

**WING TO WHATBOROUGH
TRUNK MAIN**

**INTERIM REPORT
&
POST-EXCAVATION ASSESSMENT
AND PROJECT DESIGN**

**for
Anglian Water Services Limited
and
Severn Trent Water Limited**

by

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PART ONE - INTERIM REPORT

1 Background

1.1 Desk-based Assessment

An assessment of the archaeological impact of a pipeline was commissioned from University of Leicester Archaeological Services (ULAS) by Anglian Water Services plc in January 1996 on behalf of Severn Trent Water plc.¹ The pipeline was the second phase of a relief pipeline begun in 1991 (TLAHS 66, 1992 p183 & p188). The line covered an approximately 30m wide easement, over fourteen kilometres from Wing, Rutland to Whatborough, Leicestershire.

Groundworks were to include topsoil stripping of the easement, the excavation of a pipe trench, and installation of the 4.5m long, 0.80m diameter, ductile iron pipes. Damage to archaeological deposits would be caused by the excavation of the pipetrench, the tracking of excavators on a stripped surface and subsequent rip-ploughing of reinstated land.

The preliminary assessment was prepared based on available records and a walk of the 67 fields passed through by the line (Beamish 1996). The assessment found that the development would damage a number of archaeological sites listed on the Leicestershire Museums Sites and Monuments Record, and pass within small distances of others. Other areas with an archaeological potential based on other factors were also highlighted. The report recommended that a programme of archaeological fieldwork including trial trenching, field walking and geophysical survey be instigated, to evaluate the archaeological potential.

1.2 Evaluation

An evaluation was duly commissioned from ULAS by Anglian Water Services plc on 9-2-1996. This was to include fieldwalking and geophysical survey (GSB Rep No 96/33)

Those areas identified in the desk-study were trial trenched by a JCB with ditching bucket. Trenches were placed on the side of the easement nearest the archaeological potential as identified. In several instances archaeological deposits were observed which were subsequently buried by the bunding of topsoil and subsoil.

This work attempted to identify areas of archaeological potential and their extents within the easement and lasted for three weeks. On the basis of the evaluations, it was recommended that excavation and record be employed for a number of targeted areas along the line and that a be maintained over other parts of the line².

This work was duly commissioned on 20-3-1996

¹ In the instance of a pipeline, statutory planning processes were not applicable although Anglian Water Services Ltd and Severn Trent Water Ltd follow the guidelines of PPG 16.

The Wing to Whatborough Trunk Main Scheme was funded by Severn Trent Water with Anglian Water acting as their agents. Both companies are committed within their Environmental Policies to comply with legal obligations to assist with the appropriate level of archaeological investigation and to this end Severn Trent Water have provided funding sufficient to enable these valuable finds to be assessed (Richard Smedmore, Anglian Water Services pers. comm.).

² This phase of the project was discussed with Keith Challis from Trent and Peak Archaeological Trust who was acting as Consultant to Severn Trent Water.

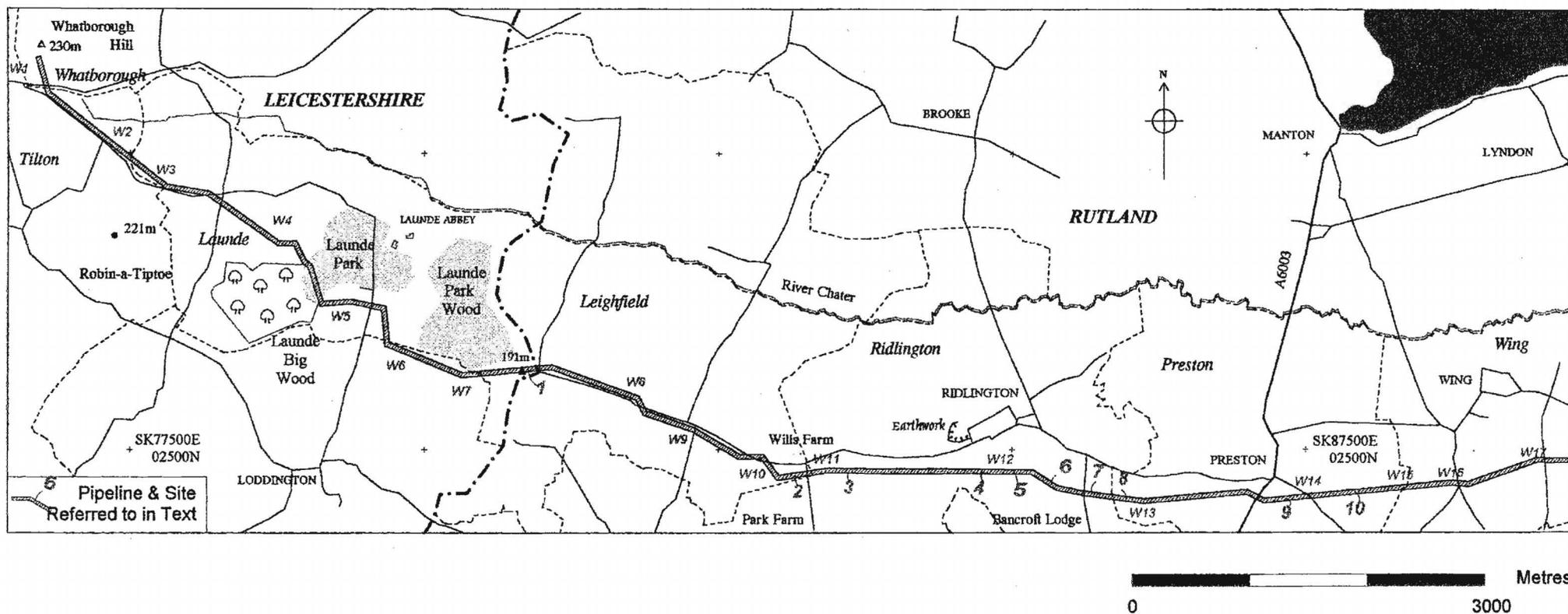


Figure 1: The Wing to Whatborough Hill Trunk Main.
 The principal archaeological sites (1-10) mark the east-west extents of a Northampton Sand ironstone ridge. The location of watching brief observations and material, are also marked (table 1).

2 Results

2.1 Site types and Chronology

A range of archaeological information was gathered during the project. The most detailed information was recorded at ten sites located along a 7km Northampton Sand (ironstone) ridge running east-west on the southern side of the River Chater, in the Parishes of Launde, Leighfield, Ridlington, and Preston. The extents of the ridge are marked by Sites 1 and 10, Fig 1).

The sites ranged from Upper Palaeolithic or Early Mesolithic to Roman. Later Prehistoric activity was well attested. Sites included occupation areas, boundary systems, enclosural systems and industrial areas. Of note in addition to the early prehistoric knapping site at Launde (Site 1) were a number of iron working deposits of probable Romano British date and several Roman ovens or dryers, in Ridlington (Sites 3 and 5).

2.2 Site Objectives

Sites 2-10

- 2.2.1 Identify areas of archaeological material within the development area.
- 2.2.2 Define and plan archaeological deposits within identified areas
- 2.2.3 Assess the preservation of deposits and the potential for providing environmental and industrial data.
- 2.2.4 Investigate and categorise by selective excavation the nature of the deposits (mostly by half section or ditch segment).
- 2.2.5 Excavate and sample selected features for environmental and industrial data (mostly by total excavation).
- 2.2.6 Provide sufficient material to provide dating of deposits, and where applicable the chronology of the sites.
- 2.2.7 Some sites were excavated less than others due to enforced time constraints; in a few cases, more was excavated than had been envisaged.
- 2.2.8 In one case, access to a prehistoric occupation site (site 8) was totally denied by the landowner, following initial identification, and no excavation or detailed records could be made.

2.3 Site Methods

2.3.1

The large areas involved and strict time scales involved dictated that resources were targeted to the perceived potentials of the sites; the length of time available for given sites was determined by the timing of pipe-trench cutting and pipelaying operations which were set within a tight timetable. A six week window for excavations was available between 26-3-96 until 7-5-96.

2.3.2

The following methods apply to all sites discussed other than the Launde site which has already been reported on (Cooper L. 1997). All stripping in the excavations window was by bulldozers. Ploughsoils were removed by an unsupervised machine working *forwards* and into the soil. This was followed by a supervised machine that worked *backwards* removing interface deposits until clean natural geological deposits were visible. These methods minimised the tracking scars on archaeological deposits. The use of bulldozers rather than excavators (machines with buckets) undoubtedly resulted in the rapid truncation of deposits particularly on the clay substrata. On the ironstone substrata damage was minimised by the unyielding nature of the ground. However, within the time scales available, the use of excavators was not feasible.

2.3.3

Following the machining, deposits were identified and selectively cleaned. In some instances plough furrows were removed to aid visibility. Due to the minimal time periods available for each site, emphasis was then placed on planning with EDM theodolite augmented by detailed hand plans of certain deposits. Selected sections were excavated to answer site objectives. Information on deposits recorded was mostly annotated on section sheets and plan sheets with the use of Pro Forma context sheets for significant contexts where necessary.



Plate 1: Archaeologists recording prehistoric circular structures at Park Farm, Ridlington

3 Results of Excavation - Summary

A rare early prehistoric knapping site of Late Glacial or Early Post Glacial date was excavated at Launde, Site 1 (LM A41.1996) (Launde, Cooper 1997). A pit containing microliths, small blades, and blade-cores of probable later Mesolithic date (L. Cooper pers. comm.) was excavated at Ridlington, (Site 5 LM A25.1996). A large scatter of Mesolithic flint-work has previously been found in this parish (Liddle 1982 p9-10).

A pit containing Bronze Age (possibly Beaker) pottery was excavated in Ridlington, Site 3 (LM A43.1996) to the east of two post-built roundhouses of Bronze Age or Iron Age date, Site 2 (LM A23.1996). A ditch and some discrete features at Preston may also be of Late Neolithic or Early Bronze Age date (Site 9).

Areas of Iron Age settlement were examined in Ridlington, Sites 4, 5, 6, and 7 (LM A24.1996, A25.1996, A26.1996, and A27.1996 respectively) and Preston, Sites 8 and 10 (LM A51.1996, A50.1996 respectively). Boundary systems indicated by aerial photographs, including single and double ditch forms of probable Iron Age date, were found in Ridlington and Preston, Sites 4, 5, 6, 7, 8,10 (Acc Nos. as above). Two areas of Roman settlement were found in Ridlington, Sites 3 & 5 (Acc as above) together with two areas adjacent to settlement (Sites 4 & 6). A number of possible structures and enclosures were recorded. Site 5 was notable for five fired pits, the largest of which measured 3.8m long. A roundhouse recorded at Site 3 was of Roman date.

Clear evidence of iron smelting was recorded in Ridlington at Sites 3 and 5. Quantities of tap and furnace slag were excavated from a number of features; the presence of *in situ* linings and *in situ* burning in some of these features (Site 3), and *in situ* slag deposits (Site 5) indicates that they were integral to the smelting process. This excavation evidence follows recent surface finds made by Elaine Jones and Jane Cowgill in the very south of the parish (Cowgill and Jones 1996; Jones 1997) and augments the distribution of iron production sites on the Jurassic Ridge.

The watching brief resulted in the collection of prehistoric flintwork of Mesolithic, Neolithic and Bronze Age date and Romano-British, Anglo-Saxon, medieval and post medieval pottery, and the recording of some landscape features and geological changes along the transect.

3 The Excavations

The following information is ordered in Site number order (Fig 1).

A plan of each site accompanies description; highlighted areas or deposits are numbered on each plan starting at 1 for each site.

All plans are provisional and are based upon raw survey data (other than Site 2). The integration of hand recorded information will greatly enhance their accuracy, detail and resolution.

Context numbers are quoted where appropriate. The cuts of negative features are prefixed by C whilst deposits are not.

3.1

Site 1

Late Glacial/Early Post Glacial Flint Scatter: Launde

Accession A41.1996

SK 808/031

Field 25

This site has been assessed in a separate report (Cooper 1997)

4.2

Site 2

Later Prehistoric Settlement: Ridlington

Accession A23.1996

SK 83210/02350

Field 40/41

Geology Northamptonshire Sand Ironstone, bisected by wide glacial feature.

Topography; northern side of flat plateau with valley edge 150m to north.

This area was evaluated because of its vicinity to a substantial Mesolithic/Early Neolithic flint scatter with appreciable Later Neolithic/Early Bronze Age content and a crop-mark of a ring ditch (LM SK80SW.Q).

The remains of two adjacent post-built circular structures were identified to the west of the farm track to Park Farm. All features were excavated by half-section, and one fully excavated. The site was plough truncated with no surfaces surviving. Post-holes generally survived to between 0.15 and 0.45m deep. No ridge and furrow was observed.

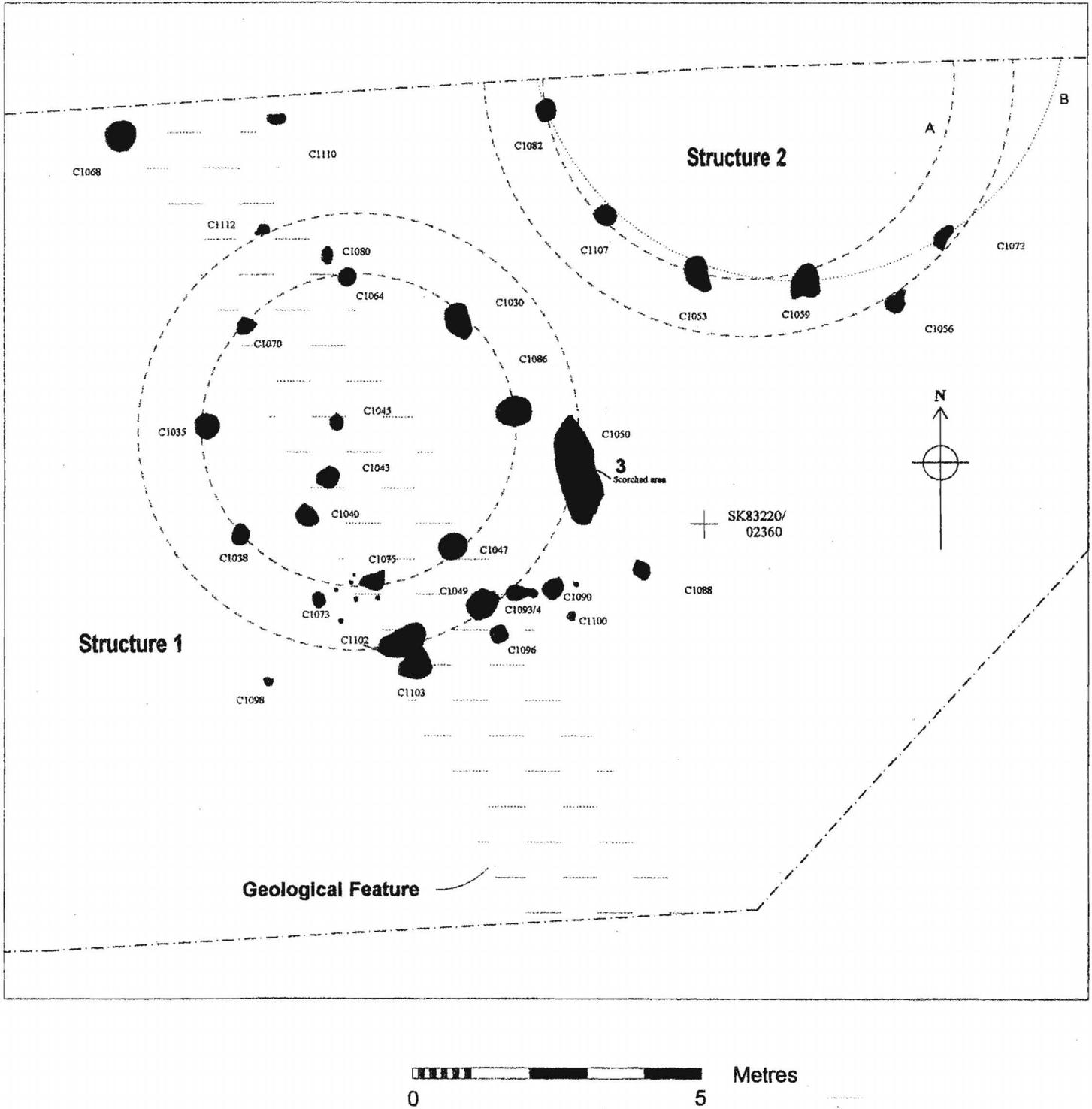


Figure 2: Site 2 - Later prehistoric structures, Ridlington.
The doubled postholes on the south side of Structure 1 formed the entrance.
The pit at (3) was very burnt, and probably pre or post dated the structure.
(Plates 1 and 2).

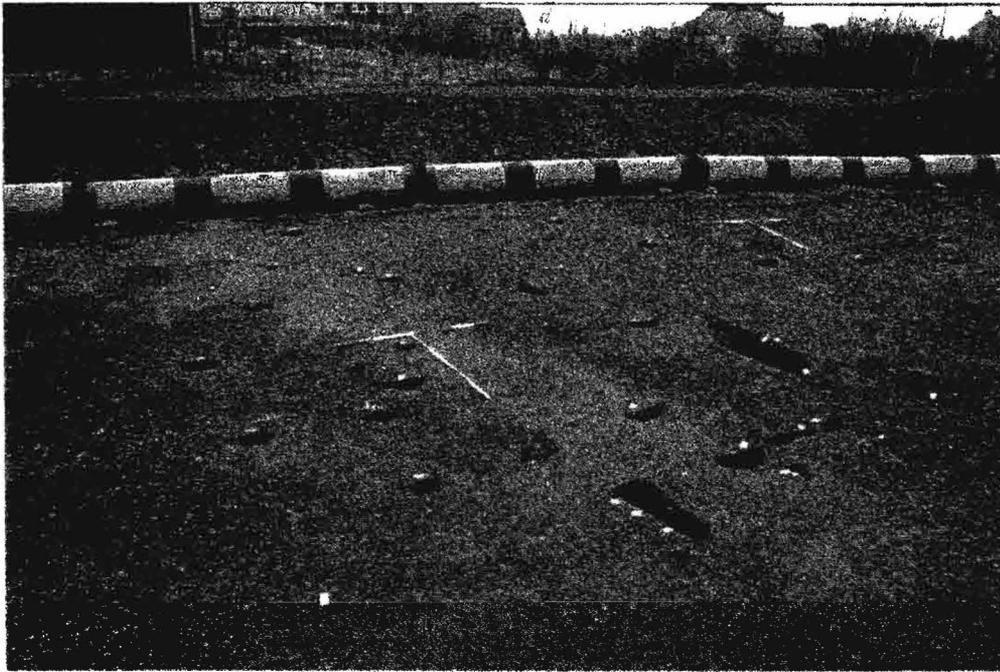


Plate 2: Site 2 - Later prehistoric structures 1 and 2 from the south-west, with centres marked by scales.
The pale band is a much earlier glacial feature passing through the entrance of the nearer house

Structure 1 appeared complete within the easement and was probably 8m in diameter as inferred from the entrance arrangement. To the north-east was second group of post-holes, Structure 2, which may have been a slightly larger, probably circular structure but was only partly visible because of the location of the northern bund. Two arcs may be fitted to this group; the first (A) suggesting that the structure may have had a similarly arranged and orientated entrance as structure 1, although not surviving as fully as its neighbour; the second (B) describing a larger circle.

An elongated pit was found at 3 (C1050). This had a clearly scorched base. Its fill produced the majority of stratified pottery from the site.

Trenches were machined along both sides of the easement to the west, but no other archaeological features were observed other than a pit (C1065) 160m to the west of the circular structures; it was half sectioned and contained a clean undiagnostic fill. Other activity was suggested by an isolated hearth (1025/C1028) on the east side of the farm track, 65m to east of the structures; this was also half sectioned; and bulk environmental samples were taken of the charcoal rich fill.

Sixteen pieces of stratified flint were recovered from the site, in addition to unstratified material, which may be contemporary with the structures.

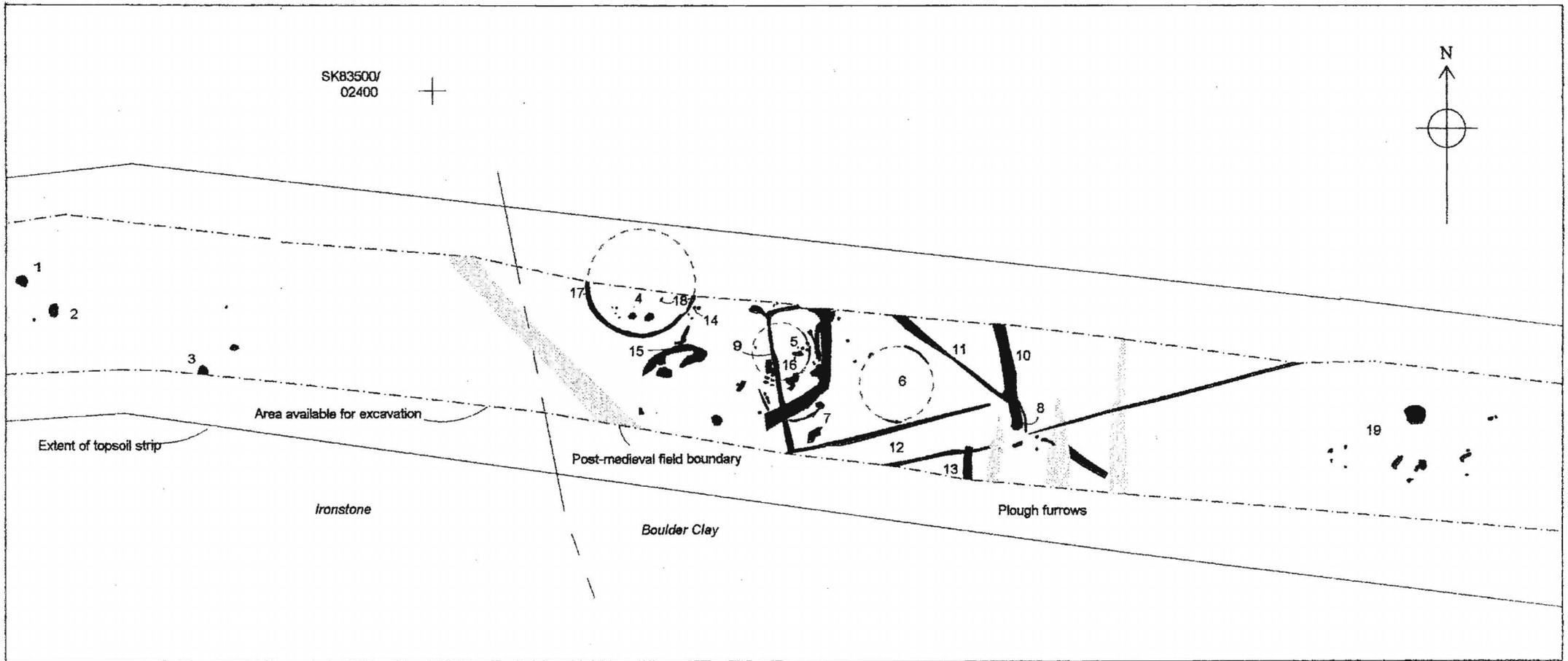


Figure 3: Site 3 - Romano-British occupation and iron working, Ridlington.
 The red circles mark probable structures.
 A pit containing Beaker style pottery was found in the extreme west at 1.
 (Plates 3 and 4)

0 20 Metres

3.2

Site 3

Early Bronze Age Pit; Roman Occupation and Iron Working: Ridlington

A43.1996
SK 83500/02350
Field 41/42

Fig 3

Northamptonshire Sand Ironstone with partial boulder clay capping on which all the Roman occupation was sited.

Topography: Northern side of plateau with valley edge 150m to north.

This area was evaluated because of cropmarks identified during the desk study of a linear feature and possible clothes-line enclosure to the south. This was the first site on the pipeline to be investigated archaeologically; and, due to the contractor's programme, time pressures were acute, accentuated by wintry conditions on a difficult substrata. A complicated and in places badly truncated multiphase Roman site was revealed. Although no surfaces survived, post-holes were present to generally between 0.15 and 0.35m in depth. Some ridge and furrow was recorded.

A leached pit was excavated in the extreme west (1), which contained highly decorated Bronze Age pottery of possible Beaker style.

Adjacent to this pit was a clay lined pit containing much burnt clay and slag (2). This feature is very likely to be the base of a smelting furnace, possibly of low-shaft type (Jackson & Tylecote 1988 - Schrüfer-Kolb below). To the south-east was another very burnt pit filled with slag and burnt stone (3); some probable lining remnants were recorded. This may have been an ore roasting pit (Dakin 1968 - Schrüfer-Kolb below).

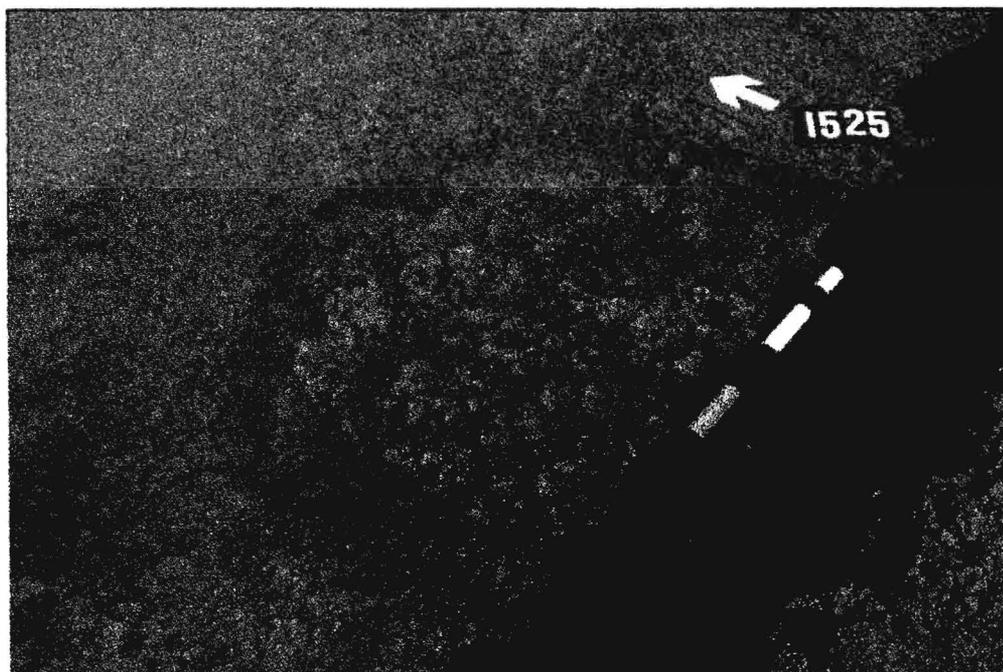


Plate 3: Site 3 - An ore roasting pit at (3) of probable Roman date. The roasting of ore prior to smelting is necessary to remove impurities.

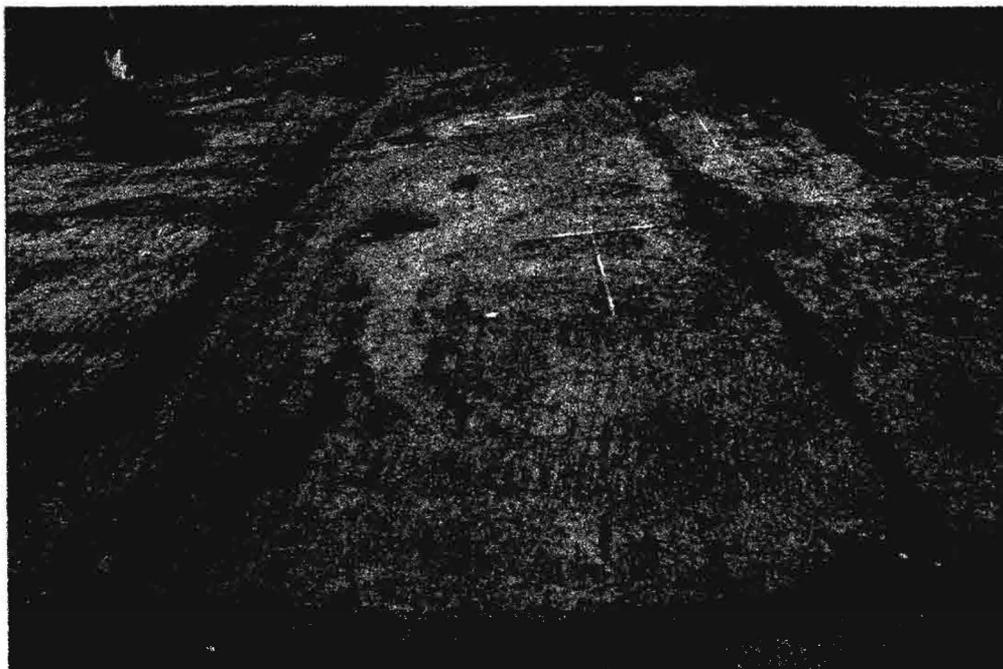


Plate 4: Site 3 - Romano-British enclosures and parts of circular structure at (5) from north

Some 40m to the east was a part of a probably circular gully (4) of which half was visible, formed by a continuous slot; on the east side were a number of features possibly connected with an entrance (14). Within the gully were a number of pits, post-holes and stakeholes (*not all illustrated*) while to the east of the gully were other truncated arcing slots that might represent structures (5-8). Some discrete features were recorded in the area of one slot (5), a sample of which were excavated. Also evident were intercutting ditches on two alignments, some forming parts of rectangular enclosures (9-13). The parallel ditches at 12 may form driveway.

In addition to the clear iron working related features, other burnt areas and burnt fills were noted over areas of the site. Fired material was found in small quantities at locations 14-18. It is notable that these cluster in and around the circular gully.

In extreme east of the site were further discrete features which were not excavated (19).

The lack of features between the apparent furnace and roasting pit, and the main body of the site along with the consistent areas of burning and discovery of burnt material over the site is interpreted as evidence of a broad contemporaneity.

The location of the site at the periphery of the boulder clay cap may be significant. Such a phenomenon has been noted elsewhere, perhaps indicating the requirement for large quantities of clay in furnace construction and maintenance (Tylecote 1961)

Scientific Dating

During excavation a program of archaeomagnetic analysis was commissioned from GeoQuest Associates. The probable smelting furnace (2) and probable roasting furnace (3) were selected. Analysis was not successful for either feature probably due to post-firing disturbance (GeoQuest Associates 1996 p5).

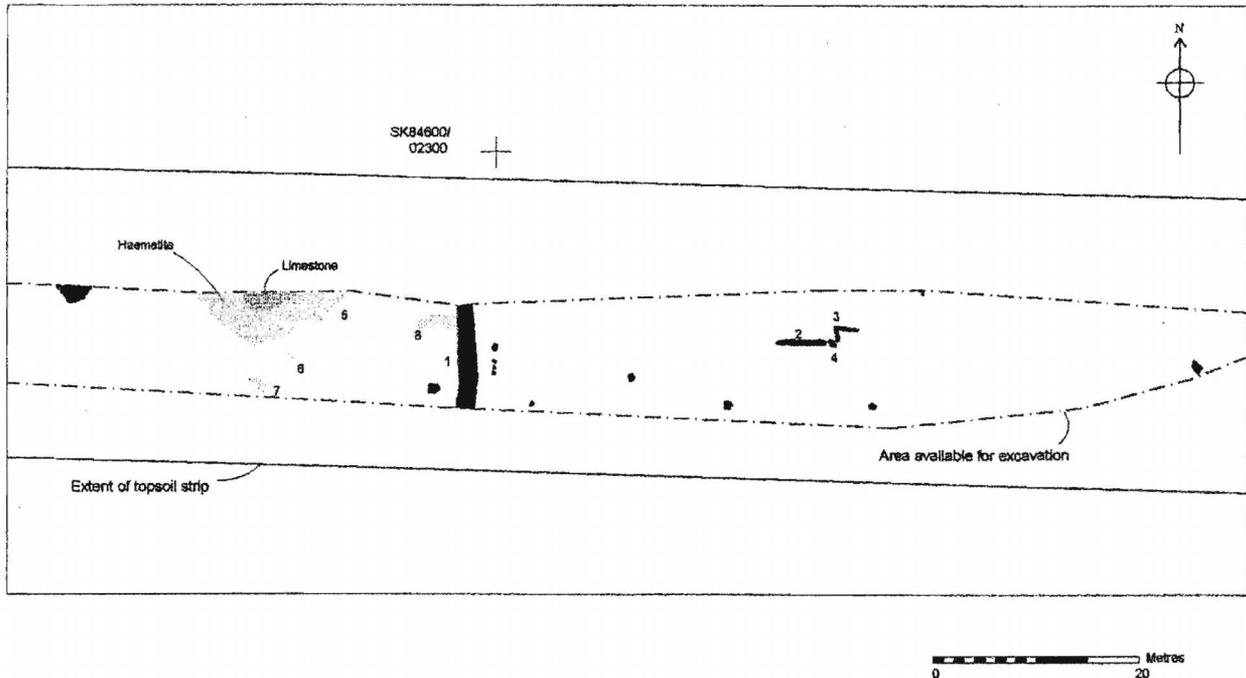


Figure 4: Site 4- Prehistoric ditch boundary (1) with Romano-British features to the east (2-4), Ridlington. The large deposit of haematite and limestone (5) is undated.

3.4

Site 4

Undated Boundary Ditch; Iron Age /Roman occupation: Ridlington

A24.1996
SK 84550/2250
Field 46

Fig 4

Geology Northamptonshire Sand Ironstone.
Topography: Protected ridge side with valley bottom and water course 130m to south.

The site was plough truncated with no surfaces surviving although post-holes survived to between 0.15 and 0.45m in depth. No ridge and furrow was observed. The area was evaluated because the pipeline route passed through a known flint scatter (LM SK80SW.W).

A boundary ditch of probable prehistoric date (1) was located together with other discrete Iron Age and Roman features, some of which were sampled. The ditch was 1.2m deep and 1.90m wide and had been backfilled following primary silting. Worked flints were found in its uppermost fill.

In the east were two linear features with irregular bases (2,3) which appeared to have a structural function and a post-hole (4). These features contained Roman and Iron Age pottery.

A large deposit of hematite and limestone was partially excavated to the west of the ditch (5) while other deposits of hematite were recorded in the vicinity (6-8). One of these deposits (8) was cut by the boundary ditch. A sample of hematite was retained.

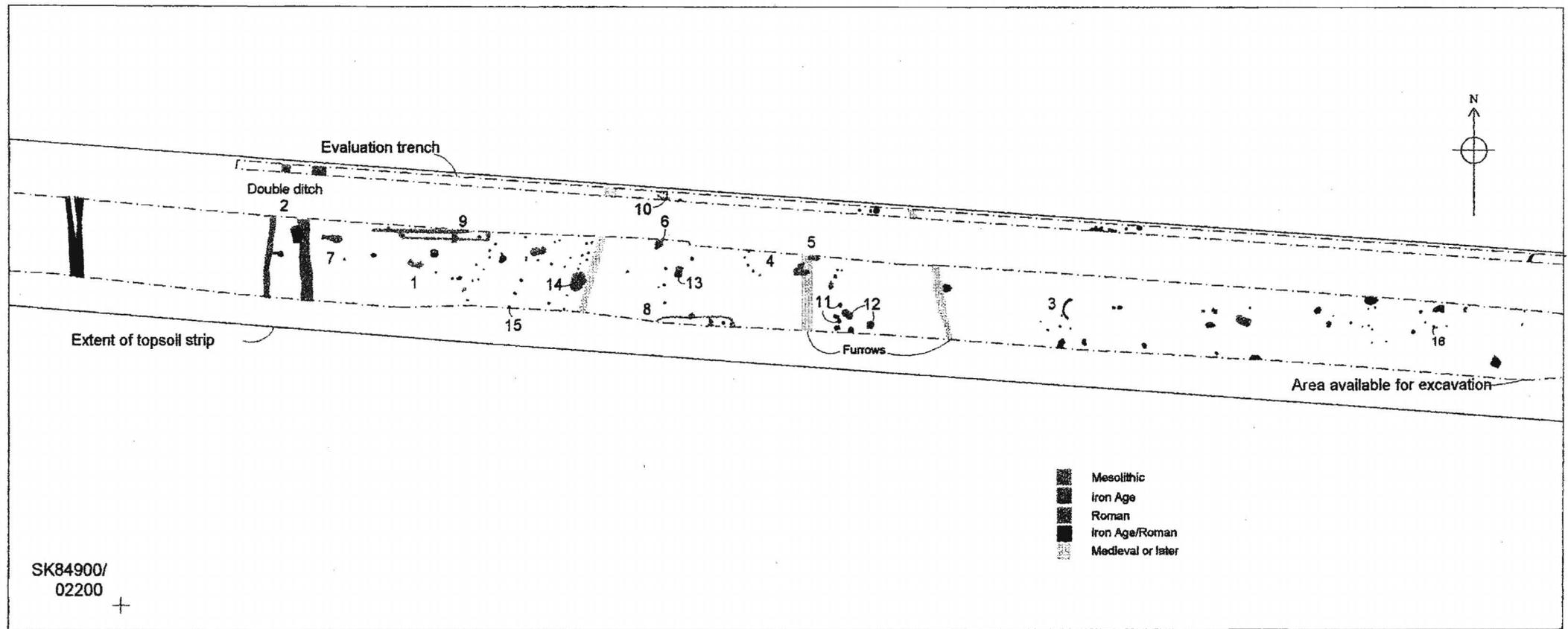


Figure 5: Site 5 - Evidence of extensive Iron Age and Roman activity, Ridlington.
 Of particular note is a Mesolithic pit (1), and later Iron working features (11)
 and fired features (5,6,7).
 Plates 5, 6 and 7.

3.5

Site 5

Mesolithic material; Iron Age boundary and occupation; Roman Occupation; Iron Age/Roman Iron Working; Roman Fired Features; Ridlington.

A25.1996
SK84900/2250
Field 47

Fig 5

Geology Northamptonshire Sand Ironstone, bisected by numerous clay filled glacial features.
Topography: Ridge side with valley bottom 200-300 m to south, and plateau 200m to north.

This area was evaluated because of cropmarks showing a double or single ditch (LM SK80SW.T) that would be crossed by the pipeline, and adjacent cropmarks to the north, noted in the desk study, including an enclosure at the northern end of which appeared an apsidal form.

The site was plough truncated with no surfaces surviving. Two medieval furrows were recorded while one post-medieval ditch crossed the site.

The spread of Iron Age and Roman deposits were extensive covering approximately 250m.

In addition two adjoining pits were located, one of which contained over 30 worked flints including a number of microliths of probable late Mesolithic date (1).

The anticipated double ditch was excavated in the west of the site (2). The easternmost ditch was cut by a substantial pit which was itself cut by a larger ditch, the upper fill of which contained Roman pottery. Further shallow convergent ditches were observed 35m to the west.

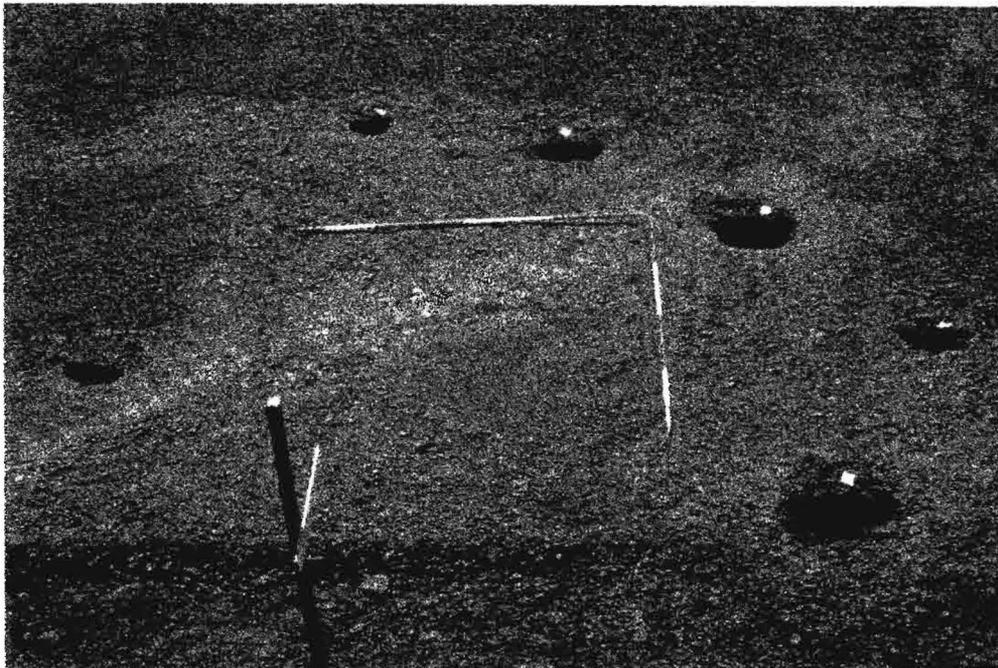


Plate 5 Site 5 - A part Circular Structure at (4) from north, of probable Iron Age date.

The Iron Age deposits comprise various pits and post-holes the form of which is not totally clear. Possible forms are semi-circular structures, one represented by a gully, and one by an arc of post-holes (3,4). It is not possible at this stage to separate some of the Iron Age deposits from the Roman without further analysis.



Plate 6: Site 5 Part of a Roman rectangular gully at (8) from the east. Beyond the second scale the gully has been cut by a later stone filled pit.

The Roman deposits include six fired features in three groups(5-7) , gullies forming rectangular forms that may relate to small enclosures, or large structures (8,9), some large pits, and post formed enclosures or structures (15 and adjacent to 14).

The three fired feature groups were up to 85m apart , and in two instances had been backfilled and rebuilt. In size they varied between less than two to four metres in length. Structural and constructional elements were

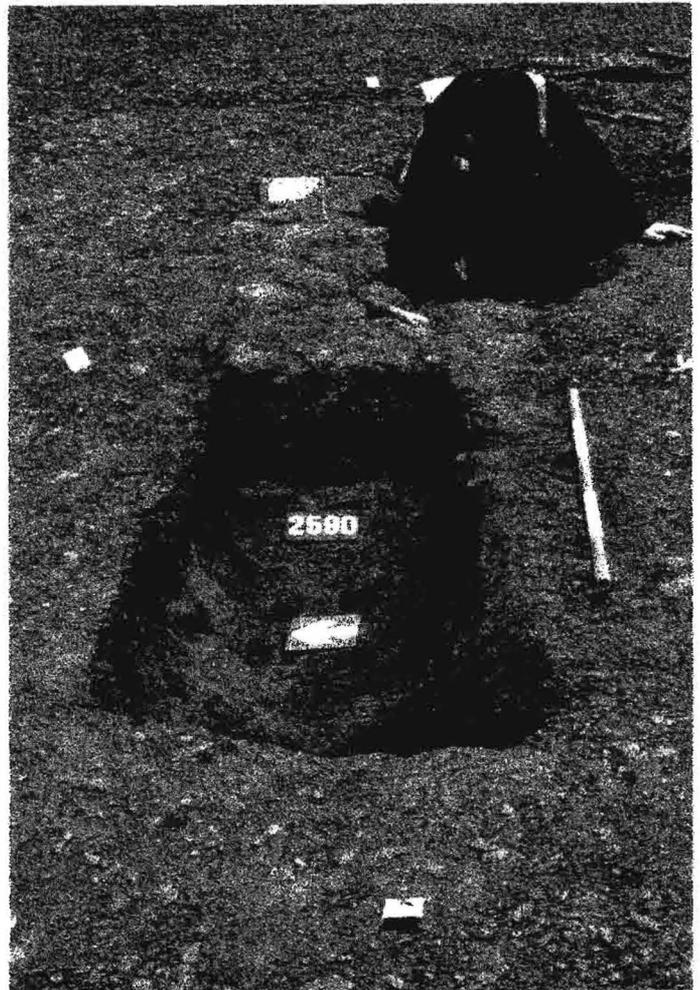


Plate 7: Site 5 - The Roman fired feature at (7) during excavation. The blackened stoke-hole (fore-ground) and heat scorched flue with stone flue lining are clearly visible.

recorded. A further fired feature was planned in the evaluation phase (10) to the north of one group (6), but due to soil dumping became inaccessible.

Soil samples were taken from features thought to be datable and with signs of charred material present in order to investigate their function and in the hope of recovering sufficient plant remains for analysis. Fired features of this form have been interpreted as corn dryers on many sites and have been found to contain cereals and waste from cereal processing which gives evidence of the crops grown and activities on the site (van der Veen 1989).

A large quantity of Roman pottery and bone was recovered from a small pit (2513/C2512) to the south of 6 at 13.

Industrial activity was attested by two similar slag filled features (11) the southern-most of which (C2557) was excavated and contained quantities of slag that had appeared to have cooled *in situ*. The uppermost fill contained furnace lining while the upper and middle fills contained five sherds of Roman pottery (2555/2556).

Adjacent were two larger pits that contained prehistoric pottery including Scored Ware (12) ; the westernmost also contained a cinder fragment and basal charcoal layer.

Slags was also recovered from a large pit (2509/C2501) at (14) which also contained a quantity of Roman pottery.

Dating

During excavation a program of archaeomagnetic analysis was commissioned from GeoQuest Associates. Three of the fired features were chosen - the fired feature bases (4) (two intercutting to the south) and the fired feature base (7).

In summary the results suggest that the stratigraphically earlier of the two intercutting features (4) (C2696) was last fired between 80BC and 130AD, and that its neighbour (C2564) was last fired between either 90AD and 210AD or 270AD and 440AD (GeoQuest Associates 1996).

As one fired feature was cut through the backfill of another it is reasonable to suggest that its presence was significant in the siting of the rebuild, and that therefore the two features were in use at some period starting shortly before 90AD and ending shortly after 130AD.

The feature base at 7 did not provide a date probably due to post-firing disturbance (GeoQuest Associates 1996 p5).

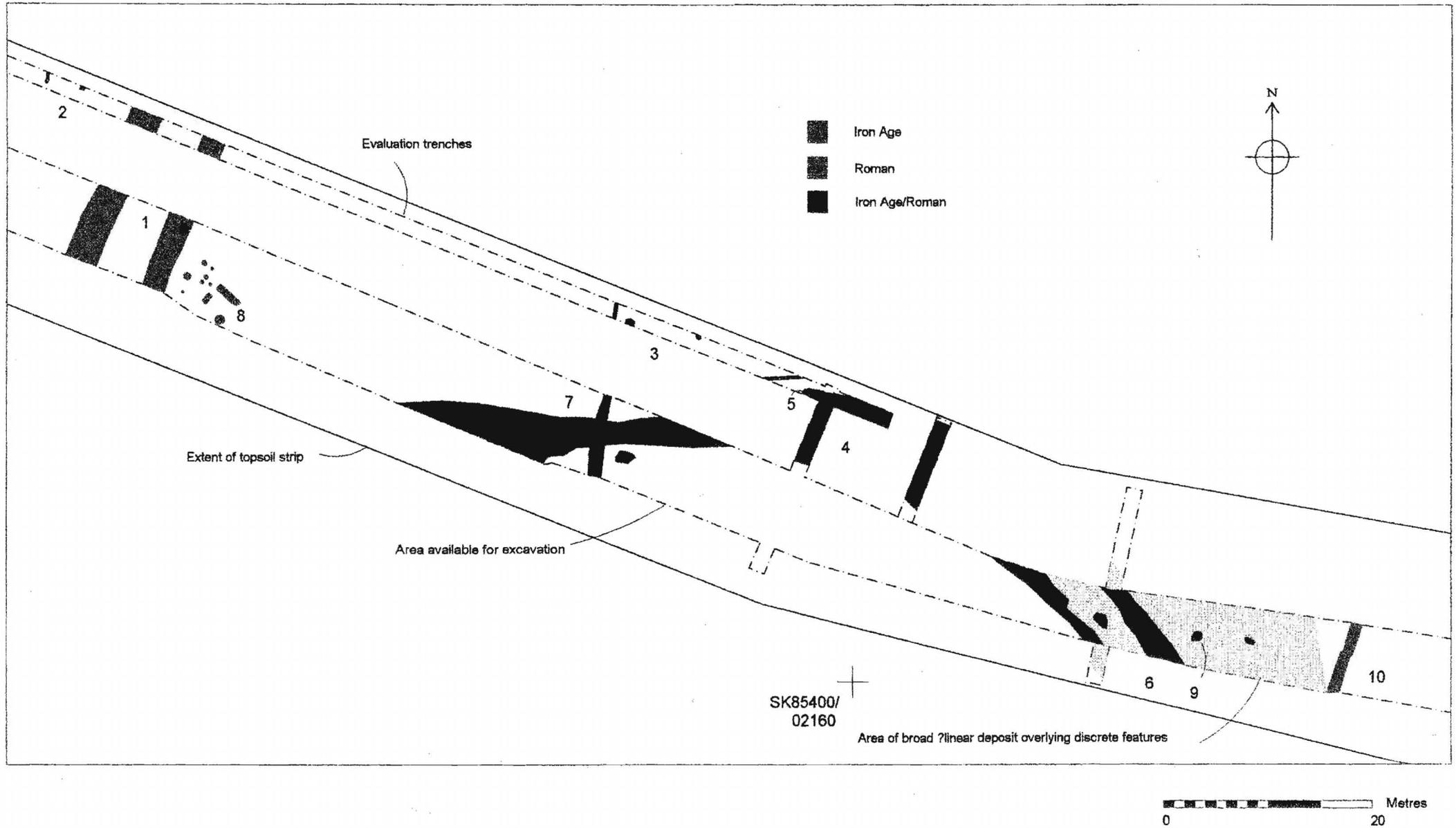


Figure 6: Site 6 - Late Iron Age/Early Roman activity on the plateau edge, Ridlington.
Plate 8

3.6

Site 6

Iron Age Boundary and occupation; Conquest period activity; Roman occupation and Ditch Systems: Ridlington

A26.1996
SK85300/2150
Field 48

Fig 6

Geology Northamptonshire Sand Ironstone.
Topography Extreme south edge of extensive flattened plateau.

This site was targeted on the basis of a cropmark of double ditches running broadly north-south, some 150m to the north (LM SK80SE.P). The site is interesting topographically as it lies on the southern edge of the plateau; to the south of the easement, the land falls away at 1 in 20 to the valley bottom.



Plate 8: Site 6 - To the right lies an Iron Age double ditch boundary at the plateau edge viewed from the north-west. The scales are perpendicular to the ditches.

Some discrete features including a right angle formed by two slots (marked by scales) are visible to the left (8) The site was plough truncated with no surfaces surviving. Post-holes generally survived to between 0.15 and 0.45m deep. No ridge and furrow was observed although it was present in the evaluation trench placed on the north side in the easement.

Due to a thick subsoil deposit of up to 0.35m below topsoil, and storage of subsoils on the south side of the easement the width available for excavation was significantly decreased.

The double ditches were successfully located (1) and excavated. Roman material was recovered from a tertiary fill of the one of the ditches (2047) suggesting a date from the 1st century AD through to the early 2nd century.

Ditches and a spread of discrete features were located in evaluation trenches placed over the site; those features identified on the north side (2-3) were subsequently inaccessible. A large linear feature was found in the evaluation at 4 up to 7.5m wide, but was also subsequently inaccessible. This feature was partially investigated by machine to a depth of 1.2m where no evidence of recutting was visible. Roman and Post-Roman material was recovered from its surfaces.

A butt end was suggested at (5) while a similarly wide deposit was recorded at (6), beneath up to 0.30m of homogeneous brown soil which was removed by machine. It overlay discrete features and parallel recut ditches. Hand excavation of one of the underlying ditches recovered part of a pottery vessel of 'transitional' Late Iron Age/Early Roman date. The ditch at (10) contained Roman pottery.

Some evidence of structural remains was found including slots set at right angles adjacent to the double ditch boundary (8) from which Iron Age pottery was recovered (2017/C2018). Similar pottery was found in the subcircular pit 2024/C2026 on the southern edge of the easement at (8).

A shallow pit containing burnt material (2010,C2014) was excavated at (9).

3.7

Site 7

Undated Single Ditch Boundary: Ridlington

A27.1996
SK84900/2250
Field 47

Fig 7

Geology Northamptonshire Sand Ironstone.
Topography ; Plateau with valley edge 80m to south

This site was investigated because the line crossed the crop mark of a single ditch (LM SK80SE.L) just to the south of a clothesline enclosure. The site was plough truncated with no surfaces surviving. No ridge and furrow was observed.

The single ditch was located and excavated and found to be much more shallow than the ditch boundaries at sites 4,5 and 6. Here it was over 3.5m wide and up to 0.50m deep. No other features were located in the trenches opened within the easement within the field. No trace of the pit alignment postulated in the desk study was found.

3.8

Site 8

Prehistoric Occupation: Preston

A51.1996
SK85900/2100
Field 50

Fig 8

Geology Northamptonshire Sand Ironstone.

Topography; Plateaux edge field; the illustrated features lay on the west side of a small valley.

Gradiometer survey recorded a possible enclosure containing a number of pit type anomalies amidst a complex of intercutting ditches (1) (GSB 1996 Fig 5). The area was partially machine stripped and the presence of archaeological features confirmed. Sherds of prehistoric pottery were recovered from the surfaces of a number of features (contexts 3500-3502). The remains of several curvilinear gullies and numerous pits or post-holes some of which showed signs of burning were broadly located on sketch plans (2). Overhead photographs were taken. The degree of plough truncation was not ascertained.

Unfortunately the landowner subsequently refused access for investigation or recording and no further work was undertaken.

Towards the eastern end of field 50 nearing the top of the small valley that bisected the field further earthfast features were observed during machining, and some stratified fired clay recovered (contexts 3503-3504). A further site in Field 51 suggested by magnetometry along the line within the holdings of the same landowner was similarly not made accessible for investigation or recording.

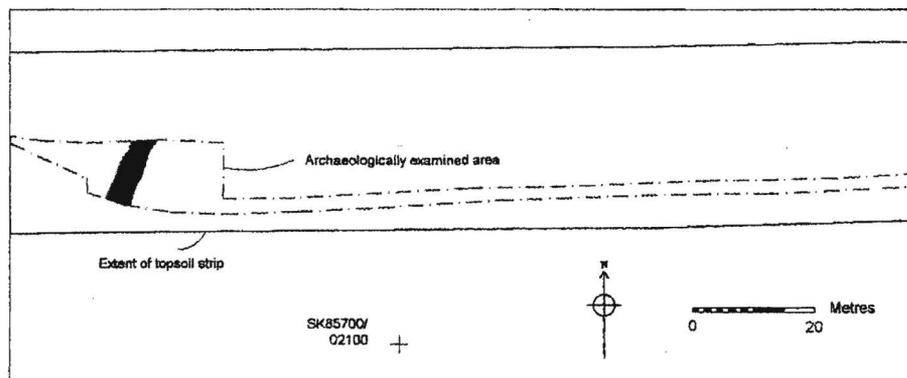


Figure 7: Site 7 - Ditch boundary of probable later prehistoric date, Ridlington. The cropmark of a clothes-line enclosure lies 50m to the north.

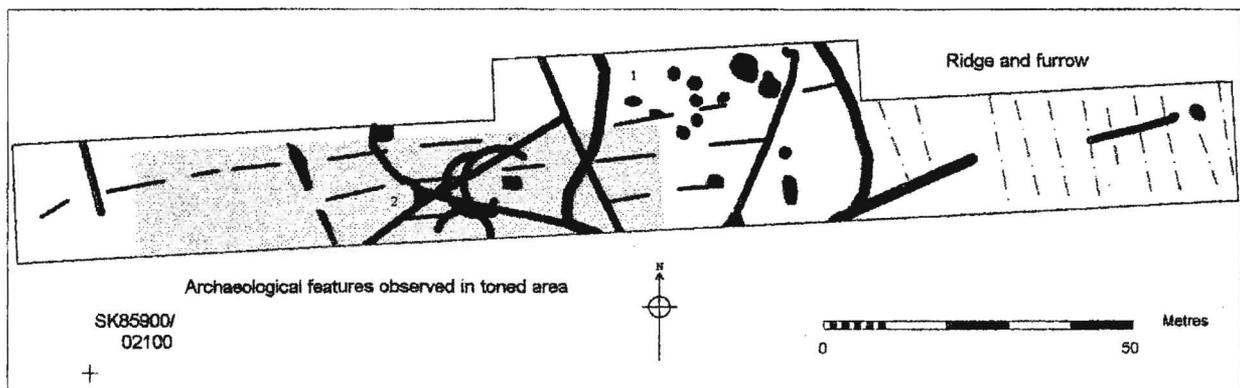


Figure 8: Site 8 - Later prehistoric occupation, Preston. This plan is based mostly on the results of magnetometer survey.

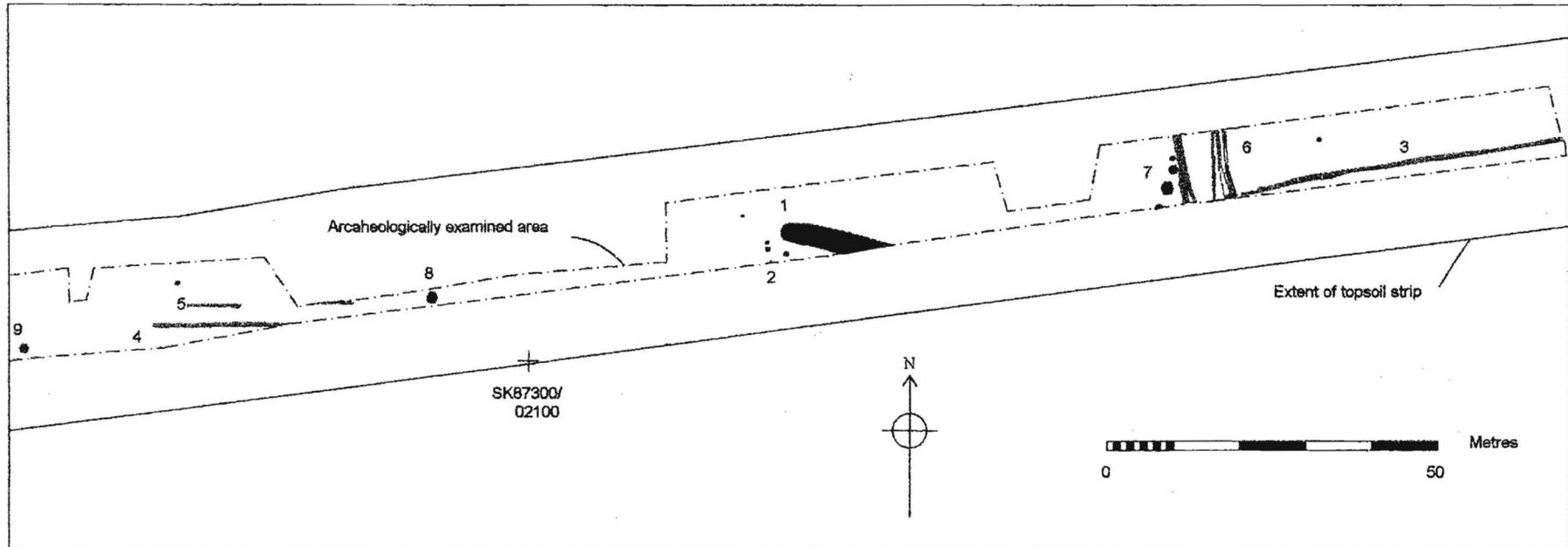
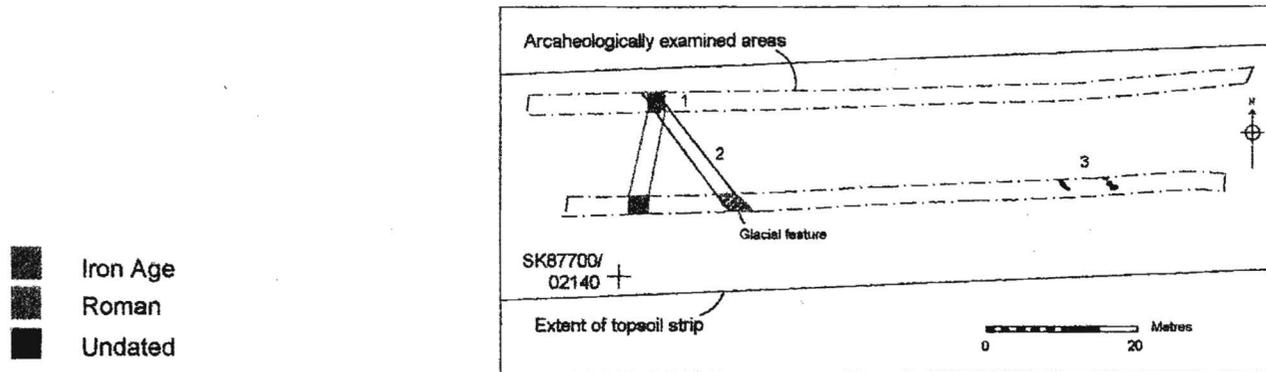


Figure 9: Site 9 - Later prehistoric and Roman activity, Preston.
 The large butt ended ditch and postholes (1) may be Late Neolithic or Early Bronze Age.
 The parallel Roman ditches may be part of a droveway



- Iron Age
- Roman
- Undated

Figure 10: Site 10 - Iron Age boundary ditch and occupation, Ridlington.

Site 9

?Early Bronze Age Ditch and associated features; Undated Pits; Roman Boundary Systems: Preston

A49.1996
SK87000/02000
Field 54

Fig 9

Geology: Northamptonshire Sand Ironstone.
Topography: Plateau

This area was investigated because of the surface collection of a thumbnail scraper and gradiometer survey. The magnetometer survey suggested the presence of discrete and linear features (GSB 1996 Fig 7) which were confirmed by excavation.

The site was plough truncated with no surfaces surviving. Ridge and furrow was observed.

A large butt-ended ditch was excavated (1); the full profile was 1.63m deep by 2.9m wide. On the south-western side of the ditch terminal were a number of discrete features (2). A small piece of possible Grooved Ware or Beaker was recovered from one of the post-holes; other post-holes and the ditch contained undiagnostic fragments of prehistoric pot. Worked flints also recovered.

A cluster of pits on a broad alignment were also excavated (7) and some dispersed features (8-9). One pit at (7) contained a few sherds of undiagnostic prehistoric pottery.

Other linear features on a broad east west alignment indicated by the magnetometer were recorded (3-5). In one area a number of linear features on a north-south alignment forming a return were part excavated and recorded (6) and assemblages including quantities of Roman indented Colour Coated Beaker pottery were recovered.

The nature of the Roman features is not clear; parallel ditches might be inferred to form a drove way; the quantities of unabraded pottery suggest proximity to occupation.

3.10

Site 10

Iron Age Boundary: Preston

A50.1996
SK87700/2100
Field 55

Fig 10

Geology: Northamptonshire Sand Ironstone, bisected by wide glacial features
Topography: East end of plateau.

This site was targeted for evaluation on the basis of an aerial photograph which appeared to show a crop-mark of a pit alignment in addition to a number of glacial features (LM SK80 SE.R); magnetometer survey suggested the presence of a linear feature and a number of discrete features.

The site was plough truncated with no surfaces surviving. Ridge and furrow was noted.

Trenching confirmed the presence of a linear feature (1) which was sectioned following the machine strip of the area. One of the discrete features suggested by magnetometry was found to be a broad geological feature (2) cut by the ditch.

Some shallow discrete features were recorded to the west end of the field (3) which suggested occupation but time constraints precluded the extension of areas of investigation. The quantities of pottery excavated from the ditch (below) also indicate proximity to occupation.

4 Watching Brief

4.1 Aims and Methods

The watching-brief was aimed to locate further archaeological material within the easement; in the hope that this would give a greater landscape context to the excavated archaeological deposits.

Following the topsoil stripping operation all 67 fields were walked, and topsoil heaps searched to recover artefactual material. Where finds were made fields were re-walked following a period of weathering.

During the pipe-trench cutting operation an attempt was made to view earthfast deposits; however the tracking of the large machines involved and the Health and Safety aspects of such work made observation and recording difficult.

4.2 Results

The material collection results of the watching brief are presented below, by Parish. None of the material was recovered systematically and cannot be used for statistical purposes.

Fig 1 Loc	Fields (DEA)	Acc. No	PARISH	Finds description
W1	1	A58.1996	WHATBOROUGH (SK7605)	Prehistoric flint-work, Romano-British pottery, medieval and post-medieval pottery was found Possible linear features of unclear origin were identified in trench section
W2	4	A59.1996	WHATBOROUGH (SK7705)	Prehistoric flint-work was found
W3	8 10	A60.1996 A61.1996	LAUNDE (SK7704)	Prehistoric flint-work and Romano-British pottery was found.
W4	13 14 15 16	A62.1996 A52.1996 A63.1996 A64.1996	LAUNDE (SK7804)	Prehistoric flint-work, Iron Age pottery and post-medieval slag and brickwaste was found during the watching brief A concentration of burnt deposit was found adjacent to the Brick Works (Beamish 1996 p 4) Some detail of the wood bank was recorded
W5	18	A65.1996	LAUNDE (SK7903)	Post-medieval pottery was found
W6	21 22	A66.1996 A67.1996	LODDINGTON (SK7903)	Prehistoric flint-work and Midland Purple pottery was found
W7	23 24	A68.1996 A69.1996	LODDINGTON (SK8003)	Prehistoric Flint-work was found. The upper stone of a beehive rotary quern was noted at Park Wood Farm.

Fig 1 Loc.	Fields (DBA)	Acc. No	PARISH	Finds description
W8	27	A70.1996	LEIGHFIELD (SK8103)	Prehistoric flint-work was
W9	32	A71.1996	LEIGHFIELD (SK8102)	Prehistoric flint-work and post-medieval pottery was found
W10	33 34 35 39	A91.1996 A72.1996 A73.1996 A74.1996	LEIGHFIELD (SK8202)	Prehistoric flint-work was found where a hearth, which became inaccessible, was observed during trial trenching
W11	40 41 42 43	A23.1996 A23.1996 A75.1996 A76.1996	RIDLINGTON (SK8302)	Prehistoric flint-work was found over recorded prehistoric and Roman sites 2 and 3
W12	45 46 47	A77.1996 A24.1996 A25.1996	RIDLINGTON (SK8402)	Prehistoric flint-work was also found over Site 5
W13	51 52	A78.1996 A79.1996	PRESTON (SK8602)	Prehistoric flint-work and post-medieval pottery was found above the unrecorded prehistoric settlement, site 8.
W14	53 54 55 56	A80.1996 A81.1996 A82.1996 A83.1996	PRESTON (SK8702)	Prehistoric flint-work, Romano-British, Anglo-Saxon, medieval and post-medieval pottery was also found in the vicinity of prehistoric and roman features recorded at site 9.
W15	57 58	A84.1996 A85.1996	PRESTON (SK8802)	Prehistoric flint-work, medieval pottery, and post-medieval pottery was found
W16	60	A86.1996	WING (SK8802)	Prehistoric flint-work and post-medieval pottery was found
W17	63 64 65 66	A87.1996 A88.1996 A89.1996 A90.1996	WING (SK8902)	Prehistoric flint-work, medieval and post-medieval pottery was found

Table 1 - Watching Brief results

PART TWO

Assessment for Further Analysis: Sites 2 to 10

1

Factual Data

Methods of Data Collection for Assessment

1.1 Structural and Stratigraphic

All quantities have been derived from the site paper and digital archive.

Qualitative assessment has involved the compilation of site plans, the checking of site records and the integration of information supplied by the finds, industrial material and environmental specialists.

1.2 Pottery

The material was washed, marked and bagged at the University of Leicester.

Quantification was by sherd count and weight, which was recorded on general pottery record sheets.

Spot dates for Roman and identifications of some of the earlier prehistoric material were made by Patrick Marsden of ULAS

Initial identification of Iron Age pottery concentrated on a division between Scored and non-scored wares.

1.3 Flint

All stratified material has been extracted and provisionally identified (tables 3,5,8,9,13). The remaining material has been scanned to provide a broad index of the assemblage in terms of diagnostic pieces, technology and cortication. Differential cortication was observed on the majority of sites and would appear to broadly reflect the date of the pieces i.e. typologically Mesolithic pieces usually display a degree of cortication, post-Mesolithic pieces invariably do not.

1.4 Industrial Material

Material collected as finds was washed and bagged. Bulk samples were wet sieved, and slags and fired clays were extracted from course fractions.

Initially all stratified materials were scanned, identified, and classified without reference to the archaeological record (therefore without influence on interpretation).

Subsequently context information was integrated with the material information.

Fractions from wet-sieved samples from the fired-features and those containing smelting related materials were scanned with a magnet for possible hammer-scale.

Density estimates were made for selected representative samples by weighing the sample and measuring its displacement (a developed Replacement Method).

1.5 Charred Plant Remains

Samples were processed in a York tank by wet sieving on a 0.5mm mesh with flotation into a 0.5mm mesh sieve. Floating the sample separates much of the charcoal, charred seeds and other plant remains, however, some may remain in the residue which should be also be examined and any remains included during analysis. The residue was air dried and sorted for all finds over 4mm and the remaining residue below 4mm reserved for further examination. The flotation fractions (flots) were air dried and carefully packed and labelled and are the subject of this assessment.

Assessment of the flots was undertaken by examining the whole or part of the flot with a stereo microscope at x10 magnification. Flots with few remains were then sorted by removal of remains to glass specimen tubes which were stored with the flot. Flots with larger numbers of remains were not completely sorted, the number of remains was estimated and the samples suggested for further analysis (Tables 4,7,10,12). Plant remains were identified rapidly without comparison with reference material so should not be regarded as final. Results of the assessment were recorded for all samples (Tables 4,7,10,12).

Charcoal fragments were recovered from 11 of the samples marked + to +++ , the remaining samples had only flecks of charcoal present in the flots.

1.6 Animal Bone

Each bag of hand recovered bone was weighed and the number of fragments counted. These were subjected to a rapid scan in order to identify the main species present, and the condition of the material.

2

Summary of Stratigraphic and Structural Data

2.1 Quantity of Records

The documentary sites archive comprises:

812 Contexts Records for which there are 43 context sheets

130 plans on 33 A2 permagraph sheets

135 sections on 27 A2 permagraph sheets

Indices for contexts, plans, sections, small finds, and environmental and industrial samples.

10 colour slide films

10 black and white films

1 levels book

51 survey files

2.2 Provenance of Records

Site	Palaeolithic Mesolithic	Bronze Age	Bronze/ Iron Age	Iron Age	Iron Age/ Roman	Roman	Med.	Unphased	Totals
2			115						115
3		3				223	9		235
4				2				28	30
5	73			8	218	27	2		258
6				6	61	8			75
7								2	2
8			5						5
9			3	1		5		61	70
10				13				9	22
Total	3	3	8	14	279	5	2	70	812

Table 2 - Summary of Context Records

2.3 Condition of the Records

The condition of the archive is good, but integration of the data is not complete.

The recording methods employed (5.1 above) have created an archive consisting of survey plots of accurate but relatively inaccessible information, and hand drawings of individual deposits that can be related to the surveys. The hand drawings are annotated with context descriptions.

3

Stratigraphic and Structural Data and Material Categories, Pottery, Flint, Fired Clay, Industrial Materials, Small Finds, Stone Objects, Plant Charred Remains, and Animal Bone.

3.1

Site 2

Later Prehistoric Settlement: Ridlington

Accession A23.1996

SK 83210/02350

Field 40/41

Fig 2

3.1.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features, of Late Bronze Age or Early Iron Age Settlement.

All defined features were investigated by half section. One pit was fully excavated

Following half sectioning, all remaining fills were hand excavated for finds retrieval

Elements of two circular, or one circular and one semi-circular structure were recorded.

The line of the outer wall of the complete structure is indicated by the entrance post-holes; traces of the outer wall have been plough truncated.

The positioning of the elongated pit (C1050) on the east side of the complete structure does not appear consistent with the projected outer wall of the structure as defined by the possible porch potholes in the south-east (c.f. Guilbert 1981), and may indicate more than one activity pre or post-dating the structure. The pit contained some prehistoric pottery.

An isolated hearth and pit were recorded to the east and west of the site respectively. These features are dated only by association, and given the proximity to earlier and later deposits are not securely dated.

A small assemblage of stratified worked flints was recovered.

The results of the environmental scanning are notably good, particularly for structure 2 (see Monckton below).

Statement of Potential

The dating of the site is not fully clear, but on the basis of the pottery, it is Bronze Age or later. The flint is not clearly residual and may be contemporary.

The site contributes a transect of a pre Late Iron Age unenclosed settlement

This site provides excavational and structural detail of pre Late Iron Age settlement in the in the East Midlands region (dating remains provisional). The complete example fits within Knights Group 1A classification of a circular ground plan defined by a single ring of post-holes with or without an entrance structure (Knight 1984 p118), and as such is one of few found in the region.

The structures are rare evidence of unenclosed settlement in a plateau location in the East Midlands. Current distributions are dominated by cropmark evidence of enclosed activity be it in plateau or valley bottom locations, dominated by the expanding Late Iron Age settlement (e.g. Enderby, Clay 1992 and Tixover, Beamish 1992).

Examples of excavated pre Late Iron Age settlement sites in the counties of Leicestershire and Rutland are rare, the only examples being the Late Bronze Age/Early Iron Age site at Kirby Muxloe (Cooper 1994) and Middle Iron Age site at Wanlip (Beamish 1994).

The quantity of environmental data from a probable domestic context is important; there is little evidence of prehistoric cereals from Leicestershire and Rutland and the region in general; comparable material from pre-Middle Iron Age contexts has only been identified in a solitary pit excavated at Lockington of much earlier Early Bronze Age date (Monckton forthcoming).

The use of C14 dating to attempt to refine the site chronology is intended.

Material Categories

3.1.2 Pottery

Quantity

Prehistoric pottery. A total of 25 sherds weighing 158gms was recovered from the excavations. None of the material was recovered from unstratified contexts.

Fired clay. The site produced a total of 15 fragments of daub weighing 35g; and 14 fragments of fired clay weighing 87g. Although a small assemblage the contexts of the deposits gives some insight into the circumstance of deposition and nature of the structures of which they form part, particularly concerning the position of outer walls.

Provenance and Dating

The pit (3)(1041) produced 92% of the material (by weight).

The pottery can only provide a broad date range, with no rim types or decoration to refine dating. The flat base sherds indicate a Bronze Age or later date.

Range and Variety

This small assemblage is dominated by the softer shell and grog tempered wares. This fabric is only represented by a small group in other excavations in the north and west of Leicestershire.

There are four base fragments but nothing diagnostic which will aid close dating of the features. Forms frequently lead to interpretation of vessel uses and hence areas of use within a building or area of site. The absence of rim fragments in this assemblage does not permit this line of analysis.

Condition of the material

The material had suffered from some post-depositional abrasion, it is also a soft fabric and has suffered from leaching. The average sherd weight is 6.3g which is high for prehistoric pottery recovered from the sites along the pipeline route and is comparable with the Later Bronze Age-Early Iron Age site of Kirby Muxloe to the west of Leicester. No conservation will be required.

Statement of potential

Combined with the material from the other sites along the pipeline, analysis of fabric will add to the knowledge of the range of local and regional material particularly from the east of Leicestershire and Rutland. Comparison of this material with the recently recovered material from west Leicestershire (Enderby, Wanlip and Kirby Muxloe) will enhance the record of later prehistoric pottery in the county, especially if combined with C14 dating.

3.1.3 Flint

Quantity

A total of 79 pieces of which 16 were stratified. A further 63 pieces were recovered from surface collection.

Provenance

The flint assemblage is associated with two post-built roundhouses of suspected Later Bronze Age or Early Iron Age date.

Range and Variety

The following are derived from various features which are of a suggested prehistoric date.

Ext	Cont.	Cut	Location	ID	Corticated
10	1025	1028	Isolated Hearth	chip	
26	1033	1035	Structure 1	discarded	
27	1033	1035	Structure 1	unlocated	
17	1044	1045	Structure 1	flake	
9	1048	1049	Structure 1	flake	
14	1041	1050	Pit at 3	small blade core	
30	1031	1068	north of Structure 1	scraper	
2	1069	1070	Structure 1	burnt	
28	1081	1082	Structure 2	flake	
79	1062	1103	Structure 1	struck piece	
7	1061	1104	Structure 1	flake	

Table 3 - Site 2: Stratified Flint

The stratified material is of a general later Neolithic/Bronze Age date and may be associated with the structural evidence. The lack of Mesolithic material suggests that residuality is not a problem. Of the unstratified material there is very little Mesolithic material (only two heavily corticated pieces), the majority being later prehistoric and includes a further 6 scrapers.

Statement of potential

The flint assemblage may help to characterise the site function. The high proportion of scrapers at c. 10% of the group might suggest that hide processing was undertaken at the site. In the absence of other dateable material the flint can be regarded as a broad dating tool.

3.1.4 The Charred Plant Remains

Quantity and Provenance

A total of 23 samples were processed from two Late Bronze Age or Early Iron Age structures related features, and an isolated hearth.

Samp	Cont.	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch Se	oth	ch	Comments
24	1025	1028	1	40	-	-	2	1	-	+++	Isolated hearth Cereal grains, an indet seed. Abundant charcoal to be sorted.
1	1029	1030	9.5	7	-	-	3	-	1	-	Structure 1 Wheat ?free-threshing, woody bud.
2	1033	1035	16.5	11	-	-	1	5	1	-	Structure 1 Cereal grain, seeds of medick and clover type, indet charred fragment.
3	1036	1038	11	10	-	-	1	1	-	-	Structure 1 Wheat cf emmer, seed of vetch type.

Samp	Cont.	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch Se	oth	ch	Comments
4	1039	1040	1.5	5	-	-	1	1	-	-	Structure 1 Wheat, indet seed.
5	1042	1043	0.5	2	-	-	-	2	-	-	Structure 1 Indet seeds,
6	1044	1045	2.5	4	-	-	-	-	-	-	Structure 1
7	1046	1047	9	4	-	-	1	-	-	-	Structure 1 Cereal grain.
8	1048	1049	15	15	-	-	4	1	-	-	Structure 1 Barley and wheat grains, a vetch type seed.
9	1041	1050	52	120	-	-	8	2	-	-	Burnt pit, east side of Structure 1 c25% examined. Barley and wheat grains, indet seeds. *
10	1051	1053	11	3	-	-	1	1	-	-	Structure 2 Cereal grain, grass seed.
11	1054	1056	5	10	-	-	100	+	-	-	Structure 2 Mostly barley grains with a few seeds. *
12	1057	1059	11	6	-	-	3	-	-	-	Structure 2 Barley grains, one germinated.
16	1063	1064	2.5	6	-	-	-	1	-	+	Structure 1
17	1069	1070	10	10	-	-	-	1	1	-	Structure 1
21	1071	1072	3	19	-	-	20	-	+	++	Structure 2 Cereal grains including barley. Charcoal. *
19	1079	1080	1.5	1	-	-	-	-	-	-	Structure 1
20	1081	1082	1.5	3	-	-	3	-	-	+	Structure 2 Barley and wheat grain.
22	1085	1086	19	45	-	-	5	3	-	++	Structure 1 Wheat including ?free-threshing, a cleavers seed. Charcoal. *
23	1087	1088	1.5	3	-	-	-	-	-	-	
13	1060	1102	12	7	-	-	1	1	-	-	Structure 1 Cereal, vetch type seed.
15	1062	1103	2	2	-	-	-	-	-	-	Structure 1
14	1061	1104	3.5	2	-	-	-	-	-	+	Structure 1

Key: Gr = grain, Sf = spikelet fork (chaff), Gl = glume (chaff), Ch Se = charred seed, Un Se = uncharred seed, oth = other charred item, ch = charcoal.

Table 4 - Site 2: Assessment of Flots for Charred Plant Remains

Range and Variety

Barley (*Hordeum vulgare*) was the most numerous cereal found with context 1054 containing over a hundred grains, Wheat (*Triticum* sp) was also found and possibly included emmer (*Triticum dicoccum*) and free-threshing wheat, possibly bread wheat. Seeds included clover type (*Medicago*, *Melilotus* or *Trifolium*), vetch type (*Vicia/Lathyrus*) and cleavers (*Galium aparine*). Remains were not numerous except in context 1054 but do show the cereals cultivated and the weeds of arable land. Four samples have been selected for recording and reference to remains in the rest is suggested as most of the samples, 15 of the 23 examined, have a few items present.

Statement of Potential

see 8.2 below

3.2

Site 3

Early Bronze Age Pit; Roman Occupation and Iron Working: Ridlington

A43.1996
SK 83500/02350
Field 41/42

Fig 3

3.2.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

The majority of these are of Roman date (Late 1st century to 4th century material identified in pottery report below).

Ten partly intercutting ditches some forming enclosures were recorded through which sixteen segments were hand excavated.

Partly enclosed within some of the ditches were elements of at least three circular structures which were increasingly truncated to the east.

The best preserved circular/part-circular structure was segmented three times.

Two pits, eleven possible post-holes and twenty six stakeholes were excavated inside the structure.

Further discrete features which may be associated were located to the east of the structure.

Eighty-two discrete features were defined and planned of which forty-three were excavated by half section.

Numerous burnt deposits areas were identified. The clearest of these were probable smelting and ore roasting pits on the western edge of the site (Schrüfer-Kolb, below). The smelting pit was fully excavated and the roasting pit half sectioned.

The Romano-British occupation features appeared exclusively on the boulder clay substrata with the exception of the iron working features on the ironstone to the west.

On the western edge of the site was a solitary pit, which was fully excavated, containing Early Bronze Age/?Beaker style pottery and worked flint.

Statement of Potential

The solitary Early Bronze Age pit provides rare stratified material in a probable non-funerary context. The value of the material is moderated by the isolation of the deposit. Fewer than ten sites in Leicestershire have produced Beaker type pottery, and most of the examples are probably from funerary contexts (e.g. Smeeton Westerby, Rutland 1976 and Eaton, Clay, 1981).

The site provides a transect of a partly enclosed rural Roman settlement and the edge of the boulder clay cap. The siting of smelting sites on clay because of the need for the material to construct the furnaces with has been noted (Tylecote 1986 p 158).

The site provides specific details of Romano-British iron smelting within the broader framework of partly enclosed rural Roman settlement, and increases the known distribution of rural Roman settlement.

Some information will be contributed to the understanding of rural Romano-British structure types, although some structural detail is lacking due to truncation.

There is a potential for investigating the spatial development of the site as individual pottery groups have good dating potential.

The parallel ditches may be part of a drove way.

It is important that the relationship between smelting debris and structures is investigated.

There is intercutting of features and a change in enclosure alignments; this may be combined with a change in the location of circular structures. Such developments need to be investigated with the chronology of the site.

Material Categories

3.2.2 Prehistoric Pottery

Quantity

A total of 26 sherds weighing 77g, were collected from three contexts. 79.2 % of this material is Bronze Age material.

Provenance and Dating

All the Bronze Age material was recovered from pit (1709) (1). A total of 12 sherds were decorated using a variety of methods including impressions with twisted cord, finger nails, ?comb and random brushing/scoring.

There are two rims from the prehistoric pottery assemblage - one Iron Age and one Bronze Age. They are both plain intumed rims and are not useful for refining the dating

Range Range

The fabric of the Bronze Age material was not the same as that found during excavations at Kirby Muxloe, and may well be *Beaker*.

Twelve sherds were decorated using impressed techniques

Condition

The condition of the material was fair, the Bronze age material in particular was soft and some of the decoration has suffered. The average sherd weight is 3.0g

Statement of Potential

The opportunity for analysis of Beaker/Bronze Age material in non-funerary contexts in Leicestershire has been limited. A few fragments were recovered from Kirby Muxloe excavations in 1993, but little is known from elsewhere. Information from this pottery will be entered into a database and will help understanding of Bronze Age settlement and activity in Leicestershire and Rutland.

3.2.3 Roman pottery

Quantity

A total of 1,028 sherds weighing 4,180g were recovered from the site. Of these sherds, one weighing 10g was collected from an unstratified context. The Roman material represents 96% of the pottery assemblage from all periods.

Provenance and Dating

There are several contexts which are noted for the quantity of material. A ditch (12) (context 1648) produced 564 sherds weighing 1,410g of one complete, or near-complete vessel. This can be dated from the mid. 2nd century to the 4th century.

Large amounts of pottery were also recovered from a circular structure (4) (1531) and a ditch (10) (1594). Material from the circular structure can be closely dated to the late 1st to early 2nd century. The ditch can be assigned a broad date range from the 1st to 2nd century.

Range and Variety

This is an interesting assemblage as it reflects the sites proximity to the production site of the Nene Valley.

Condition

The average sherd weight is 4.1g, the material being fairly abraded.

Statement of Potential

Analysis of the material should provide closely datable assemblages to aid dating of features, and implications for the longevity of the site.

Analysis of the fabric should highlight material from regional production areas as well as those made locally, from which there may be some suggestion of trading links.

Comparison can be drawn with other Roman pottery groups in Rutland, such as the Rutland Water Dam sites south-west of Empingham, Great Casterton and Ketton. Also comparison should be made with other sites on the pipeline, notably Site 5.

3.2.4 Flint

Quantity

Of the 22 pieces some 18 were stratified.

Provenance of material

Fourteen of the stratified context (exts 11- 24) are from a pit containing Beaker pottery.

Range and Variety

Ext	Cont.	Cut	Location	ID	Corticated
7	1562	1522	(adj to Beaker pit)	blade frag	
11	1709	1711	Beaker pit at 1	small flake	
12	~	1711		small flake, later notch or plough struck	++

Ext	Cont.	Cut	Location	ID	Corticated
13	~	1711		small blade core frag	++
14	~	1711		flake	+
15	~	1711		blade	
16	~	1711		broken flake	
17	~	1711		blade	++
18	~	1711		small flake	
19	~	1711		blade	
20	~	1711		small flake	
21	~	1711		cort chunk, then ploughstruck	++
22	~	1711		retouched flake (small scraper?)	
23	~	1711		small blade core	++
24	~	1711		v. small flake	++

Table 5 - Site 3: Stratified Flint

The stratified material is mixed with seven Mesolithic pieces (blade technology and cortication). The remainder is of a later prehistoric date but no piece is diagnostically Bronze Age. The unstratified material includes further Mesolithic and later pieces.

Statement of Potential

The material is only of a moderate potential in terms of providing evidence for dating and functional interpretation. Residuality is certainly evident.

3.2.5 Fired clay and industrial material

Quantity

Over 40kg of industrial residue were recovered, of which one small fragment of burnt clay was unstratified.

Sample	Context	Cut	Description	Feature type/Location
12	1550	1522	furnace lining; ore	?Low-shaft furnace at 2
14	1553	1522	furnace lining; ore	
14	1553	1522	furnace lining; ore	
15	1554	1522	furnace lining	
15	1554	1522	furnace lining	
15	1554	1522	furnace lining	
15	1554	1522	furnace lining (several vitrifications)	
15	1554	1522	furnace lining (relining?)	
15	1554	1522	furnace lining (with ore inclusion)	
16	1557	1522	furnace slag (incl. block); several pieces of lining	
4	1557	1522	furnace slag (incl. block); lining; ore	
4	1557	1522	fired clay (red. + ox)	
3	1558	1522	fired clay (lining?)	
11	1598	1522	furnace lining; fired clay	
	1579	1525	furnace slag	?Ore roasting pit at 3.
	1579	1525	furnace slag	
	1579	1525	fired clay (part burnt)	
8	1579	1525	fired clay (ox)	
8	1579	1525	furnace slag	
7	1581	1525	furnace slag; lining	
7	1581	1525	furnace slag (incl. block); fuel ash/lining; ore	
7	1581	1525	fired clay lining	
9	1607	1525	furnace slag; fused charcoal/cinder	
9	1607	1525	red. fired lining; ore	

Sample	Context	Cut	Description	Feature type/Location
	1531	1530	vitrified lining (glassy layer)	Fill of circular structure gully at 18
	1608	1609	cindery material; fused furnace lining	Fill of circular structure gully at 17
	1608	1609	fired clay (ox)	
	1619	1620	fuel ash	Small pit with circular structure at 18
	1565	1566	vitrified lining	Small pit at 14
	1567	1568	furnace lining	Slot between 14 and 15
	1518	within 1516	furnace slag; charcoal; fused lining	Curvilinear spread at 15
2	1575	1574	charcoal with some ore	Burnt patch in enclosure ditch at 16
2	1575	1574	burnt clay	
	1594	1596	fired brick	Ditch fill at 10
	U/S		fired clay (burnt/ox)	

Table 6 - Site 3: Industrial Materials

Examination of the material yielded several samples that show reddening by an open fire, thus indicating an oxidising atmosphere. Others have been fired to a grey colour in a reducing atmosphere and are more likely to have been related to a furnace. In some cases it proved difficult to classify the fired clay as fired daub, perhaps originating from the living quarters, or as fire-reddened lining.

Thermoluminescence dating of selected representative samples may provide improved dating evidence.

Density measurements of three selected furnace slag samples produced a specific gravity of c.3.8-4g/cm³.

Provenance

The bulk of the material was from the possible low-shaft furnace (C1522) at 2, and ore-roasting pit (C1525) at 3.

The remaining material was not found in sufficiently large concentrations to suggest obvious areas of in situ industrial activity, although the broad spread of stratified may indicate more extensive working areas beyond the confines of the excavations..

Range and Variety

Examination of the material from this site produced: furnace slag (i.e. molten slag retained inside the furnace), furnace lining in various stages of firing and/or vitrification, cindery material/fuel remains/ash/charcoal and ore.

This assemblage can be expected in the context of iron smelting.

Statement of Potential

Further analysis should investigate the detailed function of the two clear iron working features and their relation to other features indicative of iron production on the site.

Selected material has been sectioned to aid identification where this had not been possible on obvious typological grounds.

Future geochemical and metallographic analyses of representative slag and ore samples from the site may shed more light on the technologies that have been employed on the site and the conditions and efficiency of individual production processes. Comparative ore-slag analysis may provide information on the quality and - to a certain degree - provenance of the ore and may verify the possible use of advanced production methods.

Detailed identification of the preserved charcoal samples could give an insight on the fuel that had been used as well as information on the natural environment of the region in antiquity. Selected samples might be useful for radiocarbon dating (C14), thus providing improved dating evidence.

3.2.6 Stone objects

Quantity and Provenance

Four stone objects were recovered from the site; these included a definite quern fragment (Ext 27), recovered during machining from west of enclosure ditch 9 (1520) and possible quern fragments (Ext 26) from a burnt feature area (1526) (15). One small incomplete fragment of stone (Ext 25) was collected from the circular ditch 4 (1608), and may also have been a rubbing or grinding stone.

Statement of Potential

Archaeological evidence from South-western France suggests that rotary querns - beside their obvious connection with agriculture and food processing - may have been used also in Roman iron production.¹ As there are already several sites in the East Midlands showing quern fragments in an iron-working context detailed microscopical examination could verify their former function. Scanning Electron Microscopy (SEM) could identify indicative micro-inclusions of slag and/or metal.

3.2.7 Plant Charred Remains

Quantity

A total of 18 samples were processed: two of these (Samples 18-23) are from a pit of potential Beaker/Early Bronze Age date. The remainder are from various burnt features of Roman date including the possible smelting furnace and ore roasting pit.

Samp	Cont.	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch	Se	oth	ch	Comments
22	1709	1711	20	22	-	-	1	4	-	-	-	Beaker/EBA pit at 1 Cereal grain, grass seed and chickweed seed.
23	1710	1711	8.5	3	-	-	-	-	-	-	-	Beaker/EBA pit at 1
1	1517		2	15	1	-	1	10	5	-	-	Burnt area adjacent to 15 Barley grain, cereal sprout, cereal stem, seeds of blinks and dock. *
3	1558	1522	4	12	-	-	1	-	1	-	-	Probable smelting pit at 2 Wheat grain, indet charred frag.
4	1557	1522	3	3	-	-	-	-	-	-	-	~
5	1573	1522	1.5	2	-	-	-	-	-	-	-	~

¹ Claude Domergue (Toulouse) pers. comm. to ISK; Jarrier, C./Domergue, C./Pieraggi, B./Ploquin, A./Tollon, F. (1995) Caractérisation minéralogique, géochimique et métallurgique des résidus de réduction directe, d'épuration et de forge du centre sidérurgique romain des Martys (Aude, France), *Revue d'Archéométrie* 19, 49-61

Samp	Cont.	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch Se	oth	ch	Comments
6	1583	1522	3	1	-	-	-	-	-	-	~
10	1647	1522	0.5	3	-	-	-	-	-	+	~
13	1642	1522	1	1	-	-	-	-	-	-	~
16	1557	1522	6	2	-	-	-	-	-	-	~
7	1581	1525	10	12	-	-	-	-	-	-	Roasting pit at 3
8	1579	1525	10	8	-	-	-	-	-	-	~
9	1607	1525	2	10	-	-	-	-	-	++	
2	1575	1574	5	55	-	-	-	4	-	+++	Ring gully at 4 Fat-hen seeds, Charcoal.
19	1625	1577	6	3	-	-	-	-	-	+	Ditch at 13
20	1608	1609	18	27	-	-	-	12	-	-	Ring Groove at 4 Seeds of ribwort plantain, heath grass, sedge, ?speedwell, cinquefoil and ?self- heal. *
18	1650	1649	6.5	2	-	-	1	-	1	-	Northern ditch at 12 Cereal grain, cereal stem.
17	1665	1667	6	2	-	-	1	-	-	-	Ring gully at 4 Cereal grain.

Table 7 - Site 3: Assessment of Flots for Charred Plant Remains

Range and Variety of Material

Seven of the samples have remains present, barley and wheat were found with a few weed seeds including the damp ground plant blinks (*Montia* sp). Grassland plants were present in 1618 indicating this type of environment in the vicinity. Two samples are suggested for recording with reference to the remains in the rest.

Statement of Potential

see 8.8 below.

3.2.8 Animal Bone

Quantity

Thirteen bags of bone were recovered by hand, weighing 223g and consisting of 83 fragments.

Provenance and Dating

Animal bone was recovered from thirteen contexts of a Romano-British date, four of which were ditch fills, two were post holes, one from a burnt area and the rest from clearance.

Range and Variety of Material

Skeletal remains of horse, cow, pig and sheep/goat were noted in the hand recovered bone, mostly in the form of teeth. A small amount of burnt bone was present but none of these fragments were identifiable. Small boned creatures, such as rodents and fish, are not represented.

Condition of the Material

Most of the bone recovered is in poor condition. Fragments are small, fragile and show signs of breakage during excavation and storage. Some of the bone is identifiable to species, as the majority consists of teeth, which appear to have a better survival rate. However, there is rarely more than one identifiable bone per context.

Statement of Potential and Methods Statement

Due to the small amount of identifiable bone recovered from each context, it is unlikely that further analysis will yield useful information about the site. The quality and quantity of bone is generally deemed insufficient to justify full analysis. A rapid scan to identify species will be adequate.

3.3

Site 4

Undated Boundary Ditch; Iron Age /Roman occupation: Ridlington

A24.1996
SK 84550/2250
Field 46

Fig 4

3.3.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

A ditch of probable prehistoric date was segmented. Worked flints were recovered from its uppermost fill.

Part of a structure was identified in the east. Three adjacent shallow gullies associated with a post-hole were part excavated and found to contain Iron Age and Roman pottery. Post-settings were within the gullies.

A large deposit of hematite and limestone was partially excavated by machine to the west of the ditch and other deposits of haematite were recorded in the vicinity, one of which was cut by the boundary ditch. A sample of haematite was retained. The nature of the haemetite deposits is not clear, although they did not appear as geological formations. They may be a source for the smelting areas identified at sites 3 and 5.

Statement of Potential

The site contributes to the study of prehistoric boundaries and provides some detail of the probable periphery of a rural Roman settlement .

The linear boundary ditch of probable later prehistoric date will contribute to our knowledge of the extent and character of boundary systems in the East Midlands.

The structural features indicate the extent of Iron Age and Romano British occupation down the valley side from the plateau, and add to the known distribution of such sites.

The deposits of haematite within the pits may be associated with smelting activities recorded at sites 3 and 5.

Material Categories

3.3.2 All pottery

Quantity

The total material recovered from the site numbered 92 sherds weighing 470g. Unstratified contexts produced eight sherds weighing 48g, a percentage of 10.2%.

The prehistoric material represents 26.4% of the total assemblage, the remaining being of Roman date.

Provenance and Dating

The prehistoric pottery was recovered from a single context (3010) which was the fill of a gully (3). This material can be dated to the Iron Age but with no diagnostic features it cannot be more closely dated.

The Roman material was recovered from one context (3002) a post-hole associated with the gullies (4) two other sherds being unstratified. The grey ware vessel recovered from the two contexts is found throughout the Roman period. The unstratified Roman material includes a BB1 dish of the 2nd century AD.

Range and Variety

All the prehistoric material is of a soft, grog tempered fabric. Only body sherds are present.

The material has suffered some post-depositional abrasion; the average sherd weight for the prehistoric is 3.2.9g, and the Roman is 7.2g. No conservation will be required.

Statement of Potential

In association with the other material from the sites the length of the pipeline, information will be gathered on fabrics and forms in east Leicestershire and Rutland.

3.3.3 Flint

Quantity

A total of 96 pieces of which only 9 were stratified.

Provenance

The uppermost fill of a boundary ditch of probable prehistoric date produced all the flint. This also covers the area of two previous located flint scatters, SMR refs. SK80SW.W and SK80SW.AT.

Range and Variety of Material

Ext	Cont	Cut	Location	ID	Corticated
40	3021	3025	Tertiary ditch fill at 1	Small blade	++
41	~	3025		broken flake	++
42	~	3025		small flake	
43	~	3025		flake	++
45	~	3025		flake	
47	~	3025		burnt	
48	~	3025		flake	+

Table 8 - Site 4: Stratified Flint

The ditch contained Neolithic/Bronze Age flint and residual Mesolithic material. Its presence in the top fill of the ditch is probably due to later ploughing. The unstratified material is of mixed date; just over half is Mesolithic (corticated blades and blade core). The remainder is later and includes two retouched pieces.

Statement of Potential

The material is only of a moderate potential in terms of providing evidence for dating and functional interpretation. Residuality is certainly evident.

3.3.4 Stone samples

Future geological and geochemical examination could verify if this deposit could have possibly been the source of ore smelted at Ridlington. Although the use of limestone as a fluxing agent to date is not confirmed for the Roman period its deposit next to ore could have technological implications.

3.4

Site 5

Mesolithic material; Iron Age boundary and occupation; Roman Occupation; Iron Age/Roman Iron Working; Roman Fired Features; Ridlington.

A25.1996
SK84900/2250
Field 47

Fig 5

3.4.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

Segments were placed through a double ditch of probable Iron Age date in the west of the site, the easternmost of which ditch was cut by a substantial pit which was itself cut by a larger ditch. The upper fill of the latest ditch contained Roman pottery.

The westernmost ditch was also cut by a small slot like feature which contained Roman pottery

One segment was placed through shallow convergent ditches in the extreme west, but no dating material was recovered.

Another ditch which cut a Roman pit was found to be post-medieval in date and probably relates to Enclosure boundaries

One hundred and twenty-five discrete features were planned of which seventy four were half-sectioned and thirteen fully excavated. A further sixteen reliable features were planned in the evaluation trench to the north, none of which were excavated.

Both Iron Age and Roman occupations are well represented; the well dated Roman deposits appear in the west of the site and the few dated Iron Age deposits (apart from the double ditch which is dated by typology) to the east.

Post-holes on various alignments were identified and recorded; a sample of each alignment was half-sectioned.

Possible structural forms identified to date include

Semi-circular structures, one represented by a gully, and one by an arc of post-holes.

Post formed and gully formed rectangular forms of probable Roman date

Twenty eight pits were recorded

Six broadly rectangular fired features were recorded in three locations up to 85m apart. In two of these locations the fired features were found to be intercutting. All were excavated to demonstrate cross and longitudinal section information (with sample excavation of construction deposits to demonstrate construction sequence).

In size the fired features varied between less than two to four metres in length, with plan shapes with including varying enlarged ends. Four contained some constructional and structural elements of stone with clay bonding. In some of the secondary fills, collapsed stones were recorded which may have derived from collapsed superstructures.

Four had stone lined flues and floors, one had a clay lined flue and one appeared unlined.

The backfills of these features contained dateable material including pottery and metalwork. Interpretation of archaeomagnetic dating indicates a last firing between the late 1st century and early 2nd century AD for two of the intercutting fired features.

Several rectangular pits contained good assemblages of Roman pottery for which a 3rd century date has been suggested.

Industrial activity was attested by two small pits which appeared similar in plan, with concentrations of slag visible in plan. One was selected for excavation and was found to contain layers of industrial residues (Pit 2557, table 00). The fills also contained five sherds of Roman pottery.

One pit excavated near the largest of the fired features in the west of the site was found to contain over 30 worked flints including a number of microliths of probable late Mesolithic date. These finds were three-dimensionally recorded. The 75% of the fill of the pit was passed through a 3mm sieve on site. 40kg of soil selected from where the hand recovered flints were concentrated was retained for wet sieving. The pit was fully excavated.

Statement of Potential

The site contributes a transect of unenclosed Iron Age settlement, rural Roman settlement and provides a rare group of stratified Mesolithic material

A pit contained an assemblage of stratified Mesolithic artefacts which do not appear residual. The feature is isolated and not particularly interpretable, but provides a grouping of material which is rare in the East Midlands.

The double ditch boundary of probable later prehistoric date will contribute to our knowledge of the extent and character of boundary systems in the East Midlands.

The Iron Age features will contribute to the study of Late Iron Age settlement locations and patterning in the East Midlands.

Several structures are of potential Iron Age date, and contribute to the understanding of structure types in the Late Iron Age in the East Midlands.

The Roman archaeology possibly includes a reuse of the infilled Iron Age double ditched boundary. In any case the Roman activity is clearly delineated by the ditches and is evidence of continuity in the landscape.

The excavated Late Iron Age/Roman features will contribute to a number of interests

1) Late Iron Age/Roman Smelting technology: the features must be studied in a considered chronology of the site; the slag filled pits could be interpreted as slag-tapping pits; their connection with any furnace remains are unclear and need investigation.

Possibly the furnace has been totally truncated away; alternatively, the large rectangular pit adjacent to the tapping pits housed a furnace (cf Aschwicken, Tylecote 1986 p158).

2) Roman fired features; the function of the fired features has to be investigated; the clear differential in size between them and spatial variation on site perhaps indicates different functions; contextually a functional relationship with iron production might be investigated in addition to the more usual corn-dryers and perhaps, on tentative inference from the environmental results malting ovens (Monckton below). A test for hammerscale in retained samples to investigate the possibility of smithing hearths identified a very small quantity of hammerscale in a primary (usage) fill of one of the fired features.

A number of deposits can be attributed to enclosures or structural forms; although due to the transect nature of the work, complete structures are rare and cannot be fully defined, some indicators of enclosure/structure type are apparent.

Twenty-seven other smelting sites of Iron Age or Roman date have been found over the Northamptonshire Sand Ironstone of the Jurassic Ridge for example at Byfield, Laxton, Wakerley, and Weekly (a summary in Condron 1997)

The juxtaposition of Iron Age and Roman material will contribute to the study of continuity and change in the landscape in the transitional period.

The extent of the Roman and Iron Age archaeology given the location of the pipeline on the plateau edge perhaps indicates that the occupation represented is part of a much larger site at Ridlington.

Material Categories

3.4.2 Prehistoric Pottery

Quantity

A total of 75 sherds weighing 369g was recovered from the site, none from unstratified contexts. The prehistoric pottery represented 4.9% of the assemblage for all periods.

Provenance and Dating

Two fills of a rounded pit (2596) and (2597) (the more eastern at 12) contained 66.9% of the Prehistoric material, including two sherds of Scored Ware.

A total of 47.6% (by weight) of the material was scored. Generally scoring on Iron Age pottery is thought to date from 400 BC to the 1st century AD.

Range and Variety

A variety of fabrics were present though compared with the work undertaken on sites to the west of Leicester, there seemed to be a lack of the coarser acid igneous rock temper (RQ1). This may be a result of the local production methods.

A total of seven rim sherds were identified, representing approximately four individual vessels.

Thirteen sherds (17% by sherd count) were decorated, using scoring and brushing techniques

Condition

The condition of the material was fair with some post-depositional abrasion, the average sherd weight is reasonable at 4.9g. No conservation will be required.

Statement of Potential

Analysis of fabrics will add to our knowledge of the range of local and regional material. This is particularly pertinent as less detailed work has been undertaken on material from sites to the east of the county and in Rutland. Analysis of the rim types will improve knowledge of the range of forms in use during this period in the eastern region of Leicestershire and Rutland

Analysis of the material will be related to material previously analysed (for example material from Empingham, Kirby Muxloe, Wanlip and Enderby) to provide a regional synthesis of Iron Age pottery.

3.4.3 Roman Pottery

Quantity

A total of 756 sherds weighing 7,081g was recovered from the site. Of these a total of three sherds weighing 130g were collected from unstratified deposits. The Roman material represents 94.9% of the pottery assemblage from all periods.

Provenance and Dating

Pit 2512 (13) produced the largest assemblage with 191 sherds weighing 2,844g (context 2513). This included a substantial part of six individual vessels. This assemblage is dated to the late 2nd century to the 3rd century, on the basis of material from the "Bourne-Greatam" industry, and a colour-coated jug from the Nene Valley.

Pit 2582 (15) produced a good sized assemblage which suggests a date of the late 3rd century (context 2581).

Range and Variety

The material shows a bias towards the colour-coated wares not so apparent on sites in Leicester; a result of the sites position close to the Nene Valley production areas.

It should be noted that there is an occurrence of material from the "Bourne-Greatam" production industry of eastern Rutland and Lincolnshire.

Condition

The condition of the material is varied, though generally good. The average sherd weight is 9.4g

Statement of Potential

Analysis of the material will provide closely dated assemblages to aid the dating of features, possibly highlighting a shift in areas of activity over time

Identification of vessel forms may identify functional areas within the site.

Analysis of fabrics will add to our knowledge of the range of local and regional material, highlighting trading links.

Comparison can be drawn with other Roman pottery groups in Rutland, such as the Rutland Water Dam sites south-west of Empingham, Great Casterton and Ketton. . Also comparison should be made with other sites on the pipeline, notably Site 3.

3.4.4 Flint

Quantity

A total of 77 pieces of which 58 were stratified.

Provenance

The stratified material mostly derives from features of Iron Age and Romano-British date. A good assemblage of later Mesolithic material was recovered from a pit (ext. numbers 5-8, 11-37; nb ext 31 contains 4 pieces yet to be split.)

Ext	Cont	Cut	Location	Flint ID	Corticated
5	2716	2718	Mes Pit at 1.	flake	++
6	2717	2718		chunk	++
7	2717	2718		small blade core	++
8	2717	2718		blade	++
11	2716	2718		Blade	++
12	~	2718		microlith	+++
13	~	2718		blade frag	+++
14	~	2718		flake	++
15	~	2718		natural	
16	~	2718		blade frag	+
17	~	2718		flake	+
18	~	2718		chunk	++
19	~	2718		blade frag	++
20	~	2718		m-debitage x 4	+++
21	~	2718		flake	++
22	~	2718		blade frag	++
23	~	2718		blade	++
24	~	2718		flake	++
25	~	2718		blade	+
26	~	2718		chunk	+++
27	~	2718		retouched flake	++
28	~	2718		blade frag	++
29	~	2718		small blade core	++
30	~	2718		microlith	+
31	~	2718		blade frags x 2	++
32	~	2718		small blade core	++
33	~	2718		blade frag	++
34	~	2718		flake	
35	~	2718		chip	+++
36	~	2718		blade frag	
37	~	2718		flake	+
9	2726	2748		flake	++
38	2757	2758	Undated	unchecked	

Table 9 - Site 5: Stratified Flint

The material from the Mesolithic pit includes diagnostically late Mesolithic microliths and possible evidence for their manufacture. The remaining stratified and unstratified material is a mixture of Mesolithic and later material. Three scrapers, spurred piece/piercer, core/scrapper and retouched piece are of Neolithic/Bronze Age date. A small uncorticated blade core may be later Mesolithic or early Neolithic.

Statement of Potential

The late Mesolithic material provides rare evidence (locally and regionally) for a stratified lithic assemblage.

3.4.5 The Plant Charred Remains*Quantity*

A total of 16 samples were processed including three fired features of Roman date.

Samp	Cont	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch Se	oth	ch	Comments
1	2513	2511	5.5	12	-	-	-	-	2	-	Roman pit at 13 Hazel nutshell, cereal sprout.
11	2541	2539	11	22	++	-	+	+	-	-	Roman pit south of 9 Abundant chaff with few grains and a moderate number of weed seeds. *
8	2580	2548	2	9	-	-	40	20	-	-	Fired Feature at 6 Cereal grains include hulled barley, seeds of poppy, stinking and scentless mayweed, dog's-tail grass. *
2	2555	2557	7	12	-	-	-	-	-	-	Undated pit at 11 containing slag
6	2555	2557	6.5	1	-	-	-	-	-	-	
3	2556	2557	11	3	-	-	1	1	-	-	Cereal grain, scentless mayweed seed.
7	2556	2557	8	1	-	-	-	-	-	-	
4	2558	2557	9	1	-	-	-	-	-	-	
21	2691	2564	5	15	+	-	+	+	-	+	Roman Fired Feature at 5 About 60 items, wheat with germinated grains, glumes and seeds. Charcoal not removed. *
5	2534	2591	5	2	-	-	1	2	-	-	Roman Fired Feature at 7 Cereal grain, lg grass seed and crested dog's-tail grass seed.
10	2589	2591	6	25	10	-	100	20	-	-	Wheat grains, spelt glume, rachis of glume wheat, seeds of lg grass, dog's-tail grass and scentless mayweed. *
12	2607	2591	0.5	7	-	-	-	50	30	-	Seeds of ribwort plantain, eyebright and clover type. Cereal sprouts. *
17	2636	2631	9	55	20	-	200	5	-	+	Roman Fired Feature at 5 Wheat including germinated grains, glumes and few weed seeds incl lg grass and dock. *
18	2661	2663	18	25	-	-	++	+	-	-	?Roman burnt pit north of 11 Wheat including germinated grains, seeds of cleavers and lg grass. *
23	2716	2718	6	6	-	-	-	-	-	-	

Samp	Cont	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch Se	oth	ch	Comments
22	2717	2718	5	4	-	-	-	-	-	-	Later Mesolithic pit containing microliths at 1

Key: Gr = grain, Sf = spikelet fork (chaff), Gl = glume (chaff), Ch Se = charred seed, Un Se = uncharred seed, oth = other charred item, ch = charcoal.

Table 10 - Site 5: Assessment of Flots for Plant Charred Remains

Range and Variety of Material

The most productive samples were from fired features and pits. Abundant cereal grains including wheat and hulled barley were found in the kiln samples 2580 and 2589 and in the pit sample 2636, the latter two also contained identifiable chaff (glumes) showing the presence of spelt (*Triticum spelta*). Should the pits and fired features prove contemporary it is possible that they may contain waste from the processes carried out in the kilns. A sample consisting mainly of silicified awns from the flue of the kiln may assist in this. Germinated wheat grains were also found particularly in 2631 and 2663 and these should be investigated for evidence of malting or possibly spoilage both of which result in germination of the grain. Analysis of the proportions of the types of remains in these samples may elucidate which stages of crop processing are represented (Hillman 1984). Arable weeds were also found and include charred poppy seeds (*Papaver* sp) which could be further identified, mayweed (*Tripleurospermum inodorum* and possibly *Anthemis cotula*) and cleavers. Grassland plants are also represented particularly in 2591. Seven samples are worthy of full analysis together with a sample from the flue of the largest kiln (sample 16).

Statement of Potential

see 8.9 below

3.4.6 Animal Bone

Quantity

Thirteen bags of bone were recovered by hand, consisting of 385 fragments and weighing a total of 2752g.

Provenance and Dating

53% of the bone was recovered from pit context (2513), which has been dated to the Late 2nd and 3rd century AD. The remainder was collected from pit fills, a gully fill and four fired features, two of which contained burnt bone fragments.

Range and Variety of Material

Of the identifiable bones in pit (2513) nearly 74% were cattle, with the remainder being sheep/goat. There were a large number of mandibles and loose bovine teeth and, a substantial number of skull and mandible fragments. Parts of the axial skeleton, such as pelvis and vertebrae, were represented, but there were relatively few longbones.

Skeletal remains of sheep/goat, cattle and horse were noted from the other contexts. There was a little burnt bone present, mostly unidentifiable fragments. Small boned creatures, such as rodents and fish are not represented.

Condition of the Material

The animal bone is generally in poor condition. It is fragile and crumbly, with evidence of breakage during excavation and storage. Extensive fragmentation of many of the bones has resulted in a high fragment

count. Some bone surfaces are deteriorated, inhibiting examination for butchery marks and pathologies. There appears to be a higher survival rate for teeth in the assemblage.

Statement of Potential

It is suggested that detailed analysis of pit (2513) is desirable, with a view to obtaining some information about the numbers and age of the cattle. However, the remainder of the animal bone from the site is of insufficient quality and quantity to warrant more than a rapid scan.

3.4.7 Fired Clay and Industrial Material

Quantity

Over 40kg of industrial residue were recovered. None of the material was recovered from unstratified or cleaning layers.

Sample	Context	Cut	Description	Feature type
	2527	2508	furnace lining	Subrectangular pit at 12 adjacent to 2557 ?Iron Age
	2501	2509	tap slag	Subrectangular pit at 14. Roman
	2501	2509	slag lump; probable bloom	
	2561	2562	tap slag	Post-Medieval Ditch adjacent to pit at 14 (?residual material)
	2555	2557	tap slag; slagged fuel ash	Pit at 11. In-situ formed slag.
6	2555	2557	tap slag; ore; glazed fuel ash; fuel remains; bloom fragments (?)	
2	2555	2557	tap slag; lining	
2	2555	2557	tap slag; fused lining	
	2556	2557	slagged fuel cinder (incl. fuel remains); ore; tap slag	
7	2556	2557	tap slag; conglomerate block of fuel ash/slag/ore flakes; glazed fuel ash	
7	2556	2557	tap slag; ore; cinder; fuel ash (incl. glazed); slag with fused fuel ash layer	
	2556	2557	fired clay (slightly ox)	
3	2556	2557	tap slag; fused lining	
3	2556	2557	tap slag; 1 probable corroded iron object	
	2558	2557	tap slag	
4	2558	2557	tap slag; lining	
4	2558	2557	tap slag	
21	2691	2564	red. and ox fired clay	Fired feature at 5
	2502	2600	fired clay (ox)	Fill of recut ditch at 2
	2641	2642	tap slag	Pit at 15
	2707	2706	furnace lining; ore	Pit/Posthole at 16. ?Iron Age

Table 11 - Site 5: Industrial Materials

Density measurements of three selected tap slag samples produced a specific gravity of c.4-4.3g/cm³.

Provenance

Fills of pit 2557 (to the south at 11), contributed over 27kg of material consisting of tap slag, furnace lining in various stages of firing and/or vitrification, cindery material/fuel remains/ash/charcoal and ore.

Context (2501), from a pit at (14) produced a total of 1,643g, 61.8% of the material recovered, including tap slag.

The remaining material was not found in sufficiently large concentrations to suggest obvious areas of industrial activity. For full site-internal provenance of material see Table 5.

Range and Variety

Examination of the material from this site produced: tap slag, furnace lining in various stages of firing and/or vitrification, cindery material/fuel remains/ash/charcoal and ore.

Further examination of three selected pieces will confirm if they are indeed fragments of blooms. This assemblage can be expected in the context of iron smelting.

The fine fraction of a wet sieved primary context from one of the fired features (2580/C2548) yielded some hammer-scale that is indicative of smithing. This is rare but isolated evidence.

Statement of Potential

Further analysis should investigate on

- a) whether the pits featuring the *in situ* slag are in fact an integral part of the smelting process² and
- b) how these could be related to other features indicative of iron production on the site.

Are the slag-filled pits a result of residue dumping, or are more of an integral part of the smelting process, and how might they relate to other features indicative of iron production on the site?

Selected material has been sectioned to aid identification where this had not been possible on obvious typological grounds.

Future geochemical and metallographic analyses of representative slag and ore samples from the site could shed more light on the technologies that have been employed on the site and the conditions and efficiency of individual production processes. Comparative ore-slag analysis may provide information on the quality and - to a certain degree - provenance of the ore and may verify the possible use of advanced production methods.

Detailed identification of the preserved charcoal samples may provide an insight on the fuel that had been used as well as information on the natural environment of the region in antiquity. Selected samples might be useful for radiocarbon dating (C14), thus providing improved dating evidence.

Thermoluminescence (TL) dating of selected representative samples may also provide improved dating evidence.

3.4.8 Small Finds

Quantity

There are a total of seven small finds detailed on paper records only. Of these five are identifiable in their present condition.

Range

Four categories of material were formed for cataloguing the material; iron, copper alloy, stone and glass

² Jackson/Ambrose et al. 1978, 151f; Jackson & Tylecote 1988, 292f

Material which is datable include a Roman coin and a glass bottle from the post-medieval period. Potentially datable after treatment include two iron implements. Examination of the slag samples produced one additional probable iron object.

Statement of Potential

Four objects will require examination by X-radiography, and five objects will require some level of conservation.

Accurate dating of artefacts would aid the production of a chronological framework for the site

More detailed analysis will be undertaken where groups of finds are considered to have more potential. The potential could take the form of dating purposes, evaluating social status or insight into the development of the site.

3.4.9 Stone and clay samples

Quantity, Dating and Provenance

Six samples of stone were retained from the Roman fired features for identification; in a number of instances, the material used did not appear to be ironstone. Samples of fire reddened stone were retained. The extent of reddening can be indicative of temperature (Morgan G. pers comm.)

Two undisturbed samples of clay lining were retained for possible indications of puddling.

One undisturbed sample of ash from the base of a Roman fired feature was retained for the identification of silicified fuel remains.

Statement of Potential

Identification of the material will benefit the understanding of the construction techniques and requirements of the fired features.

The extent of reddening can be indicative of temperature attained (G. Morgan pers comm.)

3.5

Site 6

Iron Age Boundary and occupation; Conquest period activity; Roman occupation and Ditch Systems: Ridlington

A26.1996
SK85300/2150
Field 48

Fig 6

3.5.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

Three ditch complexes were recorded crossing the easement including the anticipated double ditch. All ditches were segmented at least once.

Several of the ditches were found to be the product of multiple recuts. All can be associated with Late Iron Age and Early Roman activity importantly including the transitional period.

Later Roman material was found on the surface of a number of the ditches.

Due to restricted access caused by the narrowness of the easement and depth of subsoil in this area hand excavation of the 7.5m wide ditch identified in evaluation trenches was not possible. Whether a single cut or the product of recutting remains unanswered.

The double ditches displayed a notable backfill and secondary silting pattern with possible post-depositional movement of fills similar to the pattern recorded in the excavation of double ditches at Tixover (Beamish forthcoming)

Eleven features including slots, small pits and post-holes were excavated adjacent to the double ditch.

One slot and a nearby pit contained Scored Ware. The slots formed a right angle with each other and possibly defined one side of a rectangular structure.

One pit had been cut into the surface of one of the infilled double ditches

Statement of Potential

The Iron Age features will contribute to the study of Late Iron Age settlement locations and patterning in the East Midlands.

One part of a possible rectangular structure is of Iron Age date, and will contribute our knowledge of structure types in the Late Iron Age in the East Midlands.

The number of ditches and their magnitude perhaps suggest that the plateau (on the very edge of which the transect skirts) has a specific function in the Late Iron Age/Conquest period. This might be further investigated.

Some of the ditches can be attributed to a transitional period following the Roman conquest of Britain. The upper fill of one of the double ditches contained a quantity of Roman pottery and indicates Roman activity in the vicinity of the boundary which may still have existed as a landscape boundary and/or Roman backfilling of the boundary. In any case some form of reuse is implicit.

Roman material was found over a number of other features echoing the theme of settlement continuity and discontinuity.

Material Categories

3.5.2 All Pottery

Quantity

The total assemblage consisted of 191 sherds weighing 882g. This is broken down into the following divisions, 79 sherds of prehistoric pottery weighing 129g, 110 sherds of Roman pottery weighing 736g, and 2 sherds of post-Roman material weighing 17g.

Provenance and Dating

Iron Age pottery was recovered from the larger rectangular feature at 8 cut 2018 (context 2017) representing 54.4% of the material. Similar pottery was found in the subcircular pit cut 2026 (context 2024) on the southern edge of the easement at 8.

67.3% of the Roman material was recovered from a tertiary fill of the one of the large ditches (2047). It is securely dated from the 1st century AD through to the early 2nd century, but may reflect the ditches' inconsequence in the landscape in this period.

From the more eastern ditch at 6 were recovered 20 sherds weighing 94g including part of a 'transitional' late Iron Age to early Roman vessel.

Roman and Post-Roman material was recovered from the ditch surfaces at 4.

Range and Variety

There are five rims present in the prehistoric material, 6.3% of the prehistoric assemblage. These represent five different vessel forms. One rim has fingertip impressions along the top of the rim, this decorative technique is found throughout the Iron age period.

The Roman material produced six rims representing three vessels.

Condition

The material was in reasonable condition, the average sherd weight of the prehistoric pottery is 1.6g, which reflects the number of small fragments recovered from (2017). The average Roman sherd weight is 6.7g.

A fragment of spindle whorl was excavated from the same tertiary ditch fill as much of the Roman pottery (above).

3.5.3 Non ceramic material

Quantity

A small quantity of bone, a single iron object and a fragment of spindle whorl were also identified.

Only 3g of bone was recovered from contexts (2002) and (2011) which produced Iron Age rim fragments. (Further burnt material may be forthcoming from environmental sample).

The iron object was found in the easternmost ditch at 6. It is flattened and may be a fragment of a knife or similar implement, or a fragment of a larger plate; identification will be aided if the object is X-rayed

Statement of Potential

Analysis of the late Iron Age and early Roman vessel will aid our understanding of this transitional period.

The assemblage should be compared to the other sites along the pipeline.

The identification of the iron object may assist in the dating of the context from which it was recovered, and may indicate the nature of activities undertaken at this site.

3.5.4 Charred Plant Remains

Quantity

One sample of probable Late Iron Age/Early Roman date was processed.

Samp	Cont	Feat	Samp Vol. litres	Flot Vol. (mls)	Gl	Sf	Gr	Ch	Se	oth	ch	Comments
1	2010	2014	5	45	-	-	-	+	+	+		LIA/Early Roman burnt pit fill at 9 A moderate number of seeds including vetch type. *

Table 12 - Site 6: Assessment of Flots for Plant Charred Remains

Range and Variety

The single sample has seeds present including vetch type and recording is suggested.

Statement of Potential

See 7.5 below.

The archaeological integrity and phasing of the selected samples should be considered before analysis is carried out.

3.6

Site 7

Undated Single Ditch Boundary: Ridlington

A27.1996

SK84900/2250

Field 47

Fig 7

3.6.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

The anticipated ditch was located and sample excavated. No other deposits were identified.

The was wide and shallow. No finds were recovered

Statement of Potential

The site contributes an example of a single ditch boundary of probable later Prehistoric date associated with a clothesline enclosure to the north (SMR Ref SK80SE.L)

The boundary will contribute to knowledge of the extent and character of boundary systems in the East Midlands.

3.6.2 All Finds

No stratified finds were recovered from the site.

3.7

Site 8

Prehistoric Occupation, Preston

A51.1996

SK85900/2100

Field 50

Fig 8

3.7.1 Stratigraphic and Structural Data

Range and Variety

Ditches, gullies and pits were identified by geophysical survey and confirmed by archaeological stripping. The site was part photographed and sketch planned.

Some pottery and fired clay was recovered and located from the surface of negative features

No features were excavated and no further record made

Statement of Potential

The site contributes an unexcavated transect of multiphase prehistoric settlement and further expands the knowledge of site types and locations. Curvilinear ditches forming enclosures and probable circular structures are present.

Due to denial of access the information from this site is minimal but nevertheless it does provide a contribution to the study of prehistoric settlement patterns in the East Midlands.

3.7.2 Prehistoric Pottery

Quantity, Provenance and Dating

Nine sherds of prehistoric pottery were collected from the tops various features during machining (within the toned area on plan).

3.7.3 Fired Clay

25 fragments of fired clay weighing 173g were found at the eastern end of the field. One pit/post-hole contained 17 fragments showing impressions of what appear to be reeds, and also appear to be shaped. This may suggest a wattle and daub lined pit, or similar feature which had then be fired either purposely or accidentally.

3.8

Site 9

?Early Bronze Age Ditch and associated features; Undated Pits; Roman Boundary Systems; Preston

A49.1996
SK87000/02000
Field 54

Fig 9

3.8.1 Stratigraphic and Structural Data

Range and Variety

All deposits investigated were fills of negative features

Linear features predicted by geophysical survey were identified and sample excavated.

A number of discrete features was also identified.

A segment was hand excavated through the terminal of the ditch. The feature was well formed and survived to 1.70m. Some stratification was apparent with primary deposits filling a narrow uneroded lower profile, and secondary deposits filling a more slack sided eroded upper profile.

A number of small pits or post-holes were identified adjacent with the butt end. The small pits/post-holes were half-sectioned.

Small quantities of worked flint and prehistoric pottery were found in the ditch and two of the post-holes. The only diagnostic sherd was found in one of the post-holes and is may be a sherd of Grooved Ware or Beaker (P.Marsden pers. comm.) of Late Neolithic or Early Bronze Age date.

Four adjacent pits were identified in the east of the site, three of which were half-sectioned. One contained sherds of undiagnostic prehistoric pottery (4560/C4561).

Seven further linear features were recorded, through which nine segments were hand excavated.

Rim and decorated sherds of colour coated indented beaker dated to the 3rd century AD were found stratified in some of the fills.

Statement of Potential

The contribution of what appear to be Late Neolithic or Bronze Age deposits including a sizeable ditch in this plateau location is interesting and unusual, and will contribute significantly to the understanding of land-use during this period.

The Roman features provide some detail of the periphery of a rural Roman settlement.

Material Categories

3.8.2 Prehistoric and Roman pottery

Quantity of Material

The total pottery assemblage consisted of 97 sherds weighing 169g. The prehistoric total was 17 sherds weighing 22g, the remaining 80 sherds weighing 147g are of Roman date. There is no material from unstratified contexts

Provenance and Dating

The prehistoric pottery was recovered from four contexts; three of these include the ditch (4524) and two of the adjacent post-holes (4508, 4540); from one of the post-holes (4540) is a thin walled decorated sherd of possible Grooved Ware or Beaker (Late Neolithic or Early Bronze Age).

The fourth context (4561) was from one of the pits at 7 ; the pottery here was much thicker walled.

There is a concentration of Roman pottery from fill (4565) at the junction of east west (3) and north/south gullies (6), and also (4500) which is the surface of gully (3). Both contexts produced the same colour-coated, indented beaker, suggesting a date of 3rd century AD.

Range and Variety

Of the prehistoric material, one sherd is thin walled sherd with incised decoration.

The Roman material shows little variety with the two concentrations being of the same fabric.

Condition

The prehistoric pottery is generally abraded and in poor condition with an average sherd weight of 1.3g.

The Roman material has not been abraded to the same extent, though it does have a poor sherd weight of 1.8g perhaps due to the thin walled delicate indented beaker form.

Statement of Potential

Analysis of the material along with other groups from the pipeline will add to our knowledge of Bronze, Iron Age and Roman pottery production and use in this part of the East Midlands. The discovery of small quantities of pottery with what appears to be partly contemporary flint-work is important.

3.8.3 Flint

Quantity

Nine pieces, all of which were stratified.

Provenance

Ext	Cont	Cut	Location	
4	4508	4507	Posthole at 2	Scraper with invasive retouch (EBA?)
9	4509	4507	Pit at 2	Thumbnail scraper (EBA)
1	4515	4516	Posthole at 2	Irreg. flake (nb previous scars with white/orange cortication)
2	4514	4516	Posthole at 2	?Thinning flake
7	4517	4518	Posthole at 2	Flake
6	4519	4520	Stakehole at 2	Flake
8	4525	4523	Ditch at 2	Flake
3	4534	4532	Pit at 8	Piercer
5	4543	4542	Northmost pit at 7	Struck piece with earlier corticated scars

Table 13 - Site 9: Stratified Flint

Statement of Potential

The material is only of a moderate potential in terms of providing evidence for dating and functional interpretation. Residuality is certainly evident.

3.9

Site 10

Iron Age Boundary, Preston

A50.1996
SK87700/2100
Field 55

Fig 10

3.9.1 Stratigraphic and Structural Data

All deposits investigated were fills of negative features

Two linear features indicated by gradiometer survey were identified.

A segment was excavated through the linear features at their intersection. One was found to be a geological feature, cut by a later ditch from which was excavated a number of pieces of Iron Age pottery.

A cluster of discrete features were identified and excavated to the east.

Statement of Potential

The quantities of pottery excavated from the ditch (below) indicate proximity to occupation and contribute to the understanding of Late Iron Age settlement patterns.

The site is an example of a single ditch boundary of later prehistoric date. It is not clear if this boundary is part of an enclosed settlement or is serving as a land division.

Material Categories

3.9.2 All Pottery

Quantity

The site at A50-1996 produced a total of 39 prehistoric pottery sherds weighing 144g.

Provenance and Dating

With the exception of one sherd weighing 1g all the material was recovered from (4010), a ditch fill (1). 46% of the material (by sherd count) is decorated with the classic middle-late Iron Age scoring. This provides a date range from 400BC to the 1st century AD. A further seven sherds are shaped and require further analysis to assess their significance.

3.9.3 Flint

Quantity, Provenance and Dating

Nine pieces of uncorticated material of flake technology, including a scraper and a spurred piece/concave scraper were recovered from the fills of the Iron Age ditch. The material is most probably residual.

Statement of Potential

The size and nature of the assemblage does not require detailed analysis.

4

The Watching Brief and Unstratified Material Categories

4.1 Pottery

Quantity

The watching brief resulted in the collection of half one box of material

Provenance and Dating

None of the material is stratified and was not recovered in a systematic fashion to enable valid analysis.

4.2 Flint

Quantity

The watching brief resulted in the collection of 1 box of prehistoric flintwork.

Provenance and Dating

The material has been scanned. No analysis of the material is required. A brief report for the material will be entered on archive.

4.3 Slag

One box of slag was recovered. The provenance of the material is not clear and a probable post-medieval date is suspected. Further analysis is not justified.

5

Scientific Dating

5.1

Archaeomagnetic Dating

A programme of archaeomagnetic dating was commissioned from GeoQuest Associates during the excavations. The summary of the report is included as an appendix below.

No further work will be required

5.2

Radiocarbon Dating

In order to refine site chronologies particularly with reference to project research aims, it is necessary to obtain dates for carbon deposits from certain features/groups of features.

Research aim 1:

Late Bronze Age and Iron Age landscapes (EH 1997 p47) and the location of pre Late Iron Age settlement

It is suggested that two dates are obtained for Structures 1 and 2, Site 2. Suitable material has been identified during the environmental assessment from contexts 1041, 1063, 1085 and 1072 (Table 4).

5.3

Thermoluminescent Dating

The requirements for thermoluminescent dating and the likely range of results if successful dating were possible have been considered. The use of this technique is not considered suitable in this instance.

6**Primary Sources or relevant documentation**

Most relevant cartographic information was scanned in the DBA phase and will not contribute further information.

However the Tithe Maps for Leighfield and Ridlington were not viewed for the DBA as they are retained in the Northamptonshire Record Office. Reference to these may provide some useful landscape information.

Field walking records from past work are lodged with the County SMR at County Hall, Glenfield, Leicestershire, but were assessed in the DBA and are unlikely to contribute further information

Aerial photographs referenced on the Leicestershire County SMR were scanned during the DBA, and prompted some of the archaeological work. A rescan of this material against recorded archaeological information is necessary. A check with NMR Swindon for any further material might provide further information.

7**Aims and Objectives of Analysis****7.1****Site 2**

Investigation of the evidence will question

1. The chronology of the site.
2. The form of the structures.
3. The stratigraphic evidence of change in the entrance area of Structure 1.
4. The function and location of the pit located on the outer wall line.
5. The possibility of a flint using culture.
6. The quantities of grain perhaps indicate domestic use that is consistent with the context of circular structures.

7.2**Site 3**

Investigation of the evidence will question

1. The chronology of the site.
2. The structural evidence.
3. The iron smelting evidence.
4. The function of the discrete features.
5. The changes in enclosure form and possible links with structures, and the evidence of trends in the site's spatial organisation.
6. The evidence for a driveway.

7.3

Site 4

Investigation of the evidence will question:

1. The chronology of the site.
2. The fill pattern of the probable prehistoric linear boundary, and its topographic character.
3. The structural evidence.
4. The evidence of the haemetite deposit.

7.4

Site 5

Investigation of the evidence will question:

1. The chronology of the site.
2. The fill pattern of the prehistoric double ditch and its topographic character.
3. The form of the Iron Age features.
4. The structural evidence of probable Iron Age date.
5. The form of the Roman features.
6. The structural evidence of Roman date.
7. The construction use and function of the fired features.
8. The evidence of Iron smelting and the type of process involved.
9. The nature of the Roman site.
10. The evidence of continuity between the Iron Age and Roman periods.

7.5

Site 6

Investigation of the evidence will question:

1. The chronology of the site with reference to the evidence for continuity.
2. The fill pattern of the prehistoric double ditch and its topographic character.
3. The structural evidence.
4. The nature of the further ditch systems.

7.6

Site 7

Investigation of the evidence will question:

1. The chronology of the site.
2. The fill pattern of the single ditch and its topographic character.

7.7

Site 8

The evidence can not be investigated in detail.

1. Work will be limited to the integration of magnetometry and sketch plans with possible rectification and incorporation of photographic evidence.
2. Reanalysis of aerial photographs and integration with excavations information

7.8

Site 9

Investigation of the evidence will question:

1. The chronology of the site.
2. The fill pattern of the prehistoric ditch its topographic character and relationship with discrete features.
3. The nature of the Roman features and evidence of a droveway.

7.9

Site 10

Investigation of the evidence will question:

1. The nature of the site.
2. The fill pattern of the prehistoric ditch, its topographic character.
3. The possible structural evidence.

8

Project Design

The project will contribute to the following research programmes:

8.1 Late Bronze Age and Iron Age landscapes (EH 1997 p47) and the location of pre Late Iron Age settlement

The evidence from Site 2 and the Early Bronze Age material from Site 3 (and possibly Site 9) are rare evidence of pre Late Iron Age settlement. The location on an exposed plateau away from nearby watercourses is interesting. If of Bronze Age or Early Iron Age date it is important given the general scarcity of information for this period. Settlement patterns before the Middle to Late Iron Age are poorly understood in the transition from a monument dominated landscape to settlements and fields dominated one (E.O.P. 1991 p36). The possible round barrow and extensive flint scatter (LM SK80SW.Q) c.300m to the south are of note.

8.2 The evidence for agriculture on East Midlands prehistoric sites

The recovery of identifiable cereal and weeds of cultivation remains from prehistoric sites in the East Midlands is a priority for the region. The stratigraphic and environmental evidence from Site 2 will contribute to this aim.

The remains recovered have the potential to show the crops cultivated over the phases of the sites which range from Bronze Age to Iron Age to Roman. The weeds present can show the type of land cultivated and the season of growth while the presence of other wild plants may indicate other resources exploited in the area such as grassland. The charcoal from the site, if identified, could show the type of wood exploited and also give indications of the environment. Comparison with other sites investigated in the area, particularly at Tixover and Ketton, would allow more detailed conclusions about the general landscape over the period as well as investigation of the more detailed conclusions such as the indications of hedgerows and pasture at the Iron Age site at Tixover (Monckton forthcoming).

8.3 The dating and social significance of East Midlands Scored Ware

Iron Age settlements in the East Midlands are characterised by a particular style of pottery known as East Midlands Scored Ware (formerly Ancaster-Breedon). Work by Sheila M Elsdon suggests that areas of Derbyshire, Nottinghamshire and Leicestershire may represent a sub-culture of the Corieltavi which was not in contact with the finer ware users of Lincolnshire perhaps centred on Dragonby. Dating and provenance of this and associated styles of Iron Age pottery is incompletely understood. Recent work on an assemblage of Scored Ware from Wanlip, 25km to the west has indicated a 450-350 BC date for the pottery i.e. slightly earlier than the normal starting date for the growth of Scored Wares in the region.

The small assemblages from sites 4, 5, 6 and 10 will contribute to the ongoing study of this pottery, and will provide comparative material to the larger assemblages from Wanlip (Marsden forthcoming) Empingham³ (Cooper forthcoming) and Weekley (Jackson and Dix 1987) in Northamptonshire.

8.4 The study of prehistoric boundary systems and their chronological and topographic context

Six sites contain boundary forms of prehistoric date. Two of these are double ditches, and four are single ditches.

The double ditches attain some size (to 1.45m deep and over 3m wide); some have notably distinct infill characteristics showing similarities to the double ditch fillings recorded at Tixover (Beamish forthcoming); there is possibly a degree of patterning in the silting/backfilling/eroding process.

Although the level of information from each excavated example is often dispersed, the number of excavated examples and collation of the material from the project will improve our understanding of developing land boundaries in the later prehistoric period.

The lack of information regarding the development of field systems and land boundaries nationally has been noted (e.g. Bradley forthcoming cited in EH 1997 p47). The special character of the East Midlands is starting to be addressed, and the project will contribute to further analyses (Willis 1997 p210). Recent work on later prehistoric boundary forms in Northamptonshire has identified a patterning and chronology that furthers our understanding of prehistoric land-use particularly with reference to territoriality and tenure (Taylor J 1997 unpublished PhD thesis).

8.5 Leicester and the later Iron Age

The Iron Age material from the project will contribute to a growing corpus of information of Iron Age settlement and ongoing discussion of settlement status and inter-relationships with particular reference to the possible tribal capital at Leicester.

8.6 The Late Iron Age and the Roman transition - Briton into Roman PC4 (EH 1997 p44)

The existence of juxtaposed Iron Age and Roman material on site 5, and transition period material on site 6 will contribute information for future research into nature of late Iron Age societies and the transition to Roman Britain. The transition from the LPRIA to the early Roman period is a national research aim as detailed in *Exploring Our Past* (EH 1991 p 37), and has been reiterated at the regional level (Mattingley 1995).

8.7 Continuity and change in Roman settlement and landscape use

A regional framework for research has recently been addressed (Mattingley 1995). The rural Roman sites at Sites 3 and 5 (and less so Sites 4 and 9) start to fill an empty area in this particular part of Leicestershire but reflect similar types of sites found in the nearby Welland and Gwash valleys. A number of Villa sites are recorded in the vicinity e.g. at Tixover and Whitwell, but the number of lower status sites with structural deposits remains under represented. The site information will benefit research into landscape themes of settlement hierarchies and settlement locations. The environmental information from Site 5 will aid research into the Roman economy. The pottery from Sites 3 and 5 will help understanding of trade links and pottery consumption. The small animal bone group from site 5 will provide a detailed and well dated assemblage which will contribute in a small way to the evidence of economy.

³ May be earlier (Cooper pers. comm.)

8.8 Roman Economy

Agriculture

Analysis of samples from the Roman fired features at Site 5 has the potential to provide more detail about the types of crops cultivated and their processing, this may give indication about the uses of the kilns. Such kilns used as corn dryers can have a variety of functions (van der Veen 1989) such as parching and drying grain for storage either as ears of cereal, threshed cereal or as cleaned grain. They may be used for parching grain for dehusking or have other functions such as the roasting of germinated grain for malting. The germinated grains found here, if examined in detail, have the potential to show whether malting was carried out or spoilt grain was being dried. Waste chaff was often used as fuel for these processes and this can provide additional information about the crops but can also make interpretation of the process more difficult because of mixing of the product with the fuel (van der Veen 1989). However as chaff is a traditional fuel for these processes this should contribute to the interpretation of the features as corn dryers. The cereal assemblages in the pits from this site should also contribute to the study of crop related activities on the site. This type of material is rare in this area and has only been analysed from Norfolk St Roman villa in Leicester (Jones 1982) so this is the first opportunity in Rutland and Leicestershire since then to add to this information which is important for comparison with other regions in England.

Ironworking

The economic importance of the Roman iron industry of the East Midlands has probably been much underestimated (Mattingley 1995). Sites 3 and 5 provide substantial potential for the further analysis of iron production evidence. The fact that both sites have been excavated just recently involving modern documentation methods and an awareness of the possible importance of the iron production evidence allows the data to be examined in detail - quite in contrast to many earlier excavations in the East Midlands where much of the evidence has been either lost or not properly recognised.

Publication of the findings in an archaeological journal of regional/national and/or specialist interest would present the results to a specialist community as well as promote awareness among archaeologists of the possible importance of iron production evidence retrieved by fieldwalking and excavations.

One sample yielded some hammer-scale that is indicative for smithing though isolated.

Further in-depth assessment of the iron production evidence of the site would contribute to the better understanding of the lives of its inhabitants and their activities within their settlement. Of particular interest would be a detailed comparison of the iron production evidence of Site 5 with the one from Site 3: the different slag types already indicate different smelting technologies. Results then could be viewed against a broader background of settlement mechanisms and technological development in the region, thus improving the picture that can be drawn of the East Midlands in antiquity.

Ridlington could be integrated into a wider context of industrial activity in the East Midlands: previous fieldwalking evidence (Cowgill and Jones 1996; Jones 1997) for local iron production supplements the excavational information, perhaps indicating a nucleus of ironmaking sites at Ridlington. Evidence for certain or probable Roman period iron production in the vicinity has been known for Lyddington, Whitwell and Tixover; the Ridlington site now fills a gap in the distribution pattern of iron production sites along the western fringe of the Jurassic Ridge, and the distinct clusters of sites in North-eastern Northamptonshire and the Upper Witham Valley in particular. Future in-depth study of the Ridlington iron production evidence would contribute to the accurate assessment of the extensive evidence for iron production all over the East Midlands, suggesting a highly important element of the regional economy. An integrated view of this industry with other local and regional activities such as the Nene Valley potteries and/or coastal salt production would considerably improve our picture of the East Midlands archaeo-economy.

Roman Pottery Consumption

The assemblages from sites 3 and 5 will provide useful comparative material to other Roman pottery groups in Rutland, such as the Rutland Water Dam sites south-west of Empingham, Great Casterton and Ketton.

9

Presentation

9.1

Publication

A summary report has been published in the local journal (Beamish 1997), and the ULAS web page (<http://www.leicester.ac.uk/archaeology/>)

It is intended that the results of the project will be published in appropriate media; the following form is a suggestion:

1. All the sites information will be reported in the *Transactions of the Leicestershire Archaeological and Historical Society*, including a synopsis of the metallurgy report. The report would centre on later prehistoric issues such as the changing landscape and landscape divisions.

The report would compliment the excavations undertaken for Anglian Water between Duddington and Tixover in 1991.

2. If the results warrant it, the detailed metallurgy report will be submitted to a specialist publication such as *Historical Metallurgy*.

3. The six fired-features, iron working evidence and synopsis of the Roman sites may be submitted to *Britannia* if considered suitable.

4. Alternatively, all the sites including the Late Glacial/Early Post-Glacial Flint scatter at Launde (Cooper 1997) may all be discussed in a single monograph publication with wider scope, discussing the archaeology of the pipeline in terms of landscape transects.

5 A suggested synopsis of sites 2 to 10 is as follows :

(i) *Introduction*

(ii) *The changing landscape*

Evidence of monuments and settlement in the Late Neolithic to Late Bronze Age

(iii) *Infilling of the landscape*

The explosion of Iron age settlement, increasing land division, the evidence for a pastoral economy and

the development of regionalism/tribalism and appearance of defended sites

(iv) *The Conquest and Roman period*

Continuity and change, lower status settlement locations, the economy and industrial evidence

9.2

Display Potential

The pipeline investigations (including Site 1) have excellent display potential. A display could be mounted both for Museums and perhaps Anglian Water and Severn Trent publicity purposes.

Five lectures have already been given on the material, with further dates set in 1998.

10**Implementation of Analysis*****Methods of Analysis and Task Quantification***

To fulfil the project aims, appropriate methods are required for stratigraphic, artefactual and environmental analyses.

10.1**Stratigraphic and Structural****Task 1 Complete and Enhance Site Archive (Sites 2-10)**

Site records will be entered onto a customised computer database (D'EASE ©); this will facilitate firstly the production of an enhanced and integrated paper archive for the sites and secondly ease interrogation of the data at site specific and inter-site levels

Customise Database	1 day
812 Contexts @ 100/day	8 days

Total **9 days**

Task 2

Site grids will be checked against national grids with re-computing of files if necessary. This will enable a fully integrated presentation of the data in published form .

1 day

Scan/Digitise Hand recorded plan/section drawings

Site drawings will be digitally copied using either a flat-bed scanner or digitising tablet. If scanned, drawings will be converted to vectors with an NGR base, using TURBOCAD© 4 *trace* software.

4 days

Total **5 days**

Site drawings will then be integrated with site survey data from IntSurveyor IS2 © software in TURBOCAD.

This will enable detailed interrogation of the site data, and facilitate the production of high standard illustrations for archive, display and publication.

Task 3 Compile Context Sub-groups

Following the initial analysis of site data, contexts will be placed into stratigraphic units, and entered onto the Database. Each unit will be described specifying the evidence of association.

Site 2	1 day
Site 3	10 days
Site 4	0.5 day
Site 5	10 days
Site 6	3 days
Site 7	-
Site 8	-
Site 9	2 days
Site 10	-

Total**26.5 days****Task 4** Compile provisional Groups

The stratigraphic units will be integrated into groupings based upon interpretation of evidence from the material categories. These groups will be fully described specifying the evidence for the association of the stratigraphic units.

Site 2	1 day
Site 3	4 days
Site 4	0.5 day
Site 5	6 days
Site 6	2 days
Site 7	-
Site 8	-
Site 9	1 day
Site 10	-

Total**14.5 days****Task 5**

Enhance stratigraphic record and provisional phasing

Any stratigraphic information to be incorporated into the provisional Groupings information

Provisional groups will be communicated to all material category specialists.

Site 2	-
Site 3	2 days
Site 4	- day
Site 5	3 days
Site 6	1 days
Site 7	-
Site 8	-
Site 9	1 day
Site 10	-

Total**7 days****Task 6**

Spatial Distribution analysis (Sites 3 and 5)

The locations of structures and activity areas will be investigated with reference to material categories Pottery and Industrial Materials

Site 3	1 day
Site 5	2 days

Total**3 days****Task 7**

Incorporate specialist data

Site 2	1 day
Site 3	3 days
Site 4	0.5 day
Site 5	5 days

Site 6	0.5 day	
Site 7	-	
Site 8	-	
Site 9	0.5 day	
Site 10	-	

Total **10.5 days**

Task 8

Update Site Interpretations

All sites **5 days**

Task 9

Re-examine aerial photographic information and investigate further sources at RCHM, Swindon

All sites **2 days**

Task 10

Research parallel site types

Site 2	0.5 day	
Site 3	1 day	
Site 4	-	
Site 5	4 days	
Site 6	0.5 day	
Site 7	-	
Site 8	-	
Site 9	0.5 day	
Site 10	-	
Total		6.5 days

Task 11

Write Excavation Report

Site 2	2 days	
Site 3	5 days	
Site 4	0.5 day	
Site 5	7 days	
Site 6	0.5 day	
Site 9	0.5 day	
Sites 7, 8, 10	1 day	
Total		16.5 days

Task 12

Incorporate Specialist Reports

Site 2	0.5 day	
Site 3	2 days	
Site 4	-	
Site 5	2 days	
Site 6, 8, 9, 10	0.5 day	
Total		5 days

Task 13

Produce Illustrations comprising plans and selected section and detail plans

Site 2	1 day	
Site 3	3 days	
Site 4	0.5 day	
Site 5	5 days	
Site 6	1 day	
Site 9	0.5 day	
Site 7,8,10	1 day	
Total		12 days

Task 14

Edit Excavation Reports

All sites		5 days
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Task 15

Complete and Deposit Archive

5 days**Task 16**

Dissemination of Results

5 days

Total		137.5 days
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Material Categories**10.2****Pottery****10.2.1****Prehistoric Pottery**

Site 2:		
Analysis of pottery fabrics:	0.5 day	
Analysis of ceramic material:	0.5 day	
Compiling report:	1 day	
Total		2 days

Site 3:		
Analysis, including illustration:	1 day	
Compiling report:	1 day	
Total		2 days

Site 4:		
Analysis and compiling report:	1 day	
Total		1 day

Site 5:

Analysis of fabrics and form:	2 days	
Detailed analysis of specific stratigraphic groups:	1 day	
Overall view with the other material from the pipeline:	2 days	
Compiling and editing report:	2 days	
Total		7 days
Site 6:		
Analysis of Prehistoric material, including illustration:	2 days	
Compiling report:	1 day	
Total		3 days
Site 8:		
Analysis of prehistoric pottery:	0.5 day	
Compiling report:	0.5 day	
Total		1 day
Site 9:		
Analysis of pottery, including illustration:	1.5 days	
Compiling report:	1 day	
Total		2.5 days
Site 10:		
Analysis of pottery, including illustration:	1 day	
Compiling report:	1 day	
Total		2 days
Total		20.5 days

10.2.2**Roman Pottery**

Site 3:		
Ceramic archive	5 days	
Report	5 days	
Illustration	2 days	
Total		12 days
Site 4:		
Archive and Report	1 day	
Total		1 day
Site 5:		
Ceramic Archive	10 days	
Report	10 days	
Illustration	3 days	
Total		23 days
Site 6:		
Ceramic archive and report	1 day	
Total		1 day
Site 9:		
Ceramic archive and report	1 day	
Total		1 day

Total **38 days**

10.3**Fired Clay**

Site 2 and Site 8

Analysis and compiling report:

1 day

Total **1 day**

10.4**Flint**

Sites 2 - 10

Analysis and report on material either stratified or site related material

10 days

Archive report on unstratified material

5 days

Illustration of selected pieces

4 days

Total **19 days**

10.5**Animal Bone**

Site 3:

Rapid scan and archive report on site 3 material

0.5 day

Total

0.5 day

Site 5:

Scan and detailed analysis of material including species proportions, tooth wear and ageing where appropriate.

Detailed scan of context 2513

1 day

Rapid scan of remainder of bone

0.5 day

Report writing

1.5 days

Total

3 days

Total **3.5 days**

10.6**Industrial**

Analysis of material

Report writing

No cost incurred

10.7**Charred Plant Remains**

Analysis and Report

Site 2, 3 and 6

Analysis of 7 samples

3 days

Site 5:

Analysis of 8 samples

7 days

Report with reference to other samples from this assessment
and comparison with other sites in the area:

4 days

Total :

 14 days**10.8****Stone Objects**

Site 3:

Analysis:

1 day

Illustration:

2 days

Compiling report:

1 day

Total

 4 days**10.9****Small Finds**

Site 5 and 6:

Analysis:

1 day

X ray

-

Illustration:

1.5 day

Compiling report:

0.5 day

Total

 3 days**10.10****Charcoal**

Identifications (G.Morgan)

£200

Sites 2,3,5,6.

RadioCarbon Sample Preparation (A.Monckton)

1 day

Site 2

10.11**Watching Brief****Pottery**

The material, mostly of Roman and Post Roman date has been quantified but will require time for cataloguing and archiving.

Catalogue and Archive _____ **5 days**

10.11**Summary of Time Requirements****Structural, Stratigraphic and Overall Reports**

Matthew Beamish, ULAS, 137.5 days

Prehistoric Pottery

Dawn Harvey, ULAS 20.5 days

Roman Pottery

ULAS 38 days

Fired Clay

(non industrial)

Dawn Harvey 1 day

Flint

Lynden Cooper, ULAS 19 days

Animal Bone

Jenny Browning, ULAS 3.5 days

Industrial Materials

Irene Schrüfer-Kolb, University of Leicester, School of Archaeology No charge

Charred Plant Remains

Angela Monckton 14 days

Stone Objects

Dawn Harvey, ULAS 4 days

Small Finds

Dawn Harvey 3 days

Watching Brief Material

(other than flint)

Dawn Harvey, ULAS 5 days

Charcoal

G.Morgan - Identifications £200
A.Monckton - Sample Preparation 1 day

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Jim Meek and Susan Ripper also surveyed and supervised, and Dawn Harvey looked after the finds. Martin Shore did the wet-sieving.

The watching brief was maintained by Elaine Jones.

The project has been managed by Patrick Clay.

The report was compiled by Matthew Beamish and first draft edited by Patrick Clay. All the illustrations are by the author using IntSurveyor IS2© and TURBOCAD© software.

My thanks to all the specialists involved for their contributions.

MGB 17-12-1997

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Appendix

Archaeomagnetic Dating Summary

INTRODUCTION

During May 1996, excavations were carried out by University of Leicester Archaeological Services on the route of the Wing to Whatborough water pipeline at Ridlington near Uppingham. This work revealed a number of burnt archaeological features of probable industrial nature built on, or cut into, the local ironstone bedrock.

The aim of this research was to obtain oriented samples of fired material from five of these features in order to:

- 1 Establish whether the fired material had been burnt in situ and retained a record of the ancient geomagnetic field
- 2 If possible, establish an absolute date for the last firing event in each feature based on the archaeomagnetic record.

The archaeomagnetic sampling was commissioned by the University of Leicester Archaeological Services who were responsible for conducting the site investigation on behalf of Severn Trent Water plc.

SAMPLING

Archaeomagnetic sampling was carried out on 2nd May 1996 during the final stages of the excavation when the fired features had been either fully excavated or half-sectioned, and recorded. The five features selected for archaeomagnetic study were as follows:

Site 5 A25/1996: Ridlington

Context 2696: A possible furnace of sub-circular plan.

Context 2564: A possible furnace of sub-circular plan intercutting 2696.

Context 2591: A very substantial furnace of boat-shaped plan, cut into the underlying ironstone and lined with large blocks of stone.

Site 3: Site A43.1996: Park Farm, Ridlington

Context 1525: A small, partly-excavated, sub-circular smelting furnace.

Context 1522: A small, half-sectioned, sub-circular smelting furnace.

All surfaces were first brushed clear of loose material and oriented samples then recovered using the button method devised by Clark, Tarling & Noel (1988). This technique employs a 25mm, flanged plastic disc to act as a field orientation reference, sample label and specimen holder inside the laboratory magnetometer. Buttons were glued in position using a fast setting epoxy resin (Devcon Rapid) with their surfaces set horizontal with a spirit level. Small beads of plasticine beneath the buttons held them steady while the resin cured. Finally, geomagnetic orientation arrows were marked using a Nautech fluxgate compass, along with a specimen code. The set of orientation arrows were finally checked for parallelism to test for errors due to the bulk magnetisation within each feature; no significant flux distortion was detected.

The specimens were slowly dried over several days and then consolidated by impregnation with a dilute solution of PVA in acetone. Each specimen was cut with a diamond saw until the button retained a volume which fitted the standard 25x25mm specimen holder inside the archaeomagnetic magnetometer. Despite the impregnation, several samples disintegrated during cutting and could not be used for magnetic analysis. Finally, all specimens were reimpregnated to strengthen them prior to archaeomagnetic measurement.

MEASUREMENT

The natural remnant magnetisation (NRM) of all the samples was measured in a Molspin fluxgate spinner magnetometer (Molyneux, 1971) with a minimum sensitivity of around $5 \times 10^{-9} \text{Am}^2$. Remanence directions were corrected for the local geomagnetic variation using data published by the British Geological Survey and the vectors plotted on the stereograms of Figures 1 to 5 and listed in Table 1.

Generally, the NRM of an archaeological material will comprise a primary magnetisation, (in this case presumed to be of thermal origin), together with secondary components acquired in later geomagnetic fields due to diagenesis or partial reheating. Usually, a weak viscous magnetisation is also present, reflecting a tendency for the remanence to adjust to the recent field. If the secondary components are of relatively low stability, then removal by partial demagnetisation will leave the primary remanence of archaeological interest. A pilot specimen with typical NRM and lithological characteristics (RID23, Context 2564) was demagnetised incrementally, up to a peak alternating field of 50mT and the changes in remanence recorded in order to identify the components of archaeomagnetism and their stability (Figures 6 and 7). From a study of the pilot sample behaviour, an alternating field of 5mT was chosen which would provide for the optimum removal of secondary components of magnetisation in the remaining samples. After partial demagnetisation in this field, sample remanences were remeasured and the results are shown on the stereograms of Figures 8 to 12.

RESULTS AND DISCUSSION

General

Intensities of natural remnant magnetisation in the material were found to be very variable and most intense in samples from Context 1525. Such intense magnetisations are entirely consistent with this feature having been used as an iron smelting furnace.

Context 2696: Figures 1 and 8

Samples from this feature have produced a tight cluster of archaeomagnetic vectors which are clearly geomagnetically controlled and which change little after partial demagnetisation in an alternating field of 5mT. Indeed, tests on pilot specimen RID23, of similar Ethology, indicate a good stability of magnetisation in the sampled material. These data demonstrate that the furnace material has acquired a stable thermoremanent magnetisation as a result of having been heated in the ancient geomagnetic field.

Context 2564: Figures 2, 6, 7 and 9

NRM vectors in this material are more scattered than those recorded in Context 2696 but are nevertheless centred on a direction which is geomagnetically controlled. Hence the results confirm that the material in this feature has also acquired a thermoremanent magnetisation as a result of being heated in the ancient Earth's magnetic field. The stability of the remanence is indicated by the small change in vector distribution induced by partial demagnetisation in a field of 5mT.

Context 2591: Figures 3 and 10

Samples from this context produced a distribution of archaeomagnetic vectors which, although geomagnetically influenced, are rather dispersed with regard to magnetic inclination. From this it is concluded that the feature has suffered disturbance after being fired: this might have been caused by ploughing, tree roots, animal burrows or the weight of farm vehicles. Owing to the poor grouping of archaeomagnetic vectors this feature was not considered suitable for an attempt at archaeomagnetic dating.

Context 1525: Figures 4 and 11

Archaeomagnetic directions in this feature were found to be very scattered both before and after partial demagnetisation. One specimen was even found to have a reversed magnetisation. Again the randomisation of the archaeomagnetism is ascribed to mechanical disturbance of the structure and enclosing subsoil. This context was therefore also considered an unsuitable candidate for archaeomagnetic dating.

Context 1522: Figures 5 and 12

Samples from this furnace produced an extremely scattered set of archaeomagnetic vectors which correlates with the fact that the structure appeared to be the least well preserved of the five that were sampled. Hence this furnace was also considered unsuitable for an attempt at archaeomagnetic dating.

Absolute Dating

A standard correction was used to convert the mean archaeomagnetic vector for Contexts 2696 and 2564 to Meriden, the reference locality for the British Master Curve (Noel & Batt, 1990).

Figures 13 and 14 then compare the new vectors and their associated error envelopes to the Master Curve segments 1000BC-600AD and 600AD-2000AD. Figure 14 shows that the two mean archaeomagnetic vectors are indistinguishable and are most consistent with last firing during the Roman period. From a study of the intercepts of the vector with the Curve the following date ranges for the last firing can be inferred:

Context 2696: 80BC - 130AD

Context 2564: 90AD - 210AD or 270AD - 440AD

Hence the archaeomagnetic results suggest that Context 2564 was last fired after Context 2696.

CONCLUSIONS

The results of this research can be summarised as follows:

An archaeomagnetic study has been carried out of five fired features excavated by The University of Leicester Archaeological Services on two sites at Ridlington.

Only Contexts 2564 and 2696 provided sets of archaeomagnetic vectors which proved suitable for magnetic dating. The remaining contexts appear to have suffered post-firing disturbance which has rotated or remagnetised individual blocks of burnt material. Possible causes include ploughing and animal burrowing.

From a study of the archaeomagnetic data the following dates can be inferred:

Context 2696: 80BC - 130AD; Context 2564: 90AD - 210AD or 270AD - 440AD.

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