

GDIS Phase II Gloucestershire Driver Information System along the M5 in Gloucestershire

Archaeological Impact Assessment

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Prepared for InterRoute

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Archaeological Impact Assessment

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Archaeological Impact Assessment

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This assessment was researched and produced by Stephen Beach and managed on behalf of Wessex Archaeology by Rob ArmourChelu.

Archaeological Impact Assessment

1 INTRODUCTION

1.1 **Project Background**

- 1.1.1 Wessex Archaeology was commissioned by InterRoute to undertake an impact assessment of the archaeological resource affected by the installation of a number of motorway signal sites (MS4) and Motorway Incident Detection and Automatic Signalling loops (MIDAS) along the north and southbound verges of the M5 around Junction 12, centred on NGR 380186 211098 (see **Figure 1**).
- 1.1.2 The underlying geology is characterised by Lower Lias clays overlain by River Severn gravels. The overlying local soils are generally brown calcareous earths (Soil Survey of South West England, 1980 and Geological Survey of Great Britain, Sheet 2, 1957).
- 1.1.3 The works are to include the installation of eight 8×10m bases for the MS4 signals. The MS4 bases are installed using helical piles or bored micro-piles which will minimise any required excavation. The MS4 bases consist of two cabinets, duct chambers, access paths and safety barriers.
- 1.1.4 The MIDAS loops are to be cut into the existing motorway surface. Each MIDAS loop will be supported by duct chambers, access steps, pathways and safety barriers. It is expected that the footprint of each MIDAS loop site will be 4×5m long.
- 1.1.5 Four Electricity Interface Chambers (EI) will also be installed, these will include:
 - Two Els at Junction 12
 - Two Els in the line of the motorway boundary fence (at Sites 4 and 9)
- 1.1.6 Four new Cross Carriageway Ducts are to be constructed; these will be excavated using a trenchless boring technique, which may involve considerable excavation ether side of the carriageway to position the machinery.
- 1.1.7 In addition *c*.1800m of 2×0.10m local duct will be installed parallel to the carriageway. Trenches will be 0.60m wide and will be situated 2m from the rear of the motorway hard shoulder.
- 1.1.8 It is expected that pre-cast plastic chambers will be utilised during the installation of this infrastructure.

- 1.1.9 During the initial stages of this study the heritage impacts of 12 separate Sites along a *c*.5km section of the M5 were assessed. The potential heritage impact of each Site was assessed using a corresponding Study Area of 300m radius (see **Figure 1**).
- 1.1.10 The 12 Sites initially assessed comprised:
 - Site 1 Centred on NGR 378941 209165
 - Site 2 Centred on NGR 379169 209535
 - Site 3 Centred on NGR 379396 209905
 - Site 4 Centred on NGR 379645 210324
 - Site 5 Centred on NGR 379835 210644
 - Site 6 Centred on NGR 380218 211127
 - Site 7 Centred on NGR 380695 211438
 - Site 8 Centred on NGR 381022 211547
 - Site 9 Centred on NGR 381273 211620
 - Site 10 Centred on NGR 381699 211736
 - Site 11 Centred on NGR 382052 211838
 - Site 12 Centred on NGR 382505 211994
- 1.1.11 Following the initial scoping stage, which included consultation with the local planning authorities, four out of the twelve Sites were considered to require further assessment (see **Appendix 2** for the scoping and consultation report). The four Sites requiring further assessment comprise 5, 7, 8 and 9.
- 1.1.12 The following report presents the results of the further assessment of Sites 5, 7, 8 and 9, the details and methods used to establish the baseline conditions and value the heritage resource. It then sets out and applies the method of assessing the likely impact on the identified resource resulting from the proposed scheme (during construction and operation) with and without mitigation.
- 1.1.13 This report will form the basis of the Cultural Heritage chapter of an assessment of the overall environmental impact of the proposed scheme (InterRoute in *prep*), in line with guidance provided by the Design Manual for Roads and Bridges Volume 11 Chapter 3 Section 2 Cultural Heritage (DMRB 11.3.2).

2 METHODOLOGY

2.1 Study Area

2.1.1 The recorded archaeological resource within a 300m radius from each Site was collated, in order to provide a context for the discussion and interpretation of the known and potential resource. The Sites and corresponding Study Areas are shown on **Figures 2 - 5**.

2.2 Sources

- 2.2.1 A number of publicly accessible sources of primary and synthesised information were consulted. A brief summary of the sources is set out below.
 - Gloucestershire Sites and Monuments Record (GSMR)
 - English Heritage online resources
 - The Gloucestershire Structure Plan, Second Review (adopted 1999)

- The Stroud District Local Plan (adopted 2005
- Planning Policy Guidance Note 16 Archaeology and Planning (PPG16)
- Planning Policy Guidance Note 15 (PPG15) Planning and the Historic Environment.
- Wessex Archaeology archives and library
- Ordnance Survey 1st to 3rd editions
- Geological Survey

Previous studies

- 2.2.2 Information within the GSMR is often derived from unreliable/spatially inaccurate sources such as secondary accounts of archaeological discoveries and the chance recovery or archaeological artefacts. However, in some cases the information contained within the records comes from more reliable and useful sources, such as from the results of organised archaeological investigation. The information from such investigations is often published and can be very useful when trying to establish the confidence level on which assumptions relating to the resource are being made.
- 2.2.3 A number of previous investigations have been conducted in the area (particularly around Haresfield), these have been summarised in Appendix 1.

Chronology

2.2.4 Where mentioned in the text, the main archaeological periods are broadly defined by the following date ranges:

•	Modern	1900-present
•	19 th century	1800-1900
•	Post-medieval	1500-1799
•	Medieval	AD1066-1499
•	Saxon	AD410-1066
•	Post-Roman	AD410-650
•	Romano-British	AD 43-410
•	Iron Age	700 BC- AD 43
•	Bronze Age	2400-700 BC
•	Neolithic	4000-2400 BC
•	Mesolithic	8500-4000BC
•	Early Post-glacial	10,000-8,500BC
•	Upper Palaeolithic	30,000-10,000BC
•	Middle Palaeolithic	150,000-30,000BC
•	Lower Palaeolithic	500,000-150,000BC

Best practice

2.2.5 This assessment has been carried out in accordance with the Institute for Archaeologists' *Standard and Guidance for desk-based assessment* (IfA 2008) and in line with DMRB guidance contained in DMRB 11.3.2 (HA 208/07).

Assumptions and limitations of baseline data

2.2.6 Data used to compile this report consists of secondary information derived from a variety of sources, only some of which have been directly examined

for the purposes of this assessment. The assumption made is that this data, as well as that derived from other secondary sources, is reasonably accurate.

2.2.7 The GSMR is not a record of all surviving elements of the archaeological resource but is a record of the discovery of a wide range of archaeological and historical components. The information held within it is not complete and does not preclude the subsequent discovery of further elements of the historic environment, which are at present unknown.

2.3 Assessments of Impacts

2.3.1 Assessment of impact follows DMRB 11.3.2. All detail is contained within **Appendix 2** of this document.

2.4 Mitigation

- 2.4.1 The assessment and design process informs the adoption of appropriate mitigation or enhancement measures to achieve the design objectives. Mitigation measures are identified on a case by case basis. In the case of buried archaeological remains techniques can include: avoidance or burial (preservation *in situ*); or excavation (preservation by record).
- 2.4.2 The effects of development on the setting/context of a Scheduled Monument or other important extant heritage features are based on the principle of sympathetic design, which can include alterations to layout, scale; massing or landscaping to reduce the extent the development changes the existing setting/context of the designated resource.

3 PLANNING BACKGROUND

3.1 Introduction

3.1.1 There is national legislation and guidance relating to the protection of, and proposed development on or near, important archaeological sites within planning regulations as defined under the provisions of the *Town and Country Planning Act 1990*. In addition, local authorities are responsible for the protection of the archaeological resource within the planning system.

3.2 National legislation and planning guidance

3.2.1 The following section provides details of the national planning and legislative framework governing the treatment of the heritage resource within the planning process.

POLICY NO.	TITLE	POLICY TEXT
n/a	Ancient Monuments and Archaeological Areas Act 1979 (as amended)	Scheduled Monuments and AAIs are afforded statutory protection and the consent of SoS (DCMS), as advised by EH, is required for any works.
n/a	Planning (Listed Buildings and Conservation Areas) Act 1990	Works affecting Listed Buildings or structures and Conservation Areas are subject to additional planning controls administered by LPAs. EH are a statutory consultee in relation to works affecting Grade I/II* Listed Buildings.

PPG15	Planning and the Historic Environment	Guidance on protection and enhancement of the historic environment including built heritage and historic landscape through the LDPs. LPAs administer special consents, in addition to regular planning controls, for planning applications involving Listed Buildings, Conservation Areas, Historic Parks and Gardens and Registered Battlefields.
PPG 16	Archaeology and Planning	Archaeology is a material consideration in the planning process and LDPs should include policies for the protection, enhancement and preservation of sites and their settings. There is a presumption in favour of the preservation in situ of nationally important remains and their settings, whether Scheduled or not. Planning applications should include an assessment of likely impacts on archaeology. It is reasonable for the LPA to require archaeological evaluation in order to make an informed and reasonable decision.

3.3 Local planning guidance and policy

3.3.1 The following polices are relevant to the Site at a regional and local level. The Site is subject to the county/district wide policies set out in the planning documents.

Gloucestershire Structure Plan (Adopted 1999)						
POLICY NO. DETAILS						
NHE 6 The distinctive historic environment of the county will be conservation Areas, and their settings will be preserved. His settlements and landscape, historic parks and gardens, and site archaeological importance will be protected from the adverse effort development.						
The Tewkesbury Loc	al Plan (Adopted 2006)					
POLICY NO.	TITLE/DETAILS					
BE12	Development Affecting a Listed Building or its Setting					
BE13 Alteration or Damage of Archaeological Remains						
BE14	Affects Archaeological Remains					

3.4 Consultations

- 3.4.1 Details of the proposed Sites were provided to the relevant Planning Archaeologist at Gloucestershire County Council.
- 3.4.2 As no Scheduled Monuments or Grade I or II* Listed Buildings were affected by the proposed scheme, English Heritage were not consulted in this instance.

4 BASELINE RESOURCE

4.1 Archaeological Resource

- 4.1.1 The following section provides a description of the identified heritage resource within each Study Area established from the sources detailed above. The aim of this synopsis is to consider the nature and significance of the known resource at the Site and to provide context for the identification and understanding of the potential archaeological resource which may be present.
- 4.1.2 A gazetteer of the sites referred to in the text is provided in **Appendix 1**. These locations are numbered with a **WA** prefix for the ease of reference. An overall illustration of the sites in the gazetteer is provided in **Figure 1**.

Site 5

- 4.1.3 Site 5 is located outside the northern limits of Moreton Vallence WWII airfield (**WA4**), although parts of the old airfield are present within the southern and eastern portions of the Study Area.
- 4.1.4 A possible Iron Age settlement (**WA5**) is situated near Broadfield Farm, and a late 17th century Listed cottage (**WA6**) are both located within the Study Area.

Site 7

- 4.1.5 Site 7 is located *c*.200m east of Junction 12. The southern projected limits of the probable Romano-British activity (**WA10**) are contained within the northern boundary of the Site itself. Much of the northern half of the Study Area is filled by the projected location of this Romano-British activity. The area encompassed by **WA10** has been investigated by Gloucestershire County Council Archaeological Service (**WA9**) and subjected to a detailed magnetic geophysical survey in 2005 (**WA12**). Directly outside the Study Area an archaeological Desk Based Assessment (**WA14**) was conducted in 1999 and further highlighted the Iron Age and Romano-British potential of the area. A Romano-British settlement site (**WA7**) has also been identified to the north west *c*.120m outside the Study Area.
- 4.1.6 Haresfield Lane (**WA13**), a minor medieval route extends in a north-south direction across the eastern part of the Study Area, and the western projected limits of the medieval settlement at Pool Farm (**WA15**), are also contained within the eastern half of the Study Area.
- 4.1.7 No Listed Buildings are located within the Study Area.

Site 8

- 4.1.8 Site 8 is situated around and below the Haresfield Lane Bridge across the motorway. Located within the Study Area is the Romano-British site **WA10** (to the north-west) and medieval settlement **WA15** to the south-east
- 4.1.9 One mid to late 17th century Grade II Listed Building (**WA16**) is located in the eastern portion of the Study Area.

Site 9

- 4.1.10 Site 9 is situated c.85m east of Site 8. The projected eastern limits of the Romano-British site WA10 are included within the Study Area, as is the medieval settlement WA15, which is situated directly south of the Site. In addition the medieval Haresfield Lane (WA13) extends through the far western potion of the Study Area.
- 4.1.11 Outside the Study Area a Romano-British cemetery (**WA18**) is located to the north east, and Romano-British occupation debris has been indentified to the south east at **WA19**.
- 4.1.12 Two Listed Buildings are recorded with the Study Area. Pool Cottage (WA16), a Grade II Listed mid to late 17th century dwelling and Pool Farmhouse (WA17), a Grade II Listed early 17th century building, are both located in the eastern portion of the Study Area.

5 EVALUATION OF HERITAGE ASSETS

5.1 Introduction

- 5.1.1 Using the criteria set out in **Table 1** above, the following section summarises the value of the identified heritage resource at the Site which may be affected by the proposed remedial works.
- 5.1.2 In summary, there are archaeological features surviving in the landscape and known from the GSMR and other documentary sources which indicate further buried archaeological remains may survive as buried deposits.

5.2 Value of Resource

- 5.2.1 In summary, there are archaeological features surviving in the landscape and known from the GSMR and other documentary sources which indicate further buried archaeological remains may survive as buried deposits.
- 5.2.2 The purpose of this evaluation is to provide an assessment of the maximum effect of the proposed remedial works on the resource, leading to a reduction in impact through a programme of archaeological mitigation.
- 5.2.3 Evaluation of the resource follows DMRB 11.2.5, Table 2.1 as reproduced in **Appendix 2**, **Table 1**.

Site 5

5.2.4 At Site 5 it is likely that, where present, the potential buried archaeological resource could comprise archaeological remains relating to the potential Iron Age settlement to the north west of the Site, or to any as yet, unidentified activity relating to the Roman Road (also situated to the north east). Overall, any buried remains relating to the probable Iron Age settlement or any Romano-British activity are likely to be of *Medium Value*, any remains relating to the WWII airfield are likely to be of *Low Value*. There is only a generic possibility of identifying any archaeological at Site 5, any surviving remains are likely to be of *Medium Value*.

Site 7

5.2.5 At Site 7 it is likely that, where present, potential buried archaeological remains could relate to the Romano-British activity situated to the north of the Site. Any remains relating to the Romano-British activity is likely to be of

a *Medium*. However, the Site has clearly been landscaped during the construction of the M5 and this may have compromised the survival of the archaeological deposits. Therefore, any archaeological remains are likely to be of *Medium* to *Low Value*.

Site 8

5.2.6 At Site 8 the potential buried resource could relate to the medieval settlement located to the south of the Site. Any remains relating to the Romano-British activity to the north is likely to have been removed by the construction of the Haresfield Lane Bridge. Any remains relating to the medieval settlement are likely to be of *Low to Medium Value*, however the construction of the motorway cutting is likely to have removed any archaeological features which may have been present. As such, any buried archaeological remains are likely to be of *Low Value*.

Site 9

5.2.7 At Site 8 the potential buried resource could relate to the medieval settlement located to the south of the Site. Any remains relating to the medieval settlement are likely to be of Low to *Medium Value*, however the construction of the motorway cutting is likely to have removed any archaeological features which may have been present. As such, any buried archaeological remains are likely to be of *Low Value*.

6 IMPACT ASSESSMENT

6.1 Definition of impacts

- 6.1.1 The impact of the proposed highway works within this section of the M5 will be considered below. If no works are undertaken ('Do Nothing' Option), there will be no construction or operational phase impacts.
- 6.1.2 Scheme details provided by InterRoute are referred to below and presented in **Project Background (section 1.1)**. Should details of any of the options change significantly, or additional options be put forward, then further impact assessment may be required.

6.2 Magnitude of impacts

6.2.1 Assessment of the magnitude of impacts on the resource follows DMRB 11.2.5, Table 2.2, as reproduced in **Appendix 2**, **Table 2** of this document.

Construction impacts

6.2.2 At all of the four Sites, excavations required for the installation of the infrastructure associated with the GDIS Phase II development could result in a localised, direct, permanent adverse impact on archaeological deposits (where present). This could result in a permanent loss or damage to buried archaeological deposits where present.

Operational impacts

6.2.3 Following the construction phase, no operational impacts other than the presence of the MS4 Driver Information Sign at Site 8 and some of the more visible support infrastructure at all of the Sites (safety barriers etc.) is expected. Given the existing adverse visual impact of the motorway itself and as there are no Scheduled Monuments or Grade I/II* Listed Buildings near to any of the Sites.

6.3 Mitigation

- 6.3.1 There is no mitigation technique which completely mitigates the loss of archaeological deposits as they are a finite and non-renewable resource. However, in line with the government guidance provided in PPG16, *preservation by record* is a suitable mitigation technique where archaeological deposits are of limited value and the impact is limited in spatial extent.
- 6.3.2 Where appropriate this mitigation technique could be achieved through the archaeological monitoring of the groundworks during the construction phase.
- 6.3.3 An Archaeological Watching Brief would be sufficient to identify and record archaeological deposits, where present, and in line with a Written Scheme of Investigation the scope of which is agreed in advance by the client, contractor and Planning Archaeologist at the LPA.
- 6.3.4 There is no realistic potential to limit the operational impact at any of the four Sites.

6.4 Impacts without mitigation

Construction phase

6.4.1 Without archaeological mitigation at Sites 5, 7, 8 and 9 any excavations required for the installation the GDIS infrastructure, could result in a *Moderate Adverse* impact to any below ground archaeological remains, based on the topographical location of the Site, potential previous landscaping, consultation of the GSMR and of recent historical mapping.

Operational phase

- 6.4.2 At Site 5 no significant visual impacts are expected. The only potential visual impact could be on the 17th century Listed Building at Hiltmead (**WA6**) as such, the operational impact of Site 5 is considered to be *Negligible*.
- 6.4.3 At Site 7 no significant visual impacts are expected and no Listed Buildings are present within the Study Area. Therefore *No Change* is expected.
- 6.4.4 At Site 8 no significant visual impacts are expected. The MS4 Driver Information Sign is shielded from the Grade II Listed Building (**WA16**) so the operational impact of Site 8 is considered to be *Negligible*.
- 6.4.5 At Site 9 no significant visual impacts are expected. The only potential visual impact could be on the two Grade II Listed Building to the south-east of the Site (**WA16** and **WA17**). The operational impact of Site 9 is therefore considered to be *Negligible*.

6.5 Impacts with mitigation

Construction phase

- 6.5.1 The preservation by record of any archaeological deposits identified during the archaeological watching brief can not completely mitigate the loss of the archaeological resource. Therefore, the excavations could result in a *Minor Adverse* impact on buried archaeological remains (where present).
- 6.5.2 With archaeological mitigation, any excavations required for the SP4 Driver Information Signs, MIDAS loops or any associated infrastructure at Sites 5, 7, 8 and 9 could result in a *Minor Adverse* impact to any below ground

archaeological remains, based on the topographical location of the Site, potential previous landscaping, consultation of the GSMR and of recent historical mapping.

Operational Phase

- 6.5.3 As there is no realistic potential to limit the operational impact at any of the four Sites, the Operation Phase impacts with mitigation remains identical to the Operation Phase impacts without mitigation. This will result in:
 - A Negligible impact at Site 5
 - No Change at Site 7
 - A Negligible impact at Site 8
 - A Negligible impact at Site 9

6.6 Significance of Effects

- 6.6.1 Assessment of the significance of effects on the resource follows DMRB 11.2.5, Tables 2.3 and 2.4, as reproduced in **Appendix 2**, **Table 3** of this document.
- 6.6.2 Overall, taking into account the proposed construction phase with mitigation, the Driver Information infrastructure at Sites 5 and 7 would probably result in a *Slight* effect on potential buried archaeological remains, where present. At Sites 8 and 9 a *Neutral/Slight* effect is expected. If no archaeological deposits are identified during the course of the construction phase these effects would be reduced to *Neutral*.
- 6.6.3 The operational phase with mitigation is likely to have a *Neutral/Slight* effect on the heritage resource at Sites 5, 8 and 9 and a *Neutral* effect on Site 7.

7 REFERENCES

7.1 Bibliography

Wessex Archaeology (1999), Hunts Grove, Stroud District, Gloucestershire, Archaeological Desk Based Assessment and Walk-Over Survey, Unpublished Client Report.

Wessex Archaeology (2001), Hunts Grove, Stroud District, Gloucestershire, Archaeological Position Statement, Unpublished Client Report.

7.2 Cartographic sources

1886 – 1938 Ordnance Survey mapping 6" to one mile
c.1957 Geological Survey of Great Britain 1:625 000
1980 Soil Survey of South West England 1:250 000
2002 Ordnance Survey Explorer OL14 1:25 000
2009 Ordnance Survey Digital Mapping 1:10 000

7.3 Online resources

1

http://www.magic.gov.uk http://lbonline.english-heritage.org.uk/ http://www.gloucestershire.gov.uk/archives

8 APPENDIX 1: GAZETTEER OF GLOUCESTERSHIRE SITES AND MONUMENTS RECORDS

,	SMR/NMR		-					
WA No.	No.	Name	Summary	Status	Grade	Period	Easting	Northing
		Medieval Potsherds,	Medieval pottery sherds found by					
1	6897	Standish	M5	Findspot		Medieval	378790	208790
2	132504	Manor Farmhouse	Farmhouse	Listed Building			378861	208933
3	132503	Quintons	House	Listed Building	II		379092	208867
4	21459	Moreton Valence airfield	Opened as Haresfield in 1939. In 1941 it was rebuilt with three runways and two Blister hangars and renamed Moreton Valence			wwii	379395	209921
5	29668	Possible Iron Age settlement, near Broadfield Farm, Haresfield.	A modern archaeological desk based assessment was undertaken by Gloucestershire County Council Archaeology Service	Previous Archaeological Work		Iron Age	379610	210790
6	132479	Hiltmead	Late 17th century cottage	Listed Building			379684	210682
7	4422	RB settlement E of Summerhouse Farm	Evidence of RB settlement at Hardwicke was discovered during investigations on the line of the M5 motorway	Previous Archaeological Work		Romano- British	380200	211500
8	13972	M5 Junction 12 improvements. 1992 negative evaluation	1992 - An archaeological evaluation was undertaken by Gloucestershire County Council Archaeology Service on the site. Seven trenches were excavated. No archaeological features were identified in any of the trenches	Previous Archaeological Work			380300	211200

(Summarised from source)

	0	45472	NW quadrant, M5 junction 12	An assessment of a development site covering 48Ha was undertaken by Gloucestershire County Council Archaeology	Previous Archaeological			200400	011000
-	9	15473	assessment.	Service	Work			380400	211800
	10	4421	Cropmark complex west of Colethrop Farm	Parallel linear features & enclosures visible on NMR Aerial Photographs.			Romano- British	380600	211800
	11	4149	Circular enclosure S of RAF Quedgeley	Small circular feature visible within arable field on Severn-Trent aerial photographs			Undated	380650	210940
	12	27957	A geophysical survey of Hunts Grove, Gloucester	2005 - Stratascan undertook a detailed magnetic survey (gradiometry) during April and May, as a continuation of a geophysical survey carried out in October and November 2002	Previous Archaeological Work			380900	211700
	13	12652	Haresfield Lane	A minor route linking Haresfield village with Gloucester. In exsistance by the mid 13th century			Medieval	381010	211340
	14	20712	Desk-based assessment, walk over survey, geophysical survey and evaluation	1999 - (20712/1) - Wessex Archaeology were commissioned to carry out a desk-based assessment of land proposed for development at Hunts Grove. A number of sites of archaeological interest lie within the assessment area	Previous Archaeological Work			381150	212000
			Site of Medieval	Low earthworks of Med settlement					
			Settlement W of Pool	discovered during investigations				00/0-5	044500
	15	4423	Farm	on the line of the M5 motorway			Medieval	381250	211520
	16	132440	Pool Cottage	Cottage	Listed Building			381412	211526

17	132441	Pool Farmhouse	Farmhouse	Listed Building	П		381488	211580
18	3845	Romano-British Cemetery	Romano-British Cemetery discovered in 1847			Romano- British	381550	212000
19	3849	Romano-British Occupation Debris	The site of a Romano-British settlement indicated by building material and pottery found during investigations on the line of M5 motorway.			Romano- British	381900	211500
20	6555	Rectilinear Enclosure	Rectilinear enclosure and a long bank			Undated	382400	211900
21	6556	Possible settlement site	Settlement site by discovery of pottery, tiles and stone - thought to be of a post-medieval date.			Post- medieval	383000	212220

9 APPENDIX 2: ASSESSMENT OF IMPACT FOLLOWING DMRB 11.3.2

Definition of impacts

- 9.1.1 Within DMRB 11.3.2 an impact is defined as a 'change to the cultural heritage resource caused by the mitigated scheme', and guidance is given on the identification and definition of impacts, which in summary can be: positive; negative; direct; indirect; long-term; temporary; and/or cumulative. Impacts can arise from activities which take place during construction and operational phases.
- 9.1.2 DMRB 11.3.2 sets out an assessment methodology for each cultural heritage sub-topic, defining significance of effects as being dependent on the value and/or sensitivity of the cultural heritage receptors, and the magnitude of the predicted impacts upon them. For each sub-topic the guidance defines impacts and effects very specifically; these definitions have been followed in this assessment.

Evaluation criteria

- 9.1.3 In assessing the value of archaeological remains, professional judgements have been made with reference to the criteria used by the Secretary of State for Culture, Media and Sport to consider applications for Scheduling (PPG 16 Annex 4):
 - rarity;
 - documentation;
 - group value;
 - survival/condition;
 - diversity;
 - fragility/vulnerability;
 - potential, and
 - amenity value.
- 9.1.4 Reference has also been made to section 5.10 of Annex 5 of DMRB 11.3.2 which considers factors including the local and regional context of the heritage asset (based on the policies within statutory and emerging development plan documents and knowledge from research frameworks and characterisation initiatives), and changes in setting.
- 9.1.5 The following table provides a framework for assessing the value of archaeological remains.

Value	Factors for assessment			
Very High	World Heritage Sites			
	Assets of acknowledged international importance			
	Assets that can contribute significantly to acknowledged international research objectives			
High	Scheduled Monuments			
	Undesignated assets of Schedulable quality and importance.			
	Assets that contribute significantly to acknowledged national research objectives.			
Medium	Designated or undesignated assets that contribute to regional research objectives.			
Low	Undesignated assets of local importance.			
	Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives.			
Negligible	Assets with very little or no surviving archaeological interest.			

Table 1: Framework for assessing value of remains (after DMRB 11.3.2)

Criteria for assessing magnitude of impact

- 9.1.6 Assessment of the magnitude of impact derives from the principle that the physical preservation of the historic receptor is preferred and that the most severe impact would be the destruction of the resource. Other types of impact are ranked between these extremes. The assessment of the magnitude of impact (i.e. the damage caused to the receptor by the proposed works) does not take into account the value or sensitivity of the receptor which is taken into consideration in assessing the overall significance of effect.
- 9.1.7 **Table 2** (below) provides guidance as to how to judge the magnitude of impacts to archaeological remains taken from DMRB Annex 5.

Table 2: Factors in the assessment of the magnitude of impacts on archaeological remains

Magnitude of Impact	Factors for assessment
Major adverse	Change to most or all key archaeological elements, such that the resource is totally altered. Comprehensive changes to setting.
Moderate adverse	Changes to many key archaeological elements, such that the resource is clearly modified. Considerable changes to setting.

Minor adverse	Changes to key archaeological elements, such that the asset slightly altered. Slight changes to setting.
Negligible adverse	Very minor changes to elements or setting.
No change	No change.

Assessing significance of effect

- 9.1.8 DMRB sets out an assessment methodology which defines the significance of effect as being dependent on the value/sensitivity of the cultural heritage receptors and the magnitude of the impacts upon them. Therefore the significance of effect is dependent upon the following.
 - The value/sensitivity of the cultural heritage receptors affected;
 - The magnitude of the impacts, adverse or beneficial, on cultural heritage receptors.
- 9.1.9 The assessment has been guided by the following matrix (**Table 3**) allowing the value and/or sensitivity of the receptor to be judged against the magnitude of impact, to ascertain the significance of effect. It is important that professional judgement is applied, so that the assessment is flexible and realistic rather than being applied mechanically.

		Magnitude of Impact				
		No change	Negligible	Minor	Moderate	Major
Value/sensitivity	Very High	Neutral	Slight	Moderate/Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight/Moderate	Moderate/Large	Large/Very Large
	Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
	Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Slight/Moderate
	Unknown	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight

9.1.10 In some circumstances, beneficial effects may arise from projects, e.g. an improvement to the condition of a Scheduled Monument following the production and adoption of a management plan to reduce existing impacts. These effects are not recorded in **Table 3** and are usually considered on a case by case basis.

10 APPENDIX 3: INITIAL HERITAGE APPRAISAL

Extract from GDIS Phase II (Gloucestershire Driver Information System), Along the M5, Heritage Statement in prep for InterRoute (Area 2)

Wessex Archaeology has been commissioned by InterRoute to undertake an impact assessment of the archaeological resource affected by the installation of a number of motorway signal sites (MS4) and Motorway Incident Detection and Automatic Signalling loops (MIDAS) along the north and southbound verges of the M5 around Junction 12, centred on NGR 380186 211098.

The works are to include the installation of eight 8×10m bases for the MS4 signals. The MS4 bases are installed using helical piles or bored micro-piles which will minimise any required excavation. The MS4 bases consist of two cabinets, duct chambers, access paths and safety barriers.

The MIDAS loops are to be cut into the existing motorway surface. Each MIDAS loop will be supported by duct chambers, access steps, pathways and safety barriers. It is expected that the footprint of each MIDAS loop site with be 4×5m long.

Four Electricity Interface Chambers (EI) will also be installed, these will include:

- Two Els at Junction 12
- Two Els in the line of the motorway boundary fence (at Sites 4 and 9)

Four new Cross Carriageway Ducts are to be constructed, these be excavated using a trenchless boring technique, which may involve considerable excavation ether side of the carriageway to position the machinery.

In addition c.1800m of $2 \times 0.10m$ local duct and will be installed parallel to the carriageway. Trenches will be 0.60m wide and will be situated 2m of the rear of the motorway hard shoulder.

It is expected that pre-cast plastic chambers will be utilised during the installation of this infrastructure.

For the purposes of this report, and to make the assessment of the potential heritage impact more meaningful, the scheme (which covers a *c*.5km section of the M5) was spilt into 12 separate Sites, each with a corresponding Study Area of 300m in radius.

It should be noted that the information contained in this document has been drawn from limited sources: primarily the Gloucestershire Sites and Monuments record and English Heritage dataset available online.

At this stage no historic mapping has been viewed and no third party documentation has been consulted. Caution should therefore be exercised in drawing any but the broadest of conclusions from the information contained herein.

The proposed GDIS Sites

For the purposes of this document heritage information within a Study Area of 300m radius at each site was considered. The Sites area all situated on, or adjacent to, the north and southbound carriageways of the M5 in the county of Gloucestershire.

Site 1

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 378941 209165. The Site is located on the north eastern end of a embankment associated with a bridge which crosses the motorway *c*.235m to the south west (Standish Lane). The surrounding topography consists of relatively flat ground covered by large angular arable fields with occasional farm buildings and industrial units.

The south western limit of Moreton Valence WWII airfield is located in the northern half of the Study Area.

No other archaeological Sites are recorded within the Study Area. However, the route of the probable Margary 541 Roman road extends in a north east to south west direction c.325m from the north western limit of the Study Area, and a findspot of medieval pottery was located c.60m to the south of the Study Area.

Two Grade II Listed Buildings are located within the south portion of the Study Area. The first, Manor Farmhouse is late 18th century in date and is built of red brick and stone. The second Listed Building, a detached dwelling (formally a pair of cottages) called the Quintons, probably dates to the late 16th or early 17th century.

The proposed construction at Site 1 consists of the installation of one MS4 signal base, two MIDAS loops, one Cross Carriageway Duct and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

The situation of Site 1 on a embankment which carries the existing motorway negates any impact on potential buried archaeological deposits from the installation of the proposed infrastructure. It is probable that any present archaeological deposits would have been severely truncated during the construction of the motorway. It is therefore suggested that no further consideration of the impact of Site 1 on the heritage resource is necessary.

Site 2

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 379169 209535. The Site is situated in an area of relatively low embankment. The surrounding topography consists of relatively flat ground covered by large angular arable fields with occasional farm buildings and industrial units.

The Site is located within the southern end of the area encompassed by the Moreton Valence WWII airfield. No other archaeological sites, findspots or Listed Buildings are recorded within the Site or Study Area.

The route of the probable Margary 541 Roman road extends in a north east to south west direction c.380m from the north western limit of the Study Area.

The proposed construction at Site 2 consists of the installation of two MIDAS loops and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

The construction of the motorway embankment, and its close proximity to the location of the southern end of the main runway of the old Moreton Valence airfield, suggests there is limited potential survival of archaeological remains at Site 2. As the installation of the infrastructure associated with the MIDAS loops is likely to only disturb re-deposited embankment material, it recommended that Site 2 be scoped out at this stage, and that no further consideration of the impact is necessary.

Site 3

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 379169 209535. The Site is situated in an area of relatively low embankment overlying the surrounding topography which consists of relatively flat ground covered by large, angular arable fields with occasional farm and industrial buildings.

The proposed construction at Site 3 consists of one MS4 signal base and the installation of two MIDAS loops and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

Site 3 is located within the confines of Moreton Valence WWII airfield, roughly in line with the approximate location of the Main north-south runway.

No other archaeological sites, findspot or Listed Building are recorded within the Study Area.

The route of the probable Margary 541 Roman road extends in a north east to south west direction *c*.436m from the north western limit of the Study Area.

As the installation of the infrastructure at Site 3 is only likely to only disturb redeposited embankment material, or material disturbed by the main north-south runway of the WWII runway, it recommended that no further consideration of the heritage impact at Site 3 is necessary.

Site 4

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 379645 210324. The Site is situated in an area of embankment overlying the surrounding topography which consists of relatively flat ground, covered by large angular arable fields with occasional farm and industrial buildings.

The proposed construction at Site 4 consist of one MS4 signal base and the installation of two MIDAS loops, one EI chamber and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

Site 4 is also located within the confines of Moreton Valence WWII airfield. It is situated approximately where a smaller north west to south east runway crosses the main north-south runway.

No other archaeological sites or find spots are recorded within the Study Area.

A possible Iron Age settlement, near Broadfield Farm, is located outside the Study Area c.80m to the north west, and the probable Margary 541 Roman road extends in a north east to south west direction c.407m from the north western limit.

One late 17th century Grade II Listed Building is located within the Study Area.

The installation of the infrastructure at Site 4 is only likely to only disturb re-deposited embankment material, or material disturbed by the main north-south or the crossing

north west to south east runway of the WWII airfield, it is therefore recommended that no further consideration of the heritage impact at Site 4 is necessary.

Site 5

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 379835 210644. The Site is situated in an area of embankment leading to Junction 12, which is situated to the north east. The surrounding topography consists of relatively flat ground covered by large angular arable fields mixed with occasional farm and industrial units.

Construction at Site 5 consists of the installation of two MIDAS loops and all associated cable trenches, duct chambers, access steps, pathways and safety barriers and one Cross Carriageway Duct.

Site 5 is located outside the northern limits of Moreton Valence WWII airfield, although parts of the old airfield are present within the southern and eastern portions of the Study Area.

A possible Iron Age settlement and a late 17th century Listed Building are both located within the Study Area.

As the installation of the Cross Carriageway Ducting may evolve the removal of embankment material down to natural deposits, and given the relatively close proximity of a possible Iron Age settlement to the north west, it is recommended that further heritage assessment of Site 5 is required.

Site 6

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 380218 211127. The Site is situated on Junction 12, an area which has been heavily landscaped. The surrounding topography consists of relatively flat ground covered by large, angular arable fields with occasional farm and industrial buildings.

Site 6 was subject to an archaeological evaluation in 1992 when the Junction was improved. No archaeological features were identified during the evaluation.

Within the Study Area, a Romano-British settlement site has been identified *c*.290m north of the Site, and extensive probable Romano-British cropmarks, have been identified *c*.500m to the north east (the projected limits of this site are inside the northern edge of the Study Area).

The northern edge of Moreton Valence WWII airfield (now occupied by Javelin Park) is also located within the Study Area.

No other archaeological sites or Listed Buildings are located within the Study Area.

One undated circular cropmark is located *c*.70m outside the eastern limit of the Study Area.

The proposed construction at Site 6 consists of two MS4 signal bases, four smaller driver information installations, eight MIDAS loops, two EI chambers and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

Given the heavy landscaping associated with the construction of the motorway Junction and the negative results of the 1992 evaluation, it is recommended that no further assessment of the heritage impact at Site 6 is necessary.

Site 7

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 380695 211438. The Site is situated in an area of positive embankment *c*.205m west of the Haresfield Lane Bridge which crosses the motorway. The surrounding topography consists of relatively flat ground covered by large, angular arable fields with occasional farm building.

The southern projected limits of the probable Romano-British activity are contained within the northern boundary of the Site. Much of the northern half of the Study Area is filled by the projected location of this Romano-British activity. The area encompassed by Romano-British activity has been investigated by Gloucestershire County Council Archaeological Service, and subjected to a detailed magnetic geophysical survey in 2005.

Directly outside the Study Area an archaeological Desk Based Assessment was conducted in 1999, and further highlighted the Iron Age and Romano-British potential of the area. A Romano-British settlement site has also been identified to the north west *c*.120m outside the Study Area.

Haresfield Lane, a minor medieval route extends in a north-south direction across the eastern part of the Study Area, and the western projected limits of the medieval settlement at Pool Farm are also contained within the eastern half of the Study Area.

No Listed buildings are located within the Study Area.

The proposed construction at Site 7 consists of two MIDAS loops, one Cross Carriageway Duct and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

As the Site intersects the projected extent of the Romano-British activity to the north and the installation of the Cross Carriageway Ducting may involve the excavation of material to natural deposits, it is recommended that Site 7 be considered for further heritage assessment.

Site 8

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 381022 211547. The Site is situated on and around the base of the Haresfield Lane Bridge, which crosses over the motorway at this point.

This area has been heavily landscaped during the construction of the bridge. The surrounding topography consists of relatively flat ground covered by large, angular arable fields with occasional farm building and industrial units.

Located within the Study Area (to the north west) is the Romano-British area of potential activity, and to the south east is a medieval settlement site.

One mid to late 17th century Grade II Listed building is located in the eastern portion of the Study Area.

The proposed construction at Site 8 consists of one MS4 signal base, two MIDAS loops and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

Due to the landscaping activity associated with the construction of the motorway and bridge, it is unlikely any archaeological remains survive in that area, however a new stretch of cable trench is proposed on the cutting of the southbound carriageway. This cable trench may reach someway up the cutting towards the medieval settlement site. It is therefore recommended that Site 8 is considered for further heritage assessment.

Site 9

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 381273 211620. The Site is situated in an area of cutting, *c*.230m east of the Haresfield Lane Bridge. The surrounding topography consists of relatively flat ground rising gradually to the east. The land is characterised by large angular arable fields mixed with the occasional farm complex.

The projected eastern limits of the Romano-British site are included within the Study Area, as is a medieval settlement, situated directly south of the Site. In addition the medieval Haresfield Lane extends through the far western potion of the Study Area.

Outside the Study Area a Romano-British cemetery is located to the north east, and Romano-British occupation debris has been indentified to the south east.

Pool Cottage a Grade II Listed mid to late 17th century dwelling and Pool Farmhouse, a Grade II Listed early 17th century building, are both located in the eastern portion of the Study Area.

The proposed construction at Site 9 consists of two MIDAS loops, one Cross Carriageway Duct, one EI chamber and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

The Cross Carriageway Ducting at this Site is located at the base of a negative cutting and is unlikely to disturb any archaeological remains. However, one El chamber on the verge of the southbound carriageway is proposed. The El chamber is likely to be positioned near to the outer boundary of the motorway and therefore the top of the cutting, as such; there remains the possibility to disturb any surviving archaeological remains associated with the medieval settlement site. It is therefore recommended that Site 9 be considered for further heritage assessment.

Site 10

The Site covers both the northbound and southbound carriageways of the M5, centred on NGR 381699 211736. The Site is situated in an area deepening cutting, *c*.100m west of the railway bridge crossing the motorway at this point. The surrounding topography consists of relatively flat ground rising to the east. The land is characterised by large angular arable fields with the occasional farm complex. The Shorn Brook is located to the south east of the Site.

A Romano-British cemetery site and an area of Romano-British occupation debris are contained within the Study Area. No other archaeological sites are recorded.

The Grade II Listed early 17th century Pool Farmhouse building is located in the south western quarter of the Study Area.

The proposed construction at Site 10 consists of one MS4 signal base, two MIDAS loops, one Cross Carriageway Duct and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

Installation work at Site 10 is confined within a deepening motorway cutting. It is therefore recommended that no further heritage assessment is required.

Site 11

The Site is situated on the southbound carriageway of the M5, centred on NGR 382052 211838. The Site is situated in an area of substantial cutting, *c*.102m east of the railway bridge crossing the motorway at this point. The surrounding topography consists of ground rising to the east, which is characterised by large angular arable fields with the occasional farm complex.

There are two archaeological sites within the Site 11 Study Area. Located to the south west is an area of Romano-British occupation debris, and to the east an undated rectilinear enclosure may be linked to a possible settlement site and two long barrows c.615m to the north east.

No Listed buildings are recorded within the Study Area.

The proposed construction at Site 11 consists of one MIDAS loop and all associated cable trenches, duct chambers, access steps, pathways and safety barriers.

The installation work at Site 11 is located at the base of a very deep motorway cutting. It is therefore recommended that no further heritage assessment is required.

Site 12

The Site is situated on the southbound carriageway of the M5, centred on NGR 382505 211994. The Site is situated in an area deep cutting, *c*.600m east of the railway bridge. The surrounding topography consists of steepening ground rising to the east, which is characterised by large angular arable fields with the occasional farm complex.

An undated rectilinear enclosure is the only recorded archaeological site within the Study Area. The enclosure may be linked to a possible settlement site and two long barrows c.340m to the north east of the Study Area.

A possible Post-medieval settlement site is located *c*.180m to the east of the Study Area.

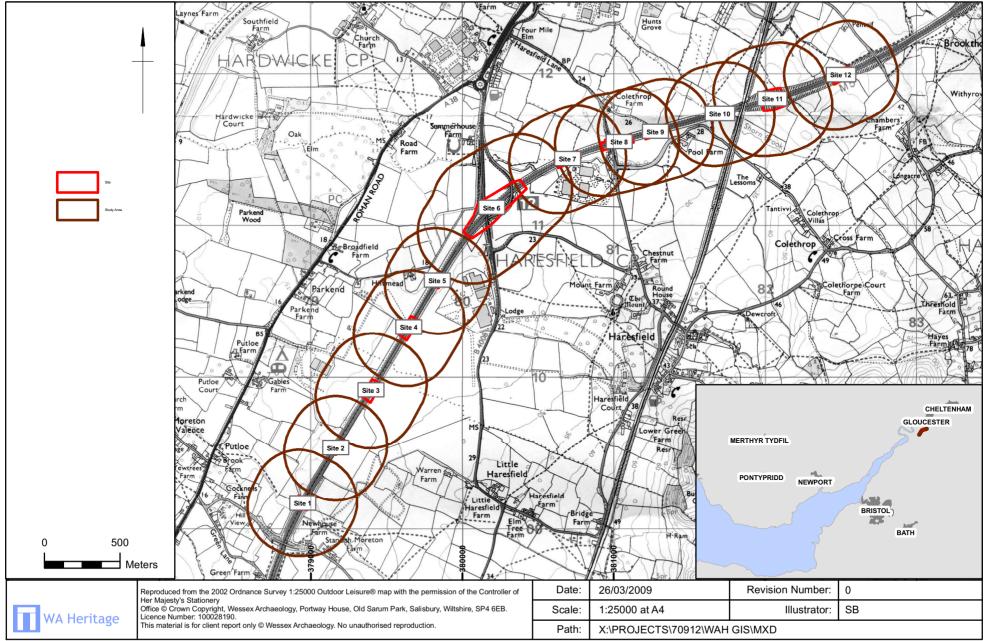
No other archaeological sites or Listed Buildings are recorded within the Study Area.

The proposed construction at Site 12 consists of one MS4 signal base, one MIDAS loop and all the associated cable trenches, duct chambers, access steps, pathways and safety barriers.

The proposed installation work at Site 12 is located at the base of a deep motorway cutting. It is therefore recommended that no further heritage assessment is required.

Conclusion

On the basis of this initial review we propose to carry out further assessments on Sites 5, 7, 8 and 9 and we have scoped out Sites 1 to 4, Site 6 and Sites 10 to 12. In the first instance detailed desk-based analysis of the proposed sites is suggested in order to establish he need for and scope of any intrusive heritage investigations and / or mitigation.



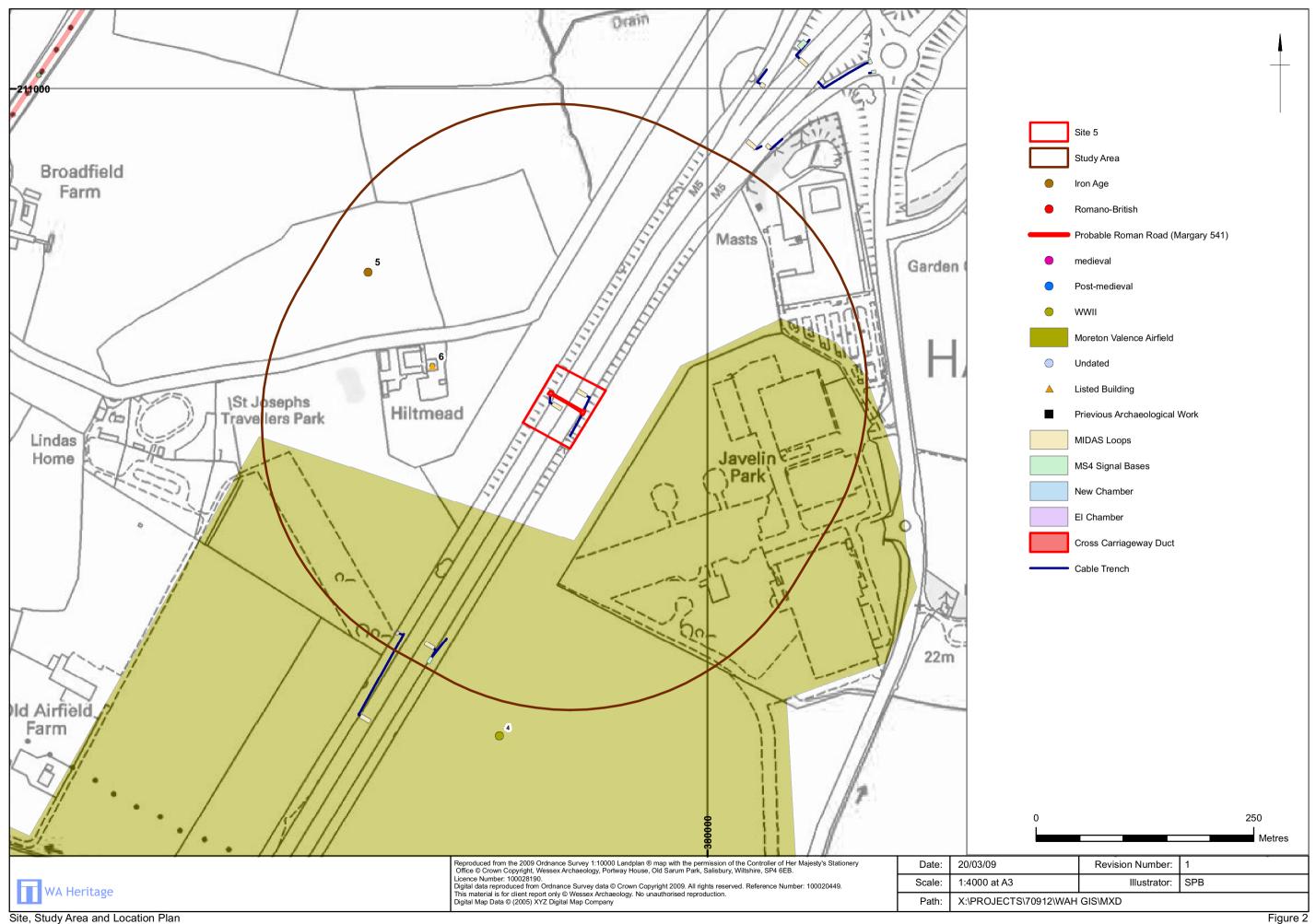
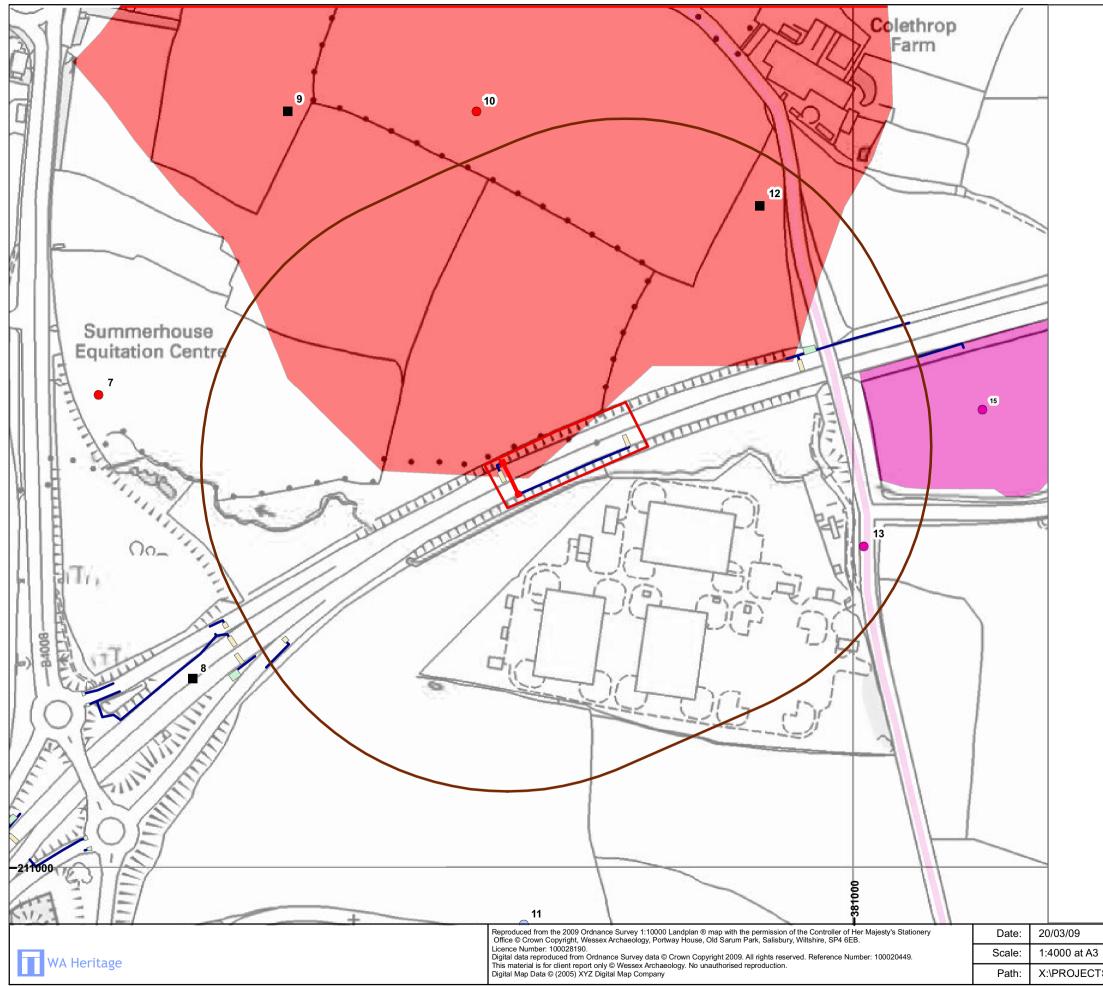


Figure 2

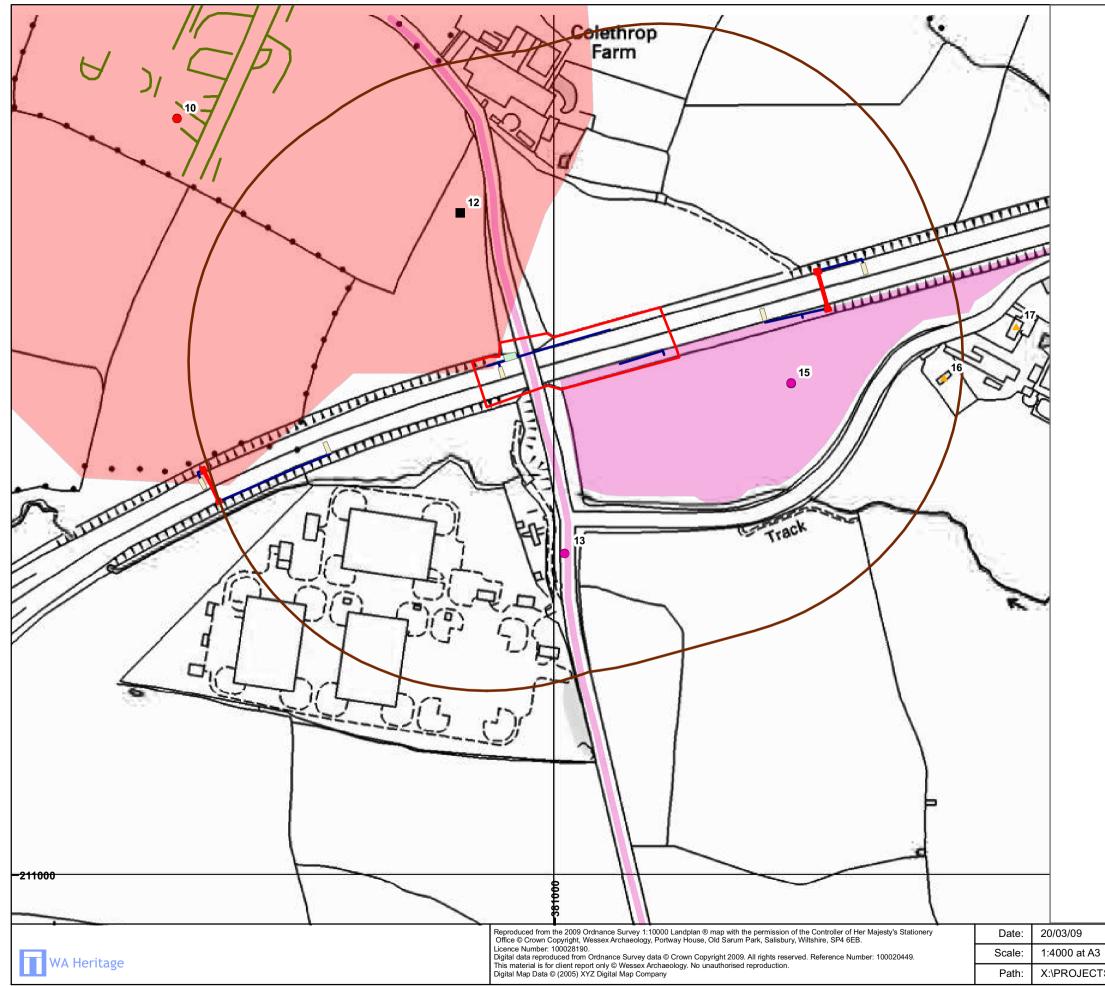


Site, Study Area and Location Plan

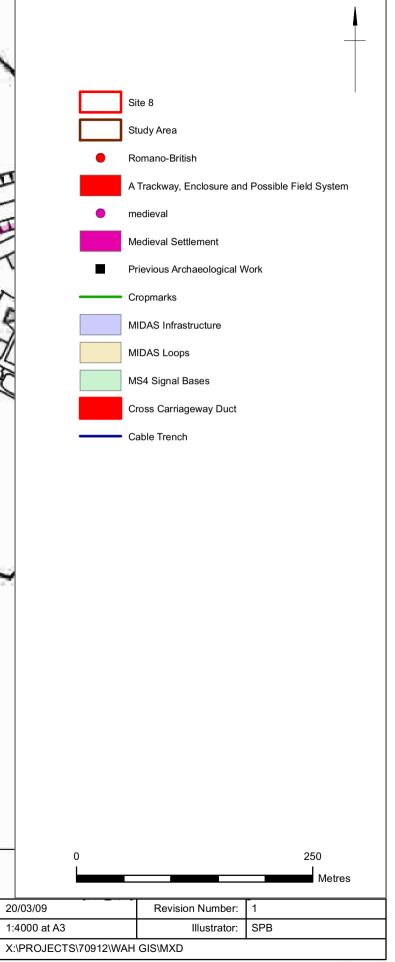


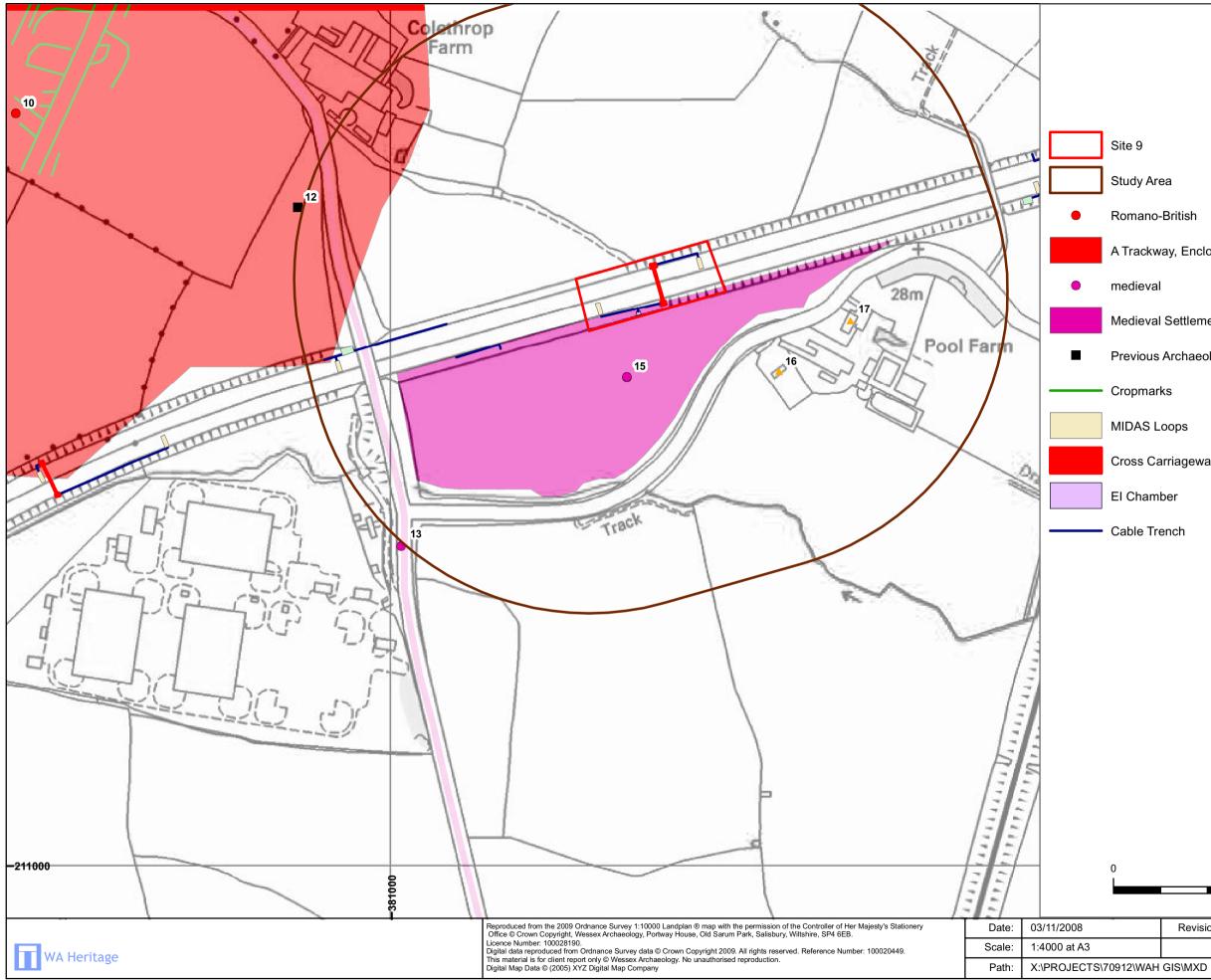
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Figure 3



Site, Study Area and Location Plan





Site, Study Area and Location Plan

Site 9					
Study Area					
Romano-British					
A Trackway, Enclosure and Possible Field System					
medieval					
Medieval Settlement					
Previous Archaeological Work					
Cropmarks					
MIDAS Loops					
Cross Carriageway Duct					
El Chamber					
Cable Trench					
0 250 Metres					
Revision Number: 1 Illustrator: SPB					



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