, attract emerging graduates and inspire people to move into the profession.

- 4.2.4 Given the potential public benefit that could be achieved by delivering this objective, the *Employer* has determined that the works will contribute to the development of capacity in the sector; particularly given the need to address similar issues on Phase Two of HS2.

Headline objective 03: A highly accessible and outstanding archival legacy will be developed and actively promoted

Focus: knowledge and legacy

- 4.2.5 The challenges of managing physical and digital archives are well known: with particular pressures on museum storage space for deposited artefacts and the constant advancement in technology and software requiring continual training and management of digital archives to ensure they remain accessible. However, despite these challenges, there exists an exciting opportunity to make the HS2 Phase One historic environment archive more interesting, accessible and purposeful for both lay and professional users.
- 4.2.6 The *Employer* will therefore seek to ensure that a highly accessible archive that is usable, relevant and retains an ongoing purpose and knowledge value is delivered. The development of the archive, in digital form, will commence early in the delivery process to enable early use by a range of audiences. Once established, awareness of the archive will be raised and information on ways to use them for research, display and interpretation will be readily available.

Headline objective 04: New and existing methods of historic environment investigation and practice will be tested and developed and the results used to inform works along the route and beyond

Focus: knowledge and legacy

- 4.2.7 Phase One of Hs2 provides the opportunity to assess and develop existing techniques and strategies for historic environment investigation, including archaeological prospection, built heritage recording and landscape analysis. It will be possible to build upon previous assessments of prospection techniques within commercially-led archaeology for example, the evaluation of archaeological decision making processes and sampling strategies (Hey and Lacey 2001) and to test the ability of existing methods to answer specific research objectives. An example of methods and strategies tailored to specific research objectives can be found in the Heathrow Terminal 5 excavations (e.g. Framework Archaeology 2010).
- 4.2.8 The *Employer* seeks the implementation of new and innovative sampling strategies and prospection techniques that can be tested for their effectiveness in detecting archaeological remains, their form and extent of preservation. Potential exists, for example, for the application and testing of new techniques in geophysical survey and remote sensing technologies. Examples of previous research-led investigations include the 'Where Rivers Meet' project, using innovative geophysical technologies, including Ground Penetrating Radar, to examine the sub-surface form and extent of prehistoric ritual monuments on the

gravels of the River Trent, followed by a programme of ground truthing (Watters 2006; Watters 2006a). Opportunities also exist for testing and developing 3D scanning/ photogrammetric/remote sensing techniques relating to the recording and analysis of standing buildings and existing landscapes.

Headline objective 05: Local communities along the route and a wider audience of lay, professional and academic practitioners will be engaged and involved with the delivery of the strategy

Focus: involvement, legacy and knowledge

- 4.2.9 Establishing and sustaining a collaborative approach to discovering, researching and interpreting the historic environment along the route of Phase One of HS2 is a central tenet of the GWSI: HERDS. This collaboration seeks to go beyond the confines of the *Employer's* relationships with the *Contractors* and encompass relationships with communities along the route and wider lay, professional and academic bodies. There is clear support from the professional and academic community to ensure public and community engagement is of value and allows for meaningful contribution.
- 4.2.10 To achieve this objective, routes to collaboration and engagement will be developed by the *Contractor* in discussion with the *Employer*, as part of the wider community engagement strategy at an early stage.
- 4.2.11 The GWSI: HERDS has been developed with input from a range of professional, academic and lay audiences. This collaborative engagement will continue through the delivery of the GWSI: HERDS with a range of communities being involved in defining and delivering works along the route at an early stage.

Headline objective 06: A diverse range of quality outputs will be delivered across the lifetime of the project. These will address the needs of a broad range of audiences and set new standards for publication and engagement.

Focus: involvement and legacy

- 4.2.12 Typically, historic environment works for major infrastructure schemes result in limited range of outputs, these generally include a physical archive, digital archive, monograph type publication, lay reader type publication and perhaps a temporary exhibition. These outputs tend to emerge at the end of the project following lengthy post-investigation assessment and analysis periods.
- 4.2.13 The *Employer* seeks to take a different approach to the outputs from the Phase One works. The GWSI: HERDS has at its heart the desire to engage a broad range of audiences with the historic environment works along the route. The outputs from the historic environment programme are central to this engagement.
- 4.2.14 The *Contractor* will be required to design and deliver a diverse range of quality outputs throughout the lifetime of the project, not just after in-field investigations have completed.

4.2.15 Outputs may include:

- Television and online shows and programmes;
- Performance and art work exploring aspects of the process;
- Targeted community and national events;
- Primary and secondary school projects and materials aimed at humanities and STEM agendas;
- Establishment of new research networks;
- Strategy-based website/social media outlets throughout the lifetime of the project;
- Digital interactive products to support engagement with digital savvy audiences;
- Specifically developed outreach, research and engagement projects to meet the needs of hard-to-reach communities and individuals including disadvantaged populations, economically challenged areas and 'inner city' audiences;
- Temporary and/or permanent fixed/travelling exhibitions drawing on the physical material and interpretation of the investigations;
- Robust and highly accessible digital archive;
- Fully curated and sustainable physical archive;
- Range of location specific technical reports relating to work activities, published digitally;
- Range of route-wide technical reports relating to work activities published digitally; and
- Stimulating and intellectually challenging synthetic publications that provide material for academic and lay audiences, published in a mixture of hard copy and digital forms.

Headline objective 07: All historic environment activities will be delivered within defined cost and programme parameters and demonstrable public benefit will be achieved through the investment in these activities

Focus: legacy

4.2.16 Programme and resourcing are critical factors for the *Employer*, consequently the *Contractor* shall design and deliver the historic environment programme within clear programme and budget parameters and this shall be set out in the project plans and LSWSIs.

5 Resource assessment: overview

5.1 Introduction

5.1.1 The resource assessment synthesises the known heritage resource along the route from London to Birmingham and Lichfield and identifies known gaps in knowledge. The assessment has been defined principally from the Environmental Statement documents, and subsequent Supplementary Environmental Statements. The synthesis has formed a significant component in the development of key research themes and questions (see Section 5.4), alongside an analysis of regional and national research agendas (see Section 5.2 and [Appendix A](#)) and the results of a series of discussion workshops held with representatives of the heritage sector. The aim of the assessment process has been to provide a starting point for the development of a series of specific objectives, which will form the framework for historic environment investigation and knowledge creation along the route.

Identifying regionality and recognising bias

5.1.2 In identifying the known historic environment resource and defining regional characteristics across archaeological and historic periods, it is important to note a number of potential and inherent biases in the data. Differential geological conditions may, for example, introduce bias into the distribution of known cropmark sites such as settlement enclosures and land divisions, where they are more or less conducive to the formation of cropmarks. Similarly alluvial and colluvial deposits may seal and mask earlier archaeological deposits. Differential land use, such as arable and pasture, may introduce bias into the identification and known distribution of artefacts, such as those from fieldwalking, where some regions have been historically less suitable for such investigation. Urban and sub-urban development will also have introduced bias into the archaeological record, not only by masking and removing deposits but by increasing the frequency of past developer funded investigations.

5.2 National and regional research objectives: an overview

5.2.1 A concise summary of existing published national and regional research objectives is presented below and a more detailed synthesis of the existing national and regional research objectives is presented in Appendix A. The national frameworks for research are period-based and thematic. The regional frameworks set out research priorities by historical and archaeological period. The research priorities across the regions are many and varied, although common themes can be identified. The proposed HS2 Phase One route traverses a number of regional research framework geographic areas, which include:

- London and Greater London;
- The East of England;
- The South of England (the Solent-Thames Research Framework);
- The East Midlands; and
- The West Midlands.

5.2.2 The national and regional research priorities provide a context for the resource assessment and feed into the key research themes (Section 5.4 below).

National research priorities

- 5.2.3 Common themes have been identified across these agendas, which are discussed in Appendix A, and include social organisation, people and society, landscape and settlement subsistence and industrial economies, past environments and key transitions. The existing national research priorities are summarised below, period by period.

Palaeolithic

- 5.2.4 National and thematic research priorities for the Palaeolithic in Britain focus principally upon forming models of human occupation through palaeo-environmental, geomorphological and artefactual data. The Historic England draft *Research Strategy for Prehistory* (2010) emphasises the reconstruction of Pleistocene and Early Holocene landscapes, key transitions, human responses to environmental change and human interactions with the environment in prehistory (English Heritage 2010). This echoes research themes detailed in the *Research and Conservation framework for the British Palaeolithic*, where the improvement in our understanding of the formation and chronology of the British Pleistocene record is also stressed (English Heritage 2008).
- 5.2.5 The Ancient Human Occupation of Britain project (AHOB) highlights the need to focus upon natural factors controlling human dispersal, population dynamics and human responses (<http://www.ahobproject.org>). Seven key periods for the Palaeolithic are defined by the AHOB project, focusing upon environmental transitions and phases of human occupation, absence and re-colonisation.

Mesolithic

- 5.2.6 National perspectives on the Mesolithic have highlighted environmental change and responses to environmental conditions, mobile subsistence strategies and variation in the use and deposition of lithic technology as themes which would contribute to a greater understanding of the period (Milner and Blinkhorn 2013).

Neolithic and Bronze Age

- 5.2.7 The English Heritage *Research Strategy for Prehistory* includes a number of themes relevant to furthering the understanding of the Neolithic and Bronze Age. These include regional diversity in prehistory, mobility and sedentism in prehistoric agricultural societies, characterising and contextualising prehistoric sites and monuments, integrating research across different landscape zones, understanding ploughsoil archaeology, the place and role of the dead in prehistory and human responses to environmental change.

Iron Age

- 5.2.8 National themes for the Iron Age include refining existing chronologies for the period, exploring settlements, landscapes and the population of the period, identifying and defining regionality and recognising and defining key processes of change (Haselgrove *et al.* 2001).

Romano-British

- 5.2.9 National themes for understanding the Romano-British period include understanding Roman-period landscapes, defining and understanding key transitions and the context of human interaction with the environment and change (English Heritage 2012). Themes of Romanisation and rural settlement have been highlighted previously (James and Millet 2001)

and have been the subject of the recent Rural Settlement of Roman Britain project (University of Reading).

Early Medieval

- 5.2.10 The transition from late Roman Britain and the extent of continuity in the landscape is one of the key themes for current research with recent studies undertaken on field and landscape boundaries and environmental evidence (e.g. Rippon *et al.* 2013). The impact of Germanic migration on ethnic British communities and the ethnic and cultural identity of the Anglo-Saxon population has been the subject of recent multidisciplinary studies combining burial archaeology with genetic and isotopic studies. Burials have also been used to advance radiocarbon dating methods (Baylis *et al.* 2013). The origin of the fully developed Medieval landscape, particularly the champion areas of nucleated villages and open fields lie in the Saxon period and this continues to be an area for research (e.g. Hall 2015).

Medieval

- 5.2.11 The importance of combining archaeological study with historical research has been emphasised by the Medieval Settlement Research Group (2007). Further key themes for research include a focus upon dispersed settlement and the relationship between settlement and the natural environment (*ibid.*).

Post-Medieval

- 5.2.12 Understanding the development of early industry from the 16th to the 18th century has been emphasised as a research theme alongside the shift from domestic-based industry to factory-based production (English Heritage 2010). The impact of industrialisation, both in the development of towns and cities, transport and communication infrastructure but also in the extractive industries is another key theme (*ibid.*).

Regional research priorities

Palaeolithic

London

- 5.2.13 For London, research priorities focus upon establishing clear chronologies and reconstructing geomorphology, the palaeo-environment including faunal development, in order to more fully understand the context of human settlement. Improving models of Palaeolithic site formation and post-depositional modification are seen as an important means of understanding the potential for identifying remains of this period.

Solent-Thames

- 5.2.14 Research themes highlighted for the Solent-Thames region (including Buckinghamshire and Oxfordshire) also focus upon a fuller understanding of environmental contexts and periods of climatic change, and their relationship with processes of human colonisation. The need to develop models of human behaviour at both a site and landscape level is also emphasised.

East of England

- 5.2.15 A greater understanding of landscape exploitation and social structures may be achievable through programmes of fieldwalking for the Upper Palaeolithic. Activity in river valleys could be better understood by a broader understanding of surrounding landscapes. Seasonality in

patterns of settlement may be able to be explored where well-preserved palaeo-environmental remains are identified. The potential of deep-lying channel deposits for palaeo-environmental, faunal and artefactual evidence is highlighted for the Lower and Middle Palaeolithic in the East of England (Medlycott 2011).

East Midlands

- 5.2.16 For the East Midlands themes of presence and absence of human occupation within defined chronological periods are stressed for the Lower and Middle Palaeolithic. Identifying 'open air' sites and understanding patterns of movement within the Upper Palaeolithic have also been emphasised.

West Midlands

- 5.2.17 A fuller understanding of Pleistocene palaeo-environments particularly within river gravel contexts has been emphasised for the West Midlands region, including the development of predictive modelling. The importance of developing methods for the identification of Upper Palaeolithic 'open air' sites is also stressed.

Mesolithic

London

- 5.2.18 Geomorphological mapping and predictive modelling has been emphasised as a significant means of identifying potential locations of human activity for London. Explaining the gap in knowledge for the Late Mesolithic is also highlighted.

Solent-Thames

- 5.2.19 The identification of settlement forms the key theme for this region. Creating models of settlement in the Mesolithic for the Solent-Thames region could potentially be enhanced through fieldwalking programmes, and the investigation of potential colluvial and alluvial masking deposits. Palaeo-environmental and geoarchaeological sampling could also contribute to understandings of both settlement location, frequencies of occupation and seasonality.

East of England

- 5.2.20 The need to understand more fully Holocene environmental change for the East of England has been emphasised, which would place Mesolithic settlement into a broader environmental context.

East Midlands

- 5.2.21 Identifying and understanding transitions from the Late Upper Palaeolithic to the Early Mesolithic and from the Later Mesolithic into the Early Neolithic has been highlighted as a theme for the East Midlands. The need for a greater understanding of spatial distributions of activity in the Mesolithic along with identifying the location of sites which may have been masked through alluvial or colluvial deposits has also been stressed. Identifying episodes of woodland clearance through palaeo-environmental data has also been highlighted as significant for furthering our understanding of this period.

West Midlands

- 5.2.22 Identifying the location and spatial distribution of Mesolithic activity again provides the principal theme for furthering the understanding of the Mesolithic period for the West Midlands region, through both surface collection and ploughsoil sampling and the identification of Mesolithic material on later sites.

Neolithic and Early Bronze Age

London

- 5.2.23 Themes for the Neolithic and Bronze Age in London focus upon settlement and monuments. The need for a greater palaeo-environmental record to facilitate the understanding of the subsistence economy and a better understanding of settlement sites are highlighted. The potential significance of river confluences for the location of monuments and funerary and ceremonial activity is also noted.

Solent-Thames

- 5.2.24 Regional variation in both monument form and distribution and settlement character are highlighted for the Solent-Thames region. A greater understanding of landscape use, settlement and agriculture may be achieved through the identification of significant palaeo-environmental sequences. Achieving a greater understanding of sequences of activities at monuments, their dating, landscape context and relationship with both settlement and other monuments are all stressed. A greater understanding of specialised activities, including trade, exchange, craft and industries and the function and date of distinctive site types such as burnt mounds are also highlighted.

East of England

- 5.2.25 For the East of England the development of agriculture and fixed settlement sites is highlighted alongside the identification of areas of activity, such as flint scatters or pit groups, which are less visible than monuments in the archaeological record. Areas of masking such as colluvial deposits are highlighted for further investigation. The relationship between settlement and monuments is also highlighted as a theme that requires further understanding.

East Midlands

- 5.2.26 Themes of settlement and landscape have been emphasised for the Neolithic and Bronze Age in the East Midlands, including settlement and monument location, the adoption of agriculture and the continuity of hunter gatherer subsistence strategies. The need to more fully understand networks of trade and exchange through raw material resources has also been stressed.

West Midlands

- 5.2.27 The identification and recognition of Early Neolithic monuments is a theme which is highlighted for the West Midlands alongside a greater understanding of the spatial variation of activities. Lithic scatters for the Early Neolithic, for example, may be identifiable through specifically designed field survey techniques. The identification of monuments for the Late Neolithic and Early Bronze Age, their regional distribution, landscape context, chronology and sequences of activity are stressed alongside a greater understanding of the spatial

relationships between groups of monuments. The importance of radiocarbon dating for the understanding of monument chronologies is also highlighted.

Later Bronze Age and Iron Age

London

- 5.2.28 For London, for the Later Bronze Age and Earlier Iron Age, themes include exploring processes of agricultural intensification from the Later Bronze Age and potential links with production and consumption. For settlement the relationship between riverine environments and potentially associated settlements is highlighted as is the relationship between distinctive Late Bronze Age ring forts and Later Iron Age settlement at hillforts. Along with studying ceramic and metalwork material culture, a greater understanding of seasonal craft activities is highlighted. For the Late Iron Age and early Roman period, the influence of pre-Roman settlement on the foundation of Roman London is highlighted as a key theme, alongside themes of regionality and renewed agricultural intensification.

Solent-Thames

- 5.2.29 Potential gaps in knowledge through fieldwork bias in areas, for example, which are not conducive to cropmarks is highlighted in the Solent-Thames research framework, as is the identification of environmental change, and the need for greater chronological resolution within the period. The palaeo-environmental record has the potential to contribute to themes of landscape and land use. The origin of field systems and the potential for seasonal settlement are highlighted, along with the further understanding of large-scale land division, the development of domestic architecture, sub-regional distinctiveness within material culture and patterns of exchange. The evidence for ceremony and ritual in the period is varied and a greater understanding of both burial practice and the final use and construction of funerary monuments in the Bronze Age is highlighted.

East of England

- 5.2.30 The transition between the Iron Age and the Roman period is considered a key focus for the East of England. Areas for further understanding include the establishment of field systems, and the extent of cultural continuity including building styles.

East Midlands

- 5.2.31 Understanding regional variability in settlement patterns for the Late Bronze Age and Iron Age including the broader landscape of field systems and other landscape boundaries has been emphasised for the East Midlands. Further study of the production, distribution and use of artefacts can also contribute to a greater understanding of trade, exchange, identity and status in the period.

West Midlands

- 5.2.32 For the West Midlands the use of scientific dating to refine regional chronologies has been highlighted. Palaeo-environmental investigation has the potential to contribute to themes of landscape change. Gaps in knowledge, for example a lack of Later Bronze Age settlement evidence may be addressed by examining the contexts of burnt mound sites through non-intrusive survey. Other later prehistoric settlement sites may be identifiable through similar

methods. There is also a need to examine regionality through the development of regional models in addition to recognising material culture from other regions.

Romano-British

London

- 5.2.33 Research themes for Roman London include investigating continuity between the Iron Age and Roman period and the extent of change, understanding how *Londinium* interacted with its hinterland, the demographics of London and its social and ethnic identities, identifying the economic character of different parts of the region through production, consumption and distribution.

Solent-Thames

- 5.2.34 Palaeo-environmental evidence can contribute to a greater understanding of the regional variations in agricultural regimes and cultivation and the function of field systems in the period. Exploring settlement types may be a means of further understanding social organisation and there is a need to characterise settlement beyond the Thames valley, in areas characterised by chalks, heathlands and claylands. Attention upon ceremonial and ritual sites including temples and burials includes a greater focus upon populations through scientific techniques, the absolute dating of later burials and the landscape context of temples and artefacts. For material culture questions focus upon exploring social identity, markets and settlement hierarchies. There is a need for a greater understanding of craft, trade and industry, in terms of the settlement context of known pottery industries, the use and import of stone and iron making. Focus on communications and trade include both mechanisms of long distance trade and the influence of Roman roads.

East of England

- 5.2.35 Regional variation, the changing agricultural economy and rural settlement, continuity and change with the preceding Iron Age and the Roman/Saxon transition are themes highlighted for the East Midlands. In addition a greater understanding of the Roman road network may contribute to a fuller understanding of networks of trade. A greater understanding of the form, organisation and consumption patterns of small towns is also highlighted as a research theme.

East Midlands

- 5.2.36 For the East Midlands alongside establishing greater chronological resolution within the period research themes focus upon the military impact including continuity and change and the growth of urban centres along with understanding rural settlement patterns and the agricultural economy. Identifying exchange networks can be achieved through artefact studies along with a greater understanding of social identity. Continuity and change may be more greatly understood through the study of Roman roads, ritual sites and the influence of existing practices in the Late Iron Age upon these.

West Midlands

- 5.2.37 The extent of Romanisation within the West Midlands region has been questioned, identifying regional zones through social structures, environmental evidence, artefact use and deposition.

Early Medieval

London

- 5.2.38 A number of research themes have been highlighted for the Early Medieval settlement of London or *Lundenwic*. These include a greater understanding of rural land use, the size and character of *Lundenwic* and the relationship between the principal settlement and surrounding settlements, town and country. A greater understanding of transport networks in the period could contribute to the understanding of the economy in the period. The influence of natural events such as floods and climatic change upon settlement requires greater understanding. The character of society in this period would be better understood by exploring themes of identity and ethnicity, religion, belief and status.

Solent-Thames

- 5.2.39 Assessing the interface between Romano-British period and the Anglo-Saxon period is a key theme, including the recognition of changing ethnicity and identity. The evidence for occupation at sites of Later Medieval settlement is a key theme at sites both with and without documentary evidence. Changes in landscape and land use are also seen as a priority including the recognition of agricultural intensification and the development of open field systems in the later Anglo-Saxon period. The extent to which this period forms a legacy for the Medieval period is another key area of research, including the development of settlements and the formation of villages in this period alongside the development of a system of local churches.

East of England

- 5.2.40 The East of England reflects a national picture of a lack of archaeological evidence for this period, the absence of material culture for the post-Roman period in Hertfordshire has been highlighted. The morphology of settlement sites is also emphasised as a key theme, as is a greater understanding and synthesis of sites that span the Roman and Anglo-Saxon periods.

East Midlands

- 5.2.41 Can different political and social groups be identified in the region for the period and can social and political boundaries be defined in the landscape? There is a lack of information upon the location of cemeteries in the period and variation in burial practice. A recurring theme across regions is the extent to which Roman roads were used in the Early Medieval period. The extent to which these routeways, along with significant river systems, acted as both communication routes and social and political boundaries can also be questioned. Systems of trade and exchange and patterns of material culture distribution may contribute to the understanding of variation in social status. There is a lack of clear evidence for settlement patterns and the morphology of settlement and a further understanding of the development of agricultural systems in the period is required.

West Midlands

- 5.2.42 Identifying variations in ethnicity is a key theme for understanding Early Medieval society in the West Midlands region alongside the identification of rural settlement. It is suggested that locations where a both Romano-British and Medieval settlement exists may provide evidence of settlement continuity through the Early Medieval period. The identification of systems of wider land use is also emphasised as a priority.

Medieval

London

- 5.2.43 Placing Medieval London into its regional context and the use of documentary sources alongside archaeological research have been emphasised. Specific areas requiring further understanding include identifying varying social status and different ethnic and functional social groups in London and distinctive patterns of consumption. A greater understanding of rural settlement and the impact of the Black Death have also been highlighted.

Solent-Thames

- 5.2.44 For the Solent-Thames region key research aims include a greater understanding of the organisation of landscape including field systems, ridge and furrow, deer parks and boundaries, along with water management systems. The origins, development and form of settlements, both nucleated and dispersed is also emphasised including village shrinkage and the origin of manorial sites. Identifying the location of craft production sites is emphasised along with the spatial range of industry and systems of transportation. It is highlighted that testing evidence from documentary sources against physical remains may contribute to a fuller understanding of the period. It may also be possible to tie in chronological patterns of building development with key historical events such as the Black Death.

East of England

- 5.2.45 Settlement and landscape forms a key focus for further research in the East Midlands. A greater understanding of regional and landscape variation in the form of settlements has been highlighted along with examining the function of individual buildings. Within the wider landscape the size and shape of field systems and their relationship with potentially different agricultural practices is not well understood. A greater understanding of trade and exchange including the pottery industry is emphasised along with the identification of communication routes. Exploring the impact of climate change may provide a broader context for the understanding of social and economic change in the period.

East Midlands

- 5.2.46 Settlement character and form, landscape organisation and communication form key research themes for the East Midlands. Further understanding is required for rural settlement morphology, the development and structure of manorial estates, the development of the open field system, woodland management and the regional communications infrastructure that tied these settled landscapes together.

West Midlands

- 5.2.47 Themes for the West Midlands focus upon forms of settlement, populations and the influence of the church. Key areas for research include the origins of villages and the desertion and shrinkage of rural settlements, the role of towns in the wider landscape and defining the hinterlands of urban centres, along with the organisation of trade. The population of the period may be better understood through study of groups of skeletal remains. Understanding the relationships between monastic sites and their wider landscape is also highlighted.

Post-Medieval/Modern

London

- 5.2.48 The development and expansion of London in this period has raised a number of research questions. Key themes include the social and economic origins of changing house design, public and civil infrastructure and the consequences of infrastructure development on local populations. A greater definition of social, economic, religious and ethnic regions in London across the period is required. In addition to themes on the organisation of space through changes in the built environment, the relationship between London and surrounding areas is highlighted through themes of agricultural production and the relationship between London and small towns.

Solent-Thames

- 5.2.49 Understanding changing landscapes and land use in the period for this region has been emphasised as a key theme. Research questions include exploring the origins of fields and changes in agricultural practice and the impact of large towns and industry. The relationship between nucleated settlement and dispersed farms and hamlets may contribute to a greater understanding of settlement patterns. Social organisation can be explored through, for example, population movements and recognising social hierarchy. Cultural variation may be identifiable through the built environment of urban and rural settlement, along with the influence of London upon regional building styles.

East of England

- 5.2.50 Changes in the form of the landscape are emphasised for the East of England, from the enclosure of common land to the establishment of military bases. The development and character of rural industry and the influence of significant communication routes upon the development of the region are also highlighted. Changes in society following the dissolution and the rise of nonconformism are further themes highlighted.

East Midlands

- 5.2.51 Research themes for the East Midlands include broad scale landscape change, including processes of agricultural improvement and the industrialisation of agriculture. Further themes include the development of industry and its impacts upon settlement and the landscape. Understanding the role of rivers on transport infrastructure has also been highlighted.

West Midlands

- 5.2.52 Research themes highlighted for the West Midlands focus upon identifying social change through both developments in industry and the enclosure of rural landscapes. Themes of identity, consumption (both material goods and ideas) and the role of the West Midlands in global trade, exchange and development are explored.

5.3 Period-based review

- 5.3.1 The resource assessment set out below summarises the known heritage assets along the route with a concise period-based review drawing out key areas of significance. Fuller period-based narratives placing the sites into their regional and national context are contained in [Section 11](#).

Palaeolithic (c.800,000-10,000 BC)

- 5.3.2 The archaeological record for the Palaeolithic is characteristically scarce. Where evidence has been identified this is characterised by worked stone artefacts, faunal remains and palaeo-environmental data, although rarely in combination and *in-situ* Palaeolithic sites are extremely rare. Pleistocene environmental change and geomorphological processes have profoundly affected the distribution and visibility of surviving Palaeolithic sites.
- 5.3.3 The Palaeolithic record is dominated by evidence recovered from former riverine environments, typically floodplain deposits and river terrace sequences (Pettitt and White 2012, p.108). Other environmental contexts can also be identified which also have potential for the recovery of artefactual, faunal and palaeo-environmental remains, including glacial tills, fluvio-glacial deposits, 'clay-with-flints', reworked loessic or aeolian deposits, often known as 'brickearth', and 'head deposits' or solifluction gravels.
- 5.3.4 There is a general paucity of evidence for the Lower Palaeolithic and the Lower to Middle Palaeolithic transition and it has been noted that even within inter-glacial stages which are better represented nationally, the distribution of evidence is not uniform, with a lack of evidence in the Midlands contrasting with the South and East of England.
- 5.3.5 Conclusive evidence for human activity becomes very limited nationally from c.245-186 thousand years ago (Ka), in the Middle Palaeolithic, and there appears to have been a prolonged hiatus in occupation between c.186 and 60 Ka.
- 5.3.6 The Upper Palaeolithic is poorly represented nationally and is most prominently attested to by cave sites and sporadic flint scatters or isolated findspots in secondary contexts. Open air sites with *in-situ* artefactual and/or faunal remains are exceptionally rare in Britain.

Palaeolithic evidence in the study area

- 5.3.7 The major river systems active throughout the Pleistocene, including the Bytham (alternatively termed the Ingham) and the Thames, their tributaries and other minor drainage systems have the potential to provide evidence for the Palaeolithic period. The location and depth of former channels of these river systems are not fully understood. The route of HS2 will intersect with the projected course of the Bytham River north of Cubbington and may provide an opportunity to identify this former river system. The route of HS2 will also cross areas containing Pleistocene deposits attributed to the Thames drainage system within CFA01 (Euston) and CFA07 (Colne Valley). Other riverine locations that have potential for Palaeolithic deposits include the Colne Valley (CFA07), the Misbourne Valley (CFA08) and the Thame and its tributary systems extending through the Aylesbury Vale region of Buckinghamshire (CFA11-12). Pleistocene faunal remains were recovered during 19th and early 20th quarrying at Locke's Pit (SMA042) between Walton Court and Hartwell, possibly from primary contexts within the terrace gravels, and it is possible that buried land surfaces may survive within the extent of the scheme in this area. At present, it is uncertain if any contiguous or associated deposits extend into the route of HS2. Areas of the Chilterns containing head deposits and clay-with-flints (CFA08, CFA09) may also have potential for Palaeolithic deposits and Upper Palaeolithic deposits have been recorded at Birmingham City Centre in the vicinity of Curzon Street.

Key high level questions and areas of research

5.3.8 The national and regional resource assessments and the assessment of Palaeolithic evidence within the study area have identified a number of research questions and themes. Key areas for further research include:

- Understanding Pleistocene environmental change;
- Exploring the relationship between human occupation, the natural environment and climatic change and identifying phases of abandonment, re-colonisation and occupation;
- Identifying palaeo-environmental and archaeological deposits within major river valleys, particularly the pre-Anglian river systems and understanding complex Pleistocene geomorphology; and
- Identifying and understanding Palaeolithic deposits and human activity away from the major river valleys.

The Mesolithic and Earlier Neolithic (c.10,000-2,900 BC)

5.3.9 The earliest Mesolithic sites in the British Isles date to around the 8th millennium BC and consist of a string of early hut structures along the coast of northeast England and southwest Scotland, such as Howick in Northumberland, East Barns in East Lothian, and most recently Echline, on the River Forth.

5.3.10 Beyond these locations the archaeological evidence for Mesolithic activity in Britain principally consists of lithic material, often recovered as isolated, chance finds in secondary contexts and occasionally larger assemblages in the form of residual scatters identified during fieldwalking and excavation. Primary context sites with *in-situ* evidence are very scarce nationally. The distribution of known sites and residual artefacts suggests a preference for areas of elevated terrain close to water sources.

Mesolithic evidence in the study area

5.3.11 Notable evidence for Mesolithic activity has been recorded within the Colne Valley (CFA 07). The clay-with-flints strata of the Chilterns (CFA08) and the Hampshire Greensand belt have also produced evidence for Mesolithic activity. Occupation close to watercourses has been recorded at a number of locations in the West Midlands, including at Wishaw Hall Farm on the line of the M6 toll road (Powell *et al.* 2008) and Sandwell Priory, West Bromwich (Hodder 1991). In Birmingham *in-situ* Late Upper Palaeolithic and Mesolithic palaeo-environmental deposits have been identified beneath post-Medieval deposits (Higgins and Score 2009) in the vicinity of the former Curzon Street station, and it is possible that these deposits may extend into the route of HS2.

5.3.12 There may also be an elevated potential for encountering evidence of Mesolithic activity within other riverine locations traversed by the route of HS2, for example, within the floodplain deposits and higher ground overlooking the Thames Valley system (CFA06), the Misbourne Valley (CFA08), the River Ray, the Thame (CFA11), and the upper slopes of the River Great Ouse and the Cherwell and further north at the Rivers Itchen, Tame and Cole in, Warwickshire and tributaries of the Tame and Trent, Staffordshire. It is possible that Mesolithic activity sites located within such environments may be buried beneath alluvial deposits.

Earlier Neolithic evidence in the study area

5.3.13 Earlier Neolithic communities were the first to leave their mark prominently on the landscape, through the construction of monuments. The extent to which mobile subsistence strategies continued from the Mesolithic into the Earlier Neolithic period is a subject of research and debate. Evidence for settlement remains elusive and largely defined by occasional pits, postholes and surface scatters.

5.3.14 The Thames Valley contains a relative abundance of evidence for Earlier Neolithic activity (Bradley 2014), although the extent to which this is a reflection of the high levels of archaeological investigation, principally gravel extraction but also housing development, carried out in this region is unclear. Earlier Neolithic funerary monuments have been recorded on the Chiltern Scarp and in the Colne Valley. The Clay-with-flints and Greensand belt geologies are notable in having produced assemblages of worked flint suggestive of increasing levels of settlement in this area. Earlier Neolithic activity has been recorded in the Thames Valley in Oxfordshire, suggesting contemporary remains might be expected elsewhere along its course.

5.3.15 In the Midlands a high density of cropmarks have been recorded in the Trent Valley, some of which may relate to Early Neolithic activity, on the basis of both morphological identification and radiocarbon dating. The central part of the West Midlands, however, is characterised by a paucity of Earlier Neolithic monuments (Garwood 2011). This may be a result of soils that are not conducive to the production of cropmarks and areas of alluvial masking (*ibid.*). Extensive urban areas may also have affected the survival, identification and visibility of any remains. Numerous sites in the general vicinity of the HS2 route have revealed Earlier Neolithic pits and lithic assemblages suggestive of settlement activity (within CFA7, CFA8, CFA9, CFA10, CFA11 and CFA15), although few monuments are recorded in close proximity to the route. This indicates that despite a lack of monuments, evidence for activity in the Neolithic may still be present in the landscapes covered by the route. The extent to which activity within these landscapes differ from those with a clearer presence of monumental architecture is unclear (*cf.* Bradley 2014).

Key high level questions and areas of research

5.3.16 The national and regional resource assessments and the assessment of Mesolithic and Earlier Neolithic evidence within the study area have identified a number of research questions and themes. Key areas for further research include:

- Understanding human responses to environmental conditions in the Mesolithic and Earlier Neolithic;

- Identifying the spatial distribution of activities in the Mesolithic and Earlier Neolithic and understanding the frequency of activity at specific locations;
- Understanding the frequency of mobility within settlement patterns between the Late Mesolithic and Earlier Neolithic; and
- Understanding the relationship between settlement and monuments in the Earlier Neolithic.

The Later Neolithic and Early Bronze Age (c.2,900-1,500 BC)

- 5.3.17 The Later Neolithic and Early Bronze Age are characterised by a range of distinctive monument types, ranging from timber circles, stone circles, henges, single Beaker burials, round barrows and ring ditches with funerary rites showing a general trend from inhumation to cremation in the Early Bronze Age. Round barrows are largely identified in upland and pastoral regions where they have not been truncated through ploughing, whereas in the lowlands barrows are often identified as ring ditches which may have originally surrounded a since ploughed out mound. Other monument types may also be identifiable as cropmarks from the air. In contrast, evidence for domestic settlement, settlement structures and settlement sites is extremely limited and discussions on settlement have focused on both factors of preservation, systems of mobility and the role of monuments in structuring settlement space and mobility. The interpretation of settlement location at a broad scale in the landscape is, therefore, largely based upon the presence of artefacts in the landscape including lithics and metalwork alongside the distribution of ritual and funerary monuments. Palaeo-environmental evidence suggests a landscape increasingly cleared of woodland with some, albeit limited, evidence for arable agriculture.
- 5.3.18 The period witnessed the development of metalwork from copper and gold through to Bronze. The earliest metalwork in southern England is associated with early Beaker burials including copper artefacts and gold ornaments. Early Bronze Age artefacts may be associated with burials, but are also found as occasional stray finds more broadly within the landscape. There is no certain association between settlement and metalwork for this period and the relationship between metal artefacts recorded in the landscape and the location of settlement is unclear.
- 5.3.19 Settlement evidence for the period across much of Britain is difficult to identify and often insubstantial in the form of pits, gullies or artefact scatters suggesting transient systems of occupation. The relationship between settlement and funerary monuments is not fully understood. Settlement remains have been regularly recorded beneath round barrows, for example, but it is not clear if such activity was a prelude to funerary and ceremonial development at the sites, or representative of a wider pattern of settlement.
- 5.3.20 There is a lack of evidence for Later Neolithic and Early Bronze Age funerary monuments across broad areas of the route and question marks over the dating of many known sites. Regions such as the Chilterns and Misbourne Valley appear to have greater potential for the presence of lithic artefacts, contrasting with a lack of monuments. It is uncertain, however, whether the lack of identified monuments is a result of bias in the archaeological record or reflects genuine differences in the location and nature of activities in the past. There is a general lack of palaeo-environmental data for the period, which would help interpretations of the settled landscape where evidence for settlement is particularly insubstantial.

- 5.3.21 Much of the evidence for this period within Greater London has been recorded from the gravel terraces of the Thames and much less evidence has been recorded from the north London clays (Lewis 2002; Brown and Cotton 2000; Nixon *et al.* 2002). There is a notable lack of monuments within the central Chilterns, the Chiltern dip-slope and the Misbourne Valley when compared to regions further south such as the Thames Gravels or the Wessex chalkland (*cf.* Bradley 2014). In the West Midlands there are concentrations of Early Bronze Age activity and clusters of monuments on the Warwickshire Avon and in Staffordshire at the Trent-Tame confluence and at Wolvey, north-east Warwickshire (Garwood 2011).
- 5.3.22 Within the HS2 route there is a lack of evidence from the London clays for the presence of monuments and previously excavated cremation urns in the area between South Ruislip and Ickenham is the southernmost indication of funerary activity of this period. Ring ditches have been recorded within the Colne Valley, between Waddesdon and Quainton and north of Chetwode. Possible ring ditches have been recorded north of Newton Purcell and within the Greatworth to Lower Boddington area. Further north some possible ring ditches have been identified from aerial photography west of Coleshill and to the north of the River Tame near Curdworth. Cropmark ring ditches have been identified at the north part of the scheme around Kings Bromley (CFA22), at the margins of well-recorded monument complexes recorded at the Trent-Tame confluence.
- 5.3.23 Evidence of occupation in the wider landscape is recorded through the relatively widespread presence of artefacts, including lithic scatters, recorded across many of the areas along the route. This has the potential to show regional variation in the intensity of activities during the period, albeit with potential patterns of recovery bias. Areas where lithic scatters are regularly recorded include the Clay-with-Flints geology (including with areas of the Chiltern dip-slope and Misbourne Valley) and the Colne Valley. A lack of lithic artefacts has been highlighted for the central part of the West Midlands (Garwood 2011). Flintwork has been recovered during fieldwalking in a number of locations in the central Chilterns, Dunsmore, Wendover and Halton and Stoke Mandeville and Aylesbury (SMA027; SMA034). Further north, flintwork has been recorded within Greatworth to Lower Boddington and some residual flintwork has been recorded at Coleshill from the ridge top of the town and within the valley.

Key high level questions and areas of research

- 5.3.24 The national and regional resource assessments and the assessment of the Late Neolithic and Early Bronze Age evidence within the study area have identified a number of research questions and themes. Key areas for further research include:
- Understanding the degree of settlement mobility, identifying and defining settlement location and subsistence strategies;
 - Identification of areas of activity which are less visible than monuments;
 - Contextualising monuments, their landscape context and relationship with settlement; and
 - Defining regionality and zones of activity in the landscape.

The Mid to Late Bronze Age and Iron Age (c.1,500 BC-AD 43)

- 5.3.25 This period encompasses the transition from the Middle Bronze Age (c.1,500-1,100 BC) through the Late Bronze Age (c.1,100-700 BC) to the Early (c.700-400 BC), Middle (c.400-100 BC) and Late (100 BC-43 AD) phases of the Iron Age. There is a degree of continuity archaeologically through the period, making it difficult to discuss trends generally without reference to what came before or after. Within these identified general trends there are of course regional and sub-regional variations and marked changes in social organisation, beliefs and economic practices that over the course of a millennium altered the character of much of the landscape of England.
- 5.3.26 Evidence for land division and settlement has been recorded from the gravel terraces of the Thames in Greater London from the Middle and Late Bronze Age, although as with the Early Bronze Age evidence there is limited evidence for activity upon the north London clays (Brown and Cotton 2000). Burnt mounds are recognised in a number of regions, notably the West Midlands, and are frequently dated to the Middle and Late Bronze Age. Examples of settlement sites are rarely recorded in the Midlands, although examples of settlement and middens have been excavated towards the south of the region near Kemerton in Worcestershire and Whitchurch, Warwickshire (Jackson and Napthan 1998; Waddington and Sharples 2011). Pit alignments have been recognised which may fall into the Late Bronze Age and may mark the earliest large-scale land division in Staffordshire, for example (Coates 2002).
- 5.3.27 There is no evidence from the suburban London sections of the route (CFA1-5) for activity in this period. It has been suggested that there was a preference for the Thames gravels for settlement activity rather than the areas of London clays (Brown and Cotton 2000).
- 5.3.28 Undated cropmark sites in the Colne Valley have the potential to date from the Late Bronze Age, where examples have been recorded, although in common with other comparable cropmarks, are generally attributed a late prehistoric or Romano-British date (Lambrick 2014). Other examples include those in Stoke Mandeville and Aylesbury (CFA11) and towards the north of the route in Curdworth to Middleton (CFA20). Other potentially Late Bronze Age systems of land division include pit alignments recorded towards the north of the route at Hints (CFA21). The linear earthwork, Grim's Ditch recorded within Dunsmore, Wendover and Halton (CFA10) may also have its origins in the Late Bronze Age.
- 5.3.29 East of Birmingham it is notable that a burnt mound has been recorded at Park Hall, south of the Tame, within the scheme boundary. Middle Bronze Age cremations have been excavated at Hints (CFA21) and pit alignments have also been recorded in the vicinity, including some within the scheme boundary.
- 5.3.30 Larger scale land division began during the Bronze Age, with extensive field systems, often co-axial or rectilinear in plan, covering large swathes of the landscape by the Late Iron Age. Generally this period is one of dispersed rural settlement, but the rise of hillforts and latterly the 'oppida' of southern and south eastern England emphasises an increase in both social complexity and the development of larger social groupings. In many cases these hillforts have their origins in the Late Bronze Age. Although none lie within the route itself, they are likely to have influenced the pattern of settlement and occupation in their surrounds. Evidence for funerary practice is generally poorly represented throughout this period across the UK.

Cremation and inhumation burials of Late Bronze Age date have been recovered, while occasional inhumations, often in disused storage pits are recorded in Iron Age Britain. However, quantities of disarticulated bone are common finds on Iron Age sites, suggesting that many funerary rites may not have left tangible archaeological remains, and it was only with the adoption of burial rites from the continent in the Late Iron Age that funerary rites are evident in quantity.

- 5.3.31 Excavations along the length of Grim's Ditch have recovered small assemblages of pottery indicating that it was in existence during the Iron Age. Notable areas of late prehistoric activity have been identified around Aylesbury to the north of HS2 at Aston Clinton, Bierton, and Weedon Hill, as well as, within the HS2 study area, the site of a valley fort (a hill fort in a lowland location).
- 5.3.32 To the north west of Aylesbury lies the site of a Romano-British town south of Fleet Marston (CFA11) that has potential for earlier phases of activity. Possible late prehistoric/Romano-British settlement has been identified on the edge of the route of HS2, south of Stoke Mandeville (CFA11).
- 5.3.33 A possible late prehistoric settlement site has been identified by geophysical survey within the route of HS2, on the northern side of the River Cherwell valley to the east of Edgcote, in Northamptonshire (CFA15). Geophysical anomalies indicative of enclosures, field systems, trackways and roundhouses, of potential late prehistoric and/or Romano-British date have also been recorded within the scheme in Warwickshire (CFA17).

Key high level questions and areas of research

- 5.3.34 The national and regional resource assessments and the assessment of the Mid to Late Bronze Age and Iron Age evidence within the study area have identified a number of research questions and themes including:
- Evidence for patterns of settlement and land division in the Middle and Late Bronze Ages, both specifically within the gravel terraces of the River Thames, and elsewhere along the route;
 - Investigation of undated cropmark sites in the Colne Valley, and elsewhere along the route (Stoke Mandeville Aylesbury, and further north in CFA20 and CFA21) to determine whether the patterns of enclosure identified have their origins in the Bronze Age;
 - Grim's Ditch and its chronology – can scientific techniques allow us to date the construction and use of this ditch;
 - Potential evidence for changes to settlement pattern as a reflection of an increasingly hierarchical society in the Late Bronze Age and Iron Age;
 - Regional evidence for changes to and developments of funerary practice from the Middle and Late Bronze Age to the Late Iron Age; and
 - What evidence is there for prehistoric precursors or origins for the apparently Romano-British complexes at Fleet Marsden and Edgcote?

The Romano-British Period (AD 43-c.410)

- 5.3.35 There is a distinctive Romano-British component within the archaeological record that marks a transformation from earlier periods. Among the most prominent changes evident is the establishment of a network of Roman roads. Those within the scheme include Watling Street, the Fosse Way, the Upper and Lower Icknield Way and Ryknild Street. These acted both as key communications and transport links both for military and civilian users, but also as boundaries and even informal frontiers. As well as the physical remains of the roads themselves, evidence for contemporary roadside settlement, commercial and industrial activity, funerary contexts, field systems, and other forms of activity may be encountered in association with them.
- 5.3.36 The intensity, rate and nature of change during the Romano-British period appear to have varied considerably. Significant evidence has been recorded within South and East of England, particularly within the Thames corridor. There is, nevertheless, relative paucity of substantial evidence for Romano-British activity recorded on the periphery of Roman London (CFA1-6) from Euston to Ruislip. Archaeological remains of Romano-British date are relatively abundant across the East Midlands, when compared with the limited evidence across the West Midlands.
- 5.3.37 Significant Romano-British sites within and adjacent to the scheme include the site of a probable small Roman town at Fleet Marston (CFA11), north west of Aylesbury. Also of considerable note is the site of a scheduled Romano-British villa and/or settlement site at Edgcote in Northamptonshire. Although the Scheduled Monument lies outside of the route of HS2, the Edgcote villa site appears to be associated with a roadside settlement or small town in the vicinity of Blackgrounds Farm (GLB144). Other areas of substantial archaeological interest include the valley of the River Great Ouse, where previous investigations have revealed widespread evidence of late prehistoric and Romano-British activity.
- 5.3.38 Romano-British burials and other features have been recorded to the south west of Stoke Mandeville hospital (CFA11). The site of a probable Roman temple complex lies at Sundale, within the Newton Purcell to Brackley (CFA14) study area. The route of HS2 also passes in close proximity to the site of a Scheduled Romano-British settlement and/or villa at Glasshouse Wood (CFA18), on the edge of Kenilworth, Warwickshire. Large areas of cropmarks have been identified at the north of the route within the Whittington to Handsacre study area north and north east of Lichfield (CFA22).

Key high level questions and areas of research

- 5.3.39 The national and regional resource assessments and the assessment of the Romano-British evidence within the study area have identified a number of research questions and themes.
- 5.3.40 There are a number of key sites and themes worthy of further investigation:
- The development and expansion of the Roman road network. What effect did the road network have on the pattern of Iron Age settlement and occupation, and how did it influence the creation of new settlements? Is there evidence that the establishment of this network was a driver of both economic and social change?
 - The route has been designed to avoid the known centres of Roman activity at Fleet Marston, Edgcote and Glasshouse Wood, but there is potential here for investigating

the hinterlands of these sites, in particular to determine to what extent these sites affected and influenced their surrounding landscapes.

- The site at Sundale has the potential to provide important evidence for Romano-British religion in the form of a temple and associated complex. What can excavations of this site tell us about the origins of the temple complex, and whether there is evidence for which divinity was worshipped there?
- There is potential for the scheme to uncover evidence for Roman funerary practice, both at known sites and in areas where activity was previously unknown. These can provide us with valuable information on the burial rites of the time and also, through scientific analysis, much about the genetic makeup and origins of the population.

Early Medieval (AD 410 to 1066)

5.3.41 Archaeological evidence for Early Medieval settlement and land use along the route of HS2 is scarce. This is particularly the case for the early Anglo-Saxon period, 5th and 6th centuries, and the transition from Roman Britain, with evidence from the few excavated settlement and burial sites augmented by isolated finds of pottery and metalwork. From the 7th/8th century the record includes place names and documentary evidence from land charters. Where investigated, early to middle Saxon communities appear to be small and dispersed and possibly mobile, with a preference for the lighter permeable soils in river valleys such as the Thames, Great Ouse, Avon, Nene and Trent. Recent studies of burial populations indicate communities that may have been of mixed British and Germanic origin with significant continuity in landscape organisation and land use from the later Roman period. There is less evidence for settlement in upland and/or forested areas such as the north London claylands, Chilterns and Warwickshire Arden. For much of this period the study area lay within the Kingdom of Mercia, although from the 9th century it approximated to the boundary between Wessex and the Danelaw. By the 10th/11th century, large early Saxon estates, possibly based on an earlier prehistoric/Romano-British template, had broken down and fragmented into the manorial structures described in the Domesday Book, with nucleated villages and open field agrarian systems probably in place, at least in lowland areas such as the Aylesbury Vale and Warwickshire Feldon. Elsewhere, in the Chilterns and Arden for example, older forms of dispersed settlement appear to have persisted.

5.3.42 Where the route passes through river valleys, areas of terrace gravels may provide enhanced opportunities to locate populations and settlement sites and these should also be expected close to earlier Roman and Later Medieval inhabitation. Waterlogged valley bottom deposits could preserve important environmental information. There are known pagan burials close to the Roman site at Edgcote, Northamptonshire, and close to Fleet Marston Roman town (Putlowes) in Buckinghamshire. Settlement is also likely near Walton Court, south of Aylesbury. The sites of deserted Medieval settlements, both villages, moats and isolated farms might also include evidence for an Anglo-Saxon origin as seems likely at Stoke Mandeville, Buckinghamshire, which may have been an important late Saxon ecclesiastical holding. A charter of 949, including descriptions of estate boundaries, also indicates potential for Early Medieval potential at Chetwode, Buckinghamshire, and the settlement here may have been established as early as the 7th century AD.

Key high level questions and areas of research

5-3.43 There is so little well excavated evidence for this period that any opportunity to undertake large-scale investigation should be prioritised. The national and regional resource assessments and the assessment of the Early Medieval evidence within the study area have identified a number of research questions and key research themes include:

- the investigation of early Germanic settlers and their relationship to Romano-British settlement and earlier patterns of landscape organisation and land use;
- the ethnic and cultural identity of British and Anglo-Saxon populations, and to what extent a process of acculturation took place; and
- the nature of early Saxon dispersed settlement and how this relates to later village nucleation and the development of open field agriculture.

Medieval (AD 1066-1540)

5-3.44 HS2 provides an unparalleled opportunity to investigate aspects of lowland Medieval rural life and settlement, including in the hinterlands of Westminster/City of London, and Birmingham. From the 11th to 14th century there is a marked expansion in population, with increased building within existing settlements and foundation of new often planned settlements, greater agricultural production and an expansion of open fields, and colonisation of wood pasture and waste. After the 14th century there is a dramatic collapse leading to migration, settlement shrinkage and abandonment, although the responses to these changes are regionally distinct.

5-3.45 There is significant variation on the resulting types of settlement pattern and form across the route, and in particular between the lowland vales of Buckinghamshire and Warwickshire's 'Central Zone' (Roberts and Wrathmell 2000) and the more upland and wooded areas to north and south, often either within Royal Forests (Middlesex, Bernwood, Whittlewod and Cannock) or ancient areas of woodland and heath (the Chilterns and the Arden).

5-3.46 The lowland vales are characterised by nucleated villages surrounded by open fields, where areas of arable pasture and woodland held in common predominated. The upland and wooded areas are more commonly characterised by more dispersed patterns of hamlets and farms, with a mix of enclosed land, limited open fields and heath and woodland grazing allowing a wider variety of economic and agrarian models with a greater emphasis on stock.

5-3.47 Although the HS2 Phase One route avoids the historic cores of modern settlement, it passes close to, or through a significant number of shrunken or abandoned manor sites, villages, and farms, set within landscapes of relict field systems. These include significant parts of the deserted villages at Stoke Mandeville, Doddershall, Upper Radstone, Lower Radbourne (with a possible chapel), and Hurst, with smaller parts of settlements at Bury farm, Hartwell, Costow House, Milburn, Curborough and Diddington. These settlement sites and their surrounding landscapes allow investigation into detailed aspects of settlement form and building types, but also broader questions of the effects of population and economic expansion in to the mid-14th century, and subsequent impacts from famine, plague and agrarian changes into the mid-16th century. Most of the settlements available for investigation are deserted and the factors that contributed to this are complex and often locally/regionally determined.

- 5.3.48 Stoke Mandeville is particularly important because of the associated graveyard which was in use throughout the Medieval period. This has the potential to answer questions about the origins and demography of a rural population.
- 5.3.49 The HS2 route also passes through the eastern edge of the registered battlefield at Edgcote in Northamptonshire (CFA15), where supporters of the Earl of Warwick defeated King Edward IV in 1469 – and where battlefield burials might be expected.
- 5.3.50 Less easily predictable are remains of Medieval settlements that might be uncovered in the areas of dispersed settlement, including north London and Birmingham (where later urban development also mitigates against site identification). In London the route passes through areas that were still largely either Royal forest, woodland or pasture during the Medieval period and in Birmingham the route enters the city just to the north of the Medieval settlement at Digbeth/Deritend. In these areas, including the Arden and the Chilterns, some of the most obvious forms of settlement evidence are the moated sites, some being manorial in origins, others representing farmsteads. The route will pass through or close to sites at The Hermitage (CFA13), Glasshouse Wood (CFA18), Bockenden Grange (CFA18), through two moats at Coleshill (CFA19), Fulfen Wood (CFA22), and Mercote near Berkswell (CFA23). Investigation of these sites will provide important information about dispersed settlement, but also provide an opportunity to investigate manorial origins and the organisation of the manorial landscape (looked at together with parks, fish ponds and other manorial features).
- 5.3.51 These settlement earthworks frequently survive in association with areas of ridge and furrow or other field/boundary evidence, providing an insight into the wider organisation and development of the landscape, and there are a number of areas where coherent and extensive field systems could be investigated, for instance in the Misbourne Valley in the Chilterns, around Thorpe Mandeville and Lower Thorpe, Northamptonshire, and Ladbroke/Radbourne in Warwickshire. Studying the morphology of field systems with sampling for environmental indicators of crop types over time would provide valuable information on the agrarian systems.
- 5.3.52 Deer parks were part of the manorial landscape and especially common in the Arden, with examples on the route at Drayton, Shirral, Bangley (CFA21), Berkswell (CFA23), and Park Hall in Birmingham (CFA25). There are large areas of ancient woodland through which the route passes and in places these preserve boundaries of relict field systems such as at Crackley (CFA18) in the Chilterns. Areas of ancient woodland have high potential to contain evidence of pre-woodland features and features contemporary with the management of the woods.
- 5.3.53 Other elements of the Medieval landscape that survive include evidence for transport, in roads and bridges (e.g. Carville Lane, the Bourne Bridge and the old road at Bickinhill) and industry, with pottery production the Chilterns at Potters Row, charcoal burning on the edge of Cannock Chase near Curdworth.
- 5.3.54 Water mills were common during the Medieval period and the route crosses a number of water courses where mill sites are indicated at Stoke Mandeville, Clerks Mill in Wendover on the River Ray, at Twyford and Chetwode, also in the Chilterns, and at Trafford Bridge near Edgcote. Fish ponds are attached to many of the moated sites, potentially including ponds linked to the moated site at North Wood, south of Middleton in Staffordshire and also occur on their own at Costow House near Thorpe Mandeville.

Key high level questions and areas of research

5.3.55 The scale of the evidence, its variety, geographical spread and time depth allows for significant landscape level investigation, bringing together field survey, documentary research and large-scale excavation. Comparative studies can be undertaken between sites and across regions and it will be possible to test our understanding and models for settlement development, land use and rural industry. Sites which are well preserved and combine multiple landscape and settlement elements, such a village and manorial earthworks, field systems, good documentary evidence, and potential for population and/or environmental reconstruction will provide the best opportunities for new knowledge creation.

5.3.56 The national and regional resource assessments and the assessment of the Medieval evidence within the study area have identified a number of research questions and key areas of focus include:

- combining archaeological and historical research;
- the origin and development of manorial sites, including moats, fish ponds and parks;
- dispersed settlement in the Chilterns and Arden;
- impact on the countryside of population expansion and economic growth in the 11th to mid-14th centuries;
- the impact of economic and social shocks, including the Black Death, on rural settlements, populations and agrarian systems from the mid-14th century;
- Medieval woodland management, crafts and industries;
- the development of water mills;
- Medieval road and transport systems; and
- Medieval population dynamics.

Post-Medieval (AD 1540-1901)

5.3.57 The post-Medieval period was a time of significant and wide-reaching change and development in British history and in the physical character of the British landscape. These four hundred years saw sustained and often rapid population growth, with the population of England and Wales roughly trebling between the 16th and 19th centuries (Whyte 1999). Growing industrialisation led to the expansion of towns and cities with many moving to urbanised areas for work. In rural areas, dramatic changes in land ownership and enclosure led to the prevalence of more commercialised agriculture (*ibid.*). Evidence from the post-Medieval period comprises data collected from archaeological investigations and from documentary sources. Archaeological evidence is not substantial for the early part of the period, and documentary sources can, in many cases, have a bias away from ordinary people (Hind 2014). Research into this period offers the opportunity for the evidence, both archaeological and documentary, to be considered together and for significant collaboration between archaeologists, historians, historical geographers and other disciplines (Hind 2014).

5.3.58 At the beginning of the post-Medieval period there was much continuity from the Medieval period and although there may have been some growth in rural industries in the 16th

centuries, the characteristic features of the post-Medieval period develop from the 17th and 18th centuries. These are: extensive land enclosure and agricultural improvement, particularly in the 18th and 19th centuries; designed landscapes; rural building from the 17th to 19th centuries; urban expansion from the 18th century onwards, including new cemeteries; expansion of urban and rural industries; and substantial improvements in transport consisting of turnpike roads, canals from the 18th century and railways in the 19th century. Buildings, other structures, and landscapes and townscape survive from this period as well as buried archaeological remains, and documentary sources enhance our knowledge of the period. The major defining elements of the post-Medieval period are undoubtedly the agricultural and industrial revolutions.

- 5.3.59 The majority of the route passes through land that remained in agricultural use throughout the post-Medieval period. The greatest change to the make-up of the rural landscape was the large-scale enclosure of the former Medieval open fields. This can be seen across the landscape of the route with early piecemeal enclosures from at least the 17th century and later planned parliamentary enclosures from the 18th and 19th century characterising this process. Other forms of enclosure in this period include designed parklands associated with country house estates during the 18th and 19th centuries, many of which developed from earlier deer parks. Hartwell Park and Jacobean house in the Aylesbury Vale, Buckinghamshire, represents a designed landscape set out between the 17th to the 19th centuries. Stoneleigh Abbey park, Warwickshire, includes several buildings relating to the 18th century manor house and included a Humphry Repton-designed landscape garden, since bisected by the creation of the National Agricultural Centre. At Coleshill, Warwickshire, the new hall at Coleshill Hall Hospital coach house and stable block was constructed at the centre of an earlier deer park in the 19th century.
- 5.3.60 Post-Medieval rural settlement from the mid-16th century was largely located within areas of current occupation, largely avoided by the HS2 route, although the now deserted settlement of Stoke Mandeville may have continued in occupation into the 18th century before it was relocated, and burials continued at the church into the early 20th century, providing an opportunity to investigate agricultural and industrial changes on the population.
- 5.3.61 There is also a noticeable increase in the construction of farmhouses and farms between the 17th and 19th centuries, many of which are 'isolated' and located away from the settlement centres. This development can be linked to the very significant changes in agricultural production of which land enclosure was a part. Examples of 18th century farm buildings include Shepherd's Furze in the Aylesbury Vale, Buckinghamshire, Coleshill Hall Farmhouse and outbuildings in Warwickshire and Bucks Head Farm in Staffordshire.
- 5.3.62 In addition to farmhouses and associated agricultural buildings a number of other rural domestic dwellings are located along the route ranging from detached houses to terraces. Buildings associated with leisure include public houses and the Whittington Heath Golf Course Clubhouse in Staffordshire.
- 5.3.63 Together with the agricultural revolution of the mid-17th to mid-19th centuries, the major defining element of the post-Medieval period is undoubtedly the industrial revolution. In London, rapid urban development is visible from cartographic sources with Rocque's 1762 'Map of London' showing the focus of this development centred around a 'New Road', now Euston Road. Urban growth in both London and Birmingham followed the release of estates

on which roads were laid out and houses constructed. Birmingham developed considerably during this period and established itself as a manufacturing centre and commercial hub, aided by the development of canals and railways that transported fuel, raw materials and finished products. Other than water, clay and sand, Birmingham was deficient in resources such as coal, metal ores and minerals. Entrepreneurialism and a long established manufacturing tradition also contributed to Birmingham's growth.

- 5.3.64 Earlier examples of domestic developments include late Georgian terraces of houses in the vicinity of Euston constructed following the laying out of Euston Road in 1756. In Kentish Town mid and late Victorian semi-detached and terraced properties illustrate the outward growth of London. Public Houses grew in scale, complexity and number throughout the 19th century, reflecting the commercial expansion and proliferation of the major breweries. Examples include the Bree Louise, Euston Street/Cobourg Street, London and the Eagle and Tun and Fox and Grapes, both in Birmingham.
- 5.3.65 With the expansion in industry came innovations in transport and infrastructure, which was dominated in the first instance by the development of the canal system and later the rail network. The London and Birmingham Railway was planned by Robert Stephenson and opened in 1838, running between a terminus at London Euston and Curzon Street in Birmingham. Euston Station is the second oldest mainline terminus in London, although the original terminal building was demolished in 1963. The Grade I Listed Curzon Street terminal building was closed to passengers in 1854 following the opening of the New Street Station, however it remained open for excursions until 1893 when it was finally closed. The HS2 route crosses railway bridges; viaducts, station buildings signal boxes and associated engineering along with disused rail lines. Examples include Primrose Hill Station, Camden Town, and Calvert Station on the disused Great Central Line in Buckinghamshire and Lawley Street Viaduct in Birmingham.
- 5.3.66 The extent of the canal network can be seen across the route with examples including the Oxford Canal, the Coventry Canal, the Trent and Mersey Canal and the Grand Union Canal, which linked London to the industrial heartland of the Midlands.
- 5.3.67 Two major urban cemeteries are present within the bounds of the scheme at St. James' Gardens, Hampstead Road, London and Park Street Gardens, Birmingham. St. James' in the Parish of St. James' Piccadilly, received burials from 1790 to 1853. Park Street was an overspill burial ground for St. Martin's in the Bull Ring, Birmingham, and was used for burial over a comparable period to that of St. James' between 1810 and 1873.
- 5.3.68 A third cemetery which spans potentially the whole post-Medieval period is present within a rural context at St. Mary's, Stoke Mandeville, Buckinghamshire. The cemetery was established in the Medieval period and the final burials at Stoke Mandeville took place in 1908. A chapel, demolished in the 1960s is present at the site, alongside areas of deserted settlement possibly occupied into the 18th century.
- 5.3.69 This assessment of the post-Medieval resources along the route of HS2 Phase One suggests the following focus and key areas for investigation:
- collaboration between archaeologists, historians, historical geographers and others;
 - the impact of agricultural improvements on the form of settlements, fields and buildings;

- new urban building types, domestic and leisure;
- population changes – impacts on the rural population and the origin of new urban populations; and
- major infrastructure, evidence for the construction of turnpikes, canals and the railways, and the impacts on the countryside and growth of the cities.

Modern (AD 1901-present)

- 5.3.70 The modern period can be defined by the two world wars of the 20th century, and the social changes that they brought about. First World War aerodromes and associated infrastructure are a landscape feature of this period as are, at a different scales, memorials to the war dead. Following the First World War and during the inter-war years significant housing programmes were developed and further aerodromes were developed for the Second World War, along with defensive features in the landscape such as pill boxes.
- 5.3.71 One of the most extensive changes to the landscape during and following the Second World War was agricultural intensification, which altered the pattern of land division through the removal of field boundaries, and brought new areas into cultivation.
- 5.3.72 After the end of the Second World War a period of rebuilding and regeneration began. Many urban areas had suffered significant bomb damage that led to widespread clearance of affected buildings, and new urban residential areas in London and Birmingham. Rapidly increasing population and post-war wealth also lead to expansion of housing and employment zones in rural areas, with most villages experiencing growth.
- 5.3.73 The development and popularity of the motor car transformed public infrastructure with the construction of new roads, such as the M40, leading to large-scale reduction in the railway network. The Great Central Line was one of many to be axed after the Beeching Report in 1963. Other examples of redundant railway lines exist along the route.
- 5.3.74 Few assets associated with the two world wars are known within the scheme boundary. These include the First World War memorial at Euston Square Gardens and Second World War airfields partly within the scheme at Turweston (CFA14) and RAF Lichfield (CFA22). An RAF Wireless intercept/ transmission station at Greatworth Park is also within the scheme boundary (CFA15).
- 5.3.75 The national and regional resource assessments and the assessment of the modern evidence within the study area have identified a number of research questions and key areas to focus on in the investigation of the modern period:
- multidisciplinary collaboration;
 - the physical evidence for conflict and the impact of these changes to the rural and urban landscape;
 - the continued evolution of rural and urban building types resulting from economic and social changes;
 - the impact of mechanisation in agriculture; and
 - the impact of new transport infrastructure and the loss of redundant systems.

5.4 Key research themes

5.4.1 Arising out of the review of national and regional research objectives and resource assessment, a number of key research themes have been identified. The themes are not specific to periods or locations, but seek to identify useful and universal topics to guide our investigation of human inhabitation of the landscape, as far as practicable, through all periods and throughout the route.

5.4.2 The themes:

- connect our current understanding of the significance of the historic environment resource with the considerable body of research and investigation previously undertaken at a national and regional level;
- provide a coherent and consistent framework for thinking about the past and knowledge creation that should apply to all HS2 historic environment investigations; and
- provide a platform for the generation of detailed specific objectives that will in turn drive the scope, scale and direction of specific investigative works.

Route-wide scale of analysis

5.4.3 Phase One of HS2 provides the opportunity to construct a landscape level narrative of human inhabitation between the Thames and the Trent, from the Palaeolithic to the modern day, to challenge our existing understanding of the past and to compare and contrast this with other areas of the UK. The natural landscape and environment of the route provide the setting for past human action and the project will investigate how local/regional human populations have developed different political, economic and social strategies over time and space, exploiting the resources of the landscape and at the same time adapting to its constraints. The project will also provide an opportunity to explore themes of change and identity.

5.4.4 There are unique characteristics to the HS2 Phase One project that make it well suited to consider broad, landscape level themes, in particular its scale, its location (cutting across the grain of the geomorphic template), and the time depth of available data. To leverage these characteristics and get the most value out of the project the GWSI: HERDS takes a 'single site' approach whereby a coherent research and methodological approach is taken across the entire development area, with individual buildings, settlements and areas of historic landscape considered components of the larger whole. As such decisions about how best to address the project objectives can be taken within the context of our developing understanding of the overall landscape narrative.

The natural environment: human impact and adaption

5.4.5 The natural environment, comprising geology, topography, soils, flora and fauna provides the template against which human inhabitation takes place. It is important, therefore, both to understand the development of conditions which allowed human occupation of the landscape and understand how human communities have changed their environment and adapted economic and social strategies.

- 5.4.6 In order to achieve a greater understanding of human interaction with the natural environment, it is necessary to examine evidence for:
- climate change through the Pleistocene/Holocene;
 - human impact upon the natural environment – both flora and fauna;
 - the influence of human action upon geomorphic processes and soil development; and
 - the influence of the environment on the formation of identity, of settlement patterns and land use.

Regionality

- 5.4.7 It is possible to identify regional distinctiveness within the archaeological record across periods of history and prehistory. It is necessary, however, to define patterns of regionality that reflect key differences in the occupation of the landscape by past societies. Attempts have been made to define regions for different periods, e.g. Cunliffe's models for the Iron Age (Cunliffe 2005), Roberts and Wrathmell (2003) for the Medieval period, and recent research including EngLald (University of Oxford), Fields of Britannia (Rippon *et al.* 2015) and the Roman Rural Settlement Project (University of Reading, Cotswold Archaeology and the ADS). There is, therefore, clearly an opportunity to examine existing models of regional distinctiveness across the area of study and contribute to the formation of new narratives of regional identity.

Movement through the landscape: communication routes as agents of economic and social change

- 5.4.8 What were the key mechanisms, corridors and patterns of movement through time and how did these contribute to change?
- 5.4.9 Early prehistoric communities may have moved across large territories, exploiting a range of seasonal resources and environments and mobile settlement patterns may have persisted into later periods (e.g. the early/middle Saxon). Natural routes including ridgeways and rivers would have been important during early phases of occupation.
- 5.4.10 Significant change and formalisation of route ways and the ability to move through and communicate across landscapes will have facilitated not only movements of people and physical goods, but equally the spread of ideas, concepts and technology. This is clearly identifiable with the growth of populations and industrialisation associated with the construction of canals and railways in the 18th and 19th centuries, with the growth, for example, of non-conformist religion alongside this.
- 5.4.11 The formation of route ways in other periods of the past, such as Roman roads may not only have influenced population movement and cultural change within the landscape during that period, but may have continued to exert an influence upon movements through and the definition of the landscape in subsequent periods.
- 5.4.12 Clear communication routes in prehistory may be less easy to demonstrate, although the development of networks of trade and exchange may allow for the definition of route ways for example in late prehistory.

The interpretation of ancient landscapes and material culture by past societies

- 5.4.13 The development of the landscape and cultural change is a cumulative process and past societies will have lived among physical references to the past that may have been interpreted in different ways (*cf.* Bradley 2002). Funerary monuments, for example, may have been re-visited and re-interpreted across long histories of use. Past landscape features may have been incorporated into new definitions of space, territory and identity. Material culture may also have been re-discovered, reused and reinterpreted. There is an opportunity, therefore, to explore how societies engaged with the past and how this may have influenced concepts such as identity, place and status.

Landscapes of power and exclusion

- 5.4.14 It is possible to recognise the formation of increasingly complex and stratified landscapes where space becomes defined for elite uses. Examples include villa estates in the Roman period, Medieval manorial sites with their deer parks and later country houses and designed landscapes. Defining and investigating these landscapes can provide key insights into social and political relationships within societies.

Trade and exchange as drivers of social change

- 5.4.15 As early as prehistory the exchange of objects and artefacts has been evidenced through the broad distributions of, for example, stone axes, metalwork and ceramics. It is clear that in these early periods the exchange of material culture contributed to expressions of identity and status and the formation and maintenance of social systems. In the Romano-British and subsequent periods, material culture in the landscape can usefully inform definitions of cultural identity. The post-Medieval period of industrialisation is the clearest example of trade, exchange and the consumption of material culture and it is important in this context to evaluate how these systems of large-scale production stimulated social change. Change may be evidenced not only in changing patterns of settlement and urbanisation but also in the spread of ideas and the formation of identities.

Exploring population dynamics through scientific techniques

- 5.4.16 The application of newly developed scientific techniques such as Isotope analysis has the potential to provide insights into large-scale population movement, for example, contributing to the understanding of cultural identity within past communities. Such techniques can apply to both large-scale post-Medieval cemeteries and equally to human remains of earlier periods. Other emerging techniques such as biomolecular analysis may also contribute to closer understanding of the demography of past populations.

Vernacular building development

- 5.4.17 This theme focuses on a particular class of evidence – vernacular buildings. Questions focus on how people have used buildings to provide basic shelter and protection, but also as places to work, to come together and to display social status?
- 5.4.18 Other elements to be explored include what were the different architectural technologies and traditions used in the construction and operation of these structures and how have these changed across time and geographic regions? Also of interest is: what was the relationship with function and available building materials?

- 5.4.19 The development of building function and style can be examined from the development of buildings in prehistory through to Roman farmsteads, Medieval villages and 18th and 19th century urban forms of architecture.

Transition: legacy and inheritance

- 5.4.20 Some of the most interesting aspects of period-based study lie in the interfaces between periods around issues of continuity and discontinuity, legacy and inheritance. Key transitions may include the:

- transition from hunter-gatherer to agricultural subsistence strategies, and from shifting semi-permanent settlement to a more settled landscape of fields and farms;
- Bronze Age/Iron Age transition; this appears to be a period of marked change, with the abandonment of many Late Bronze Age field systems and population/settlement contraction. The scale, rate and nature of these changes are poorly understood – however potential origins of some apparently Iron Age land division in Bronze Age or earlier Iron Age needs investigation;
- Romanisation – extent of relict Iron Age culture, organic development and exotic introductions; and
- continuity and change in landscape division and boundaries, from the Romano-British period, through the Early and Later Medieval to the present day.

Religion and beliefs

- 5.4.21 How have groups tried to understand their relationship to the metaphysical, their past and future, their inheritance and their legacy? What is the earliest evidence for ritual/ceremonial activity, and how has this developed and changed over time? Examples of key sub-themes include:

- placed/special deposition;
- burial practice; and
- Medieval churches and chapels.

Warfare and conflict

- 5.4.22 Warfare has left indelible marks on the landscape. During which periods is there evidence for conflict? Examples of key sub-themes and evidence include:

- prehistoric settlement enclosures;
- Medieval defences, including moated sites;
- the battle of Edgcote;
- civil war features; and
- WWI/WWII installations.

Develop existing and test new methods of investigation

Site identification methodologies

5.4.23 The development of existing and new methods and technologies for the identification of different types of site. A focus on understanding the factors that might contribute to absence in the record such as limitations of current methodologies, past investigation and land use.

5.4.24 Examples of key methodologies:

- geomorphological factors in the success of geophysical and other evaluation surveys;
- evaluation trench sampling strategies (re-evaluation of Hey and Lacey 2001);
- prospection for early prehistoric sites (development of surface (ploughsoil) and sub-surface artefact collection strategies);
- prospection for sites buried beneath alluvium/colluvium;
- ground-truthing of interpretations/dating for cropmark/NMP sites; and
- use of PAS data to identify potential sites.

Site sampling strategies

5.4.25 The development of existing and new methods for selecting datasets for varying levels of investigation based on explicit research objectives.

5.4.26 Examples of key methodologies:

- landscape level sampling;
- sampling of previously little investigated landscapes and 'blank' areas;
- site level sampling; and
- standard unit measurements to enhance artefact sampling and application and assessment of quantitative techniques.

Digital recording methodologies

5.4.27 Examples of key methodologies:

- drone vertical photography; and
- photogrammetry.

Scientific methods

5.4.28 Examples of key methodologies:

- absolute dating;
- bimolecular methods (e.g. isotope/DNA analysis); and
- palaeo-environmental/geomorphology/palaeo-ecological/palaeo-climate investigations – targeted programmes of sedimentological, palynological and macrofossil analyses of sediment sequences in river valleys or lakes, adjacent to

known archaeological sites, are needed to determine the date and nature of changes associated with the adoption and development of farming, the beginnings of large-scale woodland clearance and the establishment of permanent field systems.

Artefactual studies

5.4.29 Examples of key methodologies:

- refining regional ceramic and lithic sequences; and
- targeted scientific dating to strengthen artefact chronologies.

6 Specific objectives

6.1 Introduction

6.1.1 The specific objectives, coupled with the strategies, technical standards and procedures (see Section 8) form the core of the GWSI: HERDS and translate the headline objectives into tangible potential actions. The specific objectives identify what the *Employer* requires to be achieved and the strategies, technical standards and procedures set out how the *Employer* requires them to be delivered.

6.1.2 This section sets out the specific objectives for the GWSI: HERDS. It identifies the broad categories and provides a matrix linking the specific objectives to the headline objectives and key research themes.

6.1.3 The *Contractor* shall design and deliver the works in accordance with the specific objectives set out below in Sections 6.3, 6.4, 6.5 and 6.6.

6.1.4 The *Contractor* shall select those below, or amend or devise new ones, which are relevant to the design of the works.

6.1.5 Over-arching these are the headline objectives set out in section 4, which the *Contractor* shall comply with.

6.2 Categorisation of objectives

6.2.1 Four broad categories of specific objectives have been created to support the implementation of works along the route.

- **Scheme wide** – The objectives could, in theory, be applied to any areas of works within the scheme extent depending on the nature of the known and potential resource of the nature of questions being asked.
- **Region focused** – Some questions will be targeted at broad areas, less extensive than the whole scheme but more extensive than a particular location, for example some objectives may relate to geographic compartments such as the Chilterns or a major river valley.
- **Locally demarked** – Some objectives relate to very specific locations and assets. These will have clearly defined extents and will need to be addressed when works are proposed within these areas.
- **Blended** – for some scheme wide and region focused objectives there will be known locations within those broader extents where known assets or locations require investigation. These will be spatially defined creating 'blended' objectives.

6.2.2 These categories have been defined in geographical terms and their spatial extents will be included within the GWSI: HERDS GIS. It is intended that specific objectives will be accessed geographically and thematically through the portal using combinations of keyword tags, geographical searches and objective searches.

6.3 Specific objective matrix

- 6.3.1 The matrix overleaf relates the specific objectives back to the six headline objectives and the key research themes. It has been designed to support selections of specific objectives when designing works for locations along the route.

Specific objective	Type				Headline objectives						Key research themes													
	Scheme wide	Region focused	Blended	Locally demarked	01: Works will address key current and emerging Research questions in British Archaeology and History	02: Delivery of the works will inspire the next generation of historic environment professionals and stimulate the development of skills in the sector, leaving a legacy of trained professionals and high quality, sustainable training practice	03: A highly accessible and outstanding archival legacy will be developed and actively promoted	04: New and existing methods of historic environment investigation and practice will be tested and developed and the results used to inform works along the route and beyond	05: Local communities along the route and a wider audience of lay, professional and academic practitioners will be engaged and involved with the delivery of the strategy	06: A diverse range of quality outputs will be delivered across the lifetime of the project. These will address the needs of a broad range of audiences and set new standards for publication and engagement.	07: All historic environment activities will be delivered within defined cost and programme parameters and considerable public benefit will be achieved through the investment in these activities	Route-wide scale of analysis	The natural environment: human impact and adaptation	Regionality	Movement through the landscape: Communication routes as agents of social change	The interpretation of ancient landscapes and material culture by past societies	Landscapes of power and exclusion	Trade and exchange as drivers of social change	Exploring population dynamics through scientific techniques	Vernacular building development	Transition: legacy and inheritance	Religion and beliefs	Warfare and conflict	Develop existing and test new methods of investigation
KC8: What were patterns of movement in populations from prehistory to the present day? Did the origins of individuals contribute to social and cultural identity? Can this be defined across time and space?	X				X	X	X		X	X	X			X	X			X						
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?	X				X	X	X	X	X	X	X			X										X
KC10: Provide further understanding of the transition between a mobile pattern of settlement in the Early Bronze Age to the development of fixed settlement and enclosure, in the Middle and Late Bronze Age	X				X	X	X	X	X	X	X			X	X	X			X	X				X
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?		X			X	X	X		X	X		X	X		X						X			
KC12: What is the evidence for pre-Iron Age phases of enclosure at the margins of the Trent Valley, and to what extent were Iron Age and Romano-British field systems and settlement influenced by earlier structuring of the landscape?		X			X	X	X		X	X					X									
KC13: What was the date of the establishment of Grim's Ditch? What impact did it have on the landscape following its construction?				X	X	X	X		X	X					X					X				
KC14: Identify sequences of environmental change for the Late Upper Palaeolithic–Early Mesolithic transition through investigation of sites in the Colne Valley and other locations along the route			X		X	X	X		X	X	X	X	X	X	X						X			
KC15: Can we identify regional patterns 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?	X				X	X	X		X	X	X			X	X				X	X				
KC16: Investigate the degree of continuity that existed between Late Bronze Age and Iron Age communities in terms of population, mobility and subsistence strategies	X				X	X	X		X	X	X	X	X	X	X		X				X			
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?	X				X	X	X		X	X	X			X	X			X		X	X			
KC18: Explore the evidence for increasing social complexity in the archaeological record in the Late Bronze Age and Iron Age, and identify patterns of intra-regional and regional variation.	X				X	X	X		X	X	X			X			X		X		X	X		

Specific objective	Type			Headline objectives							Key research themes													
	Scheme wide	Region focused	Blended	Locally demarked	01: Works will address key current and emerging Research questions in British Archaeology and History	02: Delivery of the works will inspire the next generation of historic environment professionals and stimulate the development of skills in the sector, leaving a legacy of trained professionals and high quality, sustainable training practice	03: A highly accessible and outstanding archival legacy will be developed and actively promoted	04: New and existing methods of historic environment investigation and practice will be tested and developed and the results used to inform works along the route and beyond	05: Local communities along the route and a wider audience of lay, professional and academic practitioners will be engaged and involved with the delivery of the strategy	06: A diverse range of quality outputs will be delivered across the lifetime of the project. These will address the needs of a broad range of audiences and set new standards for publication and engagement.	07: All historic environment activities will be delivered within defined cost and programme parameters and considerable public benefit will be achieved through the investment in these activities	Route-wide scale of analysis	The natural environment: human impact and adaptation	Regionality	Movement through the landscape: Communication routes as agents of social change	The interpretation of ancient landscapes and material culture by past societies	Landscapes of power and exclusion	Trade and exchange as drivers of social change	Exploring population dynamics through scientific techniques	Vernacular building development	Transition: legacy and inheritance	Religion and beliefs	Warfare and conflict	Develop existing and test new methods of investigation
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?	X				X	X	X		X	X	X			X			X							
KC20: Investigate the changing nature of funerary rites in the Late Iron Age and Romano-British periods. What evidence is there that the adoption of new rites or changes in existing practices are the result of the movement of people, contact with new ideas, or even new religions?	X				X	X			X	X	X			X	X	X	X	X		X	X			
KC21: Assess the evidence for regional and cultural distinctiveness along the length of the route in the Romano-British period, with particular regard to the different settlement types encountered along the route	X				X	X			X	X	X			X			X		X					
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	X				X	X	X	X	X	X	X	X	X	X			X	X	X	X				X
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?		X			X	X			X	X	X				X						X			
KC25: Characterise the nature of the Romano-British activity in the hinterland to the Edgcote Roman villa, and investigate the possibility that it developed from an Iron Age precursor				X	X	X			X	X	X		X		X		X				X			
KC27: Investigate the origins, development and decline of the Romano-British complex and possible temple at Sundale/Illet's Farm				X	X	X			X	X	X		X		X					X	X			
KC28: Establish the relationship between the Romano-British small town at Fleet Marston, its rural hinterland and wider networks of communication and settlement				X	X	X			X	X	X		X	X			X		X					
KC29: Can regional and cultural distinctiveness in the Romano-British period be defined through systematic surface collection?	X				X	X	X	X	X	X	X		X				X							X
KC30: Identify the location and form of Early and Middle Saxon settlement and investigate evidence for land use in the period	X				X	X	X	X	X	X	X	X	X	X	X				X	X				X

Specific objective	Type				Headline objectives							Key research themes												
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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	X				X	X	X	X	X	X	X	X	X						X	X				X
KC32: Investigate the ethnic and cultural identity of Anglo-Saxon populations	X				X	X	X	X	X	X	X	X						X	X		X	X	X	X
KC33: Investigate the development of water mills from the Anglo-Saxon through to the modern period. How did the technology of milling change, and what implications has this for farming practice?	X				X	X	X		X	X	X	X	X				X		X	X				
KC34: Undertake research and investigation into Medieval manorial complexes. What was their origin, development and impact on the landscape?	X				X	X	X		X	X	X	X	X			X	X		X	X		X		
KC35: Investigate the impacts on rural communities of social and economic shocks in the mid-14 th century and thereafter and their contribution to settlement desertion	X				X	X	X		X	X	X	X	X				X	X						X
KC36: How were Medieval and later woodlands managed and exploited and what evidence do they preserve for earlier land use?	X				X	X	X		X	X	X	X	X			X	X			X				X
KC37: Investigate the battlefield at Edgcote to locate and study any features arising out of the conflict, and in particular the potential for artefacts scatters and battlefield burial grounds				X	X	X	X		X	X	X								X			X	X	
KC38: Understand the history of settlement and rural life at the deserted Medieval village of Stoke Mandeville				X	X	X	X		X	X	X	X			X	X	X	X	X	X	X	X	X	X
KC39: Develop a detailed understanding of the nature, formation, date and chronology of the historic landscape at Coleshill including the former Coleshill Deer Park, Coleshill Hall Farm and moated site				X	X	X	X		X	X	X	X				X			X	X				X
KC40: Identify patterns of change within Medieval rural settlement from the 11 th to mid-14 th century			X		X	X	X		X	X	X	X	X				X		X	X				X
KC42: Develop sampling strategies to examine and compare the origin and degree of mobility in 18 th and 19 th century urban and rural populations			X		X	X	X		X	X	X			X				X						X
KC43: Investigate the link between the development of the railways and broader changes in the historic landscape, such as urban settlement expansion and the decline of the canal network	X				X	X	X		X	X	X			X			X		X					

Specific objective	Type			Headline objectives							Key research themes														
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KC44: How did rural industries fare, and what was their contribution to society over the period of the urban-centred industrial revolution?	X			X	X	X		X	X	X	X	X					X		X						
KC45: The conflicts of the 20 th century define the history of modern Britain and the world: how can we achieve a greater understanding of the significance of sites associated with conflict to local communities along the route?	X			X	X	X	X	X	X	X	X								X			X		X	
KC46: How do archaeologists affect the record themselves in terms of their methods of investigation, their response to the material, and the decisions they make?	X			X	X	X	X	X	X	X	X											X		X	
KC47: Test and develop geophysical survey methodologies	X			X	X	X	X	X	X	X	X	X		X											X
KC48: Methods of using digital technology and social media to engage with public, communities and volunteers should be explored in a manner that enables parties to contribute to research and interpretation as well as enabling easy access to knowledge and ultimately archives	X			X	X	X	X	X	X	X	X														X
KC49: Ground truth and develop multispectral and LiDAR prospection techniques	X			X	X	X	X	X	X	X	X			X	X										X
KC50: Investigate architectural artefacts of 20 th century design with a social agenda and their legacy as contemporary built heritage	X			X	X			X	X	X	X			X											X
KC51: How do 19 th and 20 th century recreation and community buildings reflect social and economic change and contribute to community identity? Can different trajectories in the development of these amenities be recognised?			X	X	X			X	X	X	X			X											
KC52: Understanding the pattern, form and function of post-Medieval rural vernacular architecture: can we identify regional, intra-regional or temporal variations?	X			X	X			X	X	X	X			X					X	X					X
KC53: Explore techniques for analysing and recording the setting of heritage assets, where the setting and its contribution to the significance of the asset is particularly complex	X			X	X			X	X	X	X														X

Specific objective	Type			Headline objectives							Key research themes													
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KC54: Identify key changes in the technology of railway infrastructure and how these changes influenced the distribution of goods or the movement of people. Can we recognise changing public perceptions of railway infrastructure and associated buildings over time?			X	X			X	X	X	X	X			X			X							X
KC100: Creation of an ancient DNA database			X	X	X	X	X	X	X	X	X							X		X				X
KC101: Cemetery management and burial practice			X	X	X		X	X	X	X	X			X								X		
KC102: Health, disease and pollution in 19 th century populations			X	X	X	X	X	X	X	X	X		X					X		X				X
KC103: Burial grounds and their place in the cityscape/landscape – both in use and disuse			X	X	X		X	X	X	X	X											X		
KC104: People and place: Park Street as a snap-shot in time of a growing industrial city				X	X	X		X	X	X	X											X		
KC105: Develop a fine grained analysis of the health, diet and life history of Medieval and post-Medieval rural elites at St. Mary's Church, Stoke Mandeville				X	X	X	X	X	X	X	X							X		X	X			X

6.4 Specific objective: historic environment skills, employment and education

- 6.4.1 The specific objectives for skills development and training have been developed to deliver Headline Objective 2, and to support delivery of the other Headline Objectives. Delivery of these objectives will in many instances be a vital prerequisite for delivery of the other aspects of GWSI: HERDS.
- 6.4.2 The *Contractor* will use these specific objectives to support and contribute historic environment matters into the Skills, Employment and Education Plan. Reference should also be made to Section 10.

S&T 1: Address potential historic environment skills shortages relating to the delivery of the GWSI: HERDS

- 6.4.3 The *Employer* aims to be an exemplar for the rail engineering and construction industry in acting as a driver for improvements in the sustainability of the sector by appointing the right workforce, to be available at the right time with the right skills and behaviours. As part of this the *Contractor* shall identify the historic environment contribution to the volume and mix of Skills, Employment and Education (SEE) outputs that will be delivered and the proposed methodology within the SEE Plan.
- 6.4.4 The *Contractor* shall identify skills shortages that may affect the delivery of elements of the GWSI: HERDS and this shall form the basis for determining the route to SEE options and opportunities. Consideration shall be given to work-based learning traineeships in historic environment practice, apprenticeships, links with schools – for example to highlight the career paths, engagement with higher education organisations to highlight the career opportunities and facilitate the development of specialist skills (including data management and BIM related skills) and wider environmental, business and management training at the National College of High Speed Rail.

6.5 Specific objectives: community engagement

- 6.5.1 Three thematic specific objectives (CE1, CE2, CE3) that have been prepared, these are intended to provide guidance on the role/project themes that communities could take up. They meet the *Employer's* Design Vision themes of '*people, place, time*'. They also link into some of the knowledge creation specific objectives. Accompanying these thematic specific objectives there are two other specific objectives related to legacy (CE4 and CE5). Reference should also be made to Section 9 'Historic environment community engagement: approach'.

Specific objective CE 1: Marking and communicating the changes to landscapes and environments

- 6.5.2 Phase One of HS2 will bring landscape change, in which local communities will see a transformation of their local environment. Landscape and environments have constantly shifted and altered throughout time and this theme encourages engagement in the research and discovery of change of local and regional landscapes (e.g. landscapes of power, conflict and exclusion, the built environment – canals, railways, local monuments, favourite places, local landmarks).

6.5.3 This objective is focused on recognising personal and emotional responses to landscape change: understanding change as experienced by different generations; gaining community insights into the management and acceptance of change to local environments and landscapes. This objective encourages *Contractors* to support and engage in projects that aim to deliver community recording and marking of landscape change.

6.5.4 It seeks to explore how we can employ different methods to understand change, celebrate change and record change in the world around us. This can be through artistic expression or research; and in partnership with multiple community groups, specialists and academic institutions.

6.5.5 There are potential links with KC10, KC13, KC19, KC23 and KC53.

Specific objective CE2: Identifying and sharing our stories

6.5.6 There is a growing interest and appetite for family history and ancestry and researching roots and identities. Phase One of HS2 offers opportunities for communities to further discover their past, their links to other communities and cultures and how cultural and social developments have transformed peoples' lives. This provides the means to discover the richness of diversity and cultural progress by exploring past cultures and relationships through contemporary thinking and approaches to social engagement. This would allow some exploration of history through the connections between people and place and how this has evolved.

6.5.7 This objective aims to keep people at the heart of the delivery of Phase One of HS2; in providing a means for communities to engage with their history and present their own stories. *Contractors* will be available to support and recognise project opportunities in this area, working with the *Employer's* Community Engagement team. This aims to deliver wider social skills and learning opportunities across generations; social cohesion and celebration of diversity across cultural groups; well-being and contentment within societies.

6.5.8 There are potential links with KC8, KC32, KC38 and KC42.

Specific objective CE3: Meeting the challenge of inspiring the next generation

6.5.9 There is very limited interest in the historic environment from young people (see recent DCMS and CBA studies – see Section 9), this is also reflected in the reduction of young people taking up archaeology as an academic study or profession. The historic environment is currently in difficulty with limited professional expertise and capacity to manage the resource. It is therefore important to seek and develop opportunities through Phase One of HS2 to inspire interest in history, archaeology and the historic environment profession.

6.5.10 Working with, for example, schools, colleges, youth groups, students, young archaeologists (CBA) and community clubs *Contractors* will identify and facilitate projects that provide young people with the opportunity to work alongside professionals in the historic environment sector. This should include as wide a range as possible of the different skills and specialisms that exist within the historic environment sector. Programmes should be initiated with youth group professionals and academic institutions that includes experience of archaeological

practice, conservation and curating, as well as a variety of techniques and technologies; where they are directly contributing to outcomes, results and decisions.

6.5.11 The scale of Phase One of HS2 and the availability of a wide range of skilled professionals to engage with the younger generation through a variety of approaches aims to initiate a renewed interest in the historic environment and the breadth of professional opportunities available.

6.5.12 There are potential links with KC46, KC47, KC48 and KC49.

Specific objective CE4: Accessible information and knowledge sharing

6.5.13 In an increasingly rapidly paced world in which technology is used as a means of instant communication and engagement; the provision for the use of digital technology in order to aid decision making, communication to interested parties and dissemination of ideas is required. Identifying communication technologies and approaches that allow experts and specialists to comment remotely; share data, information and images between *Contractors* and to engage promptly (and appropriately) with the public over discoveries and interpretation.

6.5.14 A key approach set out in the Historic Environment Digital Data Management and Archives Strategy is to enable historic environment works for HS2 Phase One to be primarily digital. In attempting to achieve a 'born digital' or 'default digital' approach, digital and media communication techniques form part of a new wave of engagement and dissemination, which will aim to attract harder to engage groups (e.g. gaming, social media), keep interested audiences involved (specialist publications – Internet Archaeology; Community Archaeology); allow for specialist engagement and more purposeful and efficient project creation, delivery and analysis (e.g. digital recording), public awareness and understanding (Augmented Reality interpretations). *Contractors* will make good use of technology available and proactively support the capture, sharing and dissemination of data.

6.5.15 There are potential links with KC48.

Specific objective CE5: Contribute to the process and facilitation of audience project creation

6.5.16 There may be projects which have already been initiated or which are about to commence by community groups/academic researchers/professional archaeological investigations that could relate to the research priorities set out in the GWSI: HERDS. There may also be projects that are initiated from the GWSI: HERDS process by any of the lay, professional and academic audiences.

6.5.17 Although thematic specific objectives have been created (see CE1, 2 and 3) which may stimulate projects from audiences; equally there may be ideas for projects which may not automatically fit these themes, but may be just as valid and of importance to audiences in wishing to research the historic environment. These may be route-wide or locational specific and may relate to community anniversaries and events; academic institutions research agendas; historic environment professionals multi-specialist studies and big-data projects; community social and political imperatives; particular locations/sites or methods of historic

environment investigations that communities have a vested interest in (e.g. local landmarks; demolition of buildings; burial grounds excavations).

- 6.5.18 Through working with the *Employer*, the *Contractors* through their historic environment supply chain shall identify how they can support project facilitation or provide expertise in order to help deliver wider community projects and leave a lasting legacy of their engagement in the process. This objective aims to give communities the opportunity to direct their own research agendas and methods of participation; having access to expertise and possible funding streams to create their own legacy.

6.6 Specific objectives: knowledge creation

KC1: Refine understanding of the Palaeolithic potential of deposits beyond river valleys

Scheme wide

- 6.6.1 Palaeolithic evidence is often recovered from river valley deposits in England and these locations have traditionally formed the primary focus of research across the period. There is, therefore, clearly a bias in the data that could be redressed through a broader study. Occupation and activity was not solely confined to these areas and sites in different topographic and geological locations may yield a variety of other evidence. The understanding of the location and frequency of occupation in differing environmental contexts has the potential to significantly change accepted narratives for the period.
- 6.6.2 Environmental contexts that have potential for the recovery of artefactual, faunal and palaeo-environmental remains include areas of the Chilterns containing head deposits and clay-with-flints (CFAo8, CFAo9). Other geological contexts with potential include glacial tills, fluvio-glacial deposits, brickearth and head deposits.

KC2: Explore the location of Palaeolithic deposits, reconstruct past environments and investigate the relationship between climate variation and phases of hominin activity

Scheme wide

- 6.6.3 Ancient river valley systems may have provided both a focus for occupation and also a favourable environment for the preservation of archaeological and palaeo-environmental deposits. Mapping these systems would allow for a more accurate prediction of potential site locations along with the potential for palaeo-environmental data to be recovered from deposits. The pre-Anglian rivers are particularly important because the discoveries at Happisburgh, Norfolk and Pakefield, Suffolk, which have pushed back the date for the earliest known colonisation of Britain by around 0.5 million years.
- 6.6.4 Contextual information relating to the environment of the Palaeolithic can be invaluable in furthering our understanding of Palaeolithic periods and the people who first occupied Britain. Understanding the environment, including faunal populations, allows us to study how human populations interacted with and impacted on their environment thus allowing a fuller understanding of the populations of the period.

KC3: Develop a model of the deposits associated with the River Bytham, the proto-Thames and other pre-Anglian river systems

Blended

- 6.6.5 The modelling of sedimentary contexts for pre-Anglian river systems and associated palaeo-environmental evidence would provide further understanding of the evolving environment, and how this may have varied spatially through the study of fauna, pollen and other organic material from palaeo-channels, terrace sediments and other deposits. The major river systems active throughout the Pleistocene, including the Bytham and the Thames, their tributaries and other minor drainage systems have the potential to provide evidence for the Palaeolithic period. The location and depth of former channels of these river systems are not fully understood.
- 6.6.6 Mapping these systems would allow for a more accurate prediction of potential site locations within and outside of the route corridor. There is also the potential for palaeo-environmental data to be recovered from deposits, even in areas where no archaeological deposits exist.
- 6.6.7 The known gravel terraces between Walton Court and Hartwell have revealed faunal remains and may contain primary contexts including potential for buried landscapes and the route of HS2 will also cross areas containing Pleistocene deposits attributed to the Thames drainage system. Other riverine locations that have potential for Palaeolithic deposits include the Colne Valley (CFA07), the Misbourne Valley (CFA08) and the Thame and its tributary systems extending through the Aylesbury Vale. *In-situ* deposits have been found at Eastside in Birmingham City (WCS035).
- 6.6.8 A fuller understanding of the pre-Anglian river systems may be achieved through geoarchaeological deposit modelling and the mapping of existing river systems and palaeo-channels.

KC4: Develop more refined chrono-stratigraphic models for Pleistocene river terrace deposits present throughout the route, such as those associated with the Great Ouse, and to correlate these with the more established elements of the Thames Valley sequence

Blended

- 6.6.9 The relevant national and regional research frameworks consistently highlight the importance of Pleistocene terrace deposits for investigating a broad range of questions relating to the Palaeolithic, and the need for more detailed understanding of these sequences. The Solent-Thames Research Framework for the Historic Environment, for example, specifically identifies the Great Ouse terrace sequence as a target for further investigation. Although the Thames valley terrace sequence has received comparatively more attention than other areas and is relatively well understood as a result, valuable opportunities to clarify existing models are also presented by Phase One of HS2.

KC5: Identifying settlement location and developing models for settlement patterns for the Mesolithic, Neolithic and Early Bronze Age

Scheme wide

- 6.6.10 The location and frequency of Mesolithic settlement and activity in the landscape of the study area requires a greater resolution of understanding. Data from *in-situ* Mesolithic contexts is extremely rare nationally and can add significantly to our understanding of human populations, settlement mobility and subsistence strategies during this period. *In-situ* palaeo-environmental deposits and flintwork dating from the Late Upper Palaeolithic and Early Mesolithic have been identified at Eastside in Birmingham (WCS035), *in-situ* deposits and artefacts have been identified within the Colne Valley at Dews Farm (CFA07) and Dews Pit (CFA07). There is the potential for similar evidence in the vicinity of these known sites to extend into the route.
- 6.6.11 Elsewhere further Mesolithic activity has been identified within the major river valley of the Colne and in proximity to smaller watercourses and springs beyond the line of the route in the West Midlands. Geomorphological assessment may provide a platform from which areas of potential for settlement, above and adjacent to watercourses can be explored. A closer understanding of the frequency of Mesolithic activity adjacent to watercourses, including palaeo-channels, would contribute to the formation of models for the use and structuring of the landscape within mobile patterns of occupation and hunter-gatherer subsistence regimes. The broader landscape context of activity also requires a fuller assessment, in order to develop a broader model of settlement in the period. The identification and definition of lithic scatters may, therefore provide a useful contribution to the understanding of settlement in this period, both within landscapes where lithic material is known, and those landscapes where gaps in knowledge have been highlighted such as the central part of the West Midlands.
- 6.6.12 There is limited evidence for the physical remains of settlement, not only within the hunter-gatherer societies of the Mesolithic, but also for the Neolithic and Early Bronze Age, where despite the development of funerary monuments, the understanding of the location of contemporary activity in the surrounding landscape is limited. This has led to discussions of residential mobility through these periods. There is a distinct lack of funerary monuments across the study area of the route and the examination of surface and ploughsoil lithics may provide an alternative means of reconstructing patterns of settlement across potentially wide geographical areas, along with placing known monuments into a broader context. This has the potential to inform themes of settlement and mobility and also regional distinctiveness.

KC6: Understanding the evidence for change in the environment and management of the landscape for the Mesolithic and Early Neolithic periods

Scheme wide

- 6.6.13 Reconstruction of past environments including, for example, patterns of forest cover, land management and faunal assemblages, are critical to our understanding of settlement during this time. A period of rapid climatic warming from c.9500 BC resulted in almost complete forest cover by c.5500 BC and an associated change in faunal species. Between the Early and Late Mesolithic there is considered to have been a shift from large game hunting to the

hunting of woodland game and use of woodland plant resources. In the Early Neolithic localised woodland clearance for agriculture is likely to have taken place, but the degree of continuity of mobile hunter-gatherer subsistence strategies from the Mesolithic is uncertain.

- 6.6.14 It is possible through a route-wide scale of analysis to identify and sample deposits that may inform our understanding of environmental change and anthropogenic influence upon environments across the Mesolithic and Neolithic. This can potentially provide insights into the character of the Mesolithic and Neolithic transition, the rate of adoption of agricultural practice, continuity and change in subsistence strategies. A route-wide scale of analysis can define more closely any regional distinctiveness across contrasting landscapes and across a significant transect of southern Britain. This will provide a significant contribution to our understanding of the natural environment, human impact and adaptation.

KC7: Exploring the degree of continuity that existed between Late Mesolithic and Early Neolithic communities in terms of population, mobility and subsistence strategies

Scheme wide

- 6.6.15 Refining existing understanding of the transitions between each of the major archaeological periods and their sub-divisions is consistently cited as a priority across many of the national research frameworks. The geographical extent of the Scheme allows for a higher potential to encounter transition sites or highlight broad scale differences between patterns of occupation over time. It is thought that the uptake of Neolithic practices at a national scale may have spread from the south east along river valleys. It may be possible to explore evidence for, and develop models of, the earliest Neolithic activity within the route across a variety of landscape contexts. The identification of such activity can be used as a basis of comparison with models for the location and pattern of settlement in the Late Mesolithic.

KC8: What were patterns of movement in populations from prehistory to the present day? Did the origins of individuals contribute to social and cultural identity? Can this be defined across time and space?

Scheme wide

- 6.6.16 The scientific analysis of human skeletal material has the potential to identify large-scale movements of individuals through defining their likely geographic place of origin. This has most clearly been demonstrated through the analysis of the Amesbury Archer in Wiltshire, which indicated potential continental European origins for a single individual in the Late Neolithic/Early Bronze Age. Applying these techniques across a broader spectrum of time has the potential to identify patterns in large-scale movement, which may contribute to our understanding of identity, the spread of ideas, knowledge and beliefs. It may also be able to define periods of more frequent large-scale mobility and contrast these with more static population dynamics across periods of time and geographic regions. This may be particularly informative for periods of cultural transition, from the Roman and into the Early Medieval period for example, the period following the Black Death in the later 14th century AD and the industrial revolution. There is also clearly the potential to identify previously unknown patterns of movement. This objective has the potential to contribute to themes of movement through the landscape, regionality, communication routes as agents of social change and transition, legacy and inheritance.

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?

Scheme wide

- 6.6.17 There is a notable lack of funerary and ceremonial monuments across the area of the scheme. Regional variation in the distribution of monuments can be identified from existing data, although this may be influenced by existing bias in the archaeological record. There is, for example an apparent lack of monuments in the central West Midlands, the Clay with Flints geology in the Chilterns and the north London clays. It may, however, be possible to more clearly define regions, geologies or topographic contexts where an absence of monuments reflects a genuine regional distinctiveness. The presence and absence of monuments can influence the understanding of movement through the landscape and the organisation of settlement space in this period, where monuments may have influenced settlement location and rhythms of transient occupation of the landscape.

KC10: Provide further understanding of the transition between a mobile pattern of settlement in the Early Bronze Age to the development of fixed settlement and enclosure, in the Middle and Late Bronze Age

Scheme wide

- 6.6.18 Evidence for settlement sites and domestic architecture for the Early Bronze Age in Britain is infrequently recorded and often formed of insubstantial features and deposits. This is in contrast to the evidence for substantial and relatively frequently recorded funerary and ceremonial monuments for the period. This has resulted in interpretations of transient modes of residency in this period.
- 6.6.19 In contrast, evidence for nucleated settlement (both enclosed and un-enclosed) and field systems has been regularly recorded in the Middle and Late Bronze Age in southern England in regions such as the Thames Valley and Wessex. It is, however, notable that field systems for Middle and Late Bronze Age periods do not appear to extend north of a broad line from the Severn Estuary to the Wash and that there is limited evidence for both enclosure and settlement in the Midlands of England. Some notable exceptions for settlement in the form of middens for the Late Bronze Age have been recorded in the southern counties of the West Midlands, while pit alignments may have formed early forms of landscape division in this region.
- 6.6.20 An inter-regional research strategy provides an opportunity to explore the geographical distribution and tempo of change in the later second millennium BC, and to test regional variation in the development of settlement nucleation and the formation of enclosed landscapes in this period.

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?

Region focused

- 6.6.21 The apparent high density of evidence in the Colne Valley appears to indicate a focus of activity from the Mesolithic and into the Neolithic and Early Bronze Age. Both flint scatters and structural remains have been recorded along with a variety of monuments. To what extent does this reflect a genuine preference for this river valley in prehistory and how does this activity relate to that in contrasting topographic and environmental contexts in the region?

KC12: What is the evidence for pre-Iron Age phases of enclosure at the margins of the Trent Valley, and to what extent were Iron Age and Romano-British field systems and settlement influenced by earlier structuring of the landscape?

Region focused

- 6.6.22 It is clear that for many areas of the Midlands the first clear evidence for land division can be recognised from the Later Iron Age. A contrast has been highlighted with the development of landscape division from the Later Bronze Age in southern English counties (Yates 2007). There are, however, indications that different forms of broad scale land division were taking place from at least the Late Bronze Age, such as the formation of pit alignments.
- 6.6.23 Identifying potentially early forms of land division not only contributes to a greater understanding of the structure of settlement space from the Middle and Late Bronze Age, but also an understanding of the impact of rapid and transformative landscape enclosure from the Iron Age and Romano-British periods. Understanding the chronology of broad scale landscape enclosure more fully, particularly in regions where this is less well understood, should support the development of narratives of social change from the Iron Age onwards. The extensive cropmarks in the region of the Trent Valley, extending into the landscape of the HS2 Phase One route can provide an opportunity to investigate these questions. Within the route examples of potentially later prehistoric to Romano-British land division have been recorded towards the north of the Scheme, at the Bourne Brook, south of Kings Bromley Marina and north Ryknild Street at Streethay.

KC13: What was the date of the establishment of Grim's Ditch? What impact did it have on the landscape following its construction?

Locally demarked

- 6.6.24 The enclosure of the landscape has been recorded from the later second millennium BC and into the first millennium BC. The examination of Grim's Ditch provides an opportunity to examine the date of a specific form landscape division and investigate the impact this may have had upon the surrounding landscape, movement through it, the structure and perceptions of territory. A better understanding of the chronology of the monument may also inform the interpretation of ancient landscape features by later societies.

KC14: Identify sequences of environmental change for the Late Upper Palaeolithic–Early Mesolithic transition through investigation of sites in the Colne Valley and other locations along the route

Blended

- 6.6.25 Refining existing understanding of the transitions between each of the major archaeological periods is consistently cited as a priority across many of the national research frameworks. Evidence from the Colne Valley at Three Ways Wharf, Uxbridge and Denham, Buckinghamshire, at sites excavated in advance of mineral extraction, indicate the potential for deposits of this transitional period to survive.
- 6.6.26 This transition period experienced major environmental change with the onset of the Holocene and the development of deciduous woodland. The knowledge gaps that currently exist relate to the scarcity of *in-situ* sites nationally and a paucity of radiocarbon dates for this transition.
- 6.6.27 Potential for deposits elsewhere is exemplified by palaeo-environmental and artefactual evidence recorded at Eastside, Birmingham (WCS035) dating to the period of the Late Upper Palaeolithic and Early Mesolithic transition. The identification of further palaeo-environmental evidence within surviving organic deposits may enable a greater understanding of sequences of environmental change and provide a context for changes in social organisation, subsistence and technology.

KC15: Can we identify regional patterns 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?

Scheme wide

- 6.6.28 The location and frequency of settlement sites has the potential to vary significantly across the route of the scheme. Can regionally distinctive patterns be identified and do existing patterns of settlement reflect biases in the archaeological record? It is possible that settlement patterns were influenced by subsistence strategies, and it may, for example, be possible to recognise seasonality through settlement patterns. Studying the form and location of settlement of this period can usefully contribute to the themes of movement through the landscape and the organisation of settlement space, regionality and the influence of natural topography on the formation of identity.
- 6.6.29 Landscape divisions of potential late second and first millennium BC date have been identified across the scheme. These take the form of field systems, extensive linear boundaries such as Grim's Ditch and pit alignments. Evidence for settlement with a potential late prehistoric date has been recorded in the vicinity of Aylesbury, and near the River Leam, Leamington Spa, Warwickshire. It is possible both to define regional distinctions in the form and pattern of enclosure and landscape boundaries and to assess the relationship between known settlement sites and wider systems of enclosure and landscape division. It is possible through a greater understanding of landscape division to more greatly understand themes of movement through the landscape, the organisation of settlement space, regionality and themes of transition.

KC16: Investigate the degree of continuity that existed between Late Bronze Age and Iron Age communities in terms of population, mobility and subsistence strategies

Scheme wide

- 6.6.30 The transition between the Late Bronze Age and Early Iron Age is one that is traditionally difficult to define archaeologically, with chronologies often relying on poorly-dated pottery finds. There may well be opportunities along the length of the route to investigate this transitional period. In order to do this, however, it is key that every opportunity is taken to scientifically date key features, artefactual assemblages and investigate and sample features and deposits likely to facilitate the reconstruction of palaeo-environmental conditions. This work should focus on providing well-dated evidence that can allow examination of change over time, and thus place local and regional archaeological activity in its environmental context. There may be a potential for investigating the origins of particular individuals or populations should burials of these dates be encountered.

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?

Scheme wide

- 6.6.31 Funerary rites in the Late Bronze Age and Iron Age are not well documented, and any opportunity to shed further light on these has the potential to add important new information to our current understanding. For much of this period it is possible that the small number of burials that are recorded represent minority rites afforded to only a small proportion of the population. Scientific techniques allied to artefactual analysis and improved dating techniques may allow meaningful discussion of these rites, the origin of individuals buried in this fashion, and through comparison with other sites, an assessment of change over time.

KC18: Explore the evidence for increasing social complexity in the archaeological record in the Late Bronze Age and Iron Age, and to identify patterns of intra-regional and regional variation

Scheme wide

- 6.6.32 The 1st millennium BC was a period of marked population growth and increasing social complexity across the country. Evidence for funerary practices is typically poorly represented throughout the 1st millennium, what has been identified shows considerable variation both regionally and temporally. Indications of long distance contact, trade and exchange have also been identified. The West Midlands has been identified as holding considerable potential for investigating regional and intra-regional variation, due to the great diversity of cultural forms, practices and sequences of change evident in each period, particularly around the periphery and in the different river systems, but also because of the geographical position of the region. The scale of HS2 Phase One allows the opportunity to investigate these variations on a large, landscape scale.
- 6.6.33 Increased social complexity seems likely to have driven the development of increasingly complex settlement hierarchies, with the development of increasingly developed enclosed sites, culminating ultimately in complex hillforts, while the wider social and trade networks that developed are likely to have driven some of the cultural changes evident in the

archaeological record, including changes in burial practice, the introduction of coinage and ultimately the development of proto-urban centres or 'oppida'. While not all of these are likely to be present along the line of the route itself, there is a potential for exploring regionality in the sites that are encountered within this wider understanding of developing societal complexity.

- 6.6.34 In order to achieve this, sampling strategies should be developed to ensure consistency of approach. Scientific dating and well directed programmes of artefactual and palaeo-environmental sampling provide potential for looking at change over time, and thus place local and regional archaeological activity in its wider context.

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?

Scheme wide

- 6.6.35 The Roman infrastructure network was an extremely important element in the Roman occupation of Britain and one that endured well past the fall of the Empire. A number of Roman roads traverse the route including Akeman Street, Ryknild Street, Watling Street and the Fosse Way. The formation of these routes clearly impacted upon the structure of the landscape. It is possible to explore how these routes structured not only contemporary settlement but also settlement, movement, communication and landscape organisation in subsequent periods. There is good evidence that these roads influenced patterns of movement, enclosure and settlement in the post-Roman and Early Medieval periods elsewhere, and consideration should be given. How did access to wider transport networks and trade markets influence social and economic change? Is there evidence for changes in agricultural or industrial practice to take advantage of these networks?

KC20: Investigate the changing nature of funerary rites in the Late Iron Age and Romano-British periods. What evidence is there that the adoption of new rites or changes in existing practices are the result of the movement of people, contact with new ideas, or even new religions?

Scheme wide

- 6.6.36 The Late Iron Age sees, perhaps for the first time in Britain, the adoption of widespread mortuary rites, many of which seem to derive from contact with continental Europe. In south eastern Britain this takes the form of the adoption of cremation burial as a rite, often with burial in formal cemeteries, while some burials of the Welwyn Garden type clearly represent the burials of social elites. Elsewhere, inhumation is still practised, with the chariot burials recorded in northern and north eastern England probably also representing a social elite, while elsewhere there is also a tradition of inhuming the dead in disused storage pits and other settlement features, possibly as part of a wider pattern of structured deposition.
- 6.6.37 With the coming of Rome, cremation burial appears to become the norm across Britain, although there is evidence for minority rites. There is a marked change, however, in the 3rd century AD, with inhumation becoming the predominant rite, perhaps linked to the spread of

Christianity and the idea of the importance of preserving the body of the deceased. There is, however, evidence for some cremation burials in the 4th century, and other minority rites are also known. The use of scientific techniques such as isotope and DNA analysis may provide significant new evidence for the movement of people and the choice of mortuary rite.

KC21: Assess the evidence for regional and cultural distinctiveness along the length of the route in the Romano-British period, with particular regard to the different settlement types encountered along the route

Scheme wide

- 6.6.38 The presence and nature of Romano-British material culture across the landscape can contribute to the understanding of the geographic and cultural context of known settlements. The route crosses a number of different landscape zones, as well as Iron Age tribal boundaries and the Fosse Way, which may have been the de facto military boundary for a number of years in the immediate post conquest period.
- 6.6.39 The Rural settlement of Roman Britain project has recently highlighted the need for consistency in methodologies for the retrieval of artefacts from the excavation of Romano-British settlement sites. It has been highlighted that the majority of rural settlement site types were unknown prior to the advent of developer-funded archaeology in 1990 and that the current synthesis of this work has the potential to alter established narratives.
- 6.6.40 In order to build upon this research it is significant that material culture is retrieved consistently. It is necessary, therefore, for future interventions to establish the variation in material culture consumption across the site types of Roman Britain, in order for meaningful comparisons to be made at regional and national scales. A consistent approach that may include topsoil sampling and metal detecting, for example, would enable comparative data at a large scale. Consistency in the retrieval of material culture may enable a fuller understanding of the function of settlement site types across varying geographical regions.

KC22: not used

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

Scheme wide

- 6.6.41 The decline in both urban and rural settlements in the Romano-British period is not well understood or dated. Many Roman towns were in clear decline by the mid to late 4th centuries AD, and few contain clear evidence of occupation into the 5th century while our understanding of the decline of rural settlements is even less well developed. Well-dated artefacts are few and far between, but there is potential for the application of scientific dating techniques to better refine our understanding of this chronology.
- 6.6.42 Settlement within the Early Medieval period is characteristically difficult to identify from the archaeological record, and reflects long-standing questions of both settlement dislocation and cultural change. Opportunities may exist within the scheme where the identification of Romano-British and subsequent Medieval settlement may allow for the identification of

continuity through the Early Medieval period, for example at Stoke Mandeville. Similarly deserted and shrunken Medieval settlement at both Stoke Mandeville and other locations across the route may allow for a systematic exploration of the Early Medieval origins of later settlement.

- 6.6.43 The fields and boundaries surrounding Early Medieval settlements need to be investigated to understand continuity of landscape division from the later Roman period including, where possible, to examine the potential basis of some Saxon estates in earlier Roman villa estates.

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?

Region focused

- 6.6.44 Excavations on the Thames gravel terraces, in West London and the Colne valley have established that the Bronze Age saw the first organised enclosure of the landscape, and that co-axial fields were common features of the landscape. There is evidence from some areas (such as the excavations at Terminal 5, Heathrow) for continuity of these field systems into the Roman and even into the Medieval period in some places. Elsewhere, however, there is evidence for changes to settlement patterns and the enclosure of landscape in the Late Iron Age and in particular in the Romano-British period. The latter are often associated with the development of new routes of communication, with local roads and trackways flanked by 'ladder' enclosures. The line of the route suggests that there is a potential for excavations along this stretch of the route to inform this debate and shed light on the nature of continuity and change in these regions.

KC25: Characterise the nature of the Romano-British activity in the hinterland to the Edgcote Roman villa, and investigate the possibility that it developed from an Iron Age precursor

Locally demarked

- 6.6.45 The potential for a late prehistoric phase of settlement in the vicinity of Roman roadside settlement and the scheduled Roman villa at Edgcote raises questions of settlement continuity and discontinuity or dislocation. It is important to establish the extent to which any Late Prehistoric settlement influenced the location of later Romano-British activity to provide greater understanding of themes of transition between these periods. Fieldwalking suggests that the area of activity associated with the Roman villa was wider than that enclosed within the bounds of the Scheduled Monument. What can we learn of the villa from this hinterland? Can palaeo-environmental evidence help to establish the nature of agricultural activity in the wider landscape that formed the basis of the Edgcote villa economy? How does this evidence compare to the exploitation of this area in late prehistory?

KC26: not used

KC27: Investigate the origins, development and decline of the Romano-British complex and possible temple at Sundale/Illet's Farm

Locally demarked

- 6.6.46 The presence of the possible temple complex and other features adjacent to a known Roman road presents a rare opportunity to investigate a little excavated class of Romano-British site. In the East Midlands it is already clear that the few well understood Roman shrines and other religious sites in the region were often founded on, or very near to, Iron Age predecessors, as was also the case at Coleshill in the West Midlands, to the east of the Proposed Scheme. Accordingly, the possible temple at Sundale/Illet's Farm has the potential to contribute to the understanding of social and religious practice both within the Romano-British period and potentially from the Iron Age. The objective can address themes of religion and belief, continuity and transition and the interpretation of past landscapes and material culture by past societies.

KC28: Establish the relationship between the Romano-British small town at Fleet Marston, its rural hinterland and wider networks of communication and settlement

Locally demarked

- 6.6.47 The relationship between Roman towns and their hinterlands is one that is important to the understanding of landscape organisation, settlement and industrial patterns. In the vicinity of Fleet Marston, fieldwalking and metal detecting surveys have yielded numerous finds of Roman pottery, tile, coins and other metal objects across an extensive area (approximately 100 ha) between the A41 at Actingsfield, Fleet Marston Farm and Putlowes Farm.
- 6.6.48 The town is also located in the vicinity of the River Thames and at the junction of a number of Roman roads. It may be possible, therefore, to further explore the relationship between the town and its hinterland, and establish the extent of cultural influence between the two, within the context of a wider communication network. The Roman roads which converge at the town are likely to have been a major driving force in its establishment and success, and would have afforded access to a wide network of markets to both agriculture and industry in the vicinity. This in turn may have influenced the development and evolution of agricultural practice (perhaps leading to specialisation in a particular crop or stock animal to provide a particular market) or an increase in the size and output of an industrial site.
- 6.6.49 Elsewhere there is evidence for local industries expanding to supply the needs of a town and most likely markets further afield. Local pottery kilns arose to compete with imported wares, and there is clear evidence that their wares reached markets beyond their immediate locality.
- 6.6.50 This objective has the potential to contribute to themes of trade and exchange and communication routes as drivers of social change, movement through the landscape and the organisation of settlement space.

KC29: Can regional and cultural distinctiveness in the Romano-British period be defined through systematic surface collection?

Blended

- 6.6.51 The presence of Romano-British material culture across the landscape can contribute to the understanding of the geographic and cultural context of known settlements. The influence of Romano-British settlement types within their immediate landscapes may, for example, vary regionally. Systematic surface collection of material may provide a way of exploring the extent of Romanisation across broad landscapes, which in turn may help to contextualise known settlements. This can be explored at potentially multiple scales allowing for regional and inter-regional comparative analysis. Examples of known sites that may be placed into context through broader survey include Fleet Marston and Edgcote Roman Villa.
- 6.6.52 The work of the Rural Settlement of Roman Britain project has highlighted the importance of standardising collection policy wherever possible. Inter site comparisons are difficult when sampling and collection policies vary significantly from site to site.

KC30: Identify the location and form of Early and Middle Saxon settlement and investigate evidence for land use in the period

Scheme wide

- 6.6.53 Settlement sites of this date are rare and can be difficult to locate. Known sites are focused within river valleys and on permeable geologies, although these distributions need to be tested in the light of our knowledge of site preservation and visibility. They are small, normally single or multiple farmsteads, probably representing a family or small kin-based group. Comprising rectangular post-built timber halls and smaller sunken buildings, they are generally unenclosed and may have been subject to regular re-siting, suggesting shifting patterns of settlement. There is potential for continuity with settlement locations of the Romano-British period (explored within KC23). There is, however, also the potential for settlement dislocation in the Early Medieval period and for the location of settlement beyond earlier Romano-British foci.
- 6.6.54 There is evidence for planning in the layout of settlement sites, and potential increasing complexity in the spatial organisation and functional differentiation of settlement types into the middle Saxon period. There is, for example, evidence for the location of specialist activities (production sites), and high status settlement sites (royal and ecclesiastical estates). More work needs to be done to investigate these changes.
- 6.6.55 Sites have previously been located using the normal suite of prospection techniques and a strategy should be developed that reflects local conditions including past and current land use, soils and geology. In particular surface artefact collection and test-pitting may enable the identification of settlement at a broad scale. Note should be taken of recent successful surveys in the East Midlands (e.g. Northamptonshire). Consideration should be given to selecting areas for off-route survey to provide a landscape context for discoveries within the route. Investigations of this type can be undertaken as part of community-based projects.
- 6.6.56 It may be possible to explore data across a range of landscapes zones, in order to more closely define settlement patterns at a broad landscape scale. Such an approach may include testing different prospection techniques.

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.

Scheme wide

- 6.6.57 While early to middle Saxon settlement appears to have been dispersed, from the 8th/9th into the 10th/11th century there is also evidence for settlement nucleation and the formation of open fields. This occurred at different times and in different places; in some areas it led to the development of a champion landscape of large villages, surrounded by communal arable fields often to the boundaries of the township (e.g. Roberts and Wrathmel's Central Zone) and elsewhere it was combined with extensive areas of still dispersed farms and hamlets, with ancient enclosures and a more mixed landscape of woodland, pasture and heath. Studies suggest that the settlement history and environment play a major part in the form of settlement and land use that developed in this period, exemplified in the Raunds and Whittlewood projects (Parry 2006; Jones and Page 2014).
- 6.6.58 As with the preceding Early and Middle Saxon periods, sites of this date can be difficult to locate with the added obstacle that they might lie beneath currently occupied and deserted sites. Nevertheless, and as with those earlier sites, they can be located using the normal suite of prospection techniques and a strategy should be developed that reflects local conditions including past and current land use, soils and geology. In particular surface artefact collection and test-pitting should be considered. Note should be taken of recent successful surveys in the East Midlands (e.g. Northamptonshire).
- 6.6.59 While consideration might be given to off-route test-pitting within currently occupied sites (as per recent community-based projects in the East of England), particular attention should be paid to the sites of later deserted Medieval settlements that may have been established during this period.
- 6.6.60 In addition to settlement sites, it will be important to investigate field systems and their development where these can be dated, in order to understand settlement development in the context of agricultural practice.
- 6.6.61 This objective seeks to make contributions to answering the following questions:
- At what date did settlements become nucleated and can regional patterns in early settlement nucleation be identified?
 - At what date did open field agriculture develop and to what extent can patterns of development within the agricultural landscape be recognised?
 - Is there a causal link between the establishment of nucleated settlements and open fields or can independent trajectories be recognised?
 - To what extent can environmental factors, or human agency (e.g. lordship) be identified as driving these changes?
 - In later champion areas (e.g. the Feldon and vale of Aylesbury), can limited areas of more ancient dispersed settlement be identified, like that in the Whittlewood Forest (e.g. the Bernwood Forest to the north of Aylesbury and Dunsmore in Warwickshire)?

What was the character and history of development of these areas and how were they influenced by the surrounding areas of more open landscape? How else were these areas culturally distinct from the champion lands?

- Conversely, are there areas of settlement nucleation and open field within landscapes of otherwise dispersed settlement (e.g. the Misbourne Valley in the Chilterns, and the Tame/Blythe valleys on the edge of the Birmingham plateau/Cannock Chase)?
- What different agrarian strategies were followed and to what extent can these be identified through palaeo-environmental evidence?

KC32: Investigate the ethnic and cultural identity of Anglo-Saxon populations

Scheme wide

- 6.6.62 Recent analysis of DNA from Early Medieval burials and modern populations suggests the Germanic component of the population may have been no more than 5%, and may have contributed no more than 40% to the modern genetic mix. Stable isotope and osteoarchaeological studies also support the view that ethnic Germanic settlers formed only a minority part of the population that came to call itself Anglo-Saxon.
- 6.6.63 There is clearly the opportunity to explore the origins of buried populations and to identify both patterns of movement and continuity in settled populations over time. Where datable Early Medieval burials are identified, samples should be taken for DNA and isotope analysis where these have the potential to better understand the ethnic origin of the population and the extent to which this influenced cultural identity. Pagan period burials provide the added evidence of distinctive cultural objects (grave goods) to test theories of cultural identity against ethnic origins.
- 6.6.64 Among the questions that should be considered are:
- What was the scale and extent of Germanic migration?
 - What was the British component of the Anglo-Saxon population?
 - How distinctly Germanic are early to middle Saxon populations – can a British cultural influence be seen?

KC33: Investigate the development of water mills from the Anglo-Saxon period through to the modern period. How did the technology of milling change, and what are the implications for farming practice?

Scheme wide

- 6.6.65 The development of mills and the harnessing of the power of water or wind to mechanise first agricultural processing, then aspects of industrial production is a key development in human history. There are no known windmill sites within the route of HS2 Phase One (although there are many nearby). There are, however, a number of possible water mill sites. These include locations at Stoke Mandeville, on the edge of the Chilterns at Wendover (DWH076), in the Vale of Aylesbury on the River Ray (WAD083) at Chetwode (CAL070), at Lower Thorpe Farmhouse and Ponds, Northamptonshire (GLB085; GLB086), at Trafford Bridge,

Northamptonshire (GLB131) in the Cherwell Valley. A post-Medieval mill at Cuttle Mill (CWM021) near Middleton, Warwickshire is located close to the route.

- 6.6.66 The majority of watermills appear to be of Medieval date, continuing into the post-Medieval period, but archaeological evidence and documentary sources including Domesday Book also record several of Anglo-Saxon origin. The precise location of some of the documented sites is uncertain and there is potential for some unknown sites associated with settlement to occur along the route of HS2. Where mills can be located, their investigation has the potential to refine our knowledge of the dates of origin and phases of development. In turn this can contribute to a broader understanding of the development of associated agriculture and phases of agricultural intensification and patterns of settlement.
- 6.6.67 Well excavated sites with structural evidence are rare, particularly for earlier periods, with not enough known to make generalisations about development. The nature of the location of these sites, with the high potential for waterlogged deposits, offers an opportunity for investigating the structure of mills and provides the potential for dendrochronological dating. Potential palaeo-environmental evidence from mill ponds and water management systems can contribute to our understanding of the wider development of the agricultural system. The potential complexity and preservation of remains means that early detection and appraisal of significance will be important.
- 6.6.68 Key questions include:
- Does the establishment of mills, and their phases of construction and technological change have an impact upon the local agricultural regime, settlement and land use?
 - Can environmental proxies such as pollen, beetles and plant macrofossils inform us about the local environment, such as woodland management?
 - What was the changing technology of milling, and how did these advances influence the building design?
 - If waterlogged timbers survive can they yield information about carpentry techniques? Can dendrochronological dates be obtained to inform both when the mill was established and identify possible phases of construction?

KC34: Undertake research and investigation into Medieval manorial complexes. What was their origin, development and impact on the landscape?

Scheme wide

- 6.6.69 The Royal, ecclesiastical or lay manor with its demesne, remained a constant in the Medieval landscape and the manorial court provided the focus for regulation of communal farming activities. While manors as economic landholdings are identified in the Domesday Book, many of the manorial complexes, and their principal landscape components, have not been securely located on the ground.
- 6.6.70 Manorial complexes vary in size and detail regionally and over time. Common elements do, however, tend to be present (Hunter and Ralston 2009), for example a central hall and the

lord's private accommodation. Other buildings might have also included a chapel, separate kitchen, stables and barns. Larger complexes also contained gardens, orchards and associated fish ponds and deer parks within the manorial landscape and demesne.

- 6.6.71 There remains, however, much to understand about the detailed development of manorial sites including their functional layout and construction details, much of which appears to have been regionally varied. In addition to their agricultural function many of the sites provide insights into Medieval social stratification, with deposits often containing a wider range of both utilitarian and more luxury artefacts. Associated deer parks, already common by the time of the Domesday survey may also contain important information about landscape management.
- 6.6.72 Moats became a common feature during the 13th and 14th centuries, in certain regions such as the English midlands. Moats clearly have the potential to contain waterlogged, datable deposits suitable for palaeo-environmental investigation. Such deposits may reveal much about the inhabitants of a moated manor along with enabling a fuller understanding of its broader landscape context.
- 6.6.73 Many moated sites are likely to have been conceived as high status residences. Concepts of social status may continue where moats and deer parks were incorporated into broader designed landscapes in the post-Medieval period.
- 6.6.74 Each manor and its associated elements have their own trajectory of development. Key questions include:
- Can an Anglo-Saxon origin for manorial sites be identified?
 - Can regional distinctions in the form and development of manorial complexes be recognised?
 - Are foundation dates regionally different and do some sites represent Later Medieval colonisation of waste/woodland?
 - How has the layout and function of manorial sites changed over time?
 - How do the landscape context, layout and form of the manorial site express ideas of status and lordship? How does the location of a manorial residence relate to the village and church and broader landscape?
 - At what date were moats established, can phases of reuse be identified and when did they go out of use?
 - Can waterlogged or other environmental evidence be obtained from moats/fish ponds or other features to indicate the activities that were carried out on the manorial site and the broader agricultural landscape?
 - Can deer park boundaries be identified and is there evidence for internal layout and division?

- 6.6.75 The HS2 Phase One route passes through many separate elements of known manorial landscapes. Examples include Coleshill, Warwickshire (See Specific Objective KC39) the scheduled monument of Brakenbury Farm, Ruislip (RU1002), Stoke Mandeville, Bucks (SMA003; see KC38) and at Streethay near Lichfield in Staffordshire (WHA310). Fragments of moats may be available for investigation at Edgware Road (KIL093) and Willesden Junction (KIL103) in London, at The Hermitage, Chetwode in Bucks (CAL094) and Mercote near Berkswell, Solihull (BHA132). An earthwork of uncertain type and date, survives north of Glasshouse Wood, near Stoneleigh in Warwickshire (STN030) and may be another moated site.
- 6.6.76 Along the route, deer parks are clustered in the northern part of the route, with the southernmost at Greatworth, Northamptonshire (GLB003), and otherwise they are located within the formerly wooded areas of the Arden at Coleshill (COL015), Berkswell (BHA063), at Park Hall in Birmingham (CBB012) and on the eastern margins of the former Cannock Forest at Drayton (DHW105), Shirral (DHW106) and Bangley (DHW114).
- 6.6.77 On the basis of current evidence the sites at Stoke Mandeville, Coleshill and Brackenbury Farm may represent the best opportunity for knowledge creation. Currently unknown manorial sites may also be discovered within village earthworks. There could be great value in selecting key sites for more detailed investigation dependent on, for example condition, preservation, association with other contemporary elements and documentary evidence.

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

Scheme wide

- 6.6.78 By the early 14th century it is likely that lowland Britain was heavily farmed and populated up to or beyond the previous estimated maximum at the end of the Roman period. The climate at this time was characterised by the transition from the Medieval Warm Period to the Little Ice Age, where the northern hemisphere experienced a decline in temperatures and greater seasonal variation. Historical records provide accounts of famines and plagues during the 14th century, including the Black Death from 1348. This period had a significant effect on population dynamics and the abandonment of rural settlement. The extent of regional variation within this broad trajectory of settlement change needs to be more closely defined.
- 6.6.79 Changes in agricultural practices and associated shifts in the rural economy to improve rents from farming had major implications for the fabric of rural society and were also significant reasons for the abandonment of settlements. The decline of the feudal system led to the establishment of a more mobile rural workforce. These economic changes had a significant impact on the nature of Medieval settlement continuing into the 16th century, also resulting in widespread abandonment of communal open field systems to be replaced by private enclosure.
- 6.6.80 Key questions for this objective include:
- What is the documentary evidence for individual settlements between the mid-14th and mid-16th century? How does the physical evidence on the ground match this history?

- Can the environmental record provide a more detailed picture of the impact of the onset of the Little Ice Age on rural agriculture and crop production in different regions along the proposed HS2 route during the 14th century?
- What evidence is there for the first outbreak of plague from 1348 and then subsequent outbreaks in the late 14th and first half of the 15th century? Can this be seen in settlement shrinkage or desertion, in other material culture indicators or in pathological/biomolecular evidence from human populations (e.g. the cemetery at Stoke Mandeville)?
- How did rural communities and land owners adapt to the significant reduction in population, and the changes to agricultural production, land ownership and the relationship between lord and peasant? Can different trajectories of change be seen between different areas (e.g. between the Feldon and Arden in Warwickshire)?
- What evidence is there for Later Medieval land enclosure and settlement desertion associated with the switch from arable to sheep grazing? What other reasons for settlement change is there?

6.6.81 While these broad changes in the landscape can be seen across much of the HS2 Phase One route, the regional detail is different between say, the Chilterns and the adjacent Aylesbury Vale, and individual townships experienced their own particular trajectory of change often dependent on the circumstances of land ownership and lordship. As most of the Medieval settlement sites noted in previous specific objectives are deserted, with few opportunities to investigate currently occupied or shrunken sites, there is by definition a biased sample, but it does mean that all the known sites already highlighted have some potential to address the key question above. Stoke Mandeville, with its church and cemetery is of particular importance in studying this period, where the impact of the changes on population dynamics and demography, for example may be directly visible (see Specific Objective KC 38).

KC36: How were Medieval and later woodlands managed and exploited and what evidence do they preserve for earlier land use?

Scheme wide

6.6.82 The HS2 Phase One route runs through areas of surviving ancient woodland (defined and mapped by Natural England as present in 1600). These areas have the potential to contain archaeological evidence for the management of trees for wood, timber and woodland products during the Late Medieval into the post-Medieval period. These may include woodland boundaries and internal divisions, trackways, quarries and building platforms that give clues to how the wood was worked. Trees may survive as ancient coppices, pollards or stands and indicator plants such as wild flowers can also provide evidence for the use of woodland. Evidence for woodland industries such as charcoal burning and potash manufacture can also be identified. Woods may be components of larger forests or parks. The route also passes through areas that were once woodland or wood pasture in the past, although they are not now designated as ancient woodland and changes in land use may have removed some or all the trees. Maps, field names and walkover surveys can identify these areas. Archaeological features and ancient trees may still survive as evidence of the woodland and activities within it. Mapping these areas of former woodland can contribute to a better understanding of the Medieval/post-Medieval landscape development.

- 6.6.83 Woodland recording has previously been successfully delivered as part of community-based projects (e.g. projects run by the Ancient Tree Forum, <http://www.ancienttreeforum.co.uk>)
- 6.6.84 Woodland areas can also preserve evidence for earlier land use, e.g. settlement remains, field boundaries, ridge and furrow. These remains can be well preserved as earthworks or buried deposits, having been protected from modern ploughing. In places remains are already known (e.g. within the local authority Historic Environment Record), or have recently been located (e.g. LiDAR survey), opportunities remain to further investigate already known remains and identify new ones. Depending on the date, character and nature of the identified remains this objective has the potential to contribute to others.

KC37: Investigate the battlefield at Edgcote to locate and study any features arising out of the conflict, and in particular the potential for artefact scatters and battlefield burial grounds

Locally demarked

- 6.6.85 Archaeological investigations of British battlefield sites are rare. For this period (The Wars of the Roses), Towton (1461) in Yorkshire is the best example, where metal detecting surveys have been used to plot artefacts, helping to inform an understanding of how the battle unfolded and evidence was recovered for early use of firearms. Development close to the site also revealed a mass grave. Study of the burials provided important information on both Medieval populations and the nature of the conflict and its aftermath.
- 6.6.86 At Edgcote (1469) the HS2 Phase One route probably crosses the eastern part of the battlefield and its environs and there is potential to recover similar information. A strategy to investigate the potential for plough zone preservation of artefacts could provide important information, together with scanning for sub-surface features including possible burials. These methods could be complemented with research into the history and landscape of the battle. Key questions include:
- What evidence survives in the ploughzone for artefacts that might help us understand the progress of the battle?
 - Are there any other sub-ground features that resulted from the conflict?
 - Can we add to current understanding about the progress of the battle and its landscape context?
 - Do burial pits, dug in the aftermath of the conflict, survive within the route? Scientific examination of burials can answer general questions about, for example, the demography, health of Medieval populations (to compare with Stoke Mandeville) but also specific questions about the makeup of armies (e.g. age and origin) and the wounds inflicted in this and previous battles.
- 6.6.87 There is potential for some of this work to be undertaken in partnership with local community and metal detector groups.

KC38: Understand the history of settlement and rural life at the deserted Medieval village of Stoke Mandeville

Locally demarked

- 6.6.88 The deserted village of Stoke Mandeville contains the demolished remains of the 12th century St. Mary's Church and its graveyard, earthworks interpreted variously as the remains of a mill with leats, a moat (possibly a manor site), fish ponds and village houses.
- 6.6.89 The earliest remains on the site may date to the Roman period, based on recent geophysical survey, and there are Roman remains nearby at Nash Lee. The village is listed in Domesday but may originate as early as the Middle Saxon period as an important ecclesiastical estate, linked to the nearby Minster Church at Aylesbury and acting as an important collection point and milling centre for grain. It appears to have become deserted sometime in the 18th century when the village moved north to its current site. The Church remained in use until 1866 and the graveyard until 1905. The number of interments into the graveyard is estimated at between 4,000 and 7,000.
- 6.6.90 Although the village has no statutory protection as a scheduled monument it has the potential to be of equivalent importance. This is based on the apparent completeness and level of survival of the remains (earthworks are present, there has been no significant disturbance from later agriculture or development, and the low lying location adjacent to streams with in-filled ponds, leats and moats suggests potential for excellent preservation of organic remains), the time depth of the record (spanning the Roman to Modern periods), and good supporting documentary evidence for the site (e.g. burial records). The cemetery in particular provides an important opportunity to investigate changes in a rural population over an extended period of time (e.g. demographics, origin, continuity in population etc.).
- 6.6.91 The site has the potential to contribute significant new knowledge across a range of current areas of research interest, and should provide a modern exemplar to place alongside earlier village investigations at Wharram Percy and West Heslerton. Key questions include:
- What is the documentary evidence and landscape setting for the village?
 - Is there any pre-Roman evidence for land use?
 - How does the Medieval village relate to known Roman settlement and was there an intervening early Saxon element? What evidence for direct continuity of settlement is there?
 - Is there evidence for continuity in field or territorial boundaries and agricultural systems (see specific objective KC30)? Can phases of agricultural organisation be tied to phases within other parts of the settlement, through the identification of pottery scatters within fields or other dating evidence?
 - Documentary evidence suggests the location of a Saxon ecclesiastical estate from the 7th century – what archaeological evidence is there for this? Are phases of Saxon burial present within the church and churchyard at St. Mary's and are Saxon burials present outside the limits of the existing churchyard?

- Can the earliest phase of the mill be identified and what was its subsequent development? How did the leats and channels function in relation to the mill? (see specific objective [KC33](#))
- What is the form of the Later Medieval village and how did this develop out of its Saxon origins? How does it relate to its surrounding fields, woodlands and pasture? (see specific objective [KC40](#))
- What evidence is there for shrinkage and abandonment of the settlement up to the 18th century? How does this reflect changing social and economic conditions? (see specific objective [KC35](#))
- What do artefacts and environmental remains tell us about the daily lives of the villagers at Stoke Mandeville, and how these changed over the centuries?
- How did the construction of village buildings change from the foundation of the settlement to its desertion? How long did buildings survive, how were they repaired or maintained, and how often were they replaced? Can different/changing functions be seen?
- Can a manorial site be identified? (see specific objective [KC34](#))
- Is there an earlier Saxon church beneath the Later Medieval stone building? What was the form and development of the later building?
- What environmental evidence is there to reconstruct past agricultural regimes and the changing natural landscape around the village?

6.6.92 Systematic sampling and analysis of human remains across a potentially significant depth of time at Stoke Mandeville from the Medieval period to the early 20th century would provide an unprecedented opportunity to sample the demographic of a rural community. Using current scientific techniques it is possible to explore themes of population movement, cultural identity and origins. This has the potential to provide comparative data with urban populations in London and Birmingham (see specific objective [KC42](#)).

6.6.93 There is potential for community involvement, links to higher education research projects, and national and international media coverage.

KC39: Develop a detailed understanding of the nature, formation, date and chronology of the historic landscape at Coleshill including the former Coleshill Deer Park, Coleshill Hall Farm and moated site

Locally demarked

6.6.94 A deer park at Coleshill is referenced in documentary sources from the Medieval period. Domesday describes a royal manor with a priest, a mill and woodland and in a document of 1316 a manor house with an enclosure and garden are mentioned at Coleshill, together with a park. Two mills are recorded in 13th and 14th century documents.

6.6.95 The site of Coleshill Hall Farm and associated moat are assumed to represent the location of the Medieval manor with the partly extant deer park boundary representing the Medieval

park. The date and chronology of this landscape complex are, however, not clearly understood.

- 6.6.96 The moat is of an unusual octagonal form and it is uncertain as to how this related to the phases of building associated with the hall. Geophysical anomalies on the moated platform indicate a complex formal arrangement of walls and possible formal garden features. There are documentary sources depicting the hall from at least the late 18th century but the earliest date of the complex and its relationship with the deer park are not well understood. Further buildings to the south of the former hall may also be associated, along with Hall Walk.
- 6.6.97 The former hall at Coleshill Hall Farm is located to the south west of the church and town at Coleshill, which are located on a ridge above the valley. The relationship of the moated site and hall with any closely associated settlement is, however, not well understood. A number of landscape and boundary features to the south have been recorded through remote sensing. These include a second possible moat together with earthwork platforms and enclosures to the south of the existing Birmingham Road. A third possible moated site has been recorded through remote sensing, to the south of Green Lane. The date and function of these earthworks and enclosures is uncertain, as is the relationship between them.
- 6.6.98 Within the parkland are potentially early boundary features and ridge and furrow which appear to pre-date the formation of the park. The date of park formation, the extent of any associated settlement dislocation and the relationship between the park and the wider settled area require further understanding. Later features include a duck decoy pond and the 19th century manor complex at the centre of the park, built to replace the earlier moated hall.
- 6.6.99 The Coleshill site provides a rare opportunity to investigate an integrated manorial landscape from its earliest origins into the 20th century. As such this has the potential to become an exemplar site (comparable to the village at Stoke Mandeville). Key questions include (and see specific objective [KC34](#)):
- What was the date of origin of the moated site at Coleshill and does evidence for the site at Coleshill Hall Farm tie in with documentary evidence for a manor?
 - Does the moated site relate to the manor described in Domesday, and does the site have Saxon origins? Alternatively, is there evidence that this was a Later Medieval foundation, reflecting expansion into newly colonised land within the more wooded Arden?
 - Is there evidence for landscape organisation at Coleshill being influenced by any earlier structuring of the landscape in, for example, the Romano-British period?
 - How does the form and layout of the moated site and deer park complex express ideas of elite power and status? Is this supported in the material culture?
 - What is the date of origin of the deer park boundary defined upon historic mapping, and through remote sensing? To what extent does this boundary define the historical extent of the parkland?
 - Is there evidence for sub division within the parkland, and is there evidence for its management?

- Is there evidence for the deer park having enclosed either previously settled or farmed land?
- Was there a focus of settlement in the vicinity of the moated site at Coleshill Hall Farm and what was its character and chronological development?
- What is the relationship between the moat at Coleshill and earthworks in the surrounding landscape, including two other possible moated or ditched enclosures?
- What was the chronology and function of buildings within the moated enclosure and did later buildings continue to use an existing moat for expressions of social status? Is there evidence for formal garden features within the area of the octagonal moat and to what extent was the moat part of a later formal parkland landscape?
- Were existing buildings to the south of Birmingham Road part of the hall complex and what was their function?

KC40: Identify patterns of change within Medieval rural settlement from the 11th to mid-14th century

Blended

- 6.6.100 This was a period of rapid economic and population growth. There is evidence for the expansion of existing villages and the planned foundation of new sites with expansion of arable land onto pasture and waste and asserting of woodland areas. Intensification of agricultural production appears to have been both a driver and response to population pressure and the continued development of urban markets.
- 6.6.101 Individual locations have the potential to answer a range of questions around:
- the chronology of settlement development and phases of settlement expansion;
 - building types and construction methods;
 - the relationship between settlement and surrounding systems of land use including open fields and their development; and
 - the lives of the villagers, how they farmed the land, fed and provided for their families.
- 6.6.102 There are considerable opportunities to investigate known deserted Medieval settlements using cross-disciplinary approaches and dialogue between archaeologists, historians, geographers, place-name scholars and vernacular architecture specialists. The route crosses significant parts of sites at Stoke Mandeville (SMA003) and Doddershall (WAD063), both within the Aylesbury Vale in Bucks, at Upper Radstone (NPB089) in south Northamptonshire, and Lower Radbourne (LBS035) and Hurst (STN062), both within the Warwickshire Feldon. At all these sites a major part of the settlement lies within the HS2 land take and so they represent opportunities for detailed investigation. Elsewhere smaller parts of champion settlement remains lie within the route at Hartwell Park, Bucks (SMA062), Costow House, Northants (GLB072), and Milburn, Warwickshire (STN047).

- 6.6.103 There is also the potential for the identification of areas of dispersed settlement, particularly in areas where this form of settlement was more common, e.g. the north London claylands, the Chilterns, the Arden/Birmingham plateau.
- 6.6.104 Key questions for areas of dispersed settlement include:
- What was the origin of dispersed settlement patterns? Can evidence for the date of early enclosures be identified and to what extent were these influenced by earlier elements of prehistoric or Roman land division?
 - How does the Later Medieval pattern relate to earlier Saxon settlement?
 - What forms of agriculture were practised and how are these evidenced in the pattern of enclosures, land use and environmental evidence?
 - Is there evidence for a wider range of economic activities, possibly based on woodland resources, than in the arable areas?
 - What evidence is there for new colonisation of waste and assarting of woodland?
 - To what extent are woodland areas such as the Chilterns and the Arden culturally distinctive? How might inhabitants of these areas have identified themselves as different?
- 6.6.105 Within areas of more dispersed mixed settlement, the HS2 Phase One route intersects with significant settlement remains at Bickenhill, Solihull, in the Arden (BICo32), which may represent secondary expansion onto marginal land, and lesser remains at Diddington (BHA211) and Curborough (WHA318), also in the Arden. The route enters Birmingham to the north of the Medieval town at the margins of the original settlement at Digbeth/Deritend (WCS022). Within the Chilterns the route follows the edge of the Misbourne Valley, an area of small, nucleated settlements but passes close to dispersed settlement near Bury Farm (CCo66) and finds scatters or cropmarks suggest other settlement at Cudsdens Farm (CCo35), Hunts Green Farm (DWH014), Wendover Dean Farm (DWH042), Bascombe Lane/Ellesborough Rd. (DWH116).
- 6.6.106 Strategies for the identification of settlement sites should be put in place with selection of key sites for further more detailed investigation as appropriate. Initial assessment aimed at defining key sites could include the following criteria:
- the presence of good supporting documentary evidence;
 - associated evidence for other contemporary settlement and landscape elements, e.g. manorial or ecclesiastical remains and field/enclosure systems;
 - the probable level and quality of preservation, including structural evidence for buildings;
 - the likelihood of encountering deposits with the potential to refine dating; and
 - the likelihood of encountering waterlogged or other well preserved organic/environmental remains.

KC42: Develop sampling strategies to examine and compare the origin and degree of mobility in 18th and 19th century urban and rural populations

Blended

- 6.6.107 London's population expanded from around 1 million in 1800 to 6.7 million a century later. Birmingham's population rose from 85,000 in 1811 to 522,000 in 1901. During this period rural populations also grew, although for the first time more people lived in cities than the countryside. Together with reducing mortality and rising fertility, increased migration was a major contributor to these changes. London attracted many from the home counties, including Middlesex and Buckinghamshire, and Birmingham from a similar local catchment including Warwickshire. From the late 18th century international migration was also an important factor in the growth of both cities with increased levels of immigration from Ireland in the mid-19th century in the wake of the Great Famine, but also immigration as a result of conflict elsewhere (e.g. North America, France and Russia). In the 1841 census 40% of Londoners had been born elsewhere although this declined to 33% in 1901. Population levels also increased in the countryside, for the first half of the century at least. At Stoke Mandeville population increased from 248 in 1801 to a high of 538 in 1851. The late 19th century agricultural depression saw this figure fall steadily to 411 in 1901.
- 6.6.108 This reflects migration away to the towns and cities, and beyond that to North America and the Empire. However, the Poor Laws (in place throughout this period) required those needing to access parish charity to return to the place of their birth. The sick and elderly may also have chosen to go home to die, perhaps leaving the city and returning to its hinterland resulting in a merging of urban and rural characteristics in the buried populations.
- 6.6.109 From the end of the 18th century, some city migrants may have returned to their rural homes with new social status, acquired through work in new technical or clerical roles in growing industries, in manufacturing, trade, in service or in the military. This growing middle class would be represented in both city and rural burial grounds.
- 6.6.110 The three major burial grounds in London, Birmingham and at Stoke Mandeville provide suitable locations for the development of sampling techniques to answer questions around migration such as:
- How mobile (geographically) were populations from the mid-18th to late 19th centuries?
 - What factors influenced the movement of people?
 - How did the Great Famine influence migration patterns?
 - How diverse were populations and how did this change over time?
 - What role did international migration play?
 - Is there any evidence for city migrants returning to their rural home?
 - How is change in social status reflected in treatment and marking of the dead?

- 6.6.111 Answers to these questions might best be obtained through use of scientific techniques such as (1) DNA studies to indicate ethnicity, (2) isotopic study of chemical signatures from hair, fingernails and teeth indicating origins reflected in diet, and (3) analysis of dental calculus which can also trap local environmental and dietary particles.
- 6.6.112 Cross analysis of memorials and other status symbols may deepen understanding of some of these aspects.

KC43: Investigate the link between the development of the railways and broader changes in the historic landscape, such as urban settlement expansion and the decline of the canal network

Scheme wide

- 6.6.113 The extent of the canal network in the form of channels, locks and bridges, can be seen across the route with examples including the Oxford Canal (LBS019), the Coventry Canal, the Trent and Mersey Canal (WHA340) and the Grand Union Canal (OFC004 and CVA102) which linked London to the industrial heartland of the Midlands.
- 6.6.114 In the 19th century railways superseded the canal network as the primary form of transport for goods and material and, after the establishment of the Liverpool to Manchester line in 1830 primarily for carrying passengers, revolutionised the movement of people across the country. The London and Birmingham Railway was planned by Robert Stephenson and fully opened in 1838, running between a terminus at London Euston (EUS005) and Curzon Street (WCS041) in Birmingham.
- 6.6.115 This change in transport infrastructure brought with it considerable changes to the landscape, with different effects seen in the two major centres of London and Birmingham.
- 6.6.116 Questions to be answered would be:
- How much settlement expansion can be associated with the development of the railways?
 - What effect did the railways have on canal usage and eventual abandonment?
 - Did the railways affect the growth of rural industries through the ability to acquire raw materials and transport goods more widely?
- 6.6.117 Answers to these questions might best be obtained through use of documentary research, map regression, landscape investigation and excavation.

KC44: How did rural industries fare, and what was their contribution to society over the period of the urban-centred industrial revolution?

Scheme wide

- 6.6.118 Although the industrial revolution resulted in the development of large-scale industries and factories, rural industry still played a significant part in post-Medieval society. The study of rural industry has the potential to shed light on the lives of populations at a local level. Examining the relationship between urban centres and surrounding rural landscapes can also contribute to the theme of trade and exchange as a driver of social change.

6.6.119 In the Hints and Weeford area at the two forges and slitting mill, as well as elsewhere along the route, evidence may be found to answer the following questions:

- What kind of scale of operation do the sites represent?
- How were the locations for these industries selected?
- How long were these sites in operation, and when did they go out of production?
- What evidence is there of the relationship of these industries with the surrounding landscape or wider links of trade and exchange?

6.6.120 Methods that might be used to answer these questions include documentary research, intrusive investigations, landscape surveys/geological surveys. These questions could be explored collaboratively with communities and social historians.

KC45: The conflicts of the 20th century define the history of modern Britain and the world: how can we achieve a greater understanding of the significance of sites associated with conflict to local communities along the route?

Scheme wide

6.6.121 The modern period is often largely defined by the two major conflicts that occurred within the first half of the 20th century, not only as a result of their direct consequences but also through the social changes brought about after hostilities had finally ceased. Together with the Cold War, these conflicts had a profound effect on Britain and the world in the 20th century.

6.6.122 A number of housing acts were passed following World War I and both residential and industrial development characterised the inter-war years. Following World War II there was continued agricultural intensification, changing both landscapes and associated technology, together with urban regeneration and expansion.

6.6.123 Questions to be answered in relation to this objective are:

- What evidence is there in the modern landscape of social and economic responses to the conflicts of the 20th century?
- To what extent did bomb damage contribute to changes in the character, appreciation and identity of an area?
- How were memorials to the deceased intended to be appreciated and to what extent do these still resonate in their surroundings today?
- How did technological advances initiated and developed during the wars contribute to mid-20th century industry, society, and culture?
- How did the post-war introduction of social services (e.g. the NHS and council housing) affect communities and shape modern towns and cities?

6.6.124 This objective should be explored using a broad range of methods, which should include oral history, photographic evidence, documentary research and archaeological data.

KC46: How do archaeologists affect the record themselves in terms of their methods of investigation, their response to the material and the decisions they make?

Scheme wide

- 6.6.125 The process of archaeological excavation marks a point in time and reflects the contemporary attitude of contemporary society to the past. The individuals involved in this process may have widely differing reactions to and interpretations of the archaeology they are excavating, and this may differ from the responses of archaeologists in the past or future. The nature of this very personal, cultural and time specific response can have a significant effect on the questions we ask and how we go about answering them.
- 6.6.126 Questions to answer would be:
- How do archaeologists in the 21st century respond to human remains? Does this affect the decisions they make in relation to the investigation and treatment of those remains?
 - How do the political opinions of archaeologists affect their research strategies and decision making? Do archaeologists as a group have a broadly similar political outlook?
 - Is the engagement of local communities in the investigation of the past an effective way of balancing the biases of archaeologists and those of wider society?

KC47: Test and develop geophysical survey methodologies

Scheme wide

- 6.6.127 A variety of methods of geophysical survey are available for archaeological prospection, with magnetometry surveys forming the standard technique in commercial field archaeology. It has been demonstrated in past research projects that a variety of techniques including magnetometry, magnetic susceptibility, resistivity and Ground Penetrating Radar, and can usefully be employed to assess and characterise sub-surface archaeology, alongside the 'ground truthing' of results (e.g. Watters 2006a; 2006b). The Proposed Scheme provides an opportunity to test a variety of geophysical survey techniques upon known archaeological sites, both to maximise the information available for sub-surface remains and to test new techniques and methodologies.
- 6.6.128 Data can be used to form a targeted excavation strategy designed at answering specific thematic objectives, ultimately feeding into interpretative narratives. Surveys may be intensive at sites of known archaeological remains or extensive and designed to contextualise sites where data has the opportunity to contribute to research objectives at a landscape scale.

KC48: Methods of using digital technology and social media to engage with public, communities and volunteers should be explored in a manner that enables parties to contribute to research and interpretation as well as enabling easy access to knowledge and ultimately archives

Scheme wide

- 6.6.129 Fast paced digital technology and multiplatform social media provides an increasingly common and readily available channel for multi-directional communication between organisations and people (and visa-versa). It enables conversation rather than communication and encourages debate and dialogue; all attributes that are required for the delivery of the GWSI: HERDS.
- 6.6.130 In addition to route-wide common data management and sharing processes the *Employer* will also expect the *Contractors* to collaborate to develop, trial and implement novel approaches to engaging, through digital media, a broad range of audiences. The aim is to create an active community of interest and research that encompasses the service providers and external interested parties. Examples of such approaches could include, among many others:
- rapid distribution of digital site material through an open access portal;
 - live streaming of excavations with feedback and comments;
 - creation of a Photo Lab to share of images of finds/places/features/sites and the people involved (discoverers);
 - a development of the Story Explorers scheme by the Portable Antiquities Schemes (PAS) through the creation of apps/websites showing links between field, museum, archives and artefact to help engage people with the story and how it is evolving; and
 - lunchtime, evening and weekend 'webinars' to engage those working on the projects as well as external parties in the wider audiences.

KC49: Ground truth and develop multispectral and LiDAR prospection techniques

Scheme wide

- 6.6.131 The entirety of the Phase One route has been subjected to LiDAR and Multispectral data survey. These datasets are a valuable source of information for the *Contractor* and other partners (for example community groups and higher education institutions) in terms of developing project plans and LSWSIs. The dataset covers a diverse range of topographies, ground covers and geologies and, given its scale, offers a strong comparative dataset to develop methodologies for analysing multispectral and LiDAR data for future projects.
- 6.6.132 Route wide comparative analyses will therefore be developed to ascertain key factors influencing LiDAR and multispectral prospection techniques and their performance under different conditions and in different physical environments. The results will inform future works along the entire HS2 route and will also inform re-analysis of existing data where appropriate.

KC50: Investigate architectural artefacts of 20th century design with a social agenda and their legacy as contemporary built heritage

Scheme wide

- 6.6.133 The Alexandra Road Estate in Camden was the first post-war council housing estate to be listed, celebrated as a high density development of stacked dwellings that provided an alternative to the high-rise solutions widely implemented at the time. Designed in 1968 by Neave Brown of Camden Architects' Department, the vast Grade II* listed scheme was the last of the comprehensive developments realised by local government under the 1957 Housing Act. This bold, brutalist insertion of unpainted reinforced concrete blocks combines public housing with garden spaces, educational facilities and other community buildings that integrate the development within the urban landscape and support the individual and communal life of its many residents.
- 6.6.134 At the eastern end of the conservation area is a pair of later blocks that echo the stepped profile of the Alexandra Road Estate. Clad in dark red metric brick with pre-cast concrete dressings to openings, projections and vents, these blocks are a distinctive feature at the principal entrance to Alexandra Road. The northernmost block consists of a parade of shops at ground level, with a colonnade of steel stanchions supporting residential units at first floor and workshops above and to the rear. The stepped and curved profile and the stairs to the upper units are expressed on the end elevations, which are punctuated with porthole windows and capped with curved profiled sheet roofing. Commissioned by the London Borough of Camden the blocks were designed by Tom Kay, a local architect and activist who helped form Camden Housing Action and Camden law centres in the early 1970s. This later phase of the Alexandra Road Estate became Grade II listed in February 2016, with the principal reasons for designation cited in part for its planning interest as an innovative low-rise, mixed use complex on a human scale that demonstrates clear affinities with contemporary Camden public housing.
- 6.6.135 Many purpose-built developments associated with post-war urban renewal quickly fell out of favour during the 20th century, stigmatised by images of decay and vilified as the catalyst for crime and other social issues. However, after decades of condemnation, brutalist architecture and other post-war architectural movements have come into fashion in recent years, becoming sought after real estate in many instances. The shift in the perception of these once notorious developments raises questions around notions of gentrification and whether this new found appreciation of social housing as an element of the nation's heritage will allow for this social function to be maintained.
- 6.6.136 Questions to be considered under this objective include:
- What does the building or structure reveal about the social and political aspirations of those involved in its creation? Can a specific intent be evidenced in the design, planning or materials selected?
 - What do adaptations and changes in use reveal about the ways in which the perception of the building and its surroundings has changed? Can different perceptions of the building be recognised during the social, economic and cultural changes since its development?

- What role has town planning played in shaping the urban landscape?
- What is the legacy of this approach to design with a social agenda and how can this legacy inform resident-led and other social housing initiatives of today? What can these developments reveal about the future for other forms of social housing and town planning, such as the new garden city as contemporary built heritage?

KC51: How do 19th and 20th century recreation and community buildings reflect social and economic change and contribute to community identity? Can different trajectories in the development of these amenities be recognised?

Blended

- 6.6.137 Recreation and community facilities can form an important part of the historic environment and can hold significant meaning to people in their everyday surroundings, contributing at times to a sense of local identity and social cohesion. The design and construction of such buildings and regional differences in proliferation, siting and materials can provide an important insight into the cultural, social and economic circumstances in which they emerged.
- 6.6.138 Public Houses form a significant component of the recreational buildings along the route. The local public house is often a focus of community life in Britain's villages, towns and cities and is widely considered an icon of the British cultural landscape. By the mid-18th century larger alehouses became more popular through the establishment of coaching inns on strategic routes across the country. Through the 18th and 19th centuries social class distinctions were being reflected and emphasised in the design of the public house, which became typically split into several rooms to cater for the different types and class of customer.
- 6.6.139 The 19th century public house was purpose-built to provide respite, sustenance and entertainment, growing in number in cities and provincial towns to accompany a burgeoning urban population. Comparisons can be made, for example, between the 19th century public houses encountered within the urban contexts of Birmingham (such as the Eagle and Tun) and London (the Bree Louise). Different responses may be recognised to periods of reform, political or regulatory priorities and changes in fashions and lifestyles, on the function, appearance and longevity of these buildings.
- 6.6.140 There may also be potential to explore contrasts between rural and urban establishments. Rural buildings associated with leisure include mid-19th century vernacular buildings such as Annie Baileys in Great Missenden, Buckinghamshire, and the former Black Horse Pub (the Weights and Measures Gym) on Frith Hill, Buckinghamshire, and the Whittington Heath Golf Course Club House, Staffordshire, where the history of adapted use is of particular interest.
- 6.6.141 Other examples include community buildings for which relatively little is known about their origins, significance and legacy. These include the Tin Tabernacle in Calvert and a former nursery school in Euston Square, a building thought to originate in the inter-war period that has potential research interest in the context of the arrival of this new municipal building type. Among the questions that should be considered are:
- How did the design and function of the building reflect the pre-occupations of its time?

- Was a notable or other architect involved in the design of the asset, such as those associated with a company or brewery or a particular building typology, use/ activity or social movement, and how does this reflect social values or the social and economic climate of the time?
- What do the design, materials, construction method, siting and orientation of the building tell you about the social, cultural and economic circumstances of the time?
- Importance and survival of setting – what contribution does the setting make to the significance of the asset?
- Has the function and role of this building within the local and wider community evolved, and what have been the factors involved in this change? How do the changing use, style and associations of the building reflect changing populations, demographics and cultures of a particular area? To what extent does the building maintain a link with social and cultural identity and how does the perception of a building's past influence its contemporary use?
- What can comparisons between public houses and other community amenities encountered along the line of the route reveal about the differences and similarities in how these establishments emerged, evolved and survived, and what does this reveal in terms of social, stylistic and cultural priorities in different areas?

KC52: Understanding the pattern, form and function of post-Medieval rural vernacular architecture: can we identify regional, intra-regional or temporal variations?

Scheme Wide

- 6.6.142 Post-Medieval rural vernacular architecture along the route largely dates from the 18th and 19th centuries, but with some earlier examples and the potential for some buildings to incorporate earlier phases of construction. The majority of these are agricultural buildings that relate to farm houses as part of a cohesive farm complex, although there are several examples of individual agricultural structures no longer associated with a particular farm. A number of the individual farm buildings in particular have been heavily altered and converted to accommodate other uses. Further examples of agricultural rural housing are also present, ranging from workers' cottages to more substantial dwellings that display characteristics of suburban housing design. There are also a limited number of former light industrial buildings that once provided a supporting function within a wider building complex or landed estate.
- 6.6.143 It is important to understand the origins of these rural buildings and their relationship with the rural agricultural economy, trends in the development of rural settlement and also within the context of social developments in the period. Understanding the form of rural architecture will contribute to our knowledge of, and definition of, regional styles. Identifying and understanding regional styles of form and construction also has the potential to contribute to our understanding of social and economic interaction, influence and change within rural communities in this period.

6.6.144 Key questions include:

- What does the building fabric reveal about the time, location and techniques of production and construction, and does this conform to neighbouring or regional buildings of the same period? What can this tell us about regional building techniques and common architectural styles and traditions of the area and to what extent can the building be described as representing a local vernacular? Can intra-regional traditions be identified?
- Can we recognise changes in function of a building over time? Are there materials and decorative or construction techniques present that suggest a building use that contrasts with initial interpretations? Do these reflect changes in social status or lifestyle of the building's occupants?
- What does the siting, orientation and material selection reveal about how the building was designed within its contemporary environment? To what extent has that environment changed? Has the building become absorbed within an urban or semi-urban landscape? Can an understanding of both the building and its context within the landscape or streetscape increase our understanding of changing architectural traditions and the key social and economic developments in the region?
- Would the application of specific investigative techniques, such as dendrochronology and laboratory analysis of paint, mortar or plaster samples resolve ambiguities about a building's history that could contribute to a greater understanding of the origins and development of a particular settlement?

KC53: Explore techniques for analysing and recording the setting of heritage assets, where the setting and its contribution to the significance of the asset is particularly complex

Scheme wide

6.6.145 It is recognised that the construction and operation of HS2 will change the setting of heritage assets in a variety of contexts along the line of route, including a number of listed buildings and other designated assets. The setting of a heritage asset is not just its visible context, it is the surroundings in which the asset is experienced and a heritage asset can be experienced in a number of ways. To a degree, recording setting is about analysis and perception. Setting, for example, may include spatial elements associated with the asset that enhance understanding or legibility but are not necessarily visible from the asset itself. Conceptions of setting may be influenced by our understanding of the historic relationship between places and any cultural, aesthetic or other associations that enhance the experience of the asset. There may also be more intangible aspects of the setting that contribute to the significance of the asset, such as sound, odours, and a sense of enclosure, intimacy or tranquillity.

6.6.146 While the use of photography, written descriptions and mapping may prove sufficient to record and describe the key aspects of an asset's setting, there may be instances where additional techniques to analyse and record the setting can be applied. These may include GIS viewshed analysis, recording of intangible non-visual elements or topographic survey. The use of such techniques where the setting is particularly complex will help reveal and define less tangible aspects of the setting.

6.6.147 Are there aspects of a heritage asset's setting that can be further explored through additional techniques, and how could analysing and recording the more intangible connections, associations and ephemeral aspects, help enhance our understanding of the asset in question?

6.6.148 There may be instances where the recording of the setting of a listed building or other designated heritage asset, or the character and appearance of a conservation area may be the driver for community engagement, including where community values are relevant to the understanding of significance and setting (also see Specific Objective CE1).

KC54: Identify key changes in the technology of railway infrastructure and how these changes influenced the distribution of goods or the movement of people. Can we recognise changing public perceptions of railway infrastructure and associated buildings over time?

Blended

6.6.149 A significant number of built heritage assets crossed by the HS2 route relate to the management and operation of the railway network. These assets vary greatly in date, type, form and style, which indicates the breadth of structures needed to support the operation of the railways, and the length of time that the railways have been operational. The structures include: railway bridges; viaducts, station buildings, signal boxes and associated engineering structures, including tunnels and cuttings.

6.6.150 The London and Birmingham Railway (L&BR) line opened in 1838 in the midst of a pioneering phase of British railway engineering and development. This period in railway history saw the arrival of influential figures in civil engineering, such as Robert Stephenson, Charles Fox and Joseph Locke, and innovation in the design of railway engineering structures, including the early railway roundhouse at Curzon Street and the widely imitated prefabricated wide-span iron train sheds introduced at the Euston and Curzon Street termini.

6.6.151 Railway terminus buildings provided an opportunity to create monumental structures to express the commercial and social power of the incoming railway and ascribe an architectural identity to competing companies. The L&BR line at Birmingham included Hardwick's monumental Curzon Street terminus, which was extended in 1840 to include the world's first railway hotel. At Euston train sheds and booking offices were entered through an imposing Doric propylaeum by Philip Hardwick, which was flanked by a screen of Greek lodges.

6.6.152 Further examples of railway infrastructure include: the Granby Street Carriage Shed of 1905 (EUS038), the disused Charing Cross and Hampstead Railway Underground Station of 1907 (EUS028), the 1960s British Rail Euston Station (EUS005), remains of the Curzon Street Station former pumping station (WCS072) and the remains of Calvert Station on the disused Great Central Line in Buckinghamshire (CAL009).

6.6.153 Key questions include:

- Can we identify innovative developments in railway infrastructure and associated buildings through an understanding of their function and their economic and social context?

- Can we understand the architectural impact of railway buildings, and their changing public perception through their use, adaptation, disuse and reinvention? How has this been marked by changes in the way that we travel and our perception of stations as 'urban spaces'?

KC100: Creation of an ancient DNA database

Blended

6.6.154 Large-scale systematic sampling, analysis and then publication of DNA information and sequences from the three burial grounds at St. James's Gardens Euston, St. Mary's Stoke Mandeville and Park Street Gardens Birmingham, has the potential to provide an internationally important corpus of data that could support the study of past populations in a number of ways but also, importantly, provide a highly important tool for modern medical research. Key potential outcomes include:

- An unprecedented mitochondrial DNA (mtDNA) screen for UK populations over a timeframe from the 10th to the late 19th centuries. Depending on final selection criteria it should be possible to collect c. 2,500 samples to compare with modern geo-referenced databases. This would provide important information about movement patterns since the late Saxon period through the period of the industrial revolution and into the late 19th century (also see [KC42](#)).
- Novel, detailed data on the role of natural selection in the shaping of genomes through periods of strong environmental and social change, influenced especially by epidemics over the 14th through 17th centuries, and by industrial culture through the 19th and 20th centuries. This will provide important information on the strength and direction of selective forces, shaping modern genomes.
- A major epidemiological dataset that could help establish changes to susceptibility to disease as a consequence of our historical environments and the consequent impact on our genomes. This will provide a critically important insight into the mechanisms of disease resistance, and the importance of environment.

6.6.155 This would be an outstanding legacy and would form a keystone in a world-leading ancient DNA database, which future excavations in the UK could contribute to, forming a constantly developing tool for the study of past populations and improving the health and wellbeing of future populations.

KC101: Cemetery management and burial practice

Blended

6.6.156 The three burial grounds at St. James's Gardens, St. Mary's Church Stoke Mandeville and Park Street Gardens, all demonstrate potentially very different histories and stories in relation to:

- how cemeteries have developed and managed throughout the Medieval and post-Medieval periods;
- how traditions and fashions in the interment of the dead have changed through time and under differing social and environmental conditions;

- how burial practice in terms of the treatment of bodies, coffins and grave goods for example, changed through time and how it was undertaken in different regions (also in relation to other excavated sites from a range of periods including places such as Wharram Percy);
- how cemeteries developed through the 19th century in response to rapidly changing urban and rural population sizes and characteristics;
- how the 19th century Burial Acts affected cemetery management practices; and
- changing responses to death and burial in the post-industrial age (particularly in relation to railway development).

6.6.157 The three sites therefore offer the opportunity to explore the development of cemetery and burial practice over a significant time depth, in different urban/rural contexts and through key historical events (e.g. disease outbreaks). Further engagement with historical specialists, documentary research, archaeological investigation and comparison between the sites and with other already investigated sites across the UK could provide important insights in these questions and could influence future investigations of post-Medieval and Medieval burial grounds.

KC102: Health, disease and pollution in 19th century populations

Blended

6.6.158 St James's seems to represent a relatively typical late post-Medieval London cemetery, the osteological, isotope and other data collected from future investigations has the potential to support the wider understanding of health, disease and urban pollution in London during the late 18th century and early 19th centuries, but on its own is unlikely to provide significant insights. The unique opportunity lies in the development of a new comparator dataset for the urban population of Birmingham and the rural population at Stoke Mandeville. The investigation of these two sites, and the comparison of this data with St. James's and other excavated cemeteries in London and the wider UK, should enable the development of deeper understandings around:

- the nature and impact of 19th century industrial practices and working conditions on worker and resident populations (mainly from Park Street);
- the differences in health, disease and pollution experienced by populations in rural, central London and industrialised city locations;
- the prevalence and emergence of pollution markers in differing populations through time, e.g. when and if we see the emergence of air borne pollution markers in rural populations; and
- the potentially differing health impacts of dietary changes through the 18th and 19th century on rural populations, London populations and other urban populations.

KC103: Burial grounds and their place in the cityscape/ landscape-both in use and disuse

Blended

- 6.6.159 The three known burial grounds within the scheme have all had different life histories and all have played differing roles during their active and disused phases of life. While much of the work required to describe, assess and consider the role of the individual grounds has been undertaken during the preparation of Detailed Desk Based Assessments (DDBAs), a more detailed synthetic analysis drawing on wider geographical, historical and anthropological work is required to contextualise and understand the burial grounds and to contribute to wider academic discussion regarding this subject area.
- 6.6.160 Areas of further research include the examination of the appearance and environment of overcrowded and (later) disused grounds in the mid-19th century, as factors in the development of communities, subcultures, crime and literary creativity, including ideas of Victorian Gothic. This has particular relevance for both Park Street and St. James's.
- 6.6.161 The use of burial grounds for medical research is also of interest, from bodysnatching in the 19th century to cutting edge genetic research of the 21st century, the function of cemeteries as a resource for medical students, scientists and researchers seeking material to help develop theories of illness, wellness and treatment of the human body.

KC104: People and place: Park Street as a snap-shot in time of a growing industrial city

Locally demarked

- 6.6.162 Park Street provides the opportunity for research in relation to a burgeoning and rapidly changing urban population in an industrial area during a keynote period in Birmingham's growth. Closely aligned in purpose to KC102, this specific objective seeks to provide a finer grained understanding, including work at the human/individual scale (related to CE2 and CE3), of the lives and deaths of the population buried in Park Street and how this can inform our understanding of Birmingham's history.
- 6.6.163 The possible nature of interment at the site, potentially with limited intercutting, provides the possibility for detailed analysis of a large sample of intact burials. This sample can also be compared and understood with the excavated remains from St. Martin's, the sister graveyard to Park Street. Together, analysis of this material can inform a range of questions including:
- What evidence is there for malnutrition, disease, specific occupational diseases, industrial accidents and medical care? How does this compare with St. Martin's?
 - Is there clear evidence of class structures within the burial ground? Of different trades? Are there clear differences in health, life outcomes and diseases associated with these social, economic and occupational markers?
 - Are there clear gender differences in the life outcomes of the buried population?
 - Is it possible to identify named individuals and to provide detailed documentary and osteological life stories for these individuals? Can these be used as entry points for engaging a wide audience in the history of Birmingham (see CE2 and CE3)?

- Can we plot, analyse and assess the patterns of immigration, emigration and origin in Birmingham during the 19th century (linked to KC42 and KC100)? Do these differ significantly from other known analyses of populations? Can we undertake retrospective work on the St. Martin's sample to generate a comparator population?
- Are there significant biases in the buried population of Park Street and St. Martin's in terms of social background, class, occupation, gender for example?
- Drawing on contemporary evidence in London (from a range of burial grounds, including St. James), are there substantive differences in medical care and treatment evidenced in the buried remains?

KC105: Develop a fine grained analysis of the health, diet and life history of Medieval and post-Medieval rural elites at St. Mary's Church, Stoke Mandeville

Locally demarked

- 6.6.164 The elevated potential for *in-situ* intra mural burials, including the three Brudenell children at Stoke Mandeville, presents an opportunity to assess and investigate, using a diverse array of osteological, archaeological and scientific techniques, the remains of a rural elite through the Medieval and post-Medieval period. The analysis can inform discussion around the social structure of Medieval and post-Medieval society and identify commonalities and differences between elite social groups able to command a place within the church and a wider, less privileged spectrum of the population.
- 6.6.165 The analysis can also seek to understand family connections within the burial population and explore the origin of individuals through isotope analysis. This can help develop further understanding of patterns of continuity and change in high status populations in rural locations.

7 Specifying and delivering the historic environment works

7.1 Introduction

7.1.1 This section sets out the standard approach to specifying and delivering historic environment works along the route. It also provides a process for designing and delivering works that depart from set policies, standards and procedures.

7.1.2 Unlike traditional historic environment projects it is not intended that all works along the route should follow a typical sequential process, e.g. desk-based assessment, followed by evaluation, followed by further historic environment mitigation. Instead a knowledge-led approach will be taken that is focused on outcomes. This may, in some instances, require the implementation of a staged approach, in other situations it will not.

7.1.3 The following sets out the approach to specifying works, delivering works and how to go about designing works that depart from formal strategies, technical standards and procedures.

7.2 Expertise and resources

7.2.1 The *Contractors* shall have a range of expertise and resources in their supply chain to deliver the programme of historic environment works, including but not limited to:

- historic environment manager responsible for managing historic environment activities within each area;
- archaeological contracting organisations, built heritage specialists and exhumation contractors;
- GIS, BIM and data management specialists;
- historic environment specialists including but not limited to: dating specialists, palaeo-environmental specialists, historians, documentary researchers, geophysicists, remote sensing data specialists, DNA/Isotope analysis experts, finds specialists;
- facilities for the processing of artefactual and environmental material and samples; and
- access to laboratories required for analysis of specialist materials and techniques.

7.2.2 An Environmental Management Plan will be prepared by the *Contractor*, and shall include the management of the historic environment works.

7.2.3 Once this team is assembled by the *Contractor* and agreed with the *Employer*, the *Contractor* shall prepare a GWSI: HERDS briefing for the historic environment supply chain. This supply chain briefing shall form part of the Environment Management Plan. The briefing will include communication and training on:

- the ethos and principles;
- headline objectives;
- specific objectives;
- associated strategies, technical standards and procedures;
- the resource assessment;
- delivery mechanisms;
- collaborative working relationship with the *Employer*; and
- decisions regarding the nature, scope and delivery of work activities.

7.3 Keys aspects relevant to the design and delivery of works

7.3.1 The *Contractor* shall adopt the following key aspects of the GWSI: HERDS approach to ensure the successful implementation and delivery of the historic environment programme of works:

- **Focus on outcomes not activity:** All works shall be designed and delivered to address the specific objectives, i.e. research and other outcomes. The GWSI: HERDS is designed to deliver outcomes, not to analyse and address every aspect of the historic environment along the route and then create a selective record of the historic environment that somehow 'preserves' it for future generations.
- **Collaboration:** all works shall be designed and delivered in collaboration with the *Employer* and other *Contractors* operating along the route. The need for collaboration between parties is vital to the success of the GWSI: HERDS and all works must be designed in relation to other works along the route that address similar sites and specific objectives.
- **Consistency of approach:** the *Employer* has prepared a suite of strategies, technical standards and procedures (see [Section 8](#)) to guide all work activities; the *Contractor* shall adhere to these throughout the design and delivery of all works. A Departures Procedure has been specifically developed to encourage innovation (see Section 7.20).
- **In field responsiveness:** investigations shall be developed and delivered in a way that responds to emerging material. Should the initial focus or direction of the project plan, as developed by the *Contractor*, be shown to be declining in relevance or new aspects have emerged, then the *Contractor* shall undertake a review of the work in progress and, in discussion with the *Employer*, make recommendations to the *Employer* regarding the changes of approach and scope of work.

- **Rapid feedback:** the outputs from one investigation will inform decision making by *Contractors* in relation to other investigations locally and those occurring along the route with the same or related specific objectives. This feedback mechanism is critical for sharing the results from individual activities, through the *Contractor* deliverables including summary and interim reports, data inputs into the resource assessment and GIS. The *Employer* will establish a Phase One historic environment roundtable for information exchange discussion of ongoing results, efficacy of techniques and lessons learnt between *Contractors* and the *Employer*. The *Contractor* shall attend these roundtable meeting and provide necessary input, updates and reporting, including presentations to attendees.

7.4 Summary of *Contractor* responsibilities

7.4.1 The *Contractor* is responsible for the design and delivery of all required works within the framework of objectives provided by the GWSI: HERDS and the associated strategies, technical standards and procedures. In particular they are responsible for:

- managing budgets and programmes for works;
- preparing and maintaining an integrated historic environment programme of works;
- preparing the project plans;
- preparing the LSWSIs;
- delivering specified works;
- preparing defined outputs;
- preparing and delivering physical and digital archival materials;
- engaging with the *Employer* and external parties to deliver community engagement activities;
- attending specified progress meetings with the *Employer*;
- preparing for and attending the Phase One historic environment monthly roundtable and hosting it on a cyclical basis; and
- preparing for and hosting meetings with external stakeholders, for example Historic England, local authority archaeologists and conservation officers.

7.5 Designing works and deliverables

Introduction

7.5.1 The following sets out the approach to be taken when specifying and designing works. The majority of historic environment works will be focused on specific locations, either to meet particular design requirements for particular locations, to address known assets, to address specific research aims or to explore certain aspects of archaeological potential.

Programme of historic environment works

- 7.5.2 The *Contractor* shall develop and maintain an integrated programme of historic environment investigation and recording works setting out the scope of archaeological and built heritage activities required within the area for which they are responsible (North, Central or South), in order to address the specific objectives of the GWSI: HERDS. The format of this document shall be developed and agreed in consultation with the *Employer*.
- 7.5.3 The *Contractor* shall include all historic environment design, implementation and post-excavation activities as these are developed.
- 7.5.4 The *Contractor* will ensure that the historic environment investigation programme is fully integrated with the overall construction programme and that integration will be continuously reviewed to ensure that appropriate time is allowed for investigation works without undue impact on the construction timetable.
- 7.5.5 The *Contractor* shall submit the historic environment investigation programme to the *Employer* for review and acceptance on a three monthly cycle.

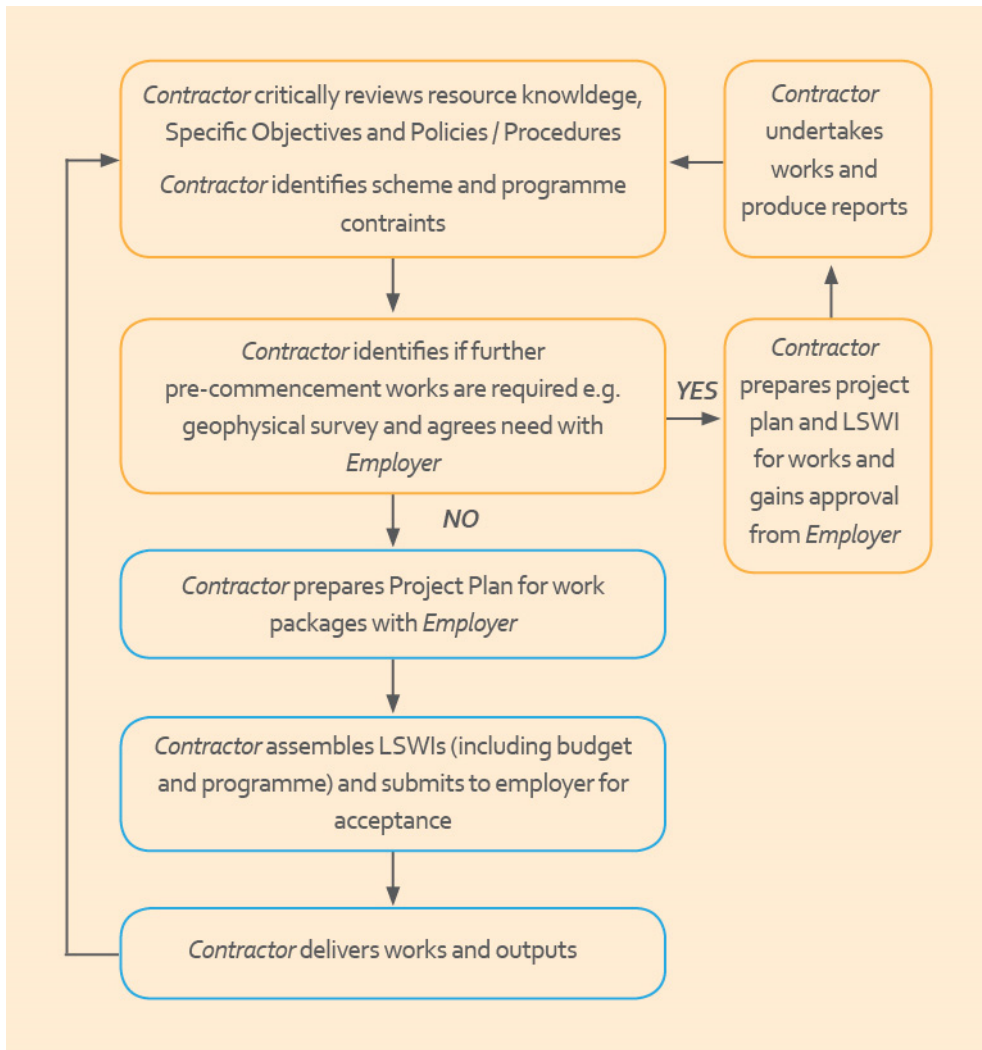
Project plans and location specific written schemes of investigation

- 7.5.6 The *Contractor* shall undertake the specification and design of all historic environment works.
- 7.5.7 The production of the project plans and LSWSIs shall be in accordance with the *Specification for project plans and Location Specific Written Schemes of Investigation*.
- 7.5.8 **Project plans** – For each specific package of activity, e.g. evaluation works, a geophysical survey, a building recording survey, archaeological excavation, palaeo-environmental sampling or a landscape setting project; the *Contractor* shall prepare a project plan for agreement with the *Employer*. The project plans shall respond to the specific objectives of the GWSI: HERDS and be delivered within an agreed budget and programme.
- 7.5.9 **Location specific written scheme of investigation (LSWSI)** – The *Contractor* shall then prepare a LSWSI that brings together one or more project plans within a defined area of land (the area of land would normally be defined to meet construction need, e.g. a series of design elements). The LSWSI shall be agreed with the *Employer* and will provide a time limited and costed approach to addressing GWSI: HERDS objectives. These would form the primary management tool for the works.
- 7.5.10 The *Contractor* may propose that historic environment works, e.g. archaeological excavation, be carried out as an extension to evaluation works, if the scope of such works is readily incorporated into the project plan and LSWSI and reflects the need to address specific objectives. The detailed method for this work shall be agreed between the *Contractor* and the *Employer* at a site meeting and subsequently in writing as an addendum to the existing PP and LSWSI.
- 7.5.11 The methodologies and techniques to be employed for historic environment works are specified in a number of technical standards and procedures set out in Section 8. These shall be adhered to when developing project plans and LSWSIs.
- 7.5.12 Project plans and LSWSIs shall include measures for archiving in accordance with the physical and digital archiving procedures.

Designing and delivering the works: the process

- 7.5.13 The *Contractor* shall adhere to the process detailed below in the design and delivery of the works.
- 7.5.14 The specification process will commence with the *Contractor* reviewing existing baseline situation with regard to the works area defined by the needs of construction and the LLAU. The potential for the investigation of the known or potential resource to address specific objectives will be assessed and reviewed. This review will be discussed with the *Employer* and set out in the Weekly Progress Report. The *Employer* will develop a proforma for the *Contractor* to complete for acceptance by the *Employer*. The outcome of this review will, in many situations, be that sufficient confidence exists regarding the historic environment resource in a given area for detailed works to be specified that address the specific objectives. In these circumstances the *Contractor* will prepare the required project plan (or plans for more complex locations) and discuss and agree these with the *Employer*.
- 7.5.15 There will however be occasions when the *Contractor* considers that further pre-commencement works may be required to provide additional key knowledge and to support the design of works to meet specific objectives. In the first instance the *Contractor* shall raise this requirement with the *Employer* in the Progress Reports using the following headings:
- area under consideration;
 - currently identified issues which require pre-commencement works; and
 - proposed pre-commencement works (in brief).
- 7.5.16 Following consideration of the information, the *Employer* will either accept the approach, request further clarification/information, or suggest an alternative approach. Once the preferred approach has been identified the *Contractor* will prepare a standard project plan and LSWSI, as set out in the Technical Standard for the proposed activities for acceptance. The outcome of this stage of investigation will then be fed back into consideration of the area (see above) and future activities will, if required, then be specified and delivered. Throughout this process the *Contractor* shall liaise with *Employer*.
- 7.5.17 The *Contractor* will report the outcomes of any evaluation works and their ground truthing at later stages of delivery in relation to the identified relevant specific objectives.

Figure 3: Historic Environment Works Development Process



Route-wide coordination

- 7.5.18 Historic environment activities cannot be designed in isolation and it is critical that *Contractors* work with each other and the *Employer* to design and deliver these works along the route, particularly in relation to specific objectives that require a route-wide response in terms of their delivery.
- 7.5.19 This will require coordinated route-wide cooperation facilitated by the *Employer*. For some locations the first wave of works will be exploratory in nature, e.g. further non-intrusive surveys, more detailed desk-based assessment, or intrusive trenching; in other locations where there is a relatively robust understanding of the likely nature of the historic environment resource it is expected that the design of the first wave of works will include more substantial activities such as detailed excavation, DNA and isotope sampling of burials, or larger scale landscape survey activities.

- 7.5.20 During this period the *Contractor* shall liaison with the *Employer* and collaborate with the other *Contractors* along the route (as facilitated by the *Employer*) to design individual packages of work that complement other proposed work activities up and down the route, and which work together to address specific objectives.
- 7.5.21 Initially these proposals will be developed at a high level, during the sequence of progress reporting and minutes of progress meetings for discussion with the other *Contractors* and for agreement with the *Employer*. Once the principle elements of the response for each contract area or defined section of works have been agreed then project plans will be prepared for each intervention in accordance with the approach set out in the relevant technical standard or procedure (see [Section 8](#)). These will be included in LSWSIs as the areas come forward within the development programme. Designing the works will require the *Contractor* to draw on resource assessment, baseline historic environment information held in the HS2 GIS, their own professional knowledge and the knowledge held by the *Employer*.
- 7.5.22 As well as route-wide specific objectives there are some that address particular sections of the route, and may therefore be confined to one contract area but require investigations at a number of locations in that area.
- 7.5.23 The *Contractor* shall prepare a contract-wide summary of proposed historic environment works to address the specific objective(s) in multiple areas. The *Employer* shall develop a format for this contract-wide summary for use by the *Contractor*.
- 7.5.24 This will be discussed and agreed with the *Employer*, during regular progress reporting. Once agreement is reached on the contract-wide approach, individual project plans will be prepared and agreed for each proposed intervention (as set out above). These project plans will be incorporated into LSWSIs as appropriate.

Handover and updating

- 7.5.25 It is possible that historic environment works will span more than one contract stage, e.g. enabling works and main works civil contracts. This will require a clear handover between *Contractors*.
- 7.5.26 At the start of each relevant contract, the *Contractor* with responsibility for works in that area will ensure that information is handed over to the new *Contractor* in accordance with the Handover Procedure (to be developed by the *Contractor* for agreement with the *Employer*). If a handover is required between *Contractors* then the *Contractor* shall prepare a Handover Plan as detailed in the Procedure between themselves and the succeeding *Contractor*.
- 7.5.27 In particular, it is important that all project plans and LSWSIs are handed over to the new *Contractor* and that relevant staff are fully briefed on the design of the works.
- 7.5.28 The *Contractor* shall ensure that key staff continue to support the new *Contractor* for a period of time to be agreed between the respective parties after handover to ensure consistency and the transfer of knowledge.
- 7.5.29 It is likely that some works and locations may come forward late in a contract phase or only under a different and later contract. In these cases the new, or existing, *Contractor* will need to review the project plans in discussion with the *Employer* to ensure their continued relevance in light of results elsewhere along the route.

- 7.5.30 All project plans over four months old shall be reviewed and updated by the *Contractor* and submitted to the *Employer* for acceptance prior to implementation; any changes will need to be accepted by the *Employer* (as detailed in the technical standard for the preparation of project plans and LSWSIs).

7.6 Delivering works specified in PPs and LSWSIs

General requirements

- 7.6.1 It is recognised by the *Employer* that some community-led and academic projects will be delivered by volunteers, academics and other non-professionals. This will form part of the community engagement element of the *Contractor's* PP and LSWSI documentation. The *Employer* shall develop mechanisms for ensuring that public benefit is maximised and opportunities for a range of engagement. See [Section 9](#).
- 7.6.2 Suitably qualified and competent professionals shall undertake all historic environment works specified and delivered by the *Contractor*.
- 7.6.3 The historic environment supply chain undertaking such works will generally be expected to have Chartered Institute for Archaeologists (CIfA) accreditation as Registered Archaeological Organisations (RAO) and their supervisory staff to have an appropriate and relevant level of demonstrable experience for the specific task in question, i.e. full members of the CIfA, IHBC or an equivalent demonstrable professional standing.

Site assessment, evaluation and investigation process

- 7.6.4 The following section provides additional explanation about the stages of potential works that are anticipated during the course of investigation works. The activities below are set out in detail in the Technical Standard for Historic Investigation.

Managing unexpected discoveries

- 7.6.5 Unexpected discoveries (including assets, artefacts, monuments, built heritage elements and other features) may be found either in the course of carrying out historic environment works or during the construction works themselves. The response of the *Contractor* to such situations will be based on the objectives and priorities of GWSI: HERDS, and all such responses will be considered by the *Employer* against the contribution to the specific objectives.
- 7.6.6 If it can be shown by the *Contractor* that the investigation of the discovery can contribute to the knowledge creation objectives being pursued at the location, or other existing objectives, then the *Contractor* will promptly prepare or update a project plan to address those objectives. Where that is not the case then the need for any further investigation will be reviewed to determine whether it would lead to new objectives that could make a meaningful contribution; if not, further investigatory works would not be undertaken.
- 7.6.7 Should unexpected discoveries be made the *Contractor* will immediately inform the *Employer*. Appropriate action will be decided in consultation with the *Employer*, who may seek external advice. Where necessary a new project plan will be prepared, or existing project plans and LSWSIs will be amended to reflect the discovery.

Code of Construction Practice

- 7.6.8 The *Contractor* will manage the impact of construction works on cultural heritage assets in accordance with the Code of Construction Practice (CoCP). Section 8 of the CoCP relates specifically to Cultural Heritage matters.

Unexpected discoveries of national importance

- 7.6.9 The procedure for addressing unexpected discoveries of national importance is set out in the Procedure for the unexpected discovery of archaeological remains of national importance, and the *Contractor* shall comply with this.

Discovery of human remains

- 7.6.10 In all situations where human remains are considered to be present (prior to works commencing) or encountered unexpectedly during works on the burial grounds, human remains and monuments procedure shall be complied with.
- 7.6.11 Human remains encountered along the HS2 Phase One route will comprise a variety of burials, deposits, monuments and associated artefacts. In some locations information exists from a range of records of burial sites and graveyards, for example the post-Medieval burial grounds at St. James's Gardens (Euston). Other burial and associated funerary monuments may be identified during the course of ongoing archaeological research and investigation, for example prehistoric or Roman remains.
- 7.6.12 The *Contractor* shall prepare project plans and LSWSIs to address the impact of the construction works, focusing on the research potential of the remains.

Discovery of treasure

- 7.6.13 In the event of the discovery of 'treasure' as defined below, the Treasure Act 1996 will apply to works for Phase One of HS2 and the *Contractor* shall comply with it.
- 7.6.14 The Treasure Act defines 'treasure' as:
- any object at least 300 years old when found which:
 - is not a coin but has metallic content of which at least 10% by weight is precious metal;
 - when found, is one of at least two coins in the same find which are at least 300 years old at that time and have that percentage of precious metal; or
 - when found, is one of at least 10 coins in the same find which are at least 300 years old at that time.
 - any object at least 200 years old designated as treasure by the Secretary of State under section 2(1) of the Treasure Act 1996:
 - Any object that would have been 'Treasure Trove'; and
 - Any object found with any of the above.

7.6.15 The Treasure (Designation) Order 2002 extends the definition of treasure to include:

- finds of least two base metal objects (other than coins) of prehistoric date; and
- any object (other than a coin) of prehistoric date with any precious metal content.

7.6.16 Should, during the course of construction of HS2 Phase One, artefacts be located that are deemed to be 'treasure' as defined by the Treasure Act 1996 (see above), then all necessary measures to comply with the requirements of the Treasure Act and any project specific requirement will be implemented.

Review of ongoing works

7.6.17 The *Contractor* shall, in all project plans, specify formal review points at which project progress and emerging findings are addressed. The scale of investigation will determine the frequency of review points, the complexity of the investigation and the likelihood of encountering unexpected remains and shall be discussed and agreed with the *Employer*.

7.6.18 The *Contractor* shall comply with the process described below in relation to the review of ongoing works.

7.6.19 The longer, more complex and higher risk the proposed works, the more review points that will be required. Review points will not be required for small, simple, short-term works, e.g. a geophysical survey or DDBAs.

7.6.20 For more substantial works review points would occur at defined times, e.g. every month. They would also be triggered if significant unexpected archaeology was identified that could affect the outcomes of the investigation.

7.6.21 These review points will include a formal discussion between the *Contractor's* Historic Environment Manager and on-site team and the *Employer*. The discussions will focus on progress against specific objectives and the scope and need for ongoing works. The proforma in Appendix B of the project plan/LSWSI technical standard will form the basis for structuring and recording these discussions. After discussion the project plan will be updated by the *Contractor* and given a new revision number. This will then be issued to the *Employer* for acceptance. The proforma would be added to an appendix to the project plan, providing an auditable record.

7.6.22 This process is intended to help manage the scope of work should there be little or no further potential to address a specific objective, or to identify and agree areas where additional work would be appropriate to further investigate a specific objective, or indeed address a new specific objective.

7.6.23 Review points shall be completed at the cessation of field-based activity, after production of factual fieldwork reports and upon completion of any post-excavation assessment (see 7.16).

7.7 Progress reporting

7.7.1 Prior to commencing the works the *Contractor* shall agree a programme of weekly (or other interval as agreed with the *Employer*) written progress reports and periodic progress meetings with the *Employer*. These will include periodic reviews to identify the direction, scope and need for works. The *Contractor* shall provide information describing progress on-site to date,

the processing of samples and artefacts and feedback from any initial assessment. The GWSI: HERDS will drive the progression of the archaeological works and assessment undertaken.

- 7.7.2 The *Employer* shall submit to the external consultees periodic updates on the progress of the HS2 historic environment programme. The *Contractor* shall provide information to HS2 within the progress reports, to inform this reporting.

7.8 Site visits

- 7.8.1 The relevant archaeological advisor to the Local Planning Authority and/or officer and the Historic England Inspector for works affecting a Scheduled Monument or Historic Battlefield (collectively the 'external consultees') shall be informed in writing at least one week in advance of commencement of fieldwork by the *Contractor*.
- 7.8.2 The *Contractor* shall arrange and convene site visits with specialist stakeholders and expert bodies to provide advice on-site where this is considered beneficial and agreed with the *Employer*. This will be undertaken within the *Employer's* communication protocols set out in the *Employer's* Community Relations Strategy.
- 7.8.3 There shall be no unauthorised access to the works in any other circumstances. Any visits to the works shall be in accordance with the *Contractor's* health and safety, site access and security requirements.

7.9 Generic requirements for interim reports

- 7.9.1 The *Contractor* shall prepare interim reports in accordance with Section 7.9.
- 7.9.2 Unless otherwise agreed, the *Contractor* shall submit an interim report to the *Employer* within seven days of completion of a fieldwork event.
- 7.9.3 For investigations or surveys anticipated in excess of six months' duration, regular interim reports shall be submitted at a frequency agreed with *Employer*.
- 7.9.4 The interim reports shall provide the *Employer* with the information necessary to inform design decisions relating to: a) the next stage of historic environment works (if required); and b) engineering design.
- 7.9.5 The interim report shall be brief, and the information contained commensurate with the timescale for production. The report shall be written in a manner that will avoid duplicating effort at a later date and shall draw on the data gathered during the initial assessment undertaken during fieldwork.
- 7.9.6 These reports will indicate whether these findings require the resource assessment and specific objectives to be updated. The *Contractor* shall set out proposed amendments to the resource assessment to the *Employer* at this time, as should recommendations for amendments to specific objectives (also see Section 7.21).
- 7.9.7 As post-investigation assessment and reporting progresses the *Contractor* shall provide recommendations to the *Employer* for the updating and amendment of the resource assessment and specific objectives (see Section 7.16).
- 7.9.8 A site plan indicating the extent of fieldwork investigations shall be provided.

- 7.9.9 For archaeological interventions a plan indicating 'as-dug' investigations shall be provided. For archaeological excavation, key stratigraphic profiles and topographic templates of any major stratigraphic units shall be provided.
- 7.9.10 The *Contractor* shall deliver the interim report including illustrations in accordance with the *Employer's* Document Management Procedure CAD files will be GIS compatible and follow standards set out in the *Cultural Heritage GIS Specification* and the *Geographical Information System Standards*.
- 7.9.11 The *Employer* shall review the summary interim reports for acceptance against the specification.

7.10 Historic environment fieldwork reports

- 7.10.1 The *Contractor* shall prepare fieldwork reports in accordance with Section 7.10.
- 7.10.2 The *Contractor* shall prepare a fieldwork report (the evaluation, excavation, investigation or monitoring/construction integrated recording report) within six weeks of the completion of the fieldwork (unless otherwise agreed).
- 7.10.3 The *Contractor* shall follow and adhere to the *Employer's* Document Management Procedure and any other document control procedures instructed by the *Employer*.
- 7.10.4 The fieldwork report shall follow the relevant ClfA and/or IHBC standards and shall contain the following sections:
- contents list;
 - non-technical summary;
 - introduction;
 - summary of project's background (including the specific objectives addressed);
 - description and illustration of the site location;
 - previous work(s) relevant to archaeology of site (e.g. DBA, DDBA, surveys);
 - geology and topography of site;
 - specific objectives and aims;
 - methodology of site-based and off-site work;
 - results and observations including quantitative report, stratigraphic report (including any constraints on site);
 - assessment and interpretation of results against original expectations and specific objectives and, where appropriate, a review of evaluation strategy;
 - statement of potential of archaeology;
 - conclusions and recommendations for appropriate historic environment investigation strategy or post-excavation assessment in light of specific objectives;

- consideration of the results and conclusions within their wider context;
- evaluation of the methodology employed and the 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; and
- illustrations, including location plans with scale and grid coordinates.

7.10.5 The fieldwork report shall provide an illustrated factual statement with associated assessment of potential for further fieldwork and/or analysis of the archive to address specific objectives. The fieldwork report shall utilise information collected during archaeological fieldwork and from any other appropriate sources agreed with the *Employer*.

7.10.6 Each component of the works (e.g. stratigraphic/structural, artefactual and environmental/economic) shall be supported by a statement setting out:

- a quantification of the resource (tabulated and cross referenced as appropriate);
- provisional dating and evidence for residuality and intrusiveness;
- the range of material, including sampling and/or taphonomic biases; and
- the condition of the material, including preservation bias.

7.10.7 The stratigraphic statement shall include: a description of the geomorphology and sedimentation record of the survey area; a description of the fieldwork results (brief context descriptions supported by plans and sections as necessary, with levels related to Ordnance Datum); a trench summary table indicating depths of all major stratigraphic units, and their boundaries. Photographs shall be included where appropriate.

7.10.8 The *Contractor* shall produce a subsurface model(s) and profiles to illustrate the extent, character and depth of the major stratigraphic topology identified. The model shall be correlated with previous works within the survey area in order to inform any future project plans for works in the area. The processing software and presentation format of the data shall be included in the *Contractor's* method statement for approval by the *Employer*.

7.10.9 The assessment of results and statement of potential shall include the *Contractor's* conclusions based on the recorded data, e.g. the building/monument/site class represented, site/feature function and relevant parallels. The statement shall primarily comment on the potential of the data to address the specific objectives set out in the GWSI: HERDS. As

appropriate, comment shall be made on the site as a whole and the individual components (e.g. artefactual, palaeo-environmental, economic, historical).

- 7.10.10 In reporting the results of the works, the accuracy of the original expectations and the appropriateness of the methods adopted shall be assessed by the *Contractor* in order to illustrate what level of confidence can be placed on the information. The *Contractor* will use that information as the basis for developing any further historic environment investigation strategy and/or further analysis and publication.
- 7.10.11 The report shall be illustrated with a site location plan, survey location plans as appropriate (to include archaeological and/or built heritage interpretation of results), and individual trench and area plans identifying archaeological features exposed and investigated. The report will also include additional drawings that will assist the interpretation and presentation of the results.
- 7.10.12 When submitted at evaluation stage, the report shall set out an outline recommendation for further historic environment investigation to meet the specific objectives of the GWSI: HERDS, if required. This may include further investigation and recording of the remains and/or historic environment monitoring. Preservation *in-situ* will only be considered where it can be integrated into the engineering design.

7.11 Historic environment summary publication

- 7.11.1 The *Contractor* shall prepare summary publication statements in accordance with Section 7.11.
- 7.11.2 A short summary publication of no more than 500 words (the summary report) for the works shall be prepared by the *Contractor* for submission to the *Employer* for subsequent publication within an appropriate journal or publication outlet specified by the *Employer*.
- 7.11.3 The *Contractor* shall submit the draft summary publication to the *Employer* for approval within eight weeks of the completion date of the fieldwork event and in accordance with the *Employer's* Document Management Procedure.

7.12 Generic requirements for historic environment survey reports

- 7.12.1 The *Contractor* shall prepare historic environment survey reports in accordance with Section 7.12.
- 7.12.2 The *Contractor* shall provide a written and graphic survey report for the works upon completion of fieldwork in accordance with the *Employer's* Document Management Procedure. Evidence shall be provided for check measurements and results of levelling for establishment of TBMs. The *Contractor* shall submit the survey report to the *Employer* within two weeks of the completion of fieldwork, unless otherwise agreed.
- 7.12.3 The *Contractor* shall prepare and submit site area outlines and levels in accordance with the *Employer's* Cultural Heritage GIS Specification and the Geographical Information System Standards and BIM requirements. Each drawing shall identify the relevant event code and sub-site division, if applicable.

7.13 Geophysics report

- 7.13.1 The *Contractor* shall prepare geophysics reports in accordance with the requirements set out in Section 7.13 and the Technical Standard for Historic Environment Investigations.
- 7.13.2 All data and reports will be produced in accordance with the *Employer's* Document Management Procedure.
- 7.13.3 Reports will contain figures accompanied by a supporting text document. As a minimum both shall be produced in accordance with the requirements of Historic England's *Geophysical Survey in Archaeological Field Evaluation* (2008).
- 7.13.4 All figures within a report shall normally be on the same paper size. Figures may be produced using CAD but final deliverables must be supplied in GIS format. GIS deliverables will follow a standard approach set out in the *Employer's* Cultural Heritage GIS Specification and the Geographical Information System Standards.
- 7.13.5 In addition to the *Employer's* and Historic England Standards, reports shall include:
- an OS map at a scale of 1:25,000 or 1:50,000 showing the site location in its wider context; and
 - colour scale plots showing extreme values for magnetometer data may be used in place of X-Y trace plots.
- 7.13.6 All categories of anomaly identified shall be assigned a number code. Each anomaly shall be labelled with the appropriate code on the figures and referred to in the text document. Figures will conform to the Cultural Heritage GIS specification.
- 7.13.7 In certain circumstances (usually when there is corroborative evidence from desk-based or excavation data) very specific interpretations can be assigned to anomalies (for example, Roman Road, Wall) and where appropriate, such interpretations shall be applied. The list below outlines the generic categories commonly used in the interpretation of the results:
- Archaeology – definitive/probable;
 - Archaeology – possible archaeology;
 - Industrial burnt-fired;
 - Old field boundary;
 - Agricultural (ploughing/R&F);
 - Natural – pedological/geological/topographical;
 - Uncertain origin; and
 - Ferrous/magnetic disturbance.
- 7.13.8 The category uncertain origin encompasses those instances where it is not possible to differentiate between archaeology and natural and agricultural. Where appropriate some anomalies will be further classified according to their form (positive or negative) and relative strength and coherence (trend: weak and poorly defined).

7.13.9 Data processing shall be carried out using appropriate software. The type of software used shall be identified in the text report stating its name and whether it is commercial software or developed in-house. Processing shall be kept to a minimum. Processing steps shall be listed along with their salient parameters.

7.13.10 The *Contractor* will supply preliminary results to the *Employer* at weekly intervals. For magnetometer and earth resistance surveys these will consist of greyscale plots, for GPR these shall consist of timeslice plots, and for ERT these shall consist of colour scale cross sections. All shall be image files overlaid on to site base maps. Timeslice plots for GPR results should be selected at depths and thicknesses to show the salient features of interest that have been detected. For example, radargrams should also be included in the final report to highlight the character of the anomaly.

7.14 Reporting of archaeological science investigations

7.14.1 The results from any specific investigations in archaeological science shall be included in the Site Archive and presented in the evaluation report or final fieldwork report. Reports shall include sufficient detail to permit assessment of potential for analysis. They shall include tabulations of data in relation to site phasing and contexts, and include non-technical summaries. The objective presentation of data shall be clearly separated from interpretation i.e. recommendations for further investigations (both on samples already collected, and at future excavations), shall be clearly separated from the results and interpretation.

7.15 Digital archival material including OASIS/Historic Environment Record summary sheets

7.15.1 The *Contractor* shall provide the required data, metadata and digital material as specified in the Historic Environment Digital Data Management and Archiving Procedure.

7.16 Historic environment post-excavation/investigation works

7.16.1 The *Contractor* shall undertake historic environment post-excavation/investigation works in accordance with Section 7.16.

7.16.2 The *Contractor* shall provide a recommendation for post-excavation/investigation assessment of the site archive to the *Employer*, where such an assessment is considered necessary and where this would contribute to specific objectives.

7.16.3 Where the *Contractor* is instructed they shall undertake a post-excavation assessment of the site archive and submit a report of their findings to the *Employer* in accordance with the *Employer's* Document Management Procedure.

7.16.4 The *Contractor* shall provide details of its current post-excavation assessment procedures with their project plans.

7.16.5 Project plans for works involving excavation/investigation activity will encompass site-based works, production of factual fieldwork reports and post-excavation assessment.

7.16.6 The *Contractor* shall produce separate project plans for post-excavation works beyond the assessment stage. The *Contractor* shall follow the sequence and process set out below.

- 7.16.7 The main stages of the post-excavation programme to be undertaken by the *Contractor* are as follows:
- processing (collating and ordering the site archive including site records (to be digital unless otherwise specified) and planning documentation (including project plan(s) and LSWSIs));
 - factual fieldwork report;
 - formal review point with the *Employer*;
 - post-excavation assessment and updated project plan;
 - initial updating of resource assessment and specific objectives;
 - formal review point with the *Employer*;
 - development of project plan for post-excavation works and acceptance from *Employer*;
 - analysis;
 - reporting;
 - further updating of resource assessment and specific objectives;
 - dissemination; and
 - archive deposition.
- 7.16.8 The detailed scope of any post-excavation activity, including processing, factual reports and assessment, will depend on the nature, extent and objectives addressed by the investigations. It is critical however that the processing, factual reporting and assessment works (i.e. steps 1, 2 and 4 in the list above) commence alongside investigatory works, particularly for larger excavations – rapid sharing of knowledge is required to inform works along the route and post-excavation works cannot be delayed for weeks, months or even years after works finish on site.
- 7.16.9 Further information relating to the above list is set out below.
- 7.16.10 Following processing (1), the results of fieldwork will be set out in factual fieldwork reports (2) produced by the *Contractor*. These will be subject to a formal review point (3) with the *Employer* to assess the need for the formal post-excavation assessment phase.
- 7.16.11 The *Contractor* will undertake the post-excavation assessment phase and a post-excavation assessment report will be produced (4); this will include a draft updated project plan and recommended changes to the resource assessment and specific objectives (5).
- 7.16.12 The post-excavation assessment is a critical stage, as it will inform the scope of any detailed analysis. The assessment will consider the quality and character of the data, and reviewing the value and potential of the archive against the specific objectives. Should the *Contractor* consider that further post-excavation works are warranted to meet specific objectives, the post-excavation assessment will set out requirements for analysis, reporting, dissemination

and archiving in an updated project plan for a detailed post-excavation programme. Work will be prioritised and focused on clearly defined objectives and final outputs will reflect the value of the data to address the specific objectives in question.

- 7.16.13 Following the completion of the post-excavation assessment phase a further formal review point will be conducted (6) and the *Employer* will determine if the work package has been completed satisfactorily. The *Employer* will also identify at this stage whether to proceed with post-excavation work for that project plan, whether to group and combine post-excavation works for a number of different investigations to better meet specific objectives; or whether to undertake no further post-excavation works in relation to that investigation. These decisions will be documented as part of the formal review point process.
- 7.16.14 Should a need for detailed post-excavation works be identified by the *Employer*, the *Contractor* will be instructed to prepare a detailed project plan setting out the works for acceptance from the *Employer* (7), the project plan will encompass all remaining stages of post-excavation work. Its scope, nature and content will be largely dependent on the complexity and character of the investigation. It should be noted that the project plan may be required to bring together post-excavation works for any number of investigations into a single cohesive process.

7.17 Information management

- 7.17.1 The *Contractor* shall manage the information derived from historic environment investigations in accordance with HS2 project standards, as defined in Section 8 and set out in Section 7.17.
- 7.17.2 This will ensure that reports prepared by the *Contractor* will be to an appropriate format, content and presentation standard, and records and materials (artefactual, documentary and digital) will be quantified, ordered and indexed in a consistent manner. In addition, the *Contractor* will store all information gathered in suitable secure conditions and locations while in preparation for permanent deposition.
- 7.17.3 It is critical that reporting and dissemination of the outputs from the programme of historic environment investigation are produced in a standardised format to help ensure consistency across the project.
- 7.17.4 Copyright issues will be managed in accordance with legal requirements (Copyright, Designs and Patents Act, 1988).

Archive deposition

- 7.17.5 The *Contractor* shall create site survey files as a repository for all evidence collected as a result of implementing the works set out in the project plans and LSWSIs.
- 7.17.6 The *Contractor* shall prepare and produce the physical and digital archives in accordance with the historic environment physical archive procedures and historic environment digital data management and archiving procedures.

7.18 Stakeholder engagement

Design development stage

- 7.18.1 The Heritage Memorandum sets out the requirement for location specific WSIs to be developed “*in consultation with Historic England and the relevant local authority and will follow the objectives set out in the GWSI: HERDS*”. For the purposes of this document, relevant statutory authorities will include the local planning authority (LPA) conservation officers and their archaeological advisors and Historic England. This is reiterated in the Code of Construction Practice (CoCP), which states that a LSWSI will be developed for each area or location specific historic environment works, in consultation with Historic England and the relevant local authority.
- 7.18.2 During the development of the detailed design, and the implementation of construction works, the *Employer* will continue to engage with Historic England and the relevant local authority (and other stakeholders, where necessary) on the overall approach to the design of historic environment works, via the Heritage sub-group to the Planning Forum. The Heritage sub-group will continue to meet throughout the design and construction period. The *Employer* convenes this group.
- 7.18.3 The *Contractor* shall be invited by the *Employer* to prepare and present to the Heritage sub-group, outlining progress and key discoveries.

Construction and post-excavation stage

- 7.18.4 The Heritage Consent Strategy details the requirements and timescales and nature of consultation and engagement with Historic England and local planning authority specialist during the preparation of project plans, LSWSIs and, in the case of Schedule 18 and 19 Heritage Agreements, method statements. The *Contractor* shall comply with that strategy.
- 7.18.5 During the construction and post-excavation stages, the *Contractor* shall continue discussions with Historic England and the local authorities as project plans and LSWSIs are developed. The *Contractor* shall include discussions relating to the design of evaluation and investigation works and may include requests for specific information. In preparing revisions of the project plans and LSWSIs, account will be taken of observations made by Historic England and the local authority.

Role of Local Planning Authority (LPA) archaeological advisors and conservation officers

- 7.18.6 The London Boroughs affected by Phase One of HS2 obtain archaeological advice from the Greater London Archaeological Advisory Service (GLAAS). Outside Greater London, a County or City Archaeologist provides this service. LPA conservation officers provide advice in relation to built heritage matters. Collectively these are referred to below as LPA historic environment specialists.
- 7.18.7 The *Contractor* shall consult the LPA archaeological advisors and conservation officers or the information held at county/metropolitan/district/borough level, which is relevant to the project plans and LSWSIs and for their extensive knowledge of the historic environment in their locality.

Project plans

- 7.18.8 During the design development stage, the *Contractor* shall invite Historic England and the local authority historic environment specialists to comment on project plans in terms of their efficacy and providing relevant updated archaeological information, including Historic Environment Record (HER) information, which may have been assembled during design development.
- 7.18.9 The *Contractor* shall comply with the process set out in the Heritage Consent Strategy.

Site-monitoring and progress reporting

- 7.18.10 During the construction stage, the *Contractor* shall invite Historic England and the local authority historic environment specialists to monitor the implementation of the works specified in the project plans and LSWSIs via pre-arranged site visits organised by the *Contractor* and agreed by the *Employer*.
- 7.18.11 This will facilitate the understanding of these stakeholders of the nature and progress of the works and provide an opportunity to discuss the findings.
- 7.18.12 There will be no access to worksites without consent from the relevant *Contractor* and all site visitors must comply with all relevant health and safety requirements.
- 7.18.13 The *Employer* will be responsible for informing Historic England and the local authority historic environment specialists on the progress of fieldwork activities and findings.

Unexpected discoveries of national importance

- 7.18.14 The *Contractor* shall comply with the procedure for the unexpected discovery of archaeological remains of potential national importance in the event of such discoveries.

Post-excavation phase

- 7.18.15 The final form of post-excavation outputs and the emphasis of post-excavation activity remain to be determined and will reflect the findings of the work in question and the *Employer's* requirements.
- 7.18.16 Historic England and the relevant local authorities will be invited by the *Employer* to review post-excavation assessments resulting from fieldwork activities. The *Contractor* in consultation with the *Employer*, will prepare the subsequent project plan (Design) for any post-excavation programme. Routewide discussion regarding themes and outputs will be held with Historic England and the Heritage sub-group.

7.19 Ownership of artefacts

- 7.19.1 The transfer of ownership of artefacts will depend on who, in any particular case, is the owner of them and whether that is the *Employer* or whether they remain in private ownership. In any case, the *Contractor* shall manage the ownership of artefacts in accordance with any undertaking and assurances, and common law.
- 7.19.2 The *Contractor* shall provide the *Employer* with clear GIS mapping relating to the location of all artefacts recovered during the works to enable the division of the artefactual archive between landowners. Mapping shall include landownership divisions.

- 7.19.3 Where land is entered onto temporarily by consent of the landowner outside the powers of the Act, either because it predates the enactment of the Act or is outside Act limits, then any artefacts belong to the landowner. The *Employer* will seek ownership in agreement with the relevant landowner.
- 7.19.4 Where land is occupied only temporarily under Act powers, it is generally on terms that it will be restored to the owner in its original condition, which would include anything found on the land during the period for which it was occupied. The *Employer* would have to secure ownership in agreement with the relevant landowner.
- 7.19.5 Where the land is entered onto following permanent compulsory acquisition under the Act, any artefact found afterwards would normally belong to the acquiring authority.

7.20 Historic environment departures process

Introduction

- 7.20.1 This section sets out how *Contractors* can apply for a departure from the strategies, technical standards and procedures set out in Section 8. It sets out how departures should be prepared and submitted to the *Employer*, and how the *Employer* will accept these applications.
- 7.20.2 In order to deliver the objectives of the GWSI: HERDS, it will sometimes be necessary and desirable to employ innovative techniques and to try alternative approaches to investigation, analysis, interpretation and communication of historic environment work. These alternative approaches may, however, not always reflect requirements specified within the strategies, specifications and procedures. To enable alternative approaches this section describes the process for managing departures from strategies, specifications and procedures to be used during the production of project plans.
- 7.20.3 The sorts of alternative methods and approaches that could necessitate an application for a departure from strategies, specifications and procedures will depend very much on the circumstances of the individual project plan, and on the nature of the resource. The detail of assessment carried out to inform an application for a departure should be proportional to the scale of the activity and the likely risks of the proposed alternative approach.

How to apply for a departure

- 7.20.4 The *Contractor* shall follow the process in identifying and applying for departures and provide the associated deliverables set out in Section 7.20.
- 7.20.5 It is the responsibility of the *Contractor* to ensure that appropriately qualified staff are involved in the preparation of any applications for departures, and that consultation with appropriate subject matter experts and authorities, and reference to appropriate research has been carried out to inform the assessment of any alternative approaches.
- 7.20.6 Applications for a departure shall be made in the detailed knowledge and understanding of construction programme considerations.
- 7.20.7 The *Contractor* shall identify opportunities for a departure based on their professional assessment of the merits or otherwise of a departure related to their work. It is their responsibility to demonstrate that a proposed departure is fully justified and can be

substantiated in relation to one or more specific objectives of the GWSI: HERDS. This means including clear references to supporting evidence or research with the application.

- 7.20.8 Before applying officially for a departure, the *Contractors* shall consult with the *Employer* as to whether a departure application is required. A brief explanation shall be provided, in writing, setting out the relevant strategies, technical standards and procedures and a brief description of the proposed alternative approach. The *Employer* will advise whether a full 'application for departure' is required.
- 7.20.9 The *Contractor* shall set out a robust justification for any departure in their application, citing how that departure will deliver one or more specific objectives of the GWSI: HERDS.
- 7.20.10 The *Contractor* shall assess the risks, negative impacts and benefits involved with a proposed departure, considering safety, programme, cost and environmental issues.
- 7.20.11 The *Contractor* shall compare the benefits and drawbacks of the proposed departure with a design fully in accordance with strategies, technical standards and procedures. The *Contractor* shall consider alternatives, if appropriate, and reasons for promoting the proposed option rather than an alternative.
- 7.20.12 The *Contractor* shall be able to confirm that the residual risks are acceptably low and that the negative impacts are outweighed by the benefits associated with the departure.
- 7.20.13 The following proforma shall be followed for each application for departure (the template for the proforma shall be developed by the *Employer*):
- contract number;
 - *Contractor* contact details;
 - date submitted;
 - project details;
 - departure details;
 - specific objectives to be met by departure;
 - relevant strategies, technical standards, procedures or legislation;
 - difference between standard approach and proposed departure;
 - reason for departure;
 - associated departures;
 - options considered;
 - justification in terms of meeting GWSI: HERDS objectives;
 - risks – cost, programme, safety, environmental and other as appropriate; and
 - details of attachments and references.

Determining an application for a departure

- 7.20.14 The *Employer* will determine within five working days, if the application for departure submitted by the *Contractor* represents a convincing argument that an alternative approach should be undertaken.
- 7.20.15 The *Contractor* shall demonstrate to the *Employer* that there is a demonstrable case that the benefits outweigh any drawbacks. In practice, particularly where impacts cannot be easily monetised, this requires professional judgement, and may require further consultation of experts and authorities. In reflecting upon a submission, *Employer* will recognise that firm evidence may not always be available to the *Contractor*, particularly for innovative designs. The absence of firm evidence is not sufficient reason on its own to reject an application, but may be reason enough to justify a higher level of scrutiny and consultation.
- 7.20.16 Where an application for departure is found to be incomplete or inaccurate, inadequately prepared or with insufficient justification, it will be rejected and returned to the *Contractor* for revision. The reasons for rejection will be articulated and an indication given as to whether a departure may be approvable once additional justification is available.
- 7.20.17 The *Employer* has three choices when deciding whether to accept an application for departure. It can (1) determine that a departure be accepted, (2) accept a departure with comments or (3) reject a departure.
- 7.20.18 Due to the varying nature of departures, their interaction with each other and existing and future, possibly as yet unknown project conditions, each application for departure will be unique (although see below for combined applications). Therefore there are no rigid criteria as to whether a particular departure will be approved or rejected. However, the following will be taken into account:
- any significant increase in risk to health and safety of employing the alternative approach;
 - current legislation;
 - the ability of the proposed departure to deliver one or more of the specific objectives of the GWSI: HERDS;
 - the benefits of the alternative approach compared to any negative impacts (e.g. construction programme) , or any other approach; and
 - the strength of the case made by the *Contractor* in their application and the outcomes of consultation between the *Contractor* and *Employer*, and where relevant other stakeholders, such as Historic England and local authority specialists.
- 7.20.19 Where similar applications for departures reoccur due to the positive results associated with earlier departures, e.g. a new technique is shown to be significantly better than an approach set out in the strategies, specifications and procedures, then the *Employer* will review whether existing strategies, specifications and procedures should be updated to reflect this outcome for all subsequent works.

Aspects not covered by strategies, technical standards and procedures

- 7.20.20 There may be a need to prepare a departure application where no strategy, technical standard or procedure exists. Where possible, the *Contractor* shall propose a recognised industry standard, strategy, specification or procedure. Once agreed with the *Employer*, the industry standard can be used as the benchmark to determine the application for departure. The *Contractor* shall reach agreement with the *Employer* on how to proceed in these circumstances.

Timing of applications and approvals

- 7.20.21 Applications for departures may be prepared and submitted at any stage of the project process. Normally it will be appropriate to submit individual applications for each aspect of work that would not comply with the strategies, technical standards and procedures. However, it may sometimes be appropriate to combine applications for departure, with the prior approval of the *Employer*.

7.21 Amending and updating specific objectives

- 7.21.1 The specific objectives are intended to be updated, amended and, where appropriate, marked as completed, as the project progresses. This section outlines how the *Employer*, with support from *Contractors*, will ensure that the specific objectives are appropriately monitored and maintained during the lifetime of the works. Responsibility for updating and amending the specific objectives ultimately rests with the *Employer*.
- 7.21.2 The digital workspace being prepared by the *Employer* to support the delivery of the GWSI: HERDS will include a section dedicated to the specific objectives. The content will be editable and managed by the *Employer*.
- 7.21.3 The *Contractor* is required, upon completion of work activities specified by a project plan, to provide the *Employer* with a statement in the fieldwork report (and post-excavation assessment) setting out how the works have contributed to the specific objective(s) and whether the *Contractor* believes that the specific objectives require amendment. In addition, the *Contractor* will also need to provide a summary of results and the contribution to the specific objectives in the form of a comment and any suggested amendments within the specific objective area of the digital workspace.
- 7.21.4 The comments provided by the *Contractor* will be visible to all users of that area of the workspace. The *Employer* will decide whether to accept or reject any comments or proposed amendments. This process will create an auditable log of changes and a forum for ongoing discussion.
- 7.21.5 To support this ongoing process the *Employer* will convene a series of bi-monthly or quarterly meetings with the *Contractor* to discuss progress against specific objectives and to review the continuing validity of objectives.
- 7.21.6 The *Contractor* shall be required to present the findings of work packages and their views of progress against specific objectives at these reviews.

- 7.21.7 The *Employer* will, if they deem necessary, invite external parties to these reviews. These reviews will be formally documented and their outcomes circulated to the *Contractors*. The specific objectives will, if required, be updated after the review meetings.

8 Strategies, technical standards and procedures

8.1 Overview

- 8.1.1 The *Employer* has developed a robust suite of strategies, technical standards and procedures to ensure that works are delivered in a consistent and cohesive manner that reflects the Secretary of State’s commitments to the historic environment.
- 8.1.2 To implement the GWSI: HERDS, the *Contractor* shall comply with and use for the development of historic environment works the strategies, technical standards and procedures set out below in Section 8.2.

8.2 Reference list

Table 1 - Mandatory strategies, technical standards and procedures

Title	Description
Heritage Consents Strategy	The purpose of this strategy is to ensure that all heritage consents required for the construction of HS2 are obtained on time, in order to avoid programme delays, and to ensure that the <i>Employer</i> meets the commitments made by the Secretary of State to the historic environment, as set out in the Heritage Memorandum Act.
Burial Grounds, Human Remains and Monuments procedure	<p>The procedure set out in this document is designed to cover all potential circumstances relating to the discovery of human remains (e.g. burials, cremations or disarticulated human bone) and associated monuments (e.g. gravestones) that may occur during the design and construction of HS2. The procedure sets out the mechanisms to be employed by all parties involved, with roles and responsibilities defined.</p> <p>This procedure will be implemented during any groundworks (including investigatory works) associated with the HS2 land take as defined by the Act. Outside the areas covered by the HS2 Act, the normal procedures for the removal of human remains using, for example, Section 25 of the 1857 Burial Act, or ecclesiastical law or any other relevant legislation should be implemented.</p>
Procedure for the unexpected discovery of archaeological remains of potential national importance	<p>The procedure set out in this document is to be followed in the event of the discovery, during the construction of HS2 Phase One, of unexpected archaeological remains that are considered to be of potential national importance.</p> <p>This procedure provides information on the required response to such a discovery, along with the mechanisms, notification requirements and procedures to be employed by all parties involved. The procedure will allow the formulation of an appropriate, intelligent response tailored to the specific assets discovered.</p> <p>This procedure will be implemented during any groundworks (including investigatory works) associated with the HS2 land take as defined by the Act.</p>
Technical Standard: Archaeology and built heritage approach to geotechnical investigation	This document details the methodologies to be adopted for archaeological and listed buildings watching briefs for those locations where ground investigations are to be undertaken for engineering purposes to inform the detailed design.
Technical Standard: Specification for historic environment investigations	<p>This specification provides the standards and minimum requirements for each type of historic environment investigation expected to be undertaken as part of the HS2 Phase One programme.</p> <p>The specification includes standards that are applicable to all historic environment investigations, in addition to specialist methodologies for individual archaeological</p>

Title	Description
	<p>investigation techniques. It also contains guidance on the reporting to be undertaken throughout a historic environment investigation.</p> <p>This document is to be used in the production of each project plan and LSWSI.</p>
<p>Technical Standard: Specification for Project Plans and Location Specific Written Schemes of Investigation</p>	<p>This specification describes the process for preparing project plans and LSWSIs for historic environment activities associated with HS2 Phase One.</p> <p>The document sets out the objectives and standards required for the preparation of project plans and LSWSIs, and sets out a consistent approach to scope, standards and report structure. This specification will ensure that all project plans and LSWSIs are consistent across Phase One of HS2.</p>
<p>Technical Standard: Recording of the Setting of Heritage Assets</p>	<p>This technical standard sets out the method for recording the setting of certain classes of designated heritage assets; specifically, listed buildings, historic battlefields, registered parks and gardens, and conservation areas. It also addresses circumstances where HS2 Phase One works occur within the boundaries of a conservation area, and would therefore have the potential to alter its character and appearance, rather than its setting.</p> <p>The document provides the decision making criteria for determining whether the recording of setting is required, at what level recording should be undertaken and the methodology to be used.</p>
<p>Technical Standard: Historic Environment Physical Archive Procedure</p>	<p>This document provides the procedures and guidance for the creation and curation of the physical archive compiled as a result of the historic environment works conducted in connection with the HS2 Phase One scheme.</p> <p>These procedures are intended for use during all phases of the historic environment works.</p>
<p>Technical Standard: Historic Environment Digital Data Management and Archiving Procedure</p>	<p>This document provides the procedures and guidance for the creation and curation of the digital archive compiled as a result of the historic environment works conducted in connection with the HS2 Phase One scheme.</p> <p>These procedures are intended for use during all phases of the historic environment works.</p>

8.2.1 The *Contractor* shall follow the relevant HS2 standards, guidance and procedures in relation to the production of documents and digital materials. This list is not exhaustive:

- HS2 Cultural Heritage GIS Specification; and
- the BIM documents set out in High Speed Two Phase One Project Requirements Specification (PRS) (section 2.1.4 Information Management).

8.2.2 The following documents provide background information:

- Historic Environment Physical Archiving Strategy;
- Historic Environment Digital Data Management and Archiving Strategy;
- Information Paper E8: Archaeology; and
- Information Paper E12: Burial Grounds.

9 Historic environment community engagement: approach

9.1 Background

9.1.1 The GWSI: HERDS set out three tenets as key to delivery of an innovative new approach to archaeological research and investigation: creating knowledge, involving people, and legacy. This section provides an overview of the *Employer's* approach for involving people from which their contribution helps to achieve a lasting legacy for Phase One of HS2.

9.1.2 It has been recognised for a long time that involving people in archaeological practice and historic environment investigation has many benefits: personal and social satisfaction, closer relationship between communities and environment, access to professionals and specialists, providing 'good news' stories for local and national press, and fulfilling social and community obligations.

9.1.3 Through the GWSI: HERDS the *Employer* has established an ethos that will ensure that community engagement lies at the heart of historic environment works for HS2 Phase One. The *Employer* wishes to push boundaries and extend thinking on how and why communities can and should be part of the process. This section of the GWSI: HERDS encourages a new approach and cites a number of good practice examples that can offer a benchmark and reference point from which to shape and translate the unique opportunity for wide reaching and meaningful community involvement.

9.1.4 The *Employer* aims to raise the standards in engaging people in historic environment investigation through the principles that involving people should be in a meaningful and stimulating manner, where engagement is part of the process and decision making, results and interpretation of peoples' projects are visible and contribute to new thinking and ideas about the historic environment, and where there is opportunity to re-engage and access information, and share and disseminate findings.

9.1.5 An assurance has been provided during the parliamentary process that:

The Secretary of State will require the nominated undertaker to develop a routewide strategy for archaeology and heritage community engagement and outreach with respect to archaeology and heritage. (Assurance No. 846).

9.2 Scope of this approach

9.2.1 This approach covers any work requiring or offering opportunity for engagement with communities and audiences¹². Potential groupings in this context include:

- **Lay Communities**

- communities living along and near to the Phase One route;

¹² This refers to lay communities, historic environment professionals and academic institutions.

- general/interested public;
- targeted groups (e.g. youth, rehabilitation);
- project community (building/working on scheme);
- societies and voluntary groups; and
- national and local media.

- **Professionals**

- LA heritage officers (e.g. archaeologists, HER, conservation officers);
- museums' archaeologists, curators;
- librarians and archivists;
- community archaeologists;
- tourism specialists;
- archaeological consultants and *Contractors*;
- HE specialists (e.g. scientists, osteoarchaeologists, periods specialists, conservators, ADS, Environmental, Geoservices);
- professional bodies/groups/orgs (e.g. CBA, FAME, University Archaeology UK; ClfA)
- Historic England; and
- specialist and period societies (Medieval archaeology).

- **Academic and Educational Institutions**

- universities and colleges (particularly depts. with specialist interest);
- academics with specialist interest;
- PhD students;
- University of the Third Age (U3A); and
- schools (particularly along the Phase One route).

9.2.2 This list is not exhaustive and other groups/people may emerge as the project progresses.

9.2.3 This approach is to encompass projects at all stages of the investigative process: initiation of ideas, delivery of tasks and presentation of results. This will provide opportunities for people to be engaged in research, investigation and archive stages.

9.3 Historic environment public and community interest

- 9.3.1 One of the most useful tools to understanding levels of participation is through the DCMS' Taking Part Surveys¹³. The latest Longitudinal Report (DCMS, July 2015) provides an insight into how people have and continue to engage with heritage (this is separate to museums and galleries and refers to archaeological sites, visiting historic parks and buildings).
- 9.3.2 This latest study reveals that there is very little change in the types of audiences that wish to engage with heritage. People who visit and are interested in heritage tend to be from higher socio-economic groups, are white, aged between 45-64, and are homeowners (DCMS, July 2015). This is also mirrored in the recent research undertaken by the Council for British Archaeology.
- 9.3.3 The DCMS has also found in its specific heritage interest studies that nearly all adults surveyed strongly believe that all historic buildings and places should be well looked after (DCMS, November 2015).
- 9.3.4 In 2015, audience participation (and non-participation) research was commissioned for the Festival of Archaeology (&Co, 2015). This is an annual event organised by the Council for British Archaeology (CBA), which aims to promote interest in and engagement with the historic environment. Key findings from the survey (821 responses) are:
- lowest attendance age group was from 16-24 year olds at only 2.8%;
 - largest groups of attendees were aged between 55-64 (17%);
 - the lowest attendance was from families on low incomes and from 'Black, Asian and minority ethnic' (BAME) groups;
 - the highest levels of attendance came from the higher affluent socio-economic groups; and
 - the majority of visitors (64%) lived locally to the archaeology event taking place.
- 9.3.5 The HS2 Community Engagement Strategy sets out how community engagement shall be managed during the planning, building and operation of the new high speed rail link. It acknowledges that the scheme will have a significant impact on the communities living along the route. As part of the research for that strategy, a demographic study has been undertaken to better appreciate the community make-up of the locations affected.

9.4 Why involve people?

- 9.4.1 Community engagement in large infrastructure projects is not new and often community projects are promoted as good news stories – demonstrating unity and collaboration with local archaeological societies; utilising local expertise and knowledge; providing opportunity for social interaction and training in new skills; offering a chance for volunteers to work on a 'live' dig and be part of the active process in the discovery of the past. This level of

¹³ This is a household survey in England that has been examining participation in the cultural and sport sector since 2005. The survey is commissioned by the Department for Culture, Media and Sport (DCMS) in partnership with Arts Council England, Historic England and Sport England.

participation has been successful in bringing audiences closer to historic environment research processes and professionals; able to employ as well as see archaeological techniques and benefit from tailored talks, exhibitions and professional time in the community. The form of community and wider audience participation is mainly structured and organised by historic environment professions; although there is growing evidence of a change in emphasis and dynamic between community and those holding responsibility for managing historic environment investigation.

- 9.4.2 Community engagement can provide exciting opportunities from which different approaches can be pursued: freeing historic environment curators from well tried and tested methods that may not continue to add value to the research agenda and our desire to create and enhance knowledge of the past and our present. Engagement in a collaborative and consultative manner means providing opportunity for more meaningful and honest community projects that make real contributions to the GWSI: HERDS. Involving people, be they local communities, academics or historic environment professionals, should allow for the instigation and conception of projects that they collaborate and shape; which may mean some ideas lie outside of research agendas conceived by the *Employer*. Communities and specialists often have access to knowledge that is not immediate to others, and an indication of where and what priorities should be the focus of research.
- 9.4.3 There has always been strong emphasis from organisations such as Heritage Lottery Fund (HLF) and the Council for British Archaeology (CBA) on ensuring that involving people is at the heart of project proposals. HLF funding has provided a catalyst for the formation of new heritage groups and organisations with a particular purpose or goal – these can be transient (created solely for the purpose of delivery project outcomes). These groups can also become more permanent and established bodies or continue to forge partnerships with other groups and institutions. The Community Archaeology Forum provides a useful insight into the health of volunteer heritage groups. There is also interest directed at the younger generation through the Young Archaeologists Club (YAC), which is aimed for children between the ages of 8-16.
- 9.4.4 There is a real appetite to be part of the historic environment research process. A number of studies have attempted to establish the wider benefits that come from engaging people with their history and environment, such as: social cohesion, health and wellbeing, sense of belonging and interaction with local environment and communities, confidence and happiness from recognition and familiarity of local landmarks, training and sharing of skills through active engagement in the historic environment.
- 9.4.5 Engaging audiences in historic environment research can have real benefits in saving time and money as local knowledge, active volunteer base and relationships made from previous investigations are readily available. There are numerous local history and archaeological societies, regional and period specialists, ex-historic environment professionals that still retain skills and interest in the sector and of value to research projects of this nature.
- 9.4.6 Academic, professional and specialist engagement will be an invaluable resource in initiating research ideas, comment and review throughout the investigative process, contributions to interpretation and understanding.

9.5 Challenges to involvement

- 9.5.1 It has long been recognised that interest in heritage and engagement in cultural activities tends to come from a small and select section of our society (see DCMS taking Part study). Hard to reach sections of our society have tended to be: those in minority communities, young families, people on low incomes and young adults. Part of the challenge is always to think about how to engage with these groups. However, this should not be done at the expense of interested audiences and their needs are as much a priority in decisions about involving people in historic environment projects.
- 9.5.2 Often barriers to involvement are due to audiences' lack of (or perceived) opportunities to be part of a project. Raising awareness, particularly of contacts and the schemes of work taking place, early on in the process allows time for engagement to happen and to reach a wider interested group of people.
- 9.5.3 Being able to engage with information, have access to it, feeling informed and able to contribute individual research pieces, provides a sense of value and importance to the community engagement process and makes it integral to the work being done. Open data and ability to reuse big 'data' are key tools for our professionals and academic communities in delivering new research and establishing approaches to project design and thinking. There is a wealth of research and work being undertaken that needs to be captured and utilised in order to feed into more comprehensive and robust project methodologies and help in deciding priorities and defining the 'big' questions that make archaeological practice interesting. However, there can be challenges to establishing strong collaborative links and partnerships, as programme pressures can mean that only limited funds and time are available to engage specialists and academics. This challenge can be partially overcome through the ease with which information sharing can take place through use of new technology (digital recording, sharepoint or project management software, GIS and BIM) and that this data can be made immediately available before, during and following the investigative process. Early and continual communication can result in greater contribution of ideas and theories and support the approach advocated by the *Employer* through the GWSI: HERDS in delivery of historic environment works.
- 9.5.4 The creation of Phase One of HS2 will result in a dramatic change to some local communities and some localities and individuals feel negative and highly critical of the new high speed railway. There could be resistance to engage in historic environment projects as this could be seen as giving personal acceptance to the scheme, particularly by groups and individuals who have actively campaigned against it. The challenge will be to consider the various routes available to involving people that will provide opportunity for local communities to document and be part of understanding this change and in thinking about the wider historical changes and implications this has had on our world.
- 9.5.5 Local community stories and official histories do not always complement each other. This often leads to dissatisfaction with how people's stories are presented or interpreted. A project like HS2 Phase One offers good opportunities for local communities to tell and rewrite their stories through exploring their social network, cultural connections, landscapes and time. Reaffirming local communities' capacity to shape and mould present thinking of who they are (through project creation as well as contribution) can be an enriching process and one which

will encourage people to be involved in the discovery and learning of the rich archaeology that could be unearthed as part of Phase One of HS2 works.

- 9.5.6 There is a general lack of interest in the historic environment by young people. There are low percentages of young people that visit historic sites, museums or undertake cultural heritage activities. In order to change perception of the historic environment as not having any real value or impact on young peoples' lives, Phase One HS2 could offer a new approach to reaching out to this group. This is also important from the perspective of securing the future of the historic environment profession, as interest sparked early can lead to pursuit of historic environment careers. Interest could be secured through promotion and encouragement of projects that have wider social and cultural remits that have young people defining the parameters and objectives of their interest. Access to historic environment professionals, community archaeologists and academic institutions can provide a stimulating and exciting collaboration and melting pot of ideas, which allow for a refreshing look and take on historic environmental meaning and appreciation.

9.6 Developing a historic environment community engagement approach

- 9.6.1 All work designed by the *Contractor* shall be in compliance with the Phase One HS2 Community Engagement Strategy.
- 9.6.2 The *Contractor* shall work with the *Employer* to develop, contribute to and implement community engagement opportunities as required by Undertaking 846.
- 9.6.3 The *Contractor* shall identify historic environment community engagement opportunities in the project plans and LSWSIs. This shall include ideas and routes of engagement and will form an integral part of the delivery of the specific objectives for involving people in the historic environment investigations.
- 9.6.4 The *Employer's* and the *Contractor's* community engagement teams, respectively, are integral to the delivery of the specific objectives and are to be consulted regarding involving people with the specific objectives, which may require their approval to ensure integration with community engagement strategy. Working with the community relations team will ensure a consistent approach to local community engagement and they will also aid in facilitating historic environment project involvement and communication.
- 9.6.5 The *Contractor* shall set out in their Community Engagement Plan how historic environment opportunities will be addressed as part of the Works.
- 9.6.6 The *Contractors* shall ensure that their project plans and LSWSIs cater for engagement with all community sectors in planning historic environment projects.
- 9.6.7 The *Employer's* Community Engagement Strategy states:

With regard to our contractors, the effectiveness of their community engagement activities will be measured through indicators of performance and value. Specific metrics will be agreed in the context of each scope of works based on the nature of works and stakeholders affected.

- 9.6.8 Involving people and community or audience engagement refers to a wide range of groups of people: local communities, national, regional and local amenity societies, academic institutions and professional practitioners. It is considered that the projects with the most community value and likely to achieve a longer-lasting legacy will be those that involve the majority of groups.
- 9.6.9 The project plans and LSWSIs shall seek to enable and support community project creation, where it is self-funded and directed research and investigation by the community but requires specialist and professional inputs by the *Contractor*. The project plans and LSWSIs shall consider how audiences will effectively and demonstrably engage in the historic environment works from project research and inception, investigation and fieldwork and finally analysis and presentation.
- 9.6.10 Where relevant and agreed with the *Employer*, the *Contractor* should seek to identify and engage with the varied potential audiences (as set out above in Section 9.2) and garner their views during the development of project plans.
- 9.6.11 Local community and audience participation and project creation can take a variety of forms, and expressed through many media, for example, music, poetry, art, performing arts, publications, online webpages, photographs and social media.

10 Developing a skills, employment and education approach for the historic environment

10.1.1 The *Contractor* shall include historic environment skills, employment and education opportunities into their Skills, Employment and Education Plan.

10.2 Overview

10.2.1 The *Employer* has strategic priorities in relation to the development of skills, employment and education in engineering and the other disciplines that will contribute to delivery. The *Employer* has commitments to improve skills, jobs, education and the economy through our investment along the length of the route and to act as a driver for improvements in the sustainability of the engineering and construction sector by ensuring that the right workforce is available at the right time with the right skills and behaviours. Some 2,000 apprenticeship opportunities will be created by the *Employer* across all Phases of HS2.

10.2.2 The *Employer* has established the National College for High Speed Rail, to be located in Birmingham and Doncaster, to provide specialist vocational training to the next generation of engineers working on the HS2 and beyond.

10.2.3 Research and consultation commissioned by the *Employer* resulted in an Environmental Skills Review (Mace 2015). During the preparation of the GWSI: HERDS, the *Employer* has identified the need for the development of skills in historic environment practice that will be required in order to achieve delivery of the programme of historic environment works. In particular, research has identified a shortage of skilled field archaeologists, archaeological specialists (in specific periods and processes of investigation) and mid-range managers. There is a further requirement to ensure that historic environment professionals become conversant with and further skilled in the application of BIM principles and processes.

10.2.4 One of the headline objectives for the GWSI: HERDS (headline objective no. 2) focuses on identifying and stimulating the development of skills needed to deliver the project and leaving a legacy (for Phase 2 and beyond) of trained professionals and high quality, sustainable training practice.

10.2.5 The following will therefore underpin the *Employer's* approach to the development of historic environment skills, employment and education opportunities:

- developing a better understanding of capacity issues in the sector and the potential for increasing the workforce from outside the UK;
- including the historic environment sector within the *Employer's* wider skills, employment and education strategy, and within plans for the National College of High Speed Rail;
- working with current sector initiatives, training providers and universities;

- supporting sector training models such as apprenticeships and other professional development schemes;
- setting supply contract requirements for best practice in training, CPD and graduate recruitment; and
- developing a strategy for communities' work that will engage and train local people, in accordance with professional archaeological and other technical standards.

10.3 Inputting into the skills, employment and education strategy

10.3.1 The kind of projects and approaches that could be included within the Skills, Employment and Education Plan in relation to the historic environment are:

- current staff (including continuing professional development (CPD));
- new staff (in recruitment and in relation to work-based training); and
- local and other communities.

Existing guidance and standards

10.3.2 The following outlines existing standards and guidance documents that could inform *Contractors* with the development of historic environment skills, employment and education opportunities within their Skills, Employment and Education Plan.

National Occupational Standards in Archaeological Practice

10.3.3 National Occupational Standards (NOS) describe the skills, knowledge and understanding needed to undertake a particular task or job to a nationally recognised level of competence. The NOS for Archaeological Practice has been in place since 2003. NOS are the building blocks of NVQs and can be used to write job descriptions or to identify skills needs and plan training.

10.3.4 A database of standards can be searched (using the key 'Archaeological Practice' at <http://nos.ukces.org.uk/Pages/index.aspx>).

National Vocational Qualification Level 3

10.3.5 The National Vocational Qualification (NVQ) enables archaeologists to demonstrate that they have particular sets of skills, competencies or experience. It is a means of accrediting informal training and on-the-job learning. An Assessment Centre within the Chartered Institute for Archaeologists (CIfA) administers the NVQ at Levels 3 and 4 in Archaeological Practice (<http://www.archaeologists.net/learning/nvq>).

The Historic Environment Apprenticeship Standard

10.3.6 An *Employer's Group* convened by Historic England is working with the Department of Business, Innovation and Skills on the development of an Apprenticeship Standard in Historic Environment Practice.

Chartered Institute for Archaeologists' technical guidance

10.3.7 Chartered Institute for Archaeologists (ClfA) has produced a Professional Practice Paper entitled *An introduction to providing career entry training in your organisation*, to guide employers and employees in the sector. The guidance is based on a tried and tested model, which can be used to structure a training programme for career entry level employees, employees transferring between specialisms, or employees moving between junior levels in the first few years of their career. The model has been piloted through the Chartered Institute for Archaeologists' Workplace Learning Bursaries Scheme and has already been adapted for use in English Heritage/Historic England and by the Council for British Archaeology. Structured training has been offered in over 50 areas of archaeological practice, for each of which a Training Plan identifies the particular skills to be taught, the required outcomes of training, the sort of support required for the training to be effective and the sorts of activities to be undertaken by the trainee through which training will be delivered. These are available through ClfA¹⁴.

Examples and case studies

Table 2 - Examples and case studies

Structured work-based learning	http://www.archaeologists.net/learning/hlf-bursaries http://new.archaeologyuk.org/community-archaeology-bursaries-project
CPD best practice and templates	http://www.archaeologists.net/development/cpd
Skills passport	http://www.archaeologyskills.co.uk/
In-house training schemes	http://www.cotswoldarchaeology.co.uk/careers/training-and-development/ https://oxfordarchaeology.com/community-training/training

¹⁴ <http://www.archaeologists.net/trainingtoolkit>

11 Period-based resource assessment

11.1 Lower to Upper Palaeolithic

"Britain has an enviable Palaeolithic record, one that forms a critical resource for global research questions. Britain is located at the north-west extremity of hominin life in the Pleistocene Old World; it has a world-class record of in-situ and secondary context Lower Palaeolithic sites, including some of the oldest in Europe..." (English Heritage 2008, p.3)

- 11.1.1 For the vast majority of the archaeological record (i.e. prior to the Neolithic), early hominin populations, including most recent modern human groups, were reliant on a hunter-gatherer mode of subsistence. This subsistence strategy leaves a characteristically scarce Palaeolithic archaeological record. In addition, the substantial time-depth involved (i.e. the last one million years of the Quaternary), and the complex interaction of a range of cultural, environmental, climatic and taphonomic factors have also exerted profound influences on the forms of evidence that survive from the British Palaeolithic.
- 11.1.2 The evidence for Palaeolithic activity in Britain overwhelmingly consists of worked stone artefacts. However, faunal remains, which occasionally display signs of butchery, and detailed studies of sedimentary sequences and palaeo-environmental data provide equally important contextual information. Early hominin remains are exceptionally rare, with the entire Lower and Middle Palaeolithic in Britain represented by only a few fragments of fossilised skeletal material, while fully modern human remains attributable to the Upper Palaeolithic are only marginally less scarce.
- 11.1.3 The nature of the anthropogenic evidence (i.e. evidence originating from human activity) recovered from Palaeolithic sites is highly variable, ranging from discoveries of isolated findspots of artefactual material, through to sites which have produced hundreds to thousands of lithic artefacts. The evidence recovered from *in-situ* and secondary context Palaeolithic sites may reflect very long histories of occupation, or repeated phases of activity by different populations spanning one or more Marine Isotope Stages (MIS) (Pettitt and White 2012).
- 11.1.4 *In-situ* Palaeolithic sites are extremely rare and are, therefore, highly significant. Some *in-situ* sites have produced very large lithic assemblages, important diagnostic faunal assemblages and sources of palaeo-environmental data, often contained within complex Pleistocene stratigraphy. Such sites typically require a range of inter-disciplinary specialisms to investigate (Stringer 2011).
- 11.1.5 However, the vast majority of the evidence for Palaeolithic activity consists of lithic artefacts recovered from secondary contexts. These discoveries can, nevertheless, contribute to our understanding of the period, particularly where their post-depositional histories can be reconstructed from the study of Quaternary (Pleistocene and Holocene) geomorphology and sediment sequences (Hosfield *et al.* 2007).
- 11.1.6 Even where evidence for anthropogenic activity is absent, multidisciplinary studies of Pleistocene sedimentary sequences containing sources of palaeo-environmental and

geomorphological information are vital in reconstructing past environments and for understanding the parameters that determined patterns of habitation, behaviour and adaptation (Pettitt and White 2012).

- 11.1.7 The palaeo-geography, vegetation and faunal communities of Britain fluctuated dramatically throughout the Pleistocene in response to climatic variations between cold glacial periods (stadials) and warm interglacial phases (interstadials). As a result, Palaeolithic sites reflect the diverse nature of Pleistocene environments, and the very wide range of climates that past populations lived in (Candy *et al.* 2011), ranging from cold glacial landscapes (Parfitt *et al.* 2010; Tizzard *et al.* 2015) to warm Mediterranean climates (Parfitt *et al.* 2005).
- 11.1.8 Pleistocene environmental change and geomorphological processes have also profoundly affected the distribution and visibility of surviving Palaeolithic sites. For example, glacial, fluvial and other processes appear to have been responsible for substantial erosion and destruction of Pleistocene deposits in some instances. In other cases, archaeologically significant Pleistocene sediments may be buried at considerable depth beneath subsequently accumulated deposits.
- 11.1.9 A key element of understanding the British Palaeolithic is that for much of the Pleistocene, when the climate was colder than now, sea levels were significantly lower, exposing huge areas of land that are now under the sea. This submerged palaeo-landscape linked the British Isles to continental Europe for most of the Pleistocene except during more inter-glacial periods when the English Channel was beginning to form (Bicket and Tizzard 2015). In order to understand the existing terrestrial Palaeolithic record it must be recognised that this only represents part of the landscape that was occupied by hominins and that the coasts and lowlands of the Palaeolithic world are to a greater or lesser extent presently underwater.
- 11.1.10 The Palaeolithic record is dominated by evidence recovered from former riverine environments, typically floodplain deposits and river terrace sequences (Pettitt and White 2012, p.108). These locations presented natural migratory corridors and must have been attractive to early populations due to the availability of a wide range of resources and opportunities. However, it is unlikely that hominin activity was solely confined to river valleys, and it is suspected that both the concentration of historical archaeological and antiquarian investigations on such environments, and biases imposed by preservational factors play a significant role in shaping this apparent emphasis.
- 11.1.11 Nevertheless, Pleistocene fluvial sequences, comprising river terrace deposits formed of sands and gravels, alluvium and buried channels, hold the greatest potential for the recovery of *in-situ* and reworked artefactual, faunal and palaeo-environmental remains. The potential for the presence of *in-situ* remains is predictably greater within fine-grained sediments deposited in low-energy riverine environments.
- 11.1.12 The relative chronological control provided by river terrace 'staircases' is especially important for investigating archaeological time beyond the scope of standard chronometric dating methods. This provides a framework for understanding both the relative sequence of archaeological, faunal and palaeo-environmental archives preserved in different terraces, in relation to the geomorphological development of major river systems, and the complex climatic factors responsible for shaping these dynamic environments throughout the Quaternary.

- 11.1.13 Beyond riverine locales, other environmental contexts may also preserve traces of Palaeolithic occupation, for example, where Pleistocene sediments have been buried and thus protected from subsequent erosion by the fortuitous interplay of topography and colluvial processes. Other Pleistocene sediments, including glacial tills, fluvio-glacial deposits, 'clay-with-flints', reworked loessic or aeolian deposits, often known colloquially as 'brickearth', and 'head deposits' or solifluction gravels also hold potential for the recovery of artefactual material and, to a lesser extent, faunal and other palaeo-environmental remains (Wenban-Smith *et al.* 2014). Artefactual material recovered from these deposits is almost inevitably reworked to varying degrees and may occur as isolated finds, although larger, and occasionally prolific assemblages are sometimes identified (Pettitt and White 2012).

The Palaeolithic colonisation of Britain

- 11.1.14 The initial stages of the colonisation of Britain have recently been demonstrated to have occurred as distantly as the latter stages of the Early Pleistocene. A series of discoveries made since 2005 at Happisburgh on the Norfolk coastline have provided the earliest evidence for human occupation in northern Europe, coinciding with either MIS 21, c.866-814 Ka, or MIS 25, c.970-936 Ka (Ashton *et al.* 2014; Parfitt *et al.* 2010). Investigations further south along the coastline at Pakefield, Suffolk have also yielded unequivocal evidence for human activity as early as MIS 19, c.750 Ka (Parfitt *et al.* 2005).
- 11.1.15 Happisburgh and Pakefield have contributed substantially to the developing picture of the Lower Palaeolithic in northern Europe, and join the evidence from other internationally significant sites, such as Boxgrove in West Sussex and High Lodge in Suffolk, for early human habitation prior to the onset of the Anglian glaciation (MIS 12), c.480 Ka.
- 11.1.16 The species of the earliest hominins to colonise Britain is uncertain, although it has been inferred that *Homo antecessor* may have been responsible for the evidence at Happisburgh (e.g. Ashton *et al.* 2014, Pettitt and White 2012). Evidence for subsequent Lower Palaeolithic activity is often attributed to *Homo heidelbergensis*. However, the origin, nature and chronology of Pleistocene hominin speciation events (the evolutionary process by which new species arise), and subsequent dispersals are obscure and continue to form the focus of international research.
- 11.1.17 The intensely cold conditions that prevailed throughout the Anglian glacial stage are likely to have rendered human occupation in Britain unviable throughout most, although possibly not all of the period. The retreat of the Anglian ice sheets and the improving climate at the onset of the Hoxnian interglacial (MIS 11), c.423 Ka, enabled early humans (*H. heidelbergensis*) to extend their range further north again to reoccupy Britain as improving environmental conditions allowed.
- 11.1.18 The Hoxnian has produced the most prolific evidence of hominin activity during the Lower Palaeolithic in Britain, represented by artefactual material associated with the Acheulian handaxe (Mode 2) and Clactonian flake tool (Mode 1) industries. However, these discoveries are not evenly distributed across the country. For example, the paucity of Hoxnian sites in the East and West Midlands stands in contrast to the abundance of evidence from southern and eastern England (Garwood 2011, p.18; McNabb 2006, p.24). It has been suggested that the Saalian (Wolstonian) glacial stages (MIS 10, 8 and 6) may have been responsible for the

widespread eradication of Hoxnian sediments across the Midlands, although this remains unresolved.

- 11.1.19 The early-middle Saalian (Wolstonian) stages (MIS 10 to 8), c.374-245 Ka, straddles the early stages of the Lower-Middle Palaeolithic transition in Britain, which was marked by the appearance of prepared core (Mode 3), or Levallois technologies, associated with the colonisation of southern Britain by *H. neanderthalensis* (White *et al.* 2006, White *et al.* 2011). As with the preceding Hoxnian interstadial, very little trace of human activity can be discerned in the West and East Midlands during MIS 10-8 (Garwood 2011, p.18; McNabb 2006, p.24), while widespread evidence has been detected in the south and east of the country, extending into now-offshore locations in the southern North Sea in MIS 8/7 (Tizzard *et al.* 2015) and across terrestrial sites in northwest Europe (Scott and Ashton 2011).
- 11.1.20 Although sustained occupation during the Hoxnian interglacial is well attested in the archaeological record, at least in southern and eastern Britain, the Saalian (Wolstonian) (MIS 10-6) may have witnessed a steady decline in population (Ashton and Lewis 2002, Ashton *et al.* 2010). Conclusive evidence for human activity becomes very limited nationally during MIS 7 (c.245-186 Ka), after which there appears to have been a prolonged hiatus in occupation between MIS 6-4 (c.186-60 Ka).
- 11.1.21 The Early to Middle Devensian (late MIS 4 to mid MIS 3), c.60-40 Ka, coincided with the reoccupation of Britain by *H. neanderthalensis*, and is associated with the emergence of late Middle Palaeolithic Mousterian industries, and the appearance of the characteristic *bout coupé* handaxe. Again, there is a marked disparity between the paucity of evidence relating to this period in the Midlands compared with the more widespread traces of activity identified in the south and east of the country.
- 11.1.22 The transition from the Middle Palaeolithic to the Early Upper Palaeolithic in Britain from c.40 ka is demarcated by the arrival of anatomically modern humans, the adoption of new technologies and more clearly resolved evidence for cultural complexity and symbolic behaviour. The occupation of Britain during the Upper Palaeolithic appears to have been punctuated by stages of absence during the cold phase that occurred c.36-32 Ka and throughout much, if not all of the Last Glacial Maximum (LGM) (MIS 2), c.25-13 Ka.
- 11.1.23 The advent of the Late Upper Palaeolithic is correlated with the recolonisation of Britain during a period of rapidly improving climate after c.13ka. A return to extreme cold conditions during the Younger *Dryas* or Loch Lomond stadial, c.11-10 Ka, appears to be synchronous with a widespread paucity of evidence for human activity in northern latitudes.
- 11.1.24 The appearance, at c.10.3 Ka, of Late, or Final Upper Palaeolithic long-blade industries in Britain appears to represent the earliest recolonisation during the rapidly improving climate that demarcated the end of the Younger Dryas. The Palaeolithic in Britain concluded at the start of the Holocene, with the first appearances of hunter-gatherer societies associated with Mesolithic material culture.
- 11.1.25 The Upper Palaeolithic is poorly represented nationally and is most prominently attested to by cave sites and sporadic flint scatters or isolated findspots in secondary contexts. Open air sites with *in-situ* artefactual and/or faunal remains are exceptionally rare nationally, and where

these have been recognised, they are most commonly associated with the long-blade industries of the early post-glacial period.

Identifying Palaeolithic activity within the HS2 route

- 11.1.26 Phase One of HS2 presents a distinct opportunity to investigate a complex range of Pleistocene sedimentary sequences within a continuous transect across the country, yielding the potential for considerable refinement of existing understanding regarding the chronology, relationships and morphology of these deposits and, possibly, for archaeological discoveries to be made.
- 11.1.27 Due to the nature of the evidence, it is often difficult to identify specific sites, or discrete geographical areas within which Palaeolithic remains might be expected. However, the process of environmental impact assessment undertaken for Phase One of HS2 has identified a number of areas in which there is an elevated potential for encountering Palaeolithic remains.
- 11.1.28 The major river systems active throughout the Pleistocene, including the Bytham (alternatively termed the Ingham) and the Thames, their tributaries and other minor drainage systems have potential for Palaeolithic deposits. The now-extinct Bytham River flowed through the West and East Midlands, and into East Anglia, prior to its destruction by the advancing ice sheets of the Anglian glaciation (MIS₁₂). The drainage system of the Bytham would have been complex and dynamic, formed of shifting channels and tributaries. However, many aspects of its geomorphological development, such as its relationship with the Mathon River, are poorly understood. The locations of the former channel(s) of the Bytham River and its associated tributaries are only partially defined, and the depth at which any associated deposits might occur is uncertain. Nevertheless, the route of HS2 will intersect with the projected course of the Bytham River north of Cubbington (OFCo41).
- 11.1.29 At present, little archaeological evidence has been recovered from the surviving fluvial sequences associated with the Bytham River across the East and West Midlands. However, it is suspected that this is as a result of limited investigation. The potential of these deposits has been demonstrated by the case of Waverley Wood Farm Pit, north of Warwick. Investigations at this site have produced handaxes and faunal remains in organic palaeo-channel deposits, sealed by Anglian sands and gravel, which are believed to be associated with the Bytham River and date to MIS₁₃, c.500 Ka.
- 11.1.30 For much of the Pleistocene, the Thames flowed considerably further to the north of its current position, around the Vale of St. Albans and through East Anglia. The southward migration of the river, driven in part by glaciation, was also accompanied by substantial changes to its wider network of tributaries. The complex and dynamic geomorphological history of the Thames drainage system has left behind a complex sequence of river terraces and other fluvial deposits across a wide transect of southeast Britain.
- 11.1.31 The geomorphological development of the Thames drainage system throughout the Pleistocene has been the focus of much research and is comparatively well understood (e.g. Bridgland 1994, Bridgland *et al.* 2004, Pettitt and White 2012). However, many questions remain to be answered with regard to the chronology and relationships between these deposits.

- 11.1.32 An abundance of Palaeolithic sites, faunal remains and individual artefacts have been identified in association with the Thames drainage system, deriving largely from the complex and extensive Pleistocene terrace sequences. The range of evidence for Palaeolithic habitation, including faunal remains and palaeo-environmental data, which might be recovered from the fluvial sequences of the Thames and its tributaries has the potential to span the pre-Anglian Lower Palaeolithic through to the Upper Palaeolithic.
- 11.1.33 Phase One of HS2 will traverse areas containing Pleistocene deposits attributed to the Thames drainage system across a broad swathe of the landscape. A number of locations in close proximity to the route of Phase One of HS2 have previously yielded Palaeolithic material (e.g. CVA044, CVA080, EUS007, EUS008), highlighting the potential for further discoveries to be made.
- 11.1.34 Fluvial deposits associated with the River Colne, a major tributary of the Thames, may hold particular significance for the critical period of the Late Upper Palaeolithic to Mesolithic transition. This is illustrated by the important evidence recovered from preserved ground surfaces in the Colne Valley at Three Ways Wharf, Uxbridge (Lewis and Rackham 2011) and quarry sites near Denham (Hey 2014). It is possible that associated deposits containing similar evidence may be encountered, for example, near Dews Farm (CVA021) and possibly elsewhere in the Colne Valley (e.g. CVA029, RUI015).
- 11.1.35 The potential for the recovery of Palaeolithic material within the Misbourne Valley (e.g. CHA076) and in areas of the Chilterns containing head deposits and clay-with-flints (CFA08, CFA09) (Wenban-Smith 2014), has also been recognised, although any such material may be reworked.
- 11.1.36 Reports of the discovery of Pleistocene mammal remains from a former gravel quarry to the north of Road Barn Farm (DWH157), east of Wendover, raises the possibility that similar material may be encountered in this vicinity within the route of Phase One of HS2.
- 11.1.37 Palaeolithic artefacts and palaeo-environmental and faunal remains could also be recovered from the terrace deposits and alluvium within the floodplains of the Thame and its tributary systems extending through the Aylesbury Vale region of Buckinghamshire (CFA11-12). Geophysical surveys conducted in this area have clearly demonstrated the existence of palaeo-channels associated with the Thame to the south of Putlowes, which could hold potential for the recovery of archaeological and palaeo-environmental evidence (see 2013 ES Appendix, figure CH-004-011).
- 11.1.38 Pleistocene faunal remains were recovered during 19th and early 20th quarrying at Locke's Pit (SMA042 (CFA11)) between Walton Court and Hartwell, possibly from primary contexts within the terrace gravels, and it is possible that buried land surfaces may survive in this area. At present, it is uncertain if any contiguous or associated deposits extend into the route of Phase One of HS2, although it remains a possibility. The head deposits that occur in this region, particularly near Hartwell and south of Putlowes, may also hold some potential to contain reworked Palaeolithic artefactual material.
- 11.1.39 Palaeolithic artefactual and Pleistocene faunal remains have also been recovered from fluvial deposits associated with the Padbury Brook in Buckinghamshire (CAL041, CLAO43) at

locations to the north and south of the route of Phase One of HS2, indicating a potential for further discoveries to be made in this area.

- 11.1.40 *In-situ* deposits containing palaeo-environmental evidence and traces of anthropogenic activity spanning the Late Upper Palaeolithic to Mesolithic transition have also been revealed adjacent to the route of HS2, in the Eastside area of Birmingham City Centre (WCS035) (Higgins and Score 2009).

Conclusion

- 11.1.41 The key areas of potential along the route of Phase One of HS2 are undoubtedly the river valleys that it intersects, and particularly the route of the pre-Anglian river systems. These locations have the potential to provide evidence for past environments, a greater understanding of hominin activity and the relationship between the two. Understanding the geomorphology of these river systems would contribute to a greater understanding of environmental change in the period. Exploring the presence of deposits with potential beyond these river systems, such as the clay-with-flints of the Chilterns, may provide a broader context for the period and seek to address any existing bias towards river valley contexts in the archaeological record.

11.2 Mesolithic and Early Neolithic

- 11.2.1 The Pleistocene/Holocene boundary, c.9,500 BC, marked the onset of a period of dramatic environmental change in Britain. Rapid climatic warming at the end of the Younger *Dryas* c.10 Ka resulted in successional changes in vegetation patterns, initiating a process of widespread and gradual afforestation.
- 11.2.2 In the first stages of this transformation, during the Pre-Boreal period, the open landscapes of the late-glacial period were gradually populated by woodland pioneer species, most abundantly by birch and pine. In turn, the early woodland colonisers gave way to species more suited to warm climates, such as hazel, elm and oak, resulting in almost complete forest cover during the Boreal period in southern Britain, c.7,500-5,500 BC.
- 11.2.3 The environment of the subsequent Atlantic period, c.5,500-3,000 BC, which saw temperatures perhaps 2.5°C warmer than today, was characterised by the establishment of extensive swathes of mixed broadleaved woodland, composed predominantly of alder, oak, elm and lime.
- 11.2.4 Major faunal change occurred, with woodland adapted species, such as red and roe deer, aurochs, boar and elk, replacing the horse, arctic hare and reindeer of the late-glacial landscapes. Sea levels rose throughout the post-glacial period to inundate the low lying plains of the North Sea basin and other coastal areas, culminating in the separation of Britain from continental Europe by c.6,500 BC.
- 11.2.5 These major environmental shifts were coincident with a prolonged period of significant social, technological, economic and cultural change in Britain. This began with the transition from the long-blade cultures of the Late or Final Upper Palaeolithic, through to the appearance and subsequent development of Mesolithic hunter-gatherer societies, ultimately coinciding with the emergence of the early agricultural societies of the Neolithic. However,

there is considerable ambiguity regarding the nature and detail of these fundamental changes.

- 11.2.6 Many of the knowledge gaps that currently exist relate to the scarce and typically insubstantial nature of the archaeological evidence. The paucity of radiocarbon dates for critical transition periods, the limited number and range of *in-situ* sites nationally, regional disparities in levels of investigation and preservational biases all impose barriers to understanding.

The Mesolithic

- 11.2.7 The earliest Mesolithic sites in the British Isles date to around the 8th millennium BC and consist of a string of early hut structures along the coast of northeast England and Southwest Scotland, such as Howick in Northumberland, East Barns in East Lothian, and most recently Echline, on the River Forth.
- 11.2.8 Although there is still much debate as to the nature and veracity of such distinctions, the development of the Mesolithic hunter-gatherer societies of the Early Holocene is commonly subdivided broadly into early and later periods. The Early Mesolithic is often characterised by 'broad-blade assemblages' utilising large microliths, while the Later Mesolithic is conventionally defined by the appearance of 'narrow-blade assemblages', utilising small microliths, the earliest of which appear in north east England and Ireland from c.8,000 BC (Tolan-Smith 2010). Over time, penetration of the mobile, adaptable 'narrow-blade' groups increases inland and by the Later Mesolithic dominates the archaeological record.
- 11.2.9 It is thought the transition from the Early to Later Mesolithic saw a shift from a reliance on subsistence strategies dominated by terrestrial large game hunting, towards broad-spectrum subsistence practices, including the hunting of woodland game and intensive exploitation of marine and woodland plant resources. However, the shifts and variations in social organisation, population mobility, economy and technology that occurred throughout the Mesolithic were doubtlessly substantially more complex than this outline suggests.
- 11.2.10 The archaeological evidence for Mesolithic activity principally consists of lithic material, often recovered as isolated, chance finds in secondary contexts and occasionally larger assemblages in the form of residual scatters identified during fieldwalking and excavation. Primary context sites with *in-situ* evidence for Mesolithic occupation or other forms of activity are very scarce nationally, while sites yielding organic, faunal and/or human remains or conclusive evidence for structures are exceptionally rare; except in northern Britain (Waddington 2015). Sources of palaeo-environmental data, where available, provide a critical resource for understanding this period.
- 11.2.11 The inherently low visibility of Mesolithic sites makes it difficult to predict the locations in which they will be encountered and detailed geomorphological assessment and geoarchaeological approaches are required to investigate these archaeological materials within a broad landscape context. Nevertheless, the distribution of known sites and residual artefactual material suggests a preference for strategic locations on ecotones where gathering/hunting grounds and areas of elevated terrain close to water sources meet.

The Mesolithic-Neolithic transition

- 11.2.12 The Mesolithic-Neolithic transition, which is traditionally demarcated by the shift from hunter-gatherer-fisher modes of subsistence to the adoption of farming, has long been the focus of archaeological enquiry. However, the traditional image of a simple dichotomy between sedentary Neolithic agriculturalists and highly mobile Mesolithic hunter-gatherer-fishers has increasingly fallen out of fashion, largely through a reassessment of the archaeological evidence for Neolithic settlement (e.g. Thomas 1991).
- 11.2.13 The specific chronology and nature of the changes that occurred during this critical period of transition remain the subjects of debate (e.g. Thomas 2004; 2013; Whittle *et al.* 2011). A key point of contention in this regard is the degree of continuity that may have existed between Late Mesolithic and Early Neolithic communities, in terms of population, mobility and subsistence strategies. What is clear is that the uptake of Neolithic practices may have spread from the area of the Thames Estuary and Kent along the river valleys and other routes over a period of one or more centuries from about 4,000 BC (Whittle *et al.* 2011) becoming more widespread after 3,800 BC. Local circumstance must, however, have been a factor in how ideas, practices and potentially people spread and may account for the regional patterns and variation seen in the evidence.
- 11.2.14 Early Neolithic communities must have undertaken localised woodland clearance to enable cultivation, although there is currently little evidence for widespread deforestation during the Atlantic period, and it is highly probable that early agriculturalists continued to exploit wild resources through foraging, fishing and hunting. Conversely, there are suggestions that Mesolithic populations may have actively managed wild resources in ways similar to domesticates, while leaving behind little archaeological signature. Mesolithic hunter-gatherers appear to have deliberately modified their environment to encourage the growth of economically productive species and to improve hunting opportunities through controlled woodland burning, while the systematic exploitation of specific woodland resources must have indirectly influenced the relative abundance and distribution of particular species.
- 11.2.15 The degree to which Early Neolithic populations adopted sedentary lifestyles over more transient residential mobility patterns remains unclear, not least as evidence for settlement remains elusive and largely defined by occasional pits, postholes and surface scatters. However, structural remains from this period are increasingly being recognised, as in the case of the four, possibly five substantial Early Neolithic timber-built structures uncovered in recent years at a gravel quarry in the Colne valley at Horton, Berkshire (Symonds 2014). Other comparable house sites are known from Cranford Lane on the east side of Heathrow (Elsdon pers comm) and Gorhambury (Hertfordshire) (Hey and Barclay 2007).
- 11.2.16 Regional disparities and variations in settlement and mobility patterns may complicate the issue, and it is uncertain if the few Early Neolithic 'houses' that have been identified can be conclusively determined to have functioned as domestic dwellings, although a distinction can be drawn between the smaller size of the buildings found in south-east England and the much larger 'halls' that are found in eastern Scotland (Brophy 2007).

Early Neolithic communities

- 11.2.17 In general terms, however, the Early Neolithic (c.4,000-3,300 BC) in Britain is differentiated from the preceding Mesolithic by the introduction of a series of profound social, technological and economic changes. The period coincides with the first arrival of domesticated animal and cereals, a change in diet, and is accompanied by new material culture, including the development of ceramics and new lithic typologies. It is also a time when long-distance connections existed across Britain, exemplified by the long-distance exchange of lithic material (e.g. stone and flint axes), and with Ireland and mainland Europe.
- 11.2.18 Early Neolithic communities were the first to leave their mark permanently and prominently on the landscape, through the construction of monuments, such as long barrows, causewayed enclosures and chambered tombs. These readily accessible monuments have traditionally dominated interpretations of the period.
- 11.2.19 The emergence of monumental architecture provides evidence for new forms of social organisation and complexity, including ritualised mortuary activity involving formal burial deposition, ceremonial practices and the construction of social and cultural identities. The phenomenon of deliberate deposition in pits, ditches and middens also appears as a characteristic feature of the Early Neolithic.
- 11.2.20 It has long been recognised that in the river valleys of central England monument complexes may be of a different character to those on the Chalk (Bradley 2014; Loveday 2006), as typified by the Colne Valley where a substantial bank barrow 3.5km in extent (previously called the Stanwell Cursus) (Framework Archaeology 2010) sits at the heart of a complex of cursus monuments and in a landscape that contained other small-scale enclosures of Early Neolithic date. Such monuments have come to light as cropmarks on the gravel terraces of the Midlands river valleys, although their proximity to rivers means that they are occasionally partially obscured by much later alluvium (e.g. Drayton Cursus in the Upper Thames Valley). The relationship between monuments and associated settlement does, however, remain unclear. It has been highlighted that monument locations may not indicate the presence of associated settlement and that an absence of monuments, in the Chilterns for example, does not preclude settlement activity (Bradley 2014).
- 11.2.21 Whiteleaf Barrow on the Chiltern Scarp overlooking Princes Risborough in Buckinghamshire provides evidence for Early Neolithic funerary activity, while the clay-with-flints and Greensand belt are notable in having produced assemblages of worked flint suggestive of increasing levels of settlement in this area.
- 11.2.22 Recent assessments of aerial photographs have provided suggestions of an increasingly complex archaeological landscape around the edges of the Trent Valley, including a high density of cropmarks, some of which may relate to Early Neolithic activity, on the basis of morphological identification and radiocarbon dating. These include two possible causewayed enclosures that have been identified at Alrewas and Mavesyn Ridware in Staffordshire (Oswald *et al.* 2001).
- 11.2.23 The recent discovery of a causewayed enclosure at an archaeologically dense multi-period site close to Thame in Oxfordshire (Pitts 2015) underscores that the Thame Valley was a focus of Early Neolithic activity, and that contemporary remains might be expected elsewhere along

its course, as have been found in the lower reaches of the valley near its confluence with the River Thames (Barclay *et al.* 2003). The discovery at Thame also highlights that other major monuments can be obscured by later settlement sites and that gaps in the known distribution may also reflect a lack of previous work (see Oswald *et al.* 2001).

- 11.2.24 The Thames Valley contains a relative abundance of evidence for Early Neolithic activity (Bradley 2014), although the extent to which this reflects the high levels of archaeological investigation, principally gravel extraction but also housing development, carried out in this region is unclear.
- 11.2.25 Patterns of regional and cultural variation become more distinct during this period, most prominently in the distribution of monuments, but also in more subtle variations of material culture and in the rates of adoption of other characteristic facets of the Early Neolithic.
- 11.2.26 As in preceding periods, much of the recorded evidence for Early Neolithic activity derives from isolated findspots and scatters of lithic material recovered from secondary contexts. However, archaeological features from this period, including pits, middens and monumental architecture, are considerably more visible than the insubstantial signatures typically left behind by Mesolithic and Palaeolithic populations.

Existing evidence from along the route

- 11.2.27 The nature of the archaeological evidence for Mesolithic and Neolithic activity often renders it difficult to identify specific areas, or discrete locations of high potential. However, a number of general observations can be made on the basis of the information collated during the preparation of the Environmental Statement.
- 11.2.28 The Colne Valley has produced a number of important sites containing traces of Mesolithic activity, including evidence for the transition period from the Late Upper Palaeolithic. These include sites at The Lea and Boyer's Pit at Denham, Sandstone at Iver and at Three Ways Wharf, Uxbridge. The latter of these sites revealed a series of *in-situ* flint scatters and faunal remains associated with two main phases of hunter-gatherer activity. The earlier phase, characterised by late glacial bruised-edge 'long blades' and associated with reindeer and horse, was dated to c.8,000 BC. The succeeding Early Mesolithic phase, with broad, obliquely backed flint points predominantly associated with red and roe deer, was dated at c.7,200 BC (Lewis and Rackham 2011).
- 11.2.29 Evidence for Mesolithic activity has also been recorded elsewhere within the Colne Valley, within the route of HS2 at Dews Farm (CVA021; CFA07) and nearby at Dews Pit (CVA029; CFA07). It is possible that deposits with the potential to yield similar evidence of Mesolithic activity, including buried land surfaces and sources of palaeo-environmental data, may survive in this area.
- 11.2.30 There may also be an elevated potential for encountering evidence of Mesolithic activity within other riverine locations traversed by the route of Phase One of HS2, for example, within the floodplain deposits and higher ground overlooking the Thames Valley system (CFA06), the Misbourne Valley (CFA08), the River Ray, the Thame (CFA11), and the upper slopes of the River Great Ouse and the River Cherwell. It is possible that Mesolithic activity sites located within such environments may be buried beneath alluvial deposits.

- 11.2.31 The clay-with-flints strata of the Chilterns (CFA08) and the Hampshire Greensand belt have also produced evidence for Mesolithic activity, while remains of this period might also be buried beneath accumulations of colluvial material in a variety of locations.
- 11.2.32 Mesolithic remains are currently poorly represented in the West Midlands, although it is uncertain if this is an accurate reflection of low levels of activity in this region, or if this pattern has resulted from preservational biases and/or lack of investigation (Garwood 2011). Nevertheless, evidence of Mesolithic activity has been recorded in association with streams, springs and small watercourses at a number of locations in the West Midlands, including at Wishaw Hall Farm on the line of the M6 toll road (Powell *et al.* 2008) and Sandwell Priory, West Bromwich (Hodder 1991).
- 11.2.33 Previous investigations in the Eastside area of Birmingham city centre (WCS035; CFA26), have also revealed *in-situ* deposits containing palaeo-environmental evidence and traces of anthropogenic activity spanning the Late Upper Palaeolithic to Mesolithic transition (Higgins and Score 2009). It is possible that these deposits may extend into the route of HS2.
- 11.2.34 A number of flint scatters have been recorded in proximity to the Phase One HS2 route that have the potential for a Neolithic component (CVA078; CHA005; CHA008; CHA030; CC015; DWH114). Three of these lithic scatters may also include Mesolithic material (CHA030; CC015; DWH114). One flint scatter partially within the scheme between Walton Court and Bishopstone, near a tributary of the River Thames, includes both Mesolithic and Neolithic flintwork. Fieldwalking within the scheme west of Moreton Road, Greatworth to Lower Boddington (GLB051) has also identified Neolithic flintwork.
- 11.2.35 The central part of the West Midlands in particular is characterised by a paucity of Early Neolithic monuments (Garwood 2011), and the reasons for this are the subject of debate. Monument visibility is affected by alluvial masking and by soils that are not conducive to cropmark formation (Garwood 2011). Another important consideration is the visibility and variable survival of early prehistoric remains in urban areas. However, a number of long barrows are known to lie near the headwaters of the River Cherwell, suggesting that evidence of Early Neolithic ceremonial and/or funerary activity may be expected on the upland areas within the watershed between the Cherwell and the Great Ouse. A possible long barrow (BHA167) has also been identified from cropmark evidence to the east of Hampton-in-Arden, c.600m south of the route of Phase One of HS2.

Conclusions

- 11.2.36 It is difficult to define the location of Mesolithic and Early Neolithic activity in the landscape, where there is little evidence for substantial settlement remains. Those regions where a greater frequency of evidence has been recorded may also potentially be the product of bias in the archaeological record. Neolithic monuments of this period have been infrequently recorded in proximity to the route of Phase One of HS2 and across broad regions such as the central West Midlands, and it is uncertain whether this represents genuine regional distinctiveness.
- 11.2.37 In general, the spatial distribution of known Mesolithic and Early Neolithic activity appears to indicate a continued preference for well-drained higher ground and slopes overlooking watercourses, particularly at the confluences of river systems. As a consequence, the valleys

of the Rivers Trent, Tame, Thame, Thames, Colne, Misbourne, Nene, Cherwell, Ray and Great Ouse and their tributaries and other watercourses can be correlated with an elevated potential for Early Neolithic remains. Like the major river valleys, streams, springs and small watercourses may have been a focus of Mesolithic activity.

- 11.2.38 Given the nature of these environments, and the evidence from previous investigations elsewhere, it can be expected that traces of Mesolithic and Early Neolithic activity may, in some cases, be buried within or concealed beneath alluvium or colluvium. The extent to which activities at riverine locations reflect continuity in the patterns and locations of settlement between the Mesolithic and Early Neolithic is unknown. Further palaeo-environmental evidence may enable a closer understanding of the degree of continuity between Mesolithic and Early Neolithic subsistence strategies and the active management of the natural environment.

11.3 The Late Neolithic and Early Bronze Age (c.2,900-1,500 BC)

- 11.3.1 The Late Neolithic and Early Bronze Age are characterised by a variety of distinctive monument types, ranging from timber circles, stone circles, henges, single Beaker burials, round barrows and ring ditches with funerary rites showing a general trend from inhumation to cremation in the Early Bronze Age (Bradley 2014; Garwood 2011). In contrast, evidence for domestic settlement, settlement structures and settlement sites is extremely limited and discussions on settlement have focused on factors of preservation, systems of mobility and the role of monuments in structuring settlement space and mobility (Fleming 1971; Gibson 1982; Whittle 1997; Brück 1999; Allen 2005). The interpretation of settlement location at a broad scale in the landscape is, therefore, largely based upon the presence of artefacts including lithics and metalwork alongside the distribution of ritual and funerary monuments. Palaeo-environmental data can also, therefore, play an important role in the reconstruction of past environments and the potential character of occupation in this period.
- 11.3.2 The round barrows and circular ditches that may once have surrounded them (ring ditches) are regularly identified in a variety of upland and lowland landscape contexts. Earthwork round barrows (or stone-built versions known as cairns) are more frequently identified in upland and pasture contexts where they have largely escaped damage from ploughing. In lowland contexts ring ditches are interpreted as the ploughed out remains of round barrows. Funerary and ceremonial monuments can, therefore, be recorded in both valley and river terrace contexts and upon chalk downlands and ridge-tops, for example.
- 11.3.3 Regional diversity in the distribution of monuments has been highlighted, with relatively few monuments in the central part of the West Midlands (Garwood 2011) and a lack of monuments on the clay-with-flints geology of the Chilterns (Bradley 2014). It has been highlighted that the presence of upland monuments, on chalk downland, for example, may reflect favourable preservation, rather than a preference for monument construction in upland locations (Bradley 2014). It has, however, been argued that the distinctive ridge-top siting of certain barrows (e.g. on the Chilterns) may relate to high-status burials and monuments (Bradley 2014).
- 11.3.4 The earliest metalwork in southern England is associated with early Beaker burials including copper artefacts and gold ornaments, for example at Barrow Hills, Radley in the upper

Thames, Oxfordshire (*ibid.*, 105). The analysis of the remains of the Amesbury Archer, in Wiltshire, associated with early gold artefacts and Beaker ceramics has suggested that the individual originated in central Europe, which raises questions on long-distance migration, the movement of artefacts, technology, ideas and cultural identity (http://www.wessexarch.co.uk/projects/amesbury/archer_finds.html). Copper alloy artefacts, including axes, develop from c. 2,200 BC (*ibid.*). The typology of Bronze Age metalwork was a subject of significant research in the 19th century and much of the 20th century. From the late 20th century, the focus moved increasingly towards interpretations of the social context of artefacts (e.g. Rowlands 1980; Bradley 1990).

- 11.3.5 Early Bronze Age artefacts may be associated with burials, but are also found as occasional stray finds more broadly within the landscape. There is no certain association between settlement and metalwork for this period and the relationship between metal artefacts recorded in the landscape and the location of settlement is unclear. It may be possible that some artefact finds in the landscape represent intentional deposition (*ibid.*) at locations that may have been considered significant, on prominent hilltops or within or close to natural boundaries such as rivers, for example. This may, however, be difficult to demonstrate for single stray finds where contextual information is lacking and the intentional gathering and deposition of hoards is more common from the Middle and Late Bronze Age. The distribution of metalwork can, nevertheless, potentially inform understanding of the structure of settlement space and landscape occupation at broad scales.
- 11.3.6 There is limited evidence for settlement structures and settlement sites for the Late Neolithic and Early Bronze Age in Britain. Evidence for domestic activity is often formed of insubstantial pits, postholes, gullies and diffuse artefact scatters. Where settlement has been identified, it is often in association with monuments, often predating later phases of funerary and ceremonial activity. This may be interpreted as fortuitous preservation, although these settlement activities may also have formed part of a sequence of events closely associated with monument construction and use. At Durrington Walls, Wiltshire, for example, exceptional evidence for Late Neolithic settlement and settlement structures may form part of the development of a significant ceremonial centre (Parker-Pearson *et al.* 2007). However activities at or preceding the construction of monuments are interpreted, they are likely to form a component of a wider settlement pattern (Brück 1999). The consistently insubstantial nature of settlement evidence for this period in Britain has led to interpretations of transient and mobile patterns of residency (*ibid.*; Fleming 1971; Thomas 1991; Whittle 1997). Monuments in the period are often, therefore, discussed in terms of structuring patterns of mobile settlement and the relationship with monuments is unlikely to have been mutually exclusive (Fleming 1971; Field 1998; Brück 1999; Johnston 2008, 274; Bradley 2014, 106).
- 11.3.7 The limited evidence for settlement sites and substantial settlement architecture should also be viewed within the context of the evidence for agriculture which may indicate that monuments were set within agricultural landscapes cleared of woodland, albeit with significant potential for regional and local variation. At Runnymede, Surrey, evidence for cereals and stock rearing indicates a mixed agricultural economy in the Neolithic in the vicinity of the Thames (MOLA 2000). Pits with charred cereal and Middle Neolithic Peterborough Ware have been recorded on the Thames gravel terraces (*ibid.*). In a study of the chalk downlands of southern England it has been suggested that Beaker occupation in the Late

Neolithic had been preceded by earlier woodland clearance, producing early phases of colluviation (Allen 2005). Further tillage and the production of further colluvial soils ultimately sealed phases of occupation within the dry valleys.

- 11.3.8 In eastern England, there is evidence for open landscapes by the Early Bronze Age (Brown and Murphy 1997). Evidence for woodland clearance in the Late Neolithic from c.3,000 BC has been identified from sites in the East Midlands, including Raunds, Northamptonshire (Monckton 2006). Evidence for cereal cultivation from the Late Neolithic and Early Bronze Age has been recorded in the East Midlands counties of Leicestershire, Nottinghamshire and Derbyshire (*ibid.*).
- 11.3.9 In the West Midlands, evidence for woodland clearance and the presence of cereals has been recorded in the west of the region for the Late Neolithic and Early Bronze Age, together with the development of open grassland landscapes (Grieg 2007). Evidence from the River Tame in Birmingham appears to confirm this, with dense woodland identified in pollen data for c.2,800 BC in the Late Neolithic, through to increasingly open grassland, possibly in the Bronze Age (Tetlow *et al.* 2008). It has been suggested that the major river valleys such as the Trent, did not witness large-scale clearance until the mid-second millennium BC (Garwood 2011).
- 11.3.10 Much of the evidence for Late Neolithic and Early Bronze Age activity within Greater London appears to have been recorded from the gravel terraces of the Thames, with evidence for ritual and ceremonial monuments (Lewis 2002; Brown and Cotton 2000). Evidence for the deposition of artefacts has been recorded from the River Thames (Lewis 2002; Brown and Cotton 2000). Much less evidence for the Late Neolithic and Early Bronze Age has been recorded from the north London clay areas, perhaps as a result of limited visibility of the evidence, although a genuine absence of activity in the past cannot be discounted (Lewis 2002; Brown and Cotton 2000; Nixon *et al.* 2002).
- 11.3.11 In the East Midlands, including Northamptonshire, it is notable that a preference for boulder clay geologies and south-facing slopes has been highlighted within the distribution of lithics from field survey (Clay 2006). Sequences of activity at monuments have been identified, as has the reuse of existing Earlier Neolithic monuments (*ibid.*).
- 11.3.12 For the West Midlands, most evidence for the Late Neolithic is recorded around the fringes of the region and artefact densities are also low within the central part of the West Midlands (Garwood 2011). There is a notable absence of Late Neolithic monuments such as timber circles and henges, and those monuments identified appear to focus upon the Avon Valley in Warwickshire and the Trent-Tame confluence in Staffordshire (*ibid.*). A similar picture exists for the Early Bronze Age. While many round barrows and ring ditches have been recorded in the West Midlands, there appear to be concentrations of activity and clusters of monuments on the Warwickshire Avon and in Staffordshire at the Trent-Tame confluence and at Wolvey, north-east Warwickshire, above the River Anker (*ibid.*). As with other regions settlement evidence is insubstantial, suggesting mobile communities, and where lithic artefact assemblages from ploughsoil contexts are identified they are not closely datable (*ibid.*).

The known resource within the study area

- 11.3.13 There is very little evidence for this period from the southernmost sections of the route. Artefact finds include a Late Neolithic axe from University College Hospital (EUS009),

although there is nothing to suggest any sustained settlement activity. This limited evidence has been explained by the suggestion of a preference for gravel terraces rather than the London clays, although arguably the lack of evidence may be a product of differential levels of preservation between modern urban, suburban and rural zones. Bronze Age cremations are recorded from near Cophthall Covert and there may be potential for further associated archaeology at this location within the scheme boundary (RUI021).

- 11.3.14 Neolithic or Bronze Age flint scatters have been recorded further north within the Colne Valley, and Bronze Age cremations have been recorded on the edge of the Colne Valley, with further potential for remains within the scheme boundary (RUI021). There is, however, a lack of funerary monuments within the southern sections of the route. There are examples of ring ditches having been recorded and potential Neolithic and Bronze Age burial monuments within the Colne Valley, but a lack of monuments within the central Chilterns, the Chiltern dip-slope and the Misbourne Valley (Bradley 2014, 89).
- 11.3.15 This is despite more widespread evidence for the presence of flintwork in the landscape that may date to the Late Neolithic and Early Bronze Age. Flintwork has been recovered during fieldwalking in a number of locations in the central Chilterns (CC024; CC034; CC035; CC064), Dunsmore, Wendover and Halton (DWH076) and Stoke Mandeville and Aylesbury (SMA027; SMA034). Farther north, flintwork has been recorded within Greatworth to Lower Boddington, including within the scheme boundary (GLB051; GLB105). It is worth stressing, however, that there is limited chronological and spatial distinctiveness within many ploughsoil flintwork assemblages, even where large quantities are recovered (Richards 1990, 18-19; Bradley 2014, 104). The clay-with-flints geology has been highlighted as a significant source of raw material and a focus of settlement in the period (Bradley 2014, 100). It is notable, therefore, that this geology is present within the Chiltern dip-slope and the Misbourne Valley (across CFAs 8-10).
- 11.3.16 The evidence for the presence of Late Neolithic and Early Bronze Age funerary monuments is intermittent across the route. Farther north a number of potential Bronze Age barrows have been suggested in the Waddesdon and Quinton area (CFA12), although there appears to be doubt about the antiquity of a number of these sites. Alternative interpretations as mill mounds have been suggested and only one with an uncertain attribution has been recorded within the scheme boundary (WAD003). This uncertainty of attribution continues northwards into the Calvert, Steeple Claydon, Twyford and Chetwode area, although possible ring ditches have been recorded north of Chetwode. Possible round barrows have been recorded within Newton Purcell to Brackley, although the comparative rarity of funerary monuments in northern Buckinghamshire and the western part of Northamptonshire has been highlighted. A single possible ring ditch has been identified within the scheme boundary in the Newton Purcell to Brackley area (NPB014).
- 11.3.17 Within the Greatworth to Lower Boddington area, three possible ring ditches have been recorded within the scheme boundary (GLB144; GLB165; GLB213). A possible barrow or later mill mound is present at Lower Thorpe (GLB083) and geophysical survey has identified potential ring ditches at Blackgrounds Farm and Edgcote (GLB144). Undated 'cinerary urns' near Greatworth may indicate the further presence of Early Bronze Age funerary monuments. The presence of activity is bolstered by the presence of flintwork collected within the area as with regions farther south along the route

- 11.3.18 Evidence for the Late Neolithic and Early Bronze Age along the route of the scheme in Warwickshire is very limited. Stray finds are recorded and the evidence for funerary monuments within the Avon Valley, for instance, beyond the study area, have been emphasised (Garwood 2011). There is no recorded evidence within the study area along the tributaries of the River Avon such as the River Itchen, for example, and the relationship between settlement within the major river valleys and alternative landscape contexts appears little understood. Evidence from the Lower Itchen beyond the study area has been used as a precedent and river terrace and stream contexts are frequently suggested as providing 'typical' contexts for settlement in the period across the route, although little substantive evidence appears to have been recorded. Despite evidence from the Avon Valley at sites such as Church Lawford and Wasperton suggesting a regionally distinctive focus of activity, there may be some bias in the archaeological record for areas of modern extraction, excavation and development, allowing for further evidence within other landscape contexts.
- 11.3.19 Within the Balsall Common and Hampton-in-Arden study area, there is a suggestion of more varied Late Neolithic to Early Bronze Age activity with the identification of a concentric ring of posts along with flintwork and evidence of other activity at Meriden Quarry. The relationship between such activity foci and landscape topography may usefully be explored further.
- 11.3.20 There is limited evidence for Late Neolithic to Early Bronze Age activity in the vicinity of the River Tame in the Coleshill area, and its tributary the River Cole. Some residual flintwork has been recorded from excavations at Coleshill, which may at least suggest some occupation upon the ridge overlooking the valley and some possible ring ditches have been identified through aerial photography at Coleshill, outside the boundary of the scheme. A possible ring ditch was recorded north of the Tame, from aerial photography in the Curdworth to Middleton area (CWMoo6). Flintwork has also been recorded within the Cole Valley at Hall Walk, Coleshill, suggesting the presence of at least intermittent settlement activity (Powell *et al.* 2008). There is, however, certainly nothing to suggest the presence of significant funerary or ceremonial foci such as that evident farther north beyond the study area at the Trent-Tame confluence in Staffordshire (Buteux and Chapman 2009). Industrial, suburban and transport infrastructure development may have removed any such evidence, although large areas of cultivated land within Coleshill Park have not provided evidence for substantial activity within this period, despite geophysical survey and aerial photographic assessment.
- 11.3.21 Possible Bronze Age ring ditches have been suggested north of the Tame within Curdworth to Middleton and a possible Neolithic axe from the vicinity of the Gallows Brook may add weight to the interpretation that small watercourses were a focus for activity in this period. The deposition of such objects is also open to interpretation in terms of their potential relationship with settlement or other more sustained or frequent activities (Bradley 1990).
- 11.3.22 There is very little direct evidence for activity within the Birmingham urban and suburban areas, except the occasional stray Bronze Age axe find. Palaeo-environmental evidence from the River Tame in Birmingham has, however, been recorded suggesting dense woodland cover in the Late Neolithic (Tetlow *et al.* 2008). There is in fact limited palaeo-environmental evidence along the route for this period and a lack of evidence has been highlighted within the West Midlands (Garwood 2011). River valleys such as the Tame may, therefore, have the potential for further environmental reconstruction where suitable deposits can be identified.

- 11.3.23 There is notably increased evidence for the presence of cropmark ring ditches within the Whittington to Handsacre study area and potential associations with small watercourses (WHA324). The relationship between this apparent zone of activity and that of the well-documented Trent-Tame confluence farther north warrants further study as does the relationship between gravel terraces, tributary streams and contrasting topographic and geological zones.

Conclusions

- 11.3.24 There is a lack of evidence for late Neolithic and Early Bronze Age funerary monuments across the route and question marks over the dating of many known sites. Regions such as the Chilterns and Misbourne Valley appear to have greater potential for the presence of lithic artefacts, yet the apparent lack of monuments in these regions raises questions about the broader landscape context of this activity. It is possible that a lack of monuments is the result of bias in the archaeological record or the difficulty in identifying sites through, for example, aerial reconnaissance. A genuine lack of monuments across large areas of the route may, however, indicate an absence of settlement, intermittent settlement, or settlement mobility at larger scales.
- 11.3.25 The potential for large-scale movement of individuals has been demonstrated through scientific analysis of the Amesbury Archer, Wiltshire, but the frequency of movement in wider populations of this period and its influence upon cultural identity is not fully understood. Where other evidence for settlement exists, a genuine lack of monuments may also inform interpretations of cultural identity in the period and regional distinctiveness. Where monuments and other potential evidence for contemporary settlement exist, such as lithic scatters, understanding the relationship between areas of activity may provide useful contributions to debates upon the location of settlement in the landscape and the extent and form of settlement mobility. There is limited evidence for settlement nationally and it is important, therefore, to provide a fuller understanding of patterns of activity drawing upon evidence for artefact scatters, palaeo-environmental data and the location and distribution of funerary and ceremonial monuments, if a fuller understanding of the landscape in this period is to be achieved.

11.4 Middle and Late Bronze Age (c.1,500-800 BC)

Settlement and land division

- 11.4.1 The Middle and Late Bronze Age marks a period in which land division, settlement enclosure and nucleated settlement can be recognised in regions of southern England, in the Thames Valley, East Anglia, Wessex and the Sussex Downs, for example (e.g. Drewett 1982; Barrett *et al.* 1991; Yates 2007; Cunliffe 2004; Pryor 1996). Evidence for land division and settlement has been recorded from the gravel terraces of the River Thames in Greater London from the Middle and Late Bronze Age, although as with the Early Bronze Age evidence there is limited evidence for activity upon the north London clays (Brown and Cotton 2000). It is notable that waterlogged trackways and jetties have been recorded within floodplain environments on the River Thames (*ibid.*).
- 11.4.2 North of a line from the Bristol Channel to the Wash, there is generally less evidence for enclosure and settlement (Yates 2007). Examples of extensive settlement have, however,

been recorded in the West Midlands, such as that at Kemerton, Worcestershire (Jackson and Napthan 1998). Pit alignments have been recognised which date to the Late Bronze Age and may mark the earliest large-scale land division in Staffordshire (Coates 2002). Elsewhere, evidence of substantial linear boundaries has been recorded in south Worcestershire and Warwickshire, as well as the upland areas of Shropshire (Hurst 2011). In the East Midlands evidence for Middle to Late Bronze Age settlement has been recorded at Stanwick (Clay 2006). It is possible, therefore, that communities beyond the south and east of England were also defining landscapes through enclosure and defining settlement sites in this period.

- 11.4.3 Burnt mounds are recognised in a number of regions, notably the West Midlands. The sites – frequently dating from the Middle and Late Bronze Age, with earlier examples – are often recorded adjacent to small streams. They are, however, notable for their lack of artefact associations and their position within broader patterns of settlement is not well understood.

Funerary evidence

- 11.4.4 The funerary evidence from the Middle Bronze Age is characterised by the development of Deverel-Rimbury ceramics and urned cremations. The lower Thames in Greater London has recorded Deverel-Rimbury ceramics, forming a regionally distinctive group, alongside examples of cremation cemeteries (Brown and Cotton 2000) with some examples of Middle Bronze Age barrows recorded in south Buckinghamshire (Lambrick 2014) and with some limited evidence from the West Midlands, for example, flat cemeteries at Bromfield, Shropshire and Ryton-on-Dunsmore, Warwickshire (Hurst 2011). For the Late Bronze Age evidence of burial is limited, with human remains forming part of votive deposition into the Thames, along with metalwork (Lambrick 2014; Bradley 1990; Brown and Cotton 2000) and occasional examples of burials within settlement contexts (Lambrick 2014). Some unusual and notable sites include Late Bronze Age/Early Iron Age shrine-like structures, such as that recorded at Aston Clinton bypass, Buckinghamshire (*ibid.*).
- 11.4.5 Greater quantities of metalwork are recorded for the Middle and Late Bronze Age, often recorded as isolated stray finds or as hoards of groups of two or more artefacts. The findspots have been infrequently investigated and there is a lack of context for the majority. Metalwork has been shown to mark the boundary between field systems and wetlands in East Anglia (Bradley 2007, 214-215). It has been suggested that certain metal artefact assemblages may be more indicative of settlement, for example, than others – such as Late Bronze Age personal items and small tools (Northover 2006, 57). Late Bronze Age hoards have also been recorded within settlement contexts such as at Petters Sports Field, Egham, Surrey (O’Connell 1986). Large midden deposits at locations in Wiltshire, such as Potterne, for example, also include metalwork deposits, as do a waterside settlement and middens at Runnymede Bridge and Wallingford on the Thames (Needham 2000; Cromarty *et al.* 2006). Large middens are infrequently encountered beyond Wiltshire and the Thames Valley, but examples have been found as far north as the site at Whitchurch, Warwickshire (Waddington and Sharples 2011). Examples of middens have also been suggested within settlement enclosures, such as at Ivinghoe Beacon, Buckinghamshire (Lambrick 2014, 133), although the context of such activity may differ from riverside sites or those within more open landscapes.
- 11.4.6 Metalwork was frequently deposited into wet places, rivers and distinctive natural landscape contexts as isolated votive or ritual consumption events that may have been separated from

settlement locales (Bradley 1990). While such finds may indicate varying intensities of settlement at a regional level along with patterns of exchange and consumption, they do not necessarily reflect the locations of sustained occupation. Significant deposits of metalwork, particularly weapons, have been recorded from the Thames (*ibid.*), seemingly increasing in frequency during the Middle and Late Bronze Age (Brown and Cotton 2000).

- 11.4.7 Limited palaeo-environmental evidence from insect remains has indicated the clearance of tree cover in gravel terrace contexts by the Late Bronze Age (Hurst 2011) and palaeo-environmental evidence from alluvial contexts at the River Tame in Birmingham has indicated increasing woodland clearance in the Bronze Age (Tetlow *et al.* 2008). It has been noted that burnt mounds may be a potential source of palaeo-environmental data for the period (Hurst 2011).

The study area – Middle to Late Bronze Age (c.1,500-800 BC)

- 11.4.8 There is no evidence from the suburban London sections of the route (CFA1-5) for activity in this period. It has been suggested that there was a preference for the Thames gravels for settlement activity rather than the areas of London clays (Brown and Cotton 2000). It may, however, be a question of identification and preservation within the clay areas, allowing bias in the data and it has been highlighted that other clay regions in southern England have produced evidence of Bronze Age activity (*ibid.* 93). A palstave or socketed axe from Harefield within the South Ruislip to Ickenham study area indicates some activity in north London in this period.
- 11.4.9 Undated cropmark sites in the Colne Valley may date from the Late Bronze Age, where examples have been recorded, although in common with other comparable cropmarks, these are generally attributed a late prehistoric or Romano-British date (CVA080; CVA087; Lambrick 2014). Potential examples have been recorded within the scheme boundary (CVA080). Possible burnt mounds have been recorded in the Misbourne Valley (CHA030) and notably infrequent metalwork finds have been recorded from Dunsmore, Wendover and Halton and farther north in Waddesdon to Quainton.
- 11.4.10 The linear earthwork, Grim's Ditch, recorded within the Dunsmore, Wendover and Halton study area may also date to the Late Bronze Age. A section of the earthwork is present within the scheme boundary (DWH008). The earthwork forms a boundary up to 27km in length across the Chilterns, with limited dating evidence for the Iron Age (Lambrick 2014). Grim's Ditch has been discussed within the context of cross ridge dykes, with several of these shorter linear earthworks having been recorded on the Chilterns. The dating and function of cross ridge dykes are, however, ambiguous. Grim's Ditch can, nevertheless, be seen as a component of the landscape that served to structure movement and define territories in the region (*cf.* Lambrick 2014).
- 11.4.11 More extensive Late Bronze Age land divisions have been recorded in the Aylesbury area. Possible later prehistoric settlement sites in the Stoke Mandeville and Aylesbury study area may belong to the Late Bronze Age (SMA004; SMA034; SMA089). It is notable that Aylesbury has been highlighted as an area where extensive recent development may have created a bias in the archaeological record (Lambrick 2014). A number of possible late prehistoric enclosures have been recorded within the scheme boundary at Stoke Mandeville and Aylesbury (SMA004; SMA089) and Greatworth to Lower Boddington (GLB105; GLB007; GLB061;

GLB202; GLB208; GLB211), although these potentially belong to the Iron Age or Romano-British periods. The only datable evidence is from the finds of two Late Bronze Age bracelets from Waddesdon to Quainton (WADo15), although their archaeological context, as with many metalwork finds of this period, is uncertain. Middle and Late Bronze Age artefacts have been recorded from an area of cropmarks at Park Spinney, Greatworth but their relationship with the cropmarks is unknown.

- 11.4.12 Moving into the West Midlands, there is very little evidence for Middle and Late Bronze Age activity from Ladbroke to Southam and northwards to Coleshill Junction. There may be some potential for a Late Bronze Age component at the settlement and enclosures identified through geophysical survey at Offchurch to Cubbington (OFCo59) and similarly at Greatworth to Lower Boddington (GLB 235; GLB236; GLB237; GLB238), though these may be more likely to date from the Late Iron Age and Romano-British periods. At Greatworth to Lower Boddington, five cropmark enclosures have been identified within the scheme boundary which have been attributed a late prehistoric to Romano-British date, and again there may be some potential for these to date from the Late Bronze Age (GLB007; GLB061; GLB202; GLB208; GLB211).
- 11.4.13 Within the Birmingham study areas, it is notable that a burnt mound has been recorded at Park Hall, south of the Tame within the scheme boundary (CBB032). Several burnt mounds have been recorded within the wider area within Birmingham (Hodder 2004), and it may be notable that a number of these are associated with tributaries of the River Cole. Farther north, possible burnt mounds have been removed in the vicinity of Middleton Hall. Burnt mounds were also recorded as part of the M6 toll road scheme in the broader region.
- 11.4.14 To the north of Middleton Hall, beyond the scheme boundary, a cropmark field system and enclosures have been suggested to be of Late Bronze Age or Iron Age date (CWMo44), although the date of the field system may have been influenced by the presence of metalwork and possible burnt mounds in the area, which may be unrelated. Further potential Late Bronze Age or Iron Age land division has been suggested east of Middleton House Farm (CWMo34).
- 11.4.15 Farther north in the broader study area, Middle Bronze Age cremations have been excavated at Hints Quarry, Staffordshire and pit alignments have also been recorded in the vicinity, including within the scheme boundary (DHW127; DHW141). Pit alignments with Late Bronze Age dating evidence have been recorded outside the study area to the north-east upon the Trent gravels at Whitemoor Haye (Coates 2002). Dating evidence from pit alignments in Britain is, however, scarce and both the function and date of pit alignments are ambiguous. In Whittington to Handsacre, linear ditches in the vicinity of earlier ring ditches, partly within the scheme boundary, have the potential to date from the Late Bronze Age (WHA324).

Conclusions

- 11.4.16 Despite the evidence for enclosed settlement and landscapes in the Middle and Late Bronze Age of southern England, there is limited evidence within the study area for both settlement and funerary remains of the period. There are a number of undated cropmark field systems, or those identified through geophysical survey, in the broad study area across the route dated generally to the late prehistoric or Romano-British period and these may have potential for Late Bronze Age origins. The presence of pit alignments towards the northern part of the

route in Staffordshire may indicate early systems of land division. Similarly, there is potential for Grim's Ditch to have Late Bronze Age origins. How the earthwork fits into a wider contemporary pattern of land division and settlement, or how it relates to an earlier existing framework of occupation is, however, uncertain. It is clear, therefore, that existing narratives of mobile settlement patterns of the Neolithic and Early Bronze Age moving into fixed and enclosed patterns of occupation in the Middle and Late Bronze Age can be tested along the route and any regional variation drawn out.

11.5 Late Bronze Age and Iron Age (c.1,100 BC-AD 43)

11.5.1 The first millennium BC broadly encompasses the transition from the Late Bronze Age (c.1,100-700 BC) through to the Early (c.700-400 BC), Middle (c.400-100 BC) and Late (100 BC-AD 43) phases of the Iron Age. The entirety of this period exhibits a degree of continuity in certain regards, although this necessarily simplistic view masks a series of regional and sub-regional variations and marked changes in social organisation, beliefs, settlement patterns, economic practices and subsistence.

Settlement: continuity and change

- 11.5.2 Continuing a trend which began in the Middle Bronze Age (c.1,500-1,100 BC), traces of permanent settlement and the associated evidence for agricultural practices and land division become progressively more visible in the archaeological record during the first millennium BC. However, settlements populated during the late second millennium and early stages of the first millennium BC continue to be difficult to identify. As a result, Late Bronze Age and Early Iron Age settlements are notably less well represented in many regions than later centres of occupation.
- 11.5.3 These early sites are typically less substantial than those associated with the Middle and Late Iron Age, and frequently lack the enclosing ditches that enable later sites to be more easily detected by remote sensing techniques (Knight *et al.* 2012; Hurst 2011). Such sites are typically small in scale, usually consisting of one or more roundhouses, characteristically represented by circular gullies with internal postholes and associated features such as enclosures, field systems and trackways.
- 11.5.4 Further complicating efforts to distinguish earlier sites, many settlements may have been continuously occupied into the Late Iron Age and Romano-British periods, thus obscuring traces of earlier phases of development.
- 11.5.5 Many settlement sites which may be broadly attributed to the first millennium BC have been identified by non-intrusive techniques such as geophysical survey, LiDAR analysis or the assessment of aerial photographs, including a large number identified during the various stages of the National Mapping Programme, coordinated by Historic England (formerly English Heritage). However, it is often difficult to ascribe these sites to specific periods due to the paucity of diagnostic indicators that can be used to distinguish them. As a result, it is often seen that there is a propensity to ascribe such sites to the Later Iron Age and Romano-British periods, whereas at least some may have earlier origins.
- 11.5.6 Even where excavation takes place, the lack of chronological resolution frequently makes it difficult to differentiate between Late Bronze Age and Early Iron Age settlement activity, as

the character of these sites is often not markedly different, and pottery typologies during this transitional period require further refinement. The shift from bronze to iron is less decisive as a chronological marker than might be expected, as the transition in use from one technology to another was a prolonged one. Moreover, metalwork is relatively uncommon on many excavated sites, with the majority of finds located elsewhere associated with hoards, structured deposits in watercourses, or recovered via metal detecting.

Late Iron Age settlement

- 11.5.7 By the Late Iron Age, traces of settlement activity become considerably more substantial and widespread, joining other strands of evidence to indicate that the first millennium was a period of marked population growth and increasing social complexity.
- 11.5.8 Although scattered enclosed and unenclosed farmsteads continued to populate the landscape, evidence for centralisation becomes more apparent in many regions throughout the Iron Age, with the appearance of larger aggregated settlements. The culmination of this process, at least in south-eastern England, sees the development of the proto-urban tribal centres, or oppida, of the Late Iron Age such as at St. Albans, or *Verulamium*, in Hertfordshire.
- 11.5.9 Among the clearest evidence of centralisation are the hillforts that emerge and develop in many areas to form the most characteristic and prominent features of the Iron Age landscape. Many hillforts appear to have developed out of Late Bronze Age precursors. In some instances, hillforts may coincide with the locations of Early Neolithic causewayed enclosures, suggesting that these sites were occasionally the focus of activity over prolonged periods, although not necessarily continuously. Though ostensibly forming the focal points of Iron Age societies, the precise function of these large 'defensive' enclosures remains the subject of much debate, and it appears that there may have been considerable diversity in this regard.

Land division

- 11.5.10 Larger-scale land division began to occur during the Bronze Age, and by the time of the Late Iron Age extensive field systems, often co-axial or rectilinear in plan, were laid out across large swathes of the landscape. The steady increase in population throughout the Iron Age appears to have seen some areas of marginal land being gradually pressed into cultivation. Occasionally, evidence for subsequent reorganisations of the landscape is revealed, with later field systems superimposed over earlier ones. In other areas, large-scale land division appears to be less widespread but this may not necessarily indicate an absence of occupation, but may instead signal that arable cultivation was eschewed in favour of animal rearing.
- 11.5.11 As with settlement sites, establishing the date and relative chronologies of the field systems, and associated enclosures and trackways commonly identified by remote sensing techniques, is problematic on the basis of morphology alone.
- 11.5.12 Larger-scale societal divisions may well have been present, but are not clear-cut until the introduction of tribal coinages in the late 1st century BC. Other indications of distinct cultural identities are evinced by the construction of long-distance linear boundaries, formed by pit alignments and single or multiple parallel ditches, which become one of the characteristic features of the first millennium in southern Britain. This phenomenon is frequently interpreted as the manifestation of increased territoriality and the forging of political and economic divisions. Linear boundaries have traditionally received less attention than settlement sites,

and as a result many are not closely dated. However, some appear to have been established in the Late Bronze Age, suggesting that some social divisions were already well entrenched early in the first millennium. There are indications that some linear boundaries were maintained and elaborated over prolonged periods, which may imply that cultural distinctions and territories were similarly enduring.

Funerary and ritual practice

- 11.5.13 The construction of the funerary and ceremonial monuments, which became a hallmark of the preceding Neolithic and Early Bronze Age, had largely ceased by the start of the first millennium BC, although there are occasional indications that these enigmatic sites continued to influence communities in later periods (Lambrick 2014).
- 11.5.14 While settlement activity becomes relatively widespread and more apparent throughout the first millennium BC, evidence for funerary practice is typically poorly represented throughout this period. Cremation burial seems to have continued to be practised in the Late Bronze Age and during the Early Iron Age, making a reappearance in the Late Iron Age. Inhumations of Iron Age date are occasionally uncovered, although these are commonly isolated and unadorned, suggesting that some burials of this period may go unrecognised where scientific dating methods are not employed (Haselgrove *et al.* 2001). However, inhumation burials are sometimes richly furnished with grave goods, particularly in certain regions during the Late Iron Age. It is often surmised that the relative paucity of recognisable funerary contexts in the Iron Age may be a result of burial practices that are less liable to leave an archaeological signature becoming prevalent, such as excarnation or cremation and scattering of ashes. Nevertheless, it is clear that the first millennium saw marked changes and considerable variation in burial practices, both regionally and temporally, which may in some instances be correlated with evidence of external influences.
- 11.5.15 Iron Age 'shrines' comprise tangible evidence of ritual activity during this period. Such sites are normally associated with the hillforts and large settlements forming the various focal points of Iron Age communities. However, shrines are rare and can be difficult to identify, particularly where they are obscured by later phases of activity. Evidence of ritualised behaviour is more frequently encountered in the form of structured deposition, which may include 'votive' offerings in bodies of water, the burial of hoards, and the interment of human and animal remains in circumstances that do not appear to relate primarily or prosaically to the disposal of the dead.

Increasing social complexity

- 11.5.16 Escalating social stratification and complexity throughout the first millennium BC is attested to in various forms, for example, in patterns in the production, distribution and consumption of material culture and, albeit sporadically, in funerary practices. There are widespread indications that long-distance contact, trade and exchange, including extensive links with continental Europe, continued to develop during this period. Increases in the size and complex organisation of occupation sites provide suggestions of developing hierarchies in settlement morphology, which are frequently seen as a reflection of wider social change. The emergence of 'elites' is also often inferred as a contingent factor in the undertaking of large-scale communal efforts involved in the construction of hillforts and large linear boundaries.

11.5.17 Arguably more so than in any preceding period, patterns of regional and sub-regional variation become a major theme in the first millennium BC. This diversity is apparent in many regards, including settlement size, form and distribution, evidence for social complexity, distribution of distinctive feature types such as burnt mounds, funerary practices, land use patterns, material culture and in relative chronologies.

11.5.18 To some extent, it is likely that that the patterning which is apparent in the archaeological record is genuinely reflective of trends in Iron Age and Late Bronze Age society. Despite this, it is clear that artificial biases are imposed, for example, by the uneven distribution of development-led investigations in recent times and by historical emphasis on research in certain geographical areas and different aspects of the period.

Regional patterns

11.5.19 Geographically, the south-east of England and the Wessex region have tended to dominate the interpretation of Iron Age societies, although it is clear that models developed for these areas may not be directly applicable in other regions.

11.5.20 Hillforts and nucleated settlements have traditionally been the focus of much investigation, and while many questions regarding these important sites remain unanswered, it is now widely recognised that they formed only part of an extensively exploited and connected landscape. As a result, there is now more emphasis on understanding the wider landscape setting of such sites. This in turn is revealing evidence for social and economic activities which had previously been poorly understood, including temporary or seasonally occupied sites, the development of field systems, funerary practices, industrial/manufacturing/processing/extraction sites, and 'open' or unenclosed settlements.

11.5.21 The Thames Valley, in particular, has been intensively studied, partly as a result of significant mineral extraction and development pressure, but also because this region exhibits widespread evidence of prolific activity during the first millennium. In contrast, the West Midlands has received less attention, although archaeological remains attributable to the first millennium BC are far from absent, and settlement and enclosure were recorded as part of the M6 toll scheme, including both enclosed and unenclosed examples (Powell *et al.* 2008). Consequently, there are many aspects that remain poorly understood, not least the nature of intra-regional variety in this considerably diverse landscape (Hurst 2011). Generally, the East Midlands appears to be rich in archaeological sites dating to the first millennium BC, though again, levels of investigation have been comparatively low (Willis 2006).

Evidence along the route

11.5.22 A number of hillforts, such as that on Horsenden Hill (NOR007) in the London Borough of Ealing, Arbury Banks (GLB152) west of Chipping Warden, and to the east of Wendover on Boddington Hill (DWH122), are located close to the route of Phase One of HS2. It can be expected that traces of late prehistoric activity focused on these sites may be encountered in the surrounding landscape.

11.5.23 Among the most prominent and significant late prehistoric features along the route of Phase One of HS2 is the scheduled linear boundary known as Grim's Ditch. Excavations along the length of Grim's Ditch, outside the extents of the Phase One of HS2 land take, have recovered small assemblages of pottery, indicating that it was in existence during the Iron Age, although

it may have a considerably earlier origin. There are numerous surviving sections of the linear earthworks aligned along the Chiltern Hills between Bradenham and Berkhamsted, spanning a total distance of 18km. The route of Phase One of HS2 will traverse a 350m-long section of Grim's Ditch (DWH008), which extends north-east from Cottage Farm, north of Great Missenden.

- 11.5.24 It is conceivable that as-yet unrecognised traces of late prehistoric activity may be concealed within various areas of woodland that will be traversed by Phase One of HS2. For example, there are hints that the existing woodland of the Chilterns contains extensive landscape scale features and boundaries, as suggested during work on the Ashridge Estate in Hertfordshire.
- 11.5.25 The area at the foot of the Chilterns and on the Gault Formation/Greensand Formation in the Aylesbury Vale has been identified as an intensively occupied zone from the prehistoric period onwards. This includes the widespread evidence for Middle Bronze Age through to Late Iron Age settlement and agricultural systems that has come to light in the Aylesbury area, partially as a result of intensive modern development in this region. Notable areas of late prehistoric activity have been identified around Aylesbury to the north of Phase One of HS2 at Aston Clinton, Bierton and Weedon Hill. Within Aylesbury itself, the site of a valley fort (a hillfort in a lowland location) (SMA048), which may have represented the focus of an Iron Age territory, has been identified.
- 11.5.26 Evidence recovered during various archaeological investigations indicates the presence of extensive areas of later prehistoric settlement and agricultural systems extending to the south of Aylesbury. This includes excavated evidence from sites on the periphery of Phase One of HS2 at Ellen Road (SMA055), Coldharbour Farm (SMA058), south of Stoke Mandeville Hospital (SMA027) and at Walton Court (SMA035).
- 11.5.27 Finds of Bronze Age through to Iron Age date have also been recovered during fieldwalking within the route of Phase One of HS2 farther south of Aylesbury, between Walton Court and Bishopstone (SMA034). Geophysical survey in this area has revealed the presence of linear features and enclosures occupying a spur of slightly higher ground between two watercourses, suggesting the existence of a possible late prehistoric/Romano-British settlement site. Late Iron Age and Romano-British finds and cremation burials were reportedly uncovered during early 20th century clay extraction nearby at Locke's Pit (SMA042), providing further indications that this area was a focus of activity. However, any such remains may have been destroyed within the extent of the former quarry.
- 11.5.28 Farther to the south-east, geophysical surveys have identified a possible late prehistoric/Romano-British ladder-type settlement with offset square enclosure, on the edge of the route of Phase One of HS2, just to the east of the demolished church of St. Mary, south of Stoke Mandeville (SMA004).
- 11.5.29 To the north-west of Aylesbury lies the site of a Romano-British town south of Fleet Marston (SMA074). As with other known Romano-British settlements along the route of Phase One of HS2 (see following section), there may be an elevated potential for traces of earlier phases of occupation to be encountered in the vicinity of Fleet Marston. Geophysical surveys in this area have clearly demonstrated the existence of a series of rectilinear enclosures flanking the line of the Roman road known as Akeman Street. Although these enclosures are likely to relate to the Romano-British settlement, there are suggestions of earlier activity. Fieldwalking in this

area has produced a small assemblage of Early to Middle Iron Age pottery, while geophysical surveys have identified two curvilinear enclosures just to the south of the A41 at Fleet Marston Cottages which may relate to later prehistoric activity.

- 11.5.30 Various undated cropmarks and earthworks, some of which may date to the first millennium BC have been identified at a number of locations in the vicinity of Phase One of HS2. These include a large D-shaped enclosure, encompassing an area of c.0.6 ha, which conforms to the contours of the top of a hill to the west of Culworth Grounds in Northamptonshire (GLB105). The enclosure may be associated with other cropmark features extending for at least a kilometre in a north-east direction along the same ridge top. Geophysical surveys in this area have provided a strong response clearly showing the enclosure with associated features, including secondary enclosures and boundaries lying in close proximity. The complexity of the features suggests that the site was occupied over a prolonged period. Flintwork recovered during fieldwalking in this area suggests that occupation on the site may have originated in the Bronze Age.
- 11.5.31 Geophysical surveys elsewhere along the route of Phase One of HS2 have revealed a series of anomalies indicative of enclosures, field systems, trackways and roundhouses, which are likely to derive from extensive late prehistoric and/or Romano-British settlements, near Leamington Spa in Warwickshire (OFC058; OFC059). The scale of activity suggested by the geophysical survey results appears to signal that these settlements may have been occupied for prolonged periods.
- 11.5.32 Excavations at Finmere Quarry (NPB019), north of Newton Purcell in Oxfordshire, have identified part of an Iron Age linear settlement comprising a number of roundhouses, with associated enclosures and pits, a possible Romano-British trackway and Early Bronze Age cremation burials (Hart *et al.* 2010). The site was located immediately adjacent to the route of Phase One of HS2, and it is possible that associated archaeological remains extend beyond the previously excavated area.
- 11.5.33 As in preceding periods, riverine locations appear to have been a focus of activity during the Late Bronze Age and Iron Age and deposition of metalwork into wet contexts has been regularly recorded (Bradley 1990). Accordingly, there may be an elevated potential for late prehistoric sites to be encountered where the route of Phase One of HS2 coincides with free draining and higher ground overlooking the valleys of rivers such as the Colne, Thame, Cole, Tame, Cherwell and other watercourses.
- 11.5.34 The results of prior work on the slopes overlooking the River Great Ouse along the line of the A43 north-east of Brackley, Oxfordshire, provide a case in point. These investigations have revealed evidence of significant Iron Age and Romano-British activity (NPB072; NPB073; NPB074), including the site of a probable Roman temple (NPB073) near Sundale and Illets Farm. Geophysical surveys in the area to the west of the A43 have identified features that appear to represent the continuation of these activity areas within the route of Phase One of HS2. Although these features may predominantly relate to Romano-British activity, traces of later prehistoric activity may also be encountered in this area, possibly including evidence of an Iron Age precursor to the Roman temple. Cropmark evidence also suggests that traces of late prehistoric to Romano-British activity may be considerably widespread across this area.

- 11.5.35 Another possible late prehistoric settlement site has been identified by a geophysical survey within the route of Phase One of HS2, on the northern side of the River Cherwell valley to the east of Edgcote, Northamptonshire (GLB144). There are suggestions that this area may have been a focus of activity for a prolonged period, as the site is adjacent to the scheduled monument of Edgcote Roman villa (GLB138), which lies outside the route of Phase One of HS2, while circular features which appear to be typical of Bronze Age ring ditches were also identified by the geophysical survey.
- 11.5.36 Key sites relating to these periods include the hinterland of the Iron Age hillforts which surround the scheme; the scheduled monument of Grim's Ditch and its potential Bronze Age origins; and potential Iron Age activity at Fleet Marston Romano-British town and its hinterland. Regional and intra-regional variation is also a key theme of these periods, particularly the Iron Age.

Conclusions

- 11.5.37 Phase One of HS2 presents the opportunity to generate a wealth of new information via the investigation of a range of late prehistoric sites. Some of these sites are located within regions typically less favoured for development or extraction and outside of areas that have traditionally been the focus of archaeological enquiry. It also raises the possibility of refining understanding of a variety of site types that are currently poorly characterised, such as those previously identified solely from cropmarks. Consequently, Phase One of HS2 offers the prospect of resolving numerous gaps in existing knowledge where various aspects of later prehistory are comparatively less well understood.
- 11.5.38 It may be possible to explore the origins of enclosure from the Late Bronze Age and into the Iron Age and the extent of continuity within populations in these periods. The potential also exists to define regional patterns of settlement. Through settlement, trade and exchange and funerary practice, both regional distinctiveness and increasing social complexity may be observed through the period.

11.6 Romano-British

Conquest and transition

- 11.6.1 The initial stages of the Roman conquest of Britain in AD 43 traditionally demarcate the conclusion of the Iron Age. However, the correlation of this historically documented event with what is, in some ways, a necessarily arbitrary distinction between two archaeological periods, obscures a considerably more complex and prolonged phase of transition.
- 11.6.2 Although cultural links and patterns of exchange had long existed between the later prehistoric societies of Britain and continental Europe, the expanding frontiers of Rome in the first century BC gradually brought Late Iron Age societies into closer contact with the empire. There is clear evidence in the archaeological record, particularly in the south and east of the country, that this exerted a profound influence on the development of Late Iron Age societies prior to the Conquest (Fulford 2014; Haselgrove *et al.* 2001; Perring and Brigham, 2000).
- 11.6.3 However, it is often difficult to ascertain a simple distinction in the archaeological record between the Late Iron Age and the Romano-British period. The evidence from settlement sites typically provides little clarity as to the nature or extent of any change precipitated

immediately after the Conquest, with continuity in occupation often being observed (Haselgrove *et al.* 2001). In other instances, Late Iron Age settlements appear to have been abandoned, while others underwent varying degrees of reorganisation, growth or contraction (Fulford 2014).

Transformation

- 11.6.4 Nevertheless, the period spanning the 1st century BC to the early 2nd century AD was one of dramatic change. There is substantial evidence for population growth in many areas, with increasing diversity and complexity in settlement morphology and changes in the density and distribution of occupation sites. Some settlements became large and significantly more complex, with the rise of major urban centres, smaller towns and markets, although small-scale settlements and scattered farmsteads continued to proliferate in many rural areas.
- 11.6.5 Among the most prominent changes evident in the archaeological record in the aftermath of the Conquest, aside from the appearance of military installations, is the establishment of a network of Roman roads. The development of the road network appears to have had a major impact on the landscape, leading to reorganisation of existing land divisions, the establishment of new settlements, the growth of existing centres and the abandonment of others.
- 11.6.6 Other fundamental shifts in society are evinced by changes in funerary practices, reorganisation of the landscape, the diversification and intensification of economic activities, technological advances and developments in agricultural practices. The period also sees significant changes in the forms and mode of production, consumption and distribution of material culture, which undoubtedly reflected underlying patterns in social organisation and complexity.
- 11.6.7 The transformative character of the Romano-British period was not confined to its early stages, and many of these aspects continued to evolve and change between the mid-2nd and early 5th centuries. One of the most significant developments in the later Romano-British period was the increasing prevalence of rural villa complexes from the mid-2nd century onward. This coincided with widespread reorganisations of the landscape and changes in the pattern of rural settlement. Although dispersed farmsteads and many rural settlements appear to have been continuously occupied throughout the early to late Romano-British periods, there is evidence of abandonment in some areas.
- 11.6.8 In general, and in comparison with earlier and later periods, sites become substantially more visible archaeologically during the Romano-British period, with the appearance of more extensive and tangible physical remains. This includes more substantial structural remains, distinctive site and feature types, and the introduction of new and more varied types of material culture, often recovered in large assemblages from settlement sites.

The end of Roman Britain

- 11.6.9 However, archaeological evidence that is closely attributable to the end of the Romano-British period, and particularly the post-Roman period, spanning the early 5th to 7th centuries, remains scarce. As a result, this important transitional phase remains poorly understood. In part, this is may be due to a lack of closely dated evidence from sites spanning the end of the Romano-British period. While the demise of recognisably Roman material culture appears to

occur rapidly at the end of the period, it is possible that this may conceal a greater degree of continuity in some areas than is otherwise indicated (Fulford 2014). The contrasting evidence for continuity of occupation in some areas and abandonment of others suggests that the actual nature of the transition may be complex and highly variable (Esmonde Cleary 2001).

Nature of the evidence

- 11.6.10 The intensity, rate and nature of change during the Romano-British period appears to have varied considerably, both regionally and intra-regionally, with these processes occurring gradually in some areas and rapidly and dramatically in others, while some locations appear to have remained little affected long after the Conquest. Disparities in levels of investigation both within and between regions have undoubtedly imposed artificial biases on the archaeological record, substantially complicating efforts to understand these variations.
- 11.6.11 Archaeological remains of Romano-British date are relatively abundant across the East Midlands, although the distribution of sites is variable. In some areas, sites of this period are materially rich and comparatively well studied, while in others the evidence is sparse and remains poorly understood (Taylor 2006). Evidence relating to many aspects of the Romano-British period is comparatively limited across the West Midlands, although this region has historically been the subject of considerably less investigation than many other parts of the country (Esmonde Cleary 2011).
- 11.6.12 By contrast, the south and east of England, particularly within the Thames corridor, have been the subject of extensive research. The comparative richness of the archaeological record within this part of the country may, however, genuinely reflect that these regions were intensively occupied during the Romano-British period.
- 11.6.13 Despite this, there is a relative paucity of substantial evidence for Romano-British activity recorded within the land required for the construction of Phase One of HS2 on the periphery of Roman London, or *Londinium* (e.g. CFA1-6). It is likely that the hinterland of *Londinium* was a managed landscape, rural in character but closely tied with the economic demands of the city. The scale and extent of modern development is doubtlessly responsible for obscuring or eradicating much of the evidence within Greater London, although the potential for as-yet unidentified Romano-British remains to survive within this area cannot be discounted.

Fleet Marston Roman town (Buckinghamshire)

- 11.6.14 Areas have been identified along the route of Phase One of HS2 that have a high potential for Romano-British remains. A key site in this regard is the probable small Roman town at Fleet Marston (SMA074), north-west of Aylesbury and south of the A41. The settlement, which occupies a low ridge overlooking the confluence of the River Thame and one of its tributaries, is located at the junction of a number of Roman roads (SMA075; SMA076; SMA079; SMA080; SMA081; SMA082; SMA083; SMA084). These include Akeman Street (SMA076), which may have been established to link St. Albans (*Verulamium*) with Cirencester (*Corinium*) shortly after the Conquest. It has also been suggested that a ford or crossing point may have existed on the River Thame, possibly in the vicinity of Putlowes.
- 11.6.15 Fieldwalking and metal detecting surveys have yielded numerous finds of Roman pottery, tile coins and other metal objects across an extensive area (approximately 100 ha), contained between the A41, Fleet Marston Farm and Putlowes Farm. Reports of the discovery of

masonry fragments suggest that structural remains of stone-built buildings may be present. The distribution of finds appears to indicate that the focus of the Fleet Marston settlement lies within the fields immediately to the north-west of Putlowes and along the route of Akeman Street.

- 11.6.16 Geophysical survey has clearly established the presence of several of the Roman roads and a number of square enclosures flanking Akeman Street as it leaves what appears to be the northern edge of the settlement. Another rectilinear enclosure with sub-divisions, which seems to overlap the line of Akeman Street slightly farther to the north-west, could relate to a later Roman building constructed over the road.
- 11.6.17 It is highly probable that the Fleet Marston settlement site contains extensive buried remains with the potential to provide important evidence relating to its construction, development and longevity, social, political, industrial, commercial and economic significance, domestic arrangements, agricultural practices, abandonment and overall landscape context.
- 11.6.18 Reports of the discovery of cremations, a lead sarcophagus and potentially the remains of a Romano-British temple close to Upper Cranwell Farm, near Fleet Marston but outside of the route of Phase One of HS2, have provided evidence of ritual and funerary activity in the local area. It is also possible that Roman cemeteries could be encountered alongside the Roman roads in the vicinity of the Fleet Marston settlement.

Edgcote villa/settlement (Northamptonshire)

- 11.6.19 Also of considerable note is the site of a scheduled Romano-British villa and/or settlement site at Edgcote (GLB138), on the northern valley side of the headwaters of the River Cherwell in Northamptonshire. The site was scheduled as a villa on the basis of investigations undertaken between the 1820s and 1840s, and other finds made in the immediate vicinity. A single Romano-British building, possibly a detached bath house, was identified in the 1840s close to the Cherwell, although structural remains have also been recorded farther to the north. Finds from the Edgcote area include a large number of Roman coins and pottery types spanning the entire Romano-British period. Several burials are also reported to have been found between 1826 and 1849. Iron Age pottery has also been found in the vicinity of Blackgrounds Farm, located to the north of the scheduled monument, suggesting earlier phases of occupation.
- 11.6.20 Although the scheduled monument lies outside of the route of Phase One of HS2, the Edgcote villa site appears to be associated with a roadside settlement or small town (GLB144), which coincides with the area required for construction. The settlement lies to the north and east of the scheduled villa, and appears to sit astride a putative prehistoric routeway and/or Roman road coinciding with the line of Welsh Lane (GLB115). The location of the settlement may lend weight to the possibility of a prehistoric or Romano-British river crossing at or near Trafford Bridge.
- 11.6.21 Geophysical survey undertaken between the scheduled monument of Edgcote villa and the crossing of the Cherwell at Trafford Bridge has identified a number of enclosures located either side of Welsh Lane, some appearing to contain roundhouses, and possible trackways extending down the slope. It is possible that the settlement may have originated during the Iron Age, although occupation of the site could also have been contemporary with the villa at Edgcote. The settlement at Edgcote/Blackgrounds therefore has the potential to contain

important archaeological evidence pertaining to the development of the adjacent scheduled villa, and the changing character of occupation of the site spanning the late prehistoric to Romano-British periods.

Ouse Valley (Northamptonshire)

- 11.6.22 Other areas of substantial archaeological interest include the valley of the River Great Ouse, where previous investigations have revealed widespread evidence of late prehistoric and Romano-British activity, including traces of settlement and associated field systems extending north along the A43 from Brackley, Northamptonshire. A number of undated burials (NPBo72) of possible prehistoric or Romano-British date were uncovered within or immediately adjacent to land required for the construction of HS2 during the construction of the A43 Brackley bypass. The full extent of the cemetery was not identified during the A43 improvement work and associated remains probably survive outside of the road construction corridor.
- 11.6.23 Among the most significant known archaeological sites in this area is that of a probable Roman temple complex (NPBo73), the eastern periphery of which was also partially excavated during the construction of the A43 bypass. Geophysical survey within the area required for construction of Phase One of HS2 has clearly revealed a series of features that appear to correspond with the unexcavated remainder of the temple, in addition to various outlying features, surviving beyond the A43 construction corridor between the service station and Illets Farm. These exhibit the characteristic form of a Roman temple complex, with a central building and a surrounding square enclosure, representing a sacred precinct or *temenos*.
- 11.6.24 The presence of the probable temple complex within the area required for construction presents a rare opportunity to investigate an unusual, enigmatic and little excavated class of Romano-British site. It has been stated that, within the East Midlands: *'It is already clear that the few well understood Roman shrines and other religious sites in the region were often founded on, or very near to, Iron Age predecessors.'* (Taylor 2006) Accordingly, the site has the potential to contain important evidence relating to ritual practices spanning the transition from the Late Iron Age to Romano-British period.

Glasshouse Wood villa/settlement (Warwickshire)

- 11.6.25 The route of Phase One of HS2 also passes near the site of a scheduled Romano-British settlement and/or villa at Glasshouse Wood (STNo34), on the edge of Kenilworth, Warwickshire. The site at Glasshouse Wood was first identified in 1971 during limited excavation undertaken before the construction of the Kenilworth bypass road, which cuts through the site from north to south. An associated and contemporary settlement site has also been previously identified to the north of the scheduled monument at Crewe Farm (STNo31) and within the land required for construction, suggesting that further remains may be encountered in this area.

Other key sites

- 11.6.26 In addition to those mentioned above, the route of Phase One of HS2 traverses, or passes in proximity to the projected routes of several other Roman roads. These include the line of Watling Street (PRMo58), which corresponds approximately with Kilburn High Street, the Fosse Way (OFCo12) east of Leamington Spa, the Upper and Lower Icknield Way (DWH119;

DWH129) near Wendover, and several others (e.g. CAM072; CHA006; CHA054; SMA098; NPBoo6; WHA328).

- 11.6.27 As well as the physical remains of the roads themselves, evidence for contemporary roadside settlement, commercial and industrial activity, funerary contexts, field systems and other forms of activity may be encountered in association with them. Roman roads frequently persisted in use for long periods and, as such, archaeological features relating to later phases of activity may also be encountered in their vicinity, while some, such as the Icknield Way, are suggested to have originated in prehistory. However, the veracity of the postulated routes of the Roman roads is questionable in some cases.
- 11.6.28 A large quantity of Roman tile, pottery and slag recovered during fieldwalking near Coneycroft Farm and Wellwick Farm, south-west of Wendover, has been suggested to indicate the site of a Romano-British building, possibly a villa (DWH111), within or close to the area required for construction. A cremation burial has also been excavated in this area following its discovery by metal detectorists, suggesting that further evidence of funerary activity may be encountered.
- 11.6.29 The Colne Valley is also considered to have a high potential for the presence of Romano-British remains, as suggested by previously identified sites such as that of an Iron Age and Romano-British agricultural settlement at Denham Park Farm and Chenies (CVA076), located on the edge of the area required for construction to the east of Chalfont St. Peter.
- 11.6.30 The area within the route of Phase One of HS2 to the south of Aylesbury has also produced evidence of Romano-British activity, as at Locke's Pit (SMA042), where cremation burials were uncovered during clay extraction in the early 20th century. Romano-British burials and other features have also been recorded to the south-west of Stoke Mandeville hospital (SMA027), while prior evaluation has identified features, possibly forming part of a field system or settlement at Old Risborough Road, south of Stoke Mandeville (SMA009).

Undated cropmarks

- 11.6.31 Numerous other locations along the route of Phase One of HS2 with the potential to contain significant archaeological remains relating to later prehistoric and/or Romano-British activity have been identified from cropmark evidence. For example, large areas of cropmarks that may represent the vestiges of a complex agricultural landscape and possibly settlement sites have been identified to the north (WHA324) and north-east (WHA315) of Lichfield.
- 11.6.32 As noted previously, it is often not possible to readily distinguish between late prehistoric and Romano-British settlement sites and field systems identified from cropmark evidence or geophysical survey results solely on the basis of morphology. Consequently, a number of sites discussed in the preceding section, which could be attributed to the Late Bronze Age or Iron Age, may have been occupied during the Romano-British period (e.g. OFC058; OFC059; SMA004; SMA034). In some cases, these sites may have been continuously occupied throughout the transitional phase from the end of the Late Iron Age into the early Romano-British period.

Conclusions

- 11.6.33 As discussed above, the route of Phase One of HS2 provides a wealth of opportunities to investigate potentially nationally significant Romano-British sites of varying types along its route. These include the probable small Roman town at Fleet Marston and its hinterland; the roadside settlement or small town possibly associated with the scheduled villa at Edgcote; and the Roman temple complex at the A43 at Sundale/Illets Farm. Opportunities also exist to explore the wider landscape, identifying Romanisation and regional distinctiveness together with broader themes such as changing funerary rites.

11.7 Early Medieval period (AD 410-1066)

Introduction

- 11.7.1 The 650 or so years from the removal of Roman imperial administration in AD 410 until the Norman Conquest in AD 1066 is conventionally labelled the Early Medieval or Saxon period. During the 5th century, migrants from the Germanic tribes of northern Europe settled across much of eastern England, followed in the 8th and 9th centuries by smaller numbers of Scandinavians (Vikings), both sets of incomers sharing the land with a pre-existing British population. It was a period of huge change that underpins many of the developments seen during the Later Medieval period that persist to the present day. Most present-day towns and villages have Anglo-Saxon or Anglo-Scandinavian origins, as do most manors, churches, parishes and counties.
- 11.7.2 Most of what is known about the Early Medieval period is derived from documentary records (although these date from no earlier than the 7th century), providing histories of the Germanic settlement, the formation of kingdoms, the struggles of the Saxons and Danes, and the establishment of Christianity and the church. Archaeology has only recently begun to significantly contribute to our understanding, but it has been severely limited by a relative paucity of information, particularly in comparison with the Romano-British and Later Medieval periods. Pagan burial sites, with their rich assemblages of grave goods, were for a long time the main archaeological evidence for Germanic settlement and these have only recently been augmented by excavations in urban and rural settlements. Evidence remains scarce, however, and while the documents describe a settled and well-populated landscape with a vibrant and energetic culture, physical evidence for the people themselves, their works and their lives is hard to come by.
- 11.7.3 The route of Phase One of HS2 passes through areas of rural landscape that were heavily settled during the Roman period and subsequently became part of the heartland of Saxon and Medieval England. Documents, place names, artefacts and excavated sites indicate inhabitation of this landscape, but there are very few currently known sites of Early Medieval date that lie within or directly adjacent to the HS2 Phase One land take. Even the potentially outstanding example of Stoke Mandeville near Aylesbury has not yet been confirmed as having buried Saxon remains. As such, this resource assessment concentrates more on what is currently known about the wider landscape to infer potential and to set the context for new discoveries that might be made prior to and during the construction phases of the project.

Historical background

- 11.7.4 The Early Medieval period is conventionally divided into three phases, early, middle and late Saxon. The early, or pagan period, runs from 410 to the return of Christianity and literacy in the late 6th century. This phase saw the migration of Germanic peoples, principally Angles, Jutes and Saxons from their homeland on the continent and the formation of multiple kingdoms in the eastern part of Britain from the Humber to the Isle of Wight. The middle phase, between the 7th and 8th centuries, sees consolidation into the seven principal kingdoms of East Anglia, Mercia, Northumbria and Wessex, together with Essex, Kent and Sussex. Much of the route of Phase One of HS2 lies within the area controlled by Mercia, although the southern part, in the Middle Thames valley, was also variously controlled by Wessex, Essex and Kent.
- 11.7.5 By the end of the middle phase the term 'Anglo-Saxon' had begun to be used to describe the inhabitants of Britain, and the Anglo-Saxons had begun to use the term 'English' to refer to themselves. Danish and Norwegian raiding began in the 8th century with full-scale invasion in 865 overrunning most of the Anglo-Saxon kingdoms by 877. This led to the Treaty of Alfred and Guthrum in approximately 878 and the establishment of the Danelaw. While most of the land through which the route of Phase One of HS2 passes lay within Wessex, the northern section was under Danish control. Further political consolidation led to Alfred's great-grandson, Athelstan, being crowned king of England in 927. This did not stop Danish raiding and invasion, culminating in the confirmation of the Dane Cnut as king of all England in 1016, and ultimately, the Norman invasion in 1066.
- 11.7.6 Throughout the late Saxon period, and despite the political uncertainties, England experienced population and economic growth within both Anglo-Saxon and Anglo-Scandinavian areas. Towns were re-established from the 7th century together with sustained production of coinage. In the countryside changes can also be seen that lay the foundations for the Later Medieval landscape, including the emergence of the manor and township as the main unit of land ownership and administration and the further development of the ecclesiastical diocesan and parochial systems. Many parts of England saw the development of nucleated villages and communal agricultural organisation based on open field arable cultivation, although other forms of settlement and agrarian organisation were also widespread.

Nature of the evidence

- 11.7.7 The only contemporary historical source for the early Saxon period is provided by the early 6th century cleric Gildas in *De Excidio et Conquestu Britanniae* (The Ruin of Britain), a polemic excoriating the Britons for their sins and illustrating their just punishment at the hands of the Saxon invaders. Bede, in the *Historia ecclesiastica gentis Anglorum* (An Ecclesiastical History of the English People), writing in the early 8th century bases much of his early account on Gildas, but has more reliable sources from the 7th century onwards. Also created around the 7th to 9th centuries was the *Tribal Hidage*, a list of 35 tribes, that later became consolidated into the main kingdoms. Probably the most important source in tracing the political history of the Saxons is the *Anglo-Saxon Chronicle*, but this was not written until the late 9th century.

- 11.7.8 From the 7th century charters appear, documenting royal grants of land to the church and lay people. These typically include a description of the bounds of the land that is the subject of the charter and they have been transcribed to provide information on land ownership, territorial organisation and the nature and character of the landscape. A number survive for estates along the route of Phase One of HS2 (Sawyer 1968; Hooke 1999, Baines 1993, 1982; Gelling 1979). Additionally, place names provide evidence to indicate Anglo-Saxon, Danish and, in some cases, British settlement and land use in a particular locale if not specific location (Gover *et al.* 1942, 1936, 1933; Mawer and Stenton 1925; Oakden 1984). Still the most useful documentary evidence is provided by the Domesday survey, compiled after the end of the Anglo-Saxon period in 1086, but which provides invaluable, if not always clear, information on land ownership and social/economic data for the whole of the route of Phase One of HS2 (Morris 1979, 1978, 1976a/b, 1975a/b; Darby and Terrett 1971; Darby and Campbell 1971).
- 11.7.9 Archaeological evidence comes from chance finds, field survey, excavation (largely resulting from commercial and infrastructure development) and fragmentary survival of architectural elements (largely ecclesiastical). Finds of metalwork from metal detecting are now logged with the Portable Antiquities Scheme (PAS) (and mapped on projects such as Viking and Anglo-Saxon Landscape and Economy (VASLE), University of York, <https://www.york.ac.uk/archaeology/vasle>). An outstanding recent example is the Staffordshire Hoard, which was discovered in 2009 approximately 10km to the west of the Phase One of HS2 route near Lichfield.
- 11.7.10 Although the number of known cemetery and settlement sites has hugely increased over the last 30 years they remain difficult to identify using current prospection techniques (Hey and Lacey 2001; Deegan and Foard 2008). Sites can be difficult to detect from aerial photographs as the often slight, scattered and isolated features often do not lead to well-developed cropmarks or parch marks. These insubstantial buried archaeological remains can also be difficult to identify either in geophysical survey or trial pitting/trenching. Often only relatively small amounts of cultural material (e.g. pottery and metalwork) are identified during survey or evaluation and sites may be indicated by only a handful of sherds. For example, a single sherd of pottery was found during evaluation at Prospect Park, Harmondsworth within the Colne Valley, the site later being excavated to reveal a large settlement of sunken buildings, halls and pits. Early to middle Saxon sites are also sometimes discovered beneath Later Medieval ridge and furrow, and later Saxon sites beneath currently occupied settlements, both circumstances further mitigating against detection.

Chronology

- 11.7.11 Historically derived dates remain the main basis for chronology but the accuracy of these are open to doubt (e.g. Bede's AD 449 date for the 'Anglo-Saxon' conquest, Hills 2009). Archaeological dating is still largely dependent on broad artefact typologies, (e.g. for metalwork, pottery and coinage), with radiocarbon dating increasingly applied (e.g. for burials, see Bayliss *et al.* 2013). Burials accompanied by grave goods cease in the late 7th century and are thereafter difficult to date. Settlement sites yield little metalwork and early Saxon pottery is difficult to distinguish from Early/Middle Iron Age material. Middle Anglo-Saxon sites are often only discernible where relatively exotic imported Maxey or Ipswich-type wares are present and in the late Saxon period St. Neots-type ware acts as a similar imported chronological indicator. The Medieval Pottery Research Group

(<http://www.medievalpottery.org.uk/>) notes that type series for Anglo-Saxon pottery are only held for the Greater London area and north Buckinghamshire (although that held for Oxfordshire can be used for the Chilterns and Aylesbury Vale). Periods when ceramics were not in use (e.g. possibly during the early Saxon period in the West Midlands and 8th century Oxford) further reduce their usefulness for dating.

Ethnicity

- 11.7.12 It is broadly accepted that during the 5th and 6th centuries there was a (currently unknown) level of separation/co-existence and interaction between a still largely ethnic British (sub-Roman) population and a sizeable and politically dominant incoming Germanic minority. The numeric balance of the population is uncertain, although recent genetic studies projecting the composition of the modern population back into the past indicate a maximum Germanic component in eastern England of 40% (Leslie *et al.* 2015, but see Oppenheimer 2006 for a lower figure). If the British element of the population is much less visible, this may be explained by a process of acculturation by which they appear to have assumed the customs, social organisation, material culture, stylistic forms and ultimately language of the new elite (Härke 2011). Certainly, it is no longer possible to call ethnicity on the grounds of material culture alone and some assumed Germanic populations within excavated burial grounds may instead be substantially 'British' (e.g. at Berinsfield, Oxfordshire, where stable isotope analysis indicates only a 5% non-local, and therefore possibly a Germanic component) (Hughes *et al.* 2014).
- 11.7.13 Cemeteries such as Wasperton and Stretton-on-Fosse in Warwickshire might now be interpreted as having a substantial British component and the major 'Anglo-Saxon' settlement site at Catholme in the Trent valley has also been interpreted as having nothing definitively Germanic about it. While any Early Medieval burial grounds have obvious potential to address issues around ethnicity (see below for a list), it should also be a priority for investigation on settlement sites where groups of artefacts, including building types, settlement layout and land use, should be carefully considered in terms of how they might signal a British, Germanic or mixed population.

Cemeteries, ritual and religion

- 11.7.14 In addition to the known burial ground at Stoke Mandeville (although Early Medieval burials are not yet confirmed), there is potential for cemeteries at six locations: Denham Park Farm and Chenies (RU021, CVA076), Tilehouse Lane (CVA080), between Walton Court and Bishopstone (SMA034), Fleet Marston (SMA074), and Edgcote (GLB 138/144). As noted above, pagan cemeteries are likely to cluster along the main river valleys and tributaries. Christian burial grounds are more difficult to locate until those that date from around the 10th century, when they become formalised within church graveyards. Wherever located, they offer opportunities to study ethnicity and cultural identity (see above, particularly pagan cemeteries with grave goods), but also aspects of social organisation, ritual and religion, as well as to collect data on age, sex diet and pathologies, etc.
- 11.7.15 The Stoke Mandeville site also provides the best currently known opportunity to study aspects of Saxon ecclesiastical organisation. Stoke Mandeville was an important episcopal manor associated with the Saxon Bishopric of Dorchester-on-Thames and later the Medieval Bishopric of Lincoln. The possible association of the manor as a chapelry linked to the Saxon

minster church at Aylesbury lends further weight to its significance and the potential evidence for an early church foundation in the locality of the demolished Medieval church.

Settlement and village formation

- 11.7.16 There is no evidence in England for towns or large nucleated settlements dating to the early Saxon period. Current evidence suggests that early and middle Saxon settlements consisted of dispersed single and clustered farmsteads of unenclosed post-built timber halls and grubenhauser (sunken buildings), each probably comprising no more than a few households, home to perhaps 30 to 50 people (Hamerow 2012). Settlements sites may not have been fixed within clear boundaries and there is evidence that where larger spreads of occupation exist these represent smaller multi-phase shifting settlements (e.g. Harmondsworth in the Colne Valley, and Catholme in the Upper Trent, 12km and 8km from the route of Phase One of HS2 respectively).
- 11.7.17 Early settlement areas, indicated by Germanic-type cultural material within cemeteries and occupation sites, are concentrated in central and eastern England along the river valleys of the Trent, Nene, Ouse and Thames, and within the route of Phase One of HS2, the Warwickshire Avon (Hooke 2011; Farley 2008; Vince 2006; Cowie and Harding 2000). Settlements are often close to pre-existing Romano-British villas or farmsteads, but there is seldom clear evidence for continuity of site use (potential along the route includes close to the Roman roadside settlement at Fleet Marston, Buckinghamshire (SMA074) and at Edgcote Roman settlement, Northamptonshire (GLB144). There are a greater number of known settlement sites in central and north Buckinghamshire (e.g. at Walton, Aylesbury) (SMA034/35, located 2.5km to the north of the Phase One of HS2 route, where investigations have identified timber buildings and continuous settlement throughout the Early Medieval period), and farther to the north-east in the Ouse/Ouzel valley, Milton Keynes at Pennylands and Hartigan's Quarry (Farley 2008).
- 11.7.18 The early settlers either took possession of, or were restricted to, the easily cultivated (although not universally fertile) soils on gravels within the valleys, rather than the more intractable and heavily wooded claylands. In Northamptonshire, detailed study of recently located sites has shown a clear preference for permeable soils and avoidance of boulder clay (Partida *et al.* 2013). There is very little evidence for either British or Germanic occupation either to the north of the Warwickshire Avon in the wooded areas of the Birmingham plateau and the Arden, in the Chilterns (Farley 2008) or across the north London claylands, part of the Middlesex forest (Cowie and Blackmore 2000). However, remains of Saxon date have been found on the edge of the clay, close to the route of Phase One of HS2 at Northolt Manor and settlement is indicated by the 7th century altar stone at St. Pancras Old Church.
- 11.7.19 There is likely to be distinct regional patterning in early/middle Saxon settlement and land use and this is also evident when considering village formation, which occurred variously from around the 8th to 11th centuries, primarily within a central zone of champion landscapes (roughly equivalent to the area between the Chiltern Scarp and the northern limit of the Warwickshire Feldon). The process of village formation and probably associated development of open fields (see below) can be contrasted with more ancient woodland landscapes to the west (the Arden and Birmingham plateau) and east (the Chilterns and north London claylands/Middlesex Forest) (Rackham 1986; Roberts and Wrathmell 2000, 2003).

- 11.7.20 Within the central region, significant work has been undertaken on Early Medieval settlement patterning and village formation in Northamptonshire as part of the Raunds Area project (Parry 2006) where extensive fieldwalking, supported by targeted excavation identified significant numbers of dispersed early/middle Saxon occupation sites at densities of up to 0.55 per kilometre. Some of these early dispersed sites developed into possibly planned nucleated villages from the 9th and 10th centuries (e.g. Furnells), while others became abandoned, and this has been taken to represent a '*step change in settlement, the economy and land use across England*' (Higham 2010). Fieldwalking to identify Early and Later Medieval sites has also been carried out within Northamptonshire parishes through which Phase One of HS2 passes (Partida *et al.* 2013).
- 11.7.21 There has been no work to specifically target the ancient woodland landscapes in the same way, although the Whittlewood project, focusing on parishes at the border of Northamptonshire and Buckinghamshire, just to the north-east of the Phase One of HS2 route, while within the central zone is a localised area of more wooded landscape with a tradition of dispersed settlement. Here documentary research, supported by fieldwalking and test-pitting of currently occupied sites, has demonstrated occupation from around AD 600 in an area possibly largely deserted at the end of the Roman period. Here, although some nucleation of settlements could be seen from the mid-9th century, these were more an agglomeration of pre-existing dispersed sites with other sites surviving and not becoming abandoned as at Raunds (Jones and Page 2003). These and other projects indicate that there needs to be a localised modelling of Anglo-Saxon settlement and that patterns are heavily dependent on the history of occupation and land use and the variable environmental conditions (Higham 2010).
- 11.7.22 While there is high potential to investigate settlement at a landscape level, identifying new sites from field survey, currently the clearest opportunity to carry out detailed investigation and excavation is presented at Stoke Mandeville, Bucks (SMA003). The deserted Medieval settlement associated with the demolished St. Mary's Church is possibly an example of a Saxon settlement that developed close to an established Romano-British estate focus. The church and deserted settlement lie close to the Romano-British farmstead at Nash Lee and a late prehistoric/Romano-British settlement which has been identified by geophysical survey to the north of the churchyard. By the later Saxon period this church and associated village may have been an important ecclesiastical holding specialising in the milling of grain from the Aylesbury Hundred and surrounding areas. A charter of 949, also indicates potential for Early Medieval remains at Chetwode within the Aylesbury Vale district of Buckinghamshire (Baines 1982). The settlement here may have been established as early as the AD 7th century.

Landscape, agriculture and fields

- 11.7.23 The traditional picture of Anglo-Saxon settlers clearing large tracts of virgin woodland to establish their new farming settlements has been replaced by one which acknowledges the wide extent of cleared agricultural land at the end of the prehistoric which reached its culmination during the Roman period (Higham 2010). Equally, earlier theories that saw large-scale abandonment of this open landscape with significant regeneration of woodland have also been jettisoned, although there is some post-Roman evidence for a reduction in pressure on land use, with occasional local reforestation and some evidence for localised abandonment of Roman field systems. For some areas there is a reduction in arable in favour of pasture (e.g.

Greater London, Rackham and Sidell 2000). In many areas, however, there is good evidence for the continuing use of fields and continuity of land use into the Early Medieval period and beyond, although problematically much of the environmental evidence for this comes from northern and western Britain, with relatively few pollen cores for the Midlands (Rippon *et al.* 2013; Dark 2000).

- 11.7.24 Evidence for farming practice comes from a combination of documentary sources, artefacts (tools and the products of agriculture), biological remains (for crops and livestock) and the landscape (farms and fields). While Early Saxon farming techniques have been characterised as 'prehistoric' in as much as they were focused on subsistence (Banham and Faith 2014), by the end of the period the landscape was under intensive exploitation, using new techniques that generated significant surpluses. This intensification was no doubt driven by increasing population, the demand of new urban markets and the requirement of landowners, both lay and ecclesiastical, to maximise returns (possibly also reflected in the breaking up of older multiple estates and the formation of smaller manorial units that came to dominate by Domesday). These pressures may also have contributed to village formation.
- 11.7.25 The development of villages and fields is closely interlinked, but the extent to which inception of either is directly associated is uncertain (Higham 2010). The origin of central region open field landscapes has for long taken the focus of research, these comprising two or three large open fields, cultivated in common in narrow intermingled strips, with an annual agricultural cycle agreed communally and enforced in the manorial court and with one field left fallow each year. The precise chronology of development is uncertain although it is generally believed that open fields first appeared as a landscape feature during the 7th and 8th centuries (with ridge and furrow sealing Middle Saxon settlement sites) and had become widespread by the 12th century (Hall 2014). While open fields reach their most developed forms in the champion areas such as the Feldon and Aylesbury Vale, smaller areas of open field also exist in areas to the east and west, in association with older co-axial field systems and more recently assarted land, within the areas of ancient woodland (e.g. Arden and the Chilterns).
- 11.7.26 Studies such as Whittlewood demonstrate the variety of agrarian and economic strategies that were followed in these areas (with a greater reliance on grazing and woodland exploitation) and these lead to a more complex pattern of fields and enclosures, including areas of open field arable. These possibly represent a more widespread and long-lived tradition, as opposed to fully developed open fields which might better be seen as an adaption to a specific set of circumstances in lowland, and predominantly clayland, Britain (Williamson 2003).

Conclusions

- 11.7.27 The Early Medieval period is critically under-represented in the archaeological record at a national and regional level. Major areas of study remain where new data could contribute significantly to our knowledge of how communities formed and developed, organised themselves, built their homes, farmed the land, fed, provided for and protected their families and kin. Early and middle Saxon farming landscapes and settlements lie undetected beneath modern arable and grassland and river valleys and areas of lighter permeable soils should be the focus for prospection. Regionally, fieldwalking and test-pitting have proved successful in locating these sites, and metal detecting has also proved useful. Some settlements may await

detection close to earlier Roman occupation (e.g. Blacklands, Edgcote (GLB144), beneath later deserted Medieval settlements (e.g. Doddershall, Buckinghamshire (WADo63), or currently occupied settlements (e.g. Chetwode, Buckinghamshire, (CALog3/98), and these may also provide evidence for later Saxon settlement, village and field formation, and migration onto clay and/or into more wooded areas). River and stream valleys also provide important opportunities to collect environmental data, whether in direct association with settlement or from well-dated off-site catchment areas.

- 11.7.28 A thorough understanding of the documentary evidence, especially from Domesday, land charters and place names can provide a further focus for investigation on the ground and a broad interdisciplinary approach not only provides the best opportunity to locate new evidence, but enables a more focused approach to detailed investigation. Key sites, such as Stoke Mandeville, where a combination of documentary/historical evidence, survey data providing landscape context, and well-preserved multi-period archaeological deposits, including structural, artefactual and biological remains, hold out the most potential for significant knowledge creation. Recent studies highlight the importance of local and regional development during this period, acting with and influenced by environmental and topographical factors, and the scale and linear configuration of the Phase One of HS2 route will allow an unprecedented opportunity to compare and contrast data that emerges from a range of landscape zones to test existing models and propose new ones.

11.8 Medieval (AD 1066-1540)

Introduction

- 11.8.1 Although AD 1066 provides a distinctive historical starting point to the Late Medieval period, this is barely reflected in the archaeological record except in major, but relatively rare, architectural works such as castles and ecclesiastical buildings. Otherwise, there is marked continuity from the late Saxon period into the 11th and 12th centuries, with no new migrant population, and no significant changes to settlement, land use or material culture. The end of the period, while marked by significant transfer in land, from ecclesiastical to lay ownership brought about by the Henrician Reformation, is not otherwise signalled by any noticeable dislocation in material culture.
- 11.8.2 Significant changes do occur during this period, not least major political upheaval, population and economic growth, followed by famine, plague and resulting social and economic change. However, the manorial system with its associated townships and agricultural systems had become established before the Conquest and remained the norm throughout the Medieval period, and the *'cultural milieu of the English Countryside (manor and church, ox, and from the 13th century, horse drawn ploughs and manual haymaking) may be seen as an unbroken continuum, ... changed by the age of 'improvement' but finally fractured only by the First World War'* (Munby 2010).

Nature of the evidence

- 11.8.3 As noted in the preceding section on the Early Medieval period, the documentary evidence base improves into the late Saxon period, but there is an exponential increase of data from the 11th century. Domesday provides the dropping-off point but an increasingly centralised administrative and bureaucratic state and church, together with developing land rights and

literacy, ensure there is a growing documentary base. During the 13th century it is estimated that over 8 million land charters were issued (Stamper 2009). This is mirrored by the preservation of the evidence in the ground, comprising a larger and more complex artefactual assemblage (from the 12th century pottery becomes ubiquitous and cheap once more, together with an increased availability of metalwork and coinage), as well as settlement and other sites that are often well known and visible.

- 11.8.4 Where modern settlements have destroyed or obscured much of the physical remains of their Medieval antecedents, enough survives in the layout and in often upstanding remains to begin to understand their development and function. Where settlements have shrunk, changed location or become deserted, they are often well preserved as earthworks under grass and may lie within an extensive network of contemporary field and enclosure boundaries. Where earthworks do not survive, early maps from the 17th century onwards capture what is essentially still a Late Medieval or possibly earlier layout (although fossilised at its latest stage of development). Aerial photographs, especially those taken from the mid-20th century, describe a far more complete landscape of earthwork settlement and field remains, prior to significant destruction from modern ploughing, and this picture is further enhanced by recent LiDAR survey.
- 11.8.5 While the landscapes of Saxon England are still largely unknown, and as a result any new information may be significant, our understanding of the origins and development of the Later Medieval landscape, particularly in champion areas, is far more complete, and allows us to suggest more targeted and sophisticated strategies of investigation. Given the volume of documentary and survey data, the evidence from excavated sites contributes less to our general understanding of landscape development and settlement patterns and more to detailed studies of settlement morphology and building types. Although many settlement and other sites have been investigated since the introduction of PPG16 in 1990, the majority have been small scale, representing only small parts of larger sites. While these have the potential to contribute new knowledge, significant breakthroughs in the study of Medieval settlement are more likely to arise from opportunities to investigate settlements on a larger scale (e.g. previous work at Burton Dassett and Coton in Warwickshire, and Westbury and Great Linford in Buckinghamshire). Better still have been large-scale landscape investigation projects that integrate documentary research with field survey or targeted excavation, as at Raunds, Northamptonshire (Parry 2006) and Whittlewood on the Buckinghamshire/Northamptonshire border (Jones and Page 2003).
- 11.8.6 The HS2 Phase One route avoids all but the margins of modern towns and villages, except at its northern and southern ends where it runs into central Birmingham and London. As such, it also avoids the historic cores of these settlements, and even in London and Birmingham it arrives in parts of those cities that were developed no earlier than the 18th century. The largely open agricultural land through which the route passes instead provides other opportunities for investigation, including the landscape of fields, enclosures and trackways between settlements, but also those settlements that have been abandoned and have fallen out of use.

Chronology

- 11.8.7 Documentary history provides a lead role in setting the chronological frameworks for archaeological data during this period. Pottery, as noted above, is common from the 12th century, with the introduction of a greater variety of types and wares that aid identification and dating, although it is seldom possible to provide date ranges more accurate than the nearest 50 years. Coinage circulated widely and is found within even the humblest peasant settlements, but still not in great quantities. Where timbers survive (either in standing buildings or waterlogged contexts), dendrochronology has provided very useful dating. Otherwise, scientific dating methods have not had a major impact (radiocarbon dating suffers from being imprecise for this period), although *in-situ* burnt features, such as hearths can provide archaeomagnetic dates.

Landscape

- 11.8.8 By the time of the Conquest, the settlement pattern had probably developed around many of the villages and towns that survive today. It is also likely that much of the modern layout of roads (especially the minor ones) and trackways also date to at least the Medieval period. This period also witnessed first a rapid growth in population through the 11th to 13th centuries followed by substantial checks in population due to a succession of famines in the earlier 14th century as a result of worsening climate and crop failures. These were closely followed by the outbreak of the Great Plague in 1347, which may have killed approximately a third of the population. Further outbreaks of plague occurred throughout the later 14th and 15th centuries.
- 11.8.9 The generalised picture described above is more complex at a regional and local level. Most importantly, there were differences of settlement history and environment that persisted from the Saxon period, most notably in the division between nucleated villages surrounded by communally farmed open fields in the champion or central zone (central and north Buckinghamshire, Northamptonshire and south Warwickshire Feldon), and areas of dispersed manors, farms and hamlets, with a mix of open and enclosed land in zones to the north-west (the Warwickshire Arden and Birmingham plateau) and south-east (the Chilterns and north London claylands) (Roberts and Wrathmel 2000, 2003). Even within these areas, the development of settlement and land use may have been more locally determined. Within the champion areas, although both nucleated settlement and open fields were widespread by Domesday, settlement change was still occurring, with settlements such as Burton Dassett established only in the 12th century.
- 11.8.10 While the Conquest saw the establishment of an entirely new royal dynasty and the apportionment of manors to William the Conqueror's military elite and their families, significant holdings also continued to be held by the church (e.g. at Aylesbury and Stoke Mandeville). Further additions were bequeathed to both the church and new monasteries by kings, aristocracy and emerging mercantile gentry throughout the period. By the 15th century, the church and monasteries were the landlords of a very significant proportion of England and were major employers and entrepreneurs. Cropmarks and LiDAR survey on the south-western side of Wendover (DWH116) might indicate the site of a Medieval chantry chapel and hospital of St. John the Baptist. The chapel and hospital were dissolved c.1540s and after a long period of disuse were pulled down and a school was built on the site. The location of this asset is speculative and known only from documentary records. Stoke Mandeville (SMA003) includes the remains of the 12th century St. Mary's Church and its graveyard. Other church building

may be preserved at The Hermitage moated site, Buckinghamshire (CAL094), and at the deserted settlement of Lower Radbourne, Warwickshire (LBS035).

- 11.8.11 The Stoke Mandeville site is particularly important because of the associated graveyard that was in use throughout the Medieval period. Detailed excavation of rural churches and graveyards has rarely been undertaken (e.g. Wharram Percy and Barton-on-Humber and more locally Furnells, Northamptonshire). Other Medieval burial grounds might be expected at the Wendover chantry chapel (see above), and at known deserted settlement sites (e.g. Doddershall, Buckinghamshire (WAD063) and Lower Radbourne, Warwickshire (LBS035)). The HS2 route also passes through the eastern edge of the registered battlefield at Edgcote in Northamptonshire (GLB108), where supporters of the Earl of Warwick defeated King Edward IV in 1469 and where battlefield burials might be expected.
- 11.8.12 The Norman Conquest also saw the imposition of the feudal system; labour was cheap and tied to the land and aristocratic and ecclesiastical landlords had significant power to manage and organise their holdings. Both the crown and major landholders developed vast areas of countryside as hunting preserves for the rearing of deer and other game. These forests, including Bernwood Forest, extended into the area of the Phase One of HS2 route in north Buckinghamshire and the Middlesex Forest, which covered much of the area of the Phase One of HS2 route between central London and the Colne Valley. The forests were not entirely wooded, with large areas of open grazing and settlements and farmland, but were administered under the regulations of the Forest Statutes.
- 11.8.13 From the late 12th century the crown and aristocracy also increasingly sought to improve their incomes by establishing market centres, often in conjunction with new planned settlements or reorganising existing ones. This phase of settlement formation may account for some early village abandonment, and many of the new settlements that are seen in the record. This period also saw significant investment in new technologies such as improved watermills, which had been in existence since the Saxon period, and from the 12th century, the introduction of windmills. There are no windmill mounds within the Phase One of HS2 route but watermills may survive on the edge of the Chilterns at Wendover (DWH076) (Clerks Mill/Poyntz Mills), mentioned as fulling mills in the 13th to 16th centuries. They may also survive in the Aylesbury Vale on the River Ray (WAD083) and at Chetwode (CAL070) and Trafford Bridge, Northamptonshire (GLB131) in the Cherwell Valley. The fills of the millstreams are potentially key archaeological contexts. Because they are prone to waterlogging, they can preserve environmental evidence and timbers which can reveal the nature and date of the building, the latter via radiocarbon dating or dendrochronology, and evidence of woodland management and carpentry techniques.
- 11.8.14 The rising population throughout the 12th and 13th centuries may have resulted in the uptake of more marginal land helped by the introduction of the mould board plough and later the replacement of ox teams by horses to pull the ploughs. This colonisation of more marginal clays and clearance (assarting) of woodland and waste (undeveloped land outside of a settlement's arable area) on the periphery of established settlements can be identified in part by the proliferation of moated sites, which typically date to this period of expansion. Many of these moated sites would have been provided at already established manorial centres, but others mark the location of newly established manors and/or ecclesiastical or monastic

granges, with some attached to the farmsteads of freemen and yeomen, who were increasingly becoming an important facet of the Medieval agricultural economy.

- 11.8.15 A significant number of moats are present within the dispersed settlement area of the Arden and HS2 Phase One route passes through a group of three at Coleshill, Warwickshire. These comprise (COL006), a possible rectangular moat identified through aerial photography and LiDAR, including secondary enclosures, field boundaries and a possible trackway, (COL009/10), where earthworks indicate the site of a moat with associated enclosures and ridge and furrow, and (COL014), where a large octagonal moat survives on its northern side as earthworks with regular internal features (confirmed by geophysical survey), the scale and uncommon layout of which may possibly indicate a later garden landscape feature.
- 11.8.16 Other locations where the Phase One of HS2 route provides opportunities for detailed investigation lie at Stoke Mandeville (SMA003) and at Streethay near Lichfield in Staffordshire (WHA310). Fragments of moats may be available for investigation at Edgware Road (KIL093) and Willesdon Junction (KIL103) in London, depending on survival, at The Hermitage, Chetwode in Buckinghamshire (CAL094) and Mercote near Berkswell, Solihull (BHA132). An earthwork of uncertain type and date, unlikely to be the castle that it is described as in the Warwickshire Historic Environment Record (HER), survives north of Glasshouse Wood, near Stoneleigh in Warwickshire (STN030) and may be another moated site.
- 11.8.17 Much of route north of Aylesbury and the River Thame in Buckinghamshire formerly lay within the royal hunting forest of Bernwood. Settlements here may all have been cleared of woodland (assarted) during the 13th to early 14th centuries to open up new agricultural land in more marginal areas to support the growing population. A similar process can be seen in the Forest of Middlesex, Whittlewood Forest and other wooded areas not subject to forest laws such as the Arden and Chilterns. Many of these more sparsely populated areas, particularly the Arden, provided space for lords to establish their own hunting grounds. Along HS2, deer parks are mostly clustered in the northern part of the route, with the southernmost at Greatworth, Northamptonshire (GLB003) (although the 18th century landscaped park at Hartwell in Buckinghamshire might have originated as a deer park). Otherwise, they are located within the formerly wooded areas of the Arden at Coleshill (COL015), Berkswell (BHA063), at Park Hall in Birmingham (CBB012) and on the eastern margins of the former Cannock Forest at Drayton (DHW105), Shirral (DHW106) and Bangley (DHW114).
- 11.8.18 The famines and plagues of the 14th century seem to have brought an end to the uptake of more marginal land and may in large part have been responsible for the abandonment of many sites in more marginal areas and elsewhere. The dramatic decline in population was not the only reason for the abandonment and shrinkage of rural settlement. Changes in agricultural practices and associated shifts in the rural economy to improve rents from land and lordly incomes from farming had major implications for the fabric of rural society.
- 11.8.19 This shift was most marked in the champion areas, evidenced by the widespread abandonment of the traditional communal farming system and introduction of less labour-intensive methods, including a dramatic increase in the amount of land that was given over to pasture for sheep (to provide wool that had become one of England's principal and most profitable exports) and to a lesser extent cattle (to feed the burgeoning urban populations). This shift also witnessed the decline of the feudal system with a peasantry generally tied to a

manor and the establishment of a more mobile rural workforce. This period also saw the rise of the farming yeomanry, who by the 15th century were a newly gentrified class.

- 11.8.20 These changes had a significant impact on the nature of Medieval rural settlement and resulted not only in the shrinkage and abandonment of settlements but also in the first widespread abandonment of communal open field systems with its characteristic ridge and furrow to be replaced by private enclosure.
- 11.8.21 In non-champion areas evidence for abandonment is also found, although not to the same extent, and here some protection against shock seems to have been provided by the more mixed agrarian economy, already containing a larger pastoral component, and having access to woodland resources (e.g. the possible charcoal burning site, identified from aerial photographs near the Dunton deserted settlement, Curdworth (CWMo13) and likely pottery production site near South Heath, Buckinghamshire, between Bury Farm moated site and Springfield Farm/Potter Row (CCo76/77)).
- 11.8.22 Significant areas of former Medieval settlement can be identified as village earthworks within the champion areas at Stoke Mandeville (SMAo03) and Doddershall (WADo63), both within the Aylesbury Vale, at Upper Radstone (NPBo89) in south Northamptonshire, and Lower Radbourne (LBSo35) and Hurst (STNo62), both within the Warwickshire Feldon. At all these sites a major part of the settlement lies within the HS2 land take, so they represent opportunities for detailed investigation. Elsewhere, smaller parts of champion settlement remains lie within the route at Hartwell Park, Buckinghamshire (SMAo62), Costow House, Northamptonshire (GLBo72) and Milburn, Warwickshire (STNo47).
- 11.8.23 Within areas of more dispersed mixed settlement, the HS2 Phase One route intersects with significant settlement remains at Bickenhill, Solihull, in the Arden (BICo32), which may represent secondary expansion onto marginal land, and lesser remains at Diddington (BHA211) and Curborough (WHA318), also in the Arden. The HS2 Phase One route enters Birmingham to the north of the Medieval town at the margins of the original settlement at Digbeth/Deritend (WCSO22). Within the Chilterns the route follows the edge of the Misbourne Valley, an area of small nucleated settlements but passes close to dispersed settlement near Bury Farm (CCo66) and finds scatters or cropmarks suggest other settlement at Cudsdens Farm (CCo35), Hunts Green Farm (DWHo14), Wendover Dean Farm (DWHo42), Bascombe Lane/Ellesborough Road (DWH116).
- 11.8.24 Most of the identified settlement sites lie in association with surviving elements of their surrounding field and enclosure systems. Ridge and furrow and furlong boundaries survive in many places as earthworks, but can also be traced on aerial photographs and as soil/cropmarks, in LiDAR survey, and as buried features revealed during excavation. Across large areas of midland England, this evidence has been mapped to identify where it best survives (e.g. fields to the east of Ladbroke, Warwickshire (LBSo46) and in the area of Thorpe Mandeville and Lower Thorpe, Northamptonshire (GLB224) (Hall 2014; Partida *et al.* 2013)). Further opportunities exist along the HS2 Phase One route to continue this work, investigate the development of field systems and provide context to settlement evidence (e.g. in the area of Great Missenden and the eastern flank of the Misbourne Valley in the Chilterns (CCo32; DWH156), areas of assarted enclosure at Crackley Wood in the Arden (STN1o6) and Ravenshaw Wood on the edge of Cannock Chase (WHA321)).

Conclusions

- 11.8.25 A significant amount of known and potential evidence exists for the later Medieval along the HS2 Phase One route. Much is already understood about this period from documentary sources and earlier fieldwork. The focus for much previous research has been the champion areas of nucleated settlement and open fields, although significant questions remain about the origins and development of this landscape and the competing influences of social, economic and environment/topographic factors. Large-scale excavation of a small number of settlement sites, together with more extensive documentary and landscape survey, is likely to provide the best opportunity to better understand these areas. The sites at Stoke Mandeville, Doddershall, Upper Radstone and Lower Radbourne are key to this aim. Stoke Mandeville also holds out the prospect of sampling the biological remains of the former population, significantly enhancing its potential.
- 11.8.26 Less work has been undertaken on areas of dispersed settlement and older enclosure. These smaller settlements are less visible than the large earthwork sites of the champion lands and often still lie within areas where development pressure has been low (although that cannot be said of Greater London and Birmingham, where 18th and 19th century development came too early to provide historical and archaeological research opportunities). As with the nucleated villages, there is great value in detailed excavation of these sites. However, the lack of existing data calls for sites where only limited investigation can take place also to be targeted. Just as important here is an understanding of how Medieval settlement, fields and boundaries have developed over time and out of previously existing Earlier Medieval, Roman and prehistoric landscapes. Moated sites are important in these areas and detailed investigation of the Coleshill moats may provide not only information on secondary settlement within the Arden, but also on the development of an important manorial site.
- 11.8.27 As with the preceding Saxon period Phase One of HS2 provides an opportunity not just to target and excavate individual sites, but to take an overview and test models of regional and local development, and to build on projects such as Raunds and Whittlewood. Areas of different landscape pays (such as the Chilterns and Bernwood Forest) could be targeted, where good documentary evidence coincides with opportunities to carry out landscape-wide survey and more detailed site-based excavation.

11.9 Post-Medieval period (AD 1540-1900)

Overview

- 11.9.1 The post-Medieval period, AD 1540-1900, was a time of significant and wide-reaching change and development in British history. The beginning of the period is broadly defined by the dissolution of monasteries, quintessentially Medieval institutions, and the release of their estates and resources, and the rise of a landed gentry. By the end of the period Britain had become the most powerful nation on earth, with an empire stretching across the Atlantic, Pacific and length of Africa.
- 11.9.2 These 400 years saw sustained and often rapid population growth, with the population of England and Wales roughly trebling between the 16th and 19th centuries (Whyte 1999). Growing industrialisation led to the expansion of towns and cities and the development of suburbs. Many moved to urbanised areas for work, and new urban cemeteries were created.

In rural areas, dramatic changes in land ownership and enclosure led to the prevalence of more commercialised agriculture (*ibid.*), the rebuilding of farmhouses and the establishment of farmsteads in new locations, alongside the construction of gentry houses and the creation of designed landscapes around country houses.

Nature of the evidence

- 11.9.3 Evidence from the post-Medieval period comprises buildings and other structures (most of the built heritage in the study areas is 17th century or later in date); landscapes and townscapes; data collected from archaeological investigations; and documentary sources. Documentary sources can, in many cases, have a bias away from ordinary people (Hind 2014) and while archaeological data can offer broader insights it can be difficult to contextualise uncovered features and finds.
- 11.9.4 Research into this period offers the opportunity for the evidence, both archaeological and documentary, to be considered together and for significant collaboration between archaeologists, historians, historical geographers and other disciplines (Hind 2014).
- 11.9.5 Overall, the evidence indicates much continuity from the Medieval period into the earlier part of the post-Medieval period, such as continuing urban and rural settlement patterns, continuing agricultural practices including piecemeal land enclosure, and continuing urban and rural industries. Although some rural metalworking is first recorded in the 16th century, there seems to be very little evidence in the study areas of 16th century activity that is distinct from the Medieval period: even the dissolution of the monasteries did not have a significant impact until the 17th century.

Landscape enclosure and agricultural development

General trends

- 11.9.6 The majority of the route passes through land that remained in agricultural use throughout the post-Medieval period. The greatest change to the make-up of the rural landscape was the large-scale land enclosure of former Medieval open fields and the accompanying establishment of new farmsteads at a distance from village centres. The process of enclosing open land into smaller parcels had been ongoing since at least the 12th century. However, across the Midlands a classic form of open field agriculture was still in existence in the 16th century, where the majority of villages still operated with a two-field or a three-field system. As the 16th and 17th centuries progressed, more land was subjected to piecemeal enclosure, often as a result of the actions of individuals or small groups (Yelling 1990, 184). In many cases, more than one individual had freehold ownership over parts of the land that prevented the largest landowners, often a squire, from enclosing the common land without the need for prior agreement. Enclosure in this fashion was a gradual process that is often poorly documented, but had a profound effect in changing the agricultural landscape (Yelling 1990; Whyte 1999).
- 11.9.7 From the mid-18th century, the process of parliamentary enclosure accelerated in the Midlands (Hoskins 1955; Walton 1990). Parliamentary enclosure finalised a long-running process of land reorganisation (Walton 1990), by enabling the enclosure of the remaining open fields without the need for unanimous agreement between freeholders (*ibid.*). It has

been estimated that the parliamentary enclosure process led to the enclosure of approximately 21% of the common arable land in England (Whyte 1999).

- 11.9.8 Although this serves to highlight how much land had already been enclosed, in many parishes it transformed the landscape completely. It is in the Midlands where this planned landscape is most visible (*ibid.*). Contemporary representations of enclosure can be found in a multitude of cartographic sources including Rocque's 1746 map of the cities of London and Westminster (CFA02). Across the Phase One of HS2 route, numerous hedgerows and former field boundaries are testament to the scale of this reorganisation of the landscape.
- 11.9.9 Enclosure was effective in boosting the incomes of the landowners and, coupled with other factors, led to the agricultural revolution, which saw an unprecedented increase in agricultural production across Britain. Expansion of agricultural land included felling woodland in Middlesex Forest from the 17th century onwards (CFA03 and CFA04) and piecemeal encroachment on common land. The construction of farmhouses on new sites noticeably increased between the 17th and 19th centuries. Many of the farmhouses were located away from settlement centres, and related directly to newly enclosed fields. At the same time, existing farms, some of Medieval origin, were rebuilt. Other building in the countryside included subsidiary agricultural buildings and rural housing, reflecting increased production and settlement in key areas of agricultural production.

Examples of landscape enclosure along the route

- 11.9.10 Much of the area between Euston (CFA01) and South Ruislip to Ickenham (CFA06) is characterised by urban and suburban development and transport infrastructure. From the Colne Valley northwards the historic landscape becomes more legible, and evidence of enclosure can be seen.
- 11.9.11 The enclosure of land in the Colne Valley (CFA07) appears to have taken place at a relatively early date. At Harefield land may have been extensively enclosed as early as 1700, with open fields at Denham enclosed between the 17th and 18th centuries (Reynolds 1962).
- 11.9.12 Beyond the principal settlements at Chalfont St. Peter, Chalfont St. Giles and Amersham (CFA08), a dispersed pattern of settlement is characterised in part by common edge settlements on the heaths and downlands. Within the central Chilterns (CFA09) the landscape shows evidence of early irregular enclosure, with subsequent 18th and 19th century parliamentary enclosure along with modern enclosure patterns. Early pre-18th century irregular systems of enclosure characteristic of the Chilterns are present within the Misbourne Valley towards the south of the Dunsmore, Wendover and Halton study area.
- 11.9.13 Within the historic landscape at Stoke Mandeville small fields are likely to date from the 15th to 17th centuries, when a shift in settlement has been identified from the earlier focus upon the demolished St. Mary's Church (CFA11). Other notable areas of early enclosure within the Stoke Mandeville and Aylesbury study area have been recorded at Sedrup, the Thame Valley, the Northern Vale north of Aylesbury and Winchendon Hills within Waddesdon and Fleet Marston parishes.
- 11.9.14 Later parliamentary enclosures can be recognised within the rural landscape to the north and east of Waddesdon village (CFA12). Post-Medieval parliamentary and private enclosure characterises the historic landscape in the Calvert, Steeple Claydon, Twyford and Chetwode

study area (CFA13). Early enclosure can be recognised at Newton Purcell (CFA14), which may have begun soon after 1679 (NPB094). Enclosures around Greatworth, documented by an Enclosure map of 1634 reflect early enclosure of the landscape in the Greatworth to Lower Boddington study area (GLB220).

- 11.9.15 Within Wormleighton and Stoneton parishes (CFA16), irregularly shaped piecemeal enclosures have been identified. The land to the south and east of Ladbroke village also includes areas of piecemeal enclosure within the scheme, where the field boundaries are smaller, more sinuous and frequently aligned with ridge and furrow (e.g. LBS100). Southam parish consists mostly of large, rectilinear fields, with some irregular interior boundaries, enclosed in the 18th century. The fieldscapes of the Offchurch and Cubbington study area (CFA17) reflect an early system of irregularly shaped and small piecemeal enclosure. Planned or parliamentary enclosures are rare and centred mostly on the northernmost part of the CFA.
- 11.9.16 Within the pockets of agricultural landscape at Coleshill (CFA19), irregular field boundaries are the result of piecemeal enclosure that was subsequently opened up into larger fields. Within Curdworth to Middleton (CFA20) early planned enclosure can be recognised around Dunton Hall recorded upon 18th century historic mapping, with subsequent parliamentary enclosure at Dunton and Lea Marston dating from the 18th century. Historically, areas adjacent to the River Tame were meadow, but these areas are now substantially industrialised and are surrounded by large post-war and post-enclosure field systems.
- 11.9.17 The southern part of Drayton Bassett, Hints and Weeford (CFA21) is characterised by smaller rectilinear fields and landscape features associated with deer parks. To the north the landscape is characterised by later 18th century halls and landscaped gardens, associated with large enclosed fields of relatively recent date. Early landscapes of enclosure within Whittington to Handsacre (CFA22) include irregular fields representing early and piecemeal enclosures at Curborough (WHA227) and Longdon (WHA228). At Whittington Heath the piecemeal enclosures suggest small-scale encroachment on common land.
- 11.9.18 Within the south-eastern part of Balsall Common and Hampton-in-Arden (CFA23) examples of early piecemeal enclosure, created out of the open Medieval field system are present, with later extensive areas of planned enclosure dating from the 18th and 19th centuries elsewhere. Areas of 19th century planned enclosure and plantation are legible elsewhere in the landscape at Birmingham Interchange and Chelmsley Wood (CFA24), which is otherwise characterised by extensive suburban, industrial and commercial development and transport infrastructure. At Castle Bromwich and Bromford (CFA25), a notable exception to the blanket of urban development is the Park Hall estate, with the manor established in the Medieval period. In the 17th century the house was relocated close to the River Tame and flooding may have contributed to its decline.

Examples of rural built heritage along the route

- 11.9.19 A large number of agricultural buildings lie along the route of the scheme. Three farm complexes scheduled for demolition date to the 18th century: Shepherd's Furze (CAL025), Coleshill Hall Farmhouse and outbuildings (COL051) and Bucks Head Farm (DHW057). Of these, Shepherds Furze contains an ashlar-fronted farmhouse dating to c.1770; Coleshill contains a decorative Grade II listed stable block incorporating a farmhouse or former coach house; and Bucks Head consists of an unlisted (much altered) 18th century farmhouse with

Grade II listed outbuildings, including a well-preserved smithy. Dews Farm (CVA022), a locally listed two-storey farmhouse, is also unusual in that it possibly contains the core of a 15th century building within largely 19th century fabric.

- 11.9.20 The vast majority of the farm complexes scheduled for demolition are, however, undesignated farmsteads dating to the 19th century. Durham Farm (DWH044) is a representative example: the complex consists of a much altered and extended 19th century farmhouse and two contemporary barns surrounded by 20th century outbuildings.
- 11.9.21 In addition to the cohesive farm complexes outlined above, several individual vernacular farm buildings not associated with any farm are scheduled for demolition; the farm building c.300m east of Windmill Spinney (LBS017) is a representative example. The building comprises a rectangular barn with an open side to the south which predates the 1884 OS map. It lies within a wide agricultural landscape with fields on all sides. Some of these farm buildings, such as The Old Barn, Birmingham Road (COL081), have been heavily altered and converted to other uses.
- 11.9.22 Some agricultural rural housing is set for demolition. Glebe House of c.1840 (SMA044) is a substantial detached dwelling house on the edge of Hartwell, with unusual fenestration and a suite of outbuildings dating to the later 19th century. The Lodge of c.1899 (WAD036) and Hanchwood House (WHA080) are similarly more substantial detached houses, with some of the characteristics of contemporary suburban villas. Numbers 30-40 Ellesborough Road (DWH096) consist of non-designated partial terrace and two detached buildings on the Ellesborough Road. Numbers 30-36 are the last properties at the western end of the terrace on Ellesborough Road, with numbers 38 and 40 being larger detached houses. Numbers 30-36 are double-fronted terraces dating to the 1840s-1850s and are by far the largest properties on the terrace. These properties point to a greater prosperity among agricultural communities during the agricultural boom in the first half of the 19th century.
- 11.9.23 Several rural buildings associated with leisure are also scheduled for demolition. These include two public houses, Annie Bailey's (CC055) and the former Black Horse Pub (CC061), both of which are mid-19th century vernacular buildings of modest proportions that have been heavily altered, and the Grade II listed Whittington Heath Golf Course Clubhouse (WHA302). This last example is an unusual building originally built as a grandstand for Whittington racecourse, was used as a soldiers' hospital by Whittington Barracks from 1895 and then as a golf course clubhouse from 1957.

Designed and created landscapes

General trends

- 11.9.24 As well as changes to the agricultural landscape at this time, there are isolated examples of formally designed landscapes as well as landscapes created in response to social and political events. Such events include the Civil War, the industrial revolution, general population movement, and the taking of agricultural land to develop more urbanised centres of settlement, and for military training and recreational activities such as horse racing and hunting. Between the 16th century and the late 18th century, there were numerous changes in fashion relating to the design and appearance of landscaped parks and gardens associated with country houses (Currie and Locock 1993, cited in Whyte 1999). This included a period of

grander, more formally laid out and structured landscapes in the middle of the period (e.g. works by Charles Bridgeman), followed by more naturalised, but still highly artificial, designs by landscape architects such as Capability Brown in the later part of the 18th century.

Examples of designed and created landscapes along the route

- 11.9.25 In London, Marylebone Park (EUS002) was established by Henry VIII as a deer park for royal hunting. It was later developed during the early 19th century into a prestigious park (Regents Park) at the request of the Prince Regent, later George IV. The Grade II registered park and garden at Denham Place in the Colne Valley was reworked in 1770, possibly by Capability Brown, from the previous geometric design laid out by Sir Roger Hill (CVA001).
- 11.9.26 Hartwell Park represents a designed landscape set out between the 17th and 19th centuries and is partly within the boundary of the scheme (SMA050). The park was originally a 17th century designed landscape around Hartwell House, which included an avenue linking to the Quarrendon deserted Medieval village to the north. In the later 18th century, the park was reworked as a naturalised landscape, although many of the original statues and architectural features were retained by the landscape designer Richard Woods. In the 19th century, further additions were made to the east and north-east of the inner park, although they are not equivalent in terms of design or historic integrity of coherence to the earlier park. Farther north Edgcote House park (GLB134), which originated as a Medieval deer park, was reworked as a landscaped pleasure ground in the 18th century.
- 11.9.27 Monastic buildings and the land around them became available following the dissolution of monasteries in the 16th century. Monastic buildings were converted to gentry houses (e.g. at Stoneleigh and Missenden). Existing estates, including land formerly belonging to monasteries, were converted to designed landscapes. New landowning gentlemen created new houses and landscapes, such as John Fisher who built Packington Old Hall (CFA24).
- 11.9.28 Within Stoneleigh, Kenilworth and Burton Green (CFA18) most prominent within the landscape is Stoneleigh Abbey park (STN012). This site, which includes several listed buildings relating to the 18th-century manor house as well as the Medieval Cistercian monastery of Stoneleigh Abbey, contains a number of notable landscape features. These include the Humphry Repton-designed landscape gardens, groves and woodlands, mentioned in the works of Jane Austen, and a 17th century deer park. All of these were bisected in the mid-20th century by the creation of the National Agricultural and Exhibition Centre. The historic landscape of the park is also partially obscured by its redesign as a golf course.
- 11.9.29 A deer park and manor is mentioned at Coleshill in Medieval documentary sources, which is likely to form the origin of the park, hall and moat, the location and extent of much of which appears to be identifiable in the landscape (COL015). It is clear, nevertheless, that the park was a significant component of the landscape into the late 18th century. The park boundaries are clearly defined to the north and west, as depicted upon historic mapping, and are currently demarcated by two hedgerows considered to be of importance due to their former function, despite their limited survival (COL016). Within the southern extent of the park are a moat and the site of the former Coleshill Hall Farm (COL014), with a remaining listed stable block (COL051) and other potentially associated historic buildings on Birmingham Road (COL011). Other formal landscape features include an elaborately designed duck decoy pond illustrated on historic mapping at the south-west of the park. In the 19th century the

construction of the new hall at Coleshill Hall Hospital coach house and stable block at a central and slightly elevated position within the park (COLo52) refocused the significance of the parkland landscape.

- 11.9.30 The late 17th century Dunton Hall, adjacent to the scheme (CWMo59), had associated designed gardens (CWMo60), although there is a low legibility of historic garden features. The existing landscape estate at Middleton Hall is more extensive and originated as a Medieval deer park (CWMo99). Parts of the parkland are present within the boundary of the scheme. The existing house is principally 18th century, but early post-Medieval and Medieval phases also exist within the complex (CWM100). Historic legibility of the designed landscape is demonstrated in the presence of avenues, lakes, plantations and gardens. A small part of the landscaped park, to the south-west of the hall is present within the scheme boundary.
- 11.9.31 At Whittington Heath, Staffordshire (CFA22) the former common land underwent a number of transformations from the early 18th century and into the 19th century. In 1702 an annual horse racing event was established followed by the creation of Whittington Barracks in 1880. The golf course at Whittington was established initially for the barracks in 1884, becoming Whittington Barracks Golf Club in 1910.

English Civil War

- 11.9.32 The English Civil War (1642-1651) was one of the most significant political events during the post-Medieval period, with battles and skirmishes taking place across the country. Despite widespread activity there are few known assets along the route that were constructed as a result of military actions. Aylesbury was a stronghold for parliamentary forces, with the nearby Battle of Aylesbury fought and won by the Parliamentarians, and some of its fortifications (SMAo48) remain. Other Civil War fortifications and earthworks (SMAo51; WADo50; CALo35) are located within the vicinity of Aylesbury and finds dating to the period have been recovered in Streethay (WHAo39).

Industry and transportation

General trends

- 11.9.33 The major defining aspect of the post-Medieval period is the industrial revolution that transformed the country from the mid-18th century to mid-19th century (Clark 1999). The effects of industrialisation can be seen across every English landscape, from the factories and mills of the sprawling towns and cities to the steam-powered mills and extraction sites in the countryside (Belford 2009). Factories replaced traditional forms of working and concentrated the workforce into single workplaces often within towns or cities (Clark 1999). Urban population numbers exploded, requiring housing and other amenities to be constructed to deal with the influx of people from the countryside (*ibid.*). Prior to the railways and canals, road transport was improved by the construction of bridges such as Water Orton Bridge, built in the 16th century, and later by the establishment of turnpike trusts (e.g. in CFAo9 and CFA10). With this expansion in industry came the development of the canal system and later the rail network. The major infrastructure work required for these transport systems had a significant and lasting effect on both the rural and urban landscapes (Whyte 1999).
- 11.9.34 The first canals developed from schemes to improve navigable rivers and were usually designed to transport coal (Whyte 1999). The Birmingham Canal between the Paradise Street

wharf and the Wednesbury coal mines opened in 1769, halving the cost of coal overnight (Hadfield 1985).

- 11.9.35 The railways eventually superseded the canal network as the primary form of transport for goods and material. And, after the establishment of the Liverpool and Manchester Railway in 1830 primarily for carrying passengers, the rail network revolutionised the movement of people across the country (Whyte 1999). The London and Birmingham Railway was planned by Robert Stephenson and fully opened in 1838, running between a terminus at London Euston (EUS005) and Curzon Street (WCS041) in Birmingham. Euston station is the second oldest mainline terminus in London, although the original terminal building was demolished in 1963. The Grade I listed Curzon Street terminal building stopped being used for passenger trains in 1854 following the opening of Birmingham New Street station; however, it remained open for excursions until 1893 when it was finally closed to passengers.

Examples of transport infrastructure along the route

- 11.9.36 Phase One of HS2 crosses a number of post-Medieval transport infrastructure features including the canal and railway networks. The extent of the canal network can be seen across the route. Examples include the Oxford Canal (LBS019), Coventry Canal, Trent and Mersey Canal (WHA340) and Grand Union Canal (OFC004 and CVA102), which linked London to the industrial heartland of the Midlands. The London and Birmingham Railway running between a terminus at London Euston (EUS005) and Curzon Street (WCS041) in Birmingham is also located along the route.
- 11.9.37 The greatest volume of assets scheduled for demolition relate to the management and operation of the railway network. These assets are numerous and are found along the length of the scheme route. They vary greatly in date, type, form and style, which indicates the breadth of structures needed to support the operation of the railways, and the length of time that the railways have been operational. The structures include railway bridges, viaducts, station buildings, signal boxes and associated engineering structures.
- 11.9.38 The railway bridge near Curzon Street dates to 1838, and Lawley Street Viaduct, Birmingham was completed in 1839, but otherwise the bridges along the line are generally late 19th or early 20th century in date. Historic England defines this as the 3rd and 4th phases of British railway development characterised by the consolidation and completion of the network and the proliferation of standardised types of structure across the network. The bridges scheduled for demolition are standardised constructions in engineering brick (see DWH151, WAD034, CAL010, for example). Other examples are later in date and incorporate steel work (see Saltley Viaduct, WCS014, for an example of this type). None of these bridges are designated.
- 11.9.39 The Bordesley Viaduct (WCS030) currently serves as an approach for the railway into Moor Street station and is a prominent feature of the Digbeth, Deritend and Bordesley High Streets conservation area, recognised by its classification as a Grade B locally listed building. The viaduct was constructed in 1845 shortly before the creation of the London and North Western Railway (LNWR). Although the original line into Curzon Street was never completed, it was later extended to the north to a new terminus at Snow Hill that opened in 1852. The North London line viaduct (CAM017) was constructed in 1850 in conjunction with an extension to link with the LNWR line at Chalk Farm and was widened in 1871 to handle four tracks.

- 11.9.40 A number of small branch line and suburban stations are due for demolition along the length of the line. This includes Primrose Hill station (CAMo48), Calvert station (CAL 008) and Newton Purcell station (NPBoo4). Both Calvert and Newton Purcell had domestically scaled buildings; those at Calvert were in a mildly Jacobean style, and seem characteristic of mid- to late-19th century station buildings of their size. Primrose Hill had highly decorative platform canopies and a small station building, in common with many of London's suburban stations. Each of these stations closed during the 20th century as part of rail rationalisations (there were waves of these closures at the time of the Beeching report in 1963, and then again at the privatisation of British Rail in 1994). Each of the stations survive in a partial state with their extant buildings converted to commercial or domestic usage.
- 11.9.41 A Grade B locally listed signal box in Washwood Heath (WCS009) was constructed in 1895, the last surviving example in its original form of six established to control traffic entering and leaving the sidings. The box is of a typical Midland Railway design with a weatherboarded lower level and glazed upper level.
- 11.9.42 A number of subsidiary buildings associated with the railway are scheduled for demolition along the length of the line. These include several late 19th and early 20th century carriage sheds, warehouses and depot buildings: Coburg St. Railway Warehouse of 1895 (Euso29), Granby Street Carriage Shed of c.1905 (EUSo38) and the Old Oak Common Depot of 1905 (KIL105). Although several of these have some architectural pretention (for example, the office windows of the Granby Street Warehouse have decorative treatment), they are all of late date and a broadly standardised design. At the Birmingham end the remains of the pumping station at Curzon Street station (WCS072) are also scheduled for demolition. The hydraulic pumping station provided power for lifting equipment and other machinery within the goods station yard. Most of this building, including a substantial chimney, has already been demolished. The small remaining section houses an electricity substation and is of minimal architectural interest.

Examples of rural industry along the route

- 11.9.43 Rural industry is also represented along the route of Phase One of HS2. Water or wind-driven mills were often the primary source of power in the countryside and several remain, including a prominent example in Quainton village (WADo23) and the water-powered Cuttle Mill (CWMo21) near Middleton, which was still in use into the early 20th century. Although many have since been demolished, a vast number have been identified through documentary evidence across the route.
- 11.9.44 In the Hints and Weeford area, a long history of metalworking is visible through two forges (DHW126 & DHW121) recorded from the 16th century and a later 17th and 18th century slitting mill (DHW134), which may have operated in conjunction with a hammer mill and forge.
- 11.9.45 In some cases quarries are found alongside other features associated with the industry they were supporting. Clay and sand pits are recorded close to a brickworks (CAMo37) and kiln south of Hunts Green while extraction pits and kilns are recorded close to Upper South Farm near Quainton (WADo35). At Middle Grove Farm (CCo41), South Heath, former clay pits, a brickworks, a chalk pit and a chalk mine are all found in close proximity to each other.

Urban character and development

General trends

- 11.9.46 London and Birmingham represent the most significant urban growth in the period, with the construction of housing (in the centres and suburbs) and industrial buildings as well as transport infrastructure.
- 11.9.47 In the central and north-west areas of London the majority of development during the late 18th and 19th century was focused on providing housing for the ever-increasing middle class. Rapid urban development is visible from cartographic sources with Rocque's 1762 map of London showing the focus of this development centred on a New Road, now Euston Road, and spreading from the Bloomsbury area to the south.
- 11.9.48 The city of Birmingham developed considerably during this period and established itself as a manufacturing centre and commercial hub aided by the development of canals and railways that transported fuel, raw materials and finished products. Other than water, clay and sand, Birmingham is notoriously deficient in resources such as coal, metal ores and minerals. Urban growth followed the release of estates on which roads were laid out and houses constructed. Entrepreneurialism and a long-established manufacturing tradition also contributed to Birmingham's growth (Stephens 1964; Hopkins 1989). Areas of east Birmingham were developed through the construction of factories and industrial works, along with the housing and amenities required to support the working population. By the 18th century the city had become a centre of innovation, with learned individuals attached to the Lunar Society advancing knowledge through their experiments in the fields of science, technology and medicine (Jones 2009). Birmingham was noted for its diversity of industry and highly skilled and specialised workforce, which contrasted to the low-paid, unskilled labour used elsewhere (*ibid.*).
- 11.9.49 The increasing requirement for raw materials for construction and production is evident in the number of areas along the route where quarries and extraction pits from the 18th and 19th centuries are recorded. Although similar activities took place during the 16th and 17th centuries, such instances were often small scale and are poorly documented (Whyte 1999).

Examples of urban development along the route

- 11.9.50 Within the Euston station and approach study area (CFA01), surviving early townscape features include the early 19th century Georgian villas on Regents Park Road within the scheme. The townscape within the scheme is characterised by Euston station and associated infrastructure, dating from the 19th and 20th centuries, Victorian terraces, and the 19th to 20th century Camden Town.
- 11.9.51 At Camden Town 18th to 19th century residential and commercial areas developed alongside canal and railway infrastructure (CFA2). Regent's Canal dating from 1816 was significant in the development of Camden Town, for example. During the 19th century the Camden Goods Yard developed. The North London Line, constructed between 1846 and 1851, extends through the study area on viaduct.
- 11.9.52 At Primrose Hill and Kilburn (CFA03), the historic landscape is characterised by significant suburban expansion of London from the 19th century and the development of railway

infrastructure. Notable 20th century development includes the 1960s Alexandra Estate (conservation area).

- 11.9.53 Farther north within Kilburn (Brent) to Old Oak Common (CFA 4), the development of significant transport routes is represented by railway infrastructure, particularly around Old Oak Common. Suburban development is characterised by 19th century planned estates at Kilburn, Queen's Park and North Kensington. Residential and industrial development characterises the areas west of Wormwood Scrubs and Old Oak Common constructed from the early 20th century onwards, including significant development during the interwar years.
- 11.9.54 The construction of the railway terminus at Curzon Street in Birmingham led to the establishment of new industries around it, along with a significant number of public houses, including the Eagle and Tun (WCS034), providing entertainment for the growing population in the area. The monumental former Curzon Street station building, dating from 1838, would have also formed an imposing structure within the townscape (WCS041) and is Grade I listed. Extensive goods yards and associated buildings would also have changed the character of the area in the 19th century. Much of the associated infrastructure at Curzon Street has, however, been demolished and removed.
- 11.9.55 By the mid-19th century areas in the east of Birmingham like Saltley and Washwood Heath were becoming more industrialised. Their proximity to the railway lines led to the establishment of a carriage works (the remains of which are still visible) by Joseph Wright in 1844, which due to its success employed 1,200 men in 1862 (WCS003; Metcam.co.uk 2015). The Wolseley Motor Works were also established in 1889, continuing in use into the 20th century.
- 11.9.56 Birmingham Interchange and Chelmsley Wood (CFA24) are located at the eastern edge of Birmingham and characterised by extensive suburban, industrial and commercial development alongside motorway and rail infrastructure, but also include pockets of surviving rural landscape. Similarly, Castle Bromwich and Bromford (CFA25) are predominantly urban and suburban in character and include extensive interwar and post-war residential developments. Post-war industry is focused upon linear transport corridors, including the Derby to Birmingham railway and the M6 and areas alongside the River Tame.

Examples of urban built heritage along the route

- 11.9.57 Many residential buildings, predominantly of the 18th and 19th centuries, are located along the Phase One HS2 route, as well as a number of public houses of the same era. Earlier examples of domestic buildings include late Georgian housing terraces in the vicinity of Euston (see, for example, the Georgian terraces within the EUS023 asset grouping and EUS27). These were constructed following the laying out of Euston Road in 1756. From completion, Euston Road was a major thoroughfare. It was the main link between Islington and Paddington, both burgeoning communities, but it was mainly lined with handsome terraced houses separated from the road by long, private and communal gardens, such as those at Euston Square. The character of the road changed dramatically in the 19th and 20th centuries; it is now largely lined with large commercial and institutional buildings. A number of industrial, commercial and institutional buildings are scheduled for demolition in the vicinity of Euston, reflecting the mix of land uses and built form concentrated near the main railway termini in London. These include the National Temperance Hospital, instituted for the care of people who had

foresworn alcohol, and a former printing works now incorporated into the Thistle Hotel (both within EUSo14).

- 11.9.58 Away from Euston building age tends to reduce, reflecting the outward concentric growth of London. The residential buildings in Kentish Town, for example are mid and late Victorian semi-detached and terraced properties (such as CAMo36). These buildings also illustrate the increasing desire for the expanding middle classes to move outwards (exceptions to this include heavily modified older properties lining main roads, see CAMo74, for example).
- 11.9.59 Three urban pubs are scheduled for demolition: the Bree Louise in Euston, London (EUSo23) and the Eagle and Tun (WCSO34) and Fox and Grapes (WCSO51), both in Birmingham. The Fox and Grapes has fabric dating to the 18th century and the Bree Louise was partially reconstructed following Second World War bomb damage, but all three pubs date largely from the 19th century. Public houses grew in scale, complexity and number throughout the 19th century, illustrating the increasing respectability of public alcohol consumption during this period and the commercial expansion and proliferation of the major breweries. Each of the pubs illustrates this trend. The Fox and Grape's elaborate shopfront and leaded glass, shown on old photographs, and the complex Romanesque brickwork of the Eagle and Tun, suggest that both pubs were modest examples of 'gin-palace' establishments; a type of aspirational and lavishly decorated drinking establishment that flourished in the later 19th century urban centres. It should be noted that the Fox and Grapes has been significantly damaged by a recent fire.

Burial grounds along the route

- 11.9.60 With the large increase in population during the post-Medieval period came high mortality rates as conditions in the large towns and cities were often unsanitary and the workplaces dangerous. Along the route of Phase One of HS2 are three burial grounds. The rural cemetery at Stoke Mandeville is thought to contain Medieval and post-Medieval burials, and the burial grounds at St. James's Gardens, London and Park Street Gardens, Birmingham contain post-Medieval burials.
- 11.9.61 In 18th century Birmingham the three existing burial grounds had become overcrowded, so in 1772 an act was passed to build two new chapels to ease the pressure on St. Martin's Church. By 1807 further land was required, leading to the purchase of land in Park Street (WCSO48) in 1807, with the resulting burial ground thought to contain thousands of burials (Showell 1885). Given the distance from St. Martin's, it has been suggested that the burial ground at Park Street is likely to contain individuals from the lower classes (Brickley 2006). The burial ground at Park Street, within the area of the Proposed Scheme, was given over to recreational use as early as 1880 and parts of the cemetery were taken up for the widening and reconfiguration of streets.
- 11.9.62 St. James's Gardens (EUSO40) in London was the site of a late 18th and 19th century burial ground used by the parish of St. James's Piccadilly with the land purchased in 1788-9. The burial ground was in use from 1790 to 1853, with estimates suggesting the number of burials to be between 50,000 and 61,050. This included numerous notable burials from the upper echelons of society such as high-ranking individuals from the military and clergy.

- 11.9.63 In contrast to these newly created post-Medieval burial grounds, in Stoke Mandeville, Aylesbury the burial ground associated with the now demolished St. Mary's Church (SMA003) may have been in use from the Early Medieval period, although it was only closed in 1908 and contains burials interred during the post-Medieval period. Both St. James's and Park Street were turned into public gardens in 1887 and 1927 respectively, while the burial ground at St. Mary's is part of a larger area of archaeological features associated with its deserted Medieval settlement.

Conclusions

- 11.9.64 The post-Medieval period saw a major change in the way Britain operated in both rural and urban areas. The complete enclosure of the former Medieval open field system and the introduction of the extensive infrastructure networks of the canals and railways drastically modified the rural landscape. The canals and railways allowed for the mass transport of goods and people while the enclosure of fields allowed for greater control over the agricultural landscape and its associated economy. In the towns and cities the effects of the industrial revolution led to an influx of people in search of work and a dramatic increase in the number of houses, public institutions and services, factories and industrial buildings. The route will pass through three cemeteries, developed in this period to meet the growing needs of an urban population, and of a more rural but developing settlement in Stoke Mandeville.

11.10 Modern period (1900-present)

Overview

- 11.10.1 The modern period in Britain, 1900-present, has often been overlooked archaeologically due to the quantity of documentary evidence available for study. Yet there are numerous remains which provide important information and context to the events of an often-tumultuous period. The modern period is often largely defined by the two major conflicts which occurred in the first half of the 20th century, not only as a result of their direct consequences but also through the social changes brought about after hostilities had finally ceased. Following the industrialisation of the late 18th and 19th centuries, Britain had changed considerably in a relatively short period of time. Generally, the first decade of the 20th century continued in much the same vein, with towns and cities continuing to expand as more and more people moved to work in the industrialised centres. After the events of the First World War, the Great Depression and the Second World War the country changed again, with the second half of the century defined by the provision of social services such as the National Health Service and council houses as well as rapid technological advances. Unlike any other, the modern period offers the potential to collect and interrogate primary sources in the form of eyewitness accounts. These have been used with great success in considering the great conflicts of the modern period. In conjunction with documentary sources and archaeological data, eyewitness accounts have the potential to further elucidate our understanding of other aspects of the period.

First World War

- 11.10.2 The First World War had a dramatic effect on the country as industrial warfare took its toll on a generation of young people and their families. However, there are few assets along the route that can trace a direct association to the First World War. Harefield House served as an

auxiliary hospital for the Australian Army with over 100 of the men who died there buried in the graveyard at the Church of St. Mary (CVA062). Several large houses were also used as hospitals in the Balsall Common area including The Rectory at Berkswell (CFA23). Denham Aerodrome (CVA040) was first used for flight training in 1915 with the nearby Marish Farm (CVA049) used as the commanding officer's quarters. In 1915, an airfield was established at Northolt (RU1010), later Royal Air Force (RAF) Northolt, and served as a base for fighters tasked with protecting London from Zeppelin bombing raids. In 1917, RAF West Ruislip (RU1011) was established as the primary aircraft stores depot for the Royal Flying Corps (RFC) due to its position close to several railway lines.

- 11.10.3 In many cities, towns and villages across the country the most visible reminders of the First World War are memorials, such as the Grade II* listed memorial in Euston Square Gardens (EUS004).

Interwar development

- 11.10.4 During the interwar years significant development occurred across the country. Following the end of the First World War several Housing Acts were passed, which aimed to clear the Victorian slums to provide 'Homes fit for Heroes'. The Grade II listed blocks of flats that form the Caledonian Estate (CAM007) built c.1905 are an early example of council development in response to the deterioration of housing stock. In Birmingham the slum clearance had to be stopped in the 1930s because of a shortage of housing stock.
- 11.10.5 In the Northolt Corridor, the character of the area was defined in the 1930s with the construction of residential and industrial buildings, which included a brewery for Guinness (NOR074) and the Hoover Factory (NOR026) with several now listed buildings including the Grade II* canteen block built in 1938. The Castle Bromwich aircraft factory (CB058) was established on the site of an aerodrome that had been founded in 1909 and requisitioned for use by the RFC in 1914. In 1936, the Air Ministry acquired land adjacent to the aerodrome on which it constructed the factory that built 59% of the Spitfires used during the war. Many other factories, like the former Morris Commercial plant (WCS085 & WCS086), were used to produce material for the war effort. In other cases, production was shifted outside of the urban areas, evidenced in the construction of an explosives factory in the Northolt area (NOR067), although its exact location is unknown.

Second World War

- 11.10.6 A number of military establishments along the route, the majority of which were RAF airfields, were established either immediately before the war in 1939 or during the war itself. RAF Westcott (WAD091) and RAF Lichfield (WHA316) were both used to train crews of Wellington bombers with operational missions flown from Lichfield between 1942 and 1943 including to Cologne in May 1942. RAF Chipping Warden (GLB036) and RAF Turweston (NPB054) were also used as Bomber Command Operational Training Units, while RAF Finmere (WAD107) trained aircrews to fly Mosquito fighter-bomber aircraft.
- 11.10.7 Other Second World War assets include Hartwell House (SMA050), which was used for quartering troops for the D-Day invasion in 1944, Greatworth Park transmitter station (GLB036), a prisoner-of-war camp established at Sedrup (SMA043) for captured Italian soldiers and various defensive installations such as pill boxes and anti-aircraft batteries.

Post-war rural and urban change

- 11.10.8 With the onset of rationing during the Second World War, which continued into the 1950s, there was a sudden need to produce more food, which resulted in more intensive agricultural exploitation and an overall expansion of the area used for arable farming (Williamson *et al.* 2002). The use of tractors and combine harvesters, in conjunction with advancements in the production of chemical fertilisers, led to the removal of many field boundaries to allow the efficient and effective application of modern farming techniques (*ibid.*). The effect of this post-war field amalgamation was the creation of large prairie-type fields with the remnants of the former field systems found across the route as former field boundaries, often identified through non-intrusive surveys such as geophysics or LiDAR. These changes had a considerable impact on the character and appearance of the landscape across the country.
- 11.10.9 After the end of the Second World War a period of rebuilding and regeneration began. Many urban areas had suffered significant bomb damage, which led to widespread clearance of affected buildings including many in Somers Town (EUS019) and in Birmingham where some 3,000 houses had been destroyed. In the mid-1960s, Euston station (EUS005) was demolished and replaced, while in Camden the Grade II* listed Bevin Court (CAM003) was constructed at the same time as a large council estate within the Priory Green conservation area (CAM004). In many urban areas the housing problem was solved by high-rise schemes; however, some of the new council building projects were more ambitious. The Alexandra Road Estate (PRM021), designed by the architect Sydney Cook, is considered one of the borough's most innovative housing schemes from this period.
- 11.10.10 This pattern was repeated across the country with several 'new towns' constructed in the east of Birmingham in areas such as Duddeston and Nechells, while new estates were constructed in towns like Aylesbury, expanding the settlement outwards from its core.

Conclusions

- 11.10.11 The modern period is unsurprisingly dominated by the two expansive, global conflicts that took place in the 20th century, and the significance of these events as defining points of the period cannot be understated. However, the social changes that occurred as a reaction to the conflicts are often under-represented but were of great importance in the development of the period. The provision of large areas of social housing on the edges of towns and cities, along with the establishment of 'new towns', are perhaps the most visible changes to the urban and rural landscape. The modern period allows for a synthesis of sources and evidence bases not afforded to other periods. Evidence from primary sources in the form of eyewitness accounts provides an invaluable resource that must be comprehensively integrated into any suite of work considering the period.

12 References and external guidance

12.1 Introduction

12.1.1 The following lists relevant documentation referred to in the Resource Assessment and relevant external guidance referred to in the GWSI: HERDS and other PRS documentation.

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Appendix A

Review of national and regional agendas

Introduction

The following comprises a summary of the national and regional research agenda, identifying the principal research priorities. The table below identifies the research agendas which intersect with the HS2 route and which have been summarised. A review of the common themes within the national research agendas is presented followed by a summary of both national and regional research priorities by archaeological and historical period. A synopsis of key/shared themes is given at the end of each period section.

REGION / TOPIC		DOCUMENT	URL
Northamptonshire	East Midlands	Cooper, N.J. (ed.) 2006. <i>The Archaeology of the East Midlands: An Archaeological Resource Assessment and Research Agenda</i> . Leicester Archaeological Monographs 13.	https://content.historicengland.org.uk/images-books/publications/archaeology-east-midlands/em-res-framework.pdf/
		Knight, D., Vyner, B. and Allen, C., 2012. <i>East Midlands Heritage. An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands</i> . University of Nottingham.	https://www.historicengland.org.uk/images-books/publications/east-midlands-heritage/
Hertfordshire	East of England	Glazebrook, J. (ed.), 1997. <i>Research and Archaeology: A Framework for the Eastern Counties, 1, resource assessment</i> . East Anglian Archaeological Occasional Paper 3.	http://www.english-heritage.org.uk/publications/eastern-counties-framework-resource-assess/
		Brown, N. and Glazebrook, J. (eds.), 2000. <i>Research and Archaeology: A Framework for the Eastern Counties, 2, research agenda and strategy</i> . East Anglian Archaeology Occasional Paper 8.	https://www.historicengland.org.uk/images-books/publications/eastern-counties-framework-agenda/
		Medlycott, M. (ed.), 2011. <i>Research and Archaeology Revisited: a revised framework for the East of England</i> . East Anglian Archaeology Occasional Paper 24.	https://www.historicengland.org.uk/images-books/publications/revised-framework-east-of-england/
Staffordshire	West Midlands	Watt, S. (ed.), 2011. <i>The Archaeology of the West Midlands. A Framework for Research</i> .	http://archaeologydataservice.ac.uk/archives/view/wmrrf_he_2016/download_s.cfm
Warwickshire			
West Midlands			
Oxfordshire	South East	Hey, G. and Hind, J. (eds.) 2014. <i>Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas</i> . Oxford Wessex Monograph No. 6.	https://library.thehumanjourney.net/2597/
Buckinghamshire			

REGION / TOPIC		DOCUMENT	URL
Greater London	London	Museum of London, 2000. <i>The archaeology of Greater London: an assessment of archaeological evidence for human presence in the area now covered by Greater London.</i>	http://www.mola.org.uk/sites/default/files/downloads/The archaeology of Greater London an assessment of archaeological evidence for human presence in the area now covered by Greater London_Part1.pdf
		Museum of London, 2002. <i>A Research Framework for London Archaeology.</i> (Currently being revised)	https://archaeologyinlondon.files.wordpress.com/2016/04/research-framework-for-london-archaeology-mola-2002.pdf
Prehistoric		English Heritage, 2010. <i>Research Strategy for Prehistory Draft consultation.</i>	https://content.historicengland.org.uk/content/docs/research/draft-prehistoric-strategy.pdf
Palaeolithic/Mesolithic		English Heritage, 2008. <i>Research and Conservation Framework for the British Palaeolithic.</i>	http://www.historicengland.org.uk/images-books/publications/research-and-conservation-framework-for-british-palaeolithic/
Mesolithic		Blinkhorn, E. and Milner, N. 2013. <i>Developing a Mesolithic Research and Conservation Framework. Resource Assessment.</i>	http://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-1632-1/dissemination/pdf/Resource_Assessment_2013-10-05.pdf
		Blinkhorn, E. and Milner, N. 2013. <i>Mesolithic Research and Conservation Framework 2013.</i>	http://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-1632-1/dissemination/pdf/MRF_complete.pdf
Iron Age		Haselgrove, C. et al., 2001. <i>Understanding the British Iron Age: an agenda for action.</i> Prehistoric Society Wessex Archaeology.	http://www.personal.reading.ac.uk/~lascrctn/IAAgenda.htm
Iron Age and Romano-British		James, S. and Millet, M. (eds.), 2001. <i>Britons and Romans: advancing an archaeological agenda.</i> CBA Research report 125.	http://archaeologydataservice.ac.uk/archiveDS/archiveDownload?t=arch-281-1/dissemination/pdf/cba_rr_125.pdf
Romano-British		English Heritage, 2012. <i>Research Strategy for the Roman period historic environment.</i>	http://content.historicengland.org.uk/content/docs/research/rm-res-strat-1202-v22.pdf
Medieval		Medieval Settlement Research Group, 1996 (Revised 2007). <i>MSRG Policy Statement.</i>	http://medieval-settlement.com/about/policy/
Industrial		English Heritage, 2010. <i>A Thematic Research Strategy for the Historic Industrial Environment.</i>	http://content.historicengland.org.uk/content/docs/research/industrial-research-strategy.pdf

REGION / TOPIC	DOCUMENT	URL
Urban Environment	English Heritage 2010. <i>A Thematic Research Strategy for the Urban Historic Environment.</i>	http://content.historicengland.org.uk/content/docs/research/draft-urban-strategy.pdf

National research agendas: common themes

Overview

This section presents a brief synopsis of the various national research frameworks that have been produced to coordinate and focus research across a broad spectrum of topics.

Each of the national research frameworks covers a particular archaeological period or theme, such as the industrial environment or Roman pottery. As a result, there are inevitably many individual themes, questions or priorities that are specific to the individual focus of each research framework. However, there are also many areas of consensus in terms of the overarching objectives and recommendations set out by the national research frameworks.

People and society

The priorities set out in the national research frameworks address a wide variety of aspects of past societies, such as:

- Social organisation and complexity:
 - ‘Is it possible to understand social organisation in the Mesolithic better? For instance, group sizes and population density’ (Milner and Blinkhorn 2013, 23)
 - ‘Characterising the size and social structure of human groups’ (during prehistory) (English Heritage 2010a, 30)
 - ‘Explaining later prehistoric social and political change’ (English Heritage 2010a, 30)
- Funerary beliefs and practices:
 - ‘How did the living treat the dead?’ (during the Mesolithic) (Milner and Blinkhorn 2013, 23)
 - ‘The place and role of the dead in prehistory’ (English Heritage 2010a, 30)
 - ‘Routine dating of unaccompanied burials would enable more thorough exploration of issues surrounding Iron Age funerary practices. Even an absence of Iron Age dates from such a programme would be of value in enhancing the credibility of interpretations based on exposure burial and related rites’ (Haselgrove *et al.* 2001, Section B2.2.4)
- Health and diet:
 - ‘Eating and drinking in prehistory’ (English Heritage 2010a, 30)
 - ‘What did people eat and how varied were their diets?’ (during the Mesolithic) (Milner and Blinkhorn 2013, 23)
 - ‘What was the health of people at this time?’ (during the Mesolithic) (Milner and Blinkhorn 2013, 23)
- Population, demography and ethnic, social and cultural identities:
 - ‘What was the genetic relationship between Mesolithic human populations, their predecessors and successors?’ (Milner and Blinkhorn 2013, 23)

- 'Identifying ethnic and cultural diversity in the population of Roman Britain' (English Heritage 2012, 21)
- 'Interpreting social identity and personhood' (during prehistory) (English Heritage 2010a, 30)
- 'Understanding migration and mobility (e.g. through isotope studies)' (English Heritage 2010a, 30)

Perspectives on landscape and settlement

Questions relating to landscape and settlements also figure prominently among the priorities set out in the various national research frameworks:

- Settlement morphologies:
 - 'To what extent can the composition, size and geographical characteristics of lithic scatters be used to define different types of site in the Mesolithic?' (Milner and Blinkhorn 2013, 22)
 - 'Understanding the causes and consequences of changes in settlement patterns' (English Heritage 2010a, 28)
- Mobility vs. sedentism, transience vs. permanence of occupation:
 - 'What do lithic provenancing studies and trace element analyses of organics tell us about settlement systems and land-use strategies?' (during the Palaeolithic) (English Heritage 2008, 11)
 - 'How did mobility strategies develop from the Late glacial to the end of the Mesolithic?' (Milner and Blinkhorn 2013, 22)
 - 'Understanding the nature of settlement, particularly c.4000-1500 BC' (English Heritage 2010a, 28)
 - 'Linking settlement patterns and subsistence regimes' (e.g. pastoralism) (English Heritage 2010a, 28)
- Land use:
 - 'Investigating the origins and purpose of land division' (during prehistory) (English Heritage 2010a, 28)
 - 'Understanding human exploitation of different landscape zones' (during prehistory) (English Heritage 2010a, 28)
 - 'More research is required on how the different components of Iron Age societies were organised spatially and seasonally across the landscape' (Haselgrove *et al.*, 2001, Section C3)
- The development of urban centres:
 - '...exploring how, why and when English towns assumed 'modern' forms in the post-Medieval period, leading to new understanding of urban development and significance' (English Heritage 2010c, 23)
- Political and ritual landscapes in prehistory, including patterns of territoriality:
 - 'Can patterns of territoriality be distinguished?' (during the Mesolithic) (Milner and Blinkhorn, 22)
 - 'Understanding the emergence of territories and polities' (English Heritage 2010a, 28)
 - 'Understanding monument complexes, their environs and 'catchments'' (English Heritage 2010a, 28)
- The development of transport and infrastructure networks:
 - 'Investigating the development of routes and roads' (in prehistory) (English Heritage 2010a, 28)
 - 'Investigating the development of routes, trackways and roads' (during the Romano-British period) (English Heritage 2012, 21)

- ‘Over the last three centuries improvements in inland transport systems have impacted greatly on the location and pattern of industry and associated settlements and are an integral part of the study of both industrial and urban landscapes ... Similarly the provision, distribution and consumption of energy and clean water has also impacted greatly these landscapes. They are therefore all deserving of study in their own right’ (English Heritage 2010b, 17)
- Domestic architecture:
 - ‘What is the range and nature of structural remains? How were structures built, how were they used, and did these features change through space and time?’ (during the Mesolithic) (Milner and Blinkhorn 2013, 22)
 - ‘Understanding domestic architecture and how it was inhabited’ (English Heritage 2010a, 29)
 - ‘Further research is required on regional differences in Iron Age house organisation...’ (Haselgrove *et al.*, 2001, Section C3)

Economy

The national research frameworks highlight various aspects of economic practice that are regarded as needing further research. Many of the outstanding questions relating to patterns of production, distribution and consumption overlap with other themes, such as landscape perspectives, society, regional variation and settlement. Some examples of research priorities concerned with economy include:

- Subsistence:
 - ‘How did subsistence practices and diet change through time and space?’ (during the Mesolithic) (Milner and Blinkhorn 2013, 25)
- Material culture:
 - ‘Investigating lithic, groundstone and pottery production, use and exchange’ (English Heritage 2010a, 29)
 - ‘Understanding the extraction and production of metals’ (English Heritage 2010a, 29)
 - ‘More research is needed on primary production sites of all kinds, and on the distribution of finished products’ (Haselgrove *et al.* 2001, Section D4)
- Industrialisation:
 - ‘Understanding early industry and its organisation and the evidence of early trade and transfer of technology. The investigation of the remains of early industries such as the extraction and smelting of metals and the production of salt and ceramics from the Anglo-Saxon period onwards, through the ‘first industrial revolution’ in Medieval times with the widespread adoption of water-power and the introduction of the blast furnace, is crucial to the understanding of the evolution of the industries that in the post-Medieval and modern periods were to lead to widespread industrialisation and trigger far-reaching social change’ (English Heritage 2010b, 15)
 - ‘Investigating the remains of 16th, 17th and early 18th century industries’ (English Heritage 2010b, 16)
 - ‘The impact of extractive industries on the landscape – coal, metal and other mineral mining’ (English Heritage 2010b, 16)
 - ‘Manufacturing and the rise of industrial towns and cities’ (English Heritage 2010b, 16)

Geographical diversity

Understanding observable patterns in regional and intra-regional diversity is a key priority identified in many of the national research frameworks. Differentiating between genuine aspects of diversity in the past and patterns resulting from artificially imposed biases is clearly a matter of some importance in this

regard (see below). Several of the national research frameworks also emphasise the importance of placing the evidence from British sites into a national and international context (e.g. English Heritage 2008, 10-11).

Examples of specific areas prioritised for future research include:

- 'Identifying change through the Mesolithic at national and regional scales' (Milner and Blinkhorn 2013, 20)
- 'Understanding regional variations in the appearance of different types of site' (English Heritage 2010a, 28)
- 'Understanding regional differences in artefact styles and economies' (English Heritage 2010a, 28)
- 'Understanding relations between prehistoric Britain, Ireland and NW Europe' (English Heritage 2010a, 29)
- 'Regional variations are a central feature of the British Iron Age; defining and evaluating these differences should be a core objective of future research' (Haselgrove 2001, Section E3)
- 'Characterising and modelling occupation in different regions' (during the Romano-British period) (English Heritage 2012, 21)
- 'Understanding regional differences in artefact styles and economies' (during the Romano-British period) (English Heritage 2012, 21)

Key transitions

Refining understanding of the transitions between each of the major archaeological periods and their sub-divisions is consistently cited as a priority across many of the national research frameworks (e.g. English Heritage 2008, 12; 2010, 15; 2012, 14-15, 22; Milner and Blinkhorn 2013, 23, 25; Haselgrove *et al.* 2001, Section F).

Inevitably, the difficulty in understanding these transitions is partly due to fact that the traditional framework of archaeological periods is an artificial construct imposed on the past as a convenient form of shorthand. This necessarily creates distinctions, where in fact there may have been substantial continuity, as is suspected with regard to certain aspects of the Later Mesolithic to Early Neolithic transition, or in patterns of land use during historical periods (e.g. Medieval Settlement Research Group 1996 (revised 2007), Section 3.2).

In some cases, these transitional phases are poorly understood on account of prosaic difficulties. For example, it has been noted that:

- 'The number of transitional phases flagged as priorities in national and regional research agendas suggest a widespread need for better understanding of socio-economic change and improved chronologies of different classes of sites and artefacts' (English Heritage 2010a, 15)

The scarcity of sites that span certain critical periods, such as that of the Late Upper Palaeolithic to Early Mesolithic, and the paucity of securely dated evidence from other transitional sites present particular difficulties. In other instances, substantial regional and inter-regional variations, both in terms of past societies and in levels of existing knowledge, impose barriers to understanding.

Scientific techniques and chronologies

One of the most commonly shared aspects of the national research frameworks is the call for greater realisation of the potential of scientific techniques, for example:

- '...a number of recent scientific developments have huge potential for advancing knowledge in many areas of prehistoric archaeology. In addition to dating methods (see CP2 and Theme PR4) they include various techniques for analysing human diet and mobility (e.g. stable isotopes), artefact production and exchange (petrography, metallurgical analysis) and the uses of material culture

(organic residues, microwear), as well as electronic means for the capture, presentation and analysis of spatial data (laser scanning, GIS)' (English Heritage 2010a, 15)

- 'There is great potential for aDNA studies in order to understand population history and movement of people better. Major advances have recently been made and with a developing dataset it should be possible to carry out ground-breaking research, as in other parts of Europe. aDNA analysis on animal remains should also be extended in order to understand animal demography, arrivals and extinctions' (Milner and Blinkhorn 2013, 34)
- 'Scientific analysis of all classes of artefacts is essential, not a luxury' (Haselgrove 2001, Section D4)

The wider application of scientific dating techniques, in particular, is deemed to be imperative in relation to many of the objectives outlined in the national research frameworks, such as the refining of existing chronologies, the testing of existing models and the resolution of questions pertaining to key transitional phases. For example:

- 'Multiple radiocarbon dating must become routine for Iron Age sites, even in southern England. This must be more than tokenism. All excavations should have an appropriate dating strategy from the outset and expect to address the chronological questions to which the site is capable of contributing' (Haselgrove *et al.* 2001, section B2.2.1)
- 'Dating is critical to all our endeavours in Palaeolithic archaeology' (English Heritage 2008, 13)
- 'Improving dating of poorly understood site types or monument classes' (English Heritage 2010a, 29)
- 'Other dating techniques, such as TL (Thermoluminescence) and OSL (Optically Stimulated Luminescence), should also be considered with appropriate specialist advice' (Milner and Blinkhorn 2013, 33)

The chronologies and variations in various forms of material culture, particularly lithic and ceramics typologies, are also widely acknowledged as requiring more detailed understanding, particularly in a regional context (e.g. Irving 2011; Perrin 2011; Milner and Blinkhorn 2013, 24; English Heritage 2010a, 30; 2012, 21).

Past environments

Improving existing understanding of human interactions with the environment is integral to many of the priorities enshrined in the national research frameworks.

The value of palaeo-environmental evidence is recognised as being of vital importance for understanding later prehistoric (e.g. English Heritage 2010a, 15-16, Haselgrove *et al.* 2001) and historic periods (e.g. English Heritage 2012, 21; Medieval Settlement Research Group 2007, Section 6.8). However, the reconstruction of past environments and understanding the impact of climatic variation are clearly of particular significance to the study of the Palaeolithic and Mesolithic periods.

This is reflected in the relevant national research frameworks, for example, two of the four 'Principal Themes' outlined by English Heritage (2008) in the *Research and Conservation Framework for the British Palaeolithic* are as follows: *Hominin Environments and Climate Drivers* and *Hominin Demographies: the Palaeoecology of Hominin Colonisation and Settlement Processes*. Similarly, palaeo-environmental approaches are intrinsic to two of the three Primary Research Themes outlined by Milner and Blinkhorn (2013, 20) in *Living in a Changing World* and *Investigating Change and Diversity*.

The application of multidisciplinary approaches, drawing upon the analysis of faunal remains, geoarchaeology, palynology and other sources of palaeo-environmental data, is viewed as being essential to a wide range of research priorities, such as:

- 'How much of Pleistocene time saw the presence of hominins in Britain or on the adjacent continental shelf?' (English Heritage 2008, 10); refining our understanding of the chronology of early human habitation during the Pleistocene and Early Holocene has also been established as one of the principal aims of national research programmes, such as the Ancient Human Occupation of Britain project (AHOB)
- 'What effect did Pleistocene climate change have upon British environments and faunal communities?' (English Heritage 2008, 10)
- 'How did Pleistocene faunal communities change over time, and what was the pattern of human interaction with and impact on these? (English Heritage 2008, 10)
- 'The archaeology of the routes of the pre-glacial rivers (e.g. Cromer Forest-bed, Bytham River) requires more investigation' (English Heritage 2008, 13)
- 'To what extent did environmental change impact upon Mesolithic technology and 'tool kits'?' (Milner and Blinkhorn, 2013, 21)
- 'There is a need to refine understanding of the burning episodes which occur in the Mesolithic and are attributed to human agency, with the consequent need to understand patterns of wildfire occurrence and their relationship to climatic episodes favourable for burning' (Milner and Blinkhorn, 2013, 35)
- 'Understanding human impacts on faunal and plant communities' (English Heritage 2010a, 31)
- 'Connecting palaeo-environmental sequences to archaeological chronologies' (English Heritage 2010a, 30)
- 'Dialogue is needed between researchers focusing on Iron Age societies, and those analysing plants, bones and the environment, in order to tie in agriculture and society' (Haselgrove *et al.* 2001, Section C3)
- 'Understanding the importance of environmental factors in the Roman-period occupation of Britain' (English Heritage 2012, 23)
- 'Investigating the impact of environmental factors on agriculture in Roman Britain' (English Heritage 2012, 23)

It is also widely recognised that palaeo-environmental information needs to be accompanied by accurate chronologies, and be closely integrated with the available archaeological evidence, for example:

- 'Well-dated palaeo-environmental studies should continue to be undertaken to develop understanding of the temporal and spatial scales of human interaction with the environment. These should include palaeo-environmental dating work to synchronise our chronological, environmental and archaeological records – targeted high-resolution work at coincident palaeo-environmental and archaeological sites is key' (Milner and Blinkhorn 2013, 35)

Gaps in knowledge

Understanding existing gaps in knowledge is one of the main priorities set out in the national research frameworks. In relation to the Iron Age, for example, it has been stated that:

- 'The substantial variations in current levels of knowledge between different parts of Britain seriously distort understanding of this period; efforts are needed to correct the balance and set better-known regions into proper context' (Haselgrove *et al.* 2001, Section E3)

In many instances, the nature of the evidence is simply poorly understood, as in the case of sites identified from cropmark evidence, which are often viewed as being inadequately characterised at present (e.g. English Heritage 2010a,13; Haselgrove *et al.* 2001; Section B2.2.6).

Such lacunae may have become established due to a wide range of other factors, including disparities in levels of investigation as a result of the uneven distribution of development-led fieldwork (English Heritage 2010a, 28), and historical emphases on certain regions and site types (Haselgrove *et al.* 2001, Sections B, E2.1-E2.3).

The characteristic lack of visibility of certain types of site, such as transient prehistoric occupation sites, imposes substantial difficulties in identifying them. Differential preservation also plays a significant role in shaping the archaeological record, as is often demonstrated by recovery rates of various types of material culture; ceramics and lithics typically dominate assemblages recovered from sites which lack anaerobic conditions.

That certain types of activity are more liable to have left behind tangible archaeological signatures may also erroneously influence interpretations. For example, the lack of discernible prehistoric field systems in some regions may reflect the favouring of pastoralism, rather than an absence of economic activity.

Post-depositional processes have also conspired to obscure archaeological remains in certain environments, such as where sites have become sealed by colluvium or alluvium, or where these have been concealed, disturbed or entirely eradicated by subsequent development or other geomorphological processes. The apparent paucity of evidence for early hominin activity in the West Midlands, for example, may be as a result of Pleistocene strata becoming deeply buried by thickly accumulated deposits, or destroyed by subsequent glacial scouring.

Identifying and accounting for artificial and inherent biases in the archaeological record is therefore acknowledged as a key priority in practically all of the national research frameworks.

National and regional research agendas

General themes

- regional and intra-regional variations;
- transitions between periods;
- wider application of scientific methods;
- value of palaeo-environmental/geomorphological/palaeoecological/palaeoclimate investigations; and
- dissemination of information and engagement with the public.

PALAEOLITHIC – The national agenda

English Heritage, 2008. *Research and Conservation Framework for the British Palaeolithic*, 28-33

Landscape perspectives

- moving beyond the prehistoric site: developing landscape perspectives;
- political and ritual landscapes in prehistory;
- integrating prehistoric research across different landscape zones;
- understanding biases in prehistoric data and distributions;
- addressing gaps in the prehistoric record;

- regional diversity in prehistory;
- mobility and sedentism in prehistoric agricultural societies;
- submerged prehistoric landscapes; and
- reconstructing Pleistocene and Early Holocene landscapes.

Innovative studies of sites and monuments

- characterising and contextualising prehistoric sites and monuments;
- intra-site studies in prehistory;
- new approaches to the classification of prehistoric sites and monuments;
- understanding and protecting prehistoric caves, rock shelters and mines;
- addressing the needs of prehistory in developer-funded archaeology;
- understanding ploughsoil archaeology; and
- supporting heritage protection reform in relation to prehistoric sites of special interest.

Understanding prehistoric society

- linking different regions of Britain, Ireland and north-west Europe in prehistory;
- technology and society in prehistory;
- prehistoric material culture in context;
- long-term themes in prehistory;
- place and role of the dead in prehistory;
- eating and drinking in prehistory;
- prehistoric communities and individuals; and
- developing theoretical perspectives for prehistory.

Critical approaches to key transitions in prehistory

- key transitions in prehistory; and
- building chronologies for prehistory.

Realising the full potential of scientific techniques

- developing high-quality experimental archaeology projects for prehistory;
- developing dating techniques for prehistory;
- developing scientific techniques for prehistory;
- developing survey and prospection techniques for prehistoric sites and landscapes; and
- developing quantitative and spatial methods for prehistory.

Understanding human interactions with the environment

- human responses to environmental change in prehistory;
- human interactions with the environment in prehistory; and
- managing the prehistoric environmental resource.

Responding to changing environments

- multi-agency approaches to conservation and monitoring of prehistoric sites and landscapes;
- establishing priorities for protection of prehistoric sites;
- understanding the impact of changing climate and land use on prehistoric sites;
- assessing risks to prehistoric sites and landscapes and developing conservation strategies; and
- evaluation and investigation of threatened prehistoric sites outside the planning process.

Integrating research and building partnerships

- publishing key backlog prehistoric sites and assemblages;
- realising the potential of prehistoric archives and collections;
- synthesising unpublished prehistoric data;
- building research links for prehistory with other parts of Britain, Ireland and Europe;
- identifying and addressing gaps in the research framework process for prehistory;
- researching training needs in prehistoric archaeology; and
- making Historic Environment Records (HERs) and related resources more accurate, relevant and useful for prehistory.

Raising profiles

- establishing the socio-economic values of prehistory;
- gauging and responding to perceptions of prehistory;
- engaging people with prehistoric research to build awareness and enthusiasm;
- teaching prehistory to children and adults; and
- innovative presentation methods for prehistoric sites.

Museum of London, 2002. *A Research Framework for London Archaeology*, 87

- 'Absolute dating should be routine on all prehistoric sites'.

LOWER AND MIDDLE PALAEOLOGIC

Ancient Human Occupation of Britain (AHOB)

http://www.ahobproject.org/AHOB/key_questions.html

General themes

- record of human dispersal;
- natural factors controlling human dispersal;
- population dynamics; and
- human responses.

AHOB Phase One

700,000-500,000 years: The nature and timing of the first occupation of Britain

- When did humans first reach Britain?
- To what environments were humans adapted?
- What is the nature of the lithic record?

400,000 years: The Hoxnian interglacial

- What environments did humans target and in what environments are they absent? Can we reconstruct a generalised habitat preference?
- How are humans using the landscape and its resources?
- How did humans make a living (for example, what animals are they exploiting and how are they obtaining these animals; what plant resources might have been available)?
- What can these sites tell us of human landscape use?
- Are there any chronological or spatial patterns evident in the lithic records of this period? If yes, what do these mean and with what might they correlate?

300,000-180,000 years: The Lower-Middle Palaeolithic transition

- How old are the first Levallois technologies in Britain?
- Can the appearance of Levallois be linked to any external environmental or habitat changes?
- Are these technologies intrusive, or, as the evidence from Purfleet would suggest, can we demonstrate an *in-situ* evolution from pre-existing technologies?
- What do these technologies indicate in terms of cognition and organisation?
- Given that in the Late Middle Palaeolithic (70,000-35,000 years ago) of south-west France, Levallois technology seems to be more highly transported and curated and made on further travelled flint, do the earliest Levallois technologies herald new behavioural or economic repertoires, or is it just a technological shift?

180,000-60,000 years: Middle Palaeolithic population collapse

- Is the apparent absence of humans real or due to differential preservation?
- What environmental and landscape changes may have led to Britain's depopulation?

60,000-22,000 years: Repopulation at the end of the Middle Palaeolithic and transition to the Early Upper Palaeolithic

- What is the dating of recolonisation and was it continuous or sporadic?
- Was recolonisation driven by population expansion in Europe or biogeographic or climatic change?
- What is the nature of the late Neanderthal settlement, in terms of habitats, lithic technology, landscape use and environments?
- When did the first fully modern humans arrive in Britain and with what technology are they associated?

22,000-13,000 years: Human absence: The Dimlington Stadial faunal interzone

- Were humans present in Britain between 22,000-13,000 years ago?
- What is the terminal date for the Pin Hole mammal assemblage zone (MAZ) in Britain?
- Was there a faunal interzone – a period in which there is genuinely no vertebrate fossil record – and, if so, what was its duration?

13,000-8,800 years: Recolonisation after the last glacial maximum

- What drove the late glacial recolonisation of Britain and into which habitats did humans move?
- What evidence is there for regionality in the archaeological and faunal record for this period and how were humans moving within the landscape?
- Can seasonal patterns of movement be recognised?
- What is the distribution of the Early Mesolithic record in England and Wales?

English Heritage, 2008. *Research and Conservation Framework for the British Palaeolithic*, 10-21

Principal themes

- hominin environments and climate drivers;
- hominin demographics: the palaeoecology of hominin colonisation and settlement processes;
- how we became human: social, cultural and economic change; and
- sharing human origins: developing new audiences.

Strategic research and conservation themes

- 'Areas';
- understanding the record;
- dating frameworks;
- curation and conservation;
- dealing with development;
- professional training;
- education; and
- collections and records enhancement.

Need for ongoing research in the following areas:

- furthering our understanding of the Middle and Upper Pleistocene human settlement of Britain in climatic and environmental context;
- improving our understanding of the formation and chronology of the British Pleistocene record;
- recognising and investigating the importance of the Pleistocene record of the offshore zone;
- dating is critical to all of our endeavours in Palaeolithic archaeology. We must continue to promote initiatives for improving dating methodology and thus reliability, accuracy and precision; and
- furthering public outreach through the National Curriculum, museums and new media opportunities.

PALAEOLITHIC – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 12-19

- a more detailed evaluation of the research potential of the Palaeolithic archaeology and Pleistocene palaeo-environments of the regions, especially in river gravel contexts;
- continuing assessment of quarry sites and further evaluation of museum collections;
- enhancement of Palaeolithic archaeology in the domain of developer-funded archaeology and incorporation of non-archaeological fossils and deposits into the region's HER;
- combination of 'predictive modelling' of sites and finds along with systematic and regular monitoring of sand and gravel workings into standard working practices; and
- establish protocols for dealing with Lower and Middle Palaeolithic archaeological evidence and provide training in appropriate sampling and analytical techniques.

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 24

Palaeolithic (c.950/850 kya1-c.9500 cal BC2):

Archaeological Period 1: Cromerian and Intra-Anglian (c.950-450 Kya1)

- What can analyses of artefact assemblages contribute to studies of the material culture of the earliest colonisers of western Doggerland?
- From how early does this material date?
- Where is pre-Anglian material found, and what can we deduce from its distribution about the routes of movement of early colonisers (e.g. along the Bytham River and ancestral routes of the Trent)?
- Can we detect traces of intra-Anglian activity within the region, and in particular how should we interpret rare finds of artefacts associated with Anglian outwash and till?
- Can we define more closely the distribution of sediments likely to yield traces of Period 1 activity and organic remains (notably those relating to the River Bytham and precursors of the Trent and Witham)?

Archaeological Periods 2 and 3: Pre-Levallois (c.450-250 Kya) and Levallois (c.250-150 Kya) Lower Palaeolithic

- Can we locate convincing evidence for Period 2 activity in the region?
- Can we elucidate the distribution, topographic location, character and date of Period 3 material, especially in sealed contexts in terraces?
- What is the range and variability of Levallois (prepared core) technology within the region, and what may East Midlands assemblages contribute to studies of the development of this technique?
- What is the composition of Lower Palaeolithic assemblages of non-Levallois/Levallois-type within the region, and how might this have changed over time?

Archaeological Period 4: Mousterian (c.60-40 Kya)

- How can we locate additional caves and open-air sites with evidence for Mousterian activity?
- How might caves and open-air sites have been related?
- Can we refine by radiocarbon dating the chronology of Mousterian sites and key artefact types (e.g. *bout coupé* axes)?
- Can we characterise more precisely the extant artefact collections from the region?
- What may artefact analyses contribute to studies of relationships between Mousterian hunter-gatherer communities?

Archaeological Period 5: Early (c.40-27 Kya) and Late (c.13,000-9,500 cal BC) Upper Palaeolithic

- How can studies of East Midlands sites contribute to testing and dating of the proposed Early Late Palaeolithic (EUP) and Late Upper Palaeolithic (LUP) cultural succession?
- How can studies of artefact typologies and raw materials contribute to our understanding of patterns of hunter-gatherer mobility?
- What was the relationship between caves and open-air sites, and can we discern differences in artefact typologies?
- How were EUP and LUP sites distributed across the landscape, and what contrasts may be observed with earlier and later (Mesolithic) periods?
- What may artefact analyses contribute to studies of relationships between groups across Doggerland and of regional cultural traditions?
- Can work at sites such as Creswell Crags elucidate the chronology of the recolonisation of western Doggerland after the Late Glacial Maximum?

- May further important examples of Palaeolithic artwork be preserved in caves of the Magnesian Limestone or elsewhere?
- How did lithic technology and typology change at the Terminal Palaeolithic-Mesolithic transition and what does this signify culturally?

Pleistocene environmental change

- Can we shed further light upon the development of the pre-Anglian river systems that may have served as corridors of movement for the earliest hominins (especially the Bytham River and precursors of the Trent)?
- How can studies of fauna, pollen and other organic material from palaeo-channels, caves, terrace sediments and other deposits refine our understanding of the evolving environment, and how may this have varied spatially?
- Where are resources for the identification, recording and study of organic remains best targeted?

General themes

- How can we best extend and enhance regional fieldwalking or test-pitting programmes as a means of prospecting for open-air sites?
- How can we enhance the HER dataset for study of the Palaeolithic period?
- How can we elucidate further the archaeological potential of the submerged landscapes of Doggerland?
- How can we ensure that resources are focused upon monitoring quarries with the highest potential for unearthing Pleistocene cultural and environmental remains?
- How can we maximise the research yield of Pleistocene sites investigated during developer-funded work?

Research objectives

- Refine knowledge of the earliest hominin activity in the region
- Test the hypothesis that hominins were absent from the East Midlands in the pre-Levallois Lower Palaeolithic
- Confirm the extent and nature of early human activity in the region during the Mousterian
- Further investigate Upper Palaeolithic open-air sites
- Investigate Upper Palaeolithic use of the limestone caves of Derbyshire and Nottinghamshire
- Investigate the annual patterns of movement of Late Upper Palaeolithic hunter-gatherers
- Elucidate from terrestrial sources the changing Pleistocene environment of the East Midlands
- Explore the submerged Pleistocene landscapes of Doggerland

Medlycott, M., (ed.) 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 7, 84 & 87

- There are a number of sites across the region where Palaeolithic remains are known to have been present, but we lack large collections or information on context and provenance. All these sites would benefit from further investigation, perhaps involving a machine-dug test programme, aimed at (a) providing more controlled information on artefact context, presence, density and intra-site distribution, (b) better understanding of the nature, sequence and extent of Pleistocene deposits at the site, (c) application of dating techniques such as OSL to date the deposits, (d) highlighting those sites with *in-situ* deposits in order to establish their eligibility for SAM and/or SSSI status.
- Further evidence should be sought for pre-Anglian occupation.

- Lower/Middle Palaeolithic artefactual evidence should be sought in the various channel deposits of the region. These are usually deep lying, and so have been little investigated, but the prolific evidence from the Clacton Channel has demonstrated that any remains present may be abundant, minimally disturbed and associated with good faunal and palaeo-environmental material.
- '...wider use of Optically Stimulated Luminescence dating for Palaeolithic deposits and buried surfaces...'
- Within the development control process, wider use of deep trenching for locating Palaeolithic sites as used in continental Europe (Deschodt 2005; Blancquaert 2006) should be further explored as a methodological tool.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6, 53-8

- documentation of regional sequences of material cultural change;
- dating of artefact-bearing deposits within regional, national and international Quaternary frameworks;
- developing understanding and dating of regional Pleistocene environmental, climatic and lithostratigraphic frameworks;
- explanation of diachronic and synchronic patterns of material cultural variability;
- behaviour of Archaic (pre-anatomically modern) hominids (a) at specific sites, (b) across the wider landscape;
- behaviour of anatomically modern hominids (a) at specific sites, (b) across the wider landscape;
- extent of contrasts in Archaic and anatomically modern human behaviour and adaptations, and in fundamental cognitive capacities;
- patterns of colonisation, settlement and abandonment throughout the Pleistocene;
- climatic and environmental context of Archaic settlement, and relationship between climate/environment and colonisation;
- history of isolation/connection between Britain and the continental mainland, and relationship/implications for Palaeolithic settlement and cultural development/expression;
- improved documentation and understanding of hominid physiological evolution;
- investigation of the relationship between evolutionary, behavioural and material cultural change;
- social organisation, behaviour and belief systems;
- models for cultural transmission and learning; and
- improving models of Palaeolithic site formation and post-depositional modification.

Museum of London, 2002, *A Research Framework for London Archaeology*, 13-15

- establishing firm regional chronologies tied into national chronological frameworks, taking the opportunity to clarify extant terrace sequences;
- carrying out baseline surveys for the Pleistocene in the London region, focusing on reconstructing geomorphology, ecology, ecosystems and climate, hydrology and vegetational (e.g. building on the simple model of the Holocene vegetational succession in London created by Rackham and Sidell 2000) and faunal development (addressing the bias towards botanical reconstruction, attributed to the preserved evidence); and
- making comprehensive use of predictive digital terrain models based on borehole and other geophysical data, and opportunistically examining known sites and exposures.

Framework objectives

- creating baseline surveys on topography and landscape;
- establishing a sound chronology for the period (clearly distinguishing between dating and correlating sequences, events and horizons);
- targeting categories of research and geographic areas that commercial fieldwork should address;
- extending the analysis of different modes of flintwork to establish whether they are culturally significant; and
- developing models which, rather than focusing on cultural-historical explanations, seek a different focus using issues of human perception, human behaviour and cognitive issues using London material, from the Southall mammoth kill site, and from megafauna assemblages.

KEY/SHARED THEMES

Lower and Middle Palaeolithic

- particular focus on understanding the initial hominid colonisation and subsequent recolonisations/ periods of abandonment;
- explanation of diachronic and synchronic patterns of material cultural variability;
- hominid behaviour and social organisation;
- investigation of the relationship between evolutionary, behavioural and material cultural change;
- investigation of the relationship between hominin behaviour/activity/occupation and palaeoclimate/ palaeo-environment/palaeoecology through time;
- regional/sub-regional variation (e.g. in hominin behaviour, material culture, evidence of presence/ absence);
- placing research into national and international contexts;
- improving means of identification, dating and technological/typological characterisation of lithic artefact assemblages, and integration into regional/national frameworks;
- sites with the potential to contain *in-situ* cultural material/fauna assemblages/palaeo-environmental remains of profound importance;
- pre-glacial river systems (e.g. Ancaster, Bytham, Thames, and their tributaries) require more investigation;
- developing a better understanding of Pleistocene sequences, particularly river terrace deposits:
 - investigations into spatial concentration/distribution of cultural material within deposits;
 - chronology/relationships between deposits; and
 - predictive modelling.
- emphasis typically/traditionally on riverine deposits/gravels, although potential for and derived material in other contexts/geomorphologies (e.g. areas with windblown sediments/brickearth, clay with flints, slopes/depressions with sealed/stratified deposits);
- deposits, regardless of the presence/absence of cultural material merit investigation where this will contribute to a more refined understanding of the changing Pleistocene environment;
- more systematic use of scientific techniques to refine chronologies, including wider use of OSL dating for Palaeolithic deposits and buried surfaces;
- geoarchaeological/geomorphological/palaeo-environmental/palaeoecological/palaeoclimate investigations integral to a wide range of research aims, e.g.
 - to explore and establish the potential for palaeo-environmental evidence, in particular mammalian remains, that could potentially be used for bio-stratigraphic dating;

- to aid predictive modelling for the discovery and investigation of sites/Pleistocene deposits;
 - to put hominin presence and activity in its climatic, environmental and landscape context, as well as within a chrono-stratigraphic framework; and
 - to improve models of Palaeolithic site formation and post-depositional modification – including refining understanding of the taphonomy of *ex-situ* lithic material.
- investigative methods may involve deep test-pitting, sieving, fieldwalking, borehole surveys.

UPPER PALAEOLITHIC AND MESOLITHIC – The national agenda

Blinkhorn, E. and Milner, N. 2013. *Mesolithic Research and Conservation Framework 2013. (Mesolithic) 20-25*

Living in a changing world

- What was the effect of the climate and environment on past communities, including both long-term processes and brief events such as the Storegga tsunami?
- What was the impact of a human presence upon the environment, vegetation and animal population, and how does this compare to the wider European evidence?
- To what extent did environmental change impact upon Mesolithic technology and 'tool kits'?
- How can our understanding of Holocene environmental change inform perspectives on climate change in the present day?

Technology and art

- What can Mesolithic technology (e.g. stone, antler, bone and woodworking), its production, use and deposition, tell us about Mesolithic life?
- To what extent can we understand the sourcing of raw materials and the movement of materials and people at different spatial scales?
- How can we better understand spatial and temporal variation in lithic technology, use and deposition?
- Can instances of Mesolithic cave and portable art be identified and dated, and placed within a broader understanding of social and geographical context?

Settlement and mobility

- To what extent can the composition, size and geographical characteristics of lithic scatters be used to define different types of site in the Mesolithic?
- What is the range and nature of structural remains? How were structures built, how were they used, and did these features change through space and time?
- How were caves and rock shelters utilised in this period and what were their relationship to open-air sites?
- How did mobility strategies develop from the late glacial to the end of the Mesolithic?
- Can patterns of territoriality be distinguished?
- How were coastal, island and marine environments incorporated into networks of interaction?

People

- What did people eat and how varied were their diets?
- What was the health of people at this time?
- How did the living treat the dead?

- What was the genetic relationship between Mesolithic human populations, their predecessors and successors?
- Is it possible to understand social organisation in the Mesolithic better? For instance, group sizes and population density?

Understanding the transition from late glacial to early post-glacial hunter-gatherer societies

- Did people occupy Britain during the Younger Dryas, the last cold snap of the late glacial?
- How can we refine the chronology for long blade sites and for Early Mesolithic sites, and the relationship between the two?
- How did human occupation relate to climate and environmental change at the beginning of the Holocene?
- What were the origins of the people who occupied Britain at the start of the Holocene?

Identifying change through the Mesolithic at national and regional scales

- Can we refine further the chronology of Mesolithic lithic industries?
- How did bone, antler and woodworking technology change?
- What changes were there in animal exploitation through the Mesolithic? What were the key arrival and extinction events?
- How did subsistence practices and diet change?
- How variable was site use and landscape use through this period?
- When and how did Britain become separated from continental Europe and what impact did this have on human groups?
- Can radiocarbon dates be used as a proxy for population fluctuation during the Mesolithic?
- Were there significant social changes taking place within this period?

Understanding the transition from the Late Mesolithic to the Early Neolithic

- Can we further refine the dating of final Mesolithic sites and how do these relate to the Early Neolithic?
- How can we investigate the character of final Mesolithic archaeology?
- Why does there appear to be a paucity of dated fifth millennium Mesolithic sites?
- When do domesticates appear in the archaeological record and what evidence is there for overlap with Mesolithic populations?
- What happened to the final Mesolithic hunter-gatherer groups when farming peoples brought domesticates to the British Isles?

UPPER PALAEOLITHIC AND MESOLITHIC – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 20-24

Upper Palaeolithic

- provision of guidance for field and curatorial archaeologists in dealing with Upper Palaeolithic sites;
- re-evaluation of lithic artefact collections in museums;
- implementation of a programme of cave prospection for the identification of potential new sites; and
- provision of awareness for field and curatorial archaeologists in the identification of open-air sites and of measures and strategies to locate them.

Mesolithic

- provision of guidance for field and curatorial archaeologists for dealing with Mesolithic sites, especially regarding the potential of lithic artefact analysis, site recognition and data recovery methods;
- improvement of local authority HER databases;
- preparation of precise specifications for projects that are likely to encounter Mesolithic sites;
- implementation of strategies for recognising and/or prospecting for Mesolithic material during excavations of later sites;
- systematic surface collection of Mesolithic artefacts across the region;
- widespread and intensive use of test-pitting as a means of prospecting for and evaluating Mesolithic sites;
- excavation of scatters of Mesolithic artefacts defined by surface collection to a standard procedure;
- careful and detailed recording of the character, content and spatial distribution of lithic assemblages;
- study of any well-preserved Mesolithic sites with stratified deposits, artefacts, structural remains and/or high-quality environmental and dating evidence;
- systematic evaluation of cave sites in the region to identify stratified Mesolithic deposits and recover artefact assemblages and human remains; and
- study of any Mesolithic human remains uncovered is important for dating, dietary and demographic studies and investigating mortuary and funerary practices.

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 34-45

Mesolithic (c.9,500-c.4,000 cal BC):

- periods of transition;
- spatial distribution of activity;
- identification of site types;
- lithic artefact chronologies;
- production, distribution and use of lithic artefacts; and
- environmental change and food procurement strategies.

Research objectives

- enhance understanding of the environmental background to Mesolithic activity;
- characterise the regional and local evidence for Mesolithic activity;
- investigate further the earlier Mesolithic lithic resource;
- identify changing patterns of lithic artefact use in the Later Mesolithic;
- provenancing lithic raw materials: identify patterns of mobility;
- develop a regional lithic raw material reference collection;
- investigate the topographic locations of activity foci;
- investigate the transition from the Mesolithic to Neolithic; and
- explore Doggerland: target submarine landscapes and the modern coastline.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 7

- Early Upper Palaeolithic and particularly Late Upper Palaeolithic (longblade) issues need further study – characterise and model the EUP/LUP evidence for human activity within the region; and
- a fuller understanding of the Holocene environment is still required for the region.

Hey, G. and Hind, J. (eds.), 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6, 83-85

Nature of the evidence

- recognition of how developer-funded work changes our understanding of the extent of LUP and Mesolithic activity in this region;
- review the effectiveness in recovering small scatters of material and improve the use of this material in landscape models;
- fieldwalking for LUP and Mesolithic material should become a more routine part of field evaluation;
- extent to which LUP and Mesolithic sites lie buried beneath alluvium and colluvium should be more fully investigated;
- palaeo-environmental and geoarchaeological sampling should play a much more important role in the identification of sites;
- publication of outstanding reports;
- re-examination of old assemblages;
- some new excavations are needed of old sites to test established interpretations; and
- integration of the results of underwater/foreshore archaeology, especially in the Solent, where previously dry-ground sites could be well preserved beneath the modern sea level.

Chronology

- there should be a concerted effort to improve our chronological understanding of LUP and Mesolithic flint scatters using scientific dating, particularly OSL;
- collection of samples suitable for scientific dating techniques needs to be a routine part of investigations; and
- more material should be radiocarbon dated to establish a more reliable chronology.

Landscape and land use

- excavations in river valleys should be much more clearly focused on the wider use of these locations for settlement and the impact of settlement upon the surrounding landscape;
- more work needs to be done to identify sites away from river valleys and coastal/intertidal areas, particularly open sites;
- investigation is needed into human manipulation of the woodland;
- more detailed exploration is needed of changes in landscape use over time and how these relate to climate change and vegetation succession;
- impact of changing sea levels on the populations who lived in the Solent area should be investigated;
- analysis of insect assemblages, where found, is especially important because of their rapid response to climatic and environmental change;
- evidence is needed of regional variation in the types of biological assemblages found at different geographical locations, for example the Hampshire Basin versus the Chalk Basin;

- careful sampling of sites that produce a wide range of well-stratified, well-preserved biological remains;
- it seems likely that the growth of underwater archaeology will greatly increase the number of sites producing well-preserved biological remains in the Solent. The development and refining of underwater archaeology methodologies to recover well-preserved biological remains; and
- research is needed into evidence for animals browsing under woodland conditions in the Late Mesolithic/Early Neolithic and the dating and reasons for the Elm Decline.

Society

- investigate ways to shed light on mobility, group range and group size;
- research into the differences (or similarities) between LUP society and settlement and that of the Early Mesolithic;
- investigate LUP and Mesolithic beliefs and ideologies;
- investigate human remains from rivers which may be Mesolithic in date;
- more microwear analysis on flint tools to provide a much better understanding of activities on site;
- any charred material found in association with human activity should be given the highest priority;
- collection of food remains from bulk soil samples is a priority for understanding diet during this period; and
- Mesolithic shell middens require further attention.

Material culture

- innovative methods of analysis or lines of thought should be sought to gain a better understanding of this material; and
- some reassessment of the raw materials used for tools, their sources and the distance over which they have been brought is needed.

Predictive modelling

- models should be developed and tested as predictive tools to locate archaeological sites and explain land use;
- particular landscapes that are under threat, and where good research projects could be developed, need to be identified and targeted; and
- more work in the Solent area, both in areas presently 'offshore' but also horizons in submerged river estuaries, should prove a fruitful source of evidence and help to understand the impact of coastal change.

Museum of London, 2002. *A Research Framework for London Archaeology*, 16

Framework objectives

- carrying out comprehensive baseline surveys;
- understanding what London looked like;
- addressing aspects of continuity and change in the nature of the subsistence strategies pursued by human groups: how did they change and develop through time, and why?
- explaining why the Late Mesolithic is so poorly represented in the London region. The validity of a model wherein communities retreated up the major tributaries and the valley sides in the face of rising sea and river levels needs testing.

KEY/SHARED THEMES

Upper Palaeolithic and Mesolithic

- transitions EUP-LUP, LUP-Mesolithic, Mesolithic-Neolithic (see below);
- people: health, diet, funerary practice, genetics, social organisation;
- settlement and mobility/spatial distribution of activity/evidence for structural remains/sedentism/patterns of movement/seasonality/can patterns of territoriality be distinguished?
- technology:
 - how can studies of artefact typologies and raw materials contribute to our understanding of patterns of hunter-gatherer mobility?
 - changing patterns of lithic artefact use
 - can studies of the size, shape and locational characteristics of lithic scatters and analyses of the associated lithic artefacts contribute to the identification of site types/activities?
 - impact of environmental change upon lithic artefact technology
- regional variations/sub-regional variations, temporal change;
- relationship and interaction between human populations and the environment; palaeo-environmental and geoarchaeological reconstruction are of critical importance. Sites with organic preservation should be targeted:
 - role in the identification of sites
 - elucidating the range of human activities in different environments
 - developing a better understanding of variation; changes in landscape use over time and how these relate to climate change and vegetation succession/activities in different environments
 - how did human occupation relate to climate and environmental change at the beginning of the Holocene?
 - archaeological and palaeo-environmental potential of late glacial and post-glacial landscape features such as kettle holes, palaeo-channels and waterlogged deposits should be recognised and targeted
- Upper Palaeolithic and Mesolithic sites with *in-situ* remains are extremely rare and should therefore be a priority. Current understanding is dominated by a limited number of sites (e.g. Star Carr, Thatcham/Middle Kennet Valley); however, known sites also merit further investigation;
- traditional emphasis on riverine locations; other landscape contexts merit consideration to establish if this is a factor of preservational/investigative biases or of genuine preferences for these areas in the past;
- Upper Palaeolithic open-air sites should be prioritised;
- potential for sites sealed beneath colluvium and alluvium needs exploration;
- greater application of scientific dating techniques, particularly OSL and C¹⁴ (radiocarbon), should be routine; and
- fieldwalking.

NEOLITHIC AND BRONZE AGE – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 32-80

Early Neolithic

- enhancement of the region's HER databases;
- a review of the available air photograph record;
- sample excavations of cropmark sites across the region, including those which do not conform easily to accepted morphological categories;
- development of fieldwork strategies to investigate Early Neolithic sites in all landscapes, in particular the recognition of the importance of lithic scatters;
- use of narrow sample intervals for surface collection and plough zone test-pitting;
- inclusion of methods for recognising and recoding Early Neolithic material in specifications for excavations or sites of later periods;
- recognition of spatial structuring of Early Neolithic social practices in fieldwork designs;
- application of the process of 'strip, map and sample' on extensive open-area excavations;
- complete excavation of well-defined Early Neolithic sites, at least within the area of the development;
- implementation of excavation methods on Early Neolithic sites which take into account the structured and often purposeful deposition of artefacts and other materials;
- considerable attention needs to be paid to Early Neolithic material culture studies including the construction of reliable chronologies;
- work on the sourcing and spatial distribution of stone axes;
- analysis of museum and private collections of Early Neolithic stone, flint and ceramic artefacts; and
- development of expertise among field and curatorial archaeologists in the recognition of Early Neolithic sites.

Middle and Late Neolithic

- enhancement of the HER resources for the region;
- reassessment of existing air photographs and further aerial survey work;
- identification and investigation of Middle and Late Neolithic monuments, pit circles, henges and palisade enclosures along with the recovery of evidence relating to architectural design, artefact deposition and chronology;
- recognition of the structured organisation of social practices at large spatial scales in fieldwork designs;
- implementation of appropriate fieldwork methods including surface collection and test-pit surveys along narrow transects;
- development of effective predictive modelling and site prospection methods in sub-alluvial and sub-colluvial contexts;
- application of the process of 'strip, map and sample' on extensive open-area excavations;
- complete excavation of well-defined Middle and Late Neolithic sites, at least within the area of the development;
- implementation of excavation methods on Middle and Late Neolithic sites which take into account the structured and often purposeful deposition of artefacts and other materials;

- considerable attention needs to be paid to Middle and Late Neolithic material culture studies including the construction of reliable chronologies;
- development of systems of training and support for new specialists in Middle to Late Neolithic artefacts; and
- development of expertise among field and curatorial archaeologists in the recognition of Middle and Late Neolithic sites.

Early Bronze Age

- county-based assessments of round barrows and ring ditches to establish the nature of the archaeological resource and for developing predictive modelling techniques;
- significance enhancement of the local authority HER databases;
- determine whether the regional distribution of monuments and settlement accurately represents the overall distribution and nature of activity through the survey and excavation of possible sites;
- investigate round barrows, ring ditches and other site categories in development archaeology with methods for identifying and recording Early Bronze Age evidence included in specifications for excavations in urban areas;
- initiate studies of round barrows and ring ditches to determine constructional and depositional sequences as well as spatial relationships among groups of monuments;
- research-led excavations of well-preserved round barrows;
- development of fieldwork programmes to identify and investigate Early Bronze Age sites in all landscape contexts;
- total excavation of funerary sites and pit groups, including where the site is only partially within the development;
- excavation of areas around and between monuments as areas used for repeated ceremonial activities;
- particular attention needs to be paid to the recovery of dating evidence, especially radiocarbon sample materials to enhance the chronologies on monument forms and burial categories;
- synthetic and detailed study on Early Bronze Age material culture in the region focusing on the creation of artefact chronologies, studies of artefact biographies and studies of raw materials; and
- development of expertise for both field and curatorial archaeologists for the recognition of the significance and potential of Early Bronze Age sites in the region.

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 46-57

Neolithic and Early to Middle Bronze Age (c.4,000-c.1,150 cal BC): Updated research agenda

- dating;
- continuity of hunter-gatherer traditions;
- introduction, character and development of agriculture;
- exploitation of different landscape zones;
- settlement patterns;
- ceremonial and burial monuments;

- riverine monuments and ritual foci;
- Neolithic and Bronze Age societies; and
- raw material resources and exchange networks.

Research objectives

- compile database of scientific dates and extend Bayesian modelling;
- assess the fieldwalking resource;
- develop fieldwalking strategies and guidelines for landscape zones;
- assess the regional air photographic and LiDAR resource;
- target sites with Late Mesolithic and Early Neolithic organic remains;
- identify monument complexes and prioritise for curatorial action;
- conduct additional investigations of Earlier Neolithic funerary traditions;
- recover and analyse human remains;
- investigate the development and intensification of agriculture; and
- foster relevant artefact studies.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 13-14, 20 & 85

- chronological development of pottery;
- patterns of burial practice need further examination;
- examine the processes by which agriculture became the dominant economic force, the change from mobile to more sedentary groups and the development to a fully agricultural economy during the Neolithic and Bronze Age;
- examination of the interrelationships between settlements as well as the interrelationship between settlements and monuments;
- patterns of burial practice need further exploration;
- human impact on the natural landscape, including changing patterns of alluviation, woodland management and clearance, remains a topic for further study;
- nature and extent of regional, national and international contact (i.e. monument comparisons, stone axe trade, other artefact types, animal and horticultural introductions), needs further study;
- palaeo-environmental sampling strategies need to be strengthened in deposits of this antiquity (e.g. 100% flotation of well-sealed Neolithic pits to maximise chances of recovering macrobotanical evidence, particularly of cereals) and routinely executed on sites across the region;
- further work, employing a variety of methods, is needed to establish or confirm the date and character of a representative sample of sites mapped by the NMP projects. Without dating such sites more closely, it is difficult to relate them to regional and national trends;
- many of the known Neolithic sites comprise 'monuments', usually of a funerary and/or ceremonial nature, where the form of the site (ditches, mounds, banks) is of a kind that leaves visible traces, and the outline is characteristic of a particular class of Neolithic site. However, the substantial proportion of the archaeological record which is not readily identifiable from the aerial photographs – flintworking sites, agriculture, unenclosed settlement or pit groups – is under-represented in the NMP/HER dataset. More work is needed to try to reduce or compensate for this bias, and to investigate further the relationship between the monuments and the less visible sites;
- targeted programmes of sedimentological, palynological and microfossil analyses of sediment sequences in river valleys or lakes, adjacent to known archaeological sites;

- typological identification of later Bronze Age pottery, linked to close radiocarbon dating is badly needed; and
- possibility that significant sites remain hidden under colluviation requires further study.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6. 111-114

Nature of the evidence

- why do some areas have major monuments and others do not, and why do some monuments have different distributions to others?
- why is deposition in rivers favoured in some areas, whereas deposition in graves is more common elsewhere?
- comparing the character of ceremonial activity in areas where 'typical' monuments (e.g. henges) are rare with those from conventionally accepted monument complexes; and
- comparing the character of settlement in those areas that were comparatively populous from an early period with those where settlement was sparse.

Chronology

- better dating of key sites and deposits to improve an understanding of chronological sequences across the region;
- identifying and investigating sites with both Late Mesolithic and Early Neolithic material present, especially where these can be linked to environmental and datable sequences;
- better dating of the wide range of Earlier Neolithic funerary monuments;
- better refinement of Early Bronze Age chronologies linking burials and settlement evidence;
- investigating sites with good environmental sequences with potential for environmental reconstruction;
- full analysis of well-dated lithic assemblages to aid with the dating of surface finds from field survey; and
- dating residues on ceramics, particularly Peterborough Ware and 'urn' traditions of Early Bronze Age date.

Landscape and land use

- investigating the process of tree clearance, especially in relation to expanding settlement and new monument complexes;
- examining direct evidence for cultivation;
- investigating the reasons (social and environmental) behind the episodic use of some apparently more fragile landscapes in the region; and
- obtaining more and larger animal bone assemblages to gain a better understanding of herd composition and the primary uses of domesticated animals.

Settlement

- establishing the extent and character of settlement away from monument complexes;
- is the impression that there is more extensive and denser settlement in the Later Neolithic in many parts of the region justified and, if so, does increasing population have an impact on other aspects of human activity, such as ceremony and ritual activity and burial practices?
- why is there comparatively little evidence of Early Bronze Age settlement, and to what extent can the distribution of round barrows and ring ditches be used to elucidate the picture?

- better characterisation of settlement sites;
- identifying and examining buried sites, especially beneath colluvium off the chalk and preserved ground surfaces below both alluvium and prehistoric monuments such as ring ditches. This should include the use of the widest possible range of relevant environmental techniques;
- further examination of the extent and character of midden sites; and
- does the character of settlement change between the Early and Late Neolithic, with greater mobility and emphasis on pastoralism?

Burial

- much better understanding is needed of the date range of the very varied burial monuments of the fourth millennium;
- what is the relationship of these small burial monuments to the settlement evidence? Are smaller monuments found in areas of settlement?
- what is the significance of small burial monuments in relation to monuments and the development of monument complexes?
- how were most dead bodies treated?
- investigate the extent and importance of unmarked inhumation and cremation burials, throughout the period;
- human bones found in the excavation of cursuses should be dated as a matter of course;
- were some bodies deposited in rivers, along with distinctive Neolithic and Early Bronze Age artefacts?
- it has become apparent that Early Bronze Age barrows are very complex, in terms of their contents and forms and the burial practices and other ritual activities associated with them, such as processions. Some of this evidence is found in the upper deposits of the barrows or beyond their physical extents and can be easily damaged if not recognised. Further analysis of their chronology and function is needed and recognition of the ritual use of these sites;
- piecemeal sampling of prehistoric burial mounds is likely to provide misleading results and should be avoided;
- areas around, and between, barrows should be excavated, as well as the mounds and ditches; and
- flat graves and flat cemeteries are not likely to be discovered by piecemeal sampling. A better approach is strip, map and sample.

Ceremony and monuments

- better understanding of causewayed enclosures is needed – their date, longevity of use and character of deposits;
- what is the relationship between causewayed enclosures and cursuses and why were cursuses constructed away from the earlier monuments? How were cursuses used and what is their link with small funerary monuments? Why did circular monuments that were the scene of feasting and other communal ritual activities go out of fashion?
- what was the role of the large henges and why are they only found in the north of the region? What is their relation to small henge monuments?
- why and how did some monuments attract further monument building – pit and post circles and small ditched enclosures – and become more important complexes? Could they be described as pilgrimage sites?

Specialised activities (crafts, industries and exchange)

- where did the majority of the flint used in the region come from, and how did people acquire it?

- burnt mounds are usually thought of as a Later Bronze Age phenomenon, but a few are now dated to the Early Bronze Age (or even Late Neolithic). Are these more common than we had imagined? What is their link to settlement?
- what is the extent, function and date of timber structures that are increasingly coming to light in coastal areas (for example at Langstone Harbour and Wootton Quarr)?
- what can we deduce about Neolithic and Early Bronze Age woodworking? What do we know of other crafts?
- what is the evidence of early metalworking in the region?

Links with the outside world

- investigate the potential long-distance links with the region via the movement of artefacts and similarities in the morphology of monuments;
- isotope analysis on both human and animal bones (e.g. C, N, Pb, Sr) and creation of a wider database of isotope results to address the issue of the origin and mobility of individuals, communities and their animals;
- what can we say about the beginnings of the Channel Bronze Age?
- what impact did the introduction of metal have on society in the Solent-Thames region? Can this be seen in the high-status burials of the area and in aspects of everyday life?

Museum of London, 2002. A Research Framework for London Archaeology, 17-18

Framework objectives (Neolithic and Early Bronze Age c.4,000 BC-1,500 BC)

- elucidating the nature of the Mesolithic/Neolithic transition;
- reconstructing the environment and ecology on a regional basis;
- researching the potential for categorisation of settlement sites;
- examining the influence of landscape and establishing whether the Thames confluences were considered important settings for different types of monument;
- gathering and analysing data to understand the subsistence economy. In the absence of good botanical and faunal assemblages (such as at Runnymede Bridge), the subsistence economy is poorly understood; and
- establishing a (long-overdue) dated regional ceramic sequence which includes an analysis of fabrics and vessel contents.

KEY/SHARED THEMES

Neolithic and Bronze Age

- transitions – Mesolithic-Neolithic, Neolithic-Bronze Age; adoption and intensification of agriculture, pastoralism and domestication are inevitably major themes;
- greater application of scientific dating techniques, including TL and C¹⁴, required for a wide range of themes, e.g.:
 - refining understanding of pottery/lithic technology;
 - refining understanding of site types, including monument classes; and
 - regional variations.
- other scientific techniques (e.g. lipid analysis/DNA analysis/isotope analysis) may contribute to a wide range of research questions (e.g. dietary change, population movement and composition, health);
- regional/chronological variation in site types/monument classes/material culture;

- diversity in exploitation of different landscape zones;
- greater understanding of early settlement required. Sedentism/mobility. How can we characterise more effectively the frequently insubstantial structural traces that might relate to settlement activity?
- patterns of burial practice and ceremonial activity need further exploration, including associations with settlement foci;
- human impact on the natural landscape, including changing patterns of alluviation, woodland management and clearance, remains a topic for further study. Palaeo-environmental reconstruction is important;
- nature and extent of regional, national and international contact, including aspects of production, use and exchange, require further exploration;
- how can we further refine our understanding of early metalworking?
- wide range of site types/locations/feature classes are highlighted throughout various research frameworks (e.g. buried/sealed land surfaces, burnt mounds, causewayed enclosures, henges, cursuses, barrows, other burial contexts, rivers, settlement sites).

IRON AGE – The national agenda

Haselgrove, C. *et al.*, 2001. *Understanding the British Iron Age: an agenda for action*

Chronological issues

- developing dating frameworks;
- dating audit;
- scientific dating strategies for fieldwork;
- radiocarbon as routine;
- single entity dating;
- organic residues;
- human remains;
- reporting of dates;
- targeted fieldwork;
- 'retrospective' dating programmes;
- other absolute methods; and
- exploiting 'dateable' objects from excavated contexts.

Settlements, landscapes people

- settlements;
- landscapes; and
- burials.

Material culture

- data collection;
- basic knowledge;
- artefacts in context;
- use;
- deposition;

- priorities for particular resources;
- organic; and
- inorganic.

Regionality

- regional similarities and differences;
- areas with established frameworks;
- areas with partial frameworks; and
- areas without frameworks.

Processes of change

- earlier pre-Roman Iron Age (c.800 to 300 BC);
- metalworking;
- settlement and agriculture;
- later pre-Roman Iron Age c.300 BC to AD 100;
- the Earlier to Later Iron Age transition;
- settlement expansion;
- southern and eastern England;
- other parts of Britain;
- Earlier pre-Roman Iron Age; and
- Later pre-Roman Iron Age.

IRON AGE – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 101-121

Middle Bronze Age to Iron Age

Chronology

- the use of radiocarbon dating techniques from laboratories able to deliver tight dates should be increased for large samples taken, while AMS dating is recommended for smaller samples;
- other scientific dating should also be used (e.g. archaeomagnetic dating for ceramic ovens or kiln structures); and
- there should not be an over-reliance on style in ceramic study with stylistic dating to be backed up with scientific dating.

Settlement, landscapes and people

- attempt to understand patterns of landscape development, particularly through palaeo-environmental investigations which may include survey in local wetland sites;
- the prioritisation of prospection for Bronze Age settlement in the areas of burnt mounds through fieldwalking and geophysical survey;
- establish whether later prehistoric sites can be identified through other means than aerial photography. In particular, through fieldwalking and geoarchaeological studies; and
- reinvigorate the study of hillforts, due to their importance for both the Bronze Age and Iron Age, paying particular attention to chronology and function.

Material culture

- consistent recording of artefacts using recognised typologies and scrutiny of finds which cross over from the Thames Valley into the Severn Valley for cross-referencing; and
- reworking of archived and published sites in the light of improved dating strategies and methods.

Regionality

- the development of regional typologies of structures and greater definition from synthesis including model building and large landscape contexts; and
- an active effort to identify and see sites in the process of building local profiles of Middle Bronze Age to Iron Age development.

Processes of change

- redress the poorly dated processes of change using localised environmental evidence and provide a physical context for human occupation, animal husbandry, farming practices and general landscape management .

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, pp.58-69

Late Bronze Age and Iron Age (c.1,150 cal BC-AD 43): Updated research agenda

- dating;
- site visibility, prospection and landscape exploration;
- Late Bronze Age and Early Iron Age settlements (c.1,000-450 BC);
- Middle Iron Age settlements (c.450-100 BC);
- Late Iron Age settlements (c.100 BC-AD 50);
- field systems and major linear boundaries;
- ritual and structured deposition and religion;
- the agricultural economy and landscape;
- finds, craft, industry and exchange; and
- social relations and society.

Research objectives

- compile audit of radiocarbon, dendrochronological and other scientific dates;
- refine ceramic chronology by additional radiocarbon dating and typological analyses;
- characterise the LBA-EIA settlement resource and investigate intra-regional variability;
- assess the regional resource of hillforts and analogous sites;
- assess the evidence for the evolution of settlement hierarchies;
- investigate intra-regional variations in development of fields and linear boundaries;
- study the production, distribution and use of artefacts;
- characterise placed deposits and sites of shrines or temples;
- prospect for Iron Age settlement in upland areas of the Peak District; and
- investigate settlement and environmental resource of the Witham Valley.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 30-31 & 85

- settlement types;
- finds studies;
- manufacturing and industry;
- Iron Age/Roman transition;
- the increased visibility of cropmark evidence seemingly relating to settlement and agriculture during the later Iron Age and Roman;
- the evidence for social organisation requires further study; and
- a multi-period research topic which requires further research is the dating of large boundary features such as the Devil's Ditch.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6. 149-153

Character of the regions, geological and topographical diversity

- investigation of the distribution of natural deposits that could provide natural pollen and insect sequences to map environmental change through the period;
- the use of GIS and other geographical techniques to explore the interaction of major natural geological and topographical differences with social, economic or cultural factors; and
- the potential to compare the Solent-Thames with other sub-regions to investigate regionalism in late prehistory.

Nature of the evidence

- the use of modern GIS methods to explore and counter biases in areas investigated;
- areas which have been prone to especially little coverage or have conditions that are inherently difficult to overcome deserve most attention; and
- in addition, a diverse range of 'hotspots' of later prehistoric investigation across the Solent-Thames area exists, for which comparison of results is required.

Chronology

- an audit of the existing scientific and typological chronological frameworks established on a sub-regional or thematic basis is required;
- resolution of chronological issues identified in the audit will need:
 - standards or criteria to enhance chronological resolution in terms of sampling strategies for artefacts and scientific dating;
 - enhancement of the chronological framework, using techniques such as OSL, dendrochronology and residue analysis; and
 - a programme of retrospective C¹⁴ dating with agreed priorities.
- excavations should be undertaken with the specific objective of refining chronologies using well-stratified artefact-rich sites.

Landscape and land use

- the extent of clearance in different parts of the Solent-Thames area, and at what periods this took place, should be explored. A cycle of clearance and regeneration may have persisted in some areas;

- the use of newly cleared areas, and any influence of climate on land use, need to be investigated, possibly through proxy data for temperature and rainfall. The relationship with the economy across the region and with time should be considered;
- the location and exploitation of woodland should be explored through palaeo-environmental data;
- farming and clearance should be explored through studies of alluvial and colluvial deposits;
- for field systems in the Solent-Thames area, their origin and purpose, including the reason for co-axial fields and the form taken by field boundaries, merit further study;
- changes in the relationship of fields to settlements across the region should also be investigated;
- research into whether fields were mainly created to control grazing and the importance of grassland management in the Iron Age economy; and
- the relative effects of climate change and socio-economic factors on changes in farming need to be clarified.

Settlement

- testing the decline of earlier prehistoric patterns of mobile domestic activity;
- reasons for increases in the intensity of settlement should be explored;
- the factors that led to the common shift of settlement location in the Late Iron Age need to be identified;
- pre-existing land use rights may have affected the development of settled farming communities, possibly explaining differences in settlement form and patterns of change. Evidence for the emergence of such rights should be sought;
- classifying settlements as enclosed and unenclosed may still be useful, but differences in scale, social and economic basis of settlement may be considered in other ways;
- the extent to which forts have Bronze Age origins and their role during that period form part of the larger issue of the purpose of hillforts, which might have been for reunions, ritual and refuge;
- levels of occupation of forts still need further investigation, and the presence of external settlements immediately outside forts, and the relationships between them, requires further research;
- if forts were not the prestige settlements then these need to be identified. Material culture may prove a better indicator of social hierarchy than size;
- extent to which the socio-economic basis of settlement differs across the region needs to be explored;
- more work is required on whether the form of settlements bear a relation to their socio-economic role or to other non-morphological factors, and upon the existence of geographical and chronological variations within the region;
- palaeo-environmental evidence should be used to develop spatial chronologies for settlement change and to identify functions of specific sites;
- changes in settlement function should be compared to changes in other areas (e.g. pottery typologies) to look for relationships between them; and
- palaeo-environmental evidence, including lipid residues, should be used to try to elucidate the use of middens and burnt mounds.

Social organisation

- extent to which single family pastoral farmsteads existed needs to be determined;
- more remains to be learnt about storage pits, such as the establishment of a minimum size, their reuse as latrines and the implications of this for burials in pits;
- late prehistoric healthcare may be better understood through bones and seeds of medicinal plants;

- survivors of trepanning operations may have worn their skull discs as talismans of good fortune, or these could be trophies. This might be investigated through DNA or isotope studies;
- large-scale land divisions are not well understood and there is a need to clarify their frequency, to discover whether they have defined land rights and ownership or land use areas, and to discover who organised them;
- form taken by the boundaries above ground and how long they lasted merit further study; and
- size of communities in the Iron Age, their social and economic relationships and the degree of economic specialisation need more investigation.

Built environment

- development of the architecture of late prehistoric houses over a long timescale from the Middle Bronze Age to Late Iron Age could be clarified;
- mix of cosmological and practical influences on architecture could be investigated;
- role of four-posters needs better understanding; and
- sampling strategies need to be refined, giving priority to contexts associated with Bronze Age hut platforms/roundhouses.

Material culture

- functions of common objects such as loom weights/oven bricks, antler combs and grooved and polished metapodials;
- whether there was a personal and social significance in common highly finished and decorated craft tools and domestic objects; and
- detailed study of assemblages from large numbers of excavated sites would allow exploration of the distributions of pottery fabrics, changing fashions in fabrics, forms and decoration, the definition of sub-regional styles of pottery and their links to social groups.

Crafts, trade and industry

- where did smithing fit into the organisation of metalworking?
- where were the sites where pottery was manufactured, and what evidence can be used to identify and distinguish such sites?

Transport and communication

- there is a need to explore patterns and axes of exchange, including the nature of the main exports from the region, possibly corn or horses;
- the role of the Thames as a key boundary in distribution of salt from Droitwich, Hampshire and Dorset should be investigated;
- European connections from the south coast and down the Thames and their influence on patterns of exchange at different periods should be studied; and
- more evidence for structures and waterside activities needs to be identified.

Ceremony and ritual

- when and why did people stop building and using funerary monuments during the period?
- to what extent do biases in fieldwork prevent the discovery of more urnfields and other cemeteries?
- how frequent were cremations and inhumations in boundaries, fields and settlements before monuments stopped being used?
- what were the selection criteria for pit burials? Were these the socially disadvantaged, and why does this occur with varying frequency on different sites? If (as currently appears) it was seldom more than once in a couple of generations on most sites, what is the significance of pit burial?

- how do we define an Iron Age cemetery, and do small groups outside settlements count?
- what other forms of formal burial like those in buildings at Frilford and Spring Road, Abingdon are there, are there chronological patterns in their occurrence, and how should we interpret them?
- how should we interpret practices indicated by mutilated bodies and double burials, and how prevalent was human sacrifice?
- what is the significance of differences in sex, age, health and stature of burials within cemeteries and around settlements?
- were exhumation and scattering of remains on land or river the norm?
- what was the nature, purpose and frequency of 'special deposits' of human remains and metalwork?

Warfare, defence and military installations

- the relationship between the major Late Bronze Age and Iron Age linear ditches and the concept of territorial entities needs to be explored;
- the relationship between the earthworks associated with different major centres in Late Iron Age and tribal political attitudes to Rome should be explored;
- are North Oxfordshire Grim's Ditch and Cassington Big Ring unfinished?
- more investigation is needed into the extent to which construction, maintenance and remodelling of communal enclosures and forts, with the massive deployment of labour involved, was a major means of exerting and symbolising social and political authority;
- evidence from settlements suggests that society was peaceful, although this conflicts somewhat with the picture from hillforts. The idea needs to be tested;
- the level of attack on and burning of hillforts should be established, and the context of burning requires more careful consideration; and
- there is need for review of metalwork found in rivers, considering the preponderance of weapons, their possible use in conflict, their association with deposition of bodies and their relationship to politics and the role of rivers as tribal boundaries.

What were the drivers and inhibitors of change?

- environment;
- population dynamics;
- family relations;
- communications;
- economics;
- technology;
- rights and traditions;
- religion; and
- politics.

Museum of London, 2002. *A Research Framework for London Archaeology*, 19-21

Framework objectives (Middle Bronze Age to Middle Iron Age (c.1,500-150 BC))

- re-evaluating the core/periphery model proposed for the Thames Valley in the Bronze Age (Barrett and Bradley 1980), which identified relationships between the Upper and Lower Thames and between the river valley and its hinterland, on the basis of new evidence;

- re-evaluating the burial evidence, including undated inhumations and cremations, to identify first millennium and Iron Age remains. Radiocarbon dating of burial features is imperative in the light of finds of unfurnished inhumations of Iron Age date in Britain (Haselgrove *et al.* 2001);
- clarifying the mechanisms that prompted agricultural intensification. Is there a link between such intensification and the production and consumption of prestige goods? Establishing more, better dated evidence for the subsistence economy. The balance between pastoral and arable economies and patterns of subsistence are areas for further study, but these require improved datasets, particularly the retrieval of good faunal assemblages;
- understanding the relationship between the wooden trackways in the floodplain and the settlements to which they presumably led. What was happening in the areas between the wetlands and the settlements? What light do the trackways shed on woodcraft and woodland management?
- identifying the roles that ring forts played in the developing settlement hierarchy of the Late Bronze Age, and their relationship, if any, with the few succeeding Early Iron Age sites of hillfort type such as Caesar's Camp on Wimbledon Common (AGL 2000, Gz MT1) or Warren Farm, Upminster (AGL 2000, Gz HV1);
- preparing settlement plans;
- understanding the origins of the metalwork sequence from the Thames – which is second to none;
- refining and dating the local ceramic sequence;
- constructing models for cultural links and boundaries and, in turn, a focus on wider questions about the political and socio-economic role of the Lower Thames at the time;
- understanding the place of lithics in the region at this time? Important assemblages from Runnymede Bridge and elsewhere await further study and publication; and
- exploring seasonal craft activities such as salt production and weaving, and an understanding of the sources and processes used in the manufacture of iron and quern stones (AGL 2000, 92).

Framework objectives (Late Iron Age and early Roman period (c.15 BC-AD 50))

- evaluating potential oppida;
- assessing the relationship of the London region to the core south-east zone of coinage, oppida, continental imports and elite burials in the period following Caesar's invasions;
- examining the evidence for a phase of renewed agricultural intensification in the London region at this time;
- elucidating various elements in the settlement pattern from the small rectilinear enclosures (e.g. can the attribution of *Viereckschanzen* be sustained?) to the larger enclosed sites. How do they compare with other elements in the local landscape?
- examining the Roman foundation of *Londinium* from the perspective of pre-Roman settlement and continuity; and
- identifying a pre-London road pattern? For instance, was there a Silchester-Colchester bypass road? It should be possible to find a London-Winchester road and many more local roads (Bird and Bird 1987); was it not more likely that road transport was used rather than local river transport?

KEY/SHARED THEMES

Iron Age

- LBA-EIA, EIA-MIA, MIA-LIA, LIA-RB (see below) transitions. The LBA/EIA period, in particular, is poorly understood and is therefore a high priority;
- regional variation is a major theme for Iron Age studies. The picture is incomplete; some areas are very poorly understood, due in part to uneven distribution of development-led investigations/

research has traditionally focused on Wessex/the south and east regions. How is the evidence for tribal polities expressed in the archaeological record?

- greater application of scientific dating is required to establish more detailed regional chronologies. Refinement of ceramic chronologies is widely called for; therefore, artefact-rich sites are a priority;
- the development of field systems, enclosures and major linear boundaries (e.g. Grim's Ditch) require further investigation and accurate dating;
- further exploration into ritualised/structured deposition and religion, including shrine/temple sites, is required;
- improved understanding of the development and variation in the agricultural economy and exploitation of the landscape is needed. Palaeo-environmental evidence and analysis of faunal remains are clearly important avenues of enquiry;
- exploration of a wide range of issues surrounding Iron Age funerary practices, which are currently poorly understood/poorly represented (under-represented due to biases?) in the archaeological record. Topics include belief, diet, regional and chronological variation, and demography. What can be inferred about social organisation from variations in burial practices? Scientific dating required for unaccompanied burials;
- evidence for the evolution of settlement hierarchies, distribution, density and dynamics, and relationships with social/economic organisation require further work;
- targeting fieldwork on poorly dated/less well understood classes of site;
- emphasis on understanding the wider landscape context beyond nucleated settlements (e.g. temporary or seasonally occupied sites, field systems, burials, industrial/production/manufacturing/processing/extraction sites, areas immediately outside of enclosed settlements, 'open' or unenclosed settlements);
- more research is needed on primary production sites of all kinds, and on the distribution of finished products. Metalworking is clearly a key theme; metal detecting should be undertaken to increase recovery rates;
- scientific analysis of all classes of artefacts is essential; and
- sampling strategies need to be refined.

ROMANO-BRITISH – The national agenda

English Heritage, 2012. Research Strategy for the Roman period historic environment, 21-24

Identifying and understanding vulnerable site types to support protection and management of change

- identification of sites/components of Roman period sites that are under-represented in the archaeological record; and
- Roman period suburbs and cemeteries.

Holistic approaches to Roman period landscapes

- validation and upgrading of site distribution data;
- landscape context of known sites; and
- recognition of regional diversity in the Roman period.

Understanding key transitions

- Iron Age to Roman;
- 'Early' to 'Late' Roman Britain; and
- Roman to Post-Roman.

Unlocking the potential of unpublished data

- accessing grey literature;
- publication/dissemination of nationally significant backlog data from key sites; and
- Roman period syntheses.

Responding to changes in our climate and countryside

- multi-agency approaches to conservation and monitoring of Roman period sites and landscapes;
- understanding the impact of changing climate and related land use on Roman period sites; and
- assessing risks to Roman period sites and landscapes beyond climate change.

Getting the most out of the data

- innovative intra-site studies with respect to Roman period sites and issues; and
- developing and testing survey techniques for Roman period sites, landscapes and material.

Understanding human interactions with the environment

- Roman period environmental context and change.

Approaches to the Roman period in commercial archaeology

- raising standards.

Raising awareness of recent research across the sector and engaging the public

- widening access;
- securing key archives; and
- building partnerships beyond England.

James, S. and Millet, M. (eds.), 2001. *Britons and Romans: advancing an archaeological agenda*. CBA Research report 125

- Iron Age-Roman transition;
- Romanisation, gender and class;
- material culture and identity;
- material approaches to the identification of different Romano-British site types;
- role of vertebrate zooarchaeology within a Roman research agenda;
- rural society in Roman Britain;
- themes for urban research; and
- Roman to Medieval transition.

ROMANO-BRITISH – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 127-144

- characterise the grounds for the people of much of the West Midlands to prefer to retain the established order rather than become 'Romanised';

- explore through the archaeological record what elements of 'Romanisation' were adopted and which were discarded and through this attempt address the strict teleological categories of 'Romanisation' or 'Resistance';
- identify potential points of comparison between the West Midlands and areas within Germania Inferior, e.g. the Netherlands, regarding the ideological structure of society;
- the demographic and social impacts of the removal of young men for service in the Roman army;
- investigate zones of the region classically identified as 'traditional' and 'innovative' through environmental evidence, social structures, patterns of settlement and artefact use and deposition to establish if one was more open to Roman-style practices than another; and
- distribution and trade of pottery, particularly from specific production centres and of functional types.

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 70-81

- chronology;
- the military impact;
- growth of urban centres;
- rural settlement patterns and landscapes;
- agricultural economy;
- artefacts: production, distribution and social identity;
- roads and waterways; and
- ritual and religion.

Research objectives

- create regional pottery corpora and publish key production centres;
- support dissemination and synthesis of information on Roman finds;
- promote systematic application of scientific dating techniques;
- support scientific analysis of human remains;
- promote integration of studies of subsistence, diet and health;
- develop access to Lincoln and Leicester Urban Archaeological Databases;
- promote further synthesis and analysis of secondary urban centres;
- investigate landscape context of rural settlements;
- support research and publication of landscape syntheses; and
- instigate regional scale characterisation study of industry.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 47-48

- 'Regional variation' or 'Tribal distinctions'?
- rural settlements and landscapes;
- Romanisation;
- towns;
- ritual and religion;
- infrastructure;

- manufacturing and industry;
- finds studies; and
- Roman/Anglo-Saxon transition.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6. 179-184

Inheritance

- sites with well-preserved deposits of both Late Iron Age and Roman date should be given careful attention to investigate continuity of local tradition at these sites; and
- radiocarbon dating should be used more widely and systematically to help understand change between the Late Iron Age and early Roman period.

Environmental evidence

- environmental evidence should be collected and analysed to help identify how field systems operated and developed;
- variation in resources and agricultural regimes from different scales of farm needs to be investigated;
- attempts should be made to identify any changes in farming methods from field, farm and valley environments; and
- evidence for a Roman cultivation signature in the alluvial sequences of, for instance, the Thames Valley should be sought.

Landscape and land use

- studies of different types of site within a local area should be given high priority, in order to build up a picture of supply and demand;
- corn dryers should be studied, both in terms of their archaeobotany and possible multiple functions, and their archaeological context;
- spelt wheat was used for brewing throughout the Roman period, although there is some evidence that barley or a mixture of wheat and barley were used towards the end of this period. Samples that contain sprouted barley grain, believed to represent grain prepared as malt, should be radiocarbon dated. The material itself should be used for this purpose and a minimum of two dates from a given assemblage should be obtained;
- the retrieval of information regarding the development of synanthropic fauna, pests and disease, especially in rural settlements;
- the development of horticulture and the access of the rural population to 'exotic' foods;
- detection of evidence for viticulture to compare with that found in the Midlands;
- investigation of Roman urban deposits for insects;
- diet, including evidence from mineralised deposits from latrines and other sources of cess, should be investigated;
- the location of woodland, and if and how it was managed;
- the exploitation of woodland for construction and use as fuel needs to be investigated throughout the settlement hierarchy, and in domestic, religious and industrial contexts;
- the exploitation of fish and shellfish on Roman sites, including the identification of further evidence for (freshwater) fish farming;

- investigate breed improvement for cattle and sheep, and variation in the proportions of the principal domestic animals in relation to the socio-economic status of the producer; and
- information about 'exotic' species, such as the north Buckinghamshire chestnuts, should be sought within pollen sequences.

Settlement

- a comparative, landscape approach to 'blocks' of chalkland might address questions relating to:
 - non-villa settlement and burial practice;
 - nucleated settlement and burial practice;
 - settlement economies;
 - temples and religious sites; and
 - the relationship of the above to the Middle and Late Iron Age background.
- equally important is the need to gain an understanding of settlement, its density and variability as well as economy in other environments such as claylands and heathlands where we particularly need a much better characterisation of settlement patterns in:
 - East Berkshire;
 - Aylesbury Vale, Buckinghamshire;
 - The Hampshire Basin;
 - The New Forest;
 - North-east Oxfordshire claylands; and
 - The Vale of White Horse.
- the Portable Antiquities Scheme (PAS) records show concentrations of reported finds on a landscape scale that do not map onto existing HER records. These require further investigation through geophysical survey and systematic surface collection;
- the evidence for major change in settlement occupation across the diverse landscapes of the region between the Late Iron Age and the Early Medieval period needs to be collated; and
- the relationship of such change to the development and decline of 'villas' and associated reorganisation of the rural landscape should be investigated.

Civitas capitals and other towns

- improve our knowledge of towns and their histories of origin, development and change at all levels of the urban hierarchy;
- the hinterland settlement and mortuary landscape of both 'large' and 'small' towns require further research;
- research the hinterlands and mortuary landscapes of smaller nucleated settlements;
- research settlement nucleation away from the road network to understand its context, character and later history;
- the character of urban environments and their change over time; and
- characterisation of economic activity through the various levels of the urban hierarchy.

Ceremony, ritual and religion

- sampling for biological remains from deposits associated with temples and shrines, and from cremation cemeteries, to widen our understanding of the use of plants and animals in religion and ritual;
- stable isotope analysis of cemetery populations;

- radiocarbon dating of burials potentially post-dating AD 400;
- researching the contexts of metal-detected major finds, including hoards; and
- patterns in the location and distribution of temples need to be explored.

Warfare, defences and military installations

- research on the context of Roman military equipment of all phases, with particular reference to PAS material, in the sub-region.

Material culture

- the publication of well-dated assemblages of material culture of all types;
- the development of regional pottery fabric series to complement the national series, in conjunction with the publication of as-yet unpublished pottery assemblages from kilns; and
- the resources of the PAS to be exploited to understand more clearly variations in the characteristics of the material culture of the sub-region.

Crafts, trades and industries

- increase knowledge of the Roman landscape and settlement context of the Alice Holt, New Forest and Oxfordshire industries;
- explore the relationship between kilns, workshops and settlements;
- increase knowledge of the exploitation and management of associated woodlands through the study of pollen sequences and wood charcoal assemblages from the pottery production sites;
- develop a methodology for distinguishing between the 'grey ware' products of the Alice Holt and New Forest industries in hand specimen and apply it to dated pottery assemblages to determine the respective markets of the two industries in these wares;
- collect the evidence of localised pottery manufacture and publish the pottery associated with the kilns with appropriate description/characterisation of fabrics;
- characterisation, including chemical analysis, and quantification of iron slag assemblages to ensure ironmaking and iron-working residues are correctly identified;
- in the absence of good material culture evidence, slag assemblages may require radiocarbon dating to establish a chronology of local traditions;
- characterisation and quantification of the wood charcoal used in this industry;
- the development of methodologies based on petrographic analysis to differentiate in hand specimen between Solent-Thames and extra-regional stone sources;
- characterisation, including by petrographic methods, and quantification of non-local building materials, including unworked material from settlement excavations;
- distribution of Stonesfield (Oxon) slate, *vis à vis* other sources of roofing slate;
- sources and distributions of Solent-Thames-produced querns (and millstones);
- identification of quarries;
- characterisation and quantification of settlement assemblages by type of material;
- extent of trade in these materials through research of type and fabric;
- sample coastal sites appropriately for the recovery of evidence of fishing, shellfish harvesting and salt-making;
- sample appropriately inland settlements, both urban and rural, to recover and quantify fish remains if they are present; and
- research shellfish assemblages to recover evidence of origin and to quantify relative abundance across the sub-region.

Communications and trade

- use of the Solent and its harbours for trade and communication during the Roman period;
- remains of harbours, jetties (including waterlogged structures), boats, etc.;
- extent of trade and traffic along the south coast of Britain;
- distinguishing between south coast-generated overseas trade and traffic and that connected with London and the Thames Estuary;
- development of *Claesentum* and potential associated port facilities;
- use of the Thames and its tributaries for the movement of goods and people requires investigation;
- location of river crossing points needs to be sought;
- location and extent of Roman period deposition in the river need further research;
- influence of the Thames on the development of riverine settlements needs to be explored;
- assessment of the importance of communication and trade using this east-west road communication compare with use of the river(s), particularly the Thames and its major tributaries, such as the Kennet and Thame;
- assessment of the importance of the east/west road route originating from London compared with the *Corinium-Alchester-Verulamium* road, which runs across the north of the region;
- assessment of the relative importance of north-south routes in the sub-region;
- influence of the major roads on the development of roadside settlement should be investigated; and
- assessment of changes in the relative importance of the major roads that cross the region over time.

Museum of London, 2002. *A Research Framework for London Archaeology*, 24-39

Framework objectives

- understanding whether the transition from the Late Iron Age to Roman Britain was wholly about change, or whether there is more evidence than previously thought for continuity;
- investigating whether the Roman Conquest of AD 43 can be identified in the archaeological record;
- exploring cultural interaction between Britons and Romans – taking account of such factors as inclusion, rejection and marginality;
- examining the evidence for the development of provincial government at London;
- exploring the nuances of civic status and governance: of private, public and military life;
- understanding how the relationship between hinterland and territory of *Londinium* operated;
- analysing *Londinium's* demographics, and the social and ethnic identity, family life and beliefs of its residents;
- defining the economic character of different parts of the region (and the region as a functioning whole) through time – focusing on production, consumption and distribution; and
- examining the reasons for and characteristics of contraction, decline and abandonment of the urban settlement.

KEY/SHARED THEMES

Romano-British

- Iron-Age to Romano-British transition; change vs continuity? Regional variation?
- Romano-British to post-Roman transition (See Saxon and Medieval, below);
- how far was the military conquest and subsequent occupation/presence a motor of social and economic change?

- evidence for the process and character of 'Romanisation';
- regional diversity:
 - characterising occupation/settlement, its density and variability in different regions;
 - establishing the economic character of different regions/sub-regions through time – focusing on production, consumption and distribution;
 - identifying ethnic and cultural diversity; and
 - understanding regional differences in artefact styles and economies.
- development of routes, trackways and roads:
 - can the chronology of road construction and links between road building and campaigns of conquest be clarified?
 - how were roads, rivers and artificial waterways integrated?
 - to what extent were communication routes influenced by Late Iron Age settlement patterns and routes of movement? How did these impact upon established communities and how did roads influence the development of occupation centres/urban morphology?
 - what variations in the structure of roads exist? Are they different in the countryside, and on different terrain? Why did some disappear and others continue in use?
- agriculture and land use:
 - improve existing understanding of environment and agrarian systems;
 - what was the impact of environmental factors and climate change on agriculture?
 - increase knowledge of the exploitation and management of woodlands;
 - investigate further the intensification of agriculture/developments in animal husbandry/adoption of new crops; and
 - how did field and boundary systems relate to earlier systems of land allotment, and how did these develop over time?
- funerary sites and religion:
 - what can studies of Roman cemeteries/funerary contexts teach us about changing burial practices, demography, subsistence, health, social organisation, population movement and origins? How did practices vary regionally and between different communities?
 - application of scientific techniques, e.g. stable isotope analysis of cemetery populations;
 - did the structured deposition of human/animal bone continue from the LIA?
 - evidence for the adoption of Christianity?
 - investigation of temples/other religious sites. How was the location of religious sites related to LIA activity?
- material culture:
 - further investigate the production, use and distribution of material culture, including questions relating to social identity/organisation;
 - enhance our knowledge of developing pottery industries and regional variations in pottery typology and fabric; and
 - chronology and technology of metalworking and other forms of material culture.
- settlements:
 - how and why did settlement forms and building traditions vary within/between regions and over time?

- how did rural settlements relate to each other and to towns and military sites, and how did this have vary regionally and over time?
- how does the distribution of towns correlate with Iron Age foci, and how far did their social, political and economic roles overlap?
- development and decline of 'villas' and associated reorganisation of the rural landscape
- how were towns organised, what roles did they perform and how did their morphology and functions vary over time?
- systematic application of scientific dating techniques is crucial for a wide range of themes.

EARLY MEDIEVAL AND MEDIEVAL – The national agenda

Medieval Settlement Research Group, 1996 (revised 2007). *Medieval Rural Settlements – a policy on their research, survey, conservation and excavation*

- interdisciplinary research is likely to yield the most satisfying results. Documentary evidence (including field and place names) should be studied alongside the material culture. Significant advances in knowledge are likely to proceed from dialogues between archaeologists, historians, geographers, place-name scholars, students of vernacular architecture, and those who work on bone and plant remains;
- there are still major categories of settlement sites, including villages and hamlets of the 10th and 11th centuries, deserted dispersed settlements of the Medieval period and sites in under-researched counties, such as Lancashire or Kent, which have not been excavated in adequate numbers;
- development-led excavations must be conceived as part of a wider research programme of fieldwork and documentary research, and treated as problem-solving sorties, often focused as much on peripheral areas of settlements as on the centres. The policy of preservation *in-situ* and limited archaeological intervention needs to be carefully considered;
- research excavation also has an important role to play in the development of our understanding. The value of long-term research projects which enable archaeologists to reflect upon problems, develop hypotheses and then investigate them in the field was demonstrated in the work at Wharram Percy and more recently in the excavations at Bishopstone, East Sussex;
- the academic research agenda combines the need to address recent preoccupations, and to take into account new questions. We need to extend our understanding of regional differences, assess the influence of the natural environment and define the extent to which people moulded the landscape and settlement pattern to their own needs. The role of government, or lordship, or market relations in forming regional cultures must be considered; and
- this can be addressed partly by applying new approaches and theories to evidence already published, and by constructing new syntheses. There is also a need for new research, and in particular for the type of interdisciplinary, problem-oriented enquiry into a manageable but extensive sample of the countryside – a large parish, estate or manor for example – which has yielded such fruitful results in the past. Previous work has tended to be based on nucleated villages and their territories, but now work should be focused on regions of dispersed settlement, or those with both nucleated and scattered settlements.

EARLY MEDIEVAL AND MEDIEVAL – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 149-204

Post-Roman and the Early Medieval periods

- population make-up: use of strontium isotope ratios and continued DNA testing to explore racial affinities;

- re-examination of burial evidence: bones, metalwork and pottery, in existing collections;
- urgent publication of unpublished or partially published archaeological investigations;
- evaluation of pre-Christian ritual sites;
- evaluation of the possible reuse of Iron Age hillforts in the post-Roman period;
- continued search for evidence of all forms of Early Medieval rural settlement with particular attention to sites where Roman and Medieval settlements are juxtaposed;
- identification of early minster sites, especially within Greater Mercia, using all available documentary evidence (including the extent of Medieval parishes) together with church sculpture and church fabric, for example;
- continued work on urban sites with detailed studies of ceramic evidence. Need to understand the role of commerce and markets;
- prominence needs to be given to environmental archaeology and results need to be easily accessible within the region. Definition needed in areas where environmental evidence of previous land use is likely to be well preserved (e.g. alluviated river valleys). An allotted programme in a selected area would be beneficial. Recognition of the potential of soil micromorphology to determine 5th to 9th century occupation of land use;
- need to adopt a multidisciplinary approach embodying archaeology: selected area studies likely to be most productive. However, no area can be examined in isolation; and
- need to record areas of specific land use such as early field systems etc. The difficulty of dating such features should not mean that they are ignored.

Medieval

Rural settlement

- village origins;
- the fluidity of settlement; and
- the desertion and/or shrinkage of rural settlements.

Urban settlement

- cycles of urban growth and decline, and the accompanying trends in urban populations;
- industry and production;
- houses and buildings;
- defences and urban castles;
- the church;
- towns and their role within their wider landscape;
- town planning and urban landscapes;
- buildings;
- crafts and trades; and
- development patterns.

Hinterlands

- what are the most appropriate ways of defining hinterlands?

Life and death in Medieval West Midlands

- prioritise and maximise the contribution made by environmental archaeology to our knowledge of Medieval life in town and country;
- the study of reasonable-sized skeletal groups, ideally within the context of the community they represent, for demographical information; and
- significant assessment of material culture from active excavations and archives.

Making a living

- the agricultural resource;
- industry in town and country; and
- organisation, marketing and communication.

Castles

- further work on mapping, density and distribution on a local and regional basis, alongside the extent of individual sites within their landscapes;
- the study of castles within their wider contexts, within constructs and infrastructures that were meaningful to contemporaries; and
- research to enhance our opportunity to look at the hierarchy of sites, examine the chronology and development of earthwork castle sites and address the relative imbalance that has seen most work carried out on stone-built castles.

The church

- examination of monastic sites within their wider setting and landscape;
- increase knowledge of small rural monastic houses, urban monastic sites and those associated with the military orders;
- relation of churches to earlier sites, the development of the early church and the role of monastic sites in the development of towns;
- focus on investigation of urban parish churches;
- investigation of the origins of parish churches and their position within the wider community;
- consistent baseline survey and archaeological characterisation for parish churches; and
- establishment of a regional research project into parish churches.

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 82

Early Medieval (c.AD 410-1066): Updated research agenda

- demography and the identification of political and social groups;
- ritual and belief;
- roads and rivers: transport routes and cultural boundaries;
- rural settlement patterns;
- inland towns, 'central places' and burhs;
- industry, trade and the emergence of a monetary economy; and
- agricultural economy and rural landscape.

Research objectives

- elucidate the chronology and demography of Roman to Anglo-Saxon transition period;

- assess the landscape settings of Anglo-Saxon burial sites;
- review the evidence for developing settlement hierarchies;
- investigate Anglo-Scandinavian settlement by reference to stone sculpture;
- undertake further research on Anglo-Saxon and Viking urban development;
- identify cultural boundaries in the Early Medieval period;
- elucidate development of the parochial system;
- assess the evidence for extractive industries in Late Anglo-Saxon and Viking periods;
- review the nature and distribution of Anglo-Saxon imported goods; and
- update and expand East Midlands Anglo-Saxon Pottery Project.

High Medieval (1066-1485): Updated research agenda

- urbanism;
- rural settlement;
- manors and manorial estates;
- castles, military sites and country houses;
- religion;
- industry and trade; and
- agrarian landscape and food-producing economy.

Research objectives

- undertake syntheses of urban and suburban excavation, survey and documentary data;
- enhance record of urban and suburban secular standing buildings and subterranean structures;
- investigate provisioning of the Medieval town;
- investigate further the role of markets, fairs and ports and trading routes;
- investigate the morphology of rural settlements;
- investigate development, structure and landholdings of manorial estate centres;
- investigate relationship between castles and great houses and their estates;
- investigate location and character of Medieval battlefields;
- investigate development of the open field system and woodland management; and
- research the regional communications infrastructure.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 57-59, 70-71 & 85

- evidence for change in ritual practices, including the widespread adoption of Christianity;
- complete absence of an observable material culture for the post-Roman period in Hertfordshire;
- what happened in Hertfordshire from the 5th century on?
- further work needs to be done regionally and nationally to clarify the morphology of settlement sites of the Early to Middle Anglo-Saxon period;
- synthesis of the increasing evidence from excavations for sites which span the transition period between the Romans and Saxons on a regional basis;
- further study the impact of climate change in the Medieval period;

- further research on the origins and development of the different rural settlement types, also the dynamics of Medieval settlement;
- what forms do farms take, what range of building types are present and how far can functions be attributed to them? Are there regional or landscape variations in settlement location, density or type? How far can the size and shape of fields be related to agricultural regimes? What is the relationship between rural and urban sites?
- further work is needed on the Medieval pottery industries, both at a local and regional scale;
- establish the main communication routes through the region; and
- development of the Medieval and early post-Medieval landscape, and the processes by which field systems, woods etc. contribute to the current landscape.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6. 227-233

Saxon/Early Medieval

Nature of the evidence

- this is an area made up of regions normally kept separate in geographical and regional studies, providing an opportunity to compare data across these regional boundaries;
- this is a period that remains relatively under-represented and poorly understood in the archaeological record across much of the region, and remains a high priority for investigation when opportunities arise;
- the region offers a good opportunity to compare land-based and water-based transport in the Early Medieval period; and
- there are significant differences in the levels of research and data collection across the region, making research in those areas that have been least well served a high priority for further research.

Inheritance

- establishing the identity of the group using the new culture, building on current work on isotope evidence and DNA analyses, and with particular attention to extending studies to include Roman period skeletons;
- establishing if, when and how villa estates ceased to function;
- using environmental evidence to identify possible change from specialised farming to a generalised approach;
- identifying the extent to which there was continuity of use between Romano-British sites and Anglo-Saxon;
- identifying and exploring the extent to which Romano-British agricultural practices persisted into the Anglo-Saxon period;
- arriving at a better understanding of the relationship – economic, political, social – between incoming Anglo-Saxons and surviving Romano-British communities across the region;
- carrying out detailed comparison of the settlement patterns and of the chronology of change in different activities between the Roman and early Anglo-Saxon periods; and
- reviewing existing evidence to identify areas with material culture overlap and areas without, with particular reference to the reasons for the abandonment of Silchester.

Chronology

- the date of earliest Anglo-Saxon settlement and the degree of overlap with Romano-British culture;
- development of better definition of chronologies within Anglo-Saxon cemeteries;

- better definition and dating of pottery sequences in the region;
- review of the current radiocarbon dating evidence, particularly from sites radiocarbon dated before the early 1990s; and
- identification of Middle and Late Anglo-Saxon rural settlement.

Landscape and land use

- collection of more extensive environmental samples to allow detailed analysis of particular sites, and consequently to inform comparisons of environmental data across the region;
- building upon and adding to existing environmental information to identify when and where changes in agriculture and land use took place;
- better understanding of the process of agricultural intensification in the Middle to Late Anglo-Saxon period and the origins of open field systems;
- significance of environmental data and information from other sources such as place names for understanding the way in which estates were structured in the Middle and Late Anglo-Saxon period;
- use of palaeo-environmental data and enquiry to further the identification of the location and nature of woodland, including the regrowth of more extensive woodlands such as on the slopes of the Chilterns;
- review of rural field systems to promote their preservation, particularly in the light of more intense pressure on land from modern agricultural practice; and
- geoarchaeological studies to identify activities occurring at particular sites and site types.

Settlement

- a review of settlement patterns and land use is needed, particularly regarding the apparent concentration of settlement on gravel terraces in the Thames Valley;
- there is a need for more detailed studies of landscapes at a scale comparable to the Whittlewood project, and a search for appropriate areas should be undertaken;
- more work is needed on the dating of settlements, using scientific dating methods where suitable samples are available;
- more work is needed on the way in which Anglo-Saxon settlements were organised and functioned;
- more information on settlement change and village formation in the Middle to Late Anglo-Saxon period in particular is required to test existing possible models;
- pollen analysis and environmental analysis need to be carried out as a routine part of site excavation, to look at changes in diet, for example;
- the region's archaeological resource is important for the study of urban origins and development, and this should remain a regional priority;
- settlement patterns require further study in areas of dispersed settlement such as the Chilterns; and
- more emphasis is needed on comparison of patterns of production and consumption to shed light on the relationships between rural, specialised and urban sites.

Social organisation, economy and subsistence

- so-called 'productive sites' need further study and investigation;
- the distribution of all artefact types needs to be examined in relation to these axes of exchange;
- stable isotope and DNA investigation should be prioritised for both previously excavated and new skeletal material;
- investigation should include that of evidence for origins and diet through stable isotope analysis;

- evidence is needed to allow recognition of estate centres (consumption) and specialist production sites, both of which would be expected within a 'multiple estate' model;
- date of the establishment of mills mentioned in Domesday needs to be determined;
- possible relationship of these dates to the intensification of agriculture and the establishment of open fields should be considered; and
- archaeological evidence for specialised production (e.g. vineyards recorded in Domesday) should be sought.

Ceremony, ritual and religion

- need to date known unaccompanied burials, which may well be Anglo-Saxon. It is possible that there are many more excavated unfurnished Anglo-Saxon cemeteries than are currently recognised;
- there is a serious research need for a radiocarbon dating project on skeletal material from this region on the lines of Dawn Hadley's dating project for the Northern Danelaw;
- clarification of the demise or survival of late Roman Christianity and paganism into the 5th/6th centuries should be sought;
- understanding of the significance and cultural context for the reuse of earlier sites for burial and other ritual activity needs to be improved;
- evidence for Anglo-Saxon pagan religious practice other than in burials e.g. 'shrines', ritual embedded in daily life (as often suggested for later prehistory) needs to be identified; and
- nature of Middle-Late Anglo-Saxon religious sites, including better identification and understanding of the characteristics of early minsters and monasteries, requires further work.

Transport and communications

- there is a need to focus on gathering evidence from the Thames waterfront;
- further work is needed on understanding the fate of Roman roads in the Early Medieval period;
- cross-channel and coastal communications along the south coast require investigation;
- whether the Upper Ouse was navigable prior to the construction of mills along it needs to be determined. This of necessity requires more research on riverine vessels of the Anglo-Saxon period; and
- if possible, the Late Anglo-Saxon road network should be reconstructed.

Material culture

- the systematic classification and dating of artefacts, in particular to help understand Middle Anglo-Saxon patterns of trade, travel and economy;
- rectifying the current uneven implementation of Archaeology Inventory Projects; and
- further ceramic studies to identify and understand patterns of variation within the Solent-Thames region.

Built environment

- reassessment of the current evidence for Anglo-Saxon towns in the region to identify further research priorities;
- more research into what Late Anglo-Saxon domestic buildings looked like;
- identification of regional variations in domestic buildings; and
- prioritisation of evidence for Anglo-Saxon occupation on Medieval sites with documented Saxon antecedents. Where such evidence appears to be lacking, the reasons for this also require fuller investigation.

Warfare, defences and military installations

- further research on other Early Medieval defensive structures in the region, following the Wallingford project model;
- review of the linear earthworks in the region;
- further consideration of roads and herepaths from both documentary and archaeological evidence;
- identification of pre-Viking Age defensive sites;
- exploration of the impact of the establishment of burhs on their hinterland, and their possible role as drivers for the reorganisation of estates or intensification of production;
- investigation of undocumented burh-like fortifications (e.g. Newport Pagnell?); and
- detailed recording of evidence, for example, of defensive networks of beacons, lookouts, strongpoints and recognisable around burhs.

Legacy

- extent to which the processes of nucleation of villages, formation of open fields, development of a system of local churches began in this period needs more investigation; and
- a more thorough search is needed for evidence of Anglo-Saxon occupation on 'Medieval' sites without documented Anglo-Saxon antecedents.

Later Medieval

Nature of the evidence

- evidence from documentary sources needs to be integrated with the physical evidence, and each allowed to challenge the other; and
- consideration of art and art historical studies should be included.

Chronology

- milestones for the region within the continuum of economic and social development need to be identified.

Landscape and land use

- chronology of development and character of field systems and their relationship to settlement across the region need to be further explored;
- character and organisation of ridge and furrow and field drainage;
- relation of surviving ridge and furrow to early field maps;
- identification of 'lost' ridge and furrow from old APs and LiDAR survey;
- evidence needs to be gathered for the extension of arable into forests and onto downland, assarts and early enclosure, hedge dates and types;
- management of water resources: water meadows and leats for mills;
- location of fishponds and fisheries and their relation to weirs and mills/bridges;
- canals and artificial water bodies;
- sea fishing and coastal fish weirs/traps;
- deer farming and parks, deer leaps and traps, stud farms, rabbit warrens;
- forests and chases, the bounds of the true (as well as the legal) forests and their topography and service buildings;
- timber cultivation and transportation, woodland banks and divisions;
- provision and marketing of firewood and charcoal;

- use of different cereal grains, introduction of rye wheat, brewing;
- production of fodder such as the cultivation of common vetch and the importance of oats require further consideration;
- growth of horticulture and the development of trade in herbs and spices for both culinary and medicinal use;
- rural settlements with anoxic conditions are rare – samples from these should be targeted, and analysed with particular attention to site formation processes; and
- changes in fauna of major rivers in relation to pollution and habitat loss should be investigated.

Social organisation

- stable isotope analysis of burials to investigate origins and diet may provide information of migration patterns and immigration from overseas;
- variations in diet may also reflect differences in social status and location in town/country; and
- study of faunal remains, both by quantitative analysis and through analyses such as deficiencies evident in teeth or bones, should be routinely pursued for an indication of diet.

Settlement

- origins and nature of nucleated village settlement;
- need to extend village morphology studies from Buckinghamshire to other areas;
- origins/continuation of dispersed settlement;
- continuity and contrast between Chiltern and Berkshire downs (fringe settlements on scarp edges);
- types of settlement on forest edges and commons;
- nature of dispersed settlement as farms/granges/moats/hamlets;
- character, distribution and chronology of moats;
- village shrinkage and abandonment; change from hamlets to farmsteads;
- evolution of 'farming counties', possibly origination before the Black Death;
- origins of manorial sites, their chronology and their relation to village formation;
- reasons for the abandonment of manorial sites;
- character of manorial sites (moated, relation to village plan);
- better definition of special types (e.g. royal manors, castles, ecclesiastical granges);
- character of peripheral settlements attracted to moated sites, granges, etc.;
- character and status of manorial/gentry buildings;
- what were the reasons for the survival and persistence of urban sites from the Early Medieval period?
- what factors influenced the origins and growth of the principal towns?
- how did the hierarchy of large and small towns, markets and ecclesiastical centres (former minster towns) develop?
- what was the distribution of markets and fairs, and why?
- how does the topography and plan form of towns differ, and what are the key differences between small and large towns?
- how did tenement patterns develop, and what was their relation to field patterns?
- where were the town fields and commons? How did they relate to liberty and parish boundaries?
- what were the drivers for the formation of new towns, and for town extensions and retractions?

- how does the survival of deposits vary within and between towns? How did the size of a town affect the management and disposal of waste?
- were there differences in the living conditions between small towns and larger conurbations?

Built environment

- quality of buildings, framing/roof types as indications of class/status;
- rebuilding as reflecting wealth/agricultural change;
- changing building techniques in timber, stone and brick, and the chronology and distribution of use of different materials;
- crucks and box frames, and in particular, the chronology and distribution of framing types;
- the chronology of the end of the construction of open halls, and of the start of the construction of continuous jetties;
- chronology and distribution of roof types, and in particular the change from crown-post to queen-post roofs;
- dating of buildings in local areas/regions as a guide to the chronology of change (e.g. recovery from Black Death);
- understanding regional differences in survival rates (e.g. extant stock of early peasant houses in Harwell and the Vale of White Horse, and of hall houses around Winchester);
- plan forms of farmsteads and the nature of subsidiary buildings, especially barns associated with monastic/institutional landlords;
- the identification of 'squatter dwellings' on commons and wastes;
- buildings identified in written and pictorial sources;
- origins and development of urban housing types (plan, gables and ridges in relation to streets);
- character and ranking of townhouses;
- warehouses and storage cellars;
- origins of inns (wealdens used as); taverns in special cellars;
- halls of guilds and buildings of institutions;
- hospitals, colleges and almshouses. The association of hospitals with urban settlement in particular is currently insufficiently appreciated;
- location and character of parish churches and friaries;
- lost buildings identified in written and pictorial sources; and
- development of specific building types using different materials in particular areas of towns and cities, and their relationship to social identity and status.

Ceremony, ritual and religion

- relationship of pre-Conquest churches to later churches and claustral buildings;
- character and chronology of major buildings;
- better understanding of subsidiary buildings, economic activities, water management and gardens;
- monastic life, diet, health and death;
- minor monastic and related sites (moated monastic sites);
- barns and granges;
- failed or temporary monastic houses;
- chronology of church building/rebuilding and its relationship to the evolving liturgy;

- study of patrons and rectorial works to fabric;
- regional patterns of church types and chronology;
- location of church in village/parish plan;
- change from parochia to parish, and the role of chapels;
- regional patterns of masonry, decoration, windows, sculpture;
- chronology and types of roof, screens and seating;
- church monuments, plate, bells and windows;
- churchyards and their features and burials; and
- rectories, rectory farms and vicarages.

Warfare, defences and military installations

- surviving sections of town defences need to be recorded;
- reconsideration of castle remains and sites, particularly in towns across the region, is needed;
- the measures taken to upgrade Medieval (and earlier) defensive sites, particularly on the coast, during the Later Medieval period, should be further studied in relation to contemporary events in political relations with the continent;
- given the importance of royalty in the region, castles should be considered in relation to major seigniorial establishments, such as the king's houses and the 'palaces' of bishops and magnates; and
- more investigation should be made of the relationship of castles and their landscape setting as manors with adjacent villages and fields, parks and forests (e.g. Portchester).

Material culture

- further study of the varieties and quality of pottery usage;
- small finds are important indicators of consumer activity in rural and urban households, and evidence for the influence of overseas trade and proximity to London may be identifiable. They may also indicate the presence and movement of noblemen and their retinues within and beyond the region; and
- whether these influences also affected changes in use and status of pottery or whether they were the result of wider economic and social change should be investigated.

Trade and industry

- means and location of manufacture of small metal objects;
- patterns of marketing of small metal objects;
- location of the more persistent and temporary production sites for pottery;
- means and places of production of brick and floor tiles;
- distribution of structures using brick and floor tiles should be examined for evidence of the sources of the materials, and the distance that these materials were transported i.e. the range of each industry;
- identification of quarry locations;
- means of transport (coastal, river and road) for stone;
- urban tanning sites and production of parchment;
- origins of fibre production;
- evidence for the survival of horizontal mills;
- distribution of coastal tide mills;

- salt production sites and the technology that they employed;
- identification of ironworking sites;
- production sites for wooden objects, including ships;
- study of the markings on casks to identify their origins, and thus inform patterns of trade;
- identification and study of shipwrecks and their cargoes; and
- mason's marks should be studied, not only to assist in understanding the organisation of labour on major building projects, but also to investigate the movement of craftsmen and decorative styles.

Transport and communications

- evidence for coastal and overseas trading ports, which will inform patterns of exchange within Britain and with the continent;
- wharves and other evidence for river transport should be investigated wherever possible to demonstrate how the major rivers of the region functioned;
- river craft from this period are not well recorded and evidence for Thames barges, 'shouts', punts etc. should be more actively sought;
- evidence for the creation, diversion and maintenance of waterways and for industries such as milling and fisheries is needed; and
- the extent of road transport and bridges in the region needs further investigation, including evidence from documentary records.

Museum of London, 2002. *A Research Framework for London Archaeology*

- understanding issues of nucleation and desertion, especially in connection with major events that are traceable in the archaeological record, such as the Black Death.

Saxon (AD 410-1066)

Framework objectives

- study of the transitions between Late Roman and Early Anglo-Saxon, including the reasons and implications for shifting settlement patterns;
- refining existing chronologies;
- understanding regional relationships;
- topography and landscapes;
- character and extent of the of the Early and Middle Anglo-Saxon settlement;
- character and extent of the relocated later Anglo-Saxon settlement;
- buildings;
- demography and society;
- economy: production, distribution and consumption; and
- politics and religion: the centres of power.

Medieval (c.1066-c.1500)

Framework objectives

- understanding the nature and extent of urban development, and the social and economic relationship of the core to its region;

- comparing Medieval London with other towns in Britain and on the continent, charting the reasons for changes in perception and influence;
- targeting archaeological research which has potential to complement documentary knowledge;
- topography and landscapes;
- demography and society;
- religion and ideology;
- development; and
- economy – production, distribution and consumption.

KEY/SHARED THEMES

Early Medieval/Saxon

- this period remains relatively under-represented and poorly understood in the archaeological record across regions, and remains a high priority for investigation;
- the Roman to Anglo-Saxon transition
 - what is the evidence for continuity of occupation vs. abandonment or deliberate destruction of Roman occupation centres?
 - what was the relationship between indigenous and incoming populations, and how did this vary spatially and over time?
 - to what extent were Roman roads used and maintained?
 - change vs. continuity in subsistence/animal husbandry and agricultural practice/land use
- regional variation;
- cultural boundaries in the Early Medieval period;
- the widespread adoption of Christianity during this period is still poorly understood and further study is needed into how it manifests itself within the archaeological record; e.g. evidence from burials, early churches, continued use of Romano-British religious centres;
- settlement:
 - work needs to be done regionally and nationally to clarify the morphology of settlement sites of the Early to Middle Anglo-Saxon period;
 - more information on settlement change and village formation in the Middle to Late Anglo-Saxon period is required;
 - evidence for developing settlement hierarchies;
 - how were Anglo-Saxon settlements organised and how did they function?
 - prioritisation of evidence for Anglo-Saxon occupation on known Medieval sites. Where such evidence appears to be lacking, the reasons for this also require investigation; and
 - extent to which the processes of nucleation of villages, formation of open fields, development of a system of local churches began in this period needs more investigation.
- land use and agriculture:
 - identify rural land use and the extent of agricultural exploitation;
 - development of agricultural practices and animal husbandry; and
 - how were woodlands used and managed, and how were other environments exploited?
- important role played by the investigation of cemeteries, e.g. in identifying population movement, health, ethnicity, variations in social status, regional diversity, changing burial practices and belief. The application of scientific techniques (stable isotope/DNA analysis/dating techniques) critical to

understanding the evidence from burials. Better definition of chronologies within Anglo-Saxon cemeteries is required;

- the study of faunal remains, both by quantitative analysis and through analyses such as deficiencies evident in teeth or bones, should be routinely pursued for an indication of diet;
- collection of more extensive environmental samples to allow detailed analysis of particular sites, and consequently to inform comparisons of environmental data across regions;
- better definition and dating of pottery sequences;
- variations in the use of material culture;
- military/fortified sites require further investigation;
- Domesday records many watermills. What evidence for these is preserved in the archaeological record?
- trade, industry, processing and manufacturing all require further investigation; and
- wider application of scientific dating required, particularly for post-Roman sites.

Medieval

- impact of the Conquest;
- evidence from documentary sources needs to be integrated with the physical evidence;
- regional variation;
- settlement:
 - origins and development of the different rural settlement types need further research;
 - variation in occupation sites e.g. DMVs/manorial sites/farmsteads/moated sites/hamlets/dispersed vs. nucleated settlements; by region and by site type;
 - development of urban centres also requires further research;
 - evidence for the processes of nucleation and desertion requires further investigation;
 - further investigation of domestic architecture; and
 - how did Anglo-Saxon settlements and organisation of the landscape influence the Medieval landscape?
- environment and land use:
 - how was land use influenced by environmental factors?
 - impact of climate change should be further studied, including the impact of the onset of the Little Ice Age on the economy and settlement;
 - investigate the development of the open field system/Medieval agrarian economy. The character and development of field systems;
 - woodland management, woodland banks and divisions. Ancient woodland: although its historical veracity may sometimes be doubtful, such sites may enable further information to be gathered, and allow their archaeological significance to be tested. (Opportunities to investigate the archaeology of woodland management and archaeology within woodland occur infrequently in the context of development control); and
 - other land uses, e.g. deer parks, commons, fishponds and fisheries, exploitation/management of riverine environments.
- impact of major historically documented events (e.g. the Black Death);
- further work is needed on health, disease and nutrition in population groups, skeletal pathological markers and elemental and isotopic markers for disease;

- role of the church in relation to the economy and society. Evidence for the development of parish churches;
- industrial, processing and manufacturing sites require further investigation. Questions relating to trade and economy are also integral to these themes;
- further work is needed on the Medieval pottery industries, both at a local and regional scale; and
- transport and communications:
 - evidence for the creation, diversion and maintenance of waterways and for industries such as milling and fisheries is needed; and
 - extent of road transport/road networks needs further investigation.

POST-MEDIEVAL TO MODERN – The national agenda

English Heritage, 2010. *A Thematic Research Strategy for the Historic Industrial Environment*, 15

- understanding early industry and its organisation and the evidence of early trade and transfer of technology.

English Heritage 2010. *A Thematic Research Strategy for the Urban Historic Environment*, 23

- transitions: the rebuilding of English towns – projects exploring how, why and when English towns assumed 'modern' forms in the post-Medieval period, leading to new understanding of urban development and significance.

English Heritage, 2010. *A Thematic Research Strategy for the Historic Industrial Environment*, 16

- Examining the evidence of proto-industrialisation
 - investigating the remains of 16th, 17th and early 18th century industries;
 - establishing the material evidence for the transition from domestic to factory;
 - examining the continuity of the domestic system and its longevity;
 - recording the evidence for dual economies in rural areas;
 - tracing the influence of Atlantic trade; and
 - providing national and regional syntheses of these studies.
- *The Impact of Industrialisation* (English Heritage 2010 Industrial Research Strategy, p.16.)
 - impact of extractive industries on the landscape – coal, metal and other mineral mining;
 - manufacturing and the rise of industrial towns and cities; and
 - transport systems, communications and public utilities.

POST-MEDIEVAL TO MODERN – The regional agenda

Watt, S. (ed.), 2011. *The Archaeology of the West Midlands: A Framework for Research*, 211-230

Post-Medieval, industrial and contemporary archaeology

Capitalism

- explore the social changes wrought by the adoption of capitalism which manifest themselves in the archaeological record – enclosure and improvement, commodification and privatisation of space and the development of new identities as evinced through landscape, buildings and material culture;
- development of quasi-urban spaces (e.g. Black Country, north Warwickshire); and

- careful investigation of the changing role of Medieval centres such as Hereford, Coventry and Lichfield.

Industrialisation

- explore the earlier and smaller-scale industries;
- the use of building recording and below-ground investigations, with the latter including the provision for appropriate specialist scientific analysis;
- understand the social world of the workplace as its physical and technological aspects through themes such as gender, class identity and dialogues of 'domination and resistance'; and
- understand interactions between different sites, both rural and urban, within the landscape.

Consumption

- understand the development of consumer society through the study of the rich material culture coupled with documentary sources;
- explore complex patterns of trade, exchange, identity and communication; and
- investigate the consumption of landscapes (e.g. development of tourism), consumption of spectacle (e.g. sport and leisure) and the consumption of ideas (from practices of burial and commemoration).

Globalisation

- role of the region in the development of the new world and the impact of that world on the region;
- role of the region's industry in the development and continuation of the slave trade;
- role played by scientific and industrial development in exploration and colonial exploitation;
- patterns of trade and migration and the impact of the 'other' on our own society;

Knight, D., Vyner, B. and Allen, C., 2012. *East Midlands Heritage: An Updated Research Agenda and Strategy for the Historic Environment of the East Midlands*. University of Nottingham, 8

Post-Medieval (1485–1750): Updated research agenda

- urbanism: morphology, functions and buildings;
- landscapes of display: country houses and gardens;
- agricultural landscapes and the food-producing economy;
- rural settlement patterns and building traditions;
- industry and communications;
- ecclesiastical structures, estates and burials;
- battlefields and fortifications; and
- material culture.

Research objectives

- identify and research the landless urban and rural poor;
- further research the morphology and use of caves;
- establish a typology of regional building traditions;
- investigate developments in estate and garden design and their landscape contexts;
- identify agricultural improvements of the 16th to 18th centuries;
- research the development of industry and its impact upon landscape and settlement morphology;
- study post-Dissolution reuse of monastic structures and continuity of monastic estates;

- investigate graveyards and other burial sites;
- develop further the study of ceramic assemblages; and
- investigate Civil War defences, siege works and battlefields.

Modern (1750 to present): Updated research agenda

- urban and rural settlements;
- buildings in town and countryside;
- cultural diversity and religion;
- transport infrastructure;
- estates, parks, gardens and woodland;
- agriculture;
- the growth of industry; and
- military sites.

Research objectives

- assess urban building types of the early 20th century;
- examine the early development of utilities;
- investigate the development of social and religious buildings;
- investigate use of rivers for transport and power;
- assess role and landscape impact of woodland industries;
- explore landscape legacy of rural leisure pursuits;
- assess landscape impact of industrialisation of agriculture;
- identify and record rural historic environment features;
- explore evidence for non-factory trades and industries;
- war in the towns: research the urban infrastructure of war; and
- investigate the industrialisation of the Derwent Valley.

Medlycott, M. (ed.), 2011. *Research and Archaeology Revisited: a revised framework for the East of England*. East Anglian Archaeology Occasional Paper 24, 78-80

- the development and diversity of rural industry (agricultural engineering, textiles, brickmaking) would benefit from further study, also the role of energy creation within the landscape and the built environment associated with this (e.g. watermills, windmills, pumping-stations and gasworks). The impact of the primary communication routes on the region's development and character is of considerable interest, this includes major routes such as the Great North Road, secondary routes, railways, rivers and marine transport and ports;
- serious work is required on material culture studies of the post-Medieval and particularly modern periods;
- impact of social change on the landscape such as the Dissolution, the rise of nonconformism, the enclosure of commons and greens, the increase in purpresture in the 17th century;
- the prevalence of military bases is a unifying theme across the region and their impact on the landscape and people requires further study; and
- the material culture of recent military sites is a largely unexplored field and opportunities should also be sought to explore how excavated artefacts may illuminate the lives of these closed communities.

Hey, G. and Hind, J. (eds.) 2014. *Solent-Thames Research Framework for the Historic Environment. Resource Assessments and Research Agendas*. Oxford Wessex Monograph No. 6. 287-290

Nature of the evidence

- areas where the physical and documentary evidence is contradictory need to be identified for further investigation; and
- strengths and weaknesses of the various types of evidence across the region should be assessed.

Chronology

- reliability of chronological markers, particularly for the 16th to 18th century, needs to be tested;
- architectural typologies and dendrochronology should be compared to check consistency; and
- precision of ceramic sequences should be tested.

Landscape and land use

- possible social and economic forces responsible for the distribution of 'champion' and 'ancient' landscapes within the region need to be explored;
- environmental evidence needs to be collected routinely to gather information on the origins of fields and changes in agricultural practice, which may have occurred at different times in different areas;
- impact of large towns (and of London) on their hinterlands merit further investigation;
- studies of significant gardens and parks, particularly those which are not on the Register of Historic Parks and Gardens of special interest in England, should consider social issues, such as their roles as status symbols and in competition between members of the elite, as well as their design components;
- evidence for the impact of the Little Ice Age on the coastal and marine environments should be sought;
- the impact of the Little Ice Age on daily life and the wider economy may also be found in the environmental record;
- survival of woods and commons is good across the region, particularly in south Buckinghamshire, but the reasons for this are not well understood;
- date and impact of industry on the landscape need to be established; and
- impact of the agricultural revolution on the landscape needs to be explored.

Social and administrative organisation

- social hierarchy in settlements should be investigated, through built infrastructure, decoration, symbology and material culture manifestations of social, economic and cultural/racial variation within urban and rural settlement;
- more work is needed on changes in standards of living for the lower classes. For example, to what extent was such change uniform or was it defined by local circumstance (such as the priorities of major landlords)?
- relationships between urban morphology, prosperity and backyard enterprise merit investigation;
- provision of public utilities across the region and its relationship to social hierarchies merit further investigation;
- evidence should be gathered to illustrate how the proceeds of capitalism were divided and used, both across the region and over time; and

- indirect and direct influences on the environment of the region by the monarchy, parliament, the growth of London and the growth of empire, especially with respect to the region's location in the hinterland of London and Southampton, need to be explored.

Settlement

- factors leading to the mix of settlement types across the region should be investigated;
- environmental evidence for the quality of the urban environment should be collected, and used to investigate possible zoning and evidence for social improvement in the later part of the period;
- reasons why some towns failed during the post-Medieval period, and rationale for new ones to be established, are not fully understood;
- more parish surveys are needed which explore the development of settlements in more detail, including relationships with outlying farms and hamlets, morphology etc.; and
- evidence for differences between the rural and urban economies should be collected and analysed.

Built environment

- investigation should be carried out to test whether the nature of the built environment reflects differences in settlement patterns;
- whether anciently enclosed landscapes display greater diversity and innovation than surviving open field areas needs to be explored;
- further study of public buildings (e.g. local government and justice, schools, hospitals) would illuminate their origin, development, aspects of their operation and social context;
- a better understanding of when building materials and techniques change across the region is needed;
- the role of built infrastructure, decoration, symbology and material culture as manifestations of social, economic and cultural/racial variation within urban and rural settlement would benefit from systematic study; and
- the impact of London and other major conurbations on regional building styles, particularly through suburban developments, could be tested.

Ceremony, ritual and religion

- the churches, churchyards and memorials of the region should be studied to provide information about their connections with major architectural and artistic figures, and the roles played by the inhabitants of the region in the wider environment;
- the region, in particular Berkshire, was home to a significant Catholic recusant community, and evidence for this movement should be collated;
- systematic study of nonconformism could determine whether its spread reflected socio-economic factors; and
- early evidence for places of worships linked to non-Christian groups should be sought, particularly around the major ports.

Warfare, defences and military installations

- the many sites connected with the Civil War, including garrisons, skirmishes, sieges and defences, should be identified and their archaeological potential assessed;
- more work remains to be done on 17th to 19th century military sites and First World War defences, including upon the issues of continuity and reuse;
- the scope of information about the region's wide range of Second World War defensive arrangements should be extended to include more on civilian defence, particularly air-raid shelters, and should include both identification and recording of sites and accompanying oral testimony; and

- further studies of Cold War operations and defences should be pursued, partly to identify features for future protection.

Material culture

- there is a case for more emphasis in planning conditions upon the proper investigation of sites likely to be productive for their post-Medieval interest, both to provide the data for detailed studies of contexts and associations and help to build up a better picture of ceramic and other artefact sequences;
- more detailed work should be concentrated on ceramics as a dating base, particularly for the 15th/16th century, and on helping to establish patterns of sources and manufacture for the market towns of each county;
- studies are also needed to further develop detailed understanding of non-ceramic artefact types found in excavation, especially bottle glass and tobacco pipes;
- it would be helpful to establish a methodology for the analysis of, for example, probate records, and hearth tax returns, to improve the integration of documentary and archaeological evidence, including that from building recording; and
- patterns in material culture can contribute to the understanding of patterns of trade across the region, the influence of the major south coast ports and the influence of London and royalty on society.

Crafts, trade and industries

- collection of environmental evidence for particular industries e.g. salt-making;
- exploration of the distribution of industry, the reasons for its existence and, where appropriate, its demise;
- recording of surviving industrial complexes and small-scale rural enterprises before closure;
- further investigation of the leisure and recreation industries, including those associated with the coast, which are changing rapidly; and
- searching for environmental evidence for the use of exotic imports such as spices.

Transport and communication

- more information about the pre-turnpike road network;
- exploration of the effects of the development of the communications network and related technology upon settlement patterns, land use and local economies; and
- evidence for the development of the maritime network, including environmental evidence.

Museum of London, 2002. *A Research Framework for London Archaeology*, 64-73

London after 1500

- framework objectives
 - instigating corroborative research with other historic disciplines to elucidate a framework for future research.
- development;
- society;
- demography;
- military organisation;
- religion;
- recreation and culture;

- agricultural production and the environment;
- industrial production; and
- distribution and consumption.

KEY/SHARED THEMES

Post-Medieval to modern

- integration with documentary evidence/multidisciplinary approach called for;
- impact of urbanisation and industrialisation:
 - effects of industrialisation on established settlement patterns and the rural landscape;
 - regional variation;
 - influence of London and other major urban centres on surrounding landscapes and communities;
 - growth, diversification and development of industry, manufacturing and extraction;
 - how did urban centres develop?
 - development of civic and religious buildings; and
 - urban vs. rural industry.
- land use/economy and agriculture
 - early landscapes of enclosure and improvement and the interrelationship between arable, pasture, woodland, commons and waste;
 - impact of the agricultural revolution and acts of enclosure on the landscape;
 - what changes and improvements occurred in animal husbandry and the use of animals (e.g. new breeds, traction and traded animal products)?
 - what garden plants and crops were grown in the countryside and urban market gardens, and what new types were introduced?
 - woodland management and associated industries;
 - how did water management and land drainage change the landscape?
 - evidence for developments in the agricultural processing industry.
- society:
 - investigate social stratification and cultural diversity – urban and rural poor, the emergence of the middle classes, demography, population movement including migration, material culture, the built environment and the study of burials; and
 - cemeteries, evidence for diet, health and demography. How did the diet, living conditions and status of rural and urban communities compare? What was the impact of industrialisation and urbanisation?
- material culture:
 - more detailed work should be concentrated on refining ceramic chronologies;
 - social and economic variation, urban vs. rural populations, across regions and through time; and
 - development of regional and local pottery industries.
- military:
 - how can we refine our knowledge of Civil War defences, siege works and battlefields?
 - 17th to 19th century military sites require further investigation; and
 - First World War, Second World War and Cold War sites often hold great significance for local social history and national military history.

- can we identify regional, intra-regional or temporal variations in the pattern and form of rural vernacular architecture?
- investigate developments in estate and garden design, estate farms and villages and municipal parks;
- recreation and leisure;
- development of transport, utilities and communications infrastructure;
- national and international influences;
- impact of major historical events such as the Dissolution, Reformation and the Civil War; and
- impact of the Little Ice Age.

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