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**M1 widening, Junction 6a to 10,  
Hertfordshire**

**Archaeological Post-excavation Assessment Report**

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# M1 widening, Junctions 6a to 10 Hertfordshire

NGR: TL 115 038 to TL 087 184

## Post-excavation Assessment Report

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## M1 widening, Junctions 6a to 10 Hertfordshire

NGR: TL 115 038 to TL 087 184

### 1 INTRODUCTION

- 1.1.1 The M1 is being widened by the addition of an extra lane, to relieve congestion along the road corridor between Junctions 6a to 10 within Hertfordshire and Bedfordshire. A consortium made up of Balfour Beatty/Skanska is delivering the scheme for the Highways Agency. Atkins Heritage, acting on their behalf, commissioned Oxford Archaeology (OA) to undertake a programme of trial trenching along the proposed route, followed by mitigation works as appropriate.
- 1.1.2 The scheme involves the addition of an extra lane to relieve congestion along the corridor of the M1. Existing junctions will be adapted to reduce the level of accidents. Some modification to slip and approach roads will take place, as well as accompanying mitigation such as planting. Most existing structures will be demolished or altered.
- 1.1.3 An Environmental Statement (ES) (Highways Agency 1994a) was produced in 1994 based on a full Environmental Impact Assessment (EIA). The Archaeological input to the ES was prepared in September 1994 by St Albans Museum in association with Hertfordshire County Transportation Design Services. It identified several sites on the basis of site walkover, limited geophysical survey and existing knowledge. This assessment informed the location of potential archaeological sites and formed the basis on which a programme of trial trenching was devised.
- 1.1.4 Nine sites in total were identified in the ES, and the commitments established at the Public Enquiry (PI) included further evaluation and mitigation at these sites. In addition to these, a number of other locations which were not identified at the PI were to be evaluated in this phase of highway design, to reduce the risk of discovering remains during the watching brief required during construction.
- 1.1.5 Evaluation trenching in Area S (Junction 10) was undertaken in December 2005 and January 2006 and was reported on in March 2006 (OA 2006b). Evaluation of a proposed borrow pit area immediately south-east of Junction 10, in Bedfordshire, took place in February 2006 and was also reported upon in March (OA 2006a).

- 1.1.6 Areas Q, L, M and N were subjected to a programme of trial trenching from January to April 2006 in line with a Written Scheme of Investigation (WSI) prepared by Oxford Archaeology (OA 2005). The results were presented in a report (OA 2006c) which also included an account of a watching brief undertaken near Junction 9.
- 1.1.7 Evaluation trenching in Areas T, A, B, D, F, V, G, X, H, J, Y, I, W, and E was undertaken from November to May 2006. The results of this work were presented in a further report (OA 2006d).
- 1.1.8 The results of the various phases of evaluation were used as the basis for establishing a programme of further mitigation works (Atkins 2006). The principal mitigation strategies are listed in Table 1. Substantive results were derived from three sites (Junction 8 Southbound, Junction 8 Northbound and Junction 9) with smaller bodies of information recovered from The Aubreys and Areas M and P and minor observations at locations in the vicinity of Junction 8 Northbound and at Junction 10. All of these are presented here. Records of observations from other areas are retained in archive.
- 1.1.9 This document presents the results of post-excavation assessment of the principal mitigation events, outlining the nature of the records and the character of the archaeological features and finds, with an assessment of their significance and proposals for further analysis and reporting, in line with sections 4.10 and 4.11 of *Archaeological Design Part 2: Mitigation Strategy* (Atkins 2006).

Table 1: M1 sites listed in geographical order from north to south (based on Atkins 2006, section 4.2.3)

ES number/ Evaluation Area	Additional Evaluation Area	Known sites nearby	Description of site and reason for evaluation	Evaluation Result	Report	Further Mitigation	Mitigation Result	Covered in this report?
	S (includes OA site AA)	A68, A119, A59	Junction 10 area. Prehistoric, Roman and medieval. Predominantly Roman potential.	Positive. Possible field system of ditches with 5/6 possible pits. Focus of site a possible ring ditch with one worked flint. No other dating material.	5038930/TE/D O/EHE/007	Excavation, Targeted Watching Brief, J10	Minor features, mostly undated	Y
	Borrow Pit Area	A68, A119, A59	Borrow Pit Area east of J10. Prehistoric, Roman and medieval. Predominantly Roman potential	Positive but limited. Series of field boundaries and 5 possible gullies in concentrated area. Possible prehistoric settlement. Dating material primarily Post- medieval. Possibly connected with Area S.	11.4.2006	Excavation, Borrow Pit Area	see above	Y
	R	A57	Coles Lane crossing. Prehistoric potential	Not evaluated due to limitations of access – Reverts to Scheme-wide Watching Brief as proposed at P1	-	SWWB	-	-
	Q	A60, A56	Area around J9 and the A5 Watling Street. High Roman potential (also Prehistoric and medieval)	Positive. Series of ditches containing IA/R material and some containing Mesolithic, Neolithic and Bronze Age material. Large amount of 2nd century Roman pottery and building material. Stakeholes, postholes,	5038930/TE/D O/EHE/011	Excavation, J9	Prehistoric and late Iron Age-Roman features	Y

ES number/ Evaluation Area	Additional Evaluation Area	Known sites nearby	Description of site and reason for evaluation	Evaluation Result	Report	Further Mitigation	Mitigation Result	Covered in this report?
				other occupation debris. Roman roadside activity and occupation? Stratified deposits and concentrated features.				
	J9 compound	A60, A56	J9 compound. (Prehistoric, medieval and Roman if survival)	Negative.	-	-	-	-
6/P (including OA site Z)		A120, A118, A34	Struck flint scatter and geophysical anomalies. Prehistoric and medieval potential.	Not evaluated due to limitations of access – Evaluation Watching Brief to be employed.	-	Evaluation Watching Brief	Roman linear features	Y
	O	A120, A72, A47	Lybury Lane crossing - Prehistoric and medieval potential.	Not evaluated due to limitations of access – Reverts to Scheme-wide Watching Brief as proposed at PI.	-	SWWB	-	-
7/M		A118	Flint scatters and geophysical anomalies north of the Aubreys. Iron Age/Prehistoric potential.	Positive. Trackway and boundary ditches (IA and Roman). Possible yard surface and post holes. Some Iron Age and Roman finds. Dispersed archaeology and not deeply stratified.	5038930/TE/D O/EHE/011	Targeted Watching Brief, Nicholls Farm	Late Iron Age and Roman linear features	Y
	N	A118	Flamsteadbury Lane crossing to Nicholls Farm Drive crossing - Prehistoric	Positive. Post Medieval ditches and 3 pits. Possible connection with Area M. No dating material	5038930/TE/D O/EHE/011	SWWB	-	-



ES number/ Evaluation Area	Additional Evaluation Area	Known sites nearby	Description of site and reason for evaluation	Evaluation Result	Report	Further Mitigation	Mitigation Result	Covered in this report?
			potential.	earlier than post-med.				
	EDF Cable Installation, Area L	A34, A35	Cable trench north of Gaddesdon Lane. Prehistoric, Roman and Medieval.	Positive Single Roman pit.		SWWB	-	-
	Three Valleys Water Pipeline Relocation, Area L	A34, A41, A42	Pipeline north of The Aubreys Prehistoric, Roman and medieval.	Roman boundary ditch, Medieval ? and Post-med field boundary ditches		SWWB	-	-
10/K		A34	The Aubreys - Scheduled Ancient Monument, already partly truncated by the M1 with loss of parts of outer ditch.	Positive. Outer ditch of the monument, additional ditches and a pit. Iron Age pottery from isolated pit.		Excavation, The Aubreys	'Hillfort' ditch and a few other features, very poorly dated	Y
	L	A115 A35	Areas very near to the Aubreys but east, south and north of the monument. IA potential, possibly earlier Prehistoric potential.	Positive. System of ditches with post holes and pits. No dating material. Dispersed features with no deep stratigraphy.	5038930/TE/D O/EHE/011	Targeted Watching Brief, Redbourne	-	-
8/J (includes OA area Y)		A116	Metal-working area with possible hearth at Punchbowl Lane.	Positive. Dispersed features, 1 flint flake.	5038930/TE/D O/EHE/012	-	-	-
2/J		A117	Medieval pottery scatter.	As above J.	5038930/TE/D O/EHE/012	-	-	-
	H (includes OA area W)	A62	Hogg End Lane crossing, east and	Positive. Dispersed features, flint flakes and	5038930/TE/D O/EHE/012	Targeted Watching	A few linear features and	Y

ES number/ Evaluation Area	Additional Evaluation Area	Known sites nearby	Description of site and reason for evaluation	Evaluation Result	Report	Further Mitigation	Mitigation Result	Covered in this report?
			west. Roman potential	possible prehistoric pottery (abraded). Possible hollow way and number of post holes.		Brief, Buncefield	LBA-EIA pit	
	I	A57	Punch Bowl Lane crossing, east and west. Prehistoric potential	Negative.	5038930/TE/D O/EHE/012	-	-	-
	J8 compound	A114, A115	Roman and medieval potential.	Positive. Several pits containing prehistoric pottery.		SWWB	Scattered features, most medieval	Y
1/G (includes OA area U and X)		A114, A66	Scatter of Roman pottery and conjectured Roman settlement at J8.	Positive. Large boundary ditch and metalled surface, pits and post holes containing large quantity of IA, Roman and BA pottery. Cremation and human skull recovered.	5038930/TE/D O/EHE/012	Excavation, J8N and J8S	J8S scattered features, ? LBA/EIA and Roman	Y
3/G		A115, A113, A114	Prehistoric, medieval and Roman potential.	Positive. As above G.	5038930/TE/D O/EHE/012	Excavation, J8N and J8S	Dense occupation, LIA-Roman and medieval	Y
	E	A115	Junction 7, west side. Roman and medieval potential.	Positive. Dispersed features, post medieval material recovered. Also quarry pit.	5038930/TE/D O/EHE/012	-	-	-
4/F (includes OA area V)		A113	Medieval pottery scatter. Possible Roman potential.	Dispersed features and a quarry pit, residual Roman material and 2 sherds medieval pot.	5038930/TE/D O/EHE/012	-	-	-
	D	A37, A38	Appspound Lane	Positive. Dispersed	5038930/TE/D	-	-	-

ES number/ Evaluation Area	Additional Evaluation Area	Known sites nearby	Description of site and reason for evaluation	Evaluation Result	Report	Further Mitigation	Mitigation Result	Covered in this report?
			balancing pond. Roman and medieval potential	features, 17 flint flakes recovered from topsoil.	O/EHE/012			
	C	A37, A38	Planting along Bedmond Lane in close proximity to Potters Crouch . Roman and medieval potential	Not evaluated. Reverts to Scheme-Wide Watching Brief as proposed at P1	-	SWWB	-	-
	B	A 58	Area around Bedmond Lane crossing . Roman	Positive. Pit and a post hole. Flint flake recovered from topsoil.	5038930/TE/D O/EHE/012	-	-	-
11/A		A112	Scatter of worked flint, IA enclosures, nearby Roman and medieval remains (area between Blunt's Lane and Bedmond Lane).	Positive. Dispersed cut features, 3 flint flakes and some post medieval ceramics	5038930/TE/D O/EHE/012	-	-	-

## **2 SITE LOCATION, GEOLOGY AND TOPOGRAPHY**

- 2.1.1 The sites (Figures 1 and 2) lie between Junction 6a and 10, on both sides of the M1, between NGR: TL 115 038 to TL 087 184, ie from east of Hemel Hempstead to just south of Luton, on the Bedfordshire border.
- 2.1.2 The geology is Carstens series clayey soils, frequently flinty with a silty plateau drift. The landscape is characterised by open arable farming.

## **3 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

- 3.1.1 An archaeological statement was produced as part of the Environmental Impact Assessment (Highway Agency 1994a) in September 1994 by St Albans Museum in association with Hertfordshire County Transportation Design services for the Highways Agency. Within a 500 m corridor of the scheme, approximately 16 sites were identified in the SMR and the records of the St. Albans Museum. In addition, a walk over survey, undertaken as part of the EIA, identified through surface collection and test pits a further 31 sites, indicated by the presence of archaeological finds (mostly medieval and later building materials, prehistoric chipped stone and pottery). A programme of geophysical survey was also undertaken.
- 3.1.2 Only a summary of the archaeological background to the site is presented below as extracted from the WSI (OA 2005). The reference numbers correspond to Atkins unique numbering system for the scheme as set out in their Archaeological Design (Atkins 2005).

### *Early Prehistoric*

- 3.1.3 Evidence for early prehistoric activity is limited to artefact scatters and individual findspots (see details below). According to these discoveries, the potential for remains dating from the early prehistoric period was defined as high in areas J, M and P, but low to medium in other areas.
- 3.1.4 The earliest evidence of human activity is represented by scatters of flint artefacts. Palaeolithic handaxes have been discovered at Slip End and in the vicinity of Redbourn (A33 and A36).

3.1.5 Evidence of a Neolithic presence is provided by the discovery of a polished Neolithic axe near Redbourn (A35). Other undated finds suggest a dispersed occupation during the period.

3.1.6 A Bronze Age metal hoard found near Westwick Farm features on the SMR (A51).

### *Iron Age*

3.1.7 There is some evidence for Iron Age remains along the scheme, mostly localised to two areas.

3.1.8 The area between Blunts Lane and Bedmond Lane (Area T) was identified in the St Albans District Plan as being of high archaeological potential due to scattered flint finds and suggested Iron Age enclosures revealed in aerial photographs. Three enclosures were destroyed in the original construction of the M1.

3.1.9 An Iron Age earthwork, the Aubreys, lies adjacent to, and has been clipped by, the M1 on its eastern boundary. The Aubreys is a Scheduled Ancient Monument (SAM) formed by a ditch and bank enclosure that has not been conclusively dated. It is commonly referred to as an Iron Age hillfort, though topographically it is positioned on sloping ground above the River Ver valley. Flint finds from the ditches have been dated to 4000 BC, but there is no evidence for the nature and chronology of activity within the earthwork. The results of trial trenching related to the scheme have led to the suggestion that the defences date from approximately 300 BC. A minor and inconclusive excavation occurred in the 1930s (A39). Trial trenching and a geophysical survey have taken place in advance of the scheme and have established the continuance of the outer defences of the Aubreys.

3.1.10 The Iron Age is also represented along the scheme by a number of ringed enclosures, ditches and cropmarks (A52, A63, A67).

3.1.11 The potential for the occurrence of archaeological features in the area of the Aubreys (L) was defined as high, medium in area A and T, but low in other areas.

### *Romano-British*

3.1.12 The scheme lies close to St Albans (Roman Verulamium), and so Roman sites occur with frequency in the area. The NMR lists four Roman roads that are known or thought to exist along the scheme, or to cross it (A58-61). The A5 follows the course

of Watling Street (A60) and intersects with the M1 as well as the River Ver at Junction 9. The route of Roman Watling Street runs through the site.

- 3.1.13 A Roman settlement has long been thought to exist in the vicinity of Junction 8 and finds of Roman building materials provide evidence of some kind of Roman activity on the site. Other archaeological evidence at the same site suggests a continuity of settlement and reuse of materials.
- 3.1.14 A Roman villa is thought to exist in the vicinity of Potters Crouch based on several Roman finds in a field immediately east of the current settlement (A37). Cropmarks at Annables Farm are believed to represent a Roman temple complex.
- 3.1.15 The potential for Roman remains was defined as high in areas C and G, and low in other areas.

#### *Medieval*

- 3.1.16 The medieval period is also well represented along the route. Many of the farmsteads and manorial complexes in the area have early medieval origins still evident in their fabric. Farming is the characteristic landuse of the area, reflected in the many farmsteads and ancient field boundaries.
- 3.1.17 Significant settlements close by the scheme also represent early medieval communities. Documentary evidence indicates the medieval origin of Potters Crouch as a centre of the pottery industry. Redbourn's medieval layout is also documented. The Grade I Listed Church of St Mary in Redbourn (A11) retains fabric from its origin around 1100.
- 3.1.18 The proliferation of medieval buildings along the route and the discovery of buried medieval archaeology mean that the existence of further unknown buried medieval remains is likely.
- 3.1.19 The potential for medieval archaeology was defined as high in areas G and P and medium in other areas.

#### *Post-medieval*

- 3.1.20 The dominance of the agricultural economy continued into the post-medieval period, although in recent years the construction of the motorways and the expansion of London's satellite towns has changed the character of the area and has led to the

growth of urban settlements in Hertfordshire such as Hemel Hempstead. Villages such as Redbourn have also expanded, this growth characterised by recent housing estates. In themselves these changes are important in that they represent a time of significant development in Britain's 20th century cultural heritage.

- 3.1.21 The potential for post-medieval archaeology was defined as moderate throughout the scheme, but that this would relate to arable farming or waste disposal and would be of low to moderate importance.

#### **4 MITIGATION: AIMS, METHODOLOGY AND QUANTIFICATION OF ARCHIVE**

##### **4.1 Original fieldwork aims**

- 4.1.1 The original aims of the excavations were to establish the date and character of the archaeological features.
- 4.1.2 To record any evidence of prehistoric landuse: how does the nature of the prehistoric activity compare/contrast and relate within the wider landscape?
- 4.1.3 To establish the extent and nature of Roman activity. The features and associated artefacts recovered during the evaluation suggest domestic activity. Is there a settlement present on the site or nearby? If so, how does it relate to Verulamium? When did it originate? Is there any evidence for late Iron Age activity? When did the site go out of use?

##### **4.2 Fieldwork methodology**

- 4.2.1 Fieldwork methodologies followed agreed procedures set out in a series of site-specific written schemes of investigation (WSIs; eg OA 2006e-2006i). Excavation areas were stripped with a 360° tracked machine fitted with a ditching bucket under the direct supervision of an experienced archaeologist. Excavation proceeded to the first archaeological horizon or to the underlying natural geology, whichever was reached first.
- 4.2.2 In the principal excavation areas base plans were produced digitally. Sections and detailed plans of complex areas and archaeological interventions were drawn by hand and integrated with the main site plans.

- 4.2.3 A representative sample of the features and deposits revealed was excavated by hand to determine their depth, extent and nature. Finds, where present, and environmental samples, where appropriate, were recovered. All artefacts were retained. All features and deposits encountered were issued a unique context number.
- 4.2.4 Photographs, including a record of each intervention, were taken using colour slide and black and white print film. Recording followed procedures laid down in the *OA Fieldwork Manual* (ed. D Wilkinson, 1992).
- 4.2.5 The procedures for targeted watching brief and other watching brief areas followed those set out above, with the exception that in some cases plans were prepared by hand using local grids. Fixed points on these grids were subsequently surveyed and related to NGR coordinates.
- 4.3 Post-excavation assessment methodology**
- 4.3.1 All of the records from the excavation and watching brief sites have been subject to assessment level analysis. A context database was compiled for all the principal sites and hand drawn plans digitised and incorporated into the digital base plans for each site. Features have been assigned to broad period based phases (late Neolithic-early Bronze Age, late Bronze Age-early Iron Age, Roman and medieval), using key stratigraphic sequences and spot dates provided by the pottery assessments and, in the case of the earlier prehistoric features, the flint assessment. Phase plans were produced for all of the sites and in some cases major features were assigned to feature groups, although further detailed analysis is required to confirm the stratigraphic sequence and improve existing grouping.
- 4.3.2 Artefacts were all assessed. In the case of the principal artefact groups, pottery, ceramic building material and lithics, the material was fully recorded to avoid duplication of work in subsequent phases of the project. Analysis was limited at this stage, and in most cases was restricted to establishment of chronology in order to assist the development of schemes of phasing for each site, plus a statement of the potential of the material for further work. The finds assessments are summarised below and presented in full as appendices, incorporating more detailed methodological statements.
- 4.3.3 Animal bone, like the principal artefact categories, was fully recorded for the assessment, but additional work at this stage was confined to assessment of the



potential of the material for further analysis. The assessment is summarised below and presented in full as an appendix, incorporating a more detailed methodological statement.

4.3.4 Environmental samples were assessed by category. In this case full recording was not undertaken, but provisional assessments of the character of the material were made and its potential for further work determined. The environmental assessments are summarised below and presented in full as appendices, incorporating more detailed methodological statements.

4.3.5 A summary of the stratigraphic sequence from each main site is presented below (Section 5), followed by short summaries of the principal categories of artefacts (Section 6) and ecofacts (Section 7). The site narratives are presented in approximate geographical sequence from south to north.

#### 4.4 Quantification of archive

4.4.1 The numbers of records from the various sites are summarised in Table 2. Quantities of material in artefact and ecofact categories are given in the summaries of these categories and in the Appendices below.

*Table 2: Inventory of mitigation phase archive from principal M1 sites listed in geographical order from north to south*

ES number/ Evaluation Area, including additional areas	Evaluation Report	Further Mitigation	Context records	Plans (excludes digital plans)	Sections	Soil samples
<b>Northern Scheme</b>						
S (includes OA site AA)	5038930/TE/D O/EHE/007	Excavation, Targeted Watching Brief, J10	1001-1073 801-805	1001-1004	1001-1013	-
Borrow Pit Area	23.3.2006	Excavation, Borrow Pit Area	included in above	included in above	included in above	-
Q	5038930/TE/D O/EHE/011	Excavation, J9	2000-2735 2901-2918	2901-2902	2901-2904	2001-2044
6/P (including OA site Z)	-	Evaluation Watching Brief	4001-4021	4001-4013	4001-4010	4001-4003
7/M	5038930/TE/D O/EHE/011	Targeted Watching	3000-3064	3001-3010, 3012-3028	3001-3033	3001-3009

ES number/ Evaluation Area, including additional areas	Evaluation Report	Further Mitigation	Context records	Plans (excludes digital plans)	Sections	Soil samples
		Brief, Nicholls Farm				
10/K		Excavation, The Aubreys	001-093 201-275	001-008	001-033	200-209
<b>Southern Scheme</b>						
H (includes OA area W)	5038930/TE/D O/EHE/012	Targeted Watching Brief, Buncefield	5601-5665 500-533	5601-5617 500-508	5601-5619 500-508	5601-5606
J8 compound		SWWB	5501-5533	5501-5511	5501-5510	-
1/G (includes OA area U and X)	5038930/TE/D O/EHE/012	Excavation, J8N	6000-7784	6000-6313	6000-6433	6001-6089
3/G	5038930/TE/D O/EHE/012	Excavation, J8S	5001-5358	5001-5129	5001-5125	2045-2089

## 5 MITIGATION: STRATIGRAPHIC NARRATIVES

### 5.1 Junction 8 Southbound (Figures 3-4)

#### *Summary*

5.1.1 Activity at Junction 8 Southbound can be divided into five broad phases. Flint tools and flint working debris, mostly dating to between the late Neolithic and early Bronze Age periods, were recovered from the fills of pits and tree-throws across the site suggesting that people were moving through the area and possibly using it for short term occupation in these periods. Most of this material came from pits dating to the late Bronze Age or early Iron Age, but some came from features which were otherwise without finds and could therefore be contemporary with the production of the tools themselves. Late Bronze Age to early Iron Age pits and postholes, some of which formed two distinct clusters in the northern half of the site, indicate settlement during this period.

5.1.2 Following the cessation of this activity the site appears to have been unoccupied until the early Roman period, when two ditches probably defining a sub-rectangular enclosure extending beyond the limit of excavation, were established in the north-eastern corner of the site. These were contemporary with a large quarry pit in the south-western corner of the site. A single pit containing middle to late Roman pottery

lay in the south-eastern corner of the site, suggesting some level of activity on or near the site in this period. Following the end of the Roman period there is again no evidence of activity until the establishment of field boundary ditches in the 19th or early 20th centuries.

### *Neolithic and early Bronze Age activity*

- 5.1.3 The evidence for Neolithic and Bronze Age activity suggests flint-working and possibly temporary occupation. Flint tools and working debris from this period were scattered widely over the site, but were mostly residual in later pits and ditches. However, four pits (5088, 5096, 5172 and 5226) largely in the southern part of the site contained worked flint, but no other diagnostic finds and may date to this period. The pits were circular or sub-circular in plan and averaged 0.95 m in diameter.

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### *Late Bronze Age to early Iron Age*

- 5.1.4 Late Bronze Age to early Iron Age activity was largely restricted to two concentrations of pits, although isolated pits of this date were scattered over the site and two four-post structures lay close to the south-eastern limit of excavation. In addition the site produced three unurned and unaccompanied cremation burials, which may well date to this period. One concentration of ten pits (5234, 5236, 5246, 5441, 5446, 5448, 5459, 5461, 5465 and 5474) lay in the north-western corner of the site and included a number of inter-cutting features. The pits were largely sub-circular in plan and averaged 0.71 m in diameter.

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- 5.1.5 A second concentration of eleven pits (5021, 5023, 5055, 5106, 5345, 5422, 5424, 5426, 5428, 5433, and 5450) lay in the central part of the site, close to the eastern limit of excavation. This was a more dispersed group, with no intercutting features, which formed a linear scatter, orientated north-east/south-west. These pits were largely oval or sub-circular in plan and averaged 1.68 m in diameter. In addition to these concentrations of pits, there were several isolated pits scattered across the site. These included pits 5094 and 5173 in the southern part of the site, pit 5203 to their north and pits 5006 and 5009, in the north-eastern part of the site; close to the limit of excavation. These pits were sub-circular or circular in plan and averaged 1.5 m in diameter, with the exception of pit 5202, which was irregular.

- 5.1.6 Close to the southern limit of the excavation were two possible post-built structures (5504 and 5505). Structure 5504, which lay in the south-eastern corner of the excavation, comprised five postholes (5035, 5037, 5041, 5042 and 5044) forming a

square measuring 4 m by 4 m, with a single posthole in the middle. Structure 5505 lay in the southern-central part of the excavation, measured 5.5 m by 4.5 m and was less regular in plan than structure 5504, although it also consisted of five postholes (5190, 5192, 5194, 5196 and 5198), suggesting a subrectangular plan with one post in the centre.

- 5.1.7 Three unurned cremation burials of possible late Bronze Age/early Iron Age date (5081, 5066 and 5244), were contained in sub-circular pits averaging 0.57 m in diameter and were unaccompanied. These features were dispersed across the site.

#### *Early to middle Roman activity*

- 5.1.8 During the mid to late 1st century AD a curvilinear boundary ditch (5500) was established in the north-eastern corner of the site. The ditch was orientated east-west and returned to the north-east at its eastern end, running beyond the limit of excavation at both ends. It measured approximately 155 m in length by 0.50 m in width on average and may have defined the south-western corner of a substantial rectilinear enclosure. The distance from the east-west boundary to the northern limit of excavation was approximately 70 m and from the north-western limit of excavation to the north-eastern return approximately 180 m. Any enclosure must have been many times larger than this. Within the space defined by ditch 5500 was a linear ditch (5501) orientated north-east/south-west and measuring approximately 19 m in length by 1.6 m in width, with a rounded terminus at its south-western end. Ditch 5501 was shallow (0.13 m maximum depth) and may have been truncated to the north-east, where it apparently petered out. Pottery from the fills of ditch 5500 suggest that it was backfilled, or allowed to silt up in the mid to late second century, while pottery from the fills of ditch 5501 suggests an earlier date of mid 1st century BC to mid/late first century AD. However, the assemblage from the fills of ditch 5501 comprises only 5 sherds and may therefore be residual.

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- 5.1.9 Other probable early to middle Roman activity comprised a single quarry pit (5155), situated in the south-western corner of the site and measuring 6 m in length by 5.5 m in width. The fill of this feature produced a single sherd of Dressel 20 amphora dating to between the early 1st and mid 3rd centuries AD.

#### *Middle to late Roman activity*

5.1.10 Middle to late Roman activity comprised a single pit (5269), oval in plan and 0.96 m across. This feature was situated in the south-eastern corner of the site, close to the limit of excavation and produced three sherds of pottery dating to between the late 2nd and the early 5th century.

*Post-medieval activity*

5.1.11 Post-medieval activity comprised two linear field boundary ditches (5502 and 5503) dating to the 19th and early 20th centuries.

**5.2 Junction 8 Northbound (Figures 5-7)**

*Summary*

5.2.1 Evidence for settlement at Junction 8 Northbound may be divided into two broad periods, which also correspond to two geographically distinct parts of the road cutting. The earlier activity, belonging to the late Iron Age and early Roman period, consisted of a series of enclosures occupying the south-eastern half of the site. Immediately to the north-west of the Roman activity, occupying the north-western part of the site, was an area of medieval settlement, dating to the late 12th-13th centuries and comprising a post-built structure, groups of pits and several enclosure gullies.

*Late Iron Age to early Roman activity (50 BC-AD 70)*

5.2.2 The earliest phase of activity, which belonged to the late Iron Age to early Roman period, comprised a substantial south-west/north-east orientated linear ditch (7676), measuring approximately 40 m in length by 1.5 m in width, which produced a large group of grog-tempered pottery, including two everted rim jars. To the south-east of this ditch was a row of evenly spaced, square postholes, suggesting a palisade. North-west of ditch 7676 was an irregular boundary (7187) approximately 80 m in length by 1 m in width, orientated north-east/south-west and defined by a series of ditch segments; one of which was cut by early Roman trackway ditch 6365 (see below). These two boundary features may have defined an enclosure to their north and east respectively. Immediately south of the palisade was a beam slot 7229 measuring 4.5 m in length by 0.5 m in width and a group of post-holes, suggesting a building. Approximately 15 m to the north of ditch 7676 was a large sub-rectangular pit (6780) measuring 2.4 m in length by 1.3 m in width, which produced several grog-tempered vessels, including a high-shouldered jar.

averaged 0.80 m in width. Enclosure 6624 measured approximately 35 m x 21 m and the enclosure ditch averaged 0.35 m in width. Enclosure 7277 defined an area measuring approximately 45 m by 22m and the enclosure ditch averaged 0.54 m in width. The pottery from the fills of these enclosure ditches largely comprises late 1st-2nd century material, suggesting that they may have been established slightly later than ditch 7676, although they were probably allowed to silt up at about the same time, towards the end of the 2nd century.

5.2.7 Abutting enclosure 6622 to its south-east was a double ditched (6150 and 6104) square, or sub-rectangular enclosure, which extended beyond the limit of excavation to the north-east. The enclosure measured approximately 37 m north-west/south-east by at least 17m south-west/north-east and utilised the south-eastern boundary of enclosure 6622 as its north-western boundary, with its south-eastern and south-western boundaries being defined by two L-shaped ditches, approximately 15 m apart. The innermost ditch (6104) had a 4.5 m gap for an entrance at its north-western end. Pottery from the fills of these ditches was generally of mid-late 2nd century date, suggesting that the enclosure went out of use at approximately the same time as those to the north, although its use of the boundary ditch of enclosure 6622 suggests that it may have been established slightly later, and a corn drying oven (6514) cut by ditch 6104, would seem to support this argument. Corn drying oven 6514 was T-shaped in plan and orientated south-east/north-west. It measured 2.80 m in length by 2.60 m in width at its widest point and was constructed of flint nodules bonded with a mixture of chalk and clay. The structure was back-filled with a mixture of silty-clay, chalk and ash.

5.2.8 Immediately to the north of enclosure 7700 was a substantial quarry pit (7081) measuring at least 4.4 m x 2.75 m, which extended beyond the limit of excavation to the north-east and contained late 1st to 2nd century pottery. Beyond this to the north-west were two parallel ditches 6713 and 6768, measuring 32 m in length by 1.2 m in width and 28 m in length by 1.10 m in width. These were orientated east-west, were approximately 14 m apart and contained assemblages of late Iron Age to early Roman pottery, indicating that they went out of use in the early 2nd century, although they were probably established at the same time as the enclosures to their south-east. The ditches respected the line of late Iron Age to early Roman ditch 7187 to their west, suggesting that this feature survived as a boundary marker, if not an open ditch into the early Roman period.

***Early to middle Roman activity (AD 43-200)***

- 5.2.3 At some point in the late Iron Age or very early Roman period (before AD 70) a substantial D-shaped enclosure ditch (7700) was established in the southern part of the site, cutting late Iron Age ditch 7676 and defining an enclosure to its north-east measuring approximately 77 m from north-west to south-east, which extended beyond the limit of excavation. The lower fills of this ditch contained late Iron Age-early Roman grog-tempered pottery, but the middle and upper fills contained early to middle Roman pottery, suggesting that although first established in the late Iron Age-early Roman period the ditch remained in use throughout the early and middle 2nd century, finally going out of use towards the end of that century.
- 5.2.4 Within the space defined by the enclosure ditch, approximately 21 m to its north-east was a curvilinear ditch (7701), measuring approximately 32 m in length by 0.80 m in width, orientated north-west/south-east and returning to the north-east at its north-western end, some 18 m to the south-east of ditch 7700. This ditch had been recut on numerous occasions and contained late second century pottery, indicating that it went out of use at the same time as ditch 7700, although the absence of grog-tempered material may suggest that it was established somewhat later. Intercutting with ditches 7700 and 7701, was a third linear ditch 7702, approximately 52 m in length by 0.80 m in width, orientated north-east/south-west and further sub-dividing the enclosure formed by ditches 7700 and 7701 into two parts: one to the north-west and one to the north-east.
- 5.2.5 Lying within the area defined by ditches 7700 and 7701 was a scatter of pits containing middle-late 2nd century pottery and a further scatter of pits, along with two ovens (7259 and 7335) containing pottery of the same date lay to the north-east of ditch 7701. Oven 7259 measured 1 m in diameter, with a 0.5 m flue orientated north-west/south-east and was filled with layers of clay-silt mixed with charcoal and large fragments of brick, which may have formed the oven structure. Oven 7335 was 1.4 m in diameter, with a 1.25 m flue, which had a single brick lining either side of its entrance. The oven fill comprised a layer of charcoal rich silt, overlain by a silty-clay with occasional flint gravel.
- 5.2.6 Abutting ditch 7700 to the south-west were three contiguous sub-rectangular enclosures, defined by less substantial boundary ditches (6622, 6624 and 7277). Enclosure 6622 defined an area measuring approximately 30 m x 18 m and the ditch

5.2.9 North of ditch 6768 two ditches (6364 and 6365) ran across the site from south-west to north-east, defining a trackway approximately 4 m in width. These were revealed for a total distance of 46 m. Pottery from the fills of ditch 6364 suggests that the feature went out of use at the end of the 2nd century, at the same time as the enclosures to its south-east, indicating that it was broadly contemporary with them.

*Late Roman activity (AD 250-410)*

5.2.10 Late Roman activity comprised a single pit (6874) cutting ditch (7701). It measured 3 m in diameter, was filled by a mixture of silty-clay and flint nodules and produced substantial amounts of late Roman pottery, brick and tile.

*Medieval activity (late 12th-13th centuries)*

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5.2.11 The medieval activity, which all dated to the late 12th to 13th centuries and occupied the part of the site to the north of the early Roman trackway, is divisible into two broad stratigraphic phases. The first phase comprised two boundary ditches (6095 and 7703), running across the site from north-east to south-west approximately 26 m apart and measuring 40 m in length by 1 m in width and 50 m in length by 1.5 m in width respectively. A small oven or kiln (6585) also belonged to this phase. The kiln was sub-circular in plan, with no evidence for a flue or stokehole, which may have been cut away by the later ditch (6109). It measured 1.88 m in length by 1.50 m in width and 0.60 m in depth and was lined with a mixture of flint nodules and crushed chalk. The back-fill of the kiln comprised flint nodules, chalk and silty-clay.

5.2.12 The first phase boundary ditches were superseded by an L-shaped ditch 6109, running north-west from Roman enclosure ditch 6364, which it respected, before cutting ditch 6095 and kiln 6585 and returning to the south-west, where it ran beyond the limit of excavation. Ditch 6109 measured 95 m in length by approximately 1 m in width and defined an enclosure measuring 132 m from north-west to south-east, aligned on the route of the Roman trackway, which may therefore have marked the line of a route or boundary still in use in the medieval period.

5.2.13 Within the enclosure was a post-built structure (6961), approximately 17 m in length by 5.5 m in width comprising approximately 50 postholes and aligned north-east/south-west. The arrangement of postholes indicates a possible cross-entry, approximately half way along the building's length and beam-slots and postholes at the north-eastern end suggest a possible ancillary structure. The building was surrounded by a several pits, containing assemblages of late 12th to 13th century



pottery and was flanked by a number of what appear to be drainage gullies to the south-east. Gully 6300 measured approximately 7 m in length by 0.70 m in width was aligned south-west/north-east, running beyond the limit of the excavation to the south-east and terminated close to the south-western corner of the building. Gully 7704 measured approximately 13 m in length by 0.5 m in width, was aligned south-east/north-west and terminated at the south-eastern corner of the building. To the south-east were two more gullies: 7006 and 6403, both of which were slightly curved, but aligned broadly north-east/south-west. They measured approximately 23.5 m in length by 0.6 m in width and 12 m in length by 0.70 m in width respectively. These were later filled in and replaced by a north-west/south-east aligned gully (6402) measuring 12.5 m in length by 0.8 m in width, which cut them.

5.2.14 To the north-west of building 6961 were three shallow linear gullies, or possible beam slots 6515, 6524 and 6538. Gully 6515 was 17.5 m in length by 0.40 m in width, orientated north-west/south-east and aligned at right-angles to building 6961, while gullies 6524 and 6538 were approximately 11 and 8 m in length by 0.5 m in width and aligned north-east/south-west, parallel to the building. These features may have served as beam-slots for fence lines, or a further structure, but appear too regular and shallow to have been used for drainage. In the south-east corner of the enclosure, close to ditch 6109 and to Roman trackway ditch 6364 was a lime-kiln (6577), orientated north-east/south-west. The lime-kiln was sub-circular in plan, measured 4.46 m in length by 3.02 m in width, was lined with lime-mortar and back-filled with layers of ash and silty-clay mixed with flint rubble. It was associated with two shallow gullies (7705 and 7706) to its south-east, which measured 3 m in length by 0.5 m in width and 5.5 m in length by 0.5 m in width respectively.

### 5.3 Watching Briefs at Junction 8 Northbound

5.3.1 Three areas just north of Junction 8 Northbound were the subject of watching briefs at different stages of the project. From south to north these were identified as Buncefield Road Depot, Junction 8 Compound and Junction 8 Targeted Watching Brief.

#### *Buncefield Depot Watching Brief (Figures 8-9)*

5.3.2 Evidence of activity at Buncefield depot was restricted to four pits and a short stretch of ditch, spread out over the site and containing late Bronze Age to early Iron Age pottery. The pits (510, 516, 521 and 532) averaged 2.29 m in width by 0.38 m in

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depth. Ditch 506, orientated north-east/south-west, measured approximately 70 m in length by 0.90 m in width and was up to 0.3 m deep. A number of other pits and ditches were observed during the watching brief, but none of them contained any dating evidence and they are not described further here.

**Junction 8 Compound (Figure 10)** — says these are Late Roman,

5.3.3 Features at Junction 8 Compound comprised a ditch and a group of pits. The ditch (5513) measured approximately 18 m in length by an average of 0.80 m in width and was orientated north-west/south-east. The pits (5509, 5514, 5516, 5518, 5520, 5522, 5524, 5526, 5528, 5532) were largely concentrated to the west of ditch 5513, although pit 5509 cut the ditch and pit 5514 lay to its east. In general the pits were sub-circular in shape and measured 0.78 m in diameter by 0.25 m in depth on average. In addition to the pits there was a single tree-throw hole (5530), measuring 0.90 m in length by 0.50 m in width and 0.13 m in depth. None of the features produced a great deal of dating evidence, although 11th-13th century AD pottery from the fills of pits 5514 and 5520 suggests that the whole complex may have been medieval in date.

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**Junction 8 Targeted Watching Brief (Figure 11)**

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5.3.4 A watching brief carried out north-east of the Compound area revealed scatters of pits or postholes, a linear ditch and a possible sunken trackway or hollow-way. Dating evidence comprised Roman and medieval pottery largely recovered from a group of 10 pits or postholes (5614, 5629, 5640, 5645, 5647, 5648, 5651, 5653, 5705 and 5707) in the centre of the area. The pits averaged 0.96 m in diameter by 0.35 m in depth and were filled with silty clay. During excavation five of these features were thought to represent postholes and a beam slot, belonging to a rectangular building. However, the features seem very large for a building with a maximum length of approximately 4 m and their profiles are more pit than posthole like. If they do indeed represent a building then the pottery from the fills of the postholes suggests that it was medieval in date.

5.3.5 Approximately 17 m north-east of the pit-scatter/building was a trackway or hollow way (5610) orientated north-west/south-east and measuring 4.76 m in width by 0.56 m in depth. This contained a surface of flint cobbles (5611) and an overlying layer of silty clay (5612) which produced a single sherd of Roman pottery. However, given its proximity to the medieval pit-scatter/building to its south-west, and its form, this feature is more likely to have been medieval than Roman in date. The remaining

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features were isolated and produced no dating evidence and are therefore not described further here.

#### 5.4 The Aubreys (Figures 12-13)

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##### *Summary*

5.4.1 This was a limited excavation confined largely to a very narrow strip of land immediately west of the current M1. It lay at the eastern edge of the Iron Age hillfort at its lowest point in the shallow dip sloping down north-eastwards towards the upper Ver Valley at Redbourn. Part of the outer ditch of the hillfort was revealed, together with a series of possibly related pits and hollows, but most of these features were undated.

##### *?Iron Age ditches*

5.4.2 The principal ditch, the easternmost part of which lay beneath the existing M1 embankment, was examined at two points. To the north a 40 m length of the ditch was revealed (although for much of this distance only the inner, western edge was seen), while to the south the ditch was traced for a distance of 70 m. One main section was cut through each of these two parts. In Section 10/11 to the north, the ditch (27) was some 8 m wide and 2.7 m deep. The profile was variable, being broad with gently-sloping sides in the upper part, and with a step on the inner (west) side, while the lowest part was a more steeply sided cut 1.6 m across and 0.8 m deep with a flat-bottomed V-shaped profile. There is no suggestion, however, that the lower part of the ditch represented a separate phase of hillfort construction. The basal fill (35) was of dark brownish-grey silty clay with very frequent flint lumps. This was overlain in the upper part of the steep-sided ditch bottom and in the lower part of the wider profile by a more gradually accumulated layer (34), up to 0.66 m thick, of clayey silt with few flint inclusions. A shallow deposit above this, 32, contained much flint and gravel and may represent a short-term infill episode, but it was of even thickness across the ditch and therefore did not derive solely from the rampart to the west. Subsequent fills reflect further gradual infill of the ditch. At the top of the sequence, fill 28, up to 3.8 m across and 1.1 m deep, is likely to have been the fill of a shallow sloping sided and round bottomed recut of the ditch adjacent to the rampart. This appears to have been dug after the ditch had completely infilled and its date is unknown.

- 5.4.3 In the southern part of the site the hillfort ditch (261) examined in Section 208 was more truncated, and survived as a feature *c* 5.6 m wide and 2.1 m deep. The profile was more regular than that seen to the north and was essentially a shallow V-shape with the basal section slightly more steep-sided. The character of the fills in this section was broadly similar to that seen further north, although there were numerous variations of detail. The secondary fill (263) contained much more flint than 34, and the counterpart of the latter may have been fill 264 which overlay 263. Again there was no suggestion of distinctly differential fill or collapse from the rampart side of the ditch. Equally, however, there was no evidence for the probable late recut seen in Section 10/11. The only artefacts recovered from either section were a few struck flint fragments; no pottery or other Iron Age material of any kind was found.
- 5.4.4 Some 55 m north of the point where ditch 27 disappeared into the western site baulk a substantial feature (42/85) projected from the same baulk at an oblique angle. The minimum surviving length of this feature was *c* 9.5 m. Towards the tip of the terminal the feature was 3 m wide and only 0.65 m deep and cut a possible tree throw hole which lay on its north-eastern side. Some 2.3 m further north the ditch was up to 0.9 m deep but only a 2.1 m width survived within the excavated area; the full original width and depth of the ditch are therefore unknown. Two small pottery sherds came from the main fill (86) of the more northerly intervention in this feature, one was possibly late Iron Age in date and the second, an abraded fine oxidised fragment, may have been Roman.
- 5.4.5 It is possible that feature 42/85 was simply a large pit, but the similarity of its orientation to that of the outer hillfort ditch is striking. The feature has the character of a ditch terminal and may therefore represent a further ditch, presumably of limited extent, running parallel to and outside the line of the main 'outer' ditch (27). It is just possible that feature 42/85 was related to augmentation of the defences in the vicinity of an entrance, an idea that could be supported by the geophysical survey of the site which may show a break in the line of the outer rampart, and possibly even in the associated ditch, at about this point (Stratascan 1995, fig. 33). The significance of such a break would be uncertain as there is no indication of a corresponding break in the inner rampart at this point. Apparent differences in character (of depth and main fills) between ditches 27 and 42/85, might suggest that the latter was not contemporary with the main phase of the 'hillfort', but variations in ditch character might be expected in the vicinity of an opening. The presence of an opening in the outer rampart and ditch remains speculative, at best.

### *Other features*

- 5.4.6 North of ditch 42/85 a complex cluster of features, consisting of shallow gullies, hollows and possible postholes, occupied an area a little less than 10 m x 10 m. An irregular gully (group 54) up to c 5.9 m long, 0.8 m wide and 0.28 m deep (usually considerably less) was considered to be the primary feature, but a further gully (group 83), 4.5 m long and up to 0.8 m wide, lay roughly at right angles to it and may have been related. North-east of 54 was a similar, larger gully (group 84) up to 1.2 m wide and 0.35 m deep, defining the north-eastern limit of this group of features. Other features in the area were three irregular pits, at least one of which was interpreted as a tree-throw hole, and six possible postholes, of which three (48, 50 and 52) formed a south-north line at the western edge of the feature complex. Just east of these, and between the north-west and north-east terminals of gullies 83 and 54 respectively, an oval feature (3), 1.2 m x 1.0 m and 0.06 m deep, was a hearth with a fire-reddened base and charcoal staining in the fill, which included two flint flakes. Flints are also noted as having been recovered from gully 54 and pit 65 in this complex (2 and 4 pieces respectively), but these were not closely datable.
- 5.4.7 The only significant feature north of this complex was a north-west to south-east aligned ditch/gully (6/20) up to c 0.75 m wide and 0.38 m deep, traced for some 30 m from the east edge of the site.
- 5.4.8 In the central area of the site three features, pits 13 and 211 and a possible ditch terminus (216) on a north-west to south-east alignment, were located west of the line of the outer ditch of the hillfort. None of these features was dated. Two east-west aligned gullies (1 and 23) were located in the same area, just north of pit 13. Of these, the former certainly and the latter probably cut the post-medieval subsoil, so a fairly recent date is likely, although they contained no finds.
- 5.4.9 A group of pits was located in the southern part of the site. Features 246 and 244 were relatively isolated, but to the south features 205, 258, 256, 217, 219, 226, 254, 209, 241, 222, 243 and 248 formed a reasonably discrete group. Although some were irregular in plan (and 258, 219 and perhaps 209 and 241, were suggested as possible tree throw features), a notable characteristic of a number of these pits is their oval shape. The functional significance of this, if any, is uncertain, however, and most had only a single silty clay fill. Only one feature, 218, produced pottery; eight very small

coarsely flint-tempered sherds. The date of this material is uncertain, but either a late Neolithic or middle Bronze Age date is possible.

- 5.4.10 Two further pits, 250 and 252, lay a little to the south of the main cluster. They were separated from it by a north-east to south-west aligned ditch (236/238), traced for a minimum distance of some 40 m. This ditch was up to 0.86 m wide and 0.30 m deep, with moderately sloping sides and a rounded base and had a single sterile clayey silt fill.

### *Phasing*

- 5.4.11 The almost total lack of finds makes interpretation of many of the features problematic. The outer ditch of the hillfort can be assigned to the Iron Age by association, but not on any other criteria. The possible additional ditch terminal in the northern part of the site may have been filling in the Roman period, but the evidence is exiguous. The three features (pits 13 and 211 and ditch terminus 216) in the central part of the site were located west of the line of the outer hillfort ditch. It is possible that they lay on the inner lip of this ditch, but it is more likely that the area in which they were located was occupied by the associated rampart. While it is possible that these features postdated the removal of the rampart at this point (as is almost certainly the case with an adjacent east-west aligned gullies (1 and 23)) their character does not support this suggestion. On balance, therefore, they are more likely to predate the hillfort.
- 5.4.12 This may have implications for the other groups of essentially undated features. Interpretation of the northern cluster of gullies, pits and postholes is very uncertain. The function of the probable hearth (3) within this group is reasonably certain, and the close spacing of the other features suggests that they may have been closely related temporally as well, but beyond this there is no certainty. Whether the features can be seen as forming irregular structures of two phases, as suggested by the excavator, is very unclear. As recorded they do not readily permit any obvious reconstruction. A later prehistoric (but pre-hillfort) date might be suggested by a very small number of flint fragments from the hearth and two of the associated features, but this material could be residual.
- 5.4.13 The group of pits at the southern end of the site is similarly problematic. Feature 218 may be dated by the associated pottery either to the later Neolithic or the middle Bronze Age. This may suggest a date for the other pits in its vicinity, and in either

case could support the suggestion that occasional flints of generic late Neolithic-Bronze Age character from other features outside the rampart were not residual in the contexts in which they occurred.

5.4.14 Apart from the hillfort ditch the only significant linear features were the ones found at the north and south margins of the excavated area. Their alignments are very roughly at right angles to each other and also seem broadly to reflect the alignment of the outer ditch of the hillfort. On this basis it is likely, though not demonstrable, that they postdate the hillfort. Such ditches could have formed part of a field system of late Iron Age or Roman date, for example, but this is speculative.

## 5.5 Area M (Figure 14)

### *Summary*

HER 12450

5.5.1 Area M occupied a long narrow strip on the east side of the M1 about 1 km north of The Aubreys. It slopes up to north and south from a low point in the centre. The archaeological features consisted principally of ditches, and while these were clearly of more than one phase the pottery dating evidence was consistently of late Iron Age to early Roman date. There was no evidence for significant activity after the 1st century AD.

5.5.2 Activity at area M can be divided into two main phases. In the first phase, dating to the middle to late Iron Age, two ditches, with a pit to their east defined a land boundary running from north-east to south-west across the site. In the second phase, dating to the early Roman period, these were infilled and replaced by a series of ditches on the same alignment as the earlier Iron Age boundary. The ditches may have defined two trackways, the first running from south-west to north-east, before turning east across the line of the earlier boundary ditch and the second continuing to the north-east. Alternatively these second phase ditches may have comprised successive boundary ditches for enclosures to their east. In addition there were three short stretches of intercutting ditch, on an east-west alignment, close to the southern limit of the excavated area.

### *Middle to late Iron Age activity*

a few sherds, incl. Ag shell

5.5.3 Middle to late Iron Age activity comprised two ditches, a pit and a gully. Curvilinear ditch 3008 was situated towards the northern end of the excavation area and ran north-east/south-west for a distance of approximately 5 m, before turning to the

north-west and continuing for a further 8 m. In total it measured 13 m in length and was 0.9 m wide. Cutting ditch 3008 at its southern end was a short length of gully (3024), orientated north-west/south-east and measuring 1.9 m in length by 0.34 m in width. Gully 3024 was cut in its turn by ditch 3022, which continued the line of ditch 3008 to the south-west and measured 47 m in length by 0.40 m in width. Pit 3034 lay approximately 7 m to the east of ditch 3022, about halfway down its length, was sub-circular in plan and measured 0.70 m in diameter. Although the linear features cannot have been exactly contemporary, as they were inter-cutting, they appear to have defined a single boundary, possibly the edge of an enclosure.

### *Early Roman activity*

5.5.4 The early Roman activity comprised seven ditches, potentially defining two trackways together with the edge of an enclosure, or possibly representing successive boundaries of two enclosures. Ditches 3052 and 3012 ran on a north-east/south-west alignment, before turning to the east cutting across the line of middle to late Iron Age ditch 3022. Ditch 3052 measured approximately 49 m in length by 1.20 m in width and ditch 3012 measured approximately 37 m in length and was 0.5 m wide. Together ditches 3012 and 3052 may have defined a narrow trackway at least 49 m in length and 5 m wide. Alternatively they may have represented successive boundary ditches for an enclosure to their east. To the north-east of ditches 3052 and 3012, ditches 3004 and 3006 continued on a north-east/south-west alignment. Ditch 3004 measured approximately 31 m in length by 1.20 m in width and ditch 3006 measured approximately 24 m in length 1.10 m in width. Together they may have defined a second, narrow trackway at least 33 m in length and 3 m in width, or like ditches 3052 and 3012 they may have formed successive boundary ditches for an enclosure to their east.

5.5.5 At the southern limit of the excavation ditches 3057 and 3059, on an east-west alignment, may have defined the southern limit of an enclosure bounded by ditch 3052 to the north-west, but more likely related to a possible enclosure lying to the south, further components of which were not observed. The more northerly ditch 3057 was a minimum of 12 m in length and 1 m wide. It appeared to turn sharply to the south at its western end, but the extent of the southward projection is unknown. Ditch 3059 to the south extended the full width of the site. It was at least 13.5 m in length and 1.40 m wide. Both ditches 3057 and 3059 cut a short length of north-south ditch 3061. A 1.70 m length of this feature, which was 1 m wide, was seen between 3057 and 3059 but was not traced either north of the former or south of the latter. The



significance of this is uncertain. However, excavation of the intersection of 3061 and 3057 suggested that there was a slightly curving junction in their eastern angle, which might imply that 3061 was originally continuous with an early phase of 3057. On this basis it can be (very tentatively) suggested that 1) 3061 and the eastern part of 3057 initially formed the north-west corner of an enclosure, 2) that this enclosure was extended to the west in a secondary phase of ditch 3057 (incorporating the corner observed at the west end of that ditch) and 3) the north side of the enclosure was subsequently redefined by ditch 3059. The principal problem with this speculative scheme is the lack of evidence for the southerly continuation (beyond 3059) of either 3061 or the extended version of 3057, but the poor definition of the southward arm of the latter suggests that there were difficulties with observation of features in this area.

## 5.6 Area P (Figure 15)

### *Summary*

HER 16451

5.6.1 Area P was located on the east side of the M1 about 1 km north of Area M and 2 km north of The Aubreys. It lies on relatively high ground (at about the 140 m contour) with slopes down to the north-east, east and south. A possible trackway and a few other ditches and pits of Roman date were revealed.

### *Roman features*

5.6.2 The principal features in this area were four ditches. At the north end of the site ditch 4008 ran roughly NE-SW across the area on a slightly curving alignment. It was roughly paralleled by a straighter NE-SW aligned ditch 4010 some 90-100 m to the south. Between these two features was a further pair of ditches, 4012 to the north and 4006 to the south. These were 10 m apart and aligned approximately ENE-WSW, both turning slightly more northerly at the eastern edge of the site. Ditch 4012 had a regular shallow V-shaped profile up to 0.32 m deep, while 4012 was more steeply V-shaped and c 0.60 m deep.

5.6.3 A few scattered pits were also present. Pit 4014 lay just south of ditch 4012 and an irregular feature (4004), probably a tree hole in origin, was cut by the south edge of ditch 4006. Pit 4018 lay some 5 m west of ditch 4010 at the south end of the site.

5.6.4 Pottery was recovered from the fills of all the ditches and from pit 4014. The groups from ditches 4008 and 4012 contained very small sherds (respectively 15 sherds weighing 13 g and 22 sherds weighing 82 g) of late Iron Age to early Roman

character. In contrast, ditches 4006 and 4010 produced larger groups (392 sherds weighing 3324 g and 98 sherds weighing 762 g) of more substantial sherds, both groups dated around the end of the 2nd-early 3rd century. The pottery from pit 4014 was less diagnostic but a similar date is very likely.

- 5.6.5 Superficially the dating evidence indicates an early Roman date for the two northerly ditches and a middle Roman date for the two to the south. However, the exactly parallel layout of ditches 4012 and 4006 suggests, notwithstanding their rather different sizes, that these were contemporary features, perhaps defining an ENE-WSW aligned trackway. It is possible that all the features on the site were of the same date, but the presence of some late Iron Age/early Roman pottery indicates some activity of that period in the vicinity, and it can be suggested that ditch 4008 at the north end of the site was perhaps the earliest feature here. In view of the absence of features or deposits indicating domestic activity the quantities of pottery deposited in ditch 4010 and, in particular, in 4006, are notable. The latter assemblage included samian ware and amphora sherds as well as locally and regionally produced coarse wares. If ditch 4006 did define the south edge of a trackway it may be speculated that the pottery contained within it was brought from a nearby settlement located alongside the trackway, but whether to east or west of the present site is unknown.

## 5.7 Junction 9 (Figures 16-21)

### *Introduction*

- 5.7.1 The excavation of Junction 9 in stages presented particular problems in terms of recording. The excavated area was bisected by a haul road. This was rerouted and the area beneath it examined at a late stage in the project and the level of examination of its trace was clearly less than that of the remaining areas to north and south. The overall area represented a particularly long and narrow transect, with further consequences for interpretation of the features revealed. Nevertheless, significant archaeological features were identified throughout the excavated area. During excavation the site was divided into four areas, numbered 1-4 from north to south. These numbers are used for ease of reference in the account below.
- 5.7.2 The most significant activity was of two main phases, later Neolithic-Bronze Age and late Iron Age-early/mid Roman.

### *Mesolithic*

5.7.3 The great majority of all the worked flint from the M1 excavations was recovered at this site. Chronologically diagnostic artefacts were scarce, but most of the material is assigned on technological criteria to the later Neolithic and Bronze Age. A small quantity of diagnostically earlier pieces was present, however. Specifically these included an opposed platform blade core and 18 microliths of later Mesolithic date. This material was scattered, occurring in a variety of features, always in association with later flintwork. Only three features contained two Mesolithic flints; the remaining pieces occurred individually with later material. It is likely, therefore, that the Mesolithic flint represents low level activity of this period, but the objects are entirely redeposited in later prehistoric features. It is likely, on the basis of the broadly coincident distributions, but not certainly demonstrable, that the focus of Mesolithic activity was roughly the same as that of the later prehistoric features, that is to say in the southern central part of the site.

#### *Later Neolithic-Bronze Age*

5.7.4 Struck flint of later Neolithic and/or Bronze Age character was abundant and although some of this was redeposited in features of later date a great majority, over 4000 fragments out of a site total of some 4613 pieces (including the Mesolithic material), occurred in features in which it was not associated with later material, many if not most of which be broadly dated by the flint which they contained (see Table 3, note that fills are only mentioned when more than one is present). Most of these features were postholes, pits and hollows, concentrated in the central area of the site. In some cases the distinction between these feature types was arbitrary. Many if not most were heavily truncated, making assessment of their original function difficult. Post pipes were identified in a few features, which can therefore confidently be described as postholes. These were not, however, otherwise distinguished from many of the remaining features on the basis of dimensions, profile or character of fills. Where post pipes were not present, therefore, systematic distinction between postholes and small pits was not possible, nor were the quantities and type of associated finds a guide to interpretation of features of this general character (see further below). A few features certainly interpreted as pits were both larger and deeper than the majority of features, and in some cases contained several fills, while the shallow hollows, the smaller pits and the postholes (where no post pipe was present) typically had only a single undifferentiated fill.

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16452

*Table 3: M1 J9 Features containing only prehistoric material (principally flintwork) in their fills*

Feature	Type	Dimensions (length x width x depth) /sides	Worked flint pieces	Other finds	Comment
2050	Pit	0.60 x 0.92 x 0.40, V	2		
2052	Pit	1.50 x 1.11 x 0.57, S	208		
2056	?Ditch	3.00 x 0.80 x 0.36, V	35		or elongated pit
2058	Pit	1.03 x 0.80 x 0.34, S/V	48		
2060	PH	0.59 x 0.47 x 0.28, V	4		
2062	Pit	0.85 x 0.64 x 0.47, V	21		
2064	Pit	1.75 x 1.50 x 0.38, Sh	411		fills 2063, 2176
2068	Pit	0.70 x 0.58 x 0.14, Sh	14		
2070	PH	0.65 dia x 0.31, S	15		post pipe visible
2072/ 2282	Ditch/gully	2.10+ x 0.80 x 0.32, ?S	245		terminus; fills 2071, 2281
2074	Pit	1.30 x 1.08 x 0.18, Sh	10		
2076	Pit	1.35 x ? x 0.25, Sh	32		
2078	PH	0.75 dia x 0.30, Sh	42		post pipe visible
2080	PH	0.80 dia x 0.34, Sh	25		post pipe visible
2082	?PH	0.70 dia x 0.28, Sh	22		
2084	Pit	1.68 x 0.90 x 0.10, Sh	40		
2086	PH	0.60 x 0.60 x 0.12, S	1		?packing stone
2090	Pit	1.80 x 1.24 x 0.40, Sh	234		
2092	?PH	0.56 x 0.40 x 0.10, S/Sh	1		
2094	Pit	1.65+ x 1.60 x 0.55, Sh	665		fills 2093, 2154, 2162
2096	?Pit (small)	0.80 x 0.50 x 0.26, S	56		or possible PH?
2100	Pit	1.80 x 0.58 x 0.30, Sh	365		
2102	Pit/PH	0.60 x 0.54 x 0.17, S	5		
2104	Pit	1.60 x 1.10 x 0.15, I	31		
2108	Pit	1.00 x 0.95 x 0.35, Sh	85		cuts 2182, later material in top fill
2110	?PH	0.95 x 0.77 x 0.20, Sh	33		fills 2109, 2165, poss post pipe visible
2148	?PH	0.80 x 0.70 x 0.30, I	16		poss post pipe visible
2160	?Tree throw	0.06 deep	10		
2163	?Pit	0.75 x 0.47 x 0.07, Sh	2		
2175	Layer		21		colluvium?
2182	?PH	0.65 x 0.50 x 0.54, V	1		cut by 2108
2185	?Ditch/gully	1.50+ x 1.36 x 0.55, S/Sh	9		fills 2186, 2187; cuts pit 2189
2189	Pit	1.60 x 0.80+ x 0.22, Sh	93		cut by 2185
2196	Ditch/gully	2.60+ x 0.60 x 0.35, S	203		fills 2142, 2195
2212	Pit	1.00 x 0.76 x 0.20, I	1		
2222	?Pit	c 0.70 x 0.63 x 0.10, S	2		
2230	PH	0.50 dia x 0.34, V	23		
2232	PH	0.43 dia x 0.28, S	9		
2234	Pit	1.30 x 1.22 x 0.30, I	6		
2242	PH	0.40 x 0.39 x 0.16, S	5		
2288	PH	0.58 dia x 0.31, S/V	11		
2290	?Pit	1.20 x 0.70 x 0.35, Sh	71		
2293	Pit	1.16 x 0.90 x 0.38, Sh	1		
2297	Pit	2.26 x 1.05 x 0.42, S	26		irregular plan
2299	Pit	1.00 x 0.67 x 0.43, S	65		fills 2300, 2301
2302	?Pit	0.95 x 0.44+ x 0.15, Sh	1		
2307	?PH	1.45 x 0.75 x 0.23, I	1		possible double posthole or irregular pit
2311	Pit	1.06 x c 0.85 x 0.19, I	37		subrectangular
2314	PH	0.60 x 0.60 x 0.25, S	8		
2316	Pit	1.60 x 1.14 x 0.20, S	222		
2318	Pit	0.86 x 0.84 x 0.19, S/Sh	46		

Feature	Type	Dimensions (length x width x depth) /sides	Worked flint pieces	Other finds	Comment
2320	Pit	0.69 x 0.67 x 0.16, Sh	20		
2322	?Ditch	?1.05 x 1.04+ x 0.23, Sh	55		possible ditch terminal
2324	PH	0.80 x 0.60 x 0.35, V	48		
2328	Pit	0.52 x 0.50 x 0.07, Sh	1		
2330	PH	0.50 dia x 0.60, V	9		
2337	PH	0.57 x 0.50 x 0.20, V	14		
2356	Ditch	3.60+ x 1.00 x 0.31, S	160		
2358	Pit	1.90 x 1.00 x 0.25, S	27		
2360	Pit	2.20 x 0.80 x 0.30, Sh	11		linear pit
2366	Pit	1.54 x 0.84+ x 0.10, I	3		
2370	Pit	0.80 x 0.72 x 0.40, S	30		
2381	Pit	1.02 x 0.98 x 0.25, S	12		
2384	Pit	3.00 x 1.60+ x 0.75, S	69	2 frags pot (F)	possibly more than one feature at edge of site
2386	Pit	1.35 x 1.03 x 0.44, I	2	11 frags pot (F)	
2396	Gully	8.00 + 1.20 x 0.40 x 0.06, S	1		L shaped gully cut by pit 2417 and PH 2419
2398	Pit	1.14 x 0.97 x 0.19, Sh	20		
2419	?PH	?0.25 dia x ?0.45, V	17		?cuts gully 2396
2427	PH	0.52 x 0.46 x 0.28, Sh	2		
2442	?Tree throw	4.00 x 3.00 x 0.50, I	36		irregular
2454	Pit	1.40 x 0.57 x 0.16, Sh	7		
2470	Pit/PH	0.65 x 0.45	2		not excavated
2478	PH	0.26 dia x 0.48, V	1		
2487	?Ditch	1.50+ x 0.70+ x 0.60, S	3		fills 2489, 2577
2506	?PH	0.40 x 0.30	1		not excavated
2510	Pit	1.45 x 0.50	6		elongated pit, not excavated
2522	Layer	0.04 m deep	1		
2525	PH	0.54 x 0.45 x 0.18, S	11		
2534	Gully	4.20+ x 0.30 x 0.15, Sh	2		fills 2535, 2537
2544	Pit/PH	1.70 x 0.85	4		possibly two intercutting features, not excavated
2558	Gully/pit	2.90 x 1.00	18		linear pit, not excavated
2560	Gully/pit	2.40 x 1.00	4		as 2558, not excavated
2570	Pit/PH	1.00 x 0.60	4		not excavated
2615	Layer	0.10 deep	6		
2620	PH	c 0.90 dia, x 0.43, S	14		
2665	?Hollow	9.50 x 5.00 x 0.10, Sh	1		'Terrace'
2704	Pit	1.50 x 1.50 x 0.30, S	3		

Sides: V = vertical, S = steep-sloping, Sh = shallow-sloping, I = irregular profile

5.7.5 Features assigned to this broad period concentrated notably in the south-central part of the site (in Area 3). The concentration lay mostly between the principal foci of late Iron Age and Roman activity. While this may be a coincidental consequence of preservation - that the area in question was not particularly disturbed by Roman activity and otherwise ephemeral features therefore survived better - the relative lack of earlier features in the 'Roman' areas, and the relative scarcity of redeposited flint

within their fills, suggest that the distinction is real. Broadly, therefore, there was little overlap between the area of dense prehistoric features and the concentrations of late Iron Age and Roman activity.

5.7.6 The linear character of the site makes interpretation of the pattern of the prehistoric features quite difficult, particularly as these include no significant linear features which might have provided some indication of alignments. Nevertheless, the concentration of discrete features in Area 3 may include alignments that were fortuitously reflected by that of the excavated area, although this suggestion must be treated with caution, particularly in view of the very differential level of preservation/recording of features in the line of the haul road that split Area 3. It is possible to identify NNW-SSE aligned rows of features in this area (for example, features 2102, 2096, 2092, 2082, 2070 and 2060, all described as certain or probable post holes, formed a straight row some 25 m long). Other, pit-like features occurred in the same and closely similar alignments, although the significance of this is unclear, particularly in view of the caveats expressed above. An apparent gap in the distribution of these features towards its southern end, and just west of the later southern trackway, can be tentatively suggested as respecting an area roughly 8 m in diameter (if some of the undated features are included). Such an area might possibly have been occupied by a circular structure, which could have been up to c 10 m in diameter if some of the possible postholes had been structural elements in its walls. Such an interpretation is, of course, highly speculative.

5.7.7 As mentioned above, a few of the pits were relatively substantial, well-defined features. Unsurprisingly, the larger flint assemblages tended to come from such features, but Table 3 shows that there was no consistency of depth or profile amongst the most productive features. Of the pits producing more than 200 flint fragments the richest was 2094, 1.4 x 1.35 m and 0.55 m deep - one of the deepest of the discrete prehistoric features. Despite its depth this pit had relatively gently sloping sides, a characteristic shared by a number of the richest (in terms of flint) pits, such as 2064, 2090 and 2100, though features such as 2052 and 2316 had much steeper sides. All the six most productive pits lay within the main concentration of prehistoric features. It is possible to see these as forming two NW-SE aligned rows of three, the first, comprising features 2100, 2090 and 2064, falling within the alignment of postholes (2102 etc) mentioned above, with 2094, 2316 and 2052 on a parallel alignment just to the east. Flint-rich gullies 2072 and 2196 lay immediately east and north respectively of these pits, with a further flint-rich gully, 2356, some 20 m further north.

Correlation of spatial aspects of flint distribution and feature type thus seems to be a fruitful avenue for more detailed analysis.

#### *Later prehistoric activity*

5.7.8 A small quantity of middle Iron Age pottery suggests that there was limited activity of later prehistoric date preceding the main late Iron Age/early Roman occupation phase. This pottery came from the tops of two adjacent (and probably earlier) pits, 2100 and 2108, within the area of concentrated earlier prehistoric features, and from two fills in the early Roman ditch 2047/2128 in the northern part of the site. While the fresh character of a few of the sherds probably indicates nearby contemporary activity, no features could be assigned to this period with confidence.

#### *Late Iron Age and Romano-British*

HER 16453

5.7.9 These periods have been combined since features assigned to each are closely related spatially and, as so often, the ceramic sequence shows continuity of activity through the time of the Roman conquest, with no clear break which could be correlated with that time. At the present site the quantity of pottery specifically assigned a late Iron Age date range is relatively small and it is possible that most if not all of the sequence is of the post-Conquest period, but this cannot be demonstrated with certainty.

5.7.10 In contrast with earlier activity, the evidence for this period is dominated by linear features. These indicate the division of the landscape into a variety of units on a broad NNE-SSW alignment, probably based around two roughly parallel trackways some 155-160 m apart, each defined by a pair of ditches. These are referred to hereafter as Trackway 1 (to the north-west) and Trackway 2 (to the south-east). The alignment of the trackways in relation to the site means that only a short length of each was seen, and the interpretation offered here is based on the unproven assumption that both trackways ran approximately straight over a distance of at least 400-500 m. Even if this was not the case, however, the alignment of features between the two trackways suggests a fairly regular layout of this part of the landscape, while features lying east of Trackway 2 appear to have been less regular in terms of alignment. Only one possible feature, which was not examined, was seen west of Trackway 1.

#### *Area 1 (Figures 20-21)*

5.7.11 Trackway 1, on which no metallurgy survived, was defined on the north-west side by ditch 2008, which ran for a distance of 44 m across the site, and on the south-east side

by ditch 2010/2188, some 3.5–4.5 m distant. Ditch 2188 extended some 25 m from the east baulk of the site, at which point it may have turned sharply to the east, or was adjoined by a pit 2145, mostly removed by a later feature, 2177, recorded on plan as a dogleg shaped ditch running into the east baulk of the site. No direct relationship between 2188 and 2177 survived. Later than 2177, and parallel to 2188 was a larger ditch (2531), some 2.7 m wide, which appears to have terminated in line with the south-west end of 2188, although it is possible that the south-easterly continuation of ditch 2177 was in fact part of ditch 2179. A cremation burial (cut 2012) was set at the western edge of ditch 2531. This had been placed in a late Iron Age pedestal urn, of which only part of the base survived. The fragmentary cremated remains were probably from a single adult individual.

5.7.12 The line of trackway ditch 2188 was continued to the south by ditch 2412, which must have cut the termini or junction of 2188 and 2177, but the relationship was largely obscured by a still later pit, feature 2143. Ditch 2412 was *c* 2.3 m wide with a U-shaped profile. Adjacent to the west baulk of the site an ESE aligned ditch (2032) ran from the south end of 2412 across the width of the excavated area. Ditches 2032 and 2412 are likely to have been broadly contemporary (their upper fills both produced late Roman pottery), but the relationship between them was not examined, nor was an irregularly-shaped patch of soil in the south-east angle of their junction. Trackway 1 had widened a little by the time it reached the west site baulk, and very slight changes in the ditch alignments adjacent to the baulk may indicate that the trackway branched or perhaps turned to the west just beyond the excavated area.

5.7.13 It is possible that 2032 and 2412 formed part of an enclosure east of Trackway 1, the less regular north side of which would have been formed by 2177 and perhaps 2179. Several short lengths of gully (unexcavated) lay within this area, together with two discrete features, shallow pits 2030 and 2462, the fill of the latter containing burnt material. A longer, straight NNE-SSW aligned gully was also present; this was cut by ditch 2032 and apparently terminated just to the south of it. The southern edge of ditch 2032 cut four further NNE-SSW aligned gullies. None of these was excavated and none extended north of ditch 2032; their date is therefore unknown and their significance is thus uncertain.

5.7.14 The southern part of Area 1 contained further gullies and ditches. As with the part to the north, described above, there was a tendency for gullies to be replaced by wider ditches in secondary phases. A prominent NNE-SSW alignment which was, however,



not exactly parallel to the line of Trackway 1, was formed by a narrow gully 2273, at least 33 m long. A comparable unnumbered feature some 0.7-1.0 m to the east was traced for a distance of c 22.5 m, terminating within the site at its north end and turning through a right angle to the east for a distance of 12 m at its southern end. Some 14 m south of this was another narrow L-shaped gully, 2536/2538 and a further ditch or gully (2126) lay between 2536/2538 and the unnumbered gully to the north, perpendicular to both. The north end of 2126 was cut by a larger ditch (2037/2351/2409/2593) at right angles to it. This feature ran from the east baulk of the site as far as gully 2273, which it also cut. It may in fact have turned almost a right angle to the south-west and continued the line of 2273 as far as the west edge of the site (feature 2593). This part of the ditch was cut by a later gully (2604); both 2604 and 2037 produced middle Roman (2nd century) pottery. The NNE-SSW lengths of these features were relatively narrow, while the WNW-ESE part of 2037+ was up to 2.3 m wide. An even larger ditch (2006/2047/2128), ranging from c 2-4 m in width, lay west of the alignment of 2173 and the later cuts (2037+ and 2604), but converged with this line at the east baulk of the site, where it cut 2173. The digging of ditch 2006 etc may be seen as re-establishing the west side of a field or enclosure originally defined by 2137 and the parallel unnumbered gully, additionally establishing an entrance in what was now the south-west corner.

- 5.7.15 Despite postdating 2137, the lower fills of 2006/2047/2128 consistently produced pottery with a date range of late Iron Age-AD 70, as did the lower fills of 2037 etc and the sole fill of gully 2538. Later fills in both 2006+ and 2037+ were dated to the 2nd century, while the topmost fills of 2006+ contained pottery dated to the 3rd-4th centuries. Immediately adjacent to 2006 at the east edge of the site was a well (2004). This was partly machine excavated (to an (incomplete) depth of 3.2 m, at which point the shaft was c 1.2 m in diameter. Like the top fill of ditch 2006 the main fill of the well, postdating its use, contained pottery dated AD 250-400, as did the fills of a localised recut of the top of the shaft. The uppermost of these deposits, 2005, also produced four 4th century Roman coins, the latest dated 341-348. Deposit 2005 certainly postdated the fills of ditch 2006, but it is likely that the initial digging of the well took place while the ditch was still partly open.

#### *Area 2 (Figures 19-20)*

- 5.7.16 Area 2 contained relatively few significant Roman features. The most important of these was an L-shaped ditch of two phases on the same overall alignment as the features in Area 1 and probably forming part of a single series of enclosures with

those features. The earlier of these ditches was 2388/2431/2516, up to c 1.7 m wide, which ran 11 m SSW from the east site baulk before turning a right angle to the west and apparently terminating some 13 m west of the turn. The later ditch, 2435/2512, overlapped 2388+ by about 9 m, extending for a total of 17 m to the west edge of the site. The likely association of these features with ditches to the north was reinforced by their similar dating. The fill of 2388+ and the primary fill of 2435+ produced pottery dated from the late Iron Age to AD 70, while the upper fills of the later ditch were dated to the 2nd century. On the assumption that these ditches defined a south-east corner corresponding to ditches 2037+ and 2604 to the north, the resulting roughly rectangular enclosure would have been roughly 74 m north-south by 70 m east-west.

5.7.17 Smaller gullies such as 2538 in Area 1 may have defined subdivisions of this enclosure. In Area 2 internal features were represented by further short lengths of gully, several of irregular form, but these were not investigated. A circular feature (2444) some 6 m in diameter and 0.4 m deep was probably a pond or shallow water hole, but was not dated. A number of small pits and possible postholes were scattered across the area. Several of these were examined (from north to south 2462, 2426, 2438, 2446, 2454, 2450, 2525 and 2452, with 2554 just south of the enclosure ditches). Most were undated; features 2454 and 2525 produced small quantities of flint, while 2450 contained three flint fragments and a piece of Roman ceramic building material, though the latter could have been intrusive. On balance it is most probable that the majority of these features were related to the more intensive cluster of prehistoric features located in Area 3 to the south.

5.7.18 South of the enclosure there were again few coherent features. An irregular ditch broadly on the common NNE-SSW alignment was traced in plan for about 18 m but was not seen in the area of the haul road. Just south of this feature was a short length of very shallow L-shaped gully (2396/2341) with its long axis on the WNW-ESE alignment and therefore probably of late Iron Age or early Roman date, despite the fact that the only finds were a single flint from this feature and 17 further flints from posthole 2419, one of two features that apparently cut the gully.

#### *Area 3 (Figures 17-18)*

5.7.19 The majority of features in this area were certainly or probably prehistoric, consisting mainly of pits and postholes (see above). Trackway 2 lay in the southern part of the area. This was defined by parallel ditches some 3.5-4 m apart which ran from the north-east edge of the site but possibly terminated within the excavated area. The

west ditch (2185/2226) was traced southwards for at least 33 m, but then became less clear and was not identified in the later machine cleared strip at the west edge of the site. The east ditch (2278) was similarly not seen in this area, but probably terminated at about this point, whereas the apparent absence of 2185/2226 is not considered conclusive. A 12 m length of narrow gully (2224) ran at right angles to the line of 2278 and was apparently cut by it. Its eastern end was not identified. Both features produced pottery assemblages of 2nd-mid 3rd century date.

#### *Area 4 (Figures 16-17)*

- 5.7.20 This area contained the densest and most complex Roman features, suggesting more intensive activity than that seen in the trackside enclosures further north. There was, however, still no direct evidence for domestic occupation. Few of the features are well dated, but the available evidence suggests that the large majority were of late Iron Age-early Roman date. Given that in parts of the area several successive features were assigned to this phase this was clearly a period of relatively intensive activity.
- 5.7.21 The NNE-SSW alignment of Trackway 2 was reflected by further ditches and gullies to the east. Some 18-20 m distant from the trackway was ditch 2341/2157, up to 1.5 m wide, which ran approximately 24 m from the south-west edge of the site. It is unclear if the ditch terminated or was simply obscured beyond this point. A similar alignment was maintained further north by ditch 2674/2487, but this was heavily truncated by a series of irregular hollows and at its south end was completely removed by the later kiln 2638/2644 (see further below), the flue of which was on the same alignment. It is possible that 2341/2157 and 2674/2487 were part of the same feature, but if so its line was lost just to the south of the kiln.
- 5.7.22 East of 2341/2157 and roughly parallel to it were further ditches and gullies. The principal alignment of these consisted of two closely adjacent features, 2206/2275/2680 and 2208/2269/2682. At most these were both up to c 1.2 m wide, but 2206+ was in places no more than a gully 0.35 m across in its southern part. Both curved slightly to the south-west in the vicinity of the south-west site baulk. These ditches did not extend further north than a modern well that disturbed a number of feature intersections in this area of the site, but just to the west were the southern terminals of a further pair of ditches, 2650 and 2652, of broadly similar character, which may have been related to 2206+ and 2208+.
- 5.7.23 At least two east-west ditches were also present in this area. Cuts 2254, 2155, 2137 and 2610 perhaps belonged to a single roughly west-east aligned slightly curvilinear

- 5.7.25 Just north of curvilinear gully 2200 the NNE-SSW ditch 2341/2157 was cut by a large waterhole, 2309, only partly examined. The weathered upper cone of this oval cut was 8.7 x 7.25 m and the feature was at least 2.95 m deep. The lowest fill encountered, 2332, was a gravel deposit at least 0.75 m deep. This produced animal bone and charred plant remains but no dating material, while the overlying layer (2313) contained 14 sherds of pottery, including South Gaulish samian ware, not necessarily later than the early 2nd century.
- 5.7.26 North of the east-west ditches 2254+ and 2666+ was a further complex of features, many cut into the NNE-SSW aligned ditch 2674/2487. The most significant of these features was a substantial kiln or oven, 2638/2644, which consisted of a subcircular chamber up to 4 m across and a NE-SW aligned flue some 3.3 m long and up to 2 m wide, the definition of which at the south-west end was slightly unclear owing to truncation. The circular chamber survived to a maximum depth of 1.20 m below the stripped surface. Fragmentary flint wall lining survived in the flue and in part of the circular chamber. The primary surviving fill in the chamber was a charcoal rich deposit 2721, and similar deposit were also encountered in the lower parts of the fill sequence of the flue (2725 and 2730). Deposit 2721 was immediately overlain by chalk rubble (2720). This may have derived from partial collapse of the structure, or possibly indicates the use of the oven for lime production. Either way, later use of the kiln is suggested by another thin charcoal deposit (2710) which overlay both 2720 and a further fill. Later fills included gravel and sandy clay and much flint.
- 5.7.27 The structure is not well dated, only two sherds coming from deposits earlier than those sealing 2710, but the material is consistently early, including only one sherd certainly later than *c* AD 70 and two undiagnostic sherds of uncertain 'Roman' date from upper fills. While most of the pottery might have derived from the ditch into which the oven was cut, the absence of any significantly later pottery suggests that it can be assigned to the early Roman period.
- 5.7.28 North of the kiln was a series of irregular hollows, a short, sharply angled length of gully (2614) and a number of postholes (at least eight) and possible stakeholes, many cut into the fill of ditch 2674/2487. None of these features forms a coherent plan, but it is possible that they belonged to structures relating to the operation of the kiln, although it might have been expected that some features of this sort would have concentrated in the area at the mouth of the flue rather than behind the kiln. Again, artefactual evidence provides no information about the nature of possible activity in

ditch running the entire width of the site. This feature cut the NNE-SSW aligned ditch 2341/2157 but its relationship with 2206+ and 2208+ was obscured by the modern well. Both 2254+ and a further east-west ditch (2666/2606), lying on its northern edge but having a west terminus in the centre of the site, were, however, cut by the paired north-south ditches 2650 and 2652. All the ditches are poorly dated (or, in the case of 2206+ and 2208+, not dated at all), although most of the pottery evidence is in the late Iron Age-AD 70 range. Their interpretation is likewise uncertain, but it is possible that 2341/2157 and 2206+/2208+ bordered a NNE/SSW aligned trackway that predated the better defined Trackway 2 just to the west. Whether this putative trackway ever extended north of the area disturbed by the modern well is not clear. For example, undated ditch 2610 might have formed a right angled boundary with 2206+ or 2208+, rather than forming part of a continuous east-west ditch (2254+), but the crucial relationships did not survive.

- 5.7.24 South of the east-west ditches the putative early trackway ditches were cut by other features. A curvilinear gully (2200/2256/2261/2266/2555) at least 24 m long cut both 2206+ and 2208+ as well as a short length of NNE-SSW aligned gully (2210), the latter roughly on the centre line of the possible trackway. To the south two further gullies (2204 and 2202) ran from the south-west edge of the site and curved towards the terminal of 2200+ without being aligned exactly upon it. The gap between the terminals of 2200+ and 2204 was about 4 m. Minimal pottery evidence is consistent with the suggestion that these gullies were broadly contemporary and of 2nd century date; they are therefore assigned to the middle Roman phase. They could have enclosed a subcircular area at least 19 m across (north-south). A small pit (2246) and a posthole (2259) adjacent to the terminus of gully 2202 could perhaps have been associated with an entrance into this area. Within this area and lying immediately west of ditch 2206+ was a further short length of curving gully (2343) which ended in an expanded terminal or a contemporary pit (2244), and a cluster of shallow pits and possible postholes which did not form any particular pattern. These features were more or less contiguous but rarely overlapping, suggesting that they could have been dug in quite rapid succession. Most of the features were undated but the fill of pit 2248 produced a single small sherd of Nene Valley colour-coated ware which, if not intrusive, might support the view that these features were of 2nd century (or possibly later) date and contemporary with the curving gullies rather than the possible earlier trackway. The spatial relationship of this group of features with ditches such as 2206, however, suggests that the line of the latter was not completely obscured by the time that the pits and gully 2343 were put in place.

this area, and little definition with regard to dating. Fills of gully 2614 contained pottery dated 70-200, and a similar date range was assigned to the relatively large group of c 65 sherds of pottery in 2488, a layer overlying the infilled ditch 2487 (as well as postholes 2476 and 2478 which cut the ditch) and partly filling an irregular hollow adjacent to the east edge of the excavated area.

5.7.29 Further shallow pits or hollows lay to the east of this area. Hollow 2657, lying immediately east of kiln 2638/2644, produced 232 (mostly small) pottery sherds dated to the 2nd century. Feature 2608, adjacent to the east baulk in the angle formed by ditches 2652 and 2606, was not dated, but was cut by an unexcavated pit (2706) which had 2nd century pottery on its surface.

5.7.30 The only demonstrably later features in this area were the modern well, already mentioned, and a post-medieval pit (2372) which cut the fill of waterhole 2309.

## 5.8 Junction 10 (Figure 22)

*out of country*

5.8.1 Watching brief work at Junction 10 concentrated on two areas roughly 138 m by 110 m and 158 m by 130 m. The westernmost area contained a scatter of quarry pits and a stretch of linear ditch orientated north-west/south-east, none of which contained any dating evidence. The eastern area contained a posthole alignment, or possible fence line (1017), also orientated north-west/south-east. One of the postholes in this alignment produced two sherds of late Iron Age grog-tempered pottery and a single sherd of sand and limestone-tempered material of uncertain, but probably later prehistoric, date, suggesting that the alignment may have dated to the late Iron Age.

## 6 MITIGATION: ARTEFACT SUMMARIES

The following summaries are extracted from the specialist assessments. The full texts of these assessment reports are presented in Appendices 1-10 below.

### 6.1 Worked flint (Appendix 1)

6.1.1 A total of 4772 pieces of worked flint and 638 fragments (9872 g) of burnt unworked flint were recovered from the excavations and watching brief work (Table 4). In addition, 2000 pieces of worked flint and 141 fragments (5183 g) of burnt unworked flint were recovered from the earlier programme of evaluations and fieldwalking;

these have already been reported on. The flint from the excavations was recovered from 294 contexts. Most contexts (a total of 217) contained less than ten pieces of flint; however, 65 contexts contained between 10 and 100 pieces and 12 contexts contained over 100 pieces of flint.

*Table 4. Summary of flint by excavation area and flint category*

Flint Category	Excavation area						Total
	Area M	Area P	Borrow Pit	J8 North	J8 South	J9	
Flake	45	6	2	88	113	3430	3684
Blade		1		3	6	98	108
Blade-like flake				2	3	71	76
Bladelet				4	1	67	72
Core face/edge rejuvenation flake				2	1	5	8
Rejuvenation flake tablet						1	1
Irregular waste	1	1		8	4	104	118
Chip	1			1	6	536	544
Opposed platform blade core						1	1
Single platform flake core	1				1	9	11
Opposed platform flake core						3	3
Multiplatform flake core				2	1	47	50
Keeled/non-discoidal flake core						6	6
Core on a flake						4	4
Unclassifiable/fragmentary core				1	3	19	23
Tested nodule				2		16	18
Microlith						18	18
Chisel arrowhead						1	1
End scraper						7	7
End and side scraper						3	3
Side scraper						2	2
Scraper on a non-flake blank						1	1
Retouched blade						1	1
Retouched flake					1	9	10
Serrated flake						1	1
Unclassifiable retouch						1	1
<b>Total</b>	<b>48</b>	<b>8</b>	<b>2</b>	<b>113</b>	<b>140</b>	<b>4461</b>	<b>4772</b>
Burnt unworked count	3	3		325	155	152	638
Burnt unworked weight (g)	9	14		2972	3550	3327	9872

6.1.2 The flint suggests activity stretching from the later Mesolithic through to the later Neolithic and Bronze Age. The Mesolithic material comprises the unusually high number of microliths and the relatively small proportion of technologically earlier material. With the use of detailed context and phasing information it may be possible to further isolate this material as being derived from a separate flint industry.

6.1.3 The majority of the assemblage is technologically later prehistoric (later Neolithic and Bronze Age) in date. The presence of rejuvenation flakes, chips and irregular waste, and the relatively low number of larger flakes and tools, suggest that much of

the assemblage is knapping waste as opposed to a domestic assemblage. Technological and metrical analysis on appropriate contexts (as determined by more detailed context information) will help to confirm this and prove a useful tool when compared to other known sites where knapping waste predominates.

## 6.2 Prehistoric pottery (Appendix 2)

6.2.1 Prehistoric ceramics predating the late Iron Age were found during the evaluation and mitigation fieldwork at seven sites (Buncefield Depot; Junction 8 Southbound; Junction 8 Northbound; The Aubreys; Area M; Junction 9; and Junction 10). The assemblage comprises 988 sherds weighing 4373 g. Most of the material dates to between the late Bronze Age and the middle Iron Age, although possible late Neolithic sherds were found at The Aubreys.

6.2.2 The pottery has been ascribed to twelve broad fabric groups, the majority of which are tempered with calcined (burnt) flint, although sandy, shelly and vegetable-tempered sherds are also present. The distribution of fabrics by sherd count and weight between the various sites is shown in Table 5.

Table 5: Quantification of prehistoric pottery fabrics (sherd count and weight) by site

Fabric	Buncefield Depot	Junction 8 Southbound	Junction 8 Northbound	The Aubreys	Area M	Junction 9	Junction 10
A1	13 (70 g)	229 (310 g)	42 (107 g)		3 (8 g)	23 (157 g)	
A2			5 (12 g)		11 (45 g)		
AF1	144 (943 g)	6 (27 g)			1 (2 g)	1 (2 g)	
AF2			2 (18 g)		2 (7 g)	7 (57 g)	
AL1							1 (5 g)
F1	85 (376 g)	52 (166 g)	14 (43 g)		2 (6 g)	21 (23 g)	
F2	42 (507 g)	212 (1166 g)	10 (58 g)		2 (7 g)	9 (18 g)	
F3				8 (20 g)			
S1					11 (20 g)		
V1	1 (7 g)	3 (12 g)	1 (1 g)		2 (3 g)		
VA1	16 (139 g)		7 (31 g)				
VA2							
Total	301 (2042 g)	502 (1681 g)	81 (270 g)	8 (20 g)	34 (98 g)	61 (257 g)	1 (5 g)

(inclusion types A=sand, F=flint, L=limestone, S=shell, V=organic)

6.2.3 The prehistoric pottery assemblages from these sites are small and poorly preserved. Nevertheless, given the scarcity of contemporary assemblages elsewhere in Hertfordshire south of the Chiltern ridge, the material from Buncefield Depot, Junction 8 Southbound, Junction 8 Northbound and Junction 9 does have potential to further our understanding of local ceramic development from the late Bronze Age to the middle Iron Age. The assemblage from Buncefield Depot is of particular interest as it includes a number of distinctive early Iron Age vessel forms.



### 6.3 Late Iron Age and Roman pottery (Appendix 3)

- 6.3.1 Five sites within the mitigation phase (Junction 8 Northbound, Junction 8 Southbound, Junction 9, Area M and Area P) produced assemblages of late Iron Age and Roman date, while a very few sherds were recovered from Junction 10/Borrow Pit and The Aubreys. Overall 12,058 sherds weighing 100 kg were recovered. The material was fully recorded using ware codes based on the national fabric reference collection (Tomber and Dore 1998) supplemented by those used by Malcom Lyne in his report on the pottery from Folly Lane, Verulamium (Lyne 1999), except where a fabric was not covered by either of these systems, when the Oxford Archaeology standard recording system for Iron Age and Roman fabrics was used (Booth 2007).
- 6.3.2 The assemblage from Junction 9 is dominated by material of early Roman date, which accounted for 60% of the assemblage by weight. This is supplemented by smaller amounts of late Iron Age to early Roman pottery at 10% by weight, middle Roman pottery at 17% by weight and late Roman pottery at 11% by weight. The remaining 2% comprises material that can only be assigned a broadly Roman date range.
- 6.3.3 The pottery from Junction 8 totalled 5419 sherds, generally in poor condition, having an average sherd weight of only 6 g. However, some groups were well preserved, comprising large unabraded sherds and much of the more abraded material is residual. The assemblage is dominated by middle Roman pottery which accounts for 39% of the assemblage by weight. This is supplemented by early Roman material at 24% and late Iron Age to early Roman material at 17%. Late Roman pottery comprised 7% by weight and pottery of broadly Roman date 12%.
- 6.3.4 Area M produced some 614 sherds of late Iron Age and Roman pottery which, like the assemblage from Junction 8 had a low average weight (5 g), although some groups contained well-preserved material. The assemblage is dominated by early Roman pottery, which accounts for 88% of the assemblage by weight. The remainder is accounted for by late Iron Age to early Roman pottery at 11% and pottery of broad Roman date at 1%.
- 6.3.5 The Area P assemblage of 577 sherds is dominated by middle Roman pottery, which accounts for 93% of the assemblage by weight. The remainder is accounted for by late Iron Age to early Roman material at 2% and pottery of broadly Roman date at 5%.

#### **6.4 Post-Roman pottery (Appendix 4)**

6.4.1 A total of 2245 sherds of post-Roman pottery weighing 13,679 g was recovered from 132 contexts on the site, almost entirely from Junction 8 Northbound. The material is almost entirely of medieval date with a small quantity of 19th-century pottery also present. All the pottery was examined, spot-dated and fully catalogued during the present assessment stage (details in archive). Temporary medieval pottery fabric codes were devised but with the aim of correlating these at a later date to those of the Museum of London (MoLAS) fabric reference collection which are widely used in the London area. Late post-medieval or modern wares have been assigned MoLAS codes.

6.4.2 Overall the pottery is in fragmentary condition. Average sherd weight is only 6 g and many of the smaller sherds are clearly abraded. Within this range, however, some larger fresher pieces have survived. These include at least two complete jar/cooking pot profiles and several half-profiles or significant portions of vessels. This is consistent with an assemblage largely derived from ditches, scattered pits and postholes and which appears to represent casual domestic rubbish disposal from a rural settlement context. This disposal probably took place over a century or two. The character of the pottery suggests activity perhaps from as early as the 11th century although the main period of activity appears to have been from the late 12th to the 13th century. There may have been some activity into the 14th century, although the evidence for this is a little ambiguous.

6.4.3 The pottery is mostly derived from local sources, but one possible exotic vessel was noted, represented by a few body sherds in an unusual hard-fired grey ware with traces of white slip and possibly green alkaline glaze (contexts 6407 and 6202). These sherds are reminiscent of a vessel from Canterbury of probable Near Eastern origin (Cotter 2001, 237-8) and require further examination.

#### **6.5 Ceramic building material and fired clay (Appendix 5)**

6.5.1 Ceramic building material and fired clay, predominantly of Late Iron Age and Roman date, were recovered from the mitigation phase of excavations, at Junction 8, Junction 9, Area M and Area P. The material from the evaluation excavations had been previously recorded and reported and was not re-examined.

- 6.5.2 The ceramic building material amounted to 2886 fragments weighing nearly 212 kg and fired clay totalled 2543 fragments weighing 6783 g. A high proportion of the fired clay had been recovered by sieving and was extremely fragmented, often retaining only a single surface, if any shaping survived at all. More informative pieces have been identified as oven plate and triangular oven brick. Both assemblages have been fully recorded.
- 6.5.3 Eight Roman and three medieval tile fabrics were identified. Examples of all major Roman tile types were found including *tegula*, *imbrex*, flue tile, brick, *tesserae* and more unusually a few examples of segmental brick and *tegula mammata*. However, only the larger sites (Junction 8 Northbound and Junction 9) produced a wide range of forms, whilst the smaller excavations and watching briefs produced almost exclusively brick and plain flat tile, with only a few occurrences of flue tile and *tegula*.
- 6.5.4 Small quantities of medieval tile were recovered; the majority flat roof tile - peg tile - when identifiable, together with a single ridge tile fragment, a floor tile and a few brick fragments.
- 6.5.5 Three-quarters of all the ceramic building material (by weight), and almost 70% of the fired clay, came from Junction 8 Northbound. This site also produced the greatest variety of Roman tile forms, but was dominated by brick which formed 77% by weight of the tile and it is likely that much of the plain flat tile category was thin brick also. Other identifiable forms, of which *tegula* was most common (7%), included *imbrex*, flue tile, *tesserae* and more unusually a few examples of *tegula mammata* and curved segmental bricks. Post-Roman material included a single small fragment each of medieval roof tile and brick. The fired clay included oven plate, possible hearth floor, triangular oven brick and single sherd of briquetage.
- 6.5.6 The only other significant Roman assemblage was from Junction 9, which also produced a little medieval material. Curiously, the largest (though still very small) assemblage of medieval roof tile came from Junction 8 Southbound rather than from Junction 8 Northbound, the only site where medieval buildings were found.

## 6.6 Roman coins (Appendix 6)

- 6.6.1 Only twelve Roman coins were recovered from all the M1 sites. Single early Roman coins come from the evaluation of Junction 8 Northbound, from Area P and from

Junction 9. Of these, only the first was fairly closely datable within the period, being probably of Domitian (AD 81-96). The remaining coins are all late Roman, as would be expected in the context of lower status rural settlements. Of these, one was certainly of the later 3rd century while three were assigned a broader late 3rd-4th century date range; all were in poor condition and the attribution was on the basis of size alone. The largest group of coins, from Junction 9 (9 coins, including the one from an evaluation trench), is typical of rural assemblages in including only one early Roman piece, despite that fact that the majority of activity on the site was of this date. It is notable that none of the identifiable 4th century coins (mostly from the upper fill of well 2004) post-dated the middle of that century.

## **6.7 Metal objects (Appendix 7)**

- 6.7.1 The metal assemblage from the M1 Widening comprises in total 538 fragments, excluding coins. There are 19 copper alloy finds, one piece of melted lead wire and 518 iron pieces. These totals exclude approximately 379 pieces, including slag or cinder (n = 10), natural nodules (n = 4), fragments of ironpan or corrosion products and very small iron fragments (n = 365), which are excluded from further consideration. The majority of these small fragments are from the excavations on Junction 8 Northbound, which with Junction 9 produced most of the metal objects. Most of the datable items are assigned to the Roman period, but some possible medieval and certain post-medieval pieces were recorded.
- 6.7.2 The Junction 9 assemblage produced the most significant Roman finds, comprising a small group of items of personal adornment - 2 bangles, a brooch and a finger ring of copper alloy. Iron objects included a possible hipposandal wing and an unusual flat circular object with decorative cutouts and a lined central hole, but the assemblage was dominated by nails.
- 6.7.3 Discounting the very small iron fragments (above) the Junction 8 Northbound assemblage was slightly smaller than that from Junction 9 (216 as opposed to 238 pieces). Only three of these were of copper alloy; a pin or needle stem (sf 6101, context 6816), a stud (sf 6011, context 6055) and possible pair of tweezers (sf 6081, context 6490). Again the iron objects consisted almost entirely of nails.

## **6.8 Metalworking remains (Appendix 8)**

- 6.8.1 Some 7.4 kg of slag were recovered during the excavation phase of the project, with a smaller quantity (just over 1 kg) from the evaluation. Over 90% of the material (by weight) came from the site at Junction 9, with most of the rest from Junction 8 Northbound. The great majority of the material from evaluation also came from the Junction 9 area (in Trenches 1356, 1357 and 1363). The material was recorded by number of fragments per context in terms of functional categories, where these could be determined.
- 6.8.2 The morphology of the slags from this site indicates working on small hearths. Some slags clearly represent smithing, but others are more ambiguous. The residues retained for metal working debris all contained hammerscale and four samples contained relatively high concentrations of this material. The slag is predominantly indicative of iron working, though there is some evidence for the presence of copper in some of the slags. This may indicate that different ores were being worked at times, though copper and iron do occur together in some ores. The great majority of material comes from Roman deposits, the largest groups coming from features of 2nd century date at Junction 9. A very small proportion of the slag from Junction 8 Northbound was from medieval deposits, but it is possible that this material was residual. The assemblage as a whole is relatively homogenous and is consistent with smithing of iron in small hearths.

## 6.9 Glass (Appendix 9)

- 6.9.1 The glass assemblage from the M1 Widening comprises in total 42 sherds. The diagnostic glass is almost all Romano-British - there are a few modern fragments - and the undiagnostic glass could all be Romano-British.
- 6.9.2 Most of the glass derives from the excavations at Junction 9, with only small amounts from Junction 8 Northbound (all post-medieval), and a few pieces from evaluation contexts. The only two significant fragments from the evaluation were from Trench 1363, in the same area as the subsequent Junction 9 excavation.
- 6.9.3 The Roman glass comprises fragments from several different vessels and was not confined to the bottle forms most common in rural contexts. It also included a single fragment of possible window glass.

## 6.10 Worked stone (Appendix 10)

- 6.10.1 Approximately 300 fragments of stone were recovered during the excavations at Junction 8 Northbound and Junction 9. Amongst this assemblage are a minimum of 30 rotary querns and a number of flakes indicating quern manufacture. There are also whetstones and general processors including one saddle quern.
- 6.10.2 The site at Junction 8 Northbound produced the largest number and most substantial examples of rotary querns. Of the 21 specimens, ten are groups of very small weathered fragments (nine lava, one Old Red Sandstone) and are not specifically identifiable as rotary quern fragments, although they are made of stone known only to have been used in this way. The remaining eleven rotary quern fragments are larger and more clearly identifiable. Of these, four are Millstone Grit, two are Lava, two are Old Red Sandstone and two are other (as yet unidentified) sandstone. One of these (SF 6065) could be either Old Red Sandstone or Millstone Grit. All these materials were commonly used in the area although the relationship between them is not fully understood.
- 6.10.3 A number of flakes of Hertfordshire Puddingstone were recovered at Junction 9. Eleven fragments in total were removed from contexts 2007, 2113 and 2114. These show evidence of deliberate removal similar to those found on flint, (a major component of this rock type) including bulbs of percussion and removal scars. In addition to the flakes, a number of small fragments of puddingstone were recovered from a further two contexts on this site (2557 and 2911). These two types of debris, especially the flakes, suggest that the stone was being worked on site. More than one petrological type of puddingstone is represented amongst the flakes, indicating that the working was more than a single isolated event. Interestingly, no substantial quern fragments of puddingstone or any other material were recovered from Junction 9. Small weathered fragments only of lava (three contexts) and sandstone (one context) were recovered. This is strikingly different to the findings at Junction 8.
- 6.10.4 In addition to the rotary querns, both sites produced stone artefacts suggestive of general domestic activity including whetstones (6649, 7084), saddle quern (6631) and other processors (6900, 2139, 2165, 2257, 2067). The whetstones are of typical Roman (Kentish Rag stone) and medieval (Norwegian Ragstone) materials while the general processors were more locally obtained. A neatly broken half saddle quern is made of quartzite.

## 7 MITIGATION: ECOFACT SUMMARIES

### 7.1 Cremated human remains (Appendix 11)

7.1.1 The cremated human bone assemblages comprised a minimum of six individuals, four probably adult and two of unknown age; no sex data were obtained. The material was fully recorded and is summarised in Table 6.

*Table 6: Summary of cremated human bone*

Context	Context type	Period	Weight of human bone (g)	Observations
2013	fill of [2012]	LIA-ERB	7.5	urned
3040	Ditch [3036]	LIA-ERB	1	urned
5067	fill of [5066]	LBA/EIA?	56	urned
5243	fill of [5242]	LBA/EIA?	15	urned
6291	fill of [6289]	ERB	223	contents of cremation urn SF6051
6292	fill of [6289]	ERB	17	?part of above
6295	fill of [6293]	ERB	233	associated with cremation urn SF6054
6298	fill of [6289]	ERB	10	?associated with ancillary vessel SF6052

7.1.2 No pathological lesions were present that could provide any clues as to diseases and/or living conditions in this past community.

7.1.3 The corpses had been cremated at full combustion (probably >700° C due to the predominantly white colour of the bones. Some crushing of the bones may have taken place in order to fit the cremated bones into the urns. The presence of most skeletal elements and small fragments such as dental roots and crowns and phalanges may indicate some care during collection of the remains after the cremation. However, due to the under-representation of many larger fragments it may be that the lack of common elements such as temporal bones, more rib shafts, and the epiphyses of some long bones, suggests that little care was taken during the collection of the remains from the pyre. Further investigation into the context of these cremations as well as data on more cremations from the area will clarify these issues.

### 7.2 Animal bone (Appendix 12)

7.2.1 The animal bone assemblage comprised 1512 re-fitted fragments from securely dated contexts from Junction 8 Northbound and Junction 9. The Junction 8 Northbound

assemblage consisted of 544 fragments from LIA-Roman and medieval contexts, whereas the Junction 9 assemblage consisted of 968 fragments from LIA-Roman contexts. The assemblage was fully recorded using standard methodologies.

7.2.2 Some 301 fragments (19.9%) could be determined to species (see Table 7). The species present included cattle, sheep/goat, pig, horse, cat and fowl. Some indeterminable bird bones were also found.

*Table 7. Identified bones/species in the MOW05 assemblage.*

Species	LIA-Roman	Medieval	TOTAL
Cattle	122	5	127
Sheep/goat	58	5	63
Sheep	1		1
Goat	4		4
Pig	22	12	34
Horse	67	3	70
Cat		1	1
Fowl	1	1	2
Indeterminate bird	5	6	11
Small mammal		1	1
Medium mammal	55	36	91
Large mammal	195	21	216
Indeterminate	727	163	890
<b>Total fragment count</b>	<b>1258</b>	<b>254</b>	<b>1512</b>
Total weight (g)	8675	1634	10309

7.2.3 The medieval bones were overall in good condition, whereas the Late Iron Age and Roman bones varied greatly in preservation. There were little difference in bone preservation between the different sites, suggesting similar soils and refuse disposal habits. Traces of burning and animal gnawing were found on 33 and 14 bones respectively.

7.2.4 Cattle and sheep/goat dominate the LIA-Roman assemblage, whereas pig dominate the medieval assemblage. However, the number of identified bones in the medieval assemblage is low, and therefore any interpretation of their intra-site ratio will be tentative. Age estimation could be carried out on 43 bones and 14 jaws. The majority of animals were found to be sub-adult/adult. Juvenile cattle, sheep/goat and pigs were also present.

7.2.5 Butchery marks were found on seven bones. These marks comprised skinning as well as disarticulation and filleting of long bones and ribs. They occurred on all three major domesticates as well as on horse and cat. Small exostoses, possibly related to



infections and/or muscle trauma, were found on a late Roman horse metatarsal. No other bones in the assemblage displayed pathological conditions.

### **7.3 Charred plant remains (Appendix 13)**

7.3.1 In total 176 samples were collected and assessed for charred plant remains. At the time of assessment final phasing of deposits was not complete; however, it is likely that the majority of deposits studied are of Romano-British date. This report presents the archaeobotanical assessment results for bulk soil samples collected from Areas M and P, The Aubreys South, the Junction 10 Borrow Pit, Junction 8 North and Southbound and Junction 9. The majority of samples came from excavations at Junction 8 Southbound, Junction 8 Northbound and Junction 9 (35, 57 and 24 samples respectively). Samples recommended for further work came exclusively from Junction 8 Northbound and Junction 9.

7.3.2 A total of 57 samples from this area of the excavations were assessed from Junction 8 Northbound. Seven of these samples are suitably rich to merit further analysis (samples 6017, 6018, 6020, 6024, 6052, 6088 and 6089). In addition, there are 6 samples which are borderline for further analysis (samples 6005, 6014, 6027, 6032, 6037 and 6039), but should be analysed if the archaeological context is of particular interest. All of these samples have abundant cereal grain and/or cereal chaff remains and would provide information on crop processing activities on site.

7.3.3 Twenty-four samples from Junction 9 were assessed and 7 samples (2001, 2002, 2024, 2033, 2037, 2038, 102036) have been recommended for further analysis. All of the samples have assemblages dominated by cereal grain and/or cereal chaff and accompanying weed of crop which will provide information on crop processing activities and cultivation conditions when fully analysed.

### **7.4 Charcoal (Appendix 14)**

7.4.1 A total of 101 samples were assessed for charcoal, some of these were looked at in brief, while samples noted by Smith as having mixed assemblages and/or those from key contexts, such as cremation burials, were assessed in full. The preservation of the charcoal was variable, with many samples producing few fragments. The condition was generally good, although the fragments tended to be small in size, with many comminuted pieces.

7.4.2 The most abundant taxon was *Quercus* sp. (oak) which was noted in most samples. There were quite a few samples also dominated by *Fagus* (beech) and *Fraxinus* (ash). Some of the *Fagus* was difficult to distinguish from *Prunus* (cherry, blackthorn etc), which was also present in some samples, and will require full identification. Other provisional identifications include *Alnus/Corylus* (alder/hazel), Salicaceae (willow family), *Prunus* (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc), *Ilex* (holly), *Acer* (maple) and *Ulex/Cytisus* (gorse/broom). Some of the samples were dominated by small diameter roundwood fragments.

## 7.5 Pollen (Appendix 15)

7.5.1 Pollen sequences were examined from four samples from waterhole feature 5078 at Junction 8 Southbound and one sample from ditch feature 6259 at Junction 8 Northbound. Pollen was preserved in all samples although concentrations were low or extremely low and in most cases preservation was poor or extremely poor. As the marker spores *Lycopodium* were preserved in high concentrations and in good condition, the paucity and poor quality of fossil pollen can be attributed to taphonomic conditions rather than any problem with processing. No further work is required.

## 8 SUMMARY OF SIGNIFICANCE AND ASSESSMENT OF POTENTIAL

### 8.1 Summary of the significance of the M1 sites in their regional context

8.1.1 The sites examined in the course of the Junction 6A-10 widening programme make a significant contribution to understanding of the archaeology of the region, although the importance of this contribution varies greatly from period to period.

8.1.2 The earliest material recovered was flintwork of Mesolithic date. Small quantities of this material were present at Junction 9, but none of it occurred in features or deposits that are likely to have been contemporary. Nevertheless the material indicates activity at or very close to Junction 9 in the later Mesolithic period, and as such marks a small addition to the largely river-valley focussed distribution of sites of this date mapped by Holgate (1995, 9, fig. 5).

8.1.3 The prehistoric activity represented by later Neolithic-Bronze Age flintwork may be more significant in regional terms. Such material occurred at both Junction 8 sites, at

Area M and, most particularly, at Junction 9. At this last site flints were not only very numerous, but their distribution was relatively restricted, being confined largely to the central part of the site, and was associated with a relatively dense concentration of pits and postholes. While at least one potential alignment could be discerned amongst the latter, its interpretation was uncertain. The postholes may have belonged to features such as fence lines rather than to roofed structures. The spatial arrangement of features in one part of the site did, however, suggest the possibility that they respected the position of a circular structure. Cut features of linear character were apparently absent; although their presence would not necessarily be expected, even as late as the middle Bronze Age. Another characteristic of the pit and posthole assemblages was the almost total absence of associated pottery. No significant environmental material was recovered from these features either. These characteristics make the interpretation of the prehistoric phase of Site 9 rather problematic, a problem exacerbated by the lack of precision in dating of the largely undiagnostic flint assemblage. Similar problems beset understanding of the prehistoric phase(s) at Junction 8. At Junction 8 Southbound one small group of pits may have been contemporary with the flintwork which they contained, but generally this material seemed to occur in features assigned on the basis of (admittedly limited) ceramic evidence to the late Bronze Age/early Iron Age. Only at The Aubreys was a tiny handful of sherds assigned (rather tentatively) an earlier date (perhaps late Neolithic) on the basis of their coarse flint-tempered fabric. It is not clear if these sherds dated the features with which they were associated (the more southerly of two groups of pits/hollows), but no other finds came from either group of pits/hollows.

- 8.1.4 The majority of the small assemblage of late prehistoric pottery from the project is dated to the late Bronze Age/early Iron Age although, as with the flintwork, closely diagnostic characteristics are in short supply. Flint-tempered fabrics are typical of the period, being succeeded slightly later by sand- and/or sand and flint-tempered or sand and organic-tempered fabrics. The main concentrations of such pottery were at Junction 8 Southbound and the fairly closely adjacent Buncefield depot, north of Junction 8 Northbound, recorded in the watching brief. As with the late Neolithic/Bronze Age flint, the feature associations seem to have been mostly with pits and possible postholes; certainly these produced the only significant individual assemblages. The character of activity of this period is therefore uncertain, but was apparently not particularly intensive. At Junction 8 Southbound it may have included the placing of unurned cremation burials, three of which were found, but the date of these remains to be established.

- 8.1.5 Recently published work at nearby Buncefield Lane (McDonald 2003) suggests a broadly similar scenario of discrete features, including components of several possible fencelines, while at Gadebridge Road, Hemel Hempstead, 5 km due west of Junction 8, late Bronze Age to early Iron Age activity was more varied and included a range of structures, although the landscape was still essentially open - ie not clearly divided into ditched units; the dating evidence for the few linear features possibly of this date was poor (Last 2000). Late Bronze Age-early Iron Age sites were also examined on the A41 Hemel Hempstead Bypass at Apsley and Rucklers Lane, the latter site again producing structural evidence (*ibid.*, 4). The sites in the vicinity of Junction 8 can thus begin to be set in their local context, suggesting that they form part of a pattern of exploitation of topographies and soils more wide-ranging than would have been thought likely until relatively recently.
- 8.1.6 Evidence for settlement or other activity of middle Iron Age date remains scarce in the region (eg Bryant 1995, 21-22). The fragmentary evidence from the M1 widening project is consistent with this picture, which lends some support to the idea that this area was genuinely one of low level activity at this time (eg Hill 2002, 255-6; 2007, 24). The present project added little to understanding of the one major feature potentially of this period, The Aubreys 'hillfort'. The principal outer ditch produced no dating material (or samples suitable for radiocarbon dating). Two groups of features outside the outer ditch were extremely poorly dated, and the minimal pottery, from two features in one of these pit clusters may have been of late Neolithic date (see above). The character and particularly the chronology of this site remain 'enigmatic' (Bryant 1995, 24).
- 8.1.7 In line with a widely observed pattern in the region, it is in the late Iron Age and into the early Roman period that evidence for landscape organisation and associated settlement becomes widespread. Such evidence was recovered consistently from all of the main M1 sites. Their chronology is based entirely on the pottery, which typically included material assigned to a late Iron Age/early Roman date bracket. Only in Area P was pottery of this period poorly represented (although it was present), to the extent that it is possible that the examined features were entirely post-conquest in origin. At sites Junction 8 Southbound, Junction 8 Northbound, Area M and Junction 9, therefore, occupation sequences started in the late Iron Age.
- 8.1.8 Commonly recurring features were trackways and other ditched boundaries. The former were encountered at Junction 8 Northbound, Area M, Area P and Junction 9.

Their alignments appeared to reflect the variety of topographical settings - broadly plateau (Junction 8 Northbound and Area P) and valley side (Area M and Junction 9) occupied by these sites. At Junction 9 two trackways lay approximately parallel, some 155-160 m apart. It is impossible to be certain that these were anything more than very local features, but the overall appearance of the Junction 9 features suggests an ordered landscape, divided by tracks having, in places, fields and other enclosures laid out in relation to them. It is notable that the projected alignment of the more westerly trackway (trackway 1) at Junction 9 would have passed close to the watching brief area some 400-500 m south on the south-west side of the junction, reported alongside the evaluation there (OA 2006c, fig. 12). Although the trackway itself was not seen, ditch alignments recorded in the watching brief would have been perpendicular to its alignment, suggesting that the regular layout was quite extensive. The dating evidence suggests that this process was initiated in the late Iron Age and was therefore a primary and fundamental characteristic of what might be termed a 'new landscape order'.

- 8.1.9 Quantities of pottery and other finds indicated the existence of domestic activity, but definite structural evidence was elusive, although one possible building, comprising a beamslot and a group of postholes, was located at Junction 8 Northbound. Whether this general absence indicates that structures lay adjacent to but not within the excavated areas, or that structures had been present but were not identifiable - either because of truncation or the use of ground based construction techniques such as mass walling (eg cob) or timber framing on sill beams - is not clear. While evidence for a variety of construction techniques has been recovered at sites such as Gorhambury (Neal *et al.* 1990), the centre of a villa estate, there remains a dearth of evidence for lower status rural settlements in the area. Hunn (1995, 80) proposed a five tier settlement hierarchy with villas and religious sites at the top, but he recorded effectively no evidence for the two lowest levels ('lesser Romanised farmsteads' and 'native sites') of this hierarchy (*ibid.*, 83-4), nor is it clear how they would be distinguished without extremely large and detailed datasets.
- 8.1.10 The present sites provide some of the necessary evidence for these categories but without providing any significant information on their domestic component. Their principal emphasis was presumably agricultural, an activity represented by 'corn-drying' ovens at Junction 9 and Junction 8 Northbound, the former of keyhole shape and the latter of the more familiar T-shaped plan. Both were of early Roman date and both were associated with cereal remains, principally of spelt wheat. Evidence for the

conversion of grain to flour was most commonly encountered at Junction 8 Northbound, where the majority of quernstone fragments were recovered. At Junction 9, however, flakes of Hertfordshire puddingstone indicated the production of artefacts, presumably querns, at this site. Such evidence is believed to be unique and is certainly of major regional importance. Although other craft activities - presumably carried out within an agricultural context - were poorly represented, the great majority of the limited evidence for iron smithing was also recovered from Junction 9.

- 8.1.11 Variations in the distribution of artefact types may shed some light on distinctions between the two main Roman settlement areas. It is notable that Junction 9 produced more copper alloy objects than Junction 8 Northbound, and effectively all the Roman glass from the project, this material being absent at Junction 8 Northbound. Patterns of artefact use can be compared with those across the area, although the present assemblages are very small since most of the immediate comparative material derives from villa sites. Comparison with a wider regional study (Carr 2006) may be of particular value in setting these assemblages in their regional context.
- 8.1.12 A slightly unusual component of the Junction 8 Northbound plan was the western part of a rectangular double ditched enclosure encountered at the south end of the Roman settlement area. This has some morphological similarity with temple or shrine enclosures, but the area lying within the excavated area is too limited in extent for interpretation to be certain. The existence of such a feature in an apparently lower status rural settlement context would not be readily paralleled, and obviously contrasts with the formal structures in and immediately adjacent to Verulamium, on the one hand (eg Niblett 1999, 65-72; 2005, 90-99), and the temple mausoleum complex at Wood Lane End, only *c* 1.5 km to the west (Neal 1984), on the other. No significant artefactual material was associated with the Junction 8 enclosure, and the T-shaped corndrier mentioned above lay just inside the inner ditch. On balance, therefore, a secular (and possibly agricultural) functional interpretation is preferred at present.
- 8.1.13 The majority of the 'Roman' features at all the main sites belong to the 1st and 2nd centuries AD. At both Junction 8 Northbound and Junction 9 the occupation sequences extend well into the 2nd century if not a little later, a phase that has been labelled Middle Roman. Many of the ditches at Junction 8 Northbound, for example, were filling up in the later 2nd century. The numbers of features specifically assigned to a late Roman phase (ie *c* AD 240-400, based largely on pottery dating), however,

were quite small. At Junction 9 late Roman activity comprised one possible small enclosure and the upper fills of an adjacent well, while at Junction 8 Northbound it consisted of a single pit. At both sites the relevant features produced quite substantial finds assemblages, suggesting that domestic activity was still located in the near vicinity of the features concerned although, as in the earlier periods, there is no indication of its precise location or physical form. It is unclear, therefore, if the evidence should be taken at face value to indicate an overall reduction in the level of occupation in the area in the late Roman period, or if, as is perhaps more likely, it simply means that the foci of such occupation had shifted slightly by this time.

8.1.14 At present there is insufficient evidence from sites of broadly comparable character in the region to allow inferences to be drawn about the changing character of the landscape in the late Roman period. It is possible that the main period of change was the early 2nd century, and this in turn may correlate with more widespread changes in the landscape perhaps related to changes in patterns of land tenure. The extent to which the hinterland of Verulamium was formed exclusively of a number of substantial villa based (or perhaps, in some cases, town-based) estates remains uncertain, but this question may underlie the changes that can be observed. Hunn (1995b, 89-90) sees the radical decline of the villa system in the Verulamium area in the mid 4th century as a key development in local landscape history. The evidence from the M1 sites, in contrast, suggests that the 2nd century was a key period of change in this area. The limited 4th century evidence from both Junction 8 Northbound and Junction 9, however, parallels that from the villas in not suggesting any meaningful continuation of activity into the second half of the 4th century.

8.1.15 There is no evidence from any part of the project area for activity of early post-Roman date. Significant medieval activity was encountered only at one location, in the northern part of Junction 8 Northbound. Here, however, there was a potentially important element of long-term landscape continuity, in that the medieval agricultural enclosure was laid out alongside, and clearly related to, an ENE-WSW aligned trackway which was certainly of Roman origin. Even if not in regular use the location of the trackway, at least, must have been recognised for a millennium, through the late Roman period and beyond, up to the time when its alignment formed the basis for the medieval agricultural enclosure. This situation may be broadly comparable to that at Gorhambury, where boundaries originally associated with the villa were still respected and/or redefined in the 11th-12th century (Neal *et al.* 1990, 83).

- 8.1.16 The medieval settlement, presumably a farmstead, was defined by a rectilinear enclosure ditch of which only the eastern part lay within the excavated area. It was of more than one phase, but activity was firmly centred in the period from the late 12th-13th centuries. The most important feature was a substantial timber building, and further features on similar alignments may have represented additional structures. As the extent of the enclosure beyond the western limit of the site is unknown, it is impossible to be certain whether the main excavated structure represents the principal residential building. The building form, long and narrow with probable entrances at the mid points of the long sides, might suggest a barn, and no internal features such as hearths were identified. On this basis it is possible that the main domestic building lay outside the excavated area to the west. Another significant feature within the enclosure was a lime kiln located at its south east corner. The proximity of this kiln to the earlier trackway suggests that its principal function was the provision of lime for the fields rather than for building. The almost complete absence of medieval tile from the site suggests that the buildings were roofed with thatch or shingles.
- 8.1.17 The site represents the only significant part of a medieval farmstead excavated in recent times in the St Albans area. Hunn's reconstruction of this landscape (eg Hunn 1995a) is based almost entirely upon documentary sources and field survey, because of the dearth of excavated evidence. The Junction 8 Northbound farmstead, albeit only partly revealed, constitutes an important addition to understanding the character of medieval settlement in the region, the more so because it can be correlated with the already well-studied historical background.

## **8.2 Assessment of potential: stratigraphic sequence**

- 8.2.1 The assessment has demonstrated that there is sufficient stratigraphy to elucidate major reorganisations of the landscape. Where clear relationships were absent or poorly defined, the spatial arrangements of features and dating evidence allowed for isolated areas of stratigraphy to be incorporated into the overall phasing scheme.
- 8.2.2 At Junction 9 flints of late Neolithic-Bronze Age date are very numerous and potentially indicate the existence of contemporary features, although this remains to be established. Elsewhere the Neolithic and Bronze Age evidence is largely residual and none of the small number of features assigned to this phase have any stratigraphic relationships with other archaeological features. However, the nature of the evidence should still allow the question of settlement or casual use of the landscape to be



addressed. Evidence for late Bronze Age/early Iron Age activity is more robust at Junction 8 Southbound. However, there are still few stratigraphic relationships and it may not be possible to refine the chronology using the stratigraphy.

8.2.3 The late Iron Age and Roman enclosures can be classified into a coherent sequence and there is the potential to provide a detailed picture of the evolving enclosure system, over the late Iron Age and early to middle Roman period. The medieval archaeology from Junction 8 Northbound was relatively well preserved and has the potential to answer questions on the place of the medieval settlement in the wider landscape and the development of the building.

8.2.4 In general the stratigraphy has good potential to answer the questions posed by the research aims or provide the basis to do so.

### 8.3 Assessment of potential: artefacts

#### *Flintwork*

8.3.1 Mesolithic material forms a small proportion of the overall flintwork assemblage, but with the use of detailed context and phasing information it may be possible to further isolate this material as being derived from a separate flint industry. The majority of the assemblage is technologically later prehistoric (later Neolithic and Bronze Age) in date. The presence of rejuvenation flakes, chips and irregular waste, and the relatively low number of larger flakes and tools, suggest that much of the assemblage is knapping waste as opposed to a domestic assemblage. Technological and metrical analysis on appropriate contexts (as determined by more detailed context information) will help to confirm this and prove a useful tool when compared to other known sites where knapping waste predominates. Clarification of these aspects is critical to understanding the numerous features, particularly at Junction 9, which contain this material.

#### *Prehistoric pottery*

8.3.2 The prehistoric pottery assemblages from these sites are small and poorly preserved. Nevertheless, given the scarcity of contemporary assemblages elsewhere in Hertfordshire south of the Chiltern ridge, the material from Buncefield Depot, Junction 8 Southbound, Junction 8 Northbound and Junction 9 does have potential to further our understanding of local ceramic development from the late Bronze Age to the middle Iron Age. The assemblage from Buncefield Depot is of particular interest as it includes a number of distinctive early Iron Age vessel forms. The significance of

this group would be enhanced if one or more radiocarbon dates could be obtained on associated material. In addition, investigation of the spatial distribution and context of the pottery from the Junction 8 sites and Buncefield Depot may shed light on practices of ceramic deposition during later prehistory.

### *Late Iron Age-Roman pottery*

8.3.3 Despite the poor condition of some of the late Iron Age and Roman pottery, the assemblage has good potential for further study. There are a number of good groups with reasonably well preserved datable, diagnostic material that can provide a chronological framework for the development of the sites. Additionally, the assemblage can provide good evidence for pottery supply to the sites and has the potential to increase our understanding of supply to the wider region. It therefore has potential to shed light on site economy and trading connections (Willis 2004, 2). The chronological emphasis of all the assemblages is late Iron Age and early to middle Roman and the assemblage therefore has the potential to inform on the late Iron Age to Roman transition, both in ceramic terms and as a wider research issue. A brief assessment of the relative quantities of different vessel classes within the assemblage as a whole suggests that jars are the dominant vessel class. As well as being a feature of early assemblages (Evans 2001, 28), the predominance of jars has been shown to be a feature of assemblages from rural sites (*ibid.*). The assemblage therefore has the potential to inform about site status and the role of the sites within the Roman settlement network; as well as the depth of integration of the sites into the Roman economy (Willis 2004, 11). The functional composition of funerary assemblages has been shown to adopt a different pattern to that of domestic assemblages, reflecting the deliberate choice of vessels according to perceived social status (Biddulph 2005) and the presence of pottery from graves within the assemblage therefore offers the potential address issues of social practice in relation to funerary ritual. The assemblage also has the potential to address issues of Romanisation and identity through functional analysis of vessel class. Analysis of the spatial distribution of the pottery may identify functional areas within sites and differences in function and/or status between the different sites. It may also shed light on practices of structured deposition.

### *Medieval pottery*

8.3.4 While not the best-preserved of medieval pottery assemblages this group does, however, have reasonably good potential for further study and to address a number of issues. Most obviously the pottery provides a dating framework for the site. It may be possible to refine this somewhat during the course of further research. Spatial analysis of forms/fabrics might also shed light on the development of the site and possibly highlight areas of functional or social difference such as cooking areas. The range of pottery forms present also provides information about some of the daily concerns of the inhabitants of the site, such as cooking/food preparation and storage in the case of jars and serving of liquids in the case of jugs. The notably low proportion of wide bowls, or definite bowls of any sort, might reflect on the economy of the site as wide bowls have been linked on other rural medieval sites to dairying practices, so their absence from this site requires some explanation. The geographic sources of the pottery also reflect on the needs and economy of the site's occupants. Most of the pottery needs of the site were easily supplied by relatively local south Hertfordshire sources, particularly in the case of coarse wares/cooking wares. It may be possible to suggest which south Hertfordshire kilns were supplying the site by comparing forms and fabrics against published and unpublished collections including reference collections such as those in London. Table wares such as glazed jugs were drawn from wider regional sources, even as far as Stamford in Lincolnshire, and, in the case of the possible exotic import, perhaps from even further afield.

#### *Ceramic building material*

8.3.5 The dominance of brick and any flat forms that could be used in a similar manner reflects the use of such material in small structures such as ovens, hearths, corndriers and kilns, which is the common pattern on rural agricultural settlements. Such use is attested by the extensive evidence of burning and re-firing on the material from all excavation areas.

8.3.6 The assemblage of the tile and the fired clay has the potential to provide information on the construction of such structures. Additionally this re-use of brick and tile in secondary structures can also provide information on the source of such material and the relationship of the settlement to a higher status site or sites, such as a villa, from which it would have been obtained. The proportion of fabrics at the different settlements may provide a spatial pattern on the supply areas of different producers.

8.3.7 The medieval tile assemblage, though small, does indicate that roofing tile was used in limited quantity or was very thoroughly removed for reuse elsewhere, when the building went out of use. It was also noted that a number of large groups of Roman

tile were found in medieval features on the Junction 8 Northbound site, and this may indicate the reuse of Roman brick in the medieval phase. The absence of medieval material from these features is noteworthy.

#### *Metal objects (including coins) and glass*

8.3.8 The metalwork and glass assemblages from the M1 widening have very limited group value and limited potential for detailed analysis. Nevertheless, the metalwork assemblages from Junction 9 and Junction 8 are of some value for shedding light on aspects of personal adornment on late Iron Age-early Roman sites in a relatively well-studied region. The coins are of significance for dating purposes, but insufficient in number for further comparative analysis: The only significant group of glass is from Junction 9. In conjunction with the metalwork it can be used as an indicator of site status, when compared with the absence of similar material from Junction 8 Northbound.

#### *Metalworking debris*

8.3.9 The potential of the metalworking debris is limited, but it is significant in providing evidence for smithing activity at Junction 9 and therefore underlining another distinction between this site and Junction 8 Northbound. More detailed examination of the context of the slag and related material may allow further characterisation of zones of activity within the Junction 9 site.

### **8.4 Assessment of potential: human remains and ecofacts**

#### *Human remains*

8.4.1 The human remains have some potential to provide information about the relationship of funerary to other activity in two main periods. The unurned cremation burials from Junction 8 Southbound need to be dated in order to establish their relationship with possibly contemporary features of late Bronze Age-early Iron Age date. The location of Roman burials from Junction 8 Northbound and Junction 9 can be compared with that of contemporary settlement features and with other local evidence for rural burial practices. The evidence for cremated human remains recovered during evaluation in these areas (OA 2006d, 98-101) will also be taken into account in this context, as will the evidence of unburnt bone, consisting solely of part of an adult skull recovered from evaluation trench 1122 in the area of the Junction 8 Northbound excavation. The burials have no potential to provide further information on age and sex of the deceased.

### ***Animal bone***

8.4.2 While the assemblage is rather small, it does have potential to add to our knowledge on diet and animal husbandry in both late Iron Age-Roman and medieval Hertfordshire. This is particularly in view of the lack of evidence for lower status rural settlement in the area in the former period and the complete lack of rural settlement evidence in the latter period. The analysis and discussion would include inter-site comparisons with nearby sites such as the town of St Albans (*Verulamium*) and the villa at Gorhambury (Locker 1990; 1999). More detailed intra-and inter-site analysis of the LIA-Roman assemblage has the potential to yield information on species preferences, which, in combination with botanical analysis, might suggest landscape and/or animal husbandry changes.

### ***Charred plant remains***

8.4.3 A number of samples are recommended for full analysis; all are rich in cereal grain and/or cereal chaff. It is likely that their analysis will provide insight into the range of cereal crop processing activities on site and the use of crop processing by-products. In addition, accompanying weeds of crop in the samples will provide insight into cultivation conditions and possibly issues such as season of harvest or crop harvesting height.

8.4.4 The English Heritage Environmental Archaeology Bibliography ([http://ads.ahds.ac.uk/catalogue/resources.html?eab\\_eh\\_2004](http://ads.ahds.ac.uk/catalogue/resources.html?eab_eh_2004)) lists only 9 sites with published archaeobotanical results from Hertfordshire. Although more recent work and grey literature is likely to add to this data, the limited archaeobotanical evidence from Iron Age, Roman and medieval periods in Hertfordshire means that the data generated from archaeobotanical analysis of these M1 Widening samples will greatly add to our present knowledge in the county and are, therefore, of regional importance. Romano-British results will be obviously comparable to those from Gorhambury, St Albans (Wainwright 1990); Folly Lane, St. Albans (Murphy 1995) and Boxfield Farm, Stevenage (Murphy 1990).

### ***Charcoal***

8.4.5 The samples from the M1 were a mixture of those dominated by oak and those with diverse assemblages. The majority of the former would only merit further analysis if the phasing or feature were particularly interesting. Overall, however, the charcoal

offers the opportunity to examine the fuel use of specific activities in a range of feature types.

- 8.4.6 Further analysis of all the cremation-related deposits will examine the use of a single species for ritual purposes, any temporal changes and whether ritual fuel use differs from domestic use.
- 8.4.7 Hearths/kilns have good potential for charcoal analysis, since the remains can usually be ascribed to specific activities. Two kiln deposits from Junction 9 (2721, 2725) and one from Junction 8 (6591) produced quite diverse assemblages which are worth investigating. The hearth deposits from Junction 8 (contexts 6753, 7367, 7366), in contrast, are dominated by oak and one by beech/cherry (5160), so at least some of these should be fully analysed.
- 8.4.8 Material from pits/waterholes, ditches and postholes is generally of lower potential but a number of these features from across the road scheme produced good charcoal remains, mostly mixed assemblages which will provide useful information when considered alongside the material from more functionally-specific feature types.

### ***Pollen***

- 8.4.9 The pollen has no potential for further work

## **8.5 Summary**

- 8.5.1 The results of the excavations at Junction 8 Northbound and Junction 9, and to a lesser extent those at Junction 8 Southbound, can add significantly to understanding of a number of important aspects of the archaeology of the region, in particular the nature of activity in the late Neolithic and early Bronze Age and the character of rural settlement in the late Iron Age-Roman period and in the medieval period. There is potential also to add to knowledge of the late Bronze Age-early Iron Age settlement pattern and the relationship of funerary and other activities. A number of the minor sites add to the broader picture of development of the landscape, most particularly in the late Iron Age and Roman periods. A key aspect of all these areas of research is the integration of stratigraphic and structural evidence with that of artefacts and environmental material. On this basis a programme of further, more detailed work leading to publication of the most significant results of the project is proposed.

## 9 FURTHER WORK

9.1.1 The proposed programme of further work is designed to address a number of specific questions which have been identified on the basis of the intrinsic character of the excavated sites and in relation to currently perceived regional research questions (eg Brown and Glazebrook 2000). These are set out below, along with an outline of the approaches that will be adopted in order to address the questions.

### 9.2 Specific research aims of the proposed post-excavation programme

9.2.1 The following section sets out specific research aims for the publication phase of the post-excavation program, based on the regional and national research frameworks cited above (see summary). These are set out by period.

9.2.2 *Late Neolithic and early Bronze Age Aim 1: Understanding the late Neolithic and early Bronze Age settlement pattern*

9.2.3 *What can the M1 widening excavations tell us about the character of late Neolithic and early Bronze Age activity. Was the area used for settlement during this period, or were people simply moving through the landscape and stopping to make use of natural resources, including manufacturing flint tools as they went.*

9.2.4 This subject will largely be addressed by the flint assemblage, in particular its composition in terms of tool types. Further examination of the assemblages from the four pits from junction 8 southbound, which have been provisionally identified as late Neolithic/early Bronze Age will be necessary, in order to determine whether these assemblages were residual.

9.2.5 *Late Bronze Age to early Iron Age Aim 1: Understanding the range and density of Late Bronze Age settlement throughout the region*

9.2.6 *Do the two groups of pits and postholes from Junction 8 southbound represent late Bronze Age settlement?*

9.2.7 The answer to this question will largely come from an examination of the finds assemblages from the pits, with the aim of determining whether the material represents domestic activity. Further examination of the ceramic material may be able to refine the dating and give a more secure late Bronze Age date to the activity.

- 9.2.8 *Are the two four-post structures from the south of the Junction 8 excavation area late Bronze Age or early Iron Age in date and do they relate to the scatters of pits to their north?*
- 9.2.9 A further examination of the pottery from these features may be able to address the chronological part of this question and further examination of the finds assemblages generally, may indicate whether or not they are related to the features to their north
- 9.2.10 **Late Bronze Age to early Iron Age Aim 2: Refining chronology**
- 9.2.11 *Can the pottery assemblage from Junction 8 southbound shed any light on regional chronology during the late Bronze Age and early iron Age?*
- 9.2.12 This question can be addressed through further study of the late Bronze Age to early Iron Age pottery assemblage.
- 9.2.13 **Late Bronze Age to early Iron Age Aim 3: Characterising the development of the agrarian economy**
- 9.2.14 *What can the crop assemblage from Junction 8 Southbound tell us about the agrarian economy of any late Bronze Age to early Iron Age settlement?*
- 9.2.15 This question can be addressed primarily through further study of the charred plant assemblage, although refinement of the stratigraphic sequence may help to identify groups of material which are of particular use for this purpose.
- 9.2.16 *Were the four post structures in the southern part of the Junction 8 excavation area used for crop storage?*
- 9.2.17 This question can only be addressed through the examination of crop assemblages from the posthole fills.
- 9.2.18 **Late Bronze Age to early Iron Age Aim 4: Defining the Bronze Age/Iron Age transition**
- 9.2.19 *Does the presence of late Bronze Age/early Iron Age activity represent true continuity of settlement and economy from Bronze Age to Iron Age, or is it an artefact of poor chronological resolution?*



- 9.2.20 This question can be addressed through further comparative study of the pottery assemblage.
- 9.2.21 *Is there any evidence for major changes in activity at Junction 8 Southbound during this period?*
- 9.2.22 Further analysis of the stratigraphy has some potential to provide answers to this question.
- 9.2.23 **Late Bronze Age to early Iron Age Aim 5:** Establishing patterns of burial practice in the 1st millennium BC
- 9.2.24 *Are the unurned cremation burials from Junction 8 southbound late Bronze Age in date? Do they relate to any settlement activity?*
- 9.2.25 A program of radiocarbon dating on bone from each of the three cremations should help to elucidate this issue.
- 9.2.26 **Late Iron Age Aim 1:** Identifying processes of economic and social change and development during the late Iron Age
- 9.2.27 *What is the nature of late Iron Age activity at Junction 8 northbound, Area M and Junction 9? Does it represent new settlement, or agricultural activity peripheral to settlement. In either case what can it tell us about economic and social change in this period*
- 9.2.28 A full analysis of the stratigraphy of the late Iron Age and Roman activity from the above sites, combined with analysis of the finds from the fills of the pits and ditches should elucidate these questions.
- 9.2.29 **Roman Aim 1:** Defining the Iron Age/Roman transition
- 9.2.30 *To what extent do the pattern of Roman enclosures from Junction 8 Northbound and Junction 9 show continuity with the late Iron Age activity?*
- 9.2.31 Analysis of the stratigraphic sequence combined with analysis of the spatial relationships of the late Iron Age and Roman features to one another should provide answers to these questions.

9.2.32 **Roman Aim 2: Characterising rural settlements, society and agricultural production**

9.2.33 *Were the Roman enclosures from Junction 8 Northbound, Junction 9 and Area M related to settlement, or primarily agricultural in function?*

9.2.34 This can be addressed through further examination of the stratigraphic sequence in combination with detailed consideration of the associated artefactual and environmental evidence.

9.2.35 *Why were the Roman enclosures at Junction 8 Northbound abandoned in the late 2nd or early 3rd century? Is this associated with a wider reorganisation of the agricultural landscape?*

9.2.36 Answering this question will entail placing the evidence from the M1 Widening into its wider landscape setting, through an examination of the literature on that landscape.

9.2.37 **Roman Aim 3: Defining aspects of ritual and religion**

9.2.38 *Was the double ditched enclosure at the southern end of Junction 8 Northbound a shrine or merely an agricultural/settlement enclosure?*

9.2.39 This question may be answered through an examination of the finds assemblage from the ditch fills, although given that a substantial proportion of the enclosure lies beyond the limit of excavation the answer may not be definitive. Attention will be given not only to the types and range of material but also to taphonomic characteristics in comparison with those of other features.

9.2.40 **Roman Aim 4: Defining status and identity**

9.2.41 *What evidence is there that can be used to address the question of the status and identity of the inhabitants/users of the excavated sites?*

9.2.42 This question can be addressed in part by consideration of the structural evidence, but principally in relation to artefactual material, through comparative studies of small finds and pottery with those of other Roman settlements in the region and recent work specifically on development of identity in this region and period (Carr 2006). The ecofactual material will also be relevant in terms of identification of (for example) atypical plant remains which may have particular interpretative value.

**9.2.43 Roman Aim 5: Understanding the settlements in their wider regional context****9.2.44** *What was the role of the M1 sites within the wider landscape?*

9.2.45 This question can be addressed based on the characterisation of the site achieved through consideration of Aims 1-4 above. The evidence for the M1 sites will need to be set against that for other sites in the area, with particular reference to the pattern of villas and to the influence on the wider region of the town of Verulamium (eg Niblett and Thompson 2005), its requirements in terms of consumption and aspects of related infrastructure, such as Watling Street.

**9.2.46 Medieval Aim 1: Characterisation of rural settlement forms and functions****9.2.47** *Can the 12th to 13th century farmstead from Junction 8 Northbound be related to the known medieval settlement pattern?*

9.2.48 This question can be addressed by comparison of evidence for the site layout and other characteristics with the published work on the region by Hunn.

**9.2.49** *Can the 12th to 13th century building from Junction 8 Northbound shed any light on the development of vernacular architecture in the region?*

9.2.50 This question can be addressed by reference to work by Hunn, but view of a dearth of local evidence is more likely to require consideration at wider, regional level in terms of structural comparanda.

**9.2.51 Medieval Aim 2: Characterising agricultural production****9.2.52** *Do the medieval features from Junction 8 Northbound relate to any specific agricultural or craft function*

9.2.53 Answering this question will require analysis of the stratigraphic and spatial relationships of the features, combined with analysis of the finds and ecofactual assemblages from the ditch, pit and posthole fills and plotting of the spatial distribution of the finds.

**9.3 Further analysis**

- 9.3.1 Stratigraphic sequences have so far only been examined in outline. While the broad sequences presented above are believed to be correct, further work is required both to establish this with certainty and also to refine understanding of detailed sequences and provide better characterisation of the components features and structures of the excavated sites. Provisional assignment of features to stratigraphic groups and provisional matrices will require detailed checking. Feature group and phase data will be added to the context database to facilitate phase comparisons across all sites (particularly for the late Iron Age and Roman periods) and to provide finds and environmental specialists with the reliable data necessary for their analyses.
- 9.3.2 The material in most of the significant finds categories has already been fully recorded, although in the case of Roman and medieval pottery, for example, some work is required to integrate project specific fabric codes with schemes of coding more appropriate for the region. Only in the case of the worked stone is basic recording of the material now required. For all finds categories, however, some further analysis is required, mostly in relation to the contexts from which the material derives, once refinement of the site phasing has been completed. In connection with the latter further work on the pottery is required, and this will be closely integrated with ongoing work on stratigraphic sequences.
- 9.3.3 Refinement of chronological sequences will also involve the use of radiocarbon dating. This will be applied in two main areas of prehistory. At Junction 9 a substantial group of pits and postholes is dated only by its association with struck flint assigned to a rather loosely-defined late Neolithic-Bronze Age date range. At present it is uncertain if the flint truly dates the features with which it is associated, or if some or even a substantial part of the assemblage could be redeposited in features of later date. In order to understand the nature of activity in this part of Junction 9 it is very important that independent dating be obtained. For the late Bronze Age-early Iron Age period dates will be sought for the potential late Bronze Age cremation burials from Junction 8 Southbound, where it is important to establish if these features are indeed contemporary with other likely activity of this period, and it also be important to obtain dates for the feature from Buncefield Depot containing pottery assigned on stylistic criteria to the late Bronze Age-early Iron Age.
- 9.3.4 With regard to environmental remains more basic recording work remains to be undertaken on charred plant and charcoal samples (the animal bone assemblage has been fully recorded) before analysis can be undertaken. Here it is particularly critical

that the context assemblages which have been identified in the assessment as being preferred for analysis are well understood and dated as far as is possible.

9.3.5 The specific tasks identified as being necessary to achieve the stated aims are set out in the Task List below. Further detail on some of the specific approaches can be found in the specialist reports in the Appendices below.

9.3.6 The identified tasks will be carried out by the staff named in the list below or by individuals of equivalent experience. Most of the specialists involved are OA staff members. External specialists are identified in the task list by an asterisk.

#### 9.4 Report

9.4.1 It is proposed that the results of the M1 widening work be published in a report of relatively traditional printed format. This is felt to offer the most cost-effective means of disseminating the results of the project and can, of course, be complemented by other more popular forms of dissemination as appropriate, using information generated by the formal post-excavation analysis process. The proposed publication format is an A4 monograph in the well-established OA style of such publications.

9.4.2 It is proposed that the format of the report will follow broadly that of the present assessment. That is to say that after the usual introductory sections the site narratives will be presented in sequence, making reference to details of the artefactual and environmental record as appropriate. These sections will be followed by the specialist artefact and environmental reports, each covering all the sites which produced relevant material. An overall discussion will integrate site stratigraphic and specialist data on a period by period basis across the whole project area, and will discuss the evidence for each period in its local and wider regional context, highlighting those aspects of the project which have made particularly significant contributions to knowledge of the archaeology of the region. The very recently published report on the A421 Great Barford Bypass in Bedfordshire (Timby *et al.* 2007) is a good example of this approach.

## Task list

Task	Task Description	Performed by	Days	Rate	Cost
1000	Management				
1001	Project management	P Booth	15	284	4260
1002	Project monitoring	A Smith	1	284	184
1003	Liaise with internal and external specialists	D Stansbie	3	196	588
1004	Finds management	L Allen	1	260	260
1005	Finds administration	R Grant	2	174	348
1006	Archive management	N Scott	2	196	392
1007	Environmental management	R Nicholson	1	260	260
1008	Graphics management	Sarah Lucas	3	196	588
1009	IT Support	P Miles	1	260	260
2000	Stratigraphy and Illustrations				
2001	Context database: checking and revisions	D Stansbie	5	196	980
2002	Complete, check and revise CAD plans	CAD technician	10	174	1740
2003	Grouping and matrices (all sites)	D Stansbie	40	196	7840
2004	Input into phasing and other discussions	P Booth	3	284	852
2005	Descriptive text, main sites	D Stansbie	20	196	3920
2006	Descriptive text, revisions etc, all minor sites	D Stansbie	10	196	1960
2007	Prepare plans/ sections drawing briefs	D Stansbie	10	196	1960
2008	Produce site plans and sections for publication	Illustrator	30	174	5220
2009	Check plans/ figures	D Stansbie	5	196	980
2010	Corrections to illustrations	Illustrator	3	174	522
2011	Co-ordinate C14 samples with environmental dept	D Stansbie	2	196	392
2012	Select photographs	D Stansbie	2	196	392
3000	Finds				
3001	Flint: Recording of material from environmental sample residues	H Lamdin Whymark*	1	220	220
3002	Flint: Analysis based on detailed context and phasing information	H Lamdin Whymark*	2	220	440
3003	Flint: Technological and metrical analysis on appropriate contexts	H Lamdin Whymark*	2	220	440
3004	Flint: Production of the final report	H Lamdin Whymark*	2	220	440
3005	Flint: Preparation of drawing briefs and checking illustrations (c. 5 pieces)	H Lamdin Whymark*	0.5	220	110
3006	Flint: Illustration	Illustrator	1	174	174
3007	Prehistoric pottery: Library research and report writing	L Webley	2	196	392
3008	Prehistoric pottery: Drawing briefs and liaison	L Webley	0.5	196	98
3009	Prehistoric pottery: Illustration	Illustrator	2	174	348
3010	Roman pottery: Assign NRFRC codes	D Stansbie	5	196	980
3011	Roman pottery: Write publication report	D Stansbie	24	196	4704
3012	Roman pottery: Drawing briefs and liaison	D Stansbie	2	196	392
3013	Illustrate pottery	Illustrator	8	174	1392
3014	Medieval Pottery: Consult (MoLAS) reference collection	J Cotter	1	196	196
3015	Medieval pottery: Drawing briefs and liaison and checking	J Cotter	4	196	784
3016	Medieval pottery: Data analysis, checking etc	J Cotter	2	196	392
3017	Medieval pottery: Report	J Cotter	10	196	1960
3018	Medieval pottery: Illustration	Illustrator	10	174	1740
3019	Medieval pottery: Analysis of 'exotic' sherds	Rebecca Bridgeman*			200
3020	CBM: Integrate evaluation data	C Poole	2	196	392
3021	CBM: Research and write report	C Poole	12	196	2352
3022	CBM: Drawing briefs, liaison and checking	C Poole	2	196	392
3023	CBM: Illustration	Illustrator	2	174	348
3024	Coins: Cleaning of 5 Roman coins	D Goodburn-Brown*	1	180	180
3025	Coins: Revised identification and report	P Booth	0.5	235	117.50
3026	Metal objects: Report Junction 9 finds, and note on overall assemblage. Includes preparation of drawing briefs	I Scott	1	196	196
3027	Metal objects: Report Junction 8N finds	I Scott	0.5	196	98
3028	Prepare brief note on objects from Evaluations.	I Scott	0.5	196	98
3029	Illustration (6 objects from Junction 9; 3 objects from Junction 8N 2 objects from Evaluations)	Illustrator	3	174	522
3030	Metalworking residues; Summary report relating material to context	D Stansbie	1	196	196
3031	Glass: Report, discussion, illustration liaison etc:	I Scott	1	196	196
3031	Glass: Illustration	Illustrator	1	174	174
3032	Worked stone: Full recording and publication catalogue	R Shaffrey	2.5	196	490
3033	Worked stone: Lithological analysis	R Shaffrey	3	196	588
3034	Worked stone: Thin section and other expenses				70.00

Task	Task Description	Performed by	Days	Rate	Cost
3035	Worked stone: Report writing, drawing briefs and liaison	R Shaffrey	5	196	980
3036	Worked stone: Illustration	Illustrator	5	174	870
4000	<b>Environmental</b>				
4001	Human remains: Revision of assessment report	N Marquez-Grant	0.5	174	87
4002	Animal bone: Further analysis and report	L Strid	5	196	980
4003	Charred plant remains: Sorting samples	Technician	10.5	131	1375.50
4004	Charred plant remains: Identification and recording	W Smith	10.5	196	2058
4005	Charred plant remains: Report	W Smith	3	196	588
4006	Charcoal analysis and reporting of selected samples	Dana Challinor*	12	165	1980
4007	Radiocarbon dates (notional 10 dates)	Oxford	-	295	2950
5000	<b>Report Assembly, Production and Editing</b>				
5001	Assemble specialist reports	D Stansbie	3	196	588
5002	Library time	D Stansbie	5	196	980
5003	Produce report and discussion	D Stansbie	10	196	1960
5004	Discussion contribution	P Booth	4	284	1136
5005	Illustrations for discussion text	Illustrator	10	174	1740
5006	Edit report	P Booth	10	284	2840
5007	Corrections	D Stansbie	3	196	588
5008	Copy edit	I Scott	10	196	1960
5009	Production and printing				12000
5010	Proof reading	D Stansbie	4	196	784
6000	<b>Archives and Finds Deposition</b>				
6001	Preparation of digital archive	P Miles	4	260	1040
6002	Deposition of digital archive with ADS				2000
6003	Microfilm primary and research archives				400
6004	Assemble and index paper archive	Technician	8	131	1048
6005	Finds deposition	L Allen	1	260	260
6006	Finds deposition: preparation	Rose Grant	5	174	870
6007	Finds deposition: transport	Technician	1	131	131
6008	Licence/copyright fees				150
<b>TOTAL</b>					<b>98,053</b>

\* Indicates external staff

## 9.5 Programme

A draft programme for the post-excavation analysis and reporting is attached. This is based on a start date for work at the beginning of February 2008, with analysis and reporting tasks running over a period of a year and the production phase following immediately thereafter.

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**APPENDIX 1: THE FLINT ASSESSMENT**by *Rebecca Devaney***Introduction**

A total of 4772 pieces of worked flint and 638 fragments (9872 g) of burnt unworked flint were recovered from excavations along the route of the M1 in Hertfordshire (Table A1). In addition, 2000 pieces of worked flint and 141 fragments (5183 g) of burnt unworked flint were recovered from the earlier programme of evaluations and fieldwalking. These have already been reported on and are not mentioned in more detail here. The flint from the excavations was recovered from 294 contexts. Most contexts (a total of 217) contained less than ten pieces of flint; however, 65 contexts contained between 10 and 100 pieces and 12 contexts contained over 100 pieces of flint.

*Table A1. Summary of flint by excavation area and flint category*

Flint Category	Excavation area						Total
	Area M	Area P	Borrow Pit	J8 North	J8 South	J9	
Flake	45	6	2	88	113	3430	3684
Blade		1		3	6	98	108
Blade-like flake				2	3	71	76
Bladelet				4	1	67	72
Core face/edge rejuvenation flake				2	1	5	8
Rejuvenation flake tablet						1	1
Irregular waste	1	1		8	4	104	118
Chip	1			1	6	536	544
Opposed platform blade core						1	1
Single platform flake core	1				1	9	11
Opposed platform flake core						3	3
Multiplatform flake core				2	1	47	50
Keeled/non-discoidal flake core						6	6
Core on a flake						4	4
Unclassifiable/fragmentary core				1	3	19	23
Tested nodule				2		16	18
Microlith						18	18
Chisel arrowhead						1	1
End scraper						7	7
End and side scraper						3	3
Side scraper						2	2
Scraper on a non-flake blank						1	1
Retouched blade						1	1
Retouched flake					1	9	10
Serrated flake						1	1
Unclassifiable retouch						1	1
<b>Total</b>	<b>48</b>	<b>8</b>	<b>2</b>	<b>113</b>	<b>140</b>	<b>4461</b>	<b>4772</b>
Burnt unworked count	3	3		325	155	152	638
Burnt unworked weight (g)	9	14		2972	3550	3327	9872

**Methodology**

The worked flint was catalogued according to a standard typology. Information about burning, breaks, condition, raw material and technology was recorded. In addition, cores were weighed and burnt unworked flint was quantified by count and weight. The data were entered into an MS Access database. Flint recovered from the environmental sample residues was collected, but not recorded at this stage. This material should be studied during the programme of further work and incorporated into the rest of the assemblage.

#### **Raw material**

Where identifiable, the most predominant raw material is gravel flint. In general, these pieces have a thin and abraded cortex and are likely to be locally derived, perhaps sourced from river gravel deposits. A smaller amount of chalk derived flints, which are identified by a thick white cortex, were also present. The sites are situated on chalk bedrock and so this material is also likely to be local in origin.

#### **Condition**

The condition of the assemblage is very good. Of the worked flints, 35% are in a fresh condition and 56% only exhibit slight post-depositional damage. Just 8% are more heavily damaged. Where present, the damage is most frequently seen on vulnerable unretouched edges and implies some post-depositional disturbance. The amount of surface alteration is minimal with the majority of the assemblage (81%) remaining uncorticated. Just nine pieces are iron stained. A total of 37% are broken and 7% are burnt.

#### **Technology and dating**

Unretouched debitage dominates the assemblage (4611 pieces, 97%). Of this total, 3684 pieces are flakes and 256 are blades, blade-like flakes and bladelets. This proportion (6% blades) is very low and suggests that the material dates to the later Neolithic or Bronze Age (Ford 1987, 79, table 2). However, in such a large assemblage from different sites and features, groups of earlier material are likely to be hidden. Technologically, the assemblage is dominated by pieces (mainly flakes) with clear points and cones of percussion, pronounced ventral ripples and hinge terminations. These characteristics are most commonly associated with the hard hammer flint industries of later prehistory. In contrast, a small proportion of the assemblage (mainly blades) exhibit features such as platform edge abrasion, punctiform butts and dorsal blade scars, characteristics known to be associated with the more careful, soft hammer, blade-based industries of the Mesolithic and earlier Neolithic. The presence of rejuvenation flakes, irregular waste and chips suggests the likelihood of knapping. This is supported by the relative dearth of medium to large size flakes, which have probably been removed from the site as blanks for, or as, finished tools and the high proportion of removals which retain dorsal cortex. The number of chips is higher than expected (12% of the debitage) and may be due to the presence of an experienced lithic analyst on the excavation team.

A total of 116 cores (just 2% of the entire assemblage) were recovered. The majority were utilised for the production of flakes. They range in size from a small unclassifiable/fragmentary core of 7 g to a large multiplatform flake core of 339 g. The cores are not in themselves chronologically diagnostic, but technologically all are consistent with later Neolithic and Bronze Age flint working. The exception to this is the opposed platform blade core, which was neatly worked for the production of bladelets. This core may be Mesolithic or earlier Neolithic in date. The relatively high proportion of tested nodules (16% of all cores) supports the suggestion of knapping in the immediate area.

Just 45 retouched tools were recovered, which at 1% of the total assemblage is an unusually low proportion. This figure supports the suggestion that the assemblage is mainly composed of knapping waste and not related to domestic activity. The dominance of microliths is unexpected and not consistent with the predominantly later prehistoric assemblage. Half of the microliths are scalene microtriangles (Jacobi 1978:16, fig. 6, type 7a<sup>2</sup>) and all are types seen in the later Mesolithic. Although all the microliths were recovered from excavations at Junction 9, only one context contained more than one microlith. However, with more detailed context information, it will be possible to answer questions regarding the

features they were recovered from and any spatial patterning. The chisel arrowhead is a small example and can be broadly dated to the later Neolithic (Green 1984:19). The remaining tools are chronologically undiagnostic, but are consistent with the rest of the predominantly later prehistoric assemblage.

#### Discussion and potential

The flint from the M1 suggests activity stretching from the later Mesolithic through to the later Neolithic and Bronze Age. The Mesolithic material comprises the unusually high number of microliths and the relatively small proportion of technologically earlier material. With the use of detailed context and phasing information it may be possible to further isolate this material as being derived from a separate flint industry.

The majority of the assemblage is technologically later prehistoric (later Neolithic and Bronze Age) in date. The presence of rejuvenation flakes, chips and irregular waste, and the relatively low number of larger flakes and tools, suggest that much of the assemblage is knapping waste as opposed to a domestic assemblage. Technological and metrical analysis on appropriate contexts (as determined by more detailed context information) will help to confirm this and prove a useful tool when compared to other known sites where knapping waste predominates.

This assessment report will form the basis of the final report, although some time is required to modify the text and discuss the significance of the material in relation to context and phasing information. A small number of flints (*c* five pieces) should be illustrated in order to characterise the assemblage.

Table A2: Summary of flint by site and context

Excavation Area	Context	Flint category	Total
Area M EX	3005	Flake	3
		Chip	1
	3009	Flake	9
		Burnt unworked flint	1
	3013	Flake	1
		Flake	1
	3017	Flake	1
	3021	Flake	1
	3037	Flake	2
	3038	Burnt unworked flint	1
		Flake	3
	3039	Flake	3
	3040	Single platform flake core	1
		Burnt unworked flint	1
	3051	Flake	19
Unclassifiable waste		1	
Flake		3	
Area P EX	4015	Flake	3
		Unclassifiable waste	1
	4016	Burnt unworked flint	3
	4017	Blade	1
		Flake	2
	4020	Flake	1
Borrow Pit EX	1002	Flake	2
J8 N EX	0	Multi-platform flake core	1
	6002	Bladelet	1
		Bladelike flake	1
		Flake	1
	6014	Flake	2
	6016	Flake	1



Excavation Area	Context	Flint category	Total
	6020	Flake	1
	6022	Burnt unworked flint	2
	6026	Flake	2
	6059	Flake	3
	6061	Flake	2
		Unclassifiable waste	1
	6062	Flake	1
	6071	Burnt unworked flint	1
	6075	Burnt unworked flint	1
	6110	Burnt unworked flint	1
		Flake	2
	6111	Blade	1
		Flake	8
	6115	Bladelet	1
	6123	Flake	1
	6125	Burnt unworked flint	1
		Chip	1
		Flake	2
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	1
	6140	Flake	2
	6151	Core face/edge rejuvenation flake	1
	6165	Flake	1
	6172	Unclassifiable waste	1
	6183	Flake	9
	6187	Burnt unworked flint	1
	6201	Blade	1
	6217	Flake	1
	6240	Flake	2
	6246	Burnt unworked flint	1
	6263	Burnt unworked flint	1
		Flake	1
	6265	Burnt unworked flint	240
	6273	Flake	1
	6340	Unclassifiable waste	1
	6352	Flake	1
	6367	Bladelike flake	1
		Burnt unworked flint	2
		Flake	3
		Multi-platform flake core	1
		Partially-worked nodule	1
	6417	Burnt unworked flint	3
		Core face/edge rejuvenation flake	1
		Flake	3
	6478	Flake	1
	6482	Flake	1
	6565	Burnt unworked flint	1
		Unclassifiable waste	1
	6696	Burnt unworked flint	2
	6703	Burnt unworked flint	4
		Unclassifiable waste	1
	6711	Flake	1
	6749	Burnt unworked flint	2
		Flake	3

Excavation Area	Context	Flint category	Total
	6751	Burnt unworked flint	4
		Flake	1
	6765	Flake	1
	6779	Flake	1
	6781	Burnt unworked flint	3
	6797	Burnt unworked flint	1
	6800	Burnt unworked flint	3
		Flake	5
		Unclassifiable waste	1
	6818	Flake	1
	6820	Burnt unworked flint	4
	6829	Bladelet	1
		Flake	2
	6834	Partially-worked nodule	1
	6867	Flake	1
	6899	Burnt unworked flint	3
	6900	Burnt unworked flint	14
		Flake	1
	6931	Blade	1
	6967	Burnt unworked flint	1
	7011	Flake	1
	7058	Burnt unworked flint	5
		Flake	3
	7064	Burnt unworked flint	2
	7077	Burnt unworked flint	1
	7083	Flake	2
	7085	Flake	2
	7104	Burnt unworked flint	1
	7120	Burnt unworked flint	1
	7121	Burnt unworked flint	5
	7132	Burnt unworked flint	8
	7139	Burnt unworked flint	1
	7141	Burnt unworked flint	1
	7211	Burnt unworked flint	2
		Flake	5
	7234	Bladelet	1
		Flake	1
	7263	Unclassifiable waste	1
	7279	Burnt unworked flint	1
	7300	Flake	2
	7302	Flake	1
	7313	Burnt unworked flint	1
	7316	Flake	1
	7330	Flake	1
J8 S EX	5002	Bladelet	1
		Chip	2
		Core face/edge rejuvenation flake	1
		Flake	18
		Unclassifiable / fragmentary core	1
	5007	Blade	1
	5018	Blade	1
	5019	Flake	1
	5020	Flake	1
	5022	Burnt unworked flint	1

Excavation Area	Context	Flint category	Total
	5026	Bladelike flake	1
		Burnt unworked flint	43
		Flake	9
		Unclassifiable waste	3
	5030	Flake	1
	5031	Flake	1
	5045	Flake	2
	5065	Flake	6
	5087	Burnt unworked flint	1
	5089	Flake	1
	5095	Burnt unworked flint	1
	5102	Flake	1
	5159	Burnt unworked flint	4
	5167	Flake	3
	5171	Burnt unworked flint	1
	5175	Burnt unworked flint	1
	5183	Flake	1
	5193	Flake	1
	5200	Burnt unworked flint	22
		Flake	7
	5201	Flake	1
	5202	Bladelike flake	1
		Burnt unworked flint	3
	5225	Burnt unworked flint	12
	5235	Burnt unworked flint	6
	5256	Flake	1
	5260	Flake	1
	5284	Burnt unworked flint	1
		Flake	3
	5325	Blade	1
	5346	Burnt unworked flint	1
		Flake	1
	5410	Chip	2
		Flake	8
	5411	Flake	1
	5415	Flake	2
	5419	Flake	1
	5427	Burnt unworked flint	2
	5433	Flake	1
	5442	Burnt unworked flint	24
		Flake	9
	5444	Flake	1
	5447	Burnt unworked flint	1
		Flake	1
	5449	Flake	1
	5455	Burnt unworked flint	12
		Flake	3
		Unclassifiable / fragmentary core	1
	5460	Blade	1
		Chip	2
		Flake	6
		Retouched flake	1
	5463	Blade	1
	5469	Burnt unworked flint	4

Excavation Area	Context	Flint category	Total
		Flake	2
	5476	Flake	2
	5479	Flake	2
	5617	Burnt unworked flint	1
		Flake	2
		Unclassifiable waste	1
	5621	Flake	3
	5622	Burnt unworked flint	2
	5626	Blade	1
	5628	Burnt unworked flint	11
		Flake	6
		Single platform flake core	1
		Unclassifiable / fragmentary core	1
	5630	Bladelike flake	1
	5656	Burnt unworked flint	1
		Flake	2
		Multi-platform flake core	1
J9 EX	2001	Bladelike flake	1
		Flake	30
		Multi-platform flake core	1
	2002	Blade	2
		Bladelet	1
		Chip	3
		Core face/edge rejuvenation flake	1
		Flake	108
		Keeled / non-discoidal flake core	1
		Multi-platform flake core	4
		Partially-worked nodule	1
		Side scraper	1
		Single platform flake core	3
	2005	Flake	1
	2007	Bladelike flake	1
		Burnt unworked flint	1
		Chip	1
		Flake	12
		Keeled / non-discoidal flake core	1
		Partially-worked nodule	1
	2036	Flake	5
	2041	Bladelike flake	1
		End scraper	1
		Flake	2
	2049	Chip	1
		Flake	1
	2051	Blade	6
		Burnt unworked flint	4
		Chip	16
		End scraper	6
		End-and-side scraper	3
		Flake	166
		Retouched blade	1
		Retouched flake	2
		Side scraper	1
		Unclassifiable / fragmentary core	1
		Unclassifiable retouch	1

Excavation Area	Context	Flint category	Total
		Unclassifiable waste	1
	2055	Blade	2
		Bladelet	1
		Burnt unworked flint	2
		Chip	8
		Flake	20
		Multi-platform flake core	1
		Unclassifiable waste	1
	2057	Blade	1
		Bladelet	1
		Chip	7
		Flake	35
		Microlith	1
		Unclassifiable waste	3
	2059	Chip	2
		Flake	2
	2061	Blade	1
		Bladelike flake	2
		Chip	9
		Flake	9
	2063	Blade	11
		Bladelet	15
		Bladelike flake	6
		Burnt unworked flint	2
		Chip	42
		Core face/edge rejuvenation flake	1
		Flake	255
		Keeled / non-discoidal flake core	2
		Microlith	1
		Multi-platform flake core	6
		Opposed platform flake core	2
		Partially-worked nodule	1
		Retouched flake	2
		Serrated flake	1
		Unclassifiable / fragmentary core	3
		Unclassifiable waste	8
	2067	Bladelet	1
		Bladelike flake	1
		Flake	11
		Microlith	1
	2069	Blade	1
		Bladelet	1
		Bladelike flake	2
		Flake	8
		Partially-worked nodule	1
		Unclassifiable waste	2
	2071	Blade	3
		Bladelet	2
		Bladelike flake	3
		Burnt unworked flint	18
		Chip	13
		Core on a flake	1
		Flake	154
		Multi-platform flake core	4

Excavation Area	Context	Flint category	Total
		Unclassifiable waste	7
	2073	Chip	1
		Flake	9
	2075	Chip	2
		Flake	29
		Unclassifiable / fragmentary core	1
	2077	Blade	3
		Bladelike flake	2
		Burnt unworked flint	1
		Chip	2
		Core on a flake	1
		Flake	32
		Unclassifiable waste	1
	2079	Blade	2
		Burnt unworked flint	1
		Chip	5
		Flake	17
	2081	Bladelike flake	2
		Flake	20
	2083	Bladelet	1
		Bladelike flake	2
		Chip	6
		Flake	31
	2085	Flake	1
	2087	Chip	2
		Flake	5
		Microlith	1
		Unclassifiable / fragmentary core	1
	2089	Blade	7
		Bladelet	4
		Bladelike flake	1
		Burnt unworked flint	8
		Chip	64
		Flake	146
		Partially-worked nodule	1
		Unclassifiable waste	3
	2091	Burnt unworked flint	1
	2093	Blade	3
		Bladelet	5
		Bladelike flake	2
		Burnt unworked flint	4
		Chip	44
		Flake	267
		Keeled / non-discoidal flake core	1
		Microlith	2
		Multi-platform flake core	2
		Partially-worked nodule	2
		Single platform flake core	1
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	10
	2095	Blade	1
		Flake	53
		Keeled / non-discoidal flake core	1
		Unclassifiable / fragmentary core	1

Excavation Area	Context	Flint category	Total
	2098	Unclassifiable waste	1
	2099	Blade	11
		Bladelet	10
		Bladelike flake	4
		Burnt unworked flint	9
		Chip	53
		Core face/edge rejuvenation flake	1
		Flake	263
		Microlith	1
		Rejuvenation flake tablet	1
		Unclassifiable / fragmentary core	4
		Unclassifiable waste	8
	2101	Flake	5
	2103	Blade	1
		Burnt unworked flint	1
		Chip	5
		Chisel arrowhead	1
		Flake	22
		Unclassifiable waste	1
	2107	Blade	1
		Bladelet	2
		Bladelike flake	2
		Burnt unworked flint	1
		Chip	13
		Flake	63
		Multi-platform flake core	2
		Unclassifiable waste	1
	2109	Burnt unworked flint	1
		Flake	19
	2113	Flake	6
	2114	Blade	1
		Flake	13
	2129	Unclassifiable waste	1
	2135	Burnt unworked flint	3
	2139	Burnt unworked flint	1
		Flake	7
	2142	Chip	2
		Flake	4
		Unclassifiable waste	1
	2147	Blade	1
		Bladelike flake	1
		Chip	2
		Flake	12
	2149	Blade	1
		Burnt unworked flint	4
		Chip	6
		Flake	58
		Unclassifiable waste	2
	2154	Flake	6
	2156	Blade	1
		Bladelike flake	1
		Burnt unworked flint	1
		Flake	32
		Multi-platform flake core	1

Excavation Area	Context	Flint category	Total
		Partially-worked nodule	1
		Unclassifiable waste	2
	2158	Bladelike flake	2
		Chip	5
		Flake	10
	2159	Flake	7
		Partially-worked nodule	1
		Unclassifiable waste	1
	2161	Flake	10
	2162	Blade	3
		Bladelet	2
		Bladelike flake	2
		Burnt unworked flint	7
		Chip	34
		Flake	258
		Multi-platform flake core	4
		Partially-worked nodule	1
		Single platform flake core	1
		Unclassifiable waste	3
	2164	Flake	2
	2165	Blade	1
		Flake	10
		Microlith	1
		Single platform flake core	1
	2175	Blade	1
		Bladelike flake	2
		Flake	16
		Partially-worked nodule	1
		Unclassifiable / fragmentary core	1
	2176	Blade	2
		Bladelike flake	1
		Flake	43
		Multi-platform flake core	3
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	3
	2183	Flake	1
	2186	Flake	4
	2187	Flake	5
	2190	Blade	2
		Chip	14
		Flake	75
		Unclassifiable waste	2
	2195	Blade	4
		Bladelet	1
		Bladelike flake	5
		Burnt unworked flint	10
		Chip	26
		Core on a flake	1
		Flake	142
		Microlith	1
		Multi-platform flake core	1
		Retouched flake	1
		Unclassifiable waste	4
	2213	Flake	1



Excavation Area	Context	Flint category	Total
	2223	Flake	2
	2225	Flake	1
	2231	Chip	14
		Flake	7
		Unclassifiable waste	2
	2233	Blade	2
		Chip	1
		Flake	6
	2236	Flake	6
	2243	Chip	1
		Flake	4
	2247	Burnt unworked flint	1
	2279	Flake	3
	2281	Bladelike flake	2
		Chip	8
		Flake	25
		Multi-platform flake core	2
		Opposed platform flake core	1
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	1
	2289	Flake	11
	2294	Flake	1
	2298	Blade	1
		Bladelike flake	1
		Flake	24
	2300	Blade	2
		Bladelet	1
		Bladelike flake	2
		Burnt unworked flint	5
		Chip	2
		Flake	42
		Microlith	1
		Retouched flake	1
	2301	Bladelike flake	1
		Flake	7
		Multi-platform flake core	1
	2303	Flake	1
	2305	Chip	2
		Flake	3
		Single platform flake core	1
	2306	Flake	2
	2308	Chip	1
	2312	Blade	1
		Bladelet	3
		Burnt unworked flint	11
		Chip	7
		Flake	15
	2315	Chip	3
		Flake	5
	2317	Blade	3
		Bladelet	3
		Bladelike flake	3
		Burnt unworked flint	6
		Chip	29

Excavation Area	Context	Flint category	Total
		Core face/edge rejuvenation flake	1
		Flake	166
		Microlith	1
		Multi-platform flake core	2
		Partially-worked nodule	1
		Scraper on a non-flake blank	1
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	5
	2319	Blade	1
		Bladelet	1
		Bladelike flake	1
		Burnt unworked flint	3
		Chip	8
		Flake	29
		Microlith	1
		Unclassifiable waste	2
	2321	Bladelike flake	1
		Chip	2
		Flake	15
		Multi-platform flake core	2
	2323	Blade	3
		Bladelet	2
		Bladelike flake	2
		Burnt unworked flint	1
		Chip	11
		Flake	31
		Multi-platform flake core	2
		Unclassifiable waste	3
	2325	Bladelet	4
		Burnt unworked flint	2
		Chip	16
		Flake	23
		Unclassifiable waste	3
	2329	Flake	1
	2331	Bladelet	1
		Burnt unworked flint	1
		Flake	6
		Microlith	1
	2335	Bladelet	1
		Bladelike flake	1
		Flake	12
	2353	Flake	1
	2354	Burnt unworked flint	1
		Flake	1
	2355	Bladelet	1
		Bladelike flake	1
		Burnt unworked flint	2
		Chip	17
		Core face/edge rejuvenation flake	1
		Flake	127
		Microlith	2
		Multi-platform flake core	1
		Single platform flake core	1
		Unclassifiable waste	7

Excavation Area	Context	Flint category	Total
	2357	Bladelike flake	1
		Burnt unworked flint	2
		Chip	2
		Flake	21
		Multi-platform flake core	1
	2359	Burnt unworked flint	1
		Flake	10
	2361	Microlith	1
	2367	Chip	1
		Flake	2
	2371	Burnt unworked flint	4
		Chip	6
		Flake	15
		Retouched flake	1
		Unclassifiable waste	4
	2375	Flake	2
	2380	Flake	2
	2382	Flake	11
		Single platform flake core	1
	2385	Blade	2
		Chip	1
		Flake	56
		Microlith	1
		Multi-platform flake core	6
		Partially-worked nodule	1
		Unclassifiable waste	2
	2387	Bladelike flake	1
		Flake	1
	2390	Flake	3
	2392	Bladelet	1
		Bladelike flake	1
		Flake	9
		Unclassifiable waste	1
	2395	Flake	2
		Partially-worked nodule	1
	2397	Core on a flake	1
	2399	Chip	4
		Flake	14
		Microlith	1
		Retouched flake	1
	2405	Flake	5
		Unclassifiable waste	1
	2406	Flake	1
	2408	Flake	2
	2411	Burnt unworked flint	1
	2418	Burnt unworked flint	6
		Chip	1
		Flake	9
		Opposed platform blade core	1
	2428	Blade	1
		Unclassifiable waste	1
	2434	Flake	3
	2436	Flake	3
	2437	Partially-worked nodule	1

Excavation Area	Context	Flint category	Total
	2439	Chip	1
		Flake	1
	2443	Bladelet	1
		Bladelike flake	1
		Chip	3
		Flake	30
		Unclassifiable / fragmentary core	1
	2448	Burnt unworked flint	1
	2451	Flake	2
		Multi-platform flake core	1
	2455	Blade	1
		Chip	1
		Flake	5
	2469	Flake	1
		Unclassifiable waste	1
	2479	Flake	1
	2488	Blade	1
		Chip	3
		Flake	27
		Retouched flake	1
		Unclassifiable / fragmentary core	1
		Unclassifiable waste	3
	2489	Flake	1
	2505	Flake	1
	2509	Bladelet	1
		Bladelike flake	1
		Flake	4
	2511	Burnt unworked flint	7
		Flake	2
	2522	Flake	1
	2527	Chip	1
		Flake	9
		Unclassifiable waste	1
	2529	Flake	1
	2535	Flake	1
	2537	Flake	1
	2539	Blade	1
		Flake	2
	2543	Flake	4
	2557	Bladelike flake	1
		Burnt unworked flint	12
		Chip	1
		Flake	1
	2559	Blade	1
		Bladelike flake	1
		Flake	15
		Unclassifiable waste	1
	2561	Flake	4
	2571	Flake	4
	2577	Blade	1
		Chip	1
	2579	Flake	5
		Partially-worked nodule	1
	2615	Blade	1

Excavation Area	Context	Flint category	Total
		Flake	5
	2616	Burnt unworked flint	3
	2617	Burnt unworked flint	1
		Flake	2
	2623	Blade	2
		Bladelike flake	1
		Flake	10
		Unclassifiable / fragmentary core	1
	2639	Bladelike flake	1
		Flake	9
	2664	Blade	1
	2703	Bladelike flake	1
		Burnt unworked flint	1
		Flake	1
	2718	Flake	3
	2907	Flake	5
	2916	Flake	1

## APPENDIX 2: ASSESSMENT OF PREHISTORIC POTTERY

*By Leo Webley*

Prehistoric ceramics predating the late Iron Age were found during the evaluation and mitigation fieldwork at seven sites (Buncefield Depot; Junction 8 Southbound; Junction 8 Northbound; The Aubreys; Area M; Junction 9; and Junction 10). The assemblage comprises 988 sherds weighing 4373 g. Most of the material dates to between the late Bronze Age and the middle Iron Age, although possible late Neolithic sherds were found at The Aubreys. The pottery has been fully recorded following PCRG (1997) guidelines, with the data entered onto an Access database.

### *Condition*

With an overall mean sherd weight of only 4.4 g, the condition of the assemblage is fairly poor. The few large sherds present are all from Buncefield Depot and Junction 8 Southbound. Many sherds are abraded or have missing surfaces.

### *Fabrics*

The pottery has been ascribed to twelve broad fabric groups, described in Table A3. The majority of the pottery is tempered with calcined (burnt) flint, although sandy, shelly and vegetable-tempered sherds are also present. The distribution of fabrics by sherd count and weight between the various sites is shown in Table A4.

### *Description and dating*

The pottery will be described by site. Some identifications are tentative, given the poor condition of much of the material, and the fact that knowledge of later prehistoric ceramic development in south Hertfordshire prior to the late Iron Age ('Belgic') horizon is currently limited.

### *Buncefield Depot*

Buncefield Depot produced 301 sherds (2042 g), all of which can be placed in the post-Deverel-Rimbury tradition of the late Bronze Age/early Iron Age (Barrett 1980). Most of the material is flint-tempered, with some sandy and vegetable-tempered sherds also present. A number of diagnostic vessel fragments were recovered from pit 516 and associated spread 521/522. Context 519 contained part of a round-shouldered bowl or jar with a slightly everted rim, an everted rim from a vessel decorated with fingernail impressions on its neck, sherds of a further coarse vessel decorated with fingertip impressions and a body sherd from a fine, carinated bowl. Context 521 contained part of a fine, bipartite 'furrowed' bowl with an upright rim and a fragment of a fine, burnished, carinated bowl with a flaring rim. Context 522 contained a fine sandy sherd decorated with two incised lines and two impressed dots inlaid with white paste. Elsewhere, pit 532 (fill 533) contained large group of sherds (1037 g), most of which belonged to a single coarse vessel, a shouldered jar decorated with fingertip impressions on its shoulder. The vessel forms and types of decoration seen at this site indicate a date in the early Iron Age, c 800–400 BC, and possibly in the earlier part of this period. The assemblage could be broadly contemporary with the group from pit 1013 at nearby Buncefield Lane, Hemel Hempstead, which included a shouldered jar, a fine carinated bowl, and a fine hemispherical bowl decorated with incised lines, associated with a radiocarbon date of 810–515 cal BC (McDonald 2003).

#### *Junction 8 Southbound*

Junction 8 Southbound produced 471 sherds (1674 g) of prehistoric pottery. Most of the material is in flint-tempered fabrics and can be broadly dated to the late Bronze Age/early Iron Age. In most cases, only small undiagnostic sherds were recovered. Pit 5023 (fill 5024) contained a larger group of sherds (650 g), mostly from a single vessel. The vessel is too fragmented and incomplete to reconstruct, but was probably a jar with a flaring rim. Pit 5465 (fill 5464) produced a single large fragment from a round-bodied jar with a slightly everted rim, and posthole 5192 (fill 5193) contained a T-shaped rim, probably from a jar. Jars with T-shaped rims are often associated with early Iron Age assemblages, an example from pit 1013 at Buncefield Lane (see above) being a case in point. However, the complete absence of decoration in this assemblage makes it tempting to suggest that it has an earlier emphasis than that from Buncefield Depot, perhaps falling within the post-Deverel-Rimbury plain ware tradition of c 1150–800 cal BC.

In addition to the flint-tempered material, a few contexts (notably 5107) contain sandy sherds probably dating to the middle Iron Age, although no feature sherds are present.

#### *Junction 8 Northbound*

Junction 8 Northbound produced 81 sherds (270 g) of prehistoric pottery. A number of flint-tempered sherds are present which can be broadly dated to the late Bronze Age/early Iron Age. Most of these sherds are very small, and it is likely that much of the material is residual. The one notable exception is a large fragment of a shouldered jar with an upright flat-topped rim from posthole 6195 (fill 6196). All of the material is undecorated, except for a residual body sherd decorated with fingertip impressions from context 6417.

Middle Iron Age activity is represented by a small number of sherds in sandy and vegetable-tempered fabrics. Three rim fragments are present, at least one of which derives from a slack-shouldered jar. None of the middle Iron Age sherds is decorated.

#### *The Aubreys*

Pits 207 (fill 206) and 218 (fill 213) produced eight sherds (20 g) of pottery in a particularly poorly sorted flint-tempered fabric. These are early prehistoric, possibly dating to the late Neolithic (Lisa Brown pers. comm.).

#### *Area M*

Area M produced 34 sherds (98 g) of prehistoric pottery. The material is highly fragmented, and dating is difficult. A few flint-tempered sherds are present, which are likely to be of late Bronze Age/early Iron Age date; these include a small fragment of a flat-topped rim. An early prehistoric attribution for some of the flint-tempered material cannot be ruled out, however. Some sandy sherds might date to the middle Iron Age, although no feature sherds are present. Eleven sherds from ditch 3008 (fills 3009 and 3017) are in a fabric containing fine shell inclusions which is not paralleled elsewhere in the M1 investigations; an Iron Age date can be tentatively suggested.

#### *Junction 9*

Junction 9 produced 61 sherds (257 g) of prehistoric pottery. A few very small fragments of flint-tempered pottery are likely to date to the late Bronze Age/early Iron Age, though they could well be residual. More clearly represented are middle Iron Age sherds in sandy fabrics, including rim sherds from a slack-shouldered bowl or jar from pit 2108 (fill 2107). Two sherds in fabric S1 from ditch 2047 (fill 2138) belong to an ovoid jar with an upright rounded rim and horizontal combing or scoring on the body. This has been dated to the middle or late Iron Age, with the latter perhaps more likely as the sherds were found in association with grog-tempered late Iron Age pottery.

#### *Junction 10*

Posthole 1009 produced a single residual sherd (5 g) in a fabric containing coarse limestone and iron oxide inclusions, not paralleled elsewhere in the M1 investigations. The date of this is unclear, though it could possibly be Iron Age.

#### *Statement of potential*

The prehistoric pottery assemblages from these sites are small and poorly preserved. Nevertheless, given the scarcity of contemporary assemblages elsewhere in Hertfordshire south of the Chiltern ridge, the material from Buncefield Depot, Junction 8 Southbound, Junction 8 Northbound and Junction 9 does have potential to further our understanding of local ceramic development from the late Bronze Age to the middle Iron Age. The assemblage from Buncefield Depot is of particular interest as it includes a number of distinctive early Iron Age vessel forms. The significance of this group would be enhanced if one or more radiocarbon dates could be obtained on associated material. In addition, investigation of the spatial distribution and context of the pottery from the Junction 8 sites and Buncefield Depot may shed light on practices of ceramic deposition during later prehistory.

#### *Method statement*

No further recording or analysis of the material is required. The assessment should be used as the basis for a short publication report, which should include more discussion of the local and regional context of the late Bronze Age to middle Iron Age pottery. It is recommended that nine vessels be illustrated, as follows:

- Buncefield Depot, ctx 519: shouldered jar/bowl, early Iron Age
- Buncefield Depot, ctx 519: rim with fingernail impressions on neck, early Iron Age
- Buncefield Depot, ctx 521: bipartite furrowed bowl, early Iron Age
- Buncefield Depot, ctx 521: carinated flared-rim bowl, early Iron Age
- Junction 8 Southbound, ctx 5193: T-shaped rim, late Bronze Age/early Iron Age
- Junction 8 Southbound, ctx 5464: round-bodied jar, late Bronze Age/early Iron Age
- Junction 8 Northbound, ctx 6196: shouldered jar, late Bronze Age/early Iron Age
- Junction 8 Northbound, ctx 6783: slack-shouldered jar, middle Iron Age

## Junction 9, ctx 2107: slack-shouldered bowl/jar, middle Iron Age

*Table A3: Prehistoric pottery fabric descriptions*

<b>Fabric</b>	<b>Summary type</b>	<b>Description</b>
A1	Fine sandy	Moderate to abundant quartz sand < 0.5 mm; rare iron oxide < 2 mm visible in some sherds
A2	Coarse sandy	Moderate to abundant quartz sand < 1 mm; rare iron oxide < 2 mm visible in some sherds
AF1	Sand and fine flint	Moderate to abundant quartz sand < 1 mm; sparse calcined flint < 1 mm
AF2	Sand and coarse flint	Moderate to abundant quartz sand < 1 mm; sparse, poorly-sorted calcined flint < 5 mm
AL1	Sand and limestone	Moderate quartz sand < 0.5 mm; rare limestone < 5 mm, rare flint < 5 mm, rare iron oxide < 2 mm
F1	Fine flint	Moderate calcined flint < 1 mm; sparse quartz sand < 0.5 mm
F2	Coarse flint	Moderate calcined flint < 5 mm; sparse quartz sand < 0.5 mm
F3	Coarse, poorly-sorted flint	Moderate, poorly-sorted calcined flint < 8 mm; sparse quartz sand < 0.5 mm. Hard
S1	Fine shell	Moderate shell < 1 mm; sparse quartz sand < 0.5 mm; sparse iron oxide < 1 mm. Soapy feel
V1	Vegetable inclusions	Moderate to abundant flat voids from vegetable inclusions < 5 mm
VA1	Vegetable inclusions and sand	Moderate flat voids from vegetable inclusions < 5 mm; moderate quartz sand < 0.5 mm; rare, poorly-sorted flint < 5 mm; rare calcareous inclusions < 1 mm. Friable
VA2	Vegetable inclusions and sand	Moderate flat voids from vegetable inclusions < 5 mm; moderate sand < 0.5 mm. Hard



Table A4: Quantification of prehistoric pottery fabrics (sherd count and weight) by site

Fabric	Buncefield Depot	Junction 8 Southbound	Junction 8 Northbound	The Aubreys	Area M	Junction 9	Junction 10
A1	13 (70 g)	229 (310 g)	42 (107 g)		3 (8 g)	23 (157 g)	
A2			5 (12 g)		11 (45 g)		
AF1	144 (943 g)	6 (27 g)			1 (2 g)	1 (2 g)	
AF2			2 (18 g)		2 (7 g)	7 (57 g)	
AL1							1 (5 g)
F1	85 (376 g)	52 (166 g)	14 (43 g)		2 (6 g)	21 (23 g)	
F2	42 (507 g)	212 (1166 g)	10 (58 g)		2 (7 g)	9 (18 g)	
F3				8 (20 g)			
S1					11 (20 g)		
V1	1 (7 g)	3 (12 g)	1 (1 g)		2 (3 g)		
VA1	16 (139 g)		7 (31 g)				
VA2							
Total	301 (2042 g)	502 (1681 g)	81 (270 g)	8 (20 g)	34 (98 g)	61 (257 g)	1 (5 g)

### APPENDIX 3: ASSESSMENT OF THE LATE IRON AGE AND ROMAN POTTERY

by Daniel Stansbie

#### Introduction and Methodology

Late Iron Age and Roman pottery was recovered during the evaluation and mitigation stages of the excavations. The material from the evaluation is discussed as a block, while the assemblages from the mitigation phases of the work, including the watching briefs are discussed individually (see below). Five sites within the mitigation phase (Junction 8 Northbound, Junction 8 Southbound, Junction 9, Area M and Area P) produced assemblages of late Iron Age and Roman date, while a very few sherds were recovered from Junction 10/Borrow Pit and The Aubreys. Overall 12,058 sherds weighing 100 kg were recovered. The material was fully recorded on an Access database and fabrics were identified using codes based on the national fabric reference collection (Tomber and Dore 1998) and used by Malcom Lyne in his report on the pottery from Folly Lane, Verulamium (Lyne 1999), except where a fabric was not covered by either of these systems, when the Oxford Archaeology standard recording system for Iron Age and Roman fabrics was used (Booth 2007). Where necessary the pottery was examined under a binocular microscope at x20 magnification to aid in identification of the fabric. Reference was also made to the City of London corpus (Davies et al. 1994), Hawkes and Hull's (1947) report on the pottery from Camulodunum (for 'Belgic' forms, on which Thompson (1982) was also consulted), Going's report on the pottery from Chelmsford (Going 1987) and Young's corpus of the Oxfordshire industry (Young 1977). For the purposes of assessment the pottery was divided into four ceramic phases: Late Iron Age to early Roman (50 BC-AD 70), early Roman (AD 43-120), middle Roman (AD 120-250) and late Roman (AD 250-410).

#### Condition

An average sherd weight of 8 g suggests that the condition of the pottery was poor. However, this figure is influenced by large amounts of very abraded residual material within the assemblage and belies the presence of a substantial number of well preserved groups.

#### Pottery from the Evaluation

Late Iron Age and Roman pottery from the evaluation comprises 498 sherds, weighing 4606 g. With an average sherd weight of 9 g the pottery is generally in moderate condition, although there are some large well preserved groups of sherds and some groups were heavily abraded. The material from the evaluation is dominated by pottery of broadly Roman date, which accounts for 46% by weight. This is supplemented by late Iron Age to early Roman

pottery, which accounts for 18% by weight and early Roman pottery, which also takes an 18% share. The remainder of the assemblage comprises middle Roman pottery at 11% by weight and late Roman pottery at 7% by weight.

The late Iron Age to early Roman assemblage is composed largely of body sherds of grog tempered ware, with several jars including a high-shouldered jar and a necked-bowl also present. In addition there is a butt-beaker in 'Belgic' sandy ware. The early Roman assemblage is also dominated by body sherds of grog-tempered ware, with a single grog-tempered jar. This is supplemented by a bead-rimmed jar in unsourced reduced coarse ware, a medium mouthed jar in shelly ware and body sherds in 'Belgic' sandy ware. In addition there is a single sherd of Dressel 20 amphora and a form 15/17 dish in South Gaulish samian ware. The bulk of the middle Roman assemblage comprises unsourced reduced coarse ware and Verulamium region white ware, with a single medium-mouthed jar in the former and a reeded-rim bowl in the later. In addition there is a reeded-rim bowl in unsourced oxidised ware, a jar in Highgate Wood C ware and a single body sherd of lower Nene Valley colour coated ware. The late Roman assemblage was small and was not dominated by any individual fabric, although Harrold shelly ware is most common with 16 sherds belonging to a medium-mouthed jar. This is supplemented by a bowl in Oxfordshire colour-coated ware and body sherds of Oxfordshire white ware mortaria, pink grogged ware and central Gaulish samian ware. Like the late Roman material, pottery that can only be assigned a broad Roman date range is not dominated by any individual fabric. However, unsourced reduced coarse ware is prominent, with several jars, including lid-seated and medium-mouthed types and this is supplemented by body sherds and medium-mouthed jars in Harrold shelly ware and a flagon and a jar in Verulamium region white ware. In addition there are body sherds of Highgate Wood C, pink grogged ware and Hadham oxidised ware.

*Table A5: Evaluation Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight (g)	%Weight
BATAM	1	<1	122	2.6
CGSA	1	<1	2	<1
E30 'Belgic' sandy fabrics	28	5.6	196	4.2
E40 Shell-tempered fabrics	5	<1	19	<1
GROG	264	52.6	1794	38.2
HARSH	25	5	295	6.4
HADOX	1	<1	2	<1
HGWREC	2	<1	12	<1
LCVRE3	5	1	12	<1
LVNCC	1	<1	1	<1
MISC	2	<1	2	<1
OXFRS	3	<1	48	1
OXFRSM	3	<1	6	<1
PNKGT	9	1.8	610	13.2
R90 coarse tempered fabrics	4	<1	76	1.6
SGSA	2	<1	24	<1
UNSOX	14	2.8	186	4
UNSOXC	36	7.2	181	3.9
UNSB	10	2	118	2.5
UNSR	46	9.2	603	13
UNSRF	12	2.4	55	1
VERWH	24	4.8	242	5.2
<b>Total</b>	<b>498</b>	<b>100</b>	<b>4606</b>	<b>100</b>

## Pottery from Junction 9

In total 4936 sherds of late Iron Age and Roman pottery, weighing 54 kg was recovered from Junction 9. With an average sherd weight of 11 g the pottery is in moderate condition, although some groups are particularly well preserved and a number of sherds are clearly residual, being heavily abraded. The assemblage from Junction 9 is dominated by material of early Roman date, which accounted for 60% of the assemblage by weight. This is supplemented by smaller amounts of late Iron Age to early Roman pottery at 10% by weight, middle Roman pottery at 17% by weight and late Roman pottery at 11% by weight. The remaining 2% comprises material that can only be assigned a broadly Roman date range.

The late Iron Age to early Roman assemblage is overwhelmingly dominated by grog-tempered wares (GROG), with vessels in this fabric largely being made up of medium-mouthed jars, supplemented by several high-shouldered jars; a lid seated jar and a storage jar. Also present are a carinated bowl and several lids. The grog-tempered material is supplemented by shelly fabrics (E40), 'Belgic' sandy fabrics (E30), in which there is a butt-beaker and a single sherd of flint-tempered material (E60).

The early Roman assemblage consists of a more diverse range of fabrics, although it is still largely dominated by grog-tempered wares, which account for 63% by weight (much of this material is likely to be residual). Vessels in grog-tempered ware largely comprise high-shouldered and medium-mouthed jars, with some lid-seated and bead-rimmed examples. In addition there are grog-tempered butt-beakers, carinated bowls, a globular bowl and a platter. No other fabrics are present in such substantial amounts within the early Roman assemblage, although pink-grogged wares (PNKGT), unsourced coarse-reduced wares (UNSREC) and Verulamium region white wares are the next most common fabric types at 7%, 6% and 5% by weight, respectively. Reduced ware vessels also largely comprise medium-mouthed jars, although other types, including lid-seated vessels are also present and the jars are supplemented by beakers (including poppyhead-beakers), bowls and platters. The Verulamium region white wares include ring-necked flagons, medium mouthed and neckless jars and reeded-rim bowls. The only vessels present in pink-grogged ware are storage jars. There is a small amount of samian ware, all from South Gaulish (SGSA) production centres consisting of platters, cups and a form 37 bowl. The remaining fabrics in the early Roman assemblage are all present in minor amounts of less than 5% by weight (see table). Notable among these fabrics are body sherds of Dressel 20 (BATAM) and Gallic (GALAM) amphorae, a flanged bowl in local mica-dusted ware, a platter (CAM16) in terra nigra (GABTN), body sherds of North-Gaulish white ware (NOGWH), body sherds and a storage jar in Harrold shelly ware (HARSH) and body sherds of Highgate Wood 'C' ware (HGWREC).

The middle Roman assemblage comprises a diverse range of fabrics, none of which really dominate. The most common of these are again unsourced coarse reduced wares and Verulamium region white wares, which together account for 40% of the assemblage by weight. Vessels in these fabrics largely consist of jars, including medium-mouthed, wide-mouthed and neckless varieties, with several reeded-rim bowls in Verulamium region white ware. The small amount of samian ware mostly came from Central (CGSA) and South Gaulish production centres, with a very small amount (less than 1% by weight) of East Gaulish (EGSA) material. Vessels in these fabrics include form 18/31 dishes, form 27, 33 and 35 cups, a form 36 dish and a form 37 bowl. Apart from pink grogged ware, Verulamium region white ware mortaria (VERWHM) and unsourced black burnished wares (UNSB) the remaining fabrics are all present in minor amounts of less than 5%. These fabrics include body sherds of Hadham oxidised wares (HADOX) and Hadham oxidised white-slipped wares (HADWS), along with plain rimmed dishes, a bead-rimmed dish and a cooking jar in black burnished wares (BB1) and several jars in Harrold shelly wares.

Like the middle Roman assemblage the late Roman pottery is not dominated by a particular fabric, although unsourced reduced wares are most common at 27% by weight, with vessels in these fabrics largely consisting of jars, including medium and wide mouthed types and cooking jars, supplemented by flanged and bead rimmed dishes. Body sherds and jars in

unsourced black burnished wares are next most common at 8% by weight. These are supplemented by small quantities of regional imports and specialist wares, including body sherds, a plain rimmed dish and a flanged dish in black-burnished ware, body sherds of Dressel 20 and Gallic amphorae, body sherds and a jar in Harrold shelly ware, body sherds, a flagon and a bowl-jar in Hadham oxidised ware, body sherds and a triangular rimmed dish in lower Nene Valley colour-coated wares (LNVCC) and a variety of Oxfordshire products including bowls in Oxfordshire colour-coated ware (OXFRS) and a bowl in Oxfordshire parchment ware (OXFPA). Also present are Oxfordshire white ware mortaria (OXFWM), and body sherds of Colchester colour-coated ware (COLCC) and Colchester white ware (COLWH). Quantities of grog-tempered material, which represent 18% of the assemblage by weight and Verulamium region white ware at 4% by weight indicate high-levels of residuality within the assemblage. The remaining fabrics were all present in minor quantities of less than 5% by weight (see Table A6).

Pottery which can only be assigned a broadly Roman date range is largely made up of unsourced reduced fabrics, supplemented by unsourced oxidised fabrics, Verulamium region white wares and grog-tempered wares. The remaining fabrics are all present in minor quantities of less than 5%.

A small group of nine sherds, weighing 31 g was recovered from a single context (ditch 609), during the watching brief on Junction 9. These sherds were all early Roman in date, comprising two ring-necked flagons and some body sherds in Verulamium region white ware and a jar in Hadham reduced ware.

*Table A6: Junction 9 Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight(g)	%Weight
BATAM	28	<1	1439	2.6
BB1	27	<1	408	<1
CGSA	13	<1	61	<1
COLWH	25	<1	76	<1
COLCC	6	<1	17	<1
E20 'Belgic' fine sandy fabrics	1	<1	19	<1
E30 'Belgic' coarse sandy fabrics	21	<1	55	<1
E40 shelly fabrics	205	4	1676	3
E60	1	<1	5	<1
EGSA	9	<1	87	<1
GABTN	3	<1	66	<1
GALAM	6	<1	305	<1
GROG	2068	42	27534	51
HADOX	55	1	433	<1
HADRE	7	<1	86	<1
HADREWS	14	<1	66	<1
HADWS	2	<1	12	<1
HARSH	58	1	459	<1
HGWREC	16	<1	40	<1
LNVWH	1	<1	15	<1
LONMD	4	<1	7	<1
M23 Mancetter/Hartshill mortaria	1	<1	42	<1
MISC	10	<1	9	<1
NOGWH	4	<1	48	<1
O80 oxidised coarse tempered fabrics	1	<1	180	<1
OXFPA	1	<1	30	<1
OXFRS	8	<1	77	<1
OXFRSM	1	<1	8	<1
PNKGT	212	4.2	3654	6.7
Q20 white slipped oxidised ware	2	<1	22	<1
Q30 white slipped reduced ware	24	<1	184	<1
Q51 Upchurch white slipped oxidised	2	<1	19	<1

Fabric	Nosh	%Nosh	Weight(g)	%Weight
ware				
ROBSH	5	<1	34	<1
SGSA	64	1.2	170	<1
UNSBB	227	4.5	2280	4
UNSOXC	149	3	792	1
UNSOXF	21	<1	46	<1
UNSREC	814	16	5602	10
UNSREF	82	1.6	336	<1
UNSW	5	<1	12	<1
VERRE	42	<1	407	<1
VERWH	564	11.4	3911	7.1
VERWHM	37	<1	2237	4
VERWS	1	<1	22	<1
W10 fine white fabrics	9	<1	18	<1
W20 sandy white fabrics	15	<1	40	<1
W41 south-east English white/buff fabrics	3	<1	50	<1
<b>Total</b>	<b>4936</b>	<b>100</b>	<b>54443</b>	<b>100</b>

Table A7: Junction 9 Watching Brief Quantification of Late Iron Age and Roman pottery by fabric

Fabric	Nosh	%Nosh	Weight(g)	%Weight
VERWH	8	89	19	61
HADRE	1	11	12	39
<b>Total</b>	<b>9</b>	<b>100</b>	<b>31</b>	<b>100</b>

### Pottery from Junction 8

Late Iron Age and Roman pottery from Junction 8 totalled 5419 sherds, weighing 34 kg. The pottery is generally in poor condition, having an average sherd weight of 6 g. However, some groups were well preserved, comprising large unabraded sherds and much of the more abraded material is residual. The assemblage from Junction 8 is dominated by middle Roman material, which accounts for 39% of the assemblage by weight. This is supplemented by early Roman material at 24% and late Iron Age to early Roman material at 17%. The remainder of the assemblage is made up of late Roman pottery comprising 7% by weight and pottery of broadly Roman date at 12%. The remaining 1% represents undated material.

The late Iron Age to early Roman pottery is overwhelmingly dominated by grog-tempered wares, which comprise 96% of the assemblage by weight. Vessels in this fabric are mainly jars, including medium-mouthed, high-shouldered and bead-rimmed varieties, along with a storage jar and a pedestal jar. These are supplemented by a butt-beaker in North Gaulish white ware (NOGWH). The remaining fabrics include a sherd of Dressel 20 amphora, sherds of shelly fabric and a sherd of unsourced coarse reduced ware. The late Iron Age to early Roman assemblage from Junction 8 also included pottery from two cremation burials: cremations 6289 and 6293. Cremation 6289 contained three grog-tempered vessels, one of which had been used as a cremation urn. None of these vessels was identified to type as they were all very fragmented and had lost their rims. Cremation 6293 produced three ancillary vessels, but no urn. The vessels were a platter and a carinated cup in grog-tempered ware and a beaker in 'Belgic' sandy ware.

The early Roman assemblage is likewise dominated by grog-tempered wares at 48% by weight, but these are supplemented by unsourced coarse reduced wares, which account for 21% by weight. Vessels in these fabrics are mostly medium mouthed jars, with occasional high-shouldered and lid-seated examples in grog-tempered ware. In addition to the grog-tempered wares and sandy reduced fabrics, neckless jars, bowls and ring-necked flagons in Verulamium region white ware accounted for 13% of the assemblage by weight. The remaining fabrics are all present in minor quantities of less than 5% (see Table A8) and

included jars in local mica dusted ware, a storage jar in Harrold shelly ware, body sherds in Upchurch fine reduced ware, body sherds from Dressel 20 amphorae and South Gaulish samian ware. Vessels in South Gaulish samian ware largely comprised form 18 dishes, but these were supplemented by a form 36 dish and cups of forms 27 and 24/25.

The middle Roman assemblage is more diverse in terms of fabrics than either the late Iron Age to early Roman or early Roman assemblages, but with a large component of residual grog-tempered material accounting for 24% by weight. Vessels in grog tempered ware consist exclusively of jars, including medium mouthed and bead rimmed types. The most common fabric after grog-tempered ware is unsourced coarse reduced ware at 19% by weight and this is supplemented by Verulamium region white ware, which accounts for 13% by weight. Vessels in unsourced coarse reduced ware consist largely of jars, including two cooking jars; these are complemented by a jar/bowl, several bowls, a platter, plain rimmed dishes and lids. The majority of vessels in Verulamium region white ware are also jars or bowls, largely of the neckless variety. There is also a tazza, with finger impressions around the rim. Samian ware (accounting for around 3% of the assemblage by weight) largely consists of form 18 and 18/31 dishes from Central Gaulish production centres, these are supplemented by several cups including form 27s and a form 33, a form 37 bowl and a form 36 dish. In addition there is a South Gaulish form 33 cup and an East Gaulish form 38 bowl. The remaining fabrics are all present in minor quantities, accounting for less than 5% by weight. Notable among these fabrics are plain rimmed and drop-flanged dishes in black burnished ware, a wide-mouthed jar and a beaker in Hadham white slipped reduced ware (HADREWS), mortaria in Oxfordshire white ware and Verulamium region white ware, an indented beaker in lower Nene Valley colour coated ware, a beaker in Upchurch fine oxidised ware (UPCFO), a bowl in Oxfordshire colour coated ware, a jar/bowl in Hadham oxidised ware, a body sherd of Verulamium region amphora, body sherds of Dressel 20 amphorae and body sherds of Gallic amphorae.

Unsourced coarse reduced wares dominate the late Roman assemblage at 48% by weight. Vessels in this fabric are largely drop-flanged dishes, although there is also a beaker and two jars. The next most common fabrics are unsourced black-burnished wares at 9% by weight and Verulamium region white wares at 8%. Only one vessel (a jar) is present in Verulamium region white ware and it can be assumed that this material is residual. Vessels in unsourced black burnished ware are restricted to a single drop-flanged dish or bowl. Body sherds of pink grogged ware and a single storage jar account for 9% by weight and two mortaria in Oxfordshire white ware account for 8%. The remaining fabrics are all present in small quantities, each accounting for less than 5% by weight. Notable among these fabrics are Gallic amphorae, body sherds and drop-flanged bowls in black burnished ware, body sherds and bag-shaped beakers in lower Nene Valley colour-coated ware, Harrold shelly ware, including a storage jar and Hadham oxidised ware, including a jar/bowl.

Pottery from Junction 8 that could only be assigned a broad Roman date range include grog-tempered wares, unsourced coarse reduced wares and Verulamium region white wares, which together account for 59% of the assemblage by weight. Vessels in these fabrics are largely jars, although there is one unguentarium in Verulamium region white ware. Body sherds of Dressel 20 amphora also make up a significant proportion of this assemblage at 16% by weight. With the exception of pink grogged ware at 7% by weight the remaining fabrics are all present in small quantities of less than 5% by weight (see table).

*Table A8: Junction 8 Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight(g)	%Weight
A24 Verulamium region amphorae	1	<1	118	<1
BATAM	59	1	1824	5
GALAM	9	<1	139	<1
BB1	45	<1	447	1.3
HARSH	70	1	484	1
E30 'Belgic' coarse sandy fabrics	70	1	171	1
E40 shell-tempered fabrics	49	<1	432	1.2
GROG	2043	38	13597	39

Fabric	Nosh	%Nosh	Weight(g)	%Weight
COLC	1	<1	1	<1
HADOX	18	<1	72	<1
LNVCC	34	<1	115	<1
LONMD	19	<1	145	<1
NOGWH	1	<1	17	<1
OXFRS	4	<1	27	<1
UNSCC	10	<1	36	<1
OXFWM	15	<1	779	2
VERWHM	16	<1	623	1.8
MISC	4	<1	2	<1
PNKGT	41	<1	857	2.5
UNSOXC	193	3.5	751	2.2
UNSOXF	34	<1	97	<1
UPCFO	1	<1	3	<1
HADREW	5	<1	35	<1
Q20 white slipped oxidised fabrics	6	<1	52	<1
Q30 white slipped reduced fabrics	28	<1	89	<1
VERWS	48	<1	248	<1
HADRE	3	<1	24	<1
LNVRE	2	<1	9	<1
R90 coarse tempered fabrics	8	<1	101	<1
UNSB	135	2	891	3
UNREC	1429	26	6214	18
UNREF	74	<1	454	<1
UPCFR	33	<1	195	<1
VERRE	66	1	367	1
CGSA	55	<1	370	<1
EGSA	5	<1	7	<1
SGSA	44	<1	254	<1
OXFWH	1	<1	35	<1
VERWH	729	13	3918	11
W41 South-East English white/buff fabrics	12	<1	18	<1
<b>Total</b>	<b>5419</b>	<b>100</b>	<b>34013</b>	<b>100</b>

#### Pottery from Junction 10 Borrow Pit

Two sherds of grog-tempered ware, weighing 8 g and dating to the late Iron Age-early Roman period were recovered during the excavations at the Junction 10 Borrow Pit.

#### Pottery from The Aubreys

Four sherds of pottery weighing 23 g were recovered from The Aubreys. These comprise a sherd of unidentifiable material, a sherd of unsourced oxidised ware and two sherds of unsourced reduced coarse ware. The latter three sherds are broadly Roman in date.

*Table A9: The Aubreys Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight (g)	%Weight
Misc	1	25	1	4
UNSOXC	1	25	2	8.6
UNREC	2	50	20	86.9
<b>Total</b>	<b>4</b>	<b>100</b>	<b>23</b>	<b>100</b>

#### Pottery from Area M

Some 614 sherds of late Iron Age and Roman pottery, weighing 3146 g were recovered during the excavations at Area M. With an average sherd weight of 5 g the pottery is generally in poor condition, although some groups contain well-preserved material. The assemblage is dominated by early Roman pottery, which accounts for 88% of the assemblage by weight. The remainder is accounted for by late Iron Age to early Roman pottery at 11% and pottery of broad Roman date at 1%.

The late Iron Age to early Roman pottery largely consists of grog-tempered ware, in addition to which there are two jars and body sherds of Dressel 20 amphora and 'Belgic' sandy ware. The early Roman assemblage is also dominated by grog-tempered ware, which accounts for 38% of the assemblage by weight. Several jars are present in this fabric, along with a butt-beaker and two lids. The grog-tempered ware is supplemented by a medium-mouthed jar in unsourced black burnished ware, which accounts for 22% of the assemblage by weight, and body sherds of unsourced reduced coarse ware, along with two jars and a lid, which account for 13%. The remainder of the assemblage comprises five body sherds of Dressel 20 amphora, body sherds of North Gaulish white ware, Verulamium region white ware and south-east English white ware, along with several form 18/31 dishes, a form 15/17 dish and a form 24/25 cup in South Gaulish samian ware.

Pottery of broad Roman date comprises body sherds of grog-tempered ware and unsourced reduced coarse ware.

*Table A10: Area M Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight (g)	%Weight
BATAM	6	<1	630	11.4
E20 'Belgic' fine sandy fabrics	2	<1	9	<1
GROG	214	35	1391	44
NOGWH	10	1.6	13	<1
SGSA	18	3	123	3.9
UNSOXC	7	1.14	27	<1
UNSOXF	11	1.7	17	<1
UNSB	145	23.6	599	19
UNSREC	57	9.2	356	11
UNSREF	47	7.6	75	2.3
VERWH	3	<1	3	<1
W41 South-East English white/buff fabrics	94	15.3	173	5.4
<b>Total</b>	<b>614</b>	<b>100</b>	<b>3146</b>	<b>100</b>

### Pottery from Area P

A total of 577 sherds, weighing 4405 g were recovered during the excavations in Area P. With an average sherd weight of 8 g the pottery was in a poor to moderate condition, although some groups of large, well-preserved sherds were recovered. The assemblage is dominated by middle Roman pottery, which accounts for 93% of the assemblage by weight. The remainder is accounted for by late Iron Age to early Roman material at 2% and pottery of broadly Roman date at 5%. The late Iron Age to early Roman material consists of body sherds and a medium-mouthed jar in grog-tempered ware. Jars and bowls in Verulamium region white ware dominate the middle Roman assemblage, taking a 37% share by weight. These are supplemented by jars and bowls in unsourced reduced coarse ware, which account for 18%, jars including medium-mouthed and lid-seated types in Harrold shelly ware at 15% and body sherds of pink grogged ware, which account for 8%. The remaining fabrics are all present in minor amounts of 5% or less. Notable among these fabrics are body sherds from Campanian and Gallic amphorae, body sherds of black burnished ware, plain-rimmed dishes in unsourced black burnished ware, body sherds in lower Nene Valley colour-coated ware, several form 36 dishes, a form 18/31 dish and a form 37 bowl in Central Gaulish colour-coated ware and some residual jars in grog-tempered ware. Pottery of broadly Roman date comprised a variety of



fabrics, including a jar in unsourced reduced coarse ware, body sherds of black burnished ware, lower Nene Valley colour coated ware, Hadham oxidised ware and Verulamium region white ware.

*Table A11: Area P Quantification of Late Iron Age and Roman pottery by fabric*

Fabric	Nosh	%Nosh	Weight(g)	%Weight
BATAM	25	4	809	18
BB1	4	<1	18	<1
CAMAM1	1	<1	107	2.4
CGSA	18	3	84	1.9
GALAM	1	<1	119	2.7
GROG	70	12	295	6.6
HADOX	1	<1	1	<1
HARSH	90	15.5	455	10.3
LNVCC	12	2	48	1
LNVRE	1	<1	6	<1
PNKGT	10	1.7	262	5.9
Q30 white slipped reduced fabrics	7	1.2	34	<1
UNSB	21	3.6	78	1.77
UNSOXC	39	6.7	107	2.4
UNSREC	126	21.8	579	13.1
UNSREF	20	3.4	135	3
VERRE	3	<1	57	1.2
VERWH	125	21.6	1193	27
VERWHM	1	<1	11	<1
<b>Total</b>	<b>577</b>	<b>100</b>	<b>4405</b>	<b>100</b>

### Potential

Despite the poor condition of some of the pottery, the assemblage has good potential for further study. There are a number of good groups with reasonably well preserved datable, diagnostic material that can provide a chronological framework for the development of the sites. Additionally, the assemblage can provide good evidence for pottery supply to the sites and has the potential to increase our understanding of supply to the wider region. It therefore has potential to shed light on site economy and trading connections (Willis 2004, 2). The chronological emphasis of all the assemblages is late Iron Age and early to middle Roman and the assemblage therefore has the potential to inform on the late Iron Age to Roman transition, both in ceramic terms and as a wider research issue. A brief assessment of the relative quantities of different vessel classes within the assemblage as a whole suggests that jars are the dominant vessel class. As well as being a feature of early assemblages (Evans 2001, 28), the predominance of jars has been shown to be a feature of assemblages from rural sites (*ibid.*). The assemblage therefore has the potential to inform about site status and the role of the sites within the Roman settlement network; as well as the depth of integration of the sites into the Roman economy (Willis 2004, 11). The functional composition of funerary assemblages has been shown to adopt a different pattern to that of domestic assemblages, reflecting the deliberate choice of vessels according to perceived social status (Biddulph 2005) and the presence of pottery from graves within the assemblage therefore offers the potential address issues of social practice in relation to funerary ritual. The assemblage also has the potential to address issues of Romanisation and identity through functional analysis of vessel class. Analysis of the spatial distribution of the pottery may identify functional areas within sites and differences in function and/or status between the different sites. It may also shed light on practices of structured deposition.

### Recommendations

The assemblage has been recorded to full publication standard during the assessment process and no further recording work is required. However, while every effort has been made to record the assemblage using codes already devised for the region and based upon the national fabric reference collection (Tomber and Dore 1998) by Malcom Lyne (Lyne 1999), in some cases it has been necessary to employ codes from the Oxford Archaeology recording system for prehistoric and Roman fabrics (Booth 2007). These codes need to be replaced with codes more appropriate to the region and based upon the national fabric reference collection; in order to facilitate ease of comparison with other assemblages in the region. The assemblage is large and reasonably well preserved, with the potential to advance our understanding of a number of issues within late Iron Age and Roman archaeology and should therefore be fully published. Quantified information on the functional composition of the assemblage by phase should be included in the report (Willis 2004, 15). A number of key groups representative of the chronological and typological range of the assemblage, along with all of the funerary pottery, should be illustrated for publication.

#### **APPENDIX 4: ASSESSMENT OF THE POST-ROMAN POTTERY FROM JUNCTION 8 NORTHBOUND**

*by John Cotter*

##### **Introduction and methodology**

A total of 2245 sherds of post-Roman pottery weighing 13.679 kg was recovered from 132 contexts on the site. This is almost entirely of medieval date with a small quantity of 19th-century pottery also present. All the pottery was examined, spot-dated and fully catalogued during the present assessment stage (details in archive). For each context and fabric the total pottery sherd count and weight were recorded. Vessel form, if identifiable, was also recorded together with rim EVEs (circumference length) if present. As no universally accepted classification system exists for medieval pottery forms and fabrics in this area a relatively simple site-specific system of classification was devised. Temporary medieval pottery fabric codes were devised but with the aim of correlating these at a later date to those of the Museum of London (MoLAS) fabric reference collection which are widely used in the London area. A small site-specific fabric reference collection was also created. Form typology was limited to a few basic definitions (eg jar, bowl etc.). More detailed codified definitions for vessel sub-parts (types of rim, base, handle etc) were also avoided as these rarely prove very useful on relatively small medieval assemblages such as this. Simple descriptions of vessel sub-parts and any other attributes worthy of note (eg decoration, traces of use etc.) were, however, usually recorded in a comments field. Items of interest and potential illustrations were noted and sometimes sketched. Late post-medieval or modern wares have been assigned MoLAS codes. These have been quantified by sherd count and weight but not EVEs.

##### **Date and nature of the assemblage**

Overall the pottery assemblage is in a fragmentary condition. Average sherd weight is only 6 g. and many of the smaller sherds are clearly abraded. Within this range, however, some larger fresher pieces have survived. These include at least two complete jar/cooking pot profiles - though one of these needs reconstruction - and several half-profiles or significant portions of vessels. This is consistent with an assemblage largely derived from ditches, scattered pits and postholes and which appears to represent casual domestic rubbish disposal from a rural settlement context. This disposal probably took place over a century or two. The character of the pottery suggests occupation or human activity perhaps from as early as the 11th century although the main period of activity appears to have been from the late 12th to the 13th century. There may have been some activity into the 14th century, although the evidence for this is a little ambiguous.

There are no large well-preserved groups of pottery although the material from pit fill 6407 with a total of 299 sherds (2709 g.) of pottery is a reasonably good, if somewhat fragmentary, group of presumably contemporary material. This produced parts of several dozen vessels - mainly jars/cooking pots and a few jugs including the only jug from the site in Developed Stamford ware (a high quality table ware produced at Stamford in Lincolnshire c 1150-1250) and sherds of an unidentified glazed ware that may be an exotic import (see below). A number of smaller pottery groups were also identified but context 6407 is undoubtedly the most important and perhaps most representative of the site in general in terms of the range of forms and fabrics present. This group would certainly benefit from more detailed description and publication.

A relatively small number of pottery fabrics were identified. These are briefly described below.

**Fabric 1A** South Hertfordshire-type greyware: medium-coarse. Equivalent to MoLAS code SHER (c 1170-1350) and SHER COAR. This grey reduced sandy coarse ware is the commonest pottery fabric from the site as it is from most of Hertfordshire. There is considerable variation in texture, hardness and colour tone within this range. At one end of the range the texture can be fairly even with abundant and well-sorted quartz grains. At the other end of the range there is a gradual increase in coarser inclusions including both quartz and flint grits. The basic fabric and technology, however, appears fairly uniform. Several production sites are known in the county (McCarthy and Brooks 1988, 296-7) and a kiln producing pottery in this tradition was recently discovered at Uxbridge, Middlesex (Knight and Jeffries 2004). Jars/cooking pots clearly predominate on this site. These are predominantly wheel-thrown but a few clearly have handmade bodies and wheel-finished rims. A few have bands of combed decoration and some have applied thumbed strips. A much smaller number of jugs also occur but none of these has the pronounced thumbed and stab-decorated handles that are typical of this tradition, although this may be due in part to the low number of handle fragments recovered. Rarer forms include a possible storage jar base fragment with thumbed strips and combed decoration, and parts of something like a tripod pipkin or skillet. Definite bowls are noticeably rare. An odd basal sherd (or a lid?) from context 6451 is 'decorated' underside with an unusual incised lattice design made before the vessel was fired.

**Fabric 1B** South Hertfordshire-type greyware: fine-medium. Possibly equivalent to MoLAS code SHER FINE? A much rarer and much finer variant of the above - although other sources cannot be ruled out. Present as jars/cooking pots.

**Fabric 1G** Glazed grey sandy coarse ware. Possibly a glazed variant of South Hertfordshire greyware. Possibly jugs. Rare.

**Fabric 2** Chalk-tempered ware. Possibly equivalent to MoLAS code EMCH (Vince and Jenner 1991, 70-72). Mainly oxidised with a grey core. This fabric is common from late 11th- or early 12th-century deposits at St Albans. Present as jars/cooking pots. Fairly rare from this site and possibly mostly residual?

**Fabric 3** Flint-tempered ware. Possibly equivalent to MoLAS code EMFL (Vince and Jenner 1991, 69). There may be an overlap here with coarser variants of Fabric 1A. Possibly 11th to 13th century? Probably local. Present as jars/cooking pots. Fairly rare from this site and possibly mostly residual? A small body sherd of this from context 6631 is decorated with sunburst stamps in the Saxo-Norman tradition. This is the only coarse ware sherd from the site with stamped decoration.

**Fabric 4** St Neots-type ware. A regional late Saxon shelly ware. 10th to 12th century. Present only as two small sherds.

Fabric 5 Fine grey sandy ware with fossil shell. Possibly 11th to 12th century. Present as a single small piece of jar/cooking pot rim with thumbled decoration. Regional import, perhaps London area?

Fabric 6 Developed Stamford ware. A high quality wheel-thrown green-glazed whiteware produced at Stamford in Lincolnshire c 1150-1250. Normally traded in the form of jugs. All the sherds here are from a single jug in context 6407.

Fabric 7A Oxidised orange sandy slipware. Present as a dozen or so body sherds apparently from glazed jugs with evidence of white slip decoration. The fabric is fairly coarse. These are likely to be fairly local or perhaps regional, possibly Essex? Probably 13th to 14th century.

Fabric 7B Oxidised orange sandy slipware (no visible slip). Otherwise as 7A above. One or two sherds.

Post-medieval wares. A small number (24 sherds) of late post-medieval wares occur. These have been assigned MoLAS fabric codes but are not individually listed here.

Unidentified wares (UNID). A small number of sherds cannot be assigned to any of the above fabric groups. These are individually described in the comments field and include a few small glazed sherds that cannot, at present, be confidently ascribed to known medieval pottery industries. Included here are a few body sherds from a vessel in an unusual hard-fired grey ware with traces of white slip and possibly green alkaline glaze (contexts 6407 and 6202). These sherds are reminiscent of a vessel from Canterbury of probable Near Eastern origin (Cotter 2001, 237-8) and require further examination to demonstrate whether or not they represent an exotic import.

### **Potential**

While not the best-preserved of medieval pottery assemblages this group does, however, have reasonably good potential for further study and to address a number of issues. Most obviously the pottery provides a dating framework for the site. It may be possible to refine this somewhat during the course of further research. Spatial analysis of forms/fabrics might also shed light on the development of the site and possibly highlight areas of functional or social difference such as cooking areas. The range of pottery forms present also provides information about some of the daily concerns of the inhabitants of the site, such as cooking/food preparation and storage in the case of jars and serving of liquids in the case of jugs. The notably low proportion of wide bowls, or definite bowls of any sort, might reflect on the economy of the site as wide bowls have been linked on other rural medieval sites to dairying practices, so their absence from this site requires some explanation. The geographic sources of the pottery also reflect on the needs and economy of the site's occupants. Most of the pottery needs of the site were easily supplied by relatively local south Hertfordshire sources, particularly in the case of coarse wares/cooking wares. It may be possible to suggest which south Hertfordshire kilns were supplying the site by comparing forms and fabrics against published and unpublished collections including reference collections such as those in London. Table wares such as glazed jugs were drawn from wider regional sources, even as far as Stamford in Lincolnshire, and, in the case of the possible exotic import, perhaps from even further afield.

### **Recommendations**

As the assemblage has been fully catalogued little further work will be required here. The few dozen medieval and post-medieval sherds from other M1 areas and evaluations will, however, need to be recorded to the same standard. Catalogue data will need to be analysed to generate the statistics needed for use in the publication report. Material will need to be extracted for

illustration and more detailed description. This should include the large pottery group from context 6407 which should be published as the best representative of the whole assemblage. A selection of other items for illustration should be made from amongst the more significant or complete items from other contexts. The London (MoLAS) medieval pottery reference collection should be consulted both to correlate fabric codes and to examine fabric samples from other Hertfordshire sources and a more detailed search of relevant literature should be made. The possible exotic import from context 6407 should be examined scientifically to determine its source.

## **APPENDIX 5: ASSESSMENT REPORT ON THE CERAMIC BUILDING MATERIAL AND FIRED CLAY**

by *Cynthia Poole*

### **Introduction and Methodology**

Ceramic building material and fired clay, predominantly of Late Iron Age and Roman date, were recovered from the mitigation phase of excavations, at Junction 8, Junction 9, Area M and Area P. The material from the evaluation excavations had been previously recorded and reported and was not re-examined.

The total of ceramic building material amounted to 2886 fragments weighing nearly 212 kg and fired clay totalled 2543 fragments weighing 6783 g. A high proportion of the fired clay had been recovered by sieving and those pieces recovered by hand excavation were only identified during recording the ceramic building material, from which it was frequently difficult to distinguish. The sieved material was rapidly scanned and only large size fragments recorded in any detail. Much of the sieved material was discarded, retaining only up to six representative fragments, where no shaped pieces survived. Small shattered fragments of tile were discarded, unless they were the only pieces from an individual context. Both assemblages have been fully recorded and the data entered on an OpenOffice spread sheet.

Fabrics were characterised on macroscopic characteristics as well as with the aid of a x10 hand lens and additionally with a binocular microscope at x25 magnification.

### **Condition**

No complete tiles were recovered, though in a small number of cases more dimensions than just thickness could be recorded. However the overall mean fragment weight (MFW) of 73 g for the tile reflects the relatively small size of individual pieces, many of which are moderately or heavily abraded. The fired clay was even more poorly preserved, with a mean fragment weight of 2.7 g, which reflects the fact that most was recovered from sieving. However, even the hand recovered material only had an MFW of 12.3 g, a size which rarely produces recognisable or diagnostic fragments.

### **The Fabrics**

Eight Roman and three medieval tile fabrics were identified. Nearly all the tile was orange in colour and there were frequently intermediate types, between fabrics.

#### ***Roman fabrics:***

Fabric A: pale pink-cream colour containing a high density of coarse quartz sand and sometimes a scatter of angular coarse stone grit. This was very similar in character to Eccles ware, though whether this was indeed being brought from the Eccles kilns or was produced more locally from a similar geological clay source has yet to be established.

Fabric B: clay matrix containing a high density of fine-coarse quartz sand and rounded maroon iron oxide or iron rich silty clay pellets 1-5 mm.

Fabric C: clay matrix contains medium-coarse quartz sand.

Fabric D: very fine fabric containing no or few inclusions (usually fine sand).

Fabric E: strongly laminated clay matrix with pale orange or cream streaks enlarging into rounded globules of cream clay. The clay matrix usually contained moderate-frequent quantities of fine-medium quartz sand. Sub-type E2 was similar, but laminations were more diffuse and it contained detached cream or occasionally maroon rounded silty clay pellets 1-7 mm.

Fabric F: fine clay with few visible inclusions, but highly porous, which appeared to result from shell inclusions having been leached out in most examples. In a few some evidence of shell grit survived.

Fabric G: contained a high density of white usually coarse quartz sand and common angular flint grit up to 20 mm.

Fabric H: in some ways superficially similar to fabric E2, but the cream-white rounded grits 1-8 mm that defined it were identified as chalk rather than clay pellets.

Fabrics B, C and D were sometimes visibly laminated, though the overt colour variation seen in fabric E was not present.

#### **Medieval fabrics:**

Med1: This contained a high density of coarse white quartz sand and was similar in character to fabric G.

Med2: This is a sandy laminated clay similar to fabric E/E2, but somewhat finer.

Med3: This was a more mixed finer sandy clay matrix.

There were also some very distinctive coarse gritty moulding sands used both in the Roman and medieval periods.

Fabrics used were predominantly B, C, D, E and G at all sites. Fabric A was concentrated on Junction 9 with a single fragment at Area M and Junction 8 Northbound. Fabrics F and H occurred in very small quantities only at Junction 8 Northbound. The same or very similar fabrics were used for much of the fired clay, which has resulted in the difficulty of separating the fired clay from the tile and suggests that both were using fairly local sources of clay, as it is the norm to utilise readily available clay sources for fired clay. One fired clay fabric (FC:A) was distinct from the tile and consisted of a clay mixed with poorly sorted sand and small grit and in one instance containing additional organic temper (FC:A2).

#### **Forms and Function**

Examples of all major Roman tile types were found including *tegula*, *imbrex*, flue tile, brick, *tesserae* and more unusually a few examples of segmental brick and *tegula mammata*. However only the larger sites, described in more detail below, produced a wide range of forms, whilst the smaller excavations and watching briefs produced almost exclusively brick and plain flat tile, with only a few occurrences of flue tile and *tegula*. Some of the *tegulae* had unusually wide flanges (40-50 mm), which were initially mistaken for fragments of brick.

Markings on tiles were sparse, consisting almost entirely of signature marks plus a single paw print, apart from keying on the flue tiles. The majority of signatures took the most common form of a simple semi-circle made with one or more fingers, though a more unusual type of a double loop or curving zigzag was found at Junction 9. The keying was all of standard common combing patterns, generally of straight vertical or diagonal bands. Impressed lines on a small number of tiles may be a form of tally mark.

The fired clay was all very fragmentary, often retaining only a single surface, if any shaping survived at all. More informative pieces have been identified as oven plate and triangular oven brick.

Small quantities of medieval tile were recovered; the majority flat roof tile - peg tile - when identifiable, together with a single ridge tile fragment, a floor tile and a few brick fragments.

#### **Junction 8 Northbound**

This site produced the largest individual assemblage of 2006 fragments of tile weighing 164,460 g and similarly the largest group of fired clay with 2359 fragments weighing 4679 g. This site also produced the greatest variety of forms, almost entirely Roman in character. The assemblage was dominated by brick which formed 77% by weight of the tile and it is likely that much of the plain flat tile category was thin brick also. Other identifiable forms, of which *tegula* was most common (7%), included *imbrex*, flue tile, *tesserae* and more unusually a few examples of *tegula mammata* and curved segmental bricks.

Post-Roman material included a single small fragment each of medieval roof tile and brick.

The fired clay included oven plate, possible hearth floor, triangular oven brick and single sherd of briquetage.

#### **Junction 8 Southbound**

This site produced a considerably smaller quantity of tile, amounting to 114 fragments weighing 3109 g, whilst fired clay was negligible (85 g).

The only identifiable Roman tiles were single fragments of flue tile and brick, the remainder being plain flat tile or small shattered fragments. Over three-quarters of this small assemblage was medieval, consisting primarily of roof tile together with a couple of brick fragments. This was the largest amount of post-Roman tile from any of the sites.

#### **Junction 9**

This site produced the only other substantial assemblage of tile consisting of 695 fragments weighing 40757 g, whilst fired clay amounted to 85 fragments weighing 2010 g.

The Roman assemblage contained the most common forms including *tegula*, *imbrex*, flue tile, *tesserae* and brick, of which the latter again dominated the assemblage forming just over 50% by weight. This site also produced two examples of segmental brick, though these were too shattered to discern whether they were circular or semi-circular in form.

Fired clay included possible oven plate, hearth floor and a sherd of briquetage.

A small quantity of medieval roof tile and a single floor tile fragment were also recovered.

#### **Potential**

The dominance of brick and any flat forms that could be used in a similar manner reflects the use of such material in small structures such as ovens, hearths, corndriers and kilns, which is the common pattern on rural agricultural settlements. Such use is attested by the extensive evidence of burning and re-firing on the material from all excavation areas.

The assemblage of the tile and the fired clay has the potential to provide information on the construction of such structures. Additionally this re-use of brick and tile in secondary structures can also provide information on the source of such material and the relationship of the settlement to a higher status site or sites, such as a villa, from which it would have been obtained. The proportion of fabrics at the different settlements may provide a spatial pattern on the supply areas of different producers.

The medieval tile assemblage, though small, does indicate that roofing tile was used in limited quantity or was very thoroughly removed for reuse elsewhere, when the building went out of use. It was also noted that a number of large groups of Roman tile were found in medieval features at Junction 8 Northbound, and this may indicate the reuse of Roman brick in the medieval phase. The absence of medieval material from these features is noteworthy.

#### **Recommendations**

The assemblage has been fully recorded as part of the assessment. The material from the evaluation phase of the project should be integrated with it, which will require their fabrics to be reassessed and assigned to the categories established during the assessment process. It is recommended that the assemblages of ceramic building material and fired clay be analysed both in relation to the use of the material on the settlements in terms of structural use and the

supply of material from the primary producer and kiln sites via neighbouring settlements, which may have provided the immediate source of material.

#### **APPENDIX 6: ROMAN COINS**

*by Paul Booth*

Only 12 Roman coins were recovered during the excavation phase of the project, supplementary to the two coins found in the evaluation phase (one, probably of Domitian, from Trench 1130, subsequently within the area of Junction 8 Northbound excavation and an undated (but probably 4th century) piece from Trench 1363, subsequently within the Junction 9 excavation area). In addition a 19th century penny, worn totally flat, was found. The coins were in very variable condition, some relatively well preserved and others completely eroded. Where possible, complete identifications were made. Five coins require cleaning to facilitate or improve existing identifications, while three are considered to be too eroded for further work to be meaningful. The Roman coins are listed in Table A12.



Table A12: Roman coins

Context	Site	SF no	Denomination	?Date	Obverse	Reverse	Mint	Comment
113010	(J8N)	103	24mm as	781-96	]ANAUG[ head r, probably Domitian	figure l, with cornucopia in l hand, r hand extended holding ? SC		evaluation
136311	(J9)	105	9mm+	?4C	?	figure(s), cf Gloria Exercitus		evaluation
2005	J9	2001	13mm+	13-4C	?	?		eroded
2005	J9	2004	16mm AE3	330-335	?	GLORIA EXERCITUS 2 standards		cleaning needed
2005	J9	2042	18mm AE3	330-335	CONSTANTINUSIUNNOBC	GLORIA EXERCITUS 2 standards	Trier	as LRBCI, 68
2005	J9	2005	15mm AE3	341-348	CONSTAN] SPFAUG	VICTORIAE DD NN AUGG Q NN	?Trier	LRBCI, 149
2007	J9	2002	26mm as?	1-2C	head	?figure		cleaning needed
2107	J9	2010	23-25mm antoninianus	276-282	IMPCPROBUSPFAUG	MARS VICTOR Mars r	Lyons	RIC VII, 38
2107	J9	2021	20mm+ AE2	313-315	?IMPCONSTANTINUSAUG	SOLI INV[ICTO CO]MITI	Trier	RIC VII Trier, 39 or 40
2545	J9	2048	10mm	?330-335	CON[ head l			cleaning needed
3044	Area M	3001	14mm+	13-4C	?	?		cleaning needed
4002	Area P	4001	22mm+	?1-2C	?head	?		eroded
7082	J8N	6108	17-19mm AE3	324-330	?	PROVIDENTIAE AUGG	?	cleaning needed
7234	J8N	6113	12mm+	13-4C				eroded

None of the sites has produced a meaningful assemblage. Single early Roman coins come from the evaluation of Junction 8 Northbound, from Area P and from Junction 9. Of these, only the first was fairly closely datable within the period, being probably of Domitian (AD 81-96). The remaining coins are all late Roman, as would be expected in the context of lower status rural settlements. Of these, one was certainly of the later 3rd century while three were assigned a broader late 3rd-4th century date range; all were in poor condition and the attribution was on the basis of size alone. The largest group of coins, from Junction 9 (9 coins, including one from an evaluation trench), is typical of rural assemblages in including only one early Roman piece, despite that fact that the majority of activity on the site was of this date. It is notable that none of the identifiable 4th century coins post-dated the middle of that century.

The small coin assemblage supports perceptions about the character of the main excavated sites and provides limited dating evidence for a few features. Further work will involve cleaning of five coins and subsequent revision to the present discussion in the light of refined dating of those pieces. Extensive regional comparison is not justified for this material

## APPENDIX 7: METAL FINDS

*By Ian Scott*

### Introduction

The metal assemblage from the M1 Widening comprises in total 538 fragments, excluding coins. There are 19 copper alloy finds, one piece of melted lead wire and 518 iron pieces. These totals exclude approximately 379 pieces, including slag or cinder (n = 10), natural nodules (n = 4), fragments of ironpan or corrosion products and very small iron fragments (n = 365), which are excluded from further consideration. The majority of these small fragments are from the excavations on Junction 8 North.

The metalwork derives from a number of interventions (Table A13); the most important of which in terms of numbers of finds are the excavations at Junction 9, and Junction 8 North. The finds from each intervention are considered separately below.

### Methodology

The metal work was scanned. Because it is largely made up small fragments, nails and hobnails, with very few intrinsically interesting objects, it was decided to record the assemblage at the assessment stage to minimise further work during the analytical stage. The metalwork was identified to function, counted, and where necessary measured, and the data recorded onto computer database. The material was then assessed for analytical potential.

### Site assemblages

#### *Junction 9*

The metal finds number 238, including 12 copper alloy pieces. The assemblage is dominated by nails or nail fragments of which there are 201. The remaining finds include a possible carpenter's gouge (sf 2047, context 2048), a small hammer (context 2038), an ox-goad (context 2007) and part of a pair of scissors sf 2041, context 2447). The latter fragment is medieval or later in date. The single household item is the tine from a table fork of post-medieval date (sf 2003, context 2007). Personal items that number 10 include five hobnails. The remaining personal items comprise a fragment of copper alloy buckle bow (sf 2011, context 2112), fragments of two broad bangles or armlets (sf 2008, context 2048; and sf 2050, context 2488) of Roman date, a probable finger ring (sf 2045 context 2557) and a very well-preserved Roman bow brooch of unusual form (sf 2072, context 2907). There are some structural items - clamps, holdfasts, looped pin and a washer - and miscellaneous fragments. Amongst the objects of uncertain identification are a possible fragment from a hipposandal (context 2048), and an unusual flat circular object with decorative cutouts and a lined central hole (context 2139).

The most interesting finds are the small group of items of personal adornment - 2 bangles, 1 brooch and 1 finger ring. These together with the possible hipposandal wing and the mystery circular object should be published.

#### ***Junction 8 Northbound***

There are 3 copper alloy finds and 213 iron finds from this excavation. The largest single functional category is personal, which includes three copper alloy objects, a pin or needle stem (sf 6101, context 6816), a stud (sf 6011, context 6055) and possible pair of tweezers (sf 6081, context 6490). The remaining personal items are hobnails, which number a minimum of 122; there are at least 157 fragments of hobnail. Most of the hobnails are from three contexts: 6020 (n = 43), context 6316 (n = 49) and context 6420 (n = 25). There is a single hobnail from context 6697. Nails number a relatively modest 70 pieces.

Items relating to transport (n = 8) comprise horseshoe nails, almost certainly all late medieval or post-medieval in date. Household objects comprise a single incomplete knife blade (sf 6115, context 7305). Structural items (n = 5) include a modern wall hook, as well as clamps and a possible hinge fragment. Otherwise the assemblage includes nine miscellaneous items - strip, sheet, rod, etc - and a single length of lead wire.

#### ***Junction 8 Southbound***

These excavations produced 7 objects including three nails, three miscellaneous pieces and a small ?lead decorative moulding, probably post-medieval. No further work is required.

#### ***Junction 8 Watching Brief***

The finds comprise two nails and the complete head of four tine agricultural fork, probably of 19th-century date. No further work required.

#### ***Junction 8 Compound***

The single find was part of a horseshoe of early medieval type (Clarke Type 2: Clark 1995, 86 and fig. 62). No further work required.

#### ***Junction 10 Borrow Pit***

This watching brief produced one nail and a large modern pair of probable compasses or dividers. These have iron arms and a non-ferrous hinge. No further work required.

#### ***Area M***

The finds from this are comprise three nails and small fragment of bar or nail. No further work required.

#### ***Area P***

Eleven finds were recovered, including three fragments of binding strip with expansions pierced by nail holes, six nails, a piece of iron bar, and an object formed from curved strip or bar of uncertain function (all context 4007). No further work required.

#### ***The Aubreys***

A single hobnail was recovered from context 239. No further work is required.

#### ***Evaluation Trenches***

The evaluation trenches produced 48 objects. These include part of a cast 19th- or 20th-century ploughshare, three post medieval horseshoes, and a much eroded Romano-British bow brooch (sf 109, context 133205). Amongst the objects of uncertain identification is a fragmentary circular copper alloy mount with raised beaded border (sf 106, context 136311). The other two unidentified objects are extremely poorly preserved. The remaining finds comprise a small oval iron collar or binding, 27 nails and 11 miscellaneous fragments.

The Romano-British brooch, although poorly preserved, should be noted and described in the report. Similarly the circular mount should be described and recorded in any report.

#### Assessment of potential

The metalwork assemblages from the M1 widening have very limited group value and limited potential for analysis.

The assemblages from the excavations at Junction 9 produced a small but interesting group of Romano-British items of personal adornment together with a small number of other objects, which should be published.

The assemblage from the excavations on Junction 8 North is less intrinsically interesting, but the presence of groups of hobnails should be noted, and the possible tweezers, copper alloy stud and pin/needle stem should be published briefly.

There is a small group of objects from the evaluations which are worthy a short published note.

The assemblages from the remaining interventions require no further work

Table A13: Summary Quantification of metal finds by Site and Function

Site	Function									Totals
	Tools	Transport	Household	Personal	Structural	Bindings	Nails	Misc	Query	
Junction 9 (Exc)	4		1	10	4		201	9	9	238
Junction 8 N (Exc)		8	1	125	5	2	70	10		221
Junction 8 S (Exc)							4	3	1	8
Junction 8 WB	1						2	1		4
Junction 8 Compound		1								1
Junction 10 WB				5			2		1	8
Area M							3	1		4
Area P						3	6	1	1	11
The Aubreys				1						1
Evaluation Trenches	1	3		1		1	27	11	4	48
<b>Totals</b>	<b>6</b>	<b>12</b>	<b>2</b>	<b>142</b>	<b>9</b>	<b>6</b>	<b>314</b>	<b>36</b>	<b>16</b>	<b>538</b>

#### APPENDIX 8: ASSESSMENT OF METALWORKING REMAINS

by Luke Howarth

Some 7.4 kg of slag were recovered during the excavation phase of the project, with a smaller quantity (just over 1 kg) from the evaluation. Over 90% of the material (by weight) came from the site at Junction 9, with most of the rest from Junction 8 Northbound. The great majority of the material from evaluation also came from the Junction 9 area (in Trenches 1356, 1357 and 1363). The material was recorded by number of fragments per context in terms of functional categories, where these could be determined. This information is summarised in Table A14.

Table A24: Summary description of slag assessed

Context	Sample No	No. of fragments	Comments
600		1	Possible fragment of hearth bottom
1362	112	5	No diagnostic form
1362	112	5	No diagnostic form
2038		6	No diagnostic form

Context	Sample No	No. of fragments	Comments
2038		10	Small hearth bottom
2044		4	Possible fragment of hearth bottom
2048		4	Undiagnostic
2048		1	Abraded fragment of Fe slag?
2138		2	Undiagnostic form, some pale green oxide (Copper?)
2139	2002	4	No diagnostic form
2139		1	Tabular fragment of slag with CBM annealed to one surface – Fabric of structure
2156		10	Vitrified CBM and fuel ash slag (FAS)
2279		1	Bun shaped smithing hearth bottom
2332	2024	1	No diagnostic form
2437		3	No diagnostic form
2437		1	No diagnostic form
2448	2036	2	Fragment of hearth bottom
2448	2036	11	No diagnostic form
2474		7	Vitrified CBM
2488		23	Smithing hearth bottom
2488		1	FAS
2488		2	Lump of iron surrounded with Fe oxide and CBM.
2511		14	No diagnostic form
2511		2	No diagnostic form
2513		3	No diagnostic form, iron rich slag.
2513		25	Mixture of vitrified CBM, some fragments of nail and undiagnostic fragments of Fe rich slag.
2579		35	Small hearth bottom
2583	2039	1	No diagnostic form
2587		12	Fe slag with CBM annealed to one edge
2587		1	Vitrified CBM
2605		5	FAS
2616		6	Iron fragments and partially vitrified CBM
2616		13	No diagnostic form, Fe rich slag and FAS
2616		1	partially vitrified
2619		1	No diagnostic form
2664		1	No diagnostic form
2705		11	small hearth bottoms
3051		1	No diagnostic form
3064		1	No diagnostic form
5026		15	Fe fragments
5235	2069	1	No diagnostic form
6055	6027	2	No diagnostic form
6061	6039	1	No diagnostic form
6067		1	Partly vitrified CBM
6154		1	Vitrified CBM, furnace fabric.
6169		1	Bun shaped hearth bottom. Cooling joints perpendicular to surface
6189		1	No diagnostic form
6215		1	Abraded fragment of Fe slag?
6219		2	No diagnostic form
6295	6007	1	No diagnostic form
6347		2	Abraded fragment of Fe slag?
6356	6037	1	No diagnostic form, Fe rich slag
6475		1	No diagnostic form, Fe rich slag

Context	Sample No	No. of fragments	Comments
13615		2	No diagnostic form, Fe rich slag
126304		1	No diagnostic form.
135605	111	25	No diagnostic form, Fe rich slag
135605	111	19	Fragment of smithing hearth bottom ?
135605	111	45	No diagnostic form, Fe rich slag
135607	111	19	Mostly undiagnostic fragments, some possible fragments of smithing bottom.
135607		3	No diagnostic form.
135607		5	No diagnostic form.
135612		1	No diagnostic form.
135705		1	Possible fragment of smithing hearth bottom
136313		16	No diagnostic form.

The material listed in Table A14 was mostly recovered in hand excavation, but slag fragments were also recovered from environmental samples. The larger fragments are described in the table above, but in some cases small fragments of metal working debris were also found in the finest fraction (2-0.5 mm) of the environmental samples and these residues have been retained. The residues were weighed and then ten percent by weight of the residues was examined using a magnet and a x10 hand lens to pick out any metalworking debris.

All of the residues retained specifically for such further examination contained some evidence of metal working, four samples in particular contained large concentrations of hammerscale, and these are listed below (Table A15).

*Table A15: Residues retained for metalworking debris*

Context	Sample No.	Wt of 10%	Wt of metal working debris picked out	% of hammerscale present in the sorted metalworking debris
2139	2002	38 g	2 g	~75%
1362	112	33 g	2 g	~80%
2375	2033	60 g	1 g	~25%
7336	6081	56 g	3 g	~30%

#### *Summary of the material*

The morphology of the slags from this site indicates working on small hearths. Some slags clearly represent smithing, but others are more ambiguous. The residues retained for metal working debris all contained hammerscale and four samples contained relatively high concentrations of this material (see Table A15). Hammerscale is significant as it is associated with refining of slags. The slag is predominantly indicative of iron working, though there is some evidence for the presence of copper in some of the slags. This may indicate that different ores were being worked at times, though copper and iron do occur together in some ores. The great majority of material comes from Roman deposits, the largest groups coming from features of 2nd century date at Junction 9. A very small proportion of the slag from Junction 8 Northbound was from medieval deposits, but it is possible that this material was residual. The assemblage as a whole is relatively homogenous and is consistent with smithing of iron in small hearths rather than large scale primary smelting.

No further recording work is required on this assemblage.

## APPENDIX 9: GLASS

By Ian Scott

## **Introduction**

The glass assemblage from the M1 Widening comprises in total 42 sherds. The diagnostic glass is almost all Romano-British - there are a few modern fragments - and the undiagnostic glass could all be Romano-British.

Most of the glass derives from the excavations on Junction 9 North (Table A16), with only small amounts from Junction 8, and a few pieces from evaluation contexts. The finds from each intervention are dealt with separately.

## **Methodology**

The glass was scanned and, because the assemblage is so small, it was fully recorded at the assessment stage. The glass was identified to function - window, vessel, object - counted, and where necessary measured, and the data recorded onto computer database. The material was then assessed for analytical potential.

## **Site assemblages (Table A16)**

### ***Junction 9***

There were 33 fragments of glass from this excavation, including two pieces of window glass. Context 2007 produced 12 undiagnostic body sherds, and two further joining sherds. All are blue-green in colour. The undiagnostic sherds were small and lacking in distinctive features. To judge from the different thickness of the sherds there are pieces from at least three or four different vessels. The two joining sherds from 2007 form part of the base and lower body of small vessel with an open base ring and indented base in blue-green glass.

Context 2038 produced eleven pieces of glass. This included a single sherd of possible blue-green window glass. The sherd is flat on one side, but seems a little thin for window glass. The metal is characterised by a large number of bubbles. The vessel glass from 2038 comprises three blue green sherds, a deep blue sherd, and six sherds of yellow brown glass from a single vessel with at least one self-coloured trail. The sherds do not join, but are almost certainly from a single vessel.

Context 2048 produced two sherds of pale blue-green vessel glass, probably from a single vessel, and a single yellow green vessel body sherd with self coloured trail. Contexts 2129, 2353, 2354 and 2406 all produced single sherds of vessel glass. A small indented base - possibly from a beaker - in pale green glass with small bubbles came from context 2129. The other contexts produced single undiagnostic sherds, including a deep blue sherd from context 2354.

### ***Junction 8 North***

The glass from this excavation consists of a small sherd of modern float (window) glass and a tiny undiagnostic body sherd in brown glass. A further single sherd of modern float glass came from the Junction 8 watching brief. No further work is required.

### ***Evaluation trenches***

The glass from the evaluation trenches is a mixed bunch. It includes a sherd of modern float glass, part of a moulded brown bottle with embossed printing, and part of the neck of a modern wine bottle (context 107505) and the base of moulded sauce or medicine bottle (context 141706) of flat octagonal section.

More interesting was a small indented base sherd in pale blue-green glass with bubbles in the metal (context 136305), and a thick sherd of blue-green glass which appears to have been partly melted after fracture (context 136311). The sherd is probably from a Romano-British blue-green bottle.

Table A16: Summary Quantification of Glass by Site, Context and Type

Site	Context	Vessel glass	Window glass	Totals
Junction 9 (Exc)	2001		1*	1
	2007	14		14
	2038	10	1	11
	2048	3		3
	2129	1		1
	2353	1		1
	2354	1		1
	2406	1		1
<b>Sub Totals</b>		<b>31</b>	<b>2</b>	<b>33</b>
Junction 8 N (Exc)	6420	1*		1
	6475		1*	1
	<b>Sub Totals</b>	<b>1</b>	<b>1</b>	<b>2</b>
Junction 8 WB	5613		1*	1
<b>Sub Totals</b>			<b>1</b>	<b>1</b>
Evaluation Trenches	107505	2*	1*	3
	136305	1		1
	136311	1		1
	141706	1*		1
	<b>Sub Totals</b>	<b>5</b>	<b>1</b>	<b>6</b>
<b>Totals</b>		<b>37</b>	<b>5</b>	<b>42</b>

Asterisked items are certainly post-Roman

### Assessment of potential

The glass assemblages from the M1 widening have very limited group value and limited potential for analysis.

The assemblage from the excavations at Junction 9 produced a very small but interesting group of Romano-British glass, which should be briefly published. The two sherds from the evaluation trenches, from contexts 13605 and 136311, are from the same area as the Junction 9 excavation and can be considered with the material from that site. Both are Romano-British. The part melted sherd from context 136311 in particular is worthy of note given that a cremation burial in the Junction 9 excavation was found a little to the north of the location of Trench 1363. It is possible that other cremation burials may have existed in the vicinity of the north end of the Junction 9 excavation area.

The other assemblages have little or no group value and require no further work

### Further work

A brief note on the glass from Junction 9 excavations should be prepared for publication, with a brief catalogue of selected and illustrated sherds. Sherds from contexts 2007 (2 joining sherds), 2038 (6 yellow brown sherds with self coloured trails) and 2129 (small indented base sherd) should be illustrated.

The pieces from evaluation Trench 1363 contexts (the part melted sherd (context 136311), and small indented base (context 136305) can be integrated with the discussion of the material from Junction 9. A photograph of the melted sherd would be useful.

## APPENDIX 10: ASSESSMENT OF WORKED STONE FROM JUNCTIONS 8 AND 9

by Ruth Shaffrey

### Summary and Quantification



Approximately 300 fragments of stone were recovered during the excavations. Amongst this assemblage are a minimum of 30 rotary querns and a number of flakes indicating quern manufacture. There are also whetstones and general processors including one saddle quern.

### Methodology

Where necessary the stone was examined with the aid of a x10 magnification hand lens. The stone was briefly recorded and entered into a worked stone database. Full recording will take place during the publication stage.

### Description

Over 80 quern fragments representing a minimum of 30 rotary querns were recovered during the excavations, 21 from Junction 8 Northbound, 6 from Junction 9 and 3 from the evaluation.

The site at Junction 8 Northbound produced the largest number and most substantial examples of rotary querns. Of the 21 specimens, ten are groups of very small weathered fragments (nine lava, one Old Red Sandstone) and are not specifically identifiable as rotary quern fragments, although they are made of stone known only to have been used in this way. The remaining eleven rotary quern fragments are larger and more clearly identifiable. Of these, four are Millstone Grit, two are Lava, two are Old Red Sandstone and two are other (as yet unidentified) sandstone. One of these (SF 6065) could be either Old Red Sandstone or Millstone Grit and is recommended for thin section and subsequent microscopic analysis. All these materials were commonly used in the area although the relationship between them is not fully understood.

A number of flakes of Hertfordshire Puddingstone were recovered at Junction 9. Eleven fragments in total were removed from contexts 2007, 2113 and 2114. These show evidence of deliberate removal similar to those found on flint, (a major component of this rock type) including bulbs of percussion and removal scars. In addition to the flakes, a number of small fragments of puddingstone were recovered from a further two contexts on this site (2557 and 2911). These two types of debris, especially the flakes, suggest that the stone was being worked on site. More than one petrological type of puddingstone is represented amongst the flakes, indicating that the working was more than a single isolated event. Interestingly, no substantial quern fragments of puddingstone or any other material were recovered from Junction 9. Small weathered fragments only of lava (three contexts) and sandstone (one context) were recovered. This is strikingly different to the findings at Junction 8 and is perhaps suggestive of a lack of settlement, though this is not borne out by other evidence. The Junction 8 site appears to be of a slightly later date so that the absence of puddingstone may be largely chronological. It is nevertheless noteworthy that although there appears to be evidence for the manufacture of puddingstone querns, no substantial examples were found at any site.

In addition to the rotary querns, both sites produced stone artefacts suggestive of general domestic activity including whetstones (6649, 7084), saddle quern (6631) and other processors (6900, 2139, 2165, 2257, 2067). The whetstones are of typical Roman (Kentish Rag stone) and medieval (Norwegian Ragstone) materials while the general processors were more locally obtained. A neatly broken half saddle quern is made of quartzite.

### Catalogue

*Table A17: Worked stone from Evaluation*

Ctx	SF no	Description	Notes	Lithology	Illust
112208		Rotary quern fragment	Chunk with two parallel dressed faces but no surviving edges	Lava	No
112202	102	Upper rotary quern fragment	Small fragment, pecked all over but with the grinding surface worn smooth	Old Red Sandstone	No

Ctx	SF no	Description	Notes	Lithology	Illust
112202	101	Incomplete lower rotary quern	80% survives. Probably early Roman	Old Red Sandstone QC	Poss

Table A18: Worked stone from Junction 8 Northbound

Ctx	noO	Description	Notes	Lithology	Illust
0	6114	Upper rotary quern fragment	Fragment of disc style quern. The grinding surface has the remains of at least four rounded channels each about 10mm wide and 1mm max depth. These are deliberate and not a result of wear	Millstone Grit	Poss
6049	6083	Upper rotary quern fragments	Fourteen very weathered fragments but several survive sufficiently to determine it is an upper stone. The grinding surface is also moulded with a curved concave channel starting at 15 mm from the edge. Probably part of same quern as SF 6114	Millstone Grit	No
6173		Probable rotary quern fragment	Weathered lava fragment, no details to record	Lava	No
6173		Probable rotary quern fragment	Weathered fragment of lava. Little working remains but almost certainly from a rotary quern	Lava	No
6220		Rotary quern fragments	Five fragments, weathered but with tool marks still in evidence	Lava	No
6252		Probable rotary quern fragment	In two adjoining fragments with evidence of a worked surface	Millstone Grit	No
6316	6107	Upper rotary quern fragment	Small rim fragment. Pecked all over. Looks to have slightly angled surfaces almost parallel but slightly tapered to centre	?	No
6358		Probable rotary quern fragments	Two weathered and rounded fragments of lava, one with a few tool marks on it	Lava	No
6382	6065	Upper rotary quern fragment	Fragment with rim surviving but not the centre	Millstone Grit?	No
6386	6063	Upper rotary quern fragment	Small fragment with a slight bit of rim surviving and a pecked grinding surface which is very slightly concave.	Millstone Grit	No
6449	6103	Upper rotary quern fragment	Fragment with only small portion of rim surviving.	Old Red Sandstone	No

Ctx	SF no	Description	Notes	Lithology	Illust
6631	6092	Half saddle quern	Broken neatly in half. Some damage to the grinding surface. Shaped boulder	Quartzite	Poss
6631	5091	Lower rotary quern fragment	Heavily weathered central portion revealing fairly wide circular eye. Coarse under surface, roughly shaped but not dressed	Lava	No
6777	6094	Upper rotary quern fragment	About 10% survives of flat topped type	Old Red Sandstone	No
6799	6104	Rotary quern fragment	Weathered and rounded fragment retaining some tool marks both otherwise no diagnostic features	Lava	No
6823		Upper rotary quern fragment	With pronounced projecting hopper (check this is an upper)	Lava	Poss
7009		Probable rotary quern fragment	Two pecked parallel surfaces but no edges.	Millstone Grit	No
7077		Probable rotary quern fragments	Two very tiny fragments of lava. No details worth recording but probably from rotary querns	Lava	No
7132	6111	Rotary quern fragment	Fairly large but weathered fragment of lava rotary quern with flat underneath and domed centre	Lava	No
7141		Probable rotary quern fragments	Three very small fragments with evidence of worked surface but with insufficient surviving to determine anything else	Probable Old Red Sandstone	No
7174		Probable rotary quern fragments	Three tiny and weathered fragments with no discernible features	Lava	No
7313		Probable rotary quern fragment	Small weathered fragments with no features discernible	Lava	No
7360		Rotary quern fragments	Ten weathered and rounded fragments with no recordable features	Lava	No
6154		Possible marble	Small roughly spherical pebble, possibly used as a marble	siltstone	No
6140		Unworked	Large lump of puddingstone, very weathered and not obviously worked. probably natural and too small to have been intended for use as a quern	Hertfordshire Puddingstone	No
7781		Unworked possible floor stone	An unworked slab, possibly used in a surface but no distinguishing characteristics	Fine grained grey sandstone	No

Ctx	SF no	Description	Notes	Lithology	Illust
6649	6082	Primary whetstone	Elongate tapered whetstone, with notched end; possibly a spokeshave (used to work arrows etc) although the main areas of use are on the long surfaces	Schist, looks like Norwegian rag?	Yes
7084		Primary whetstone	Broken in about half with one end surviving. Sub rectangular cross section now with a slightly bulbous end. All faces have been utilised	Kentish Rag	Poss
6900		Possible hammerstone	Flint pebble with some very slight wear marks. It is broken at one end but this very well rounded so not noteworthy	Flint	No

*Table A19: Worked stone from Junction 9*

Ctxt	SF no	Description	Notes	Lithology	Ill
2001		Possible quern fragments	Two very small adjoining fragments with one flat worked surface. These may be from a quern but they are too small to be sure	Sandstone	No
2007		Flakes (three)	Some have scars from their removal and others are curved with the classic bulb of percussion that you get with flint. Debitage from the manufacture of rotary querns?	Hertfordshire Puddingstone	No
2113		Flakes (two)	As above	Hertfordshire Puddingstone	No
2114		Flakes (six)	As above	Hertfordshire Puddingstone	Poss
2479		Probable rotary quern fragments	Lots of small weathered fragments of lava. No real evidence of working but likely to be from rotary querns	Lava	No
2488		Probable rotary quern fragment	Tiny fragment, no evidence of working but lava so almost certainly from a rotary quern	Lava	No
2557		Probable rotary quern fragments	Seven fragments of HPS. One has the remains of what may be a worked surface but it is not entirely clear. Four fragments are minuscule and three are small. They are all chunks rather than the flakes from other contexts	Hertfordshire Puddingstone	No
2653		Probable rotary quern fragments	Nine very tiny and weathered fragments	Lava	No

Ctxt	SF no	Description	Notes	Lithology	Ill
2911		Probable rotary quern fragment	Three small flint pebble fragments with small amounts of silcrete matrix still attached. Almost certainly a fragment of Hertfordshire puddingstone and potentially thus from a quern	Hertfordshire Puddingstone	No
2118		Worked piece of indeterminate function	Flat piece with evidence for pecking on both faces and with one shaped edge surviving which is curved but of which not enough survives to be sure of diameter. Both faces are worn quite smooth and one is slightly concave.	Sandstone	No
2257		Worked slab	Crude chunk of stone. Not especially worked but does have one flat surface and one straightish edge. Other face is not worked though and very uneven.	Sandstone	No
2067		Possible hammerstone	Flint pebble with a very small amount of wear to the ends. Probably used as a hammerstone or processor but not much	Flint	No
2165		Possible processor	Generally abraded flint pebble with some damage around one edge which may result from use as a pounder.	Flint	No
2139		Possible rubber	Small fragment with evidence of one worked or utilised edge. It is too small for anything to be determined however.	Reddish (but burnt) sandstone	No

### Statement of Potential

The assemblages from Junctions 8 and 9 have significant potential to inform about the nature of activity on each site, most notably in the difference between the two collection of rotary querns from the two sites but also in the presence of other worked stone such as the whetstones. Junction 8 has the larger collection of rotary querns but Junction 9 has produced evidence for the working of Hertfordshire Puddingstone. This is of particular interest for what it is able to tell us about the possible manufacture of querns on the site and in the area. Dating of the finds, in combination with an analysis of the typology and lithology of the querns, will also help with our understanding of the supply of querns and other stone artefacts to the sites and how this may have changed with time.

In a wider sense, analysis and dating will help with our understanding of the supply of querns to this region, which, with the exception of Hertfordshire Puddingstone, utilised only for a fairly short period, had no suitable exploitable stone resources of its own. Analysis of the Puddingstone has high potential to contribute to our understanding of the exploitation of this stone, in particular how and when it was worked. It is believed to have been worked almost entirely in the very late Iron Age and 1st century AD but no manufacturing sites for these querns are currently known, making this assemblage a first and therefore highly important one.

### Recommendations for future work

Future work will need to fully record all the querns and whetstones as these have only been briefly assessed thus far. The flakes and fragments will be examined in more depth and in

relation to context and phase information to determine the likelihood that here was quern manufacture on site. It is also proposed that an attempt be made to investigate the sources of the different Puddingstone varieties seen on site. These are likely to have been collected locally, but this should be investigated through some geological fieldwork to look at the variations of Hertfordshire Puddingstone. In order to put this evidence into both a local and regional setting it will be necessary to research and investigate the existence of other manufacture sites. Other querns need to be positively confirmed as either Millstone Grit or Old Red Sandstone and in order to do this, at least one quern will need to be thin sectioned (SF 6065).

Several of the flakes should be illustrated because these are unique. Two whetstones and three querns are also recommended for illustration.

## **APPENDIX 11: CREMATED HUMAN BONE**

*By Nicholas Márquez-Grant*

### **Introduction**

Deposits of cremated human bone from the M1 widening project dated from the Late Bronze Age to the Roman period. The present report gives information on the analysis of the human bone. Material derived from eight contexts, three of which were part of the same burial

### *Archaeological background*

Cremated remains came from two contexts of possible late Bronze Age-early Iron Age date at Junction 8 Southbound, from single late Iron Age-early Roman deposits at Junction 9 and Area M, and from two early Roman burials at Junction 8 Northbound.

### *Background on the cremation process*

The information that may be derived from cremated bone is less extensive than that derived from unburned bone. However, it is possible to make inferences about pyre technology and what happened to the bone after this rite. When a body is cremated, the skeleton is not destroyed, but changes to the colour and composition of the bones do occur. During the cremation, all the moisture is evaporated out of the bone, and the organic component (chiefly collagen) is combusted, leaving only the mineral portion. The bones also fragment and can become distorted in shape with some shrinkage occurring.

It is mostly the body fat that fuels the heat of a cremation. Observations in modern crematoria suggest that once the temperature has reached about 800° C the fat will ignite, and the fuel jets can actually be turned off (McKinley 2000a). When the body has been cremated, and the pyre has cooled down, the bone fragments are collected. These may be buried directly in the ground, in a small pit, but more usually they are collected together and placed inside an urn or an organic container (for example, a cloth bag or a wooden box). If they have been collected in an organic container, this will not survive the burial process, so it will appear that the cremated bone is "loose" in the soil. Collection of the entire cremated skeletal remains for burial rarely occurs. This may have been because the relatives (or undertakers) were not very efficient at collecting all the cremated bone from the pyre (the pyre would comprise a heap of charcoal, partially burnt wood, and possibly stones or burnt clay from the lining of the fire pit). Or it may have been because it wasn't important to collect all of the burnt bone, only a token handful or two. Perhaps only certain body parts were deliberately selected for burial. For example, notions about a culture can be inferred if they seem to collect the skull in particular. The deliberate selection of the skull may suggest that great significance was placed on this part of the body in the way societies treated their dead.

Cremated human bone may be recovered from a number of different contexts and these are summarised in Table A20. It is not always possible to determine the type of deposit (particularly if it is not contained within an urn) during excavation. Only by considering, during analysis, factors such as the degree of fragmentation, types of element, and the minimum number of individuals present is it possible to establish the most likely type.

Table A20: Definitions of cremation related deposit types

Deposit type	Definition
<i>Bustum</i>	Pyre site which also functioned as a grave. The pyre burnt down into the under-pyre pit and the human remains are buried <i>in situ</i> . Where no secondary manipulation has occurred, the cremated remains are expected to lie in the correct anatomical position on a bed of charcoal. The effects of the burning has been observed to penetrate the soil by 2-5 cm. The average weight of bone retrieved from cremated adult is between 1600-2000 g but may be as little as 1000 g.
Urned burial	Deposit of cremated bone within a container. May be surrounded by, on top of or overlain by a deposit of redeposited pyre debris.
Unurned burial	Concentrated deposit of bone, which may have been in an organic container, which may also include a secondary deposit of pyre debris within the backfill.
Unurned burial or redeposited pyre debris	An apparently mixed deposit of cremated human bone and charcoal which may represent the remains of one or more cremated individuals.
Pyre site	Large quantity of charcoal with relatively small amount of burnt bone fragments situated on the ground surface or in under-pyre pits. The pits may also be T or L-shaped to aid draught and are shallow (0.10-0.20 m deep). The soil beneath the pyre should show evidence of burning that may penetrate the soil by 2-5 cm.
Redeposited pyre debris	A mixture of fuel ash, fragments of cremated bone and pyre goods, and possibly burnt flint, burnt stone, burnt clay, fuel, ash and slag depending on the local environment. May contain a relatively large quantity of bone since a small deposit of bone may have been collected for burial. The deposit may be present in the backfill of the burial, over the cremation burial, within pre-existing features, uncontained in spreads and in deliberately excavated features.
Redeposited cremated remains	Small amounts of cremated bone situated or recovered from features, such as pits and ditches, and in the backfill of intercutting cremation burials.
Cremation-related deposit	Unknown deposit type including cremated human bone.

Where possible, each fragment was identified and classified into anatomical regions (e.g. neurocranium, splanchnocranium, upper limb and lower limb). The presence of any specific anatomical landmark (e.g. orbit, *linea aspera*) was annotated. The representation of skeletal elements may indicate whether certain parts of the skeleton were favoured over others for burial (see below). However, caveats relate to the fact that the prevalence of unidentifiable bone is largely dependent on the degree of fragmentation, whereby larger fragments are easier to identify than smaller ones. It must also be taken into consideration that some skeletal elements are more diagnostic and more easily identified than others and, therefore, more often recorded. This may create bias in calculations of the relative quantities of skeletal elements collected for burial.

## Materials and Methods

### Materials

9.5.1 All the cremation burials were examined. Table A21 presents the contexts (cremated human bone deposits) that were examined in this study, alongside other observations.

*Table A21: Summary of cremated human bone*

Context	Context type	Period	Weight of human bone (g)	Observations
2013	fill of [2012]	LIA-ERB	7.5	-
3040	Ditch [3036]	LIA-ERB	1	-
5067	fill of [5066]	LBA/EIA?	56	-
5243	?	?	15	-
6291	fill of [6289]	ERB	223	contents of cremation urn SF6051
6292	fill of [6289]	ERB	17	?part of above
6295	fill of [6293]	ERB	233	associated with cremation urn SF6054
6298	fill of [6289]	ERB	10	?associated with ancillary vessel SF6052

The aim was to ascertain the minimum number of individuals (MNI) represented by the cremated bone sample, the demographic profile of those individuals as well as any information regarding lifestyle as suggested by pathological lesions and other osteological indicators.

### *Methods*

In accordance with recommended practice (McKinley and Roberts 1993), samples were then wet sieved and sorted into >10mm, >4mm and >2mm size categories. The sorted bone and the residues were then examined.

Osteological analysis was undertaken by following the recommendations set out by McKinley (2004). The cremated bone was examined to determine the minimum number of individuals (MNI), their age and sex if possible, the colour and weight of the bone assemblage, the fracture pattern and maximum fragment size and the skeletal and dental elements present. Where possible, each fragment was identified and classified into anatomical regions (e.g. skull, axial skeleton, upper limb, lower limb, unidentified long bone fragments and unidentified bone fragments). The bone element, side, age, sex and presence or absence of non-metric traits and pathology were also recorded when permitted. The presence of any specific anatomical landmark (e.g. orbit, *linea aspera*) was annotated. Bone fragments were weighed to the nearest 1g. Skeletal remains were classified as 'unidentified' if the specific element they represented was unclear. Most of these fragments were portions of trabecular bone structure.

Material smaller than 4 mm was not sorted and analysis at this level only focused on the general colour and bone elements represented. Any identifiable fragments such as dental crowns, hand and foot bones and other fragments that may provide additional useful data such as the MNI count and age determination were also noted. All data were recorded on Oxford Archaeology laboratory recording sheets for cremation deposits.

A more detailed explanation of the methods employed to record MNI, age, sex, metric data and pathology are described below. All observations were made macroscopically.

### *Minimum number of individuals*

MNI was calculated by counting the presence of repeated bone elements if any (e.g. left proximal femur). Differences according to age and sex were also taken into account.

### *Estimation of biological age and sex*

When preservation allowed, standard methods for age-at-death and sex determination were employed following the guidelines set out by Ferembach *et al.* (1980), Buikstra and Ubelaker



(1994) and Brickley and McKinley (2004). Methods for estimating biological age include, for subadult individuals (<18 years), the observation of the stage of dental development (Moorrees *et al* 1963, Ubelaker 1989) and epiphyseal fusion (see Scheuer and Black 2000). In adult individuals, general observations of cranial suture closure were only used as a complementary aid to confirm a young or old age category since this method is unreliable on its own (e.g. see Key *et al.* 1994; Lynnerup and Jacobsen 2003). The speno-occipital synchondrosis was employed to give a minimum adult age to a skull, assuming fusion is complete by about the age of 21 years or even later (Genovés 1962, 57, 73; McKern 1970, 51).

When possible, individuals were classified into one of the following age categories (Table A22):

Table A22: Age categories employed in this analysis

Age category	Age
Neonate	0-1 months
Infant	1.1 months-5 years
Young Child	6-12 years
Older Child	13-17 years
Subadult	<18 years
Young Adult	18-25 years
Prime Adult	26-35 years
Mature Adult	36-45
Older Adult	> 46 years
Adult	> 18 years
Unknown	Unknown

These age groups only refer to the biological age as inferred from the skeleton. These may not necessarily correlate with chronological age and should not be confused with the social perception of age in the Prehistoric and Roman communities in Britain. Also, the identification of biological or skeletal sex must not be confused with gender. Misuse of these terms might lead to misconceptions when interpreting the funerary rite and burial customs.

Biological sex was estimated only for adult individuals when possible. This involved the observation of morphological traits of the pelvis (for example, the sciatic notch and the pubic symphysis) and the skull (for example, the glabella and the mastoid process). It must be borne in mind, however, that the process of cremation may have affected the morphology of traits used in sex determination.

The following skeletal sex categories were employed (Table A23):

Table A23: Categories employed in sex determination

Sex category	Definition
F	Female
F?	Possible female
Ambiguous	Ambiguous traits
M?	Possibly male
M	Male
?	Unknown

Each trait that was observed was assigned to one of the categories in Table A23. Later, an average was estimated from all the scored traits.

#### *Metric data and non-metric traits*

Metrical analysis involved measuring cranial vault thickness where appropriate as well as the length of long bone fragments. These may be employed to estimate biological sex, stature and to explore degrees of fragmentation, although several problems are inherent in the approach (see McKinley 2000b). Measurements were taken with a sliding calliper to the nearest 0.01 mm.

Non-metric traits are minor variants in the skeleton, some of which have been used to find about biological distance between populations. Some traits, therefore, such as the Inca bone, are highly heritable and have been used to indicate genetic relationships, whilst others, such as *torus auditivus*, may be environmentally produced (Brothwell and Zakrzewski 2004, 28). Skeletal non-metric traits were recorded following the guidelines set out by Berry and Berry (1967), Hauser and De Stefano (1989) and Buikstra and Ubelaker (1994). Non-metric

traits in a particular anatomical location were merely scored here as present or absent.

### *Palaeopathology*

Absence and presence of pathological lesions were recorded when possible. Observing the presence or absence of palaeopathological lesions provides information about the health status of an individual and of the population. However, this is dependent on completeness of the bone as well as surface preservation. Pathological lesions were described with reference to osteological and palaeopathological texts, such as Ortner and Putschar (1981) and Aufderheide and Rodríguez-Martín (1998). The data on pathology is dependent, however, on completeness of the bone as well as cortical bone preservation. Unfortunately, the pathological lesions on cremated assemblages are usually descriptive and rarely do they form part of the skeletal frequencies for pathology.

### *Surface colour, fracture pattern and texture*

The colour of bone fragments, the weight of each deposit, fracture patterns, fragment sizes and the skeletal and dental elements present were recorded to explore the cremation process and pyre technology. Colour is a reflection of the temperatures achieved during cremation, whereby white (calcined bone) indicates high temperatures and brown/black bone indicates low temperatures (Shipman *et al.* 1984; Holden *et al.* 1995). This information indicates the efficacy of the cremation and allows factors such as quality of fuel, weather conditions, pyre construction and duration of the cremation to be evaluated. Colour may indicate the temperature at which the body was burnt, although this also depends on how much soft tissue is around the bone. Examination of the type of colour and its distribution in the skeleton may allow an understanding of how the body was laid on the cremation pyre. The whiter the bone, the closer the body part to the heat centre, while colours such as blue, black and grey may reveal a further distance from the main heat focus, unless they represent areas with more muscle mass.

In addition, fracture patterns may indicate whether a body was burnt with its flesh still on, or whether only the dry skeleton was selected for the pyre after decomposition or defleshing of the soft tissues. Burning fleshed remains results in curved, transverse fracture lines, irregular longitudinal splitting, twisting and marked warping (Ubelaker 1989; Buikstra and Ubelaker 1994). Finally, weathering was recorded according to the stages set out by Behrensmeyer (1978) but modified by Buikstra and Ubelaker (1994).

Finally, fragment size is an indication of whether or not bone had been deliberately broken up prior to deposition and burial. However, fragmentation may also arise following deposition and during excavation and handling and, therefore, any results should be viewed with caution.

## **Results**

### *Weight and skeletal part representation*

The deposits ranged in weight from 1 g to 233 g (Table A24). The weight of bone of an adult cremation from a modern crematoria ranges from about 1000 to 3600g (McKinley 2000, 404), therefore none of these contexts can be considered as fully recovered or presenting most of the individual. In fact, several parts of the skeleton that survives cremation such as the petrous pyramids of the temporal bones are missing.

*Table A24: Summary of weights for each of the human cremated bone deposits*

	Context number								Total
	2013	3040	5067	5243	6291	6292	6295	6298	
<i>Skull</i>	0	0	7	0.5	53	2	19	0	81.5
<i>Axial</i>	0	0	2	0	7	0.5	13	0	22.5
<i>Upper limbs</i>	3	1	5	0.5	28	0	39	3	79.5

	Context number								Total
	2013	3040	5067	5243	6291	6292	6295	6298	
<i>Skull</i>	0	0	7	0.5	53	2	19	0	81.5
<i>Lower limbs</i>	4	0	10	7	24	10	75	5	135
<i>Long bone (unidentified)</i>	0	0	9	6	5	2	14	2	38
<i>Unidentified</i>	0.5	0	23	1	25	3	73	0	125.5
<b>TOTAL (g)</b>	<b>7.5</b>	<b>1</b>	<b>56</b>	<b>15</b>	<b>223</b>	<b>17</b>	<b>233</b>	<b>10</b>	<b>562.5</b>

The most represented bone fragment, according to weight only (obviously there is more bone in a femur than in a radius) is the lower limb, followed by skull fragments and upper limb bones. The axial skeleton, obviously much lighter is also represented.

The fragments from the skull were mainly from the frontal, parietal and occipital bones. No temporal bones were identified. Some skull fragments revealed the coronal, sagittal and lambdoid sutures. Very few skeletal landmarks were identified in the bones, with only the supraorbital margins of some cremations deposits present (contexts 6291, 6295). Facial bones, such as the maxilla were rarely present (only in context 6295). A right zygomatic (context 6295) was recovered. The mandible was also poorly represented. Few parts were present and these were mainly parts of the body with alveoli (again from context 6295). Some dental roots were recovered and did provide some data on the age of the individual. In addition, contexts 6291 and 6295 included some dental fragments representing at least one tooth in each context.

Vertebrae and ribs were incomplete, very fragmented and also poorly represented. Most remains belonged to pedicles and bodies of vertebrae and shafts of ribs. No atlas or axis vertebrae were identified.

Shoulder as well as the pelvic girdle was poorly represented. Some body portions of the scapula and some clavicle shaft fragments (in context 6291) represented the shoulder girdle. With regard to the pelvis, no sciatic notch, no acetabulum, no pubis were identified neither was the sacrum, therefore most of these fragments were from the body of the ilium.

All the major long bones in the skeleton including the humerus, radius, ulna, femur, tibia and fibula, were clearly identified. Many of the epiphyses were missing *post-mortem*, however, there were two portions of the distal epiphysis of a humerus (context 5067) and a portion of articular surface probably belonging to a proximal radius (context 6295).

Hand bones were identified in a number of deposits. A possible carpal bone (lunate?) was found in context (6295). Metacarpal shafts were identified in (6291) and (6295), while a portion of a metacarpal head was identified in context (5067). Portions of proximal hand phalanges (shaft and head portions) were also found in these three latter contexts. Amongst the foot bones, only metatarsal shafts were represented, these coming from contexts (6291) and (6295).

Many fragments (22.3%) could not be identified. These came largely from the sorted 4-2 mm sieve size, which were largely long bone fragments. Other common unidentified fragments were portions of trabecular bone.

No hyoid bone, sternum, patella, tarsals or foot phalanges were identified in the deposits.

The largest fragment measured 29.51 mm (a humerus shaft from context 3040), followed by a tibia shaft from context 6291, measuring 28.41 mm.

#### *Minimum number of individuals, sex and age determination*

If each context can be treated separately, the material represented a MNI of 8 individuals. None of the deposits included the remains of more than one individual.

The assemblage comprised five individuals that are likely to be adult individuals due to the clear adult dimensions and texture of the skull and long bones fragments.

Unfortunately, no epiphyses were preserved to appreciate fusion of the epiphyses with the shaft and also no third molars were available to confirm the adult age (>18 years) of the individuals. With regard to cranial suture closure, although in context (6291) enough fragments with sagittal and lambdoid sutures appeared to be open, this is insufficient to indicate this was a young adult. Three individuals could not be aged although, due to the dimensions of the bones, seem to be older than a child.

Although maxillary and mandibular fragments from context (6295) preserved a total of 5 alveoli, indicating that the teeth were lost *post-mortem*, tentatively this may indicate that the individual was probably not a person of old age (>46 years) when he or she died, since considerable tooth loss may be regarded as an indicator of old age. Despite several factors, for example cultural practices, that may influence tooth loss in younger adults, mandibles or maxillae with over 50% of teeth lost *ante-mortem* have been assigned by some to the older age categories (Miles 2001; Mays 2002; also see Wols and Baker 2004). If tooth loss can be considered to be an indicator of the old age (>46 years), the skeleton from this latter cremation burial did not show any signs (for example, regeneration) of complete or more than >50% *ante-mortem* tooth loss in the dentition based on the tooth sockets observed. Very tentatively and with caution, therefore, this adult may not be regarded as an old adult.

With regards to the determination of sex, no sex could be attributed to the adult skeletons due to the absence of diagnostic bones. Table A25 summarises the demographic profile of the sample.

Table A25: Summary of cremated human bone assemblage

Cremation burial	MNI	Age	Sex
2013	1	Adult?	?
3040	1	?	?
5067	1	Adult?	?
5243	1	?	?
6291	1	Adult?	-
6292	1	Adult?	?
6295	1	Adult?	
6298	1	?	?

#### Non-metric traits

Only one non-metric trait, the supraorbital foramen, could be scored for presence or absence. The left supraorbital margin found in deposit (6291) presented a supraorbital foramen.

#### Palaeopathology

Most of the recovered fragments could not be observed for pathological changes.

No apparent periostitis (non-specific infection) was found in the shaft of the long bones and that no osteoarthritis was present in the proximal hand phalanx recovered from context (6291). No joint surfaces had survived in any of the other deposits.

Finally a total of five dental sockets from the human bone from (6295), three probably from the mandible and two probably from the maxilla, were present with at least four teeth having been lost *post-mortem* since one unidentified loose dental root was also present. Thus, from the five alveoli preserved, there was no evidence of *ante-mortem* tooth loss. Periapical cavities could not be recorded due to the incompleteness of the remains. An additional context (6291) also had a dental root representing at least 1 tooth, perhaps a premolar.

#### Fragmentation

Fragments between 10 and 4 mm were the most frequent, with the exception of context

(3040) where only one fragment was recovered and this was over 10 mm in length (Table A26). In fact, the longest shaft fragment comes from this context and measured 29.51 mm and was probably part of a humerus. This was followed by fragments from contexts (6291) and (6295) with maximum fragments measuring 28.41 mm (humerus) and 23.12 mm (tibia) respectively.

*Table A26. Percentage of bone fragments larger than 10 mm, between 10-4 mm and smaller than 4 mm.*

	Context number							
	2013	3040	5243	5067	6291	6292	6295	6298
>10 mm	0g (0)	1g (100)	0g (0)	0g (0)	29g (13.0)	0g (0)	8g (3.4)	0g (0)
10-4 mm	7.5g (100)	0g (0)	15g (100)	56g (100)	113g (50.6)	17g (100)	184g (78.9)	10g (100)
<4 mm	0g (0)	0g (0)	0g (0)	0g (0)	81g (36.3)	0g (0)	41g (17.5)	0g (0)
<b>TOTAL (g)</b>	<b>7.5</b>	<b>1</b>	<b>15</b>	<b>56</b>	<b>223</b>	<b>17</b>	<b>233</b>	<b>10</b>

#### *Colour*

Most of the cremated bone was white in all contexts or predominantly white with hues of blue/ grey in contexts (3040), (5243) and (6295). There were no fragments that were a darker colour, such as deep blue, brown or black. Thus, for the assemblage complete or intense combustion of all the organic component of the bone had taken place. This generally occurs at temperatures above 700 degrees centigrade (Holden *et al.* 1995).

#### **Discussion**

##### *Efficiency of cremation and the funerary rite*

Overall, there was no a pattern of under-representation of skeletal elements [to be completed at later data when context is known, truncation, etc.]. Collection of the bones does not seem to have been undertaken with care because there are many obvious parts that are missing, such as the petrous pyramids of the temporal bones.

The colour of the bone was predominantly white reflecting successful and complete cremation at a temperature over 600-700°C.

Overall, bone weights were low, the largest deposit (6295) weighing 233 g. Investigations in modern crematoria have found that the average bone weight of a cremated adult individual is approximately 1000-2400 g, with an average of 1650g (McKinley 2000a, 269). A modern cremated female body weighs on average 1615.7g and a male body an average of 2283.5 g (McKinley 1993). Predictably, individuals of smaller and more gracile build, such as children, or those older individuals with osteoporosis will have a lower bone weight and possibly poorer bone survival (McKinley 2000b, 404). However, the adult deposits from this site are too small and may suggest that collection and deposition of the entire cremated remains of these individuals was not deemed important, and that only 'token' deposits had been buried.

Bone fragments were neither large, with only a few deposits having fragments larger than 10 mm. Amongst the factors that affect fragmentation are the cremation itself, collection and burial of the human remains, deliberate fragmentation by the mourners or grave diggers, taphonomic factors (for example, soil characteristics and ploughing), and the much later process of archaeological excavation and post-excavation processing (McKinley 1994). It is possible that cremated bone was fragmented deliberately in order to fit it into its urn. This may have been the case for some of the present cremations.

Further information on the funerary rite is limited due to the truncation affecting the material and the limited sample size. However, the clear fissuring of some of the larger bone fragments suggests that the bodies were cremated while fleshed. Further, the fragments displayed the typical transverse and longitudinal checking and splitting indicating that they were 'green' or covered with flesh when they were cremated (Reverte 1986; Ubelaker 1989). Little warping, which is also a typical pattern observed in cremated bone that was fleshed when burning (Reverte 1986; Ubelaker 1989), was observed, but this may be due to the high fragmentation and lack of >10 mm fragments to allow more accurate observation of this effect.

### **Comment**

A minimum of six individuals, four probably adult and two of unknown age, composed this human cremated bone assemblage from the M1 (MOW05). No sex data were obtained.

No pathological lesions were present that could provide any clues as to diseases and/or living conditions in this past community, perhaps associated with inadequate nutrition and an environment which would have facilitated the spread of infections.

The corpses had been cremated at full combustion (probably >700°C due to the predominantly white colour of the bones. Some crushing of the bones may have taken place in order to fit the cremated bones into the urns. The presence of most skeletal elements and small fragments such as dental roots and crowns and phalanges may indicate some care during collection of the remains after the cremation. However, due to the under-representation of many larger fragments, and without further archaeological background information, it may be that his lack of common elements such as temporal bones, more rib shafts, the epiphyses of some long bones, that little care may have been present during the collection of the remains from the pyre. Further archaeological investigation into the context of these cremations as well as data on more cremations from the area will clarify these issues.

### **Detailed records of cremations**

#### ***Cremation deposit 2013***

**Description:** Only long bones were identified and these were the radius, ulna, femur and tibia. Only shafts were preserved. No fragments were larger than 10 mm

**MNI:** Only the remains of 1 individual were identified

**Age:** The dimensions of the long bone fragments indicated an adult individual

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was predominantly white indicating a homogeneous cremation fired at high combustion.

**Other observations:** Possible Late Bronze Age/Early Iron Age in date

**Conclusion:** One possible adult individual, sex unknown

<b>CREMATION BURIAL 2013</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	0
AXIAL	0
UPPER LIMB BONES	3
LOWER LIMB BONES	4
LONG BONE UNIDENTIFIED (>4 mm)	0
UNIDENTIFIED FRAGMENTS	0.5
<b>TOTAL WEIGHT</b>	<b>7.5g</b>

***Cremation deposit 3040***

**Description:** Only one a shaft fragment of long bone, possibly from a humerus, was identified, measuring 29.51 mm

**MNI:** Only the remains of 1 individual were identified

**Age:** Unknown

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The colour of the bone fragment was white with hues of light grey indicating a cremation fired at high combustion.

**Other observations:** -

**Conclusion:** One individual, age and sex unknown

<b>CREMATION BURIAL 3040</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	0
AXIAL	0
UPPER LIMB BONES	1
LOWER LIMB BONES	0
LONG BONE UNIDENTIFIED (>4 mm)	0
UNIDENTIFIED FRAGMENTS	0
<b>TOTAL WEIGHT</b>	<b>1g</b>

***Cremation deposit 5243***

**Description:** Only two cranial vault fragments, two upper limb bone (humerus?) and several lower limb shaft fragments (femur, tibia) were recovered. No fragments were larger than 10 mm

**MNI:** Only the remains of 1 individual were identified

**Age:** Unknown

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation



**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was white with and hues of grey indicating a cremation fired at high combustion.

**Other observations:** Longitudinal fissures/striations on cortical bone due to weathering. weathering stage 4 (Buikstra and Ubelaker 1994, p. 98)

**Conclusion:** One individual, age and sex unknown

<b>CREMATION BURIAL 5243</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	0.5
AXIAL	0
UPPER LIMB BONES	0.5
LOWER LIMB BONES	7
LONG BONE UNIDENTIFIED (>4 mm)	6
UNIDENTIFIED FRAGMENTS	1
<b>TOTAL WEIGHT</b>	<b>15g</b>

***Cremation deposit 5067***

**Description:** Cranial vault (parietal) fragments were identified, several rib shafts, fragments of the ilium body and a vertebra fragments. All the major long bones, except for the fibula, were identified through shaft fragments. The distal epiphysis of a humerus was present as well as a part of the heads of a metacarpal and a hand phalanx. No fragments were larger than 10 mm

**MNI:** Only the remains of 1 individual were identified

**Age:** The dimensions of the long bone fragments indicated an adult individual. A fused humerus distal epiphysis provides a safe minimum of 15 years of age at death. The lambdoid suture was open according to one fragment that was recovered

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was predominantly white indicating a homogeneous cremation fired at high combustion.

**Other observations:** Possibly Late Bronze Age/Early Iron Age in date

**Conclusion:** One possible adult individual, sex unknown

<b>CREMATION BURIAL 5067</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	7

<b>CREMATION BURIAL 5067</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
AXIAL	2
UPPER LIMB BONES	5
LOWER LIMB BONES	10
LONG BONE UNIDENTIFIED (>4 mm)	9
UNIDENTIFIED FRAGMENTS	23
<b>TOTAL WEIGHT</b>	<b>56g</b>

***Cremation burial 6291***

**Description:** Frontal, parietal and occipital bones were represented amongst the cranial fragments. There was also the frontal process of a right zygomatic bone. The left supraorbital margin was also present, as well as a fragment of a dental crown and a dental root (premolar?). Fragments of ribs, vertebrae and ilia were also identified. Other bones (shafts) in this deposit include the clavicle, humerus, radius, ulna, metacarpal, femur, tibia and the metatarsal bones were also recovered, as well as the shaft and head of a proximal hand phalanx. The *linea aspera* was identified in the fragment of a femur. The largest fragment was 28.41 mm (humerus)

**MNI:** Only the remains of 1 individual were identified (see also 6292 and 6298)

**Age:** The dimensions of the long bone fragments indicated an adult individual. A fragment with sagittal suture and another with lambdoid suture indicate these sutures were open rather than fused

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** Presence of a supraorbital foramen on the left frontal bone

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was predominantly white indicating a homogeneous cremation fired at high combustion

**Other observations:** Possibly Roman in date

**Conclusion:** One possible adult individual, sex unknown

<b>CREMATION BURIAL 6291</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	53
AXIAL	7
UPPER LIMB BONES	28
LOWER LIMB BONES	24
LONG BONE UNIDENTIFIED (>4 mm)	5
UNIDENTIFIED FRAGMENTS	106
<b>TOTAL WEIGHT</b>	<b>223g</b>

***Cremation burial 6292***

**Description:** Only few cranial vault fragments were present, one rib shaft and the shafts of femur, tibia, fibula and metatarsal bones. No fragments were larger than 10 mm

**MNI:** See 6291

**Age:** The dimensions of the long bone fragments indicated an adult individual.

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was white indicating a homogeneous cremation fired at high combustion.

**Other observations:** Possibly Roman in date

**Conclusion:** One possible adult individual, probably part of 6291, sex unknown

<b>CREMATION BURIAL 6292</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	2
AXIAL	0.5
UPPER LIMB BONES	0
LOWER LIMB BONES	10
LONG BONE UNIDENTIFIED (>4 mm)	2
UNIDENTIFIED FRAGMENTS	3
<b>TOTAL WEIGHT</b>	<b>17g</b>

#### *Cremation burial 6295*

**Description:** Frontal and parietal bones identified, as well as fragments of maxilla and mandible. One unidentified dental root fragment present. This deposit also included one vertebral body fragment and vertebral facets, as well as rib shafts and parts of the ilium body. All the major long bones were present, including the humerus, radius, ulna, femur, tibia and fibula. There was a portion of articular surface likely to belong to the proximal epiphysis of a radius. A carpal bone was identified, probably a lunate, several metacarpal fragments and the head of a proximal hand phalanx. Metatarsal fragments were also identified. The largest fragment was 23.12 mm (tibia)

**MNI:** Only the remains of 1 individual were identified

**Age:** The dimensions of the long bone fragments indicated an adult individual

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was predominantly white with hues of light grey and blue, indicating a homogeneous cremation fired at high combustion.

**Other observations:** Probable Roman in date

**Conclusion:** One possible adult individual, sex unknown

<b>CREMATION BURIAL 6295</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	19
AXIAL	13
UPPER LIMB BONES	39
LOWER LIMB BONES	75
LONG BONE UNIDENTIFIED (>4 mm)	14
UNIDENTIFIED FRAGMENTS	73
<b>TOTAL WEIGHT</b>	<b>233g</b>

#### ***Cremation burial 6298***

**Description:** Only fragments of humerus and tibia were identified. No fragments were larger than 10 mm

**MNI:** See 6291

**Age:** Unknown

**Sex:** Sex could not be determined due to the lack of the landmarks required for sex estimation

**Non-metric traits:** None recorded

**Pathological lesions:** None recorded

**Colour and fracture pattern:** The bones reflected the typical fissure pattern characteristic of green bones when burnt. The colour was predominantly white indicating a cremation fired at high combustion.

**Other observations:** -

**Conclusion:** One individual, probably part of 6291, age and sex unknown

<b>CREMATION BURIAL 6298</b>	
<b>Skeletal area</b>	<b>WEIGHT (g)</b>
SKULL	0
AXIAL	0
UPPER LIMB BONES	3
LOWER LIMB BONES	5
LONG BONE UNIDENTIFIED (>4 mm)	2
UNIDENTIFIED FRAGMENTS	0
<b>TOTAL WEIGHT</b>	<b>10g</b>

## **APPENDIX 12: ANIMAL BONE**

*By Lena Strid*

### **Quantity of material and recording methodology**

The MOW05 animal bone assemblage comprised 1512 re-fitted fragments from securely dated contexts. The assemblage came from two sites: Junction 8 Northbound and Junction 9. The Junction 8 Northbound assemblage consisted of 544 fragments from LIA-Roman and medieval contexts, whereas the Junction 9 assemblage consisted of 968 fragments from LIA-Roman contexts.

A record of the assessed assemblage can be found with the site archive. The animal bone was recovered through hand collection during excavation, and is thus biased against smaller fragments and species.

### **Methodology**

The bones were identified to species using a comparative reference collection, as well as osteological books and articles. Sheep and goat were not identified to species at this stage, but rather classified as 'sheep/goat'. Ribs and vertebrae, with the exception for atlas and axis, were classified by size: 'large mammal' representing cattle, horse and deer, 'medium mammal' representing sheep/goat, pig and large dog, and 'small mammal' representing small dog, cat and hare.

The condition of the bone was graded on a 6-point system (0-5), grade 0 equating to very well preserved bone and grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable.

For ageing, mandibles with two or more recordable teeth (Grant 1982), and bones with fused and unfused epiphyses (Habermehl 1975) were noted. Sex estimation was carried out on pig canine teeth, and on cattle and sheep pelves, using data from Boessneck et al (1964), Prummel and Frisch (1986), Schmid (1972) and Vretemark (1997). Measurable bones were noted according to von den Driesch (1976).

### **The assemblage**

The assessed assemblage consisted of 1512 fragments, of which 301 (19.9%) could be determined to species (see Tables A27 and A28). The species present included cattle, sheep/goat, pig, horse, cat and fowl. Some indeterminable bird bones were also found.

The medieval bones were overall in good condition, whereas the Late Iron Age and Roman bones varied greatly in preservation (see Table A29). There was little difference in bone preservation between the different sites, suggesting similar soils and refuse disposal habits. Traces of burning and animal gnawing were found on 33 and 14 bones respectively.

Cattle and sheep/goat dominate the LIA-Roman assemblage, whereas pig dominates the medieval assemblage. However, the number of identified bones in the medieval assemblage is low, and therefore any interpretation of their intra-site ratio will be tentative. A more detailed intra- and inter-site analysis of the LIA-Roman assemblage might yield information on species preferences, which, in combination with botanical analysis, might suggest landscape and/or animal husbandry changes.

Age estimation could be carried out on 43 bones and 14 jaws. The majority of animals were found to be sub-adult/adult. Juvenile cattle, sheep/goat and pigs were also present.

Butchering marks were found on seven bones. These marks comprised skinning as well as disarticulation and filleting of long bones and ribs. They occurred on all three major domesticates as well as on horse and cat.

Small exostoses, possibly related to infections and/or muscle trauma, were found on a late Roman horse metatarsal. No other bones in the assemblage displayed pathological conditions.

### Recommendation

While the assemblage is rather small, it is recommended that further work should be carried out on it, as it will add to our knowledge on diet and animal husbandry in Late Iron Age-Roman and medieval Hertfordshire. The analysis and discussion would include inter-site comparisons with nearby sites such as the town of St Albans (*Verulamium*) and the villa at Gorhambury (Locker 1990; 1999).

*Table A27: Identified bones/species in the M1 assemblage.*

Species	LIA-Roman	Medieval	TOTAL
Cattle	122	5	127
Sheep/goat	58	5	63
Sheep	1		1
Goat	4		4
Pig	22	12	34
Horse	67	3	70
Cat		1	1
Fowl	1	1	2
Indeterminate bird	5	6	11
Small mammal		1	1
Medium mammal	55	36	91
Large mammal	195	21	216
Indeterminate	727	163	890
<b>Total fragment count</b>	<b>1258</b>	<b>254</b>	<b>1512</b>
<b>Total weight (g)</b>	<b>8675</b>	<b>1634</b>	<b>10309</b>

*Table A28: Identified bones/species in the LIA-Roman phases of the M1 assemblage.*

Species	LIA-ER	ER	ER-MR	MR	LR	ROM
Cattle	23	28	27	7	36	1
Sheep/goat	14	34	2	4	3	1
Sheep	1					
Goat	4					
Pig	4	8	3		7	
Horse	3	4	48	3	9	
Fowl					1	
Indeterminate bird		1	2		2	
Medium mammal	8	33	3	7	4	
Large mammal	23	81	45	15	31	
Indeterminate	130	124	156	81	235	1
<b>Total fragment count</b>	<b>210</b>	<b>313</b>	<b>286</b>	<b>117</b>	<b>328</b>	<b>3</b>
<b>Total weight (g)</b>	<b>2159</b>	<b>2499</b>	<b>1346</b>	<b>750</b>	<b>1901</b>	<b>20</b>

*Table A29: Preservation level for bones from the M1 assemblage.*

	N	0	1	2	3	4	5
LIA-Roman	1258	1.1%	17.5%	38.3%	25.1%	15.3%	2.7%
Medieval	254	0.8%	30.7%	52.0%	3.5%	13.0%	
<b>TOTAL</b>	<b>1512</b>	<b>1.1%</b>	<b>19.7%</b>	<b>40.6%</b>	<b>21.5%</b>	<b>14.9%</b>	<b>2.2%</b>

*Table A30: Mandibles and bones in the M1 assemblage providing data for ageing, sexing and measuring data.*

	LLA-Roman	Medieval	TOTAL
Ageable mandibles	14		14
Ageable bones	39	4	43
Sexable bones	4	2	6
Measureable bones	6		6

### APPENDIX 13: ASSESSMENT OF CHARRED PLANT REMAINS

by Wendy Smith

#### Introduction

Environmental sampling was carried out by Oxford Archaeology during the course of evaluation and full excavation of sites affected by the widening of the M1 motorway between Junctions 6 and 10. In total 176 samples were collected and assessed for charred plant remains. At the time of assessment final phasing of deposits was not complete; however, it is likely that the majority of deposits studied are of Romano-British date. This report presents the archaeobotanical assessment results for bulk soil samples collected from Areas M and P, The Aubreys South, the Junction 10 Borrow Pit, Junction 8 North and Southbound and Junction 9. The majority of samples (N=116 samples) came from excavations at Junction 8 Southbound, Junction 8 Northbound and Junction 9. The presence of and potential for further work on charcoal were noted, but these observations are superseded by the separate report by Challinor (below).

Samples were assessed in order to establish:

- if charred plant remains were present. If so, were they of interpretable value?
- if plant remains may provide information on agricultural activities?
- if plant remains may provide information on the surrounding environment?
- if plant remains may provide information on refuse disposal on site?
- if plant remains associated with cremations, may provide information on ritual activities?

#### Method

Sample volumes ranged from 1 to 40L, and averaged 23.5 litres. Many of the features (eg cremations, pits and postholes) encountered provided limited sediment for sampling; however, wherever possible 40L of sediment was collected. An Oxford Archaeology environmental officer processed samples by water flotation. The flot (the material which floats) was sieved over a 0.25 mm nylon mesh and the heavy residues (the material which does not float) was retained in a 0.5 mm nylon mesh. The flots and heavy residues were dried in a heated drying room at 30°C. The heavy residues were rapidly scanned using a low-power microscope at x15 magnification. Notes were made of charred plant remains (seeds, fruits, nutshells and other plant parts), charcoal, animal bones and molluscs. Provisional identification of oak/non-oak charcoal was made at magnifications up to x40. Quantification of plant macrofossils was rapid and subjective and identifications were made without directly consulting comparative material. As a result, all data presented in this assessment should be seen as provisional. Nomenclature for indigenous taxa follows Stace 1997 and for cultivated

taxa follows Zohary and Hopf (2000). The traditional binomial system for the cereals is maintained here, following Zohary and Hopf (2000, 28, Table 3 and 65, Table 5).

### **Results**

Table A31 presents the full assessment results for all 176 samples assessed. Table A32 presents a summary of the entire assemblage by area; showing the type of contexts sampled, as well as those samples recommended for further analysis or possible further analysis. In total 14 samples were considered rich enough to be recommended for further analysis, with a further 7 samples possibly rich enough to also be analysed. The results will be discussed below by area of site.

#### ***Area M***

A total of 9 samples were assessed. None was suitably rich in charred plant remains to merit further archaeobotanical analysis. Two samples (pit sample 3001, context 3011 and ditch sample 3004; context 3046) were rich in charcoal and would be suitable for charcoal analysis.

#### ***Area P***

A total of 3 samples were collected from this area of excavations; none of which was suitably rich to merit further analysis of charred plant remains or charcoal.

#### ***Aubreys South***

A total of 3 samples were collected from this area of excavations; none of which was suitably rich to merit further analysis of charred plant remains or charcoal.

#### ***Junction 10 Borrow Pit***

One sample was collected from this area. It was not suitable for analysis of charred plant remains but is extremely charcoal-rich. The majority of fragments scanned appear to be oak (*Quercus* sp.), but other taxa are present.

### ***Evaluations***

In total 23 samples from the evaluation trenching were assessed, but only one is possibly rich enough to merit further archaeobotanical analysis. Sample 100 from context 112203 contained a range of wheat (most likely spelt - *Triticum spelta* L.) grain and accompanying weeds of crop; however, not in large quantities. Unless this context is of particular interest for reasons of context or date, it is unlikely to provide an interpretable assemblage (i.e. >300 identifications) and, therefore, most likely should not be analysed. Several of the samples (101, 103, 111, 115–117, 119, 121 and 124) from this phase of excavation have produced rich charcoal assemblages, which may merit further analysis. Most of these samples, however fall within the areas of subsequent further work and do not add significantly to material recovered in the mitigation phase.

#### ***Junction 8 Northbound***

A total of 57 samples from this area of the excavations were assessed. Seven of these samples are suitably rich to merit further analysis (samples 6017, 6018, 6020, 6024, 6052, 6088 and 6089). In addition, there are 6 samples which are borderline for further analysis (samples 6005, 6014, 6027, 6032, 6037 and 6039), but should be analysed if the archaeological context is of particular interest. All of these samples have abundant cereal grain and/or cereal chaff remains and would provide information on crop processing activities on site. Six samples (6020, 6021, 6023, 6066, 6068 and 6084) had extremely rich charcoal assemblages which should be further analysed. It is also recommended that the quality of charcoal assemblages approaching 100 items (scored +++ in Table A31) be reviewed by an appropriate specialist, since some of these deposits (especially cremations and post holes) may be of archaeological interest.

#### ***Junction 8, Southbound***



A total of 35 samples were assessed from this area of the site for charred plant remains, none were considered suitably rich to merit further analysis. However, several of these deposits (samples 2049, 2073, 2080 and 2082) had extremely rich charcoal assemblages, which merit further analysis. Several other samples have charcoal assemblages approaching 100 identifiable items and should be reviewed by a charcoal specialist, since some of these deposits may be of archaeological interest.

#### ***Junction 9***

24 samples from this area of site were assessed and 7 samples (2001, 2002, 2024, 2033, 2037, 2038, 102036) have been recommended for further analysis. All of the samples have assemblages dominated by cereal grain and/or cereal chaff and accompanying weed of crop which will provide information on crop processing activities and cultivation conditions when fully analysed. In addition, 7 samples (2007, 2035, 2036, 2042, 2083, 102036, 102037) contained abundant charcoal remains, which also should be fully analysed. Several other samples have charcoal assemblages approaching 100 identifiable items and should be reviewed by a charcoal specialist, since some of these deposits may be of archaeological interest.

#### **Potential**

The samples recommended for full analysis are all rich in cereal grain and/or cereal chaff. It is likely that their full analysis will provide insight into the range of cereal crop processing activities on site and the use of crop processing by-products. In addition, accompanying weeds of crop in the samples will provide insight into cultivation conditions and possibly issues such as season of harvest or crop harvesting height.

The English Heritage Environmental Archaeology Bibliography ([http://ads.ahds.ac.uk/catalogue/resources.html?eab\\_ah\\_2004](http://ads.ahds.ac.uk/catalogue/resources.html?eab_ah_2004)) lists only 9 sites with published archaeobotanical results from Hertfordshire. Although more recent work and grey literature is likely to add to this data, the limited archaeobotanical evidence from Iron Age, Roman and medieval periods in Hertfordshire means that the data generated from archaeobotanical analysis of these M1 Widening samples will greatly add to our present knowledge in the county and are, therefore, of regional importance. Romano-British results will be obviously comparable to those from Gorhambury, St Albans (Wainwright 1990); Folly Lane, St. Albans (Murphy 1995) and Boxfield Farm, Stevenage (Murphy 1990).

#### **Recommendations**

A decision on whether the 7 samples potentially suitable for full analysis (see Tables A31 and A32) should be fully analysed will be needed prior to commencing this final stage of archaeobotanical work. Given the limited archaeobotanical data available in the region, if these contexts are of archaeological interest, it is recommended that they be included in the analysis.

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations (listed in order of sample number and by area/phase of excavation)

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
EVAL Exc	0	531	pit	1	<2	-	-	-	-	-	++	-	100% of flot scanned. Modern root present. No CPR observed. Small quantity of charcoal present - primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
EVAL Exc	100	112203	unknown	10	15	+	+	++	-	-	+	-	100% of flot scanned. Modern root present. One indeterminate cereal grain and one indeterminate wheat ( <i>Triticum</i> spp.) rachis node observed. Small quantity of weed/ wild taxa present, including: possible hairy tare (cf. <i>Vicia hirsuta</i> L.), hoary/ ribwort plantain ( <i>Plantago media</i> L/ <i>lanceolata</i> L.), melilot/ medick/ clover ( <i>Melilotus</i> spp./ <i>Medicago</i> spp./ <i>Trifolium</i> spp.), small-seeded grass (POACEAE) caryopses and vetch/ vetchling ( <i>Vicia</i> spp./ <i>Lathyrus</i> spp.). CPR Assessed as POOR to GOOD. Small quantity of non-oak charcoal observed.	B/C	?No
EVAL Exc	101	112204	unknown	10							+++		Flot not present. 10-4mm fraction of heavy residue contains abundant charcoal. Non-oak taxa present, including possibly elm ( <i>Ulmus</i> spp.)	n/a	n/a
EVAL Exc	102	112205	unknown	20	5	-	-	++	-	-	+		100% of flot scanned. Modern root present. Small quantity of weed/ wild taxa observed, including melilot/ medick/ clover ( <i>Melilotus</i> spp./ <i>Medicago</i> spp./ <i>Trifolium</i> spp.), small-seeded grass (POACEAE) caryopses and vetch/ vetchling ( <i>Vicia</i> spp./ <i>Lathyrus</i> spp.). CPR Assessed as POOR. Only a few pieces of charcoal present.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
EVAL Exc	103	112217	unknown	30	300	+	-	+	-	-	++++		- 25% of flot scanned. A few charred plant remains present - including an indeterminate cereal grain and a melilot/ medick/ clover ( <i>Melilotus spp./ Medicago spp./ Trifolium spp.</i> ) seed observed. Assessed as POOR. CPR Abundant non-oak charcoal present.	C	No
EVAL Exc	104	112208	unknown	40	25	-	+	+	-	-	+		- 100% of flot scanned. Abundant modern root and turf present in flot. One indeterminate wheat ( <i>Triticum spp.</i> ) glume base and one melilot/ medick/ clover ( <i>Melilotus spp./ Medicago spp./ Trifolium spp.</i> ) seed observed. CPR Assessed as POOR. Small quantity of non-oak charcoal present.	C	No
EVAL Exc	106	112811	unknown	10	13	+	-	-	-	-	+		- 100% of flot scanned. Only one possible wheat (cf. <i>Triticum sp.</i> ) grain observed. CPR Assessed as POOR. Small quantity of charcoal present - oak ( <i>Quercus sp.</i> ) charcoal present.	C	No
EVAL Exc	107	112813	unknown	10	ca. 2	+	-	-	-	-	+		- 100% of flot scanned. Only one wheat ( <i>Triticum sp.</i> ) grain observed. CPR Assessed as POOR. Small quantity of charcoal present.	C	No
EVAL Exc	108	133207	Ditch	10	5	+					++		Previously assessed by Seren Griffiths (OA). A few indeterminate cereal grains present. Small quantity of charcoal present. CPR Assessed as POOR.	C	No
EVAL Exc	109	101906	unknown	20	12						+		Previously assessed by Seren Griffiths (OA). No CPR observed.	C	No
EVAL Exc	110	803	pit	10	3						+		Previously assessed by Seren Griffiths (OA). No CPR observed.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluses	Comments on WPR/ CPR	CPR Potential	Full Analysis
EVAL Exc	111	1356	Ditch	20	100	++	+		+		+++		Previously assessed by Seren Griffiths (OA) and re-checked by WS. Charcoal observed includes <i>Quercus</i> sp. Cereal grain observed includes possible spelt ( <i>Triticum</i> cf. <i>spelta</i> L.), indeterminate wheat ( <i>Triticum</i> sp.) and hulled barley ( <i>Hordeum</i> spp.) grain. Emmer/ spelt ( <i>Triticum dicoccum</i> Schübl./ <i>spelta</i> L.) glume bases were also observed by SG. Hazel ( <i>Corylus avellana</i> L.) nutshell fragment and a large-seede vetch or possibly garden pea ( <i>Vicia</i> spp./ <i>Pisum sativum</i> L.) were observed.	C	No
EVAL Exc	112	1362	Ditch	20	90	+							Previously assessed by Seren Griffiths (OA) and re-checked by WS. Small quantity of indet wheat ( <i>Triticum</i> sp.) and cereal grain observed.	C	No
EVAL Exc	113	135905	Linear Feature	20	15	+	++	+	+		+		Previously assessed by Seren Griffiths (OA) and re-checked by WS. Cereal grain observed includes possible spelt ( <i>Triticum</i> cf. <i>spelta</i> L.). An indeterminate oat/brome grass ( <i>Avena</i> spp./ <i>Bromus</i> spp.) caryopsis also present. Spelt ( <i>Triticum spelta</i> Schübl.) and indeterminate wheat ( <i>Triticum</i> sp.) glume bases also are present. A cotyledon of a larg-seeded pulse ( <i>Vicia</i> spp./ <i>Pisum sativum</i> L.) was observed. CPR assessed as POOR.	C	No
EVAL Exc	114	118303	Layer	20	15						+		Previously assessed by Seren Griffiths (OA).	C	No
EVAL Exc	115	118705	Fill of slot	10	160						+++		Previously assessed by Seren Griffiths (OA).	C	No
EVAL Exc	116	118106	Fill of slot	10	100						+++		Previously assessed by Seren Griffiths (OA).	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L.)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
EVAL Exc	117	117909	Cremation	23	500						+++		Previously assessed by Seren Griffiths (OA).	C	No
EVAL Exc	118	119707	Pit	20	20				+		++		Previously assessed by Seren Griffiths (OA) and re-checked by WS. A hazel ( <i>Corylus avellana</i> L.) nutshell fragment observed. CPR assessed as POOR.	C	No
EVAL Exc	119	119711	Pit	15	100			++			+++		Previously assessed by Seren Griffiths (OA) and re-checked by WS. Small quantity of charred weed/ wild plant taxa observed - including sedge ( <i>Carex</i> spp.) and cleaver (cf. <i>Galium</i> spp.) seeds.	C	No
EVAL Exc	120	118707	Pit	10	10						+		Previously assessed by Seren Griffiths (OA).	C	No
EVAL Exc	121	118705	Linear Feature	9	280				+		+++		Previously assessed by Seren Griffiths (OA). An unidentified bud observed.	C	No
EVAL Exc	122	118706	Linear Feature	10	200						++		Previously assessed by Seren Griffiths (OA).	C	No
EVAL Exc	124	121707	Post hole/ pit	4	100				+		++++		Previously assessed by Seren Griffiths (OA). A haw (hawthorn - <i>Crataegus monogyna</i> Jacq.) stone present.	C	No
Aubreys South	200	213	Pit	40	50						++		100% of flot scanned. Abundant modern root present. No CPR observed. Small quantity of charcoal present.	C	No
Aubreys South	201	239	Ditch	40	20						++		100% of flot scanned. Abundant modern root present. Small quantity of charcoal present.	C	No
Aubreys South	211	4	Ditch	10	25								100% of flot scanned. Small quantity of modern root present. No CPR observed.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
Barrow Pit	1001	1001	Pit	20	575						++++	+	25% of flot scanned. No CPR observed. Abundant charcoal - oak prevelant. Small quantity of <i>Cecilioides acicula</i> shells present. Assessed as POOR for CPR.	C	No
J9	2001	2907	Pit	40	40	+++	++	++		++	+	+++	2/3rds of flot scanned. Small quantity of modern root. Flot dominated by spelt ( <i>Triticum spelta</i> L.), indeterminate wheat ( <i>Triticum</i> sp.) grain. A few hulled barley ( <i>Hordeum</i> sp.) grains also noted. Spelt and indeterminate wheat glume bases present. Vetch/ vetchling ( <i>Vicia</i> spp./ <i>Lathyrus</i> spp.) present. Preservation isn't particularly good. Assessed as RICH for CPR. Only a small quantity of charcoal present. Small quantity of animal bone present - looks to be mammal.	A	Yes
J9	2002	2139	Ditch	30	100	+++	++			+	+++	++	50% of flot scanned. Small quantity of modern root. Spelt ( <i>Triticum spelta</i> L.), indeterminate wheat ( <i>Triticum</i> sp.), hulled barley ( <i>Hordeum</i> sp.) and indeterminate cereal grain present. Spelt glume bases present. Elder ( <i>Sambucus nigra</i> L.) and a large-seeded pulse ( <i>Vicia</i> spp./ <i>Pisum sativum</i> L.) present. Weed/ wild taxa observed include brome grass ( <i>Bromus</i> spp.), dock ( <i>Rumex</i> spp.) and scentless mayweed ( <i>Tripleurospermum inodorum</i> (L.) Sch. Bip.). Charcoal (oak & other taxa observed) and animal bone (not fish) present. Small number of <i>Cecilioides acicula</i> snail shells present. Assessed as RICH for CPR.	A	Yes

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	2003	2162	Ditch	40	14	+			+		++		100% of flot scanned. Modern root present. Several hazel ( <i>Corylus avellana</i> L.) nutshell fragments present. A few indeterminate wheat ( <i>Triticum</i> sp.) and cereal grains present. Charcoal present - mostly <2mm. Assessed as POOR for CPR.	C	No
J9	2004	2051	Ditch	40	30						++		100% of flot scanned. A few indeterminate cereal grains observed. Assessed as POOR. Charcoal present.	C	No
J9	2006	2162	poss tree throw	40	8	+	++				+		100% of flot scanned. Modern root present. Small quantity of indeterminate cereal grain and indeterminate wheat ( <i>Triticum</i> spp..) glume bases and node present. CPR Assessed as POOR.	C	No
J9	2007	2272	Pit	20	60						++++		50% of flot scanned. No CPR observed. Abundant charcoal but primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J9	2008	2195	ditch/pit	40	10						++		100% of flot scanned. Modern root present. No CPR observed. Small quantity of charcoal present, but most <2mm. Oak ( <i>Quercus</i> sp.) charcoal observed. CPR assessed as POOR.	C	No
J9	2009	2289	post hole	20	ca. 2						+		100% of flot scanned. No CPR observed. Only small-sized charcoal fragments (<2mm) present. CPR assessed as POOR.	C	No
J9	2011	2093	Pit	40	15	+			+				100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments and a few indeterminate cereal grain fragments observed. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluses	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	2012	2095	Pit	40	20				+		+		100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments and a few indeterminate cereal grain fragments observed. CPR assessed as POOR. Small quantity of charcoal present, but most <2mm.	C	No
J9	2013	2265	post pipe	8	10				+		+		100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments and a few indeterminate cereal grain fragments observed. CPR assessed as POOR. Small quantity of charcoal present, but most <2mm.	C	No
J9	2014	2069	post hole	20	12	+	+		+		+		100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments, indeterminate wheat ( <i>Triticum</i> sp.) rachis node and a few indeterminate cereal grain fragments observed. CPR assessed as POOR. Small quantity of charcoal present, but most <2mm.	C	No
J9	2015	2338	post pipe	8	5	+	+		+		+		100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments, indeterminate wheat ( <i>Triticum</i> sp.) glume base and a few indeterminate cereal grain fragments observed. CPR assessed as POOR. Small quantity of charcoal present, but most <2mm.	C	No
J9	2017	2063	pit		20	+	+		+		++		100% of flot scanned. Modern root present. Hazel ( <i>Corylus avellana</i> L.) nutshell fragments and spelt ( <i>Triticum spelta</i> L.) grain present. Indeterminate wheat ( <i>Triticum</i> spp.) glume base present. Unidentified tuber present. Charcoal possibly of very slow growing oak ( <i>Quercus</i> sp.) present. CPR assessed as POOR.	C	No



Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	2022	2310	water hole	40	7	+	++				+		100% of flot scanned. Modern root present. Indeterminate cereal and wheat ( <i>Triticum</i> sp.) grain present. One indeterminate germinated rye/ spelt ( <i>Secale cereale</i> L./ <i>Triticum spelta</i> L.) grain observed. Several indeterminate wheat ( <i>Triticum</i> sp.) rachis nodes and glume bases observed. Small quantity of charcoal present - most <2mm. CPR assessed as POOR.	C	No
J9	2023	2313	water hole	40	ca. 2		++	+					100% of flot scanned. Spelt glume base observed, as well as indeterminate wheat ( <i>Triticum</i> spp.) rachis node and indeterminate cereal rachis internode. Indeterminate oat/ brome grass ( <i>Avena</i> spp./ <i>Bromus</i> spp.) caryopsis observed. CPR assessed as POOR. Only small quantity of small-sized charcoal present.	C	No
J9	2024	2332	water hole	40	8		+++				+		50% of flot scanned. Abundant chaff remains, including spelt ( <i>Triticum spelta</i> L.) glume base, indeterminate wheat ( <i>Triticum</i> sp.) glume base and rachis node. A charred insect - ?grub observed. Only small-sized charcoal present, most less than 2mm. CPR assessed as GOOD.	B	Yes
J9	2033	2375	Pit	40	300	++++	++++				++		10% of flot scanned. Abundant modern root. Flot clearly contains large quantities of spelt ( <i>Triticum spelta</i> L.) and indeterminate wheat ( <i>Triticum</i> spp.) grain and glume bases. CPR Assessed as RICH. Charcoal present, but not particularly rich.	A	Yes
J9	2034	2013	Pit	1	ca. 2						+		100% of flot scanned. Modern root and plant present. A few small flecks of charcoal present. No CPR observed. CPR Assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	2035	2461	Pit	20	620				+		++++		15% of flot scanned. Abundant charcoal - mainly oak. One possible plumb/ bullace/ damson stone (cf. <i>Prunus domestica</i> ssp <i>domestical insititia</i> (L.) Bonnier & Layens present). CPR Assessed as POOR	C	No
J9	2036	2717	Layer	15	60	+			+		++++		100% of flot scanned. A few emmer ( <i>Triticum dicoccum</i> Schübl.) grain present and one partial Diasy family (ASTERACEAE) flower head. Abundant charcoal - mostly smaller-sized and appears to be all oak ( <i>Quercus</i> sp.). CPR Assessed as POOR.	C	No
J9	2037	2557	Ditch	40	85	++++	++++				++		10% of flot scanned. Modern root present. Abundant spelt ( <i>Triticum spelta</i> L.) grain (some clearly germinated) and glume bases. Indeterminate wheat ( <i>Triticum</i> sp.) grain, glume bases, and rachis nodes also abundant. CPR Assessed as RICH. Charcoal present - mainly oak ( <i>Quercus</i> sp.).	A	Yes
J9	2038	2577	Ditch	15	325	++++	++++	+++			+		5% of flot scanned. Exceptionally rich flot, clearly dominated by spelt ( <i>Triticum spelta</i> L.) and indeterminate wheat ( <i>Triticum</i> sp.) grain and chaff. Brome grass ( <i>Bromus</i> spp.) caryopses frequently observed. CPR Assessed as RICH. Only a few fragments of charcoal observed..	A**	Yes
J9	2039	2583	post hole	10	75		+	+			+++		100% of flot scanned. A few indeterminate wheat ( <i>Triticum</i> sp.) nodes and a dock ( <i>Rumex</i> spp.) seed observed. Abundant charcoal - mostly oak ( <i>Quercus</i> spp.). CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	2040	2589	post hole	8	45		+				++		100% of flot scanned. A few indeterminate wheat ( <i>Triticum</i> sp.) nodes and a single spelt ( <i>Triticum spelta</i> L.) glume base observed. Abundant charcoal - mostly oak ( <i>Quercus</i> spp.). CPR assessed as POOR.	C	No
J9	2041	2317	pit	40	15	+	+		+		++		100% of flot scanned. A few possible spelt ( <i>Triticum</i> cf. <i>spelta</i> L.) grains and indeterminate wheat ( <i>Triticum</i> spp.) rachis nodes. Several hazel ( <i>Corylus avellana</i> L.) nutshell fragments. CPR assessed as POOR. Charcoal primarily oak ( <i>Quercus</i> spp.).	C	No
J9	2042	2721	kiln	20	4500						++++ >1000		5% of flot scanned. Abundant large-sized fragments of wood charcoal - appears to be mostly oak. Other ring-porous taxa are present. No CPR observed. CPR assessed as POOR. EXCELLENT for wood charcoal.	C	No
J9	2043	2714	kiln	40	2						+		100% of flot scanned. No CPR observed. Only a few flecks of charcoal present - all <2mm. CPR assessed as POOR.	C	No
J9	2044	2710	kiln	20	5		+	+			++		100% of flot scanned. A few indeterminate wheat ( <i>Triticum</i> sp.) rachis nodes and glume bases. Hoary/ribwort plantain ( <i>Plantago lanceolata</i> L./ <i>media</i> L.) seeds and small grass caryopses observed. Small quantity of charcoal present. CPR assessed as POOR.	C	No
J9	2083	2181	post hole	2	90						++++		50% of flot scanned. No CPR observed. Charcoal abundant - oak ( <i>Quercus</i> sp.) frequently observed. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J9	102036	2448	Organic layer	40	150	+++	++++		+		++++		25% of flot scanned. Small quantity of modern root. Spelt ( <i>Triticum spelta</i> L.) grain and glume bases present, as well as indeterminate wheat ( <i>Triticum</i> sp.) grain, glume base and rachis node. Charcoal abundant - appears to be mainly oak ( <i>Quercus</i> sp.). CPR assessed as RICH.	A	Yes
J9	102037	2725	Kiln	20	150						++++		25% of flot scanned. Modern root present. No CPR observed. Charcoal present - primarily oak ( <i>Quercus</i> sp.) present. CPR assessed as POOR.	C	No
Area M	3001	3011	Pit	30	825						++++		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 25% of flot scanned. No CPR observed. Abundant charcoal - strong horizontal banding on most charcoal suggests possible elm ( <i>Ulmus</i> sp.), but other taxa are present. No oak ( <i>Quercus</i> sp.) charcoal observed. CPR assessed as POOR.	C	No
Area M	3002	3009	ditch/slot	20	5						+		100% of flot scanned. Modern root, seed and insect present. No CPR observed. Small quantity of charcoal present - most <2mm. CPR assessed as POOR.	C	No
Area M	3003	3013	Ditch	40	10						+		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 100% of flot scanned. Modern root abundant. No CPR observed. Small quantity of charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
Area M	3004	3046	Ditch	40	40	+	+	?+			+++		50% of flot scanned. Small quantity of CPR present, including: a few indeterminate cereal grains, a wheat ( <i>Triticum</i> sp.) glume base and an identified seed (most likely weed/ wild taxon). Charcoal also present - non-oak taxa clearly abundant. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L.)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
Area M	3005	3015	Ditch	20	10						+		100% of flot scanned. Modern root, seed and insect present. No CPR observed. Small quantity of charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
Area M	3006	3051	Ditch	40	30						+		100% of flot scanned. ?Modern/ ?dried out waterlogged/ ?sub-fossil seed, root and twig present. No CPR observed and only small-sized (<2mm) charcoal present. CPR assessed as POOR.	C	No
Area M	3007	3044	Ditch	20	40						+		100% of flot scanned. ?Modern/ ?dried out waterlogged/ ?sub-fossil root and twig present. No CPR observed and only small-sized (<2mm) charcoal present. CPR assessed as POOR.	C	No
Area M	3008	3055	Ditch	20	60						+		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 100% of flot scanned. ?Modern/ ?dried out waterlogged/ ?sub-fossil root and twig present. No CPR observed and only small-sized (<2mm) charcoal present. CPR assessed as POOR.	C	No
Area M	3009	3056	Ditch	20	40		+				+		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 100% of flot scanned. ?Modern/ ?dried out waterlogged/ ?sub-fossil root and twig present. One wheat ( <i>Triticum</i> sp.) rachis node observed. Only small-sized (<2mm) charcoal present. CPR assessed as POOR.	C	No
Area P	4001	4015	Pit	40	35						++		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 100% of flot scanned. Modern/ ?sub-fossil/ ?ancient root present. No CPR present. Small quantity of charcoal present - both oak ( <i>Quercus</i> sp.) and non-oak taxa observed. CPR assessed as POOR.	C	No

Table 1: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
Area P	4002	4021	Pit	40	15						+		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . 100% of flot scanned. Modern/ ?sub-fossil/ ?ancient root present. No CPR present. Small quantity of charcoal present - most <2mm in size. CPR assessed as POOR.	C	No
Area P	4003	4007	Pit	40	20						+		Sample pre-treated with Na <sub>2</sub> CO <sub>3</sub> . Modern/ ?sub-fossil/ ?ancient root present. Modern/ ?sub-fossil/ ?ancient haw ( <i>Crataegus monogyna</i> Jacq. - hawthorn) and reed sweet-grass ( <i>Glyceria maxima</i> (Hartm.) Holmb.) caryopsis present. Charcoal present is mostly small-sized (<2mm). No CPR observed. CPR assessed as POOR.	C	No
J8 SEX	2045	5036	post hole - 4-post structure	5	10						+		100% of flot scanned. Modern root. Flecks of charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 SEX	2046	5038	post hole - 4-post structure	10	20						+++		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2047	5099	post hole - 4-post structure	30	100						+++		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2048	5043	post hole - 4-post structure	20	60						++		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2051	5024	Pit	20	5						+		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 SEX	2052	5067	Cremation	30	60						+++		100% of flot scanned. No CPR observed. Charcoal present appears to be mainly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2053	2087 (Think this is 5082)	Cremation	40	40						++		100% of flot scanned. Abundant modern root. No CPR present. Charcoal present is primarily oak. CPR Assessed as POOR.	C	No
J8 SEX	2057	5099	water hole	20	10						+		100% of flot scanned. Modern root present. No CPR observed. Small quantity of charcoal (mostly small-sized) present. CPR assessed as POOR.	C	No
J8 SEX	2058	5101	water hole	20	8				+		++		100% of flot scanned. Modern root and plant present. A few charred blackberry ( <i>Rubus</i> section 1 <i>Rubus</i> ) seeds. Small quantity of charcoal present - most <2mm in size. CPR assessed as POOR.	C	No
J8 SEX	2059	5100	water hole	18	90						+++		100% of flot scanned. No CPR observed. Charcoal fairly abundant and looks to be non-oak taxa. CPR assessed as POOR.	C	No
J8 SEX	2060	5100	water hole	10	40			+			++		100% of flot scanned. A few cleaver ( <i>Galium</i> spp.) seeds present. Small quantity of charcoal present. CPR assessed as POOR.	C	No
J8 SEX	2061	5160	Hearth	15	70						+++		50% of flot scanned. No CPR observed. Flot has produced irregular shaped charred plant material - presumed to be fragments of bark or outer root. Non-oak charcoal present. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 SEX	2065	5602	water hole	18	No flot								No flot was produced from this sample during processing. CPR assessed as POOR.	No flot	No
J8 SEX	2066	5164	water hole	20	ca. 2						+		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2067	5165	water hole	15	8						+		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2068	5166	water hole	3	ca. 2						+		100% of flot scanned. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2069	5235	pit/ post hole	15	10						+		100% of flot scanned. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2070	5225	post hole	4	25						++		100% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2071	5193	post hole	6	8						+		100% of flot scanned. Modern root and seed present. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2072	5199	post hole	5	80						+++		50% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly oak. CPR assessed as POOR.	C	No



Table 1: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Fail Analysis
J8 SEX	2073	5245	posthike	18	650						++++		1/6th of flot scanned. Only one small-seeded wild grass (POACEAE) caryopsis observed. Charcoal appears to be primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2074	5247	Pit	20	20						+++		100% of flot scanned. Modern root present. Small-sized, diffuse charcoal present - much of it is <2mm. CPR assessed as POOR.	C	No
J8 SEX	2075	5253	post hole	2	10						++		100% of flot scanned. No CPR observed. Charcoal present - mostly <2mm. CPR assessed as POOR.	C	No
J8 SEX	2076	5260	post hole	10	10						+		100% of flot scanned. Modern root present. No CPR observed. Small-sized charcoal present. CPR assessed as POOR.	C	No
J8 SEX	2077	5045	post hole	20	300	+					++++		25% of flot scanned. Small quantity of modern root. One possible wheat ( <i>Triticum</i> sp.) grain observed. Charcoal abundant - appears to be mainly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2078	5038	post hole	30	180								25% of flot scanned. Modern root present. No CPR observed. Charcoal abundant - appears to be mainly oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	2079	5201	Pit	10	55						+++		50% of flot scanned. Small quantity of modern root present. Charcoal present - mostly small-sized. CPR assessed as POOR.	C	No
J8 SEX	2080	5423	Cremation	20	100						++++		50% of flot scanned. No CPR observed. Abundant charcoal present - does not appear to be oak. CPR assessed as POOR. 10-4mm Heavy Residue Fraction charcoal present.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 SEX	2081	5178	Hearth	2	5						++		100% of flot scanned. Modern root present. No CPR observed. Small-sized charcoal present. CPR assessed as POOR.	C	No
J8 SEX	2082	5179	post hole	5	60						++++		50% of flot scanned. No CPR observed. Charcoal abundant - oak ( <i>Quercus</i> sp.) frequently observed. CPR assessed as POOR.	C	No
J8 SEX	2084	5325	post hole	2	15						+++		100% of flot scanned. No CPR observed. Charcoal present - other taxa than oak present. CPR assessed as POOR.	C	No
J8 SEX	2089	5325	post hole	2	50						+++		50% of flot scanned. Modern root present. No CPR observed. Charcoal present - other taxa than oak present. CPR assessed as POOR.	C	No
J8 SEX	5049 (bag mislabelled - renumber 2049)	5040	post hole - 4-post structure	15	300						++++		1/3 of flot scanned. No CPR observed. Charcoal abundant - appears to be almost entirely oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 SEX	5603	5617	post hole	40	50	+			+		+++		100% of flot scanned. Extremely dirty flot, with abundant modern root. A hazel ( <i>Corylus avellana</i> L.) nutshell fragment and a fragment of an indeterminate cereal grain were observed. Charcoal present - some of which is clearly oak ( <i>Quercus</i> sp.), but most quite small sized (i.e. <2mm). CPR assessed as POOR.	C	No
J8 SEX	5605	5615	post hole	10	5						++		100% of flot scanned. Modern root present. No CPR observed. Charcoal present but mostly <2mm. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 SEX	5606	5630	post hole	40	20	+	+				+		100% of flot scanned. Modern root present. One indeterminate cereal grain/ large grass caryopsis and one indeterminate wheat ( <i>Triticum</i> sp.) rachis node observed. Charcoal present is primarily very small-sized. CPR assessed as POOR.	C	No
J8 NEX	6001	6248	Tree throw	40	45						+++		50% of flot scanned. Modern root present. No CPR observed. ?charcoal - bark or root material present. CPR assessed as POOR.	C	No
J8 NEX	6002	6196	post hole	10	15						++		100% of flot scanned. Modern root and seed present. No CPR observed. Charcoal present includes diffuse porous taxa. CPR assessed as POOR	C	No
J8 NEX	6003	6251	stakehole	5	20						++		50% of flot scanned. Modern root present. No CPR observed. Charcoal present is primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 NEX	6004	6248	Hearth	5	30						++		50% of flot scanned. Modern root present. No CPR observed. Charcoal present is primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 NEX	6005	6097	Ditch	10	10	+	+++				+		100% of flot scanned. Modern root abundant. Spelt ( <i>Triticum spelta</i> L.) glume bases present. Indeterminate wheat ( <i>Triticum</i> sp.) glume bases and rachis nodes also present. A few indeterminate cereal grains also observed. CPR assessed as GOOD. Small quantity of charcoal present.	B	?Yes

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L.)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6006	6294	Cremation	34	20	+					+		100% of flot scanned. Modern root and seed present. One charred indeterminate cereal grain observed. Only small-sized charcoal present. CPR assessed as POOR.	C	No
J8 NEX	6007	6295	Cremation	10	10								100% of flot scanned. Modern root and seed abundant. Only small-sized flecks of charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6008	6292	Cremation	15	45	+					+++		100% of flot scanned. Abundant modern root and some modern seeds present. Only one charred indeterminate cereal grain observed. Charcoal present - appears to be primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 NEX	6009	6298	Cremation	1	10						+		100% of flot scanned. Modern root present. Charcoal present - but primarily <2mm. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6010	6299	Cremation	1	<2mm						+		100% of flot scanned. Modern root present. Charcoal present - but primarily <2mm. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6011	6291	Cremation	1	<2mm						+		100% of flot scanned. Modern root present. Flot appears to contain fragmentary bone - most likely human, but undiagnostic, some clearly burnt (blue in colour). A few small-sized fragments of charcoal present, but most is <2mm. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6012	6229	stakehole	1	20						++		100% of flot scanned. Modern root present. Charcoal present - but primarily <2mm. Most charcoal appears to be oak ( <i>Quercus</i> sp.). No CPR observed. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6014	6408	Pit	40	100	+++					+++		50% of flot scanned. Modern root present. Charcoal includes oak and various diffuse porous and ring porous taxa. Cereal grain present which is identifiable is all wheat ( <i>Triticum</i> sp.) grain. No other CPR observed. CPR assessed as POOR to GOOD. Limited range of taxa	C/B	?Yes
J8 NEX	6015	6260	unknown	20	10						+		100% of flot scanned. Modern root and seed abundant. Only small-sized flecks of charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6016	6353	unknown	20	5						+		Tag with flot labelled 2 - 0.5 mm Heavy Residue Fraction - presumably bucket re-float after no CPR flot produced. Modern root and seed present. Abundant fungal bodies observed. No CPR observed. Only small-sized (< 2mm) charcoal present. CPR assessed as POOR.	C	No
J8 NEX	6017	6591	kiln	40	75	++++	++++				+++	+++	25% of flot scanned. Abundant indeterminate wheat ( <i>Triticum</i> sp.) grain and rachis node present. Charcoal present - especially non-oak taxa. Land snails present. CPR assessed as RICH	A	Yes
J8 NEX	6018	6049	Pit	30	100	++++	++++				+++		50% of flot scanned. Abundant modern root. Abundant indeterminate wheat ( <i>Triticum</i> sp.) grain and rachis node and glume bases present. Charcoal present - especially non-oak taxa. CPR assessed as RICH	A	Yes
J8 NEX	6019	6662	post hole	10	25						+		100% of flot scanned. Abundant modern root. No CPR observed. Charcoal present - mostly small-sized (< 2mm). CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6020	6789	pit	30	200	+++	+	+	++		++++		+ 25% of flot scanned. Cereal grain (primarily indeterminate wheat ( <i>Triticum</i> sp.) grain), cereal/ large grass (POACEAE) culm node and weed/ wild taxa ( <i>Crataegus monogyna</i> Jacq. And <i>Chrysanthemum segetum</i> L.) present. Charcoal presents is primarily non-oak taxa. A few land snails observed CPR assessed as GOOD to RICH.	A/B	Yes
J8 NEX	6021	6753	Hearth	20	640						++++		25% of flot scanned. No CPR observed. Abundnat charcoal - mostly non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6023	6756	Ditch	40	100						++++		75% of flot scanned. Modern root present. No CPR observed. Abundnat charcoal - mostly non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6024	6462	Ditch	40	55	+	+++	+			+++		100% of flot scanned. Abundnat modern root. Charred indeterminate cereal grain, spelt ( <i>Triticum spelta</i> L.) glume bases and spikelet forks, indeterminate wheat ( <i>Triticum</i> sp.) glume bases and one possible wild turnip (cf. <i>Brassica rapa</i> L.) seed (possibly modern) observed. Charcoal present, but < 100 items and mostly <2mm. CPR assessed as GOOD to RICH.	A/B	Yes
J8 NEX	6026	6816	Pit	20	80						+++		50% of flot scanned. Some modern root present. No CPR observed. Charcoal present is primarily non-oak taxa, most small-sized (<2mm). CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6027	6055	Pit	40	50	+++	++		++		+++		100% of flot scanned. Modern root present. Charred wheat and indeterminate cereal grain present. Wheat ( <i>Triticum</i> sp.) rachis node also present. Small legumes (FABACEAE) present, possibly immature and one possible common vetch ( <i>Vicia</i> cf. <i>sativa</i> L.) also present. Charcoal present is non-oak taxa, most fairly small-sized. CPR assessed as POOR to GOOD.	B/C	?Yes
J8 NEX	6028	6202	Pit	40	30						+		100% of flot scanned. Abundant modern root. No CPR observed. Charcoal present is all <2mm. CPR assessed as POOR.	C	No
J8 NEX	6029	6631	Pit	40	50						++		100% of flot scanned. No CPR observed. Charcoal present is all <2mm. CPR assessed as POOR.	C	No
J8 NEX	6030	6207	Pit	40	55	+	+				+++		100% of flot scanned. A few wheat ( <i>Triticum</i> sp.) rachis nodes and indeterminate cereal grains observed. Charcoal present in flot is largely small-sized; however, larger fragments available in re-floated material. CPR assessed as POOR.	C	No
J8 NEX	6031	6146	Pit	40	30	++					+++		100% of flot scanned. Abundant modern root. Charcoal present is ring porous. Several wheat ( <i>Triticum</i> sp.) grains and indeterminate cereal grains observed. CPR assessed as POOR.	C	No

Table A312: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6032	6565	Pit	40	650	+++					+++		25% of flot scanned. Flot very dirty - will need to be refloated if analysed. Charcoal present is non-oak taxa - diffuse porous and ring porous types observed. Charred cereal grain, primarily wheat ( <i>Triticum</i> sp.) grain present. CPR assessed as POOR to GOOD.	B/C	?No
J8 NEX	6033	6779	Pit	40	20						+		100% of flot scanned. Abundant modern root and some modern seed present. Only small flecks of charcoal (<2mm) present. CPR assessed as POOR.	C	No
J8 NEX	6035	6534	unknown	10	20	+					+++		100% of flot scanned. Modern root present. A few charred grains observed. Charcoal present - some of which is oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 NEX	6036	6527	unknown	2	15						+++		100% of flot scanned. Some modern root. No CPR observed. Charcoal present - primarily oak ( <i>Quercus</i> sp.) - most <2mm. CPR assessed as POOR.	C	No
J8 NEX	6037	6356	Ditch	40	30	+++					++		100% of flot scanned. Abundant modern root. Small quantity of indeterminate wheat ( <i>Triticum</i> sp.) and indeterminate cereal grain. Charcoal present is primarily oak - most small-sized. CPR assessed as POOR.	C	?No
J8 NEX	6038	6111	enclosure ditch	40	20						++		100% of flot scanned. Some modern root. No CPR observed. Charcoal present - primarily <2mm. Fungal bodies present. CPR assessed as POOR.	C	No



Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6039	6061	Beam slot	40	50	+++					+++		100% of flot scanned. Abundant modern root. Charred indeterminate cereal grain and indeterminate wheat ( <i>Triticum</i> sp.) grain present. Charcoal present is diffuse porous non-oak taxa. CPR assessed as POOR.	C	?No
J8 NEX	6041	6147	Pit	40	80	++					+++		100% of flot scanned. Modern root present. Small quantity of wheat ( <i>Triticum</i> sp.) grain and indeterminate cereal grain present. Charcoal present is diffuse porous, non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6043	6062	Ditch	40	75								50% of flot scanned. Modern root present, as well as modern seed. Small flecks (<2mm) of charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6044	6738	Ditch	40	70	+	+				+		100% of flot scanned. Abundant modern root. Small quantity of indeterminate cereal grain and a spelt ( <i>Triticum spelta</i> L.) glume base observed. Only small flecks (<2mm) of charcoal present. CPR assessed as POOR.	C	No
J8 NEX	6045	6777	Ditch	40	40						++		50% of flot scanned. Modern/ ?dried out waterlogged/ ?sub-fossil roots/ twigs/ seeds present. Small flecks of charcoal (<2mm) present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6046	6316	Ditch	40	20						+		100% of flot scanned. Modern root. No CPR observed. Only small flecks of charcoal (<2mm) present. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6048	7184	post hole	5	30						++		100% of flot scanned. Modern root. No CPR observed. Charcoal present, mostly non-oak taxa, but much <2mm charcoal present. CPR assessed as POOR.	C	No
J8 NEX	6049	7125	Pit	40	10						+		100% of flot scanned. Modern root. No CPR observed. Only small flecks of charcoal (<2mm) present. CPR assessed as POOR.	C	No
J8 NEX	6050	7126	Pit	40	40						+		100% of flot scanned. Modern/ ?dried out waterlogged/ ?sub-fossil roots/ twigs/ seeds present. Small flecks of charcoal (<2mm) present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6051	7127	Pit	40	30						+		100% of flot scanned. Modern root. No CPR observed. Charcoal present, mostly <2mm charcoal present. CPR assessed as POOR.	C	No
J8 NEX	6052	6252	Pit	40	60	++++	++++	+++			+		Spelt ( <i>Triticum spelta</i> L.) grain (some of which is germinated) and oat/ brome ( <i>Avena</i> sp./ <i>Bromus</i> sp.) caryopses recovered from 4-2mm Heavy Residue fraction. 25% of flot scanned. Spelt grain, detached coleoptiles and spelt glume bases abundant. Small quantity of small-sized (<2mm) charcoal present. CPR assessed as RICH.	A	Yes
J8 NEX	6053	6260	Ditch	40	50						+		100% flot scanned. Abundant modern root. Small quantity of charcoal. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6054	7209	Ditch	40	ca. 100	+					+		100% of flot scanned. One barley grain present. Only small flecks of charcoal present. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6055	6899	Ditch	40	90						++		25% of flot scanned. Modern root present. No CPR observed. Charcoal present - mostly small-sized. CPR assessed as POOR.	C	No
J8 NEX	6056	7072	Ditch	40	10						+		100% of flot scanned. Modern root, seed and insect present. Small quantity of small-sized charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6058	7122	Pit	40	ca. 60						+		100% of flot scanned. Modern root present. Small quantity of small-sized charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6059	6794	post hole	10	25				+		++		100% of flot scanned. Modern root present. A few hazel ( <i>Corylus avellana</i> L.) nutshell fragments observed. Small quantity of charcoal present - mostly small-sized. CPR assessed as POOR.	C	No
J8 NEX	6060	6537	Ditch	40	ca. 200						++		25% of flot scanned. Modern/ ?dried out waterlogged/ ?sub-fossil roots/ twigs/ seeds present. Charcoal present, but most small-sized (<2mm). No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6062	5900	Ditch	40	90						+		100% of flot scanned. Modern root present. Small quantity of small-sized charcoal present. No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6063	6353	Ditch	40	20						+		100% of flot scanned. Modern root, seed and insect present. Small quantity of small-sized charcoal present. No CPR observed. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6066	7231	Beam slot	30	1400						++++		25% of flot scanned. Flot still slightly damp - so only partially scanned to reduce damage. Abundant charcoal - variety of taxa, not just oak ( <i>Quercus</i> sp.). No CPR observed. CPR assessed as POOR.	C	No
J8 NEX	6068	7305	Ditch	10	75						++++		25% of flot scanned. No CPR observed. Charcoal abundant - most looks to be oak ( <i>Quercus</i> sp.). Charcoal also present in 10-4mm HR fraction. CPR assessed as POOR.	C	No
J8 NEX	6070	6409	Pit	20	20	+					++		100% of flot scanned. A few indeterminate cereal grains observed. Charcoal present, mostly <2mm. CPR assessed as POOR.	C	No
J8 NEX	6071	6409	Pit	20	15				+		++		100% of flot scanned. A possible edible pulse (FABACEAE) observed. Charcoal present - but not particularly rich. CPR assessed as POOR.	C	No
J8 NEX	6072	6589	post hole	10	35						+++		50% of flot scanned. No CPR observed. Charcoal present is primarily non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6073	6699	Pit	20	ca. 5						++		100% of flot scanned. No CPR observed. Charcoal present is primarily non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6079	7200	post hole	40	100	+		+			+++		50% of flot scanned. A stinking chamomile ( <i>Anthemis cotula</i> L.) seed and a few indeterminate cereal grain fragments observed. Charcoal present - primarily non-oak taxa. CPR assessed as POOR.	C	No

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued...

Area	Sample No	Context No	Feature Type	Sample Volume (L.)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6081	7336	Oven	40	10		+		+		+		100% of flot scanned. A charred thorn (indeterminate) and a wheat ( <i>Triticum</i> sp.) rachis node observed. Charcoal present is primarily <2mm. CPR assessed as POOR.	C	No
J8 NEX	6082	6430	post hole	40	40	+					+++		75% of flot scanned. Modern root present. A few charred grains observed. Charcoal present is primarily non-oak taxa. CPR assessed as POOR.	C	No
J8 NEX	6083	7367	hearth	20	50						+++		50% of flot scanned. Modern root abundant. No CPR observed. Charcoal present appears to be primarily oak ( <i>Quercus</i> sp.). CPR assessed as POOR.	C	No
J8 NEX	6084	7366	Hearth	20	510						++++		15% of flot scanned. Some modern root present. No CPR observed. Abundant charcoal - non-oak taxa present. CPR assessed as POOR.	C	No
J8 NEX	6085	7367	unknown		no flot								Incomplete processing record on database. Only 10-4mm heavy residue fraction present - no CPR flot. Charcoal	C	No
J8 NEX	6087	7309	Ditch	40	60						+		50% of flot scanned. No CPR observed. Charcoal present, mostly <2mm. CPR assessed as POOR.	C	No
J8 NEX	6088	6872	Corn dryer	10	65	++++	+++				+		25% of flot scanned. Abundant cereal grain - spelt ( <i>Triticum spelta</i> L.) clearly dominant. A few indeterminate wheat ( <i>Triticum</i> sp.) glume bases observed. Small quantity of charcoal present. CPR assessed as GOOD to RICH. Preservation is variable - many poorly preserved.	A	Yes

Table A31: Summary of Assessment results for charred plant remains the M1 Widening (MOW05) excavations continued..

Area	Sample No	Context No	Feature Type	Sample Volume (L.)	Flot vol (ml)	Grain	chaff	weeds	other CPR	Animal Bone	Charcoal	Molluscs	Comments on WPR/ CPR	CPR Potential	Full Analysis
J8 NEX	6089	7784	Corndryer	10	70	++++	++++						10% of flot scanned. Abundant cereal chaff and grain - mostly spelt ( <i>Triticum spelta</i> L.) and indeterminate wheat ( <i>Triticum</i> sp.). Not much charcoal present. CPR assessed as RICH.	A	Yes
J8 NEX	6110	7087	pot contents	5	ca. 1								100% of flot scanned. Modern root present. No CPR observed. Only small flecks (<2mm) of charcoal present. CPR assessed as POOR.	C	No

**Table A32: Summary of archaeobotanical sampling at the M1 Widening (MOW05) Excavations (by area for different feature types and in terms of recommendation for full analysis)**

Feature Type	Area								Grand Total
	Area M	Area P	Aubreys S	J10 Borrow Pit	Evaluation	J8 N	J8 S	J9	
Beam slot						2			2
Corndryer						2			2
Cremation					1	6	3		10
Ditch	7		2		3	17		5	34
Ditch/plit								1	1
Ditch/slot	1								1
Enclosure ditch						1			1
Fill of slot					2				2
Hearth						4	2		6
Kiln						1		4	5
Layer					1			1	2
Linear Feature					3				3
Organic layer								1	1
Oven						1			1
Pit	1	3	1	1	5	20	2	8	41
Pit/posthole							1		1
Possible tree throw								1	1
Posthole						7	13	5	25
Posthole - 4-post structure							5		5
Posthole/plit					1				1
Post pipe							1	2	3
Pot contents						1			1
Sakehole						2			2
Tree throw						1			1
Unknown					8	5			13
Water hole							8	3	11
<b>Grand Total</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>24</b>	<b>70</b>	<b>35</b>	<b>31</b>	<b>176</b>
<b>Recommended for Analysis</b>									
<b>Yes</b>						7		7	14
<b>?Yes</b>						3			3
<b>?No</b>					1	3			4
<b>No</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>23</b>	<b>57</b>	<b>35</b>	<b>24</b>	<b>155</b>

#### APPENDIX 14: ASSESSMENT OF THE CHARCOAL

by Dana Challinor

##### Introduction

During the assessment of charred plant remains, Wendy Smith noted the quantity of charcoal and made a provisional identification of oak/non-oak charcoal. Flots which were given a charcoal score by Smith of more than 10 fragments were examined. A total of 101 samples were assessed for charcoal, some of these were looked at in brief, while samples noted by Smith as having mixed assemblages and/or those from key contexts, such as cremation burials, were assessed in full. The aim of the assessment was primarily to look at the potential of the charcoal for further analysis, to establish the information that might be provided by a study of ritual, domestic and industrial contexts. The assessment also sought to record species diversity from the bulk of the samples that will not be taken to further analysis. Determining

the potential of the samples was limited by the lack of phasing and context information, which will enable a more focussed selection of the samples at the analysis stage.

### Methodology

The flots were scanned under a binocular microscope at up to x45 magnification. Charcoal caught on the 2 mm sieve was considered identifiable and quantified; fragments were randomly extracted, fractured and examined in transverse section. While this provides a reliable method for the identification for ring porous taxa (eg *Quercus* sp.), identifications for the diffuse-porous taxa should be considered as 'type' and require confirmation. In the case of large flots, a sample of c 20% was examined, although any quantification given is based on estimates of the entire flot. A number of the samples had bags of charcoal from the residues, which were included in the quantification.

The potential of the charcoal has been grouped into 6 categories (A\*\*, A, A/B, B, C and N), taking into consideration the quantity and preservation of the material, the presence of other non-charcoal remains, the range of taxa present and the nature of the contexts. Category A\*\* is for outstanding samples. A is for high potential, while A/B is similar but considered slightly less significant (either the preservation or the context is not as good or the samples may be duplicates of other contexts). Category B is for samples which were rich in charcoal but the context is unknown or uncertain, though it could have potential if further phasing/context information became available. C are samples which produced small amounts of identifiable charcoal and are not of further interest unless the context was proved to be especially significant. Category N means no potential.

### Results

The results from all 176 samples were recorded on an Excel spreadsheet; 92 were categorised as N and 37 were C, which have not been included in Table A33. Only samples which were fully assessed and have potential for further analysis have been included in this table.

The preservation of the charcoal was variable, with many samples producing few fragments. The condition was generally good, although the fragments tended to be small in size, with many comminuted pieces. The most abundant taxon was *Quercus* sp. (oak) which was noted in most samples. There were quite a few samples also dominated by *Fagus* (beech) and *Fraxinus* (ash). Some of the *Fagus* was difficult to distinguish from *Prunus* (cherry, blackthorn etc), which was also present in some samples, and will require full identification. Other provisional identifications include *Alnus/Corylus* (alder/hazel), Salicaceae (willow family), *Prunus* (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc), *Ilex* (holly), *Acer* (maple) and *Ulex/Cytisus* (gorse/broom). Some of the samples were dominated by small diameter roundwood fragments.

### Implications

The samples from the M1 were a mixture of those dominated by oak and those with diverse assemblages. The majority of those dominated by oak would only merit further analysis if the phasing or feature were particularly interesting. The charcoal offers the opportunity to examine the fuel use of specific activities and a range of feature types should be analysed.

*Cremation burials:* One evaluation sample from a possible Bronze Age cremation pit (context 117909, sample 117) produced a mixed assemblage possibly dominated by Maloideae (hawthorn type). This sample should be analysed. Four further possible cremation samples from Junction 8 produced assemblages (contexts 5067, 5082, 5423, 6292) which should also be analysed. Three of these were dominated by oak, which is not unusual for LBA/EIA cremations, but one, which needs to be confirmed as cremation debris (5423), was dominated by beech or cherry type. Further analysis on all the cremation deposits will examine the use of a single species for ritual purposes, any temporal changes and whether ritual fuel use differs from domestic use.



*Hearths/kilns:* These features represent the next best category for charcoal analysis, since the remains can usually be ascribed to specific activities. Two kiln deposits from Junction 9 (2721, 2725) and one from Junction 8 (6591) produced quite diverse assemblages which are worth investigating. The hearth deposits from Junction 8 (contexts 6753, 7367, 7366), in contrast, are dominated by oak and one by beech/cherry (5160), so at least some of these should be fully analysed.

*Pits/waterholes:* A number of these features from across the road scheme produced good charcoal remains, mostly mixed assemblages (see Table A33). Some of these should be selected for analysis, in collaboration with excavator, on the following basis:

- The context can be assigned a date
- The contexts are consistent with domestic or industrial rubbish dumps
- A spatial and temporal range is represented.

*Postholes:* In general, the charcoal from postholes is not a high priority for analysis since its provenance can be difficult to establish. Many of the postholes from the M1 were rich in charcoal and dominated by a single species, either oak or beech. If any of the features had evidence of burning *in situ*, then the charcoal represents structural remains, for which it would be worth confirming identification (though full analysis would not be necessary). The mixed assemblages are likely to have come from domestic debris or mixed burning debris post-dating the primary use of the structure and would only merit analysis if specific dates/activities can be assigned.

*Ditches:* Like postholes, the provenance of the charcoal assemblage in these features can be difficult to determine. One sample from Junction 9 (context 2139) produced lots of charred plant material and the charcoal is probably associated with crop processing or cooking, and merits analysis. The remaining ditch samples have some quite interesting mixed assemblages which should be treated like the pit samples.

*Organic layer:* Context 2448 was a layer associated with kiln/oven 2638/2644 at Junction 9. There was a mixed assemblage of oak, ash and hawthorn type charcoal. Its potential is moderate.

#### **Further work**

It is recommended that 15 to 20 samples are taken to further analysis. The highest potential samples are listed below; others will need to be selected according to context/phasing details. It is intended that most of these samples will be analysed in full, but it will also be possible to characterise some assemblages by examining a lesser number of fragments per sample. The estimate provided reflects the diversity of the assemblages and size of the samples (i.e. single species samples will be quicker).

Table A33: Results of the charcoal assessment showing samples with potential (samples highlighted in bold have the highest potential)

Site	Sample No	Context No	Feature Type	Charcoal	Comments on charcoal	Charcoal potential	Full Analysis
Evaluation	101	112204	unknown	++++	10-4mm abundant charcoal. <i>Fraxinus, Quercus</i>	B	Depends on context
	103	112217	unknown	++++	<i>Fraxinus, Quercus</i> , other, <i>Ulex/Cytisus</i> ; small pieces of charcoal	B	Depends on context
	111	1356	ditch fill	++++	<i>Hedera, Quercus, Alnus/Corylus</i> . v mixed, good preservation	A/B	Prob, if 117 done
	117	117909	Cremation pit	++++	<i>Alnus/Corylus</i> , predominately <i>Maloideae, Quercus</i> . Q small fragments	A	Yes, if cremation
	119	119711	Pit fill with flint debitage	++++	Mostly oak, including <i>Quercus</i> heartwood	B	Depends on context
	121	118705	Upper fill of small linear	++++	Predominately <i>Quercus</i>	B	Depends on context
	122	118706	Primary fill of small linear	++++	Predominately <i>Quercus</i>	B	Depends on context
	124	121707	Posthole/pit fill	++++	Predominately <i>Quercus</i>	B	Depends on context
Borrow pit	1001	1001	Pit	++++	Predominately <i>Quercus</i> , including heartwood, roundwood and bark	B	No (not dated)
Junction 9	2002	2139	Ditch	+++	Mixed, <i>Fraxinus</i> roundwood, <i>Quercus</i> , roundwood, <i>Prunus, Maloideae, Alnus/Corylus</i>	A	Yes
	2007	2272	Pit	++++	Predominately <i>Quercus</i> including heartwood. Lots small charcoal	B	No (not dated)
	2033	2375	Pit	+++	<i>Quercus, Alnus/Corylus</i> roundwood, <i>Prunus</i> , Mixed. Q small fragments	A/B	?
	2035	2461	Pit	++++	Abundant charcoal - mostly smaller-sized and appears to be all <i>Quercus</i> .	A/B	No (not dated)
	2040	2589	post hole	+++	Mixed, <i>Quercus</i> roundwood, <i>Maloideae, Alnus/Corylus</i> roundwood. Good preservation	B	Depends on context
	2042	2721	kiln	>1000	lots of v large roundwood fragments, lots <i>Quercus</i> but other species too, including <i>Alnus/Corylus, Maloideae</i>	A**	Yes
	102036	2448	Organic layer	++++	<i>Quercus, Maloideae, Fraxinus</i>	B	No (mixed context)
	102037	2725	Kiln	++++	Mostly oak, lots roundwood, <i>Maloideae</i> , occasional other species	A	Yes

Site	Sample No	Context No	Feature Type	Charcoal	Comments on charcoal	Charcoal potential	Full Analysis
Area M	3001	3011	Pit	>1000	Predominately <i>Fraxinus</i> , v slow grown, to be checked. Other occasional species, <i>Prunus</i> roundwood	A/B	?
	3004	3046	Ditch	+++	Mixed, <i>Acer</i> roundwood, <i>Quercus</i> , Maloideae	A/B	?
Junction 8 southbound	2046	5038	post hole - 4-post structure	+++	<i>Quercus</i> , heartwood; looks like mostly oak. Small fragments	B	? Maybe one of these
Junction 8 southbound	2047	5099	post hole - 4-post structure	+++	Mostly <i>Quercus</i> . Small fragments	B	? Maybe one of these
	2052	5067	Cremation	+++	Predominately <i>Quercus</i>	A**	Yes
	2053	5082	Cremation	++	Predominately <i>Quercus</i>	A	Yes
	2059	5100	water hole	+++	Predominately <i>Fagus</i>	B	? Maybe one of these
	2060	5100	water hole	++	<i>Ilex</i> , <i>Fagus</i>	B	? Maybe one of these
	2061	5160	Hearth	+++	Mixed <i>Fagus/Prunus</i> ; check.	A	Yes
	2074	5247	Pit	+++	Mostly Maloideae type	B	?
	2079	5201	Pit	+++	Mixed, <i>Fagus</i> , other	B	?
	2080	5423	Cremation	++++	<i>Fagus/Prunus</i> - probably same species, to be checked. Some large fragments but quite infused with sediment	A**	Yes
	2089	5325	post hole	+++	Looks like mostly <i>Fagus</i> , but could be other diffuse in sample. Plus bag of hand-collected charcoal - also <i>Fagus</i>	B	?
	2049	5040	post hole - 4-post structure	++++	Predominately <i>Quercus</i>	B	?

Site	Sample No	Context No	Feature Type	Charcoal	Comments on charcoal	Charcoal potential	Full Analysis
Junction 8 northbound	6004	6248	Hearth	+++	<i>Quercus</i> , q comminuted.	B	?
	6008	6292	Cremation	+++	<i>Quercus</i> . Not great pres - q comminuted.	A**	Yes
	6014	6408	Pit	++++	Mixed, <i>Fagus</i> , <i>Prunus</i> , <i>Quercus</i> , ? <i>Salicaceae</i>	A	Yes
	6017	6591	kiln	+++	Mostly <i>Fagus</i> but could be other species present	A	Yes
	6018	6049	Pit	+++	Mixed, <i>Alnus/Corylus</i> , <i>Fraxinus</i> , <i>Quercus</i>	A	?
	6020	6789	pit	++++	Mostly ? <i>Prunus</i> roundwood, also <i>Fagus</i> , <i>Ilex</i>	A	?
	6021	6753	Hearth	++++	mostly <i>Quercus</i> , heartwood	A	Yes
	6023	6756	Ditch	++++	Mostly <i>Quercus</i> , roundwood, some other diffuse	B	?
	6026	6816	Roman pit	++++	Mixed, <i>Alnus/Corylus</i> roundwood, <i>Quercus</i> roundwood, other	A/B	?
	6027	6055	Pit	+++	<i>Quercus</i> , Maloideae, q small fragments, not great	B	?
	6030	6207	Pit	+++	<i>Fagus/Prunus</i> roundwood. Mostly <i>Fagus</i> , q comminuted.	B	Depends on context
	6032	6565	Pit	+++	Mixed Maloideae roundwood, <i>Fagus</i> roundwood, <i>Prunus</i> . Dirty	A/B	?
	6066	7231	Beam slot	++++ 1000+	Mixed, Maloideae, <i>Quercus</i> roundwood, <i>Fraxinus</i>	A/B	Depends on context
	6068	7305	Ditch	++++	Mixed, <i>Acer</i> , <i>Quercus</i> , <i>Alnus/Corylus</i> roundwood	B	?
	6083	7367	hearth	+++	Mostly <i>Quercus</i> , small fragments	A/B	?
6084	7366	Hearth	++++	Mostly <i>Quercus</i>	A	Yes	

+ = present; ++ = occasional; +++ = common; ++++ = abundant

**APPENDIX 15: ASSESSMENT OF POLLEN***Dr Lucy Verrill***Introduction**

Oxford Archaeology North undertook assessment of the palynological potential of five monoliths taken from features identified at Junction 8 as part of archaeological assessment of the M1 widening scheme.

**Quantification and Methods*****Quantification and sediment description***

The monoliths were cleaned, described and subsampled. The sediment types, including Munsell colours, and their depths are shown in Tables A34 and A35. Depths given are relative to the top of the monoliths.

*Table A34: Sediment types, Junction 8S sample sequence 2054-2064, fill of waterhole feature (5078)*

Monolith	Depth	Context	Description
2054	4cm	5100	7.5YR 4/4 dark brown compacted silty with flint inclusions and charcoal inclusions
2054	27cm	5102	7.5YR 5/4 brown and 7.5YR 4/4 dark brown (mottled) clayey silt with charcoal inclusions
2064	15cm	5102	7.5YR 5/4 brown silty clay
2064	30cm	5164	7.5YR 5/6 strong brown compacted silty clay
2063	32cm	5165	7.5YR 5/6 strong brown mottled compacted clay
2062	37cm	5166	7.5 YR 6/6 reddish yellow silty clay

*Table A35: Sediment types, Junction 8N sample 6013, fill of ditch feature (6259).*

Depth	Context	Description
24cm	6260	7.5YR 4/4 dark brown clayey silt with flint inclusions
30cm	6353	7.5YR 4/3 dark brown compacted mottled clayey silt with small flint inclusions and charcoal flecks

***Laboratory Methods***

Eight subsamples were prepared for pollen analysis using a standard chemical procedure (method B of Berglund and Ralska-Jasiewiczowa 1986), using HCl, NaOH, sieving, HF, and Erdtman's acetolysis, to remove carbonates, humic acids, particles >170 microns, silicates, and cellulose, respectively. The samples were then stained with safranin, dehydrated in tertiary butyl alcohol, and the residues mounted in 2000 cs silicone oil. Slides were examined at a magnification of 400x (1000x for critical examination) by ten equally-spaced traverses across at least two slides to reduce the possible effects of differential dispersal on the slide (Brooks and Thomas 1967). Two *Lycopodium* tablets (Stockmarr 1972) were added to a known volume (10 ml) of sediment at the beginning of the preparation so that pollen concentrations could be calculated.

**Results**

The results of the assessment are presented in Table A36. Pollen was preserved in all samples although concentrations were low or extremely low and in most cases preservation was poor or extremely poor. As the marker spores *Lycopodium* were preserved in high concentrations and in good condition, the paucity and poor quality of fossil pollen can be attributed to taphonomic conditions rather than any problem with processing.

**Conclusions**

Eight subsamples from three features excavated at Junction 8 of the M1 widening were assessed for pollen content. Whilst pollen was preserved in the samples the concentrations and quality of preservation precluded full assessment of the sequences.

#### Recommendations

It is recommended that no further palynological investigations should be carried out upon these features.

#### Acknowledgements

Pollen preparations were carried out by Sandra Bonsall. Oxford Archaeology North would like to thank the Department of Geography, University of Lancaster, for use of laboratory facilities.

Table A36: Assessment of pollen slides from M1 widening

Sample no.	Context	Depth	Content	Pollen preservation	Potential for assessment
2054	5100	4cm	<i>Lycopodium</i> , mineral material, charcoal, fern spores and rare pollen	Corroded/fair	Possible
2054	5102	27cm	<i>Lycopodium</i> , mineral material, charcoal, rare fern spores and pollen	Variable	None
2064	5102	15cm	<i>Lycopodium</i> , mineral and organic material, charcoal, fern spores and rare pollen	Crumpled and split	None
2064	5164	30cm	<i>Lycopodium</i> , mineral material, charcoal, fern spores and rare pollen	Split	Possible
2063	5165	32cm	<i>Lycopodium</i> , mineral material, charcoal, rare fern spores and very rare pollen	Crumpled	None
2062	5166	37cm	<i>Lycopodium</i> , mineral material, charcoal, very rare fern spores and pollen	Corroded	None
6013	6260	24cm	<i>Lycopodium</i> , charcoal, rare fern spores and pollen	Crumpled	None
6013	6353	31cm	<i>Lycopodium</i> , mineral material, charcoal, rare fern spores and pollen	Crumpled	None

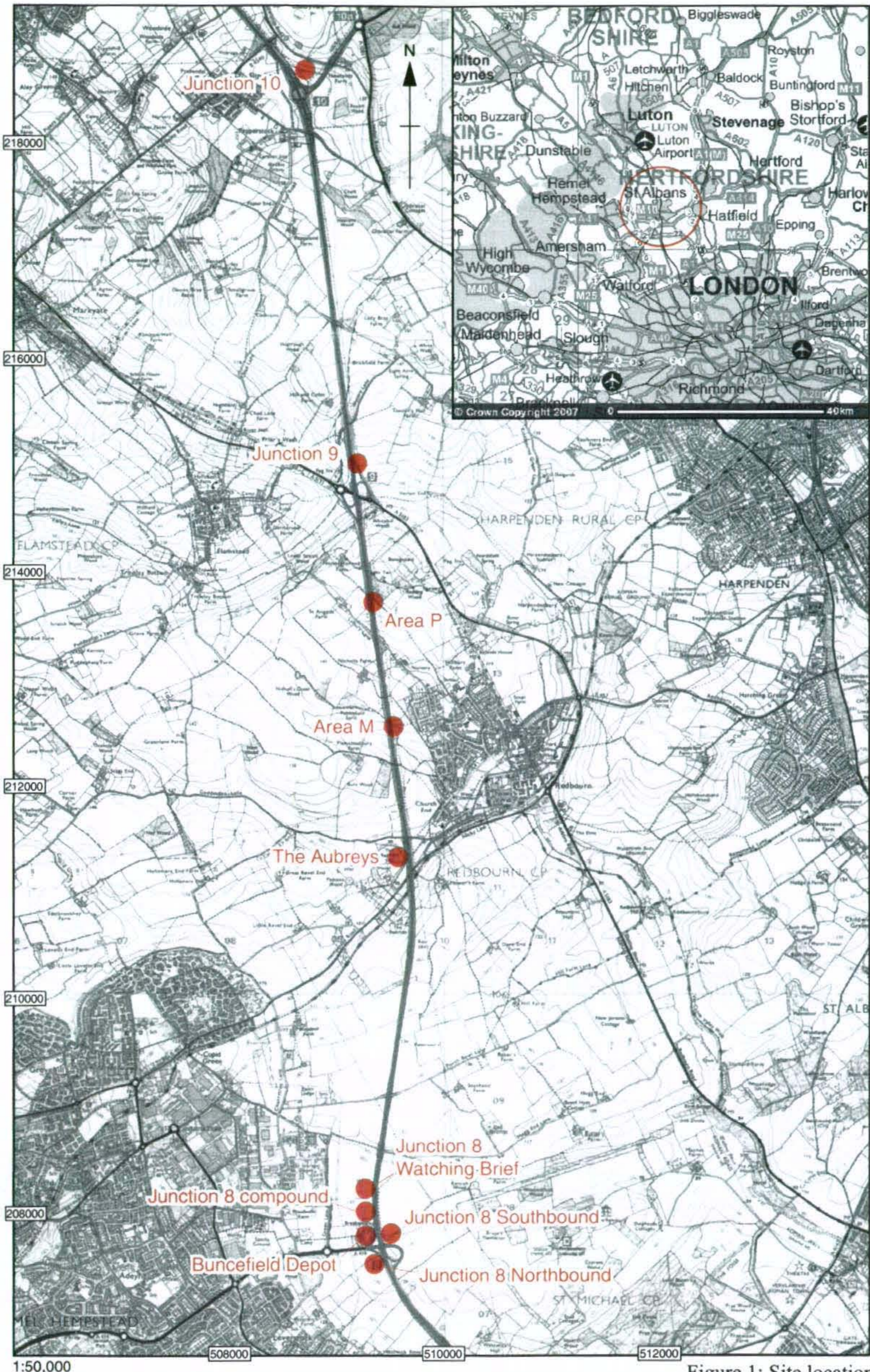


Figure 1: Site location

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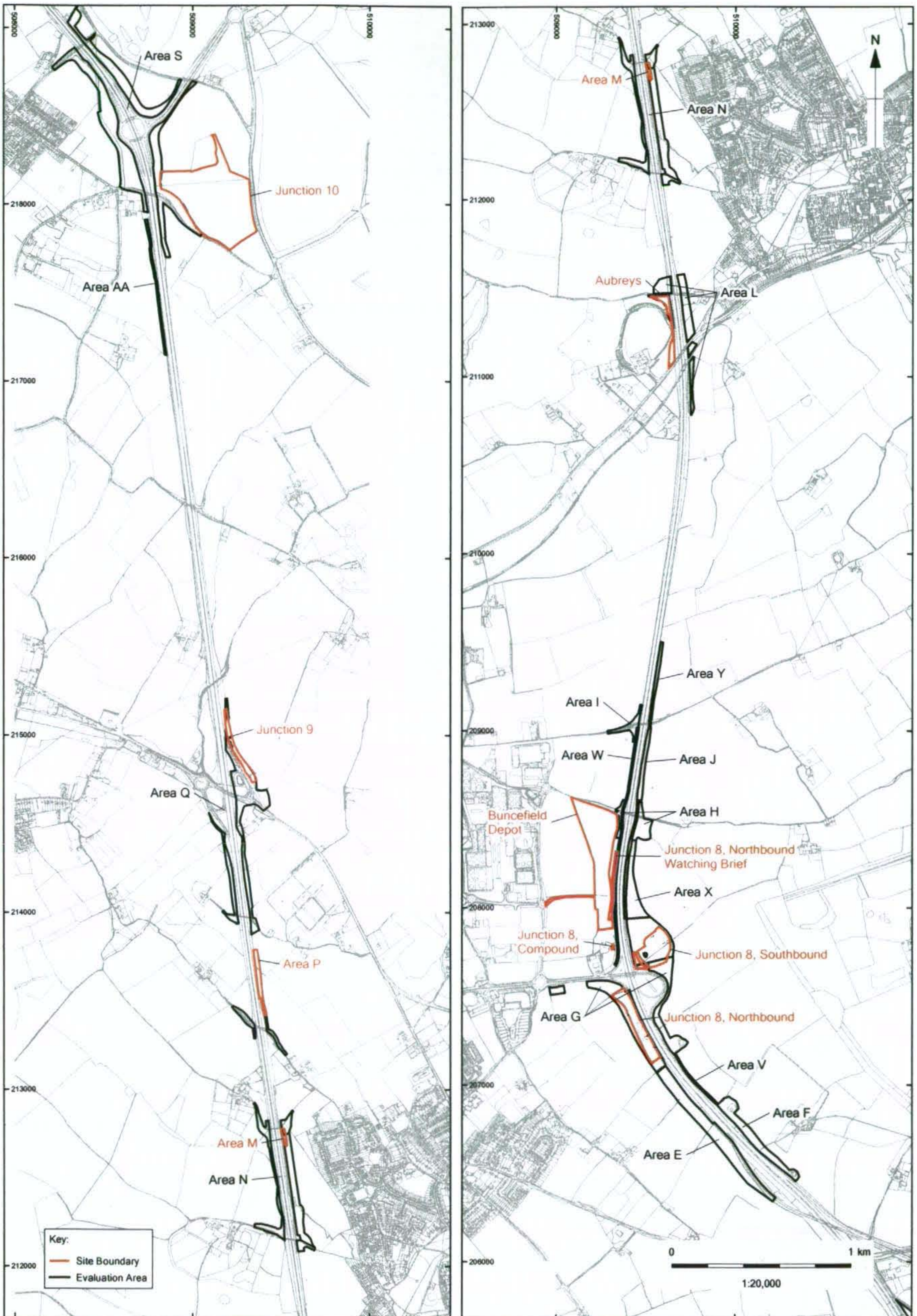


Figure 2: Site Locations



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Figure 3: Junction 8 Southbound, phase plan

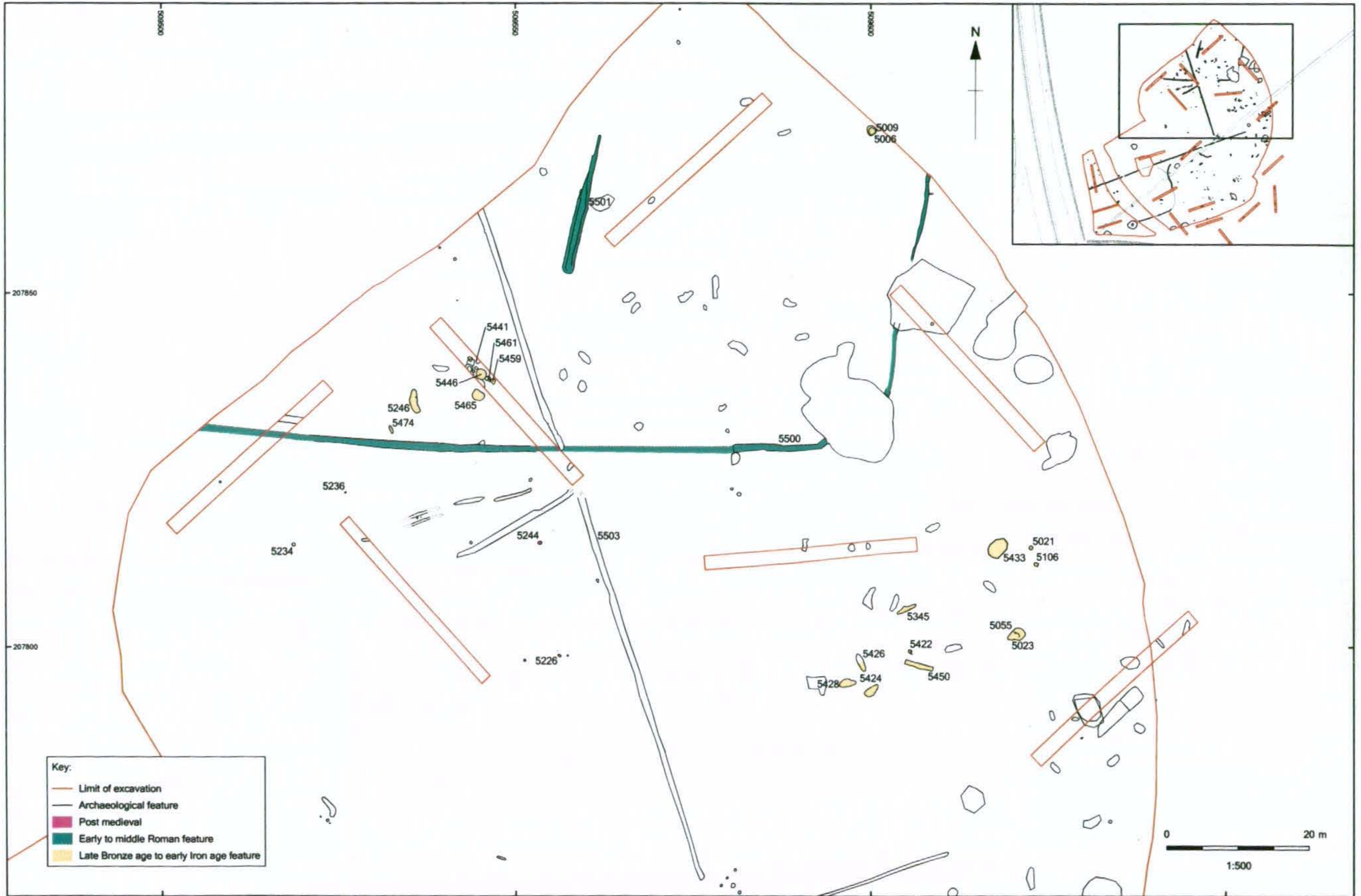


Figure 4: Junction 8 Southbound, phase plan

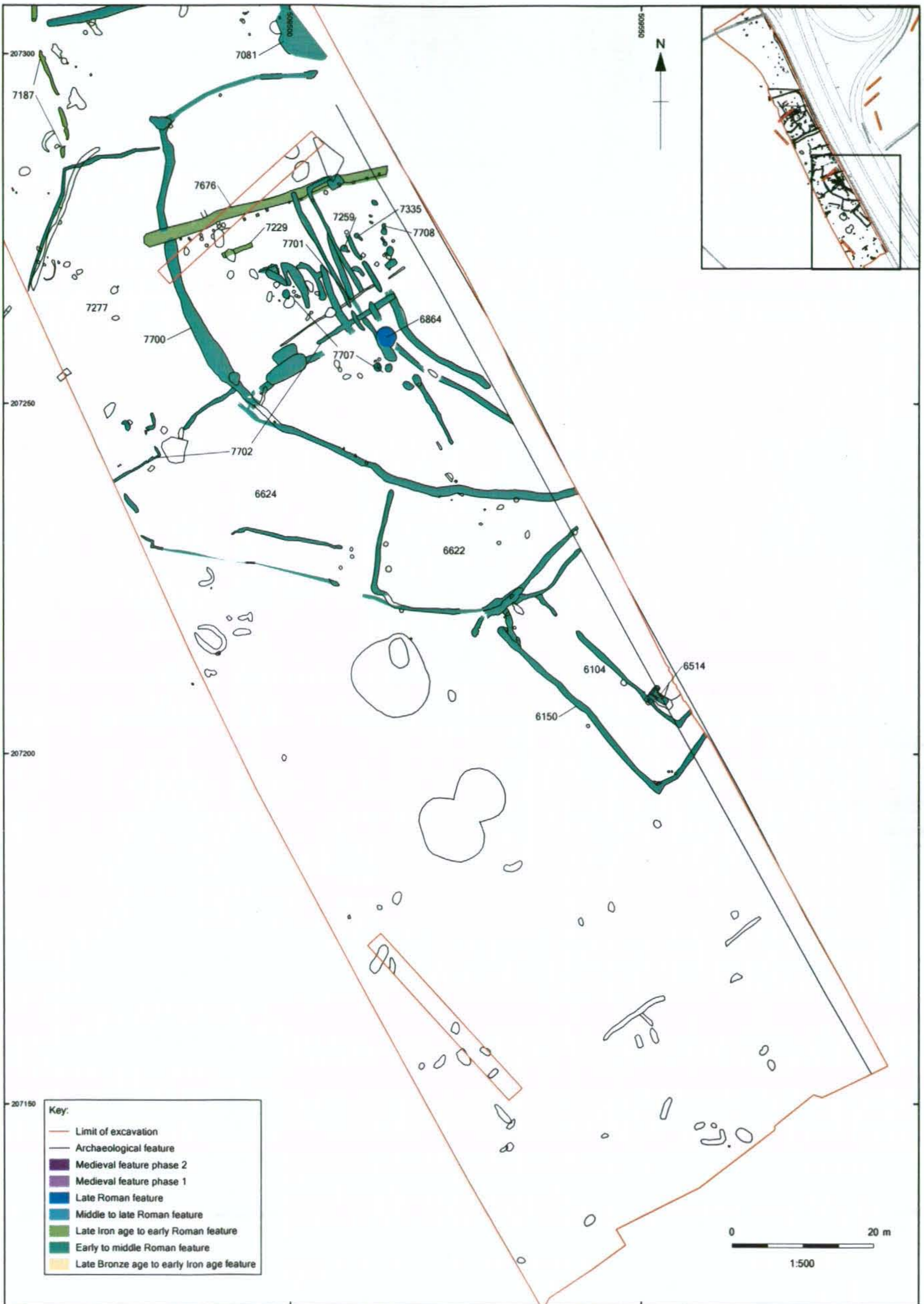


Figure 5: Junction 8 Northbound, phase plan



Figure 6: Junction 8 Northbound, phase plan

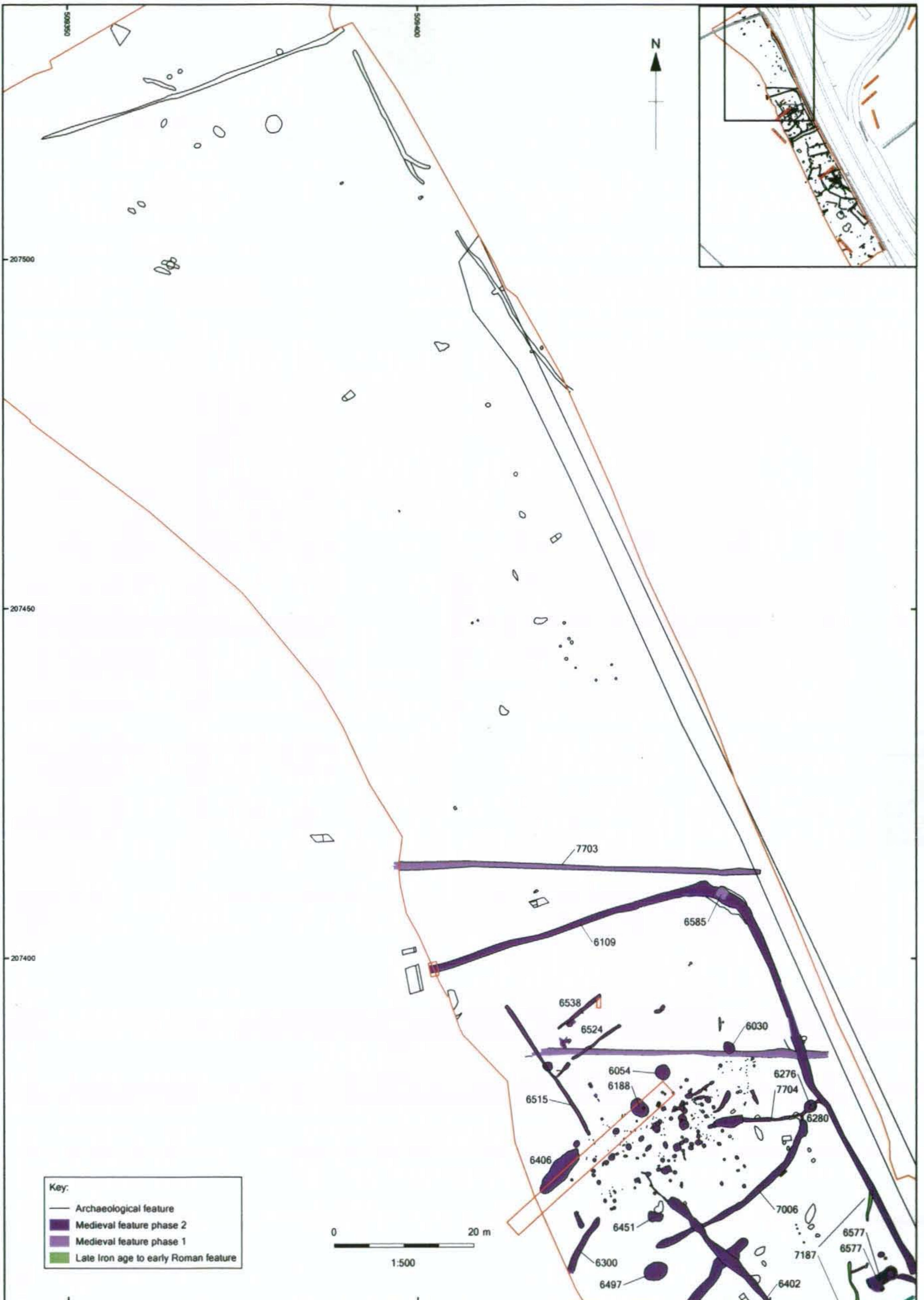


Figure 7: Junction 8 Northbound, phase plan

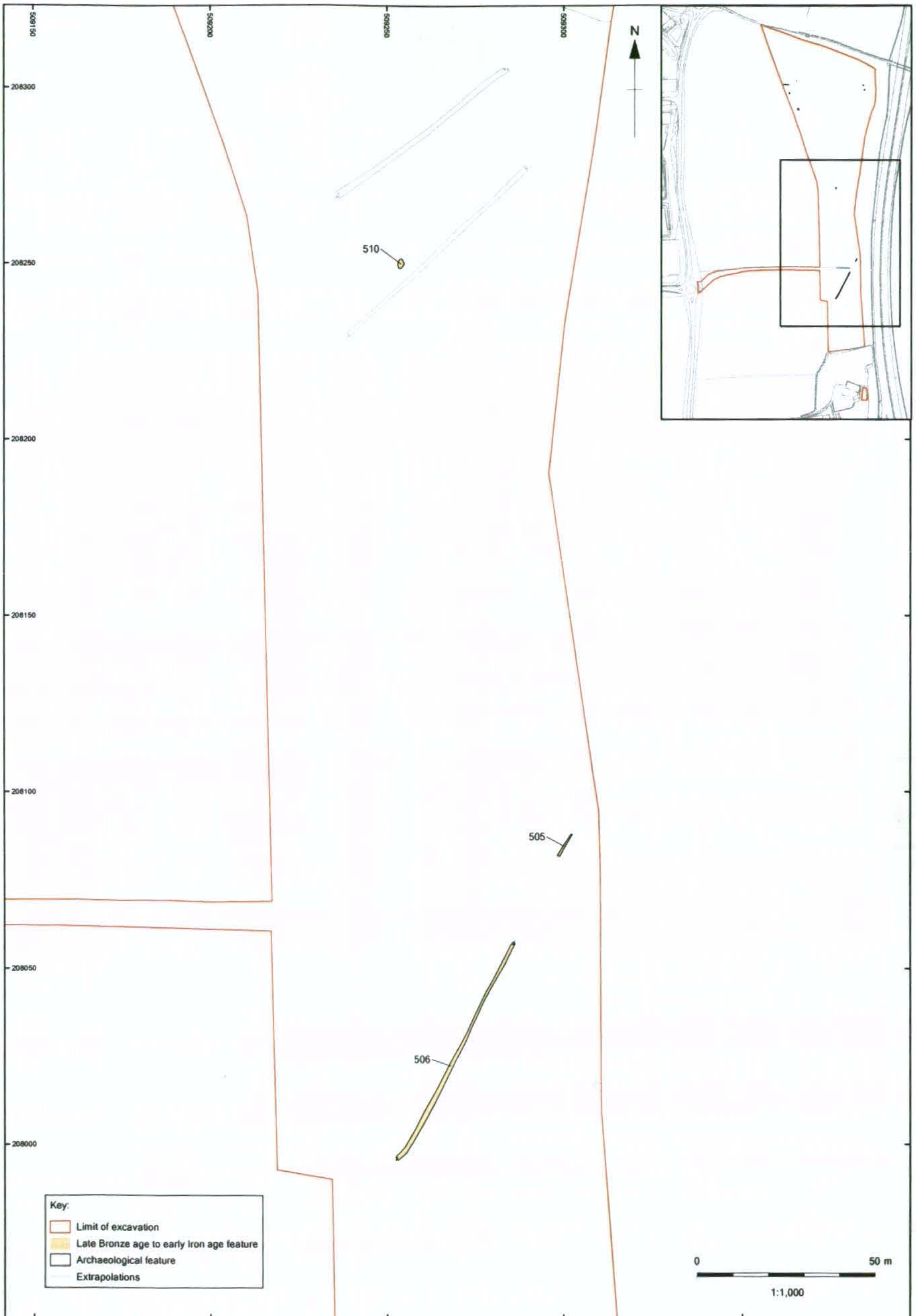


Figure 8: Buncefield Depot, phase plan

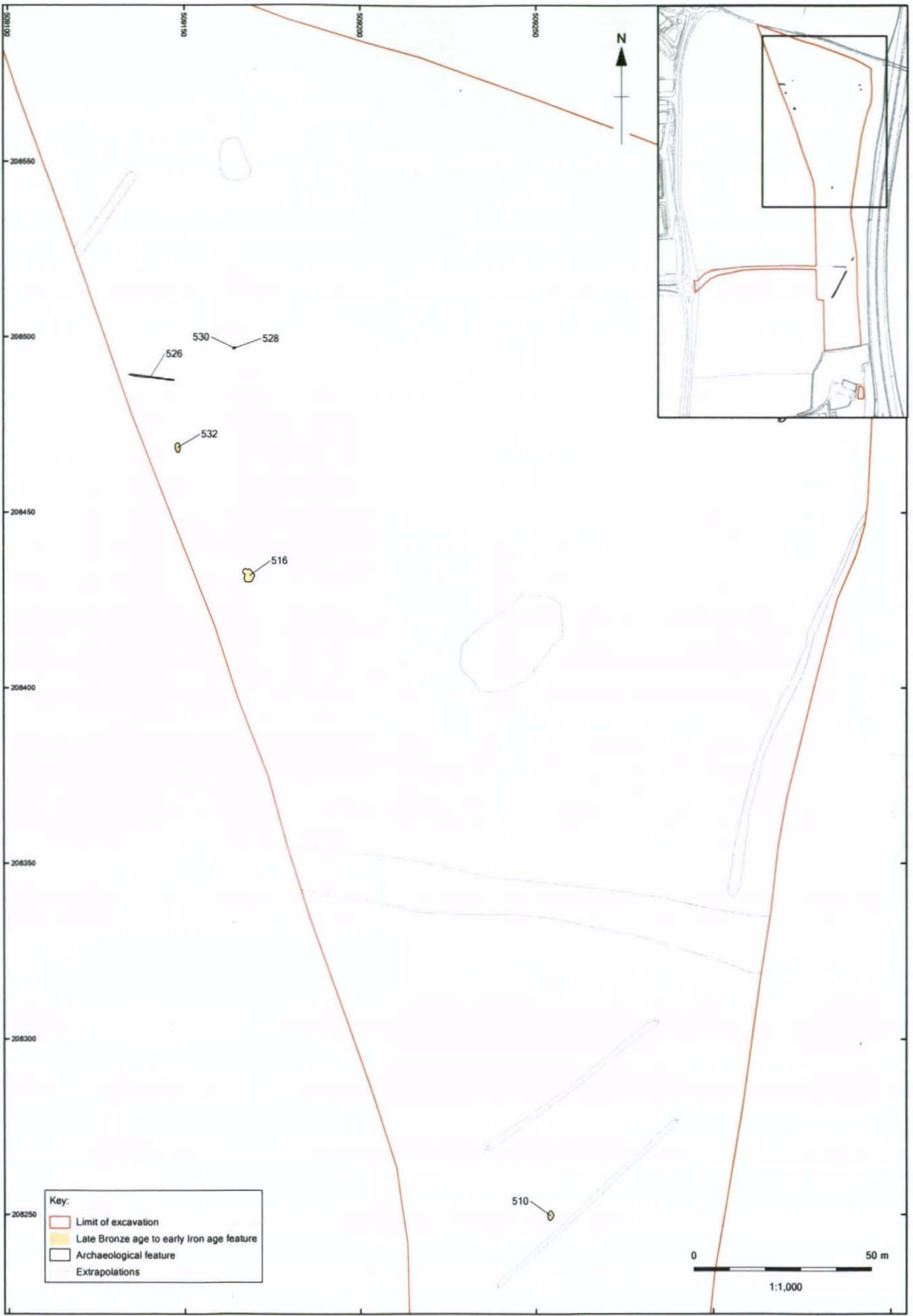


Figure 9: Buncefield Depot, phase plan

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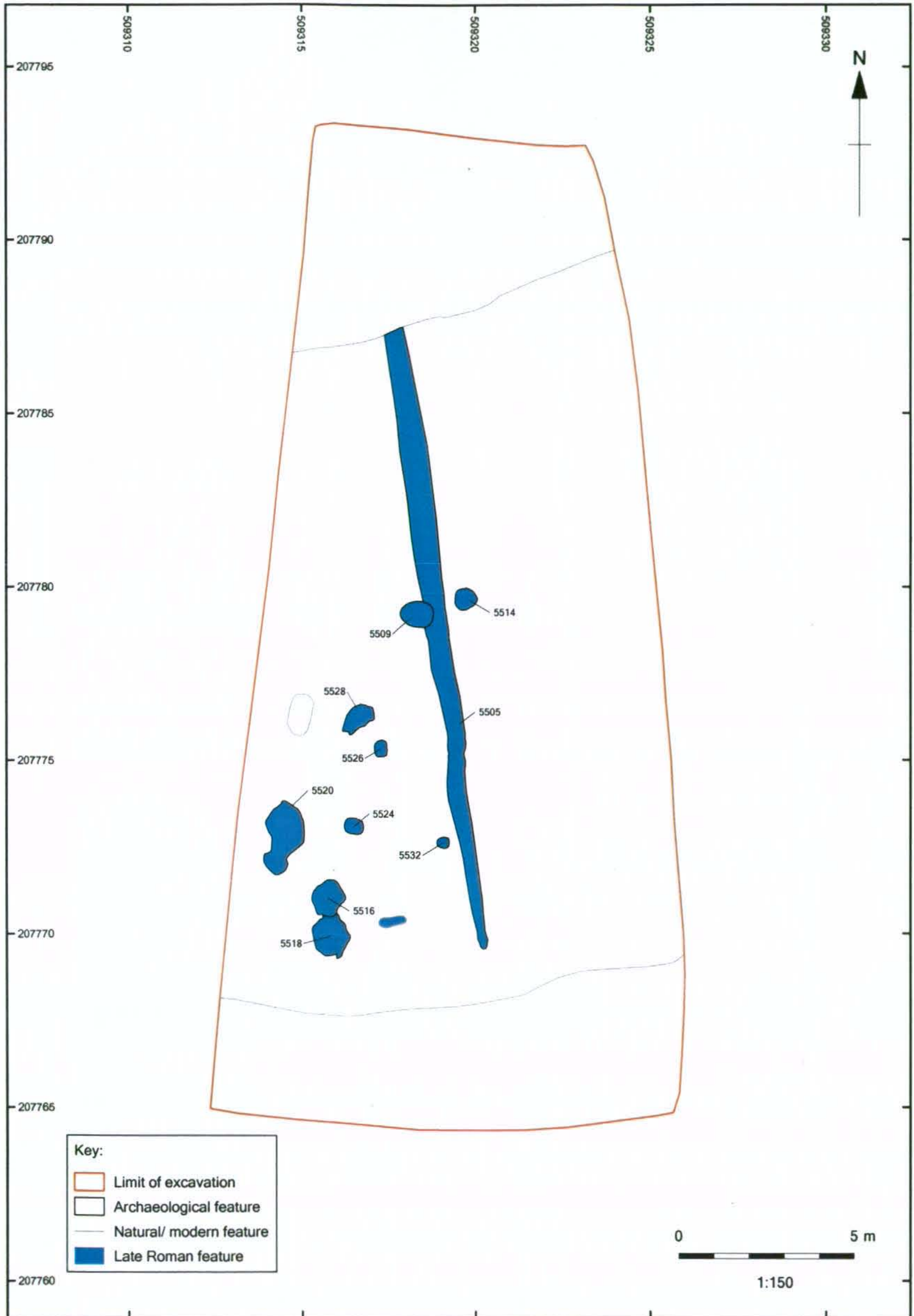


Figure 10: Junction 8, Compound, phase plan



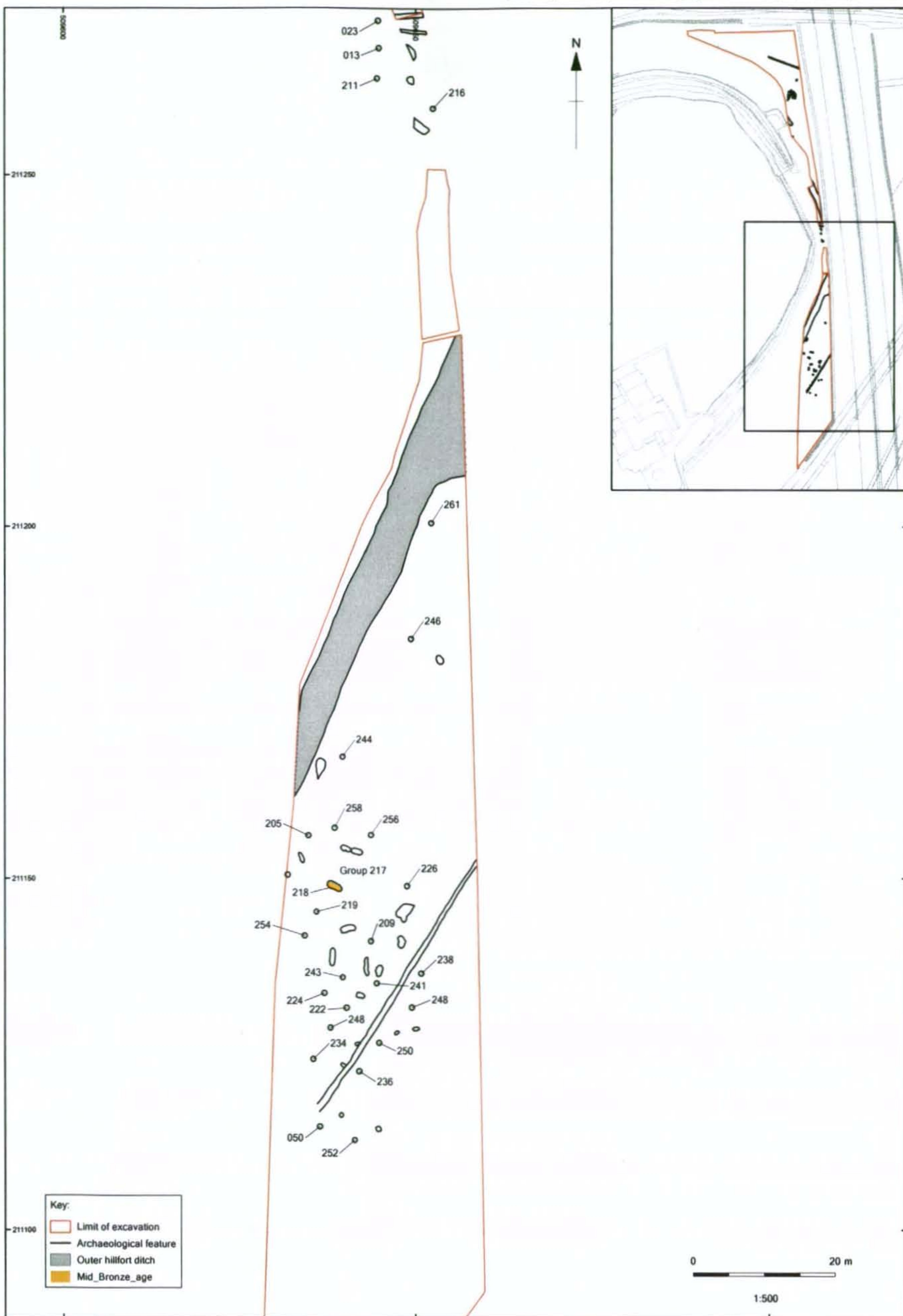


Figure 12: Aubreys, plan



Figure 13: Aubreys, plan

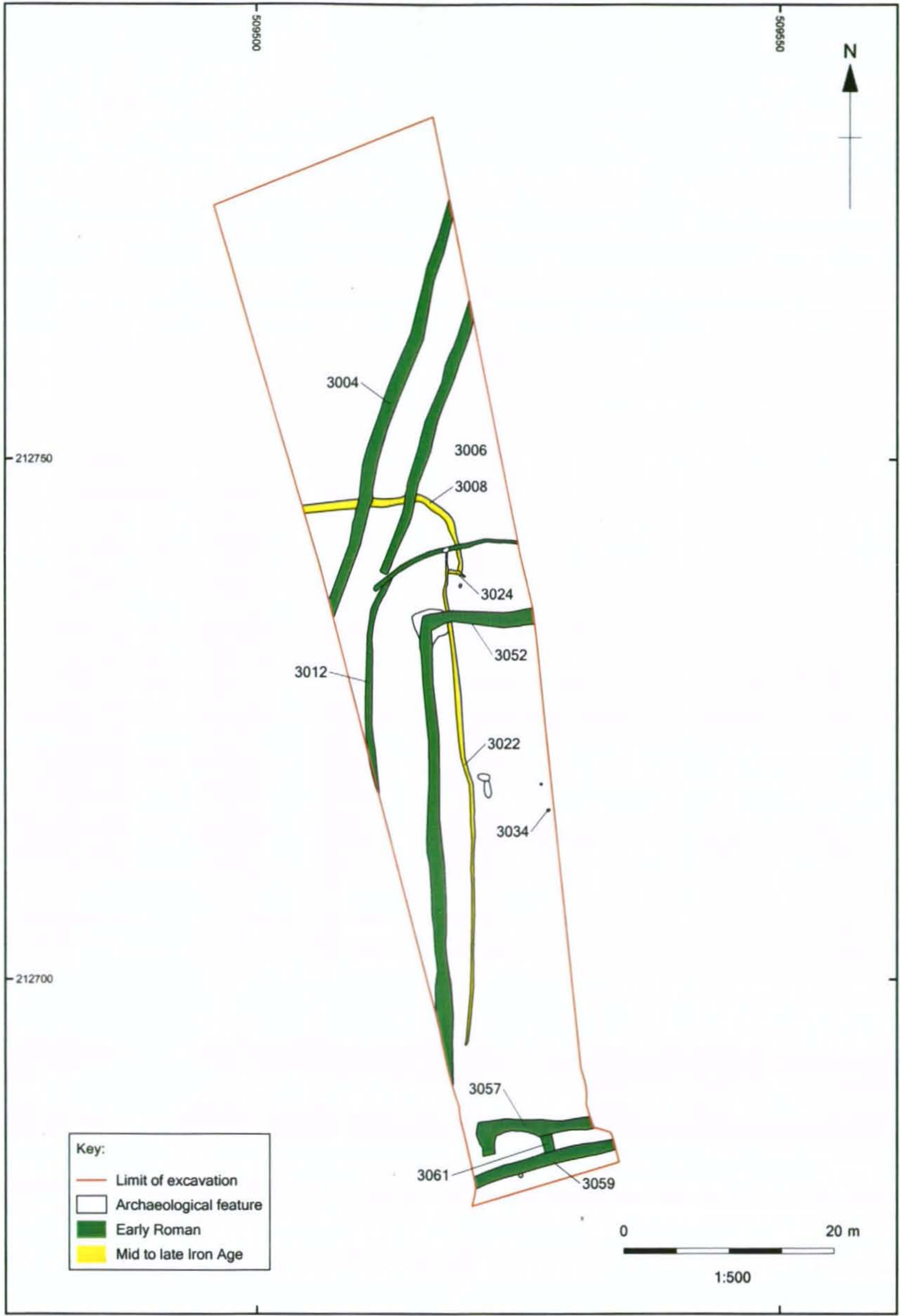


Figure 14: Area M, phase plan

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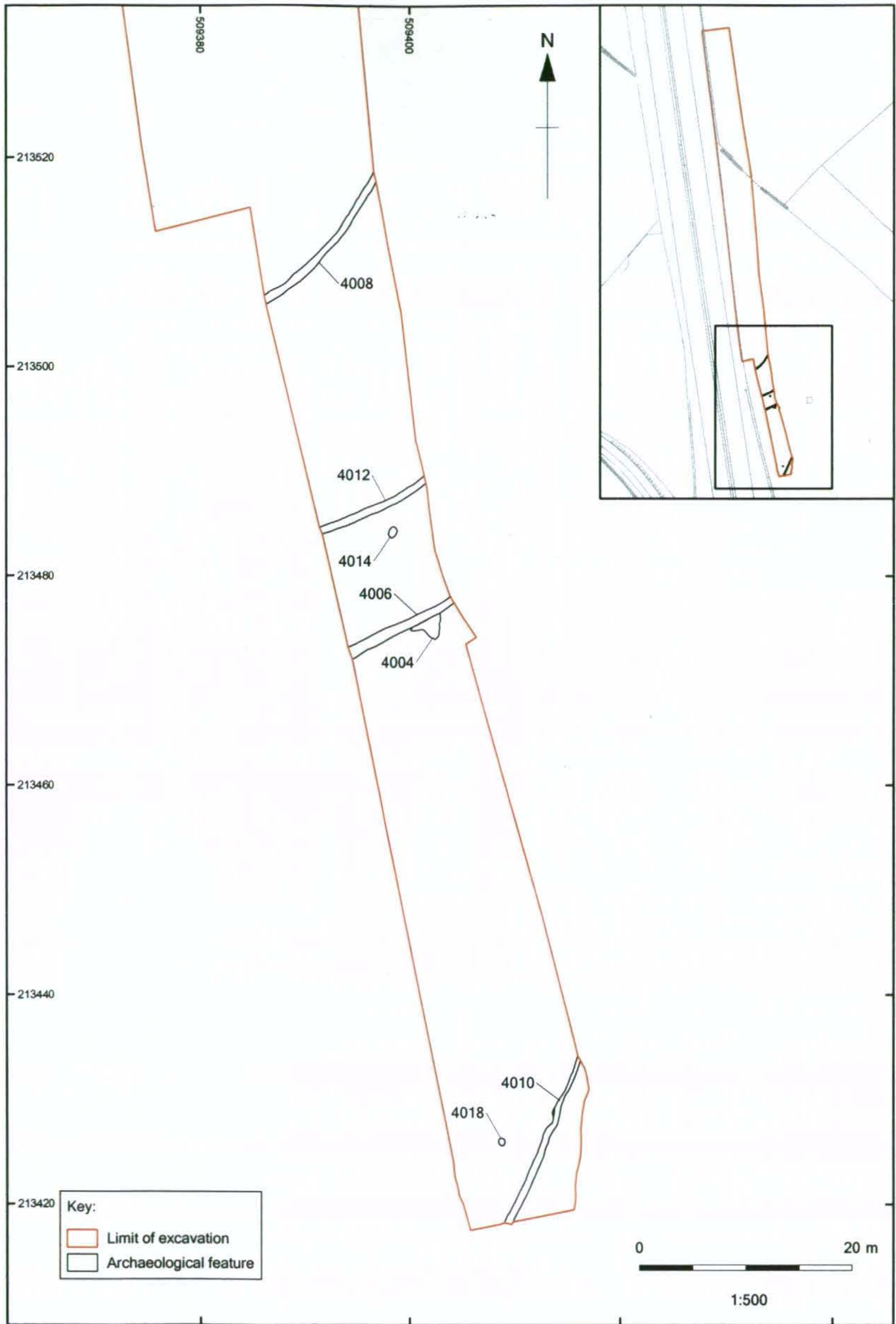


Figure 15: Area P, plan

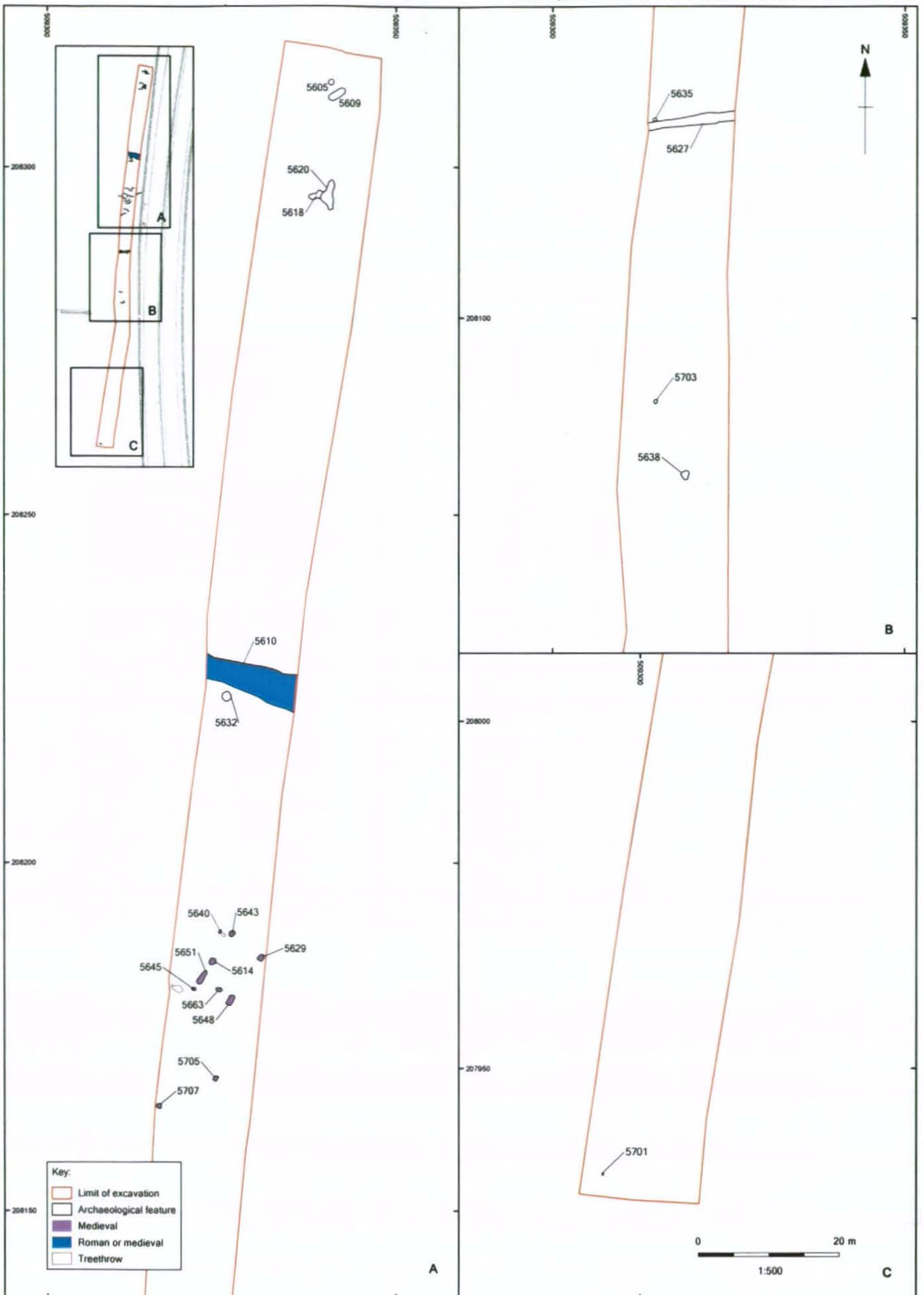


Figure 11: Junction 8 Northbound targeted Watching brief, phase plan



Figure 16: Junction 9, phase plan

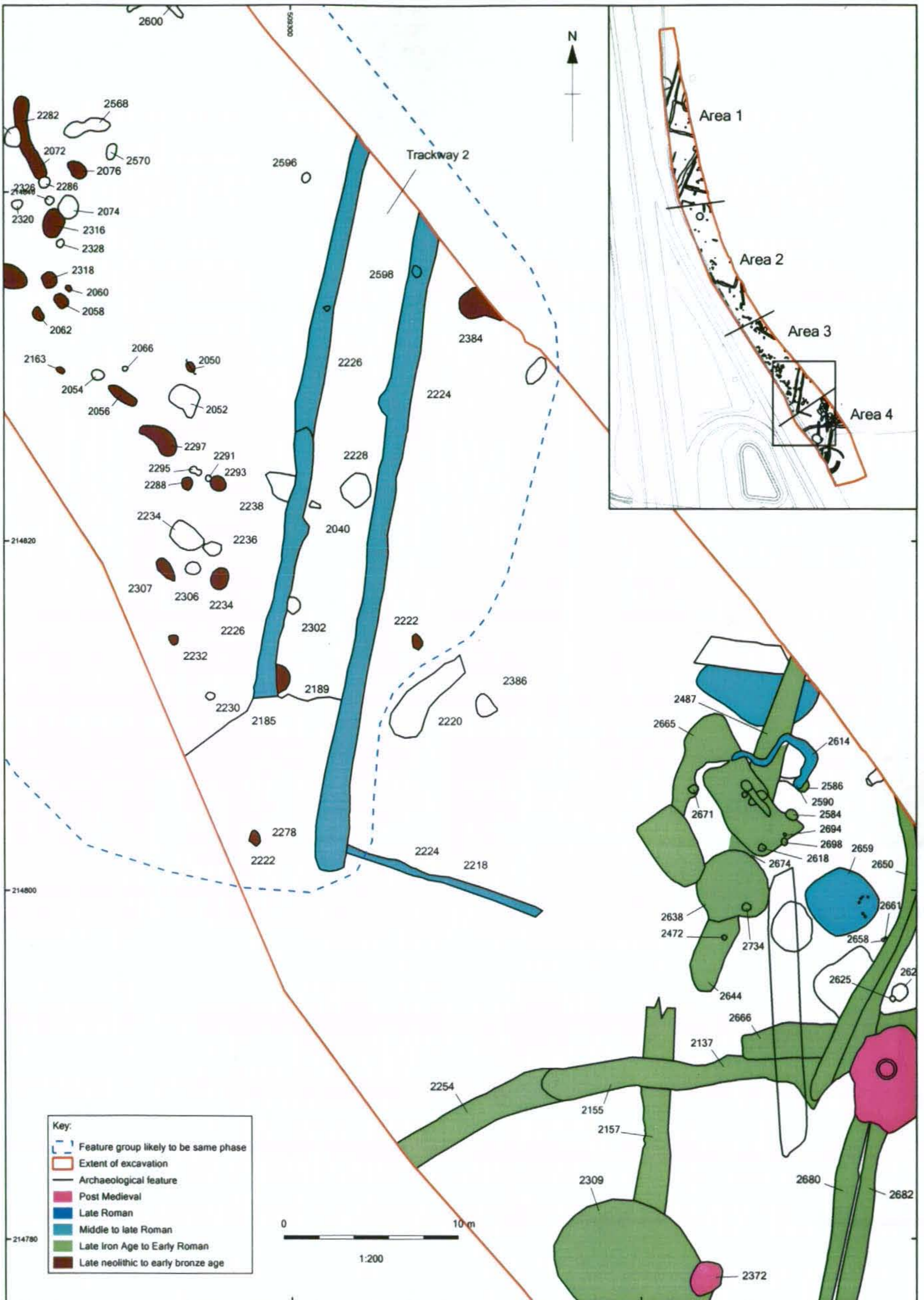


Figure 17: Junction 9, phase plan

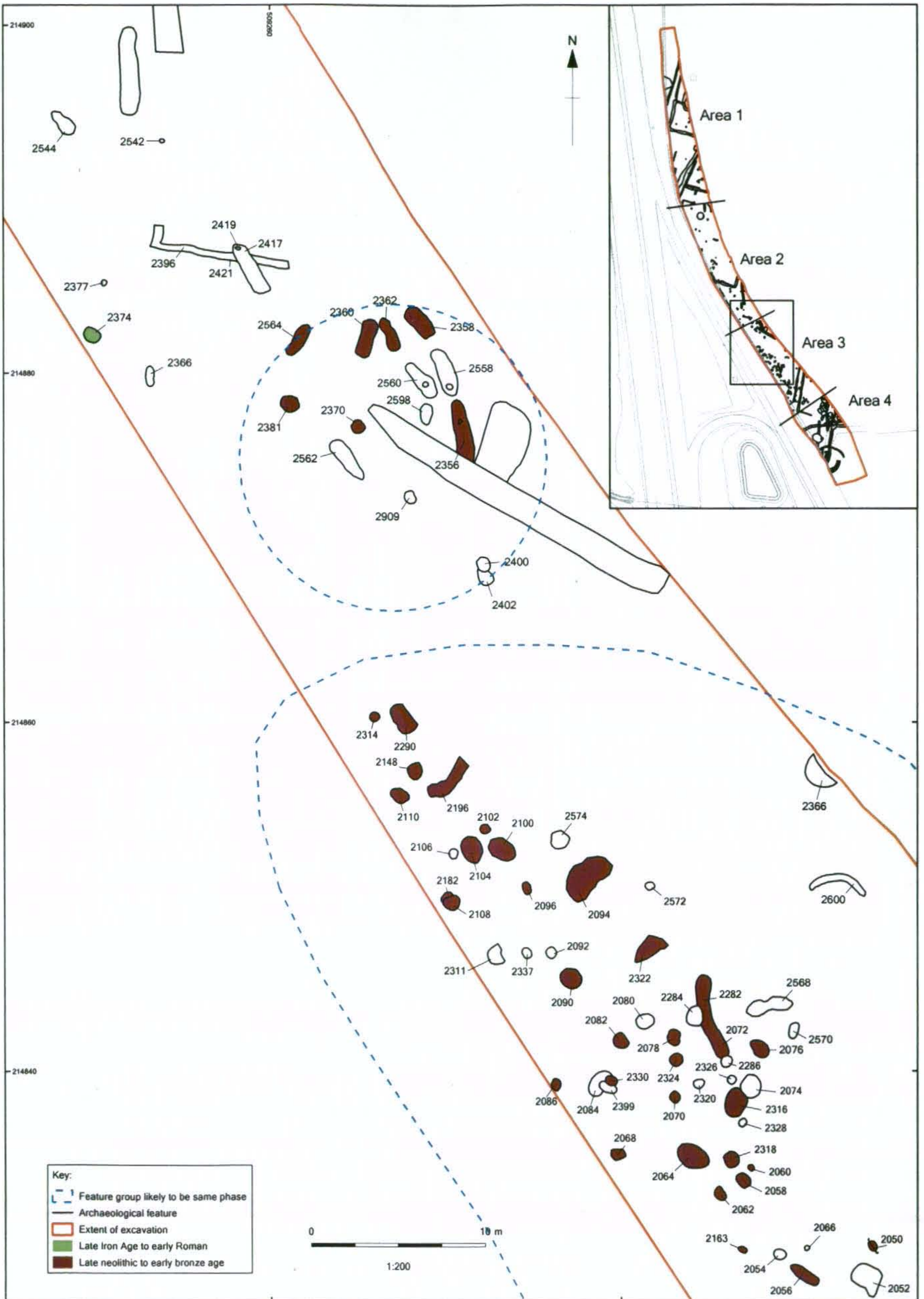


Figure 18: Junction 9, phase plan



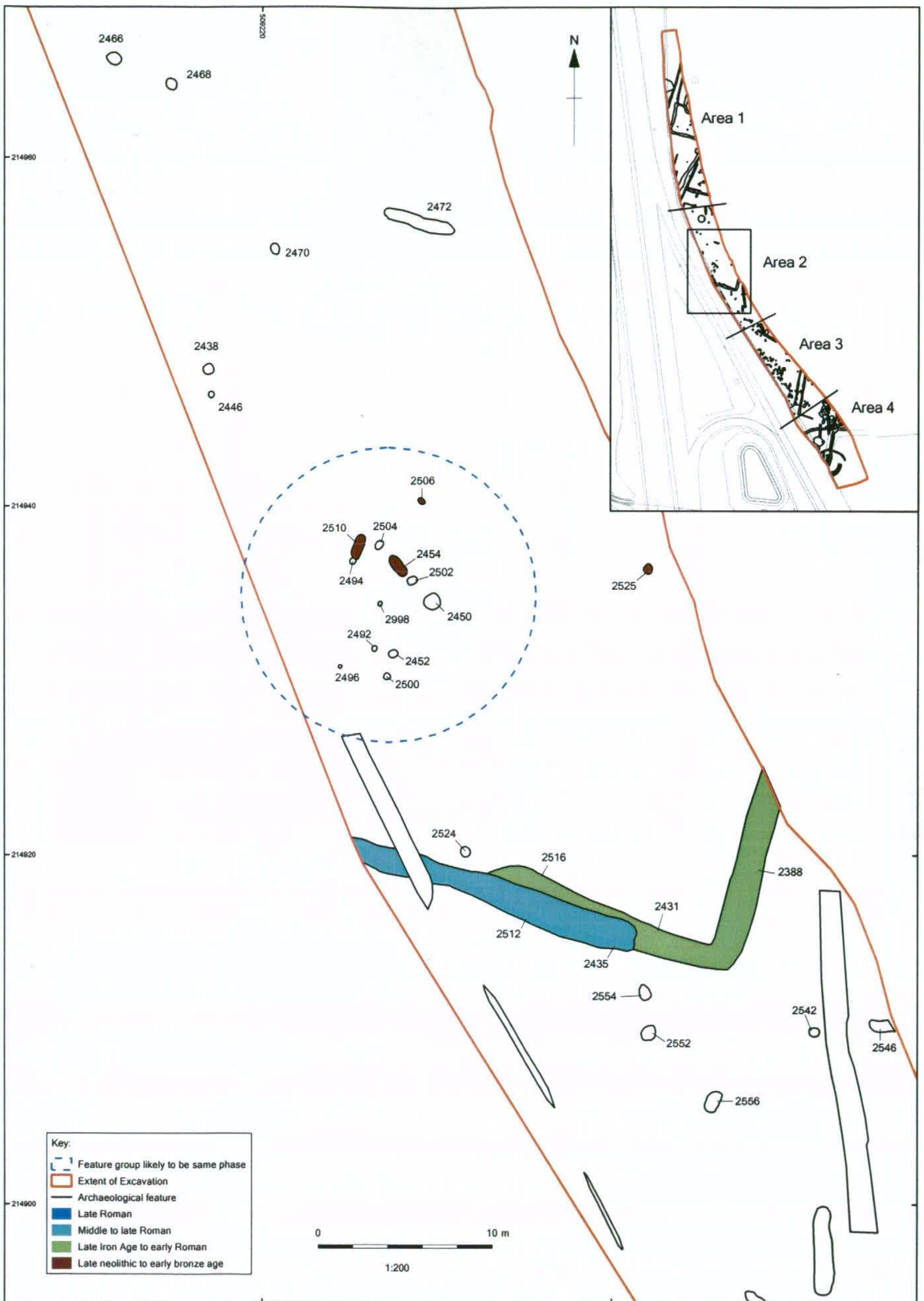


Figure 19: Junction 9, phase plan

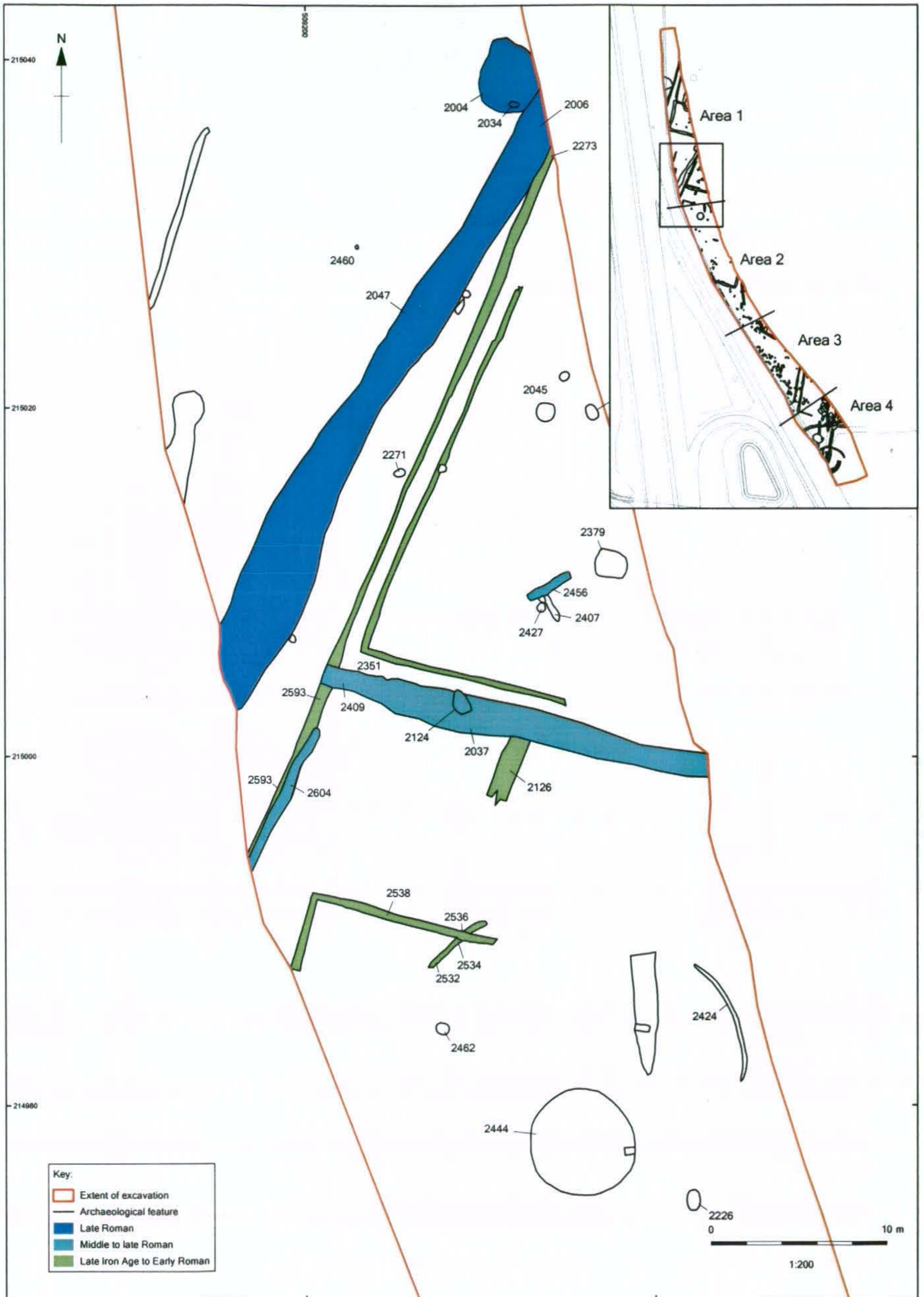


Figure 20: Junction 9, phase plan

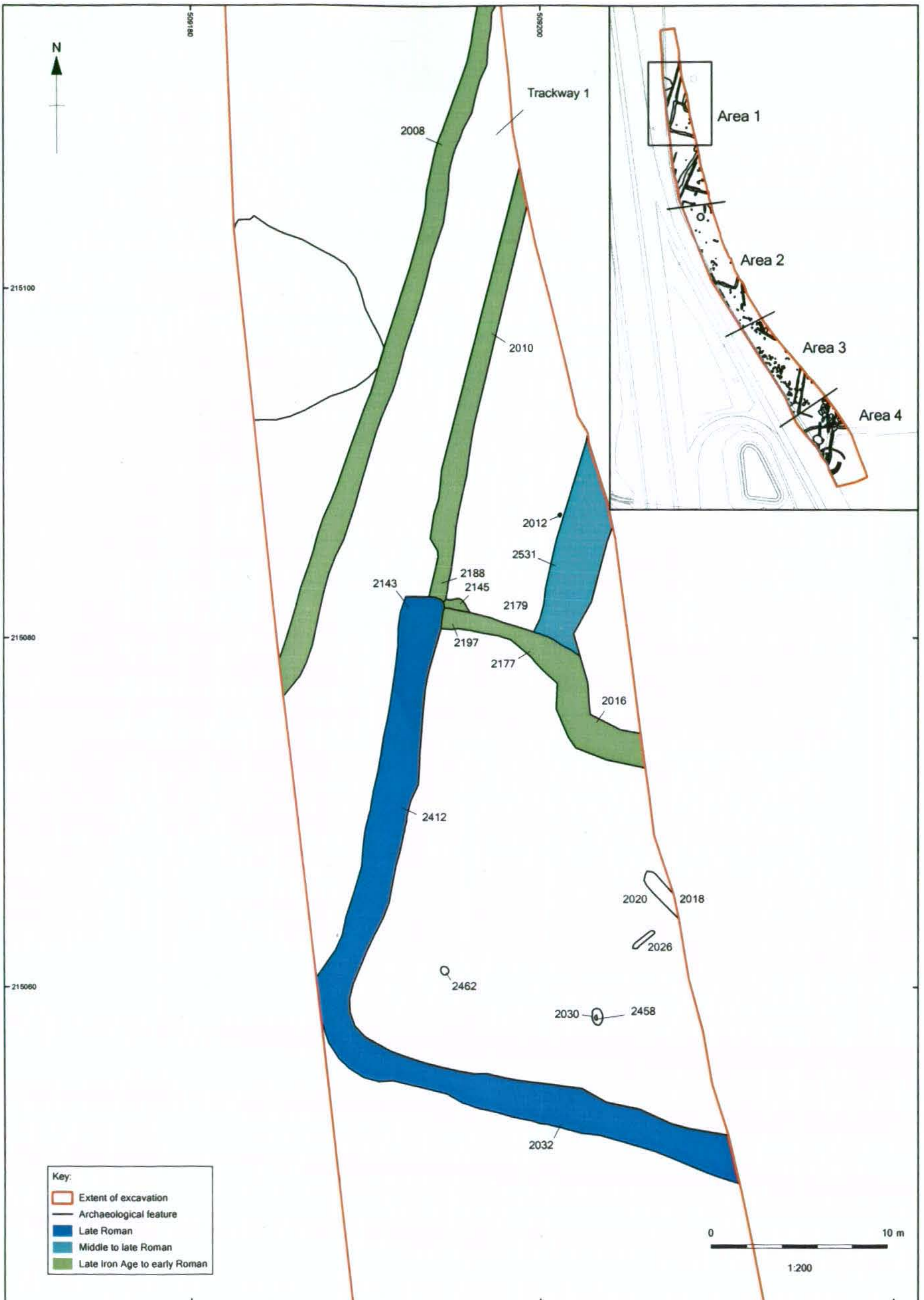


Figure 21: Junction 9, phase plan

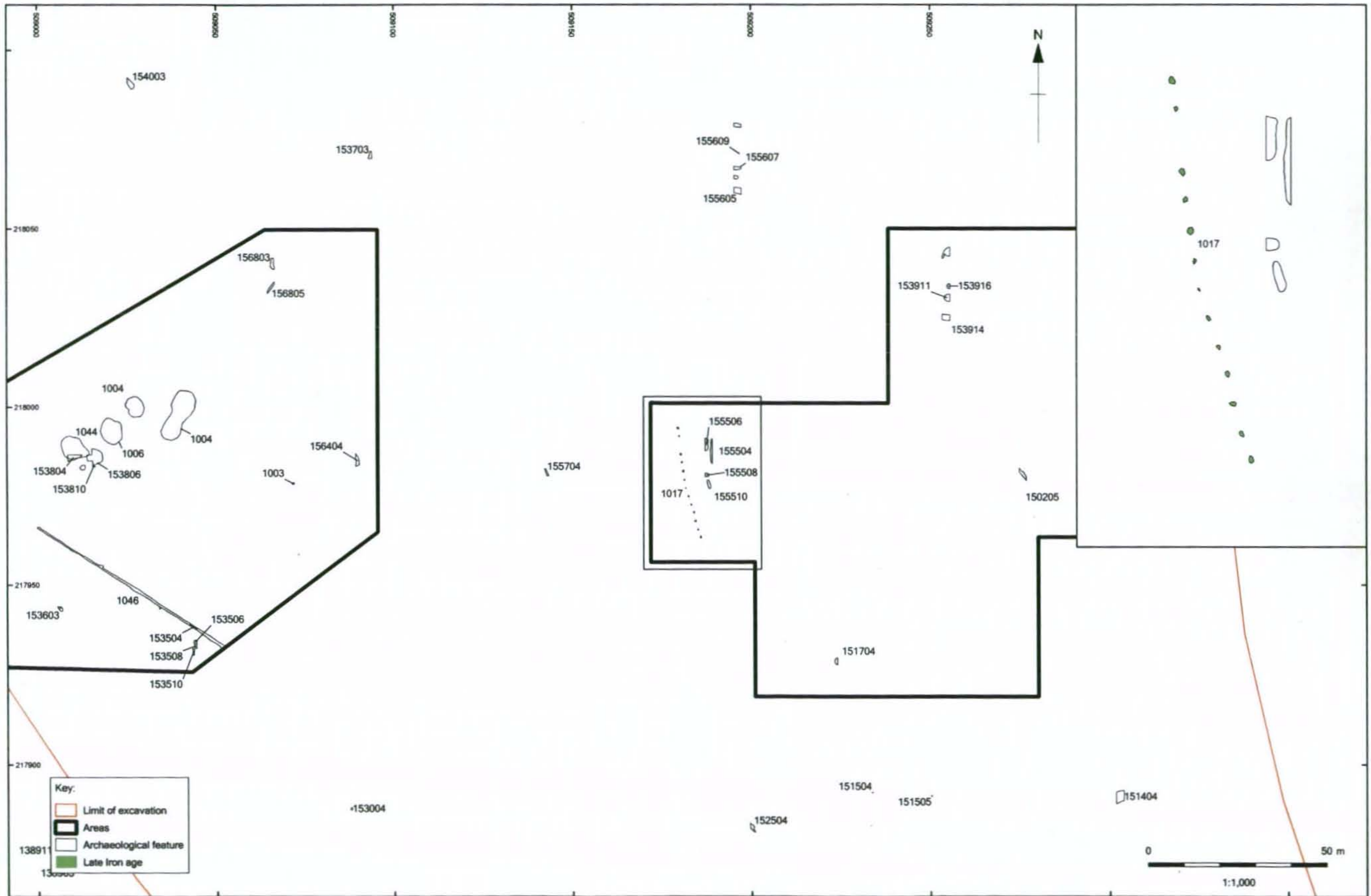


Figure 22: Junction 10, phase plan