cambridgeshire archaeology
archaeological field unit

CCC AFU Report Number 848

Bittering Quarry Extension, Longham

An Archaeological Evaluation

Dan Hounsell

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Cambridgeshire County Council
Environment & Community Services

Commissioned by Tarmac

Cover Images

Machine stripping, Soham	On-site surveying
Roman corn dryer, Duxford	Guided walk along Devil's Dyke
Bronze Age shaft, Fordham Bypass	Medieval well, Soham
Human burial, Barrington Anglo-Saxon Cemetery	Timbers from a medieval well, Soham
Blue enamelled bead, Barrington	Bed burial reconstruction, Barrington Anglo-Saxon Cemetery
Aethusa cynapium 'Fool's parsley'	Medieval tanning pits, Huntington Town Centre
Digging in the snow, Huntingdon Town Centre	Beaker vessel
Face painting at Hinchingbrooke Iron Age Farm	Environmental analysis
Research and publication	Monument Management, Bartlow Hills

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An Archaeological Evaluation

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Site Code: 41949LNG
HER Event Number: ****
Date of works: November 2005
Grid Ref: TF 93720 16705

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Summary

Between 21st November and 9th December 2005 an archaeological evaluation was carried out by Cambridgeshire County Council Archaeological field Unit (CCC AFU) on 45ha of land adjacent to Bittering Quarry, Longham (TF 93720 16705). This was undertaken to determine the archaeological potential of the area prior to an application to extend mineral extraction (gravel) onto the land by Tarmac.

This evaluation demonstrated that, while much of the potential development area was archaeologically blank, there were also some significant archaeological remains present.

These remains were primarily clustered in three zones. On the southern edge of the potential development area were four pits and a ditch which demonstrated the presence of substantial and significant prehistoric, possibly industrial, use / occupation. There was also evidence to indicate that this area may have seen some limited use in the Roman period, reflecting the pattern of known archaeological remains for the wider area.

In addition, there was substantial, but as yet un-datable, use of the site further to the east and north. This included a number of ditches which probably demonstrate the presence of some form of substantial enclosure complex on the eastern edge of the site. Toward the southern edge of the site a number of discrete pits may be associated with the ring ditch (of possible Bronze Age date) and further ditch features known from aerial photographic surveys of the adjacent field.

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1 Introduction

An archaeological evaluation was carried out by Cambridgeshire County Council Archaeological Field Unit (CCC AFU) on 45ha of land adjacent to Bittering Quarry, Longham (TF 93720 16705) to determine the archaeological potential of the area prior to application to extend mineral extraction (gravel) onto the land. The evaluation was undertaken between the 21st November and 9th December 2005.

This archaeological evaluation was undertaken in accordance with a Brief issued by David Gurney the Principal Archaeologist of the Norfolk Museums and Archaeology Service (NMAS), supplemented by a Specification prepared by Cambridgeshire County Council Archaeological Field Unit (CCC AFU).

The work was designed to assist in defining the character and extent of any archaeological remains within the proposed extraction area, in accordance with the guidelines set out in *Planning and Policy Guidance 16 - Archaeology and Planning* (Department of the Environment 1990). The results will enable decisions to be made by NMAS, on behalf of the Local Planning Authority (Norfolk) with regard to the treatment of any archaeological remains found.

The site archive is currently held by CCC AFU and will be deposited with the appropriate county stores in due course.

2 Geology and Topography

The geology of the site consists of glacial sands and gravels (British Geological Survey 1981). The area is currently under arable cultivation. The site itself slopes from 62.73m OAD at its southern edge down to 55.35m OAD at its northern edge. In addition the site also slopes down toward the west and east from a central 'ridge'. For example at Trench 48 in the centre of the site ground level sits at 60.95m OAD, but this drops off to 58.38m OAD by Trench 44 to the west, and 58.88m OAD by Trench 83 to the east. There have also been a number of known, small-scale, quarrying (gravel extraction) episodes on the site, resulting in a large central, and smaller western, pond (Fig 1)

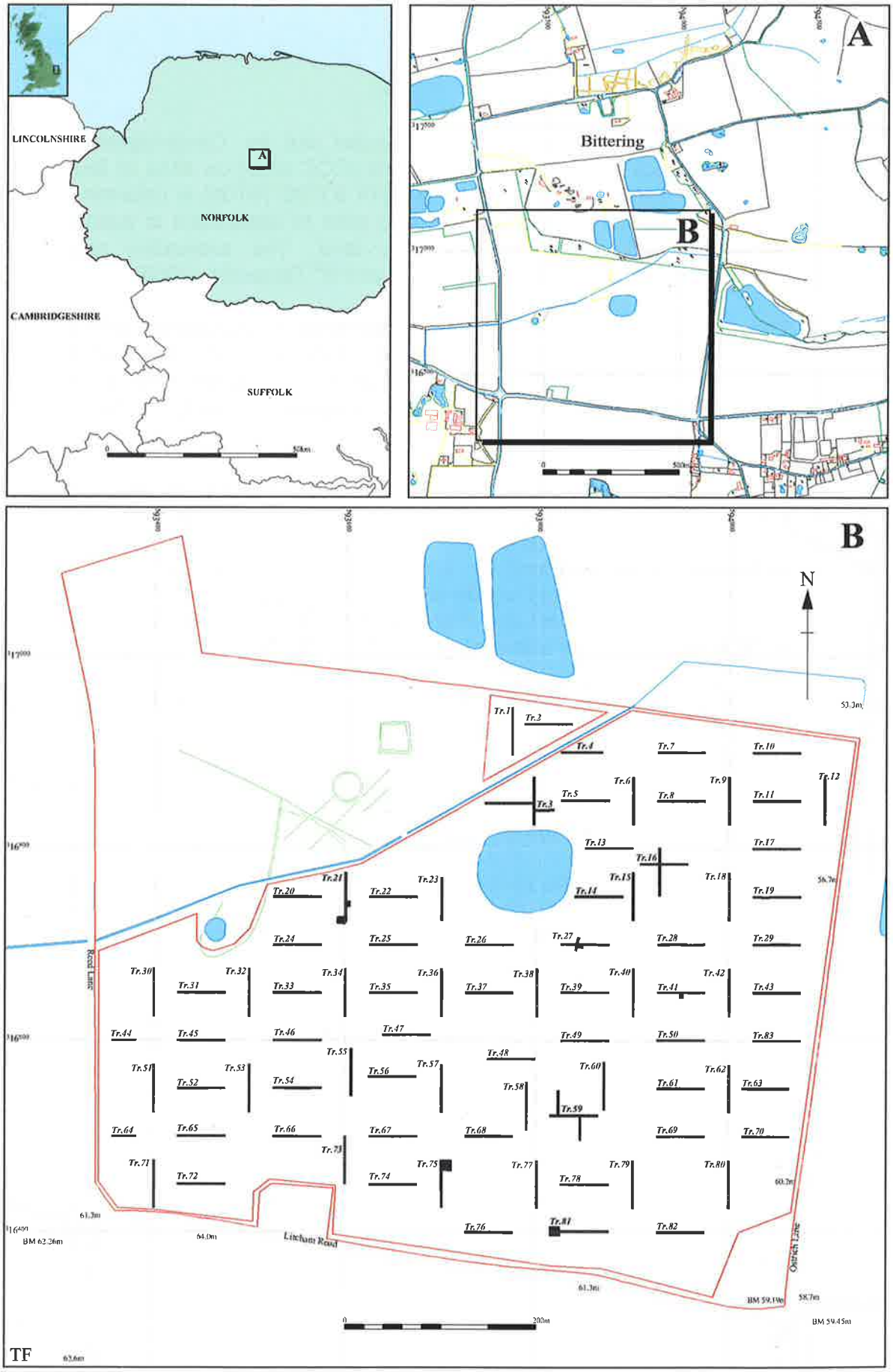

Figure 1: Location of trenches (black) with the development area outlined (red) and cropmarks (green)

3 Archaeological and Historical Background

3.1 General

The site lies between the deserted medieval village of Little Bittering, and the surviving medieval village of Longham. While no statutorily designated monuments or buildings lie within the proposed development area itself (henceforth referred to as the 'subject site'), the general area does lie within a region of moderate archaeological potential. Neolithic, Bronze Age, Roman, medieval and post-medieval remains are known to exist within a kilometre of the subject site. This background has been discussed in detail in the Cultural Heritage Assessment produced as part of a larger Environmental Impact Assessment by the archaeological consultant commissioned by Tarmac (Andrew Josephs, 2005). Since it is not necessary to repeat, verbatim, this report, the following text summarises the most important points.

3.2 Prehistoric

Within the subject site itself a ring ditch of possible Bronze Age date is known from cropmarks seen in aerial photography undertaken in 1976, 1981 and 1988. These photographs also identified a number of linear features in the vicinity of the ring ditch, possibly associated trackways. (Figure 1). A number of chance finds of Neolithic flints have been made in the surrounding area including an arrowhead and a scraper (HER 7233 & 12965). Excavations undertaken between 1978 and 1998, in advance of gravel extraction at a sites to the south and south east of the subject site, discovered pre-historic remains dating from the Neolithic Period to the early Iron Age indicating long term occupation/use of the general area during the prehistoric period.

3.3 Romano-British

No settlement is thought to have existed within the subject site or, in the surrounding area during the Roman period. The most important feature of the this period associated with the subject site is the major Roman Road know as the Fen Causeway which follows a roughly SW – NE alignment, partially following the line of modern 'Litcham Road', which lies *c.* 300m to the north (HER 2796).

3.4 Medieval

Occupation of the area immediately surrounding the subject site seems to have become truly established in the medieval period. The modern village of Longham (*c.*100m to the south west), and its associated church, have medieval roots. Indeed, Domesday book records

Longham (originally *Lawingham* probably meaning homestead of the family or follows of a man called Lawa, Mills 2003) as part of the Launditch Hundred, and that;

> *There is 1 free man, half a carucate. There has always been 1 villan and 1 bordar. And there is half a plough, 2 acres of meadow, woodland for 10 pigs. It is worth 5s and his predecessor has no interest in this except for the commendation. The soke is in Mileham, a manor belonging to the king.*

In addition *c.*600m to the north of the subject site lie a number of earthworks including remains of housing, streets and moats, as well as remnant ridge and furrow in the surrounding pasture land (HER 386). These attest to the remains of the deserted medieval village of Little Bittering. Within this site are situated both the church of St Peter (founded in 1539) and the Manor house that was the seat of the Earl of Leicester (built *c.*1600). This now deserted village (originally *Britringa* – meaning the settlement of the family or followers of a man called Beorhthere, Mills 2003) was also recorded in the Domesday book as part of the Launditch Hundred;

> *In Bittering there are 7 acres of Woodland and 1 acre of land on which there are 4 bordars. This Godric claims as of the fief of Earl Ralph and a certain woman who held it TRE* (before the conquest) *is willing to undergo judicial ordeal that it has been released from pledge. This is held by Siward in pledge*

3.5 Previous Archaeological Fieldwork

The Norfolk Archaeological Unit has undertaken two major archaeological investigations within the vicinity of the subject site, in advance of mineral extraction. The first, a series of watching briefs and excavations, was undertaken between 1978 and 1985 and examined parcels of land *c.*800m to the east and *c.*400m to the south east of the subject site. These works produced evidence for mid Bronze Age – early Iron Age occupation/use of the area in the form of a number pits, pit clusters and small features which contained quantities of pottery, including 'mid' and 'late' beaker. In addition the excavation of a putative barrow (revealed to be a naturally formed periglacial mound) uncovered a number of small pits cut into the mound, that contained some Neolithic pottery in addition to the later Bronze and Iron Age ceramics (Wymer and Healy 1996). A second long term watching brief (1990 –1998) and evaluation undertaken on a single larger area of land *c.*550m to the south east of the study site (near the village of Longham) demonstrated similar results, revealing evidence for a pre-Iron Age (Neolithic and Bronze Age) use / occupation of the area,

again principally through the ceramic content of pits / pit clusters. (Ashwin, 1998 - HER 13025).

Find spots from field walking and metal detecting activities have provided further evidence for the prehistoric, Roman and medieval occupation/use of the area.

4 Methodology

The objective of this evaluation was to determine as far as reasonably possible the presence/absence, location, nature, extent, date, quality, condition and significance of any surviving archaeological deposits within the development area.

The Brief required that the evaluation consist of both non-intrusive and intrusive elements. The non-intrusive element was to comprise aerial photograph assessment, field walking, metal detecting and a geophysical survey. The intrusive element was to consist of the trial trenching of a 2.5% sample of the subject site, with a maximum of a further 2.5% of the area as contingency, should it be required. This initial 2.5% translated as 113 trenches, each 50m x 2m. The subject site was divided up into 3 parcels of land (by boundaries consisting of mature hedgerow, trees and small ditches), initially labelled as Fields 1, 2a and 2b.

The strategy for the placement of the trial trenches was to target areas highlighted as potentially archaeologically significant by the non-intrusive works and then to randomly sample the rest of the subject site to make up the required volume.

However, following the non-intrusive survey, which indicated that there was a relatively high potential for archaeological remains in Field 1, i.e. the potential Bronze Age ring ditch and associated linear features, Tarmac decided that they would not apply to extend their extraction programme into this field. As a result the potential archaeology in Field 1 would remain undisturbed and preservation *in situ* was favoured by the NMAS. As a result this field was removed from the programme of archaeological investigation.

The remaining two fields required 83 trenches each 50m x 2m to be excavated. This new trench plan, which placed trenches 1 and 2 in Field 2a, with the remainder being in Field 2b, was approved by the NMAS prior to excavation.

Machine excavation was carried out under constant archaeological supervision by a tracked 360° mechanical excavator using a 2.10m wide toothless ditching bucket. This removed the topsoil and underlying deposits down onto the top of the archaeological deposits.

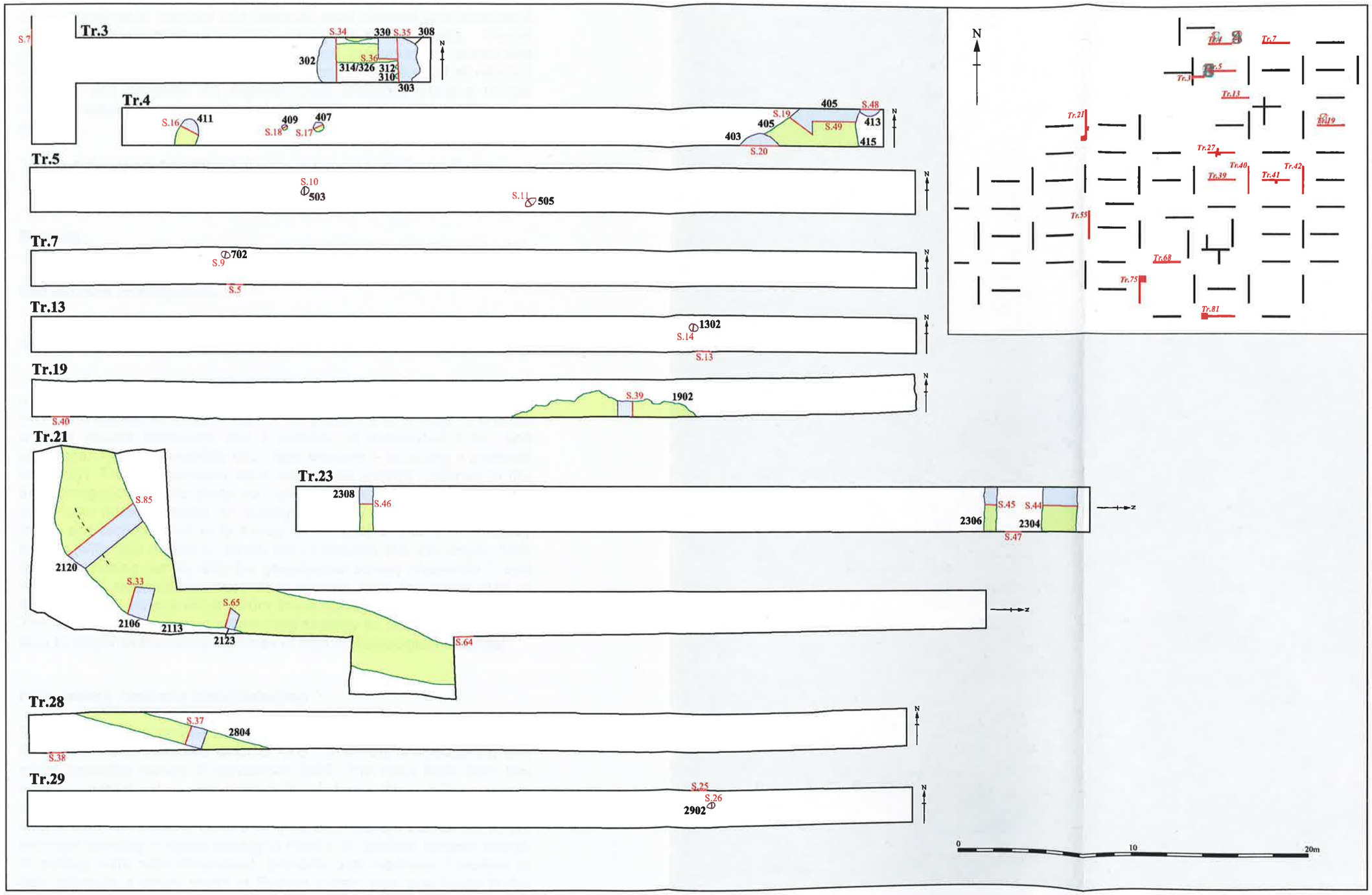

Figure 2: Trench plans

All archaeological features and deposits were cleaned and excavated by hand and recorded using CCC AFU's *pro-forma* sheets. Trench locations, plans and sections were recorded at appropriate scales and colour, monochrome and digital photographs were taken of all relevant features and deposits. All deposits were recorded using a unique number sequence commencing at 100 for Trench 1, 200 for Trench 2 etc.

The trenches were backfilled following approval from David Gurney.

5 Results

5.1 Non-intrusive Investigations.

5.1.1 Aerial Photograph Assessment

As noted above, aerial photographic (AP) surveys were carried out over the subject site in 1976, 1981 and 1988. The cropmarks these illustrated appeared to demonstrate the presence of a large ring ditch, a large square enclosure and a number of associated linear and curvilinear features (possibly ditch type features – including a potential trackway). These cropmarks were seen to be entirely confined to the area designated, in this study, as Field 1. As part of this evaluation the cropmarks noted in these AP surveys were overlain onto current OS maps and correctly tied in to a map of the subject site as it currently stands (with field divisions, ponds etc.) Following this the results from the field walking survey and the geophysical survey (Appendix 7 and Appendix 6 respectively) were also overlain onto the same plan in order that the various results from these surveys could be correlated. The resulting plan allowed a trenching strategy to be devised that was able to target all the indicated areas of high archaeological potential.

5.1.2 Field walking (Including Metal Detecting)

A full report of the results of this investigation is included as Appendix 7. In summary, members of CCC AFU carried out a fieldwalking and metal detecting survey in November 2005. The main finds from this work consisted of a large amount of burnt flint, *c.*7kg, largely concentrated in the area to the north of the large pond in Field 2b. Also *c.*35 worked flints scattered in a fairly random pattern across the fields, although showing a higher density in Field 1. In addition thirteen sherds of pottery were also discovered, primarily post-medieval / modern in date although a single sherd of Roman pottery was also found in the south east corner of Field 2b. The metal detecting identified only post-medieval / modern finds, consisting of coins, two metal buttons, a number of iron items and shotgun cartridges.

The results of this field walking indicated that a prehistoric presence on the site was likely – as suggested by the known archaeological background of the area. The presence of burnt flint, combined with worked flint of a probable Neolithic / Bronze age date, was of particular interest when combined with the presence of the possible ring ditch in Field 1.

5.1.3 Geophysical Survey

A full report of this work is included as Appendix 6 (Masters, P., 2005). In brief, Pre-Construct Geophysics carried out magnetic susceptibility and gradiometer surveys in November 2005. Both of these surveys identified relatively few magnetic anomalies although a number of discrete individual pit like anomalies were detected across the whole survey area – possibly indicating remains of pits or even burning. In addition a number of diffuse linear anomalies were also recorded across the subject site, although these probably represented the magnetic response from cultivation scores (ploughmarks). However, in Field 1 a series of diffuse linear and curvilinear anomalies were detected in the area of the known cropmarks. These were believed to represent probable ditch like features, a number of which appeared to correlate with the aerial photographic evidence.

5.2 Intrusive Investigation – Trial Trenching

5.2.1 General

A total of 83 trenches were excavated across Fields 2a and 2b. Of these 80 were initially simple linear trenches 50m long by 2.10m (bucket width) wide. Three trenches, numbers 3, 16 and 59, were more complex in shape and designed to target anomalies detected in the geophysical survey. However, during the excavation, a further 5 trenches (numbers 21, 27, 41, 75 and 81) were extended, by machine, in various ways (box areas opened up at the end of, or along the length of, the trenches etc.) This was undertaken in order to reveal more of the various archaeological features discovered within these trenches and thereby understand them better.

5.2.2 Depositional sequence

The depositional sequence across the entirety of Field 2b was very simple. A single homogenous topsoil layer, typically 0.35m thick, consisting of a dark brown, slightly clayey silt with frequent, small, gravel and flint inclusions overlay the natural geology. No subsoils were present and this topsoil layer (context 1000) was stable across this site. This is probably due to the intense and long-term arable use of the site, in particularly the deep ploughing, sub-soiling and stone

separation activities this land has been subjected to. These activities apparently served to mix the topsoil and any initial subsoils over time to produce the single homogenous layer now seen.

It is also interesting to note that while Field 2b slopes, quite steeply, downward from the south to the north, the topsoil does not show any real change in thickness across the site. There is no evidence for any slumping or flowing, and so thickening, of the topsoil down the slope. For example the topsoil in Trench 76, on the southern edge of the site, was 0.40m thick while in Trench 7, on the northern edge of the site, it was 0.30m thick. Why this was the case is unclear, but it is probable that the various agricultural activities which have taken place on this site (mentioned above) have not only served to mix and spread the soil 'vertically' creating one homogenous layer, but also horizontally, spreading the soil across the site in a fairly even manner.

The underlying natural geology was glacial gravel and sands. Most commonly this took the form of a fairly clean, mid yellow orange, compact, slightly clayey, sand matrix (*c.*60% of the layer) mixed with small to large flint nodules (*c.*40% of the layer). Context 1001 was a typical example of this type of material. However in places heavy mineral staining from manganese and iron was evident, creating patches of black and bright orange and red, such as Context 301. Less frequently the orange sand and gravels gave way to a finer and looser grey silty sand which contained less stone inclusions (*c.*20%) such as Context 401.

Field 2a was fairly flat and demonstrated a very different depositional sequence, which indicated that much of this area had been very heavily disturbed, fairly recently. This will be discussed further below, with the results from the trenches located in this field (Trenches 1 and 2).

5.2.3 *Results – The Archaeologically Sterile Trenches*

Of the 83 trenches excavated, 21 contained archaeological deposits. The remaining 62 were completely archaeological sterile containing no archaeological features or finds of any sort. Of these, 60 were located in Field 2b, and demonstrated the simple depositional sequence discussed above. The positions of these trenches can be seen on Figure 1.

Details for these trenches such as the depth of the topsoil and the various contexts numbers which record the topsoil and natural geology for these trenches can be found in tabulated form at the back of this report (Appendix 1).

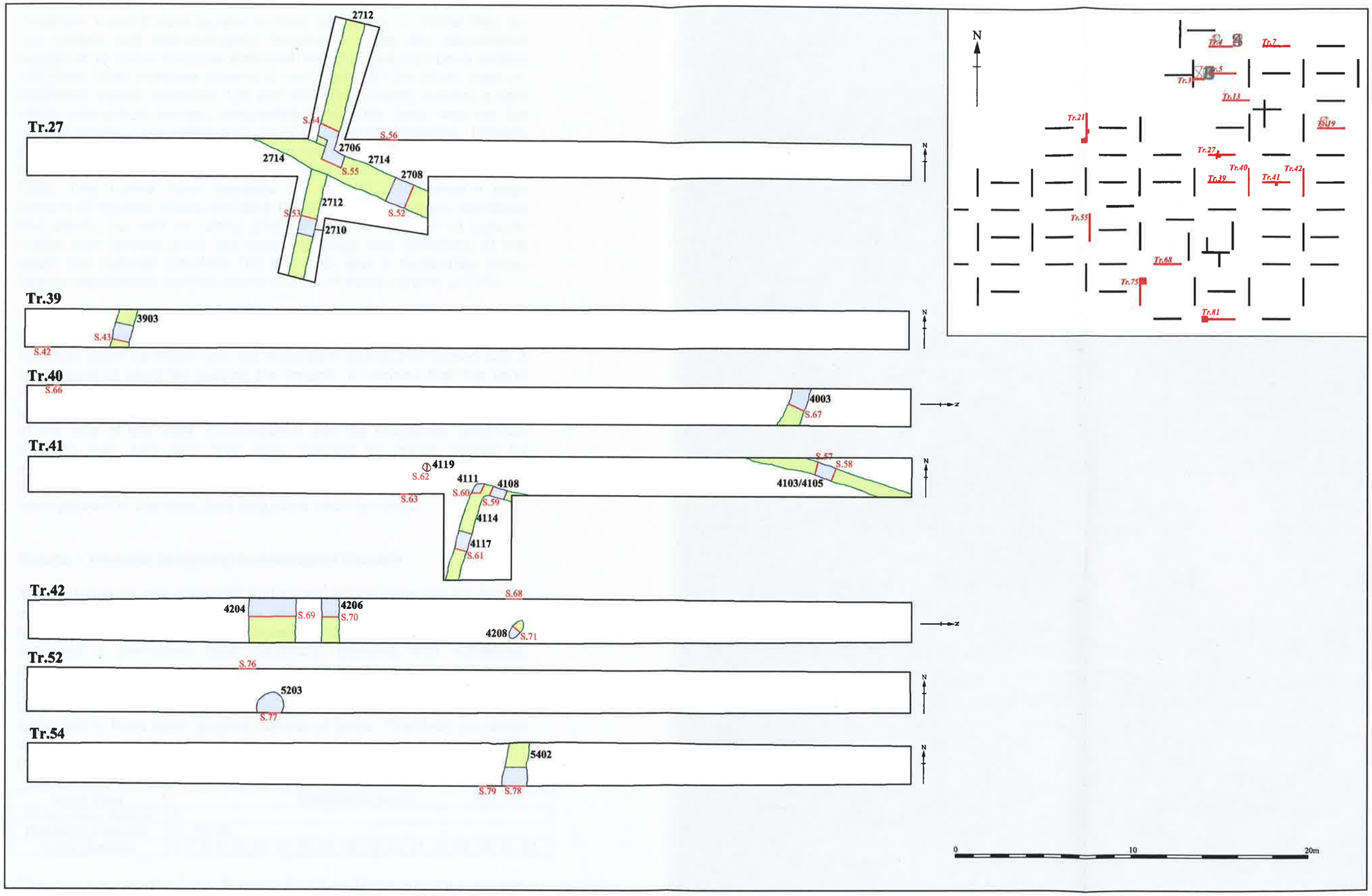

Figure 3: Trench plans

Trenches 1 and 2 were located in Field 2a (Figure 1). Whilst they did not contain any archaeological features or finds the depositional sequence of these trenches indicated that the area had been heavily disturbed. Both trenches showed a very thin (*c.*0.12m thick), dark re-deposited topsoil (contexts 103 and 200) that directly overlay a very clean, mid-yellow orange, compacted sand. This layer was not the natural geology but rather a layer of re-deposited material, typically 0.67m thick (contexts 100 and 201). In turn this sand overlay a *c.*0.67m thick layer of disturbed / buried topsoil, very similar in nature to context 1000. This 'buried' layer (contexts 101 and 202) contained a large amount of modern debris including twine, tin cans, shotgun cartridges and plastic, as well as rotting grass. Finally, at a depth of typically 1.45m from ground level, the natural geology was identified. At this depth this material (contexts 102 and 203) was a moderately loose, heavily manganese stained, sandy (*c.*30% of matrix) gravel (*c.*70%).

It appeared that this area had been deeply excavated and the gravel extracted (truncating the natural geology). Following this the resulting hole had been backfilled with the redundant topsoil and topped with a clean layer of sand (so burying the topsoil). It seemed that this sand was put in place to create a hard, free draining, surface on which to stand agricultural machinery, which indeed covered much of this field at the time of this work. Conversation with the landowner confirmed that this area had, over time, been quarried for gravel needed for agricultural purposes and, dug out to create various drainage channels. As a result of this any archaeological layers, which may have been present in this area, had long since been removed.

5.2.4 Results – Trenches Containing Archaeological Deposits

The 21 trenches that contained archaeological deposits can be divided into three 'types'. Firstly those that contained moderately sized features (chiefly pits but also a linear features), the finds from which indicated a prehistoric date. Secondly, trenches that contained, primarily, moderately sized V or U shaped linear features, but also a few discrete pits, the fills of which did not yield any finds. Finally a single trench contained a very large curvilinear feature, which appeared to have been re-cut a number of times. The finds contained within the fills of this feature did, however, indicate a post-medieval / modern date.

Group Type	Trenches In Group
Modern linear feature	21
Prehistoric Features	81, 75, 55
'Sterile' features	4, 7, 3, 5, 13, 19, 23, 27, 28, 29, 39, 40, 41, 42, 52, 54, 55, 68

The precise nature of the features found in these trenches (length, depth, breadth, profile etc.) is presented below and in Appendix 1.

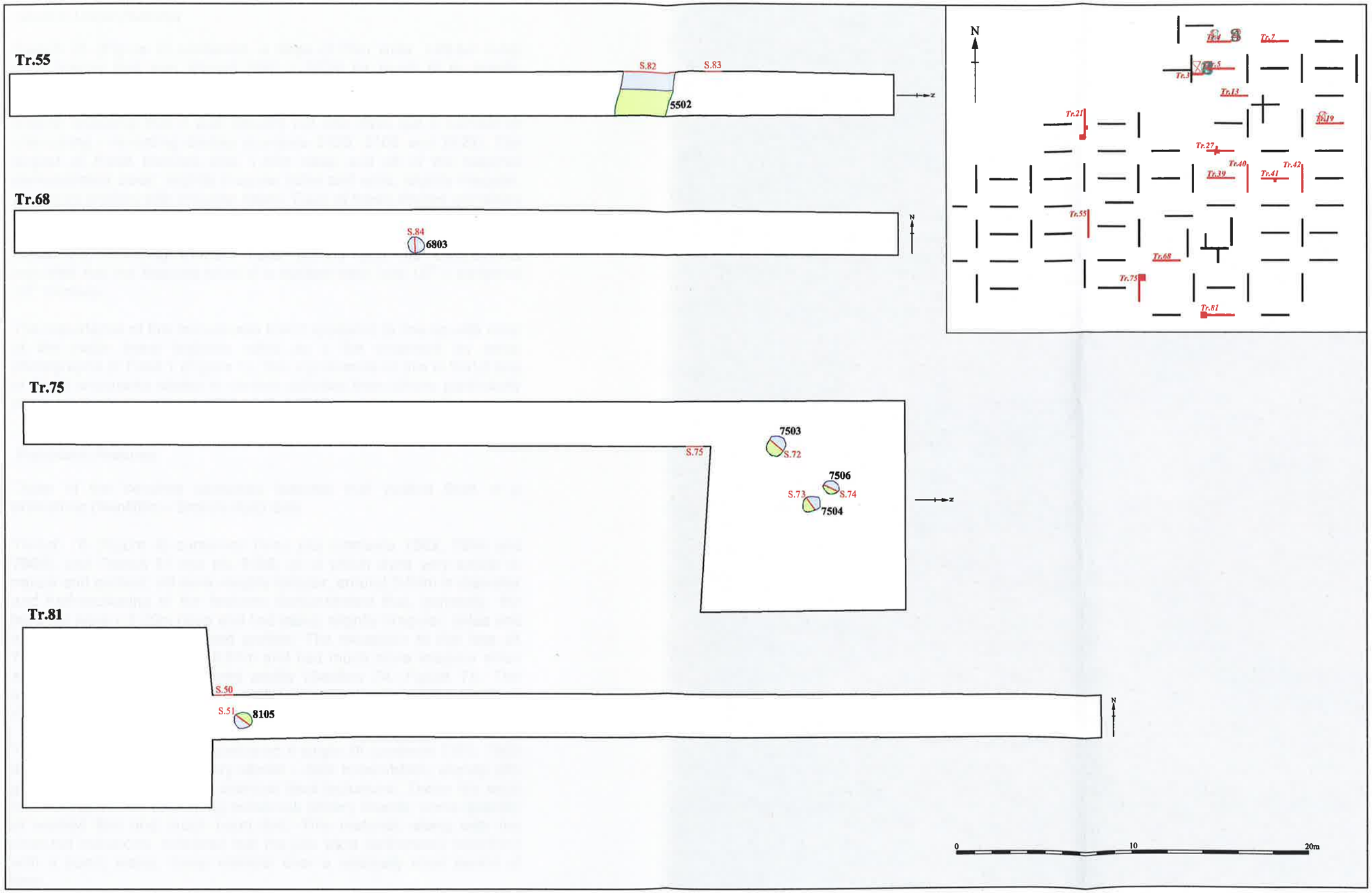

Figure 4: Trench plans

a) *Modern Linear Features*

Trench 21 (Figure 2) contained, a large (3.70m wide, >28.5m long) ditch feature that was aligned NNE – SSW for much of its length, turning through 90° toward its southern end to become aligned WSW – ENE. Three slots were excavated at points along the length of this feature revealing that it was actually not one ditch but a number of intercutting / re-cutting ditches (contexts **2120**, **2106** and **2123**). The largest of these features was 1.18m deep and all of the features demonstrated steep, slightly irregular sides and wide, slightly irregular, U-shaped profiles with irregular bases. Each of these ditches contained a number of fills, which indicated slumping into the ditch and gradual infilling resulting from the natural processes. The various finds from these fills, including modern nails, pottery and tap components indicated that the features were of a modern date, late 19th – early/mid 20th Century.

The importance of this feature was that it appeared to line up with once of the major linear features noted as a the cropmark on aerial photographs of Field 1 (Figure 1). The significance of this is that if one of these cropmarks relates to modern activities then others, particularly the linear features, may as well.

b) *Prehistoric Features*

Three of the trenches contained features that yielded finds of a prehistoric (Neolithic – Bronze Age) date.

Trench 75 (Figure 4) contained three pits (contexts **7502**, **7504** and **7506**), and Trench 81 one pit, **8105**, all of which were very similar in nature and content. All were roughly circular, around 0.90m in diameter and half-sectioning of the features demonstrated that, generally, the features were *c.*0.20m deep and had steep, slightly irregular, sides and wide, flat bottomed, U-shaped profiles. The exception to this was pit **7506** which was deeper at 0.61m and had much more irregular sides and an asymmetrical, stepped profile (Section 74, Figure 7)). The arrangement of these features both within and between the trenches did not show any alignment or apparent structural function.

The pits in Trench 75 each contained a single fill (contexts 7503, 7505 and 7507); these were all very similar – dark brown/black, slightly silty gravely sands with frequent charcoal fleck inclusions. These fills were relatively finds rich containing numerous pottery sherds, some quantity of worked flint and much burnt flint. This material, along with the charcoal inclusions, indicated that the pits were deliberately backfilled with a burnt, waste, dump material over a relatively short period of time.

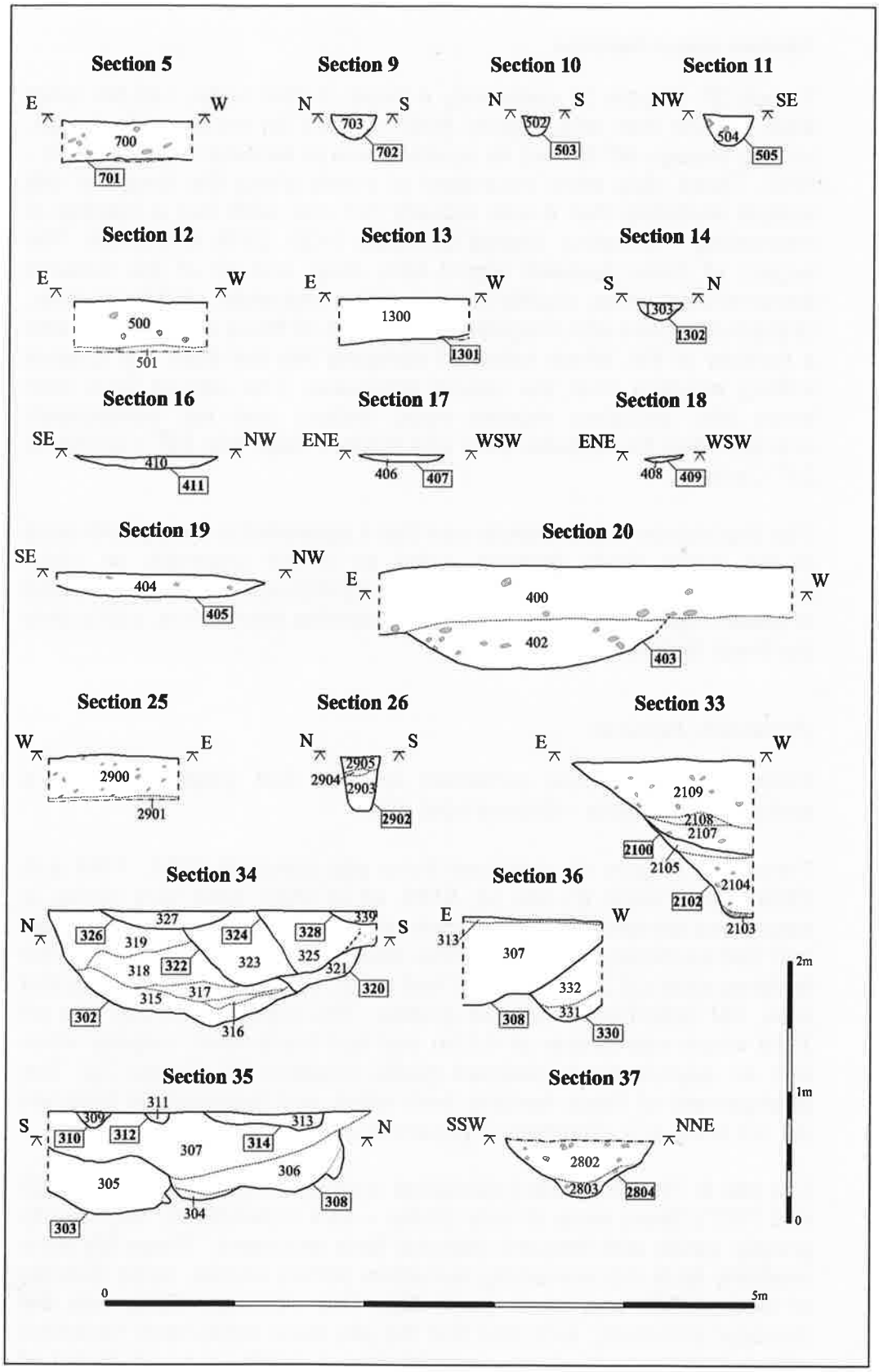

Figure 5: Section drawings

Pit **8105** (Section 51, Figure 6) was a little different containing three distinct fills, 8102 (upper), 8103 and 8104 (basal). Fill 8103 was very similar to 7503 etc, while 8102 was a little lighter and sandier, a little less 'burnt'. The basal fill, (8104), appeared to represent the redeposition of a natural geological material (it being a greyish orange, gravelly sand) and probably represented the slumping of excavated material back into the pit. Finds from contexts 8102 and 8103 were very similar to those from the pits in Trench 75, indicating a similar nature of (dis)use. Context 8104 did not contain any archaeological material.

The purpose of the pits, or at least their final disuse function, seemed to have been as dump sites for burnt waste material - there was no evidence for *in situ* burning. It is possible that some form of 'industrial' activity was occurring nearby, possibly involving the production of flint tools or even pottery. The debris from this activity, as well as other waste materials such as broken and discarded pottery, was then dumped into these pits. If these pits had any other function prior to their use as rubbish dumps it was unclear. There was no evidence either, in their form or layout, to indicate that they had any structural use, although the 'snapshot' of an area resulting from trial-trenching means that this cannot be entirely ruled out. Evidence of occupation structures from this period is notoriously difficult to recognise and understand.

Trench 55 contained a single linear feature, (**5502**, Figure 4), probably a ditch, which ran across the width of the trench (2.50m) on a E-W alignment. Excavation of a slot across the feature demonstrated a width of 3m, a depth of 0.60m and an irregular, asymmetrical, stepped, profile with a slightly concave base (Section 82, Figure 7). The feature contained three fills: 5505 (upper), 5504 and 5503 (basal). Layer 5504 was very similar to 8102 (above) while 5505 was lighter still. The basal fill (5503) was another burnt dump type fill very similar in nature to the fills of the pits in Trench 75 and fill 8103. The finds assemblage from the fills of this linear feature consisted of sherds of pottery, small quantities of worked flint and a larger amount of burnt flint. This was almost identical in character to the assemblages recovered from the pits in Trenches 75 and 81.

The initial function of ditch **5502** was also unclear, although it too ended its life as a rubbish dump for the same type of material. It is probable that this feature, initially, was part of a larger land boundary or enclosure system. It also did not appear to ever have any structural or industrial function.

The finds from the features in Trenches 75 and 55 consisted of a large quantity of burnt flint and a smaller quantity of struck flint flakes, flint tools and pottery.

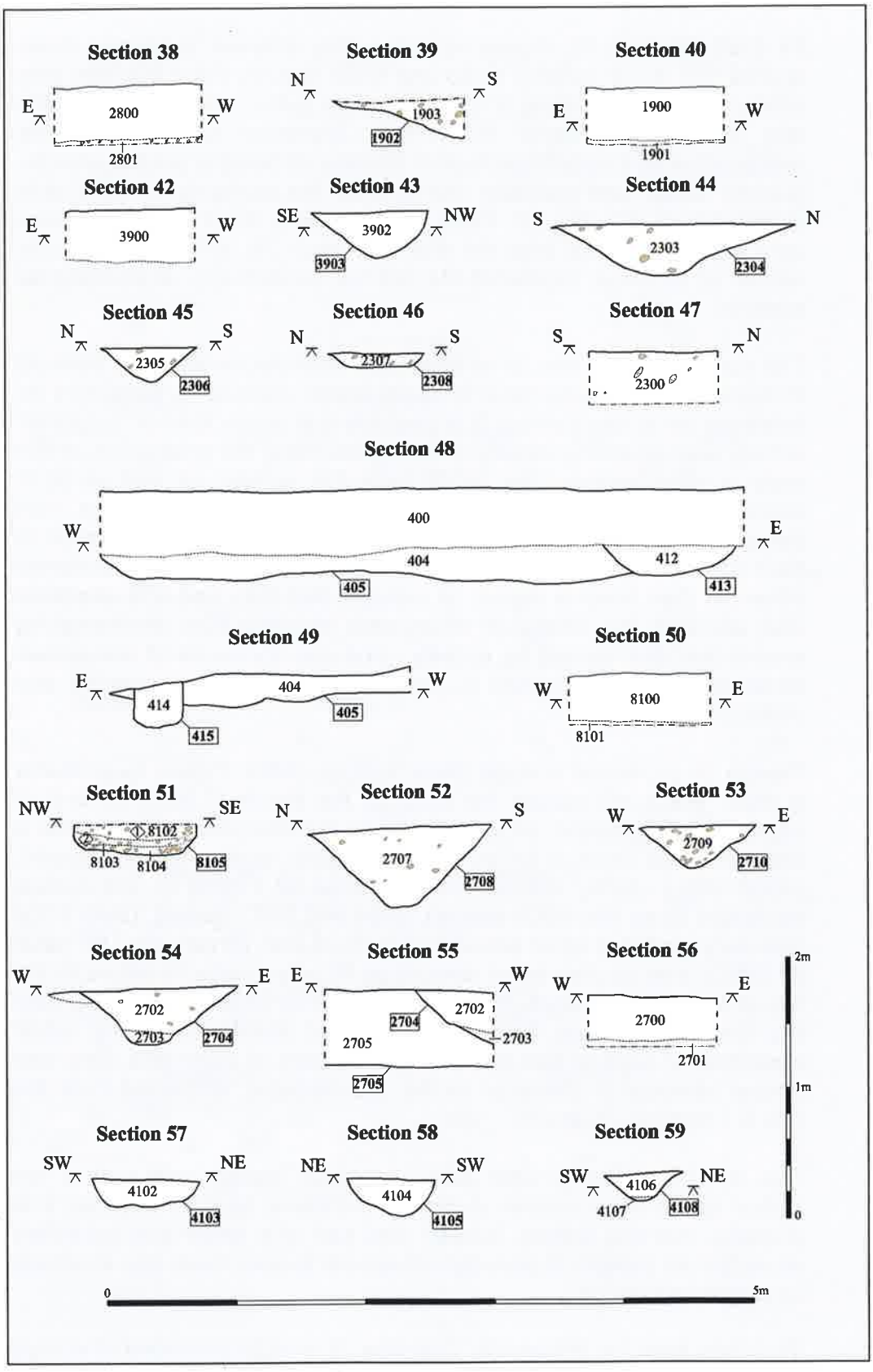

Figure 6: Section drawings

Contexts 5503, 5504, 7503 and 7507 contained a number of flint flakes that were datable to the Bronze Age (including a possible scraper from 7503). Context 5505 contained a single flint blade, which was of a Late Neolithic / Early Bronze Age date. In addition all of these contexts also contained a substantial quantity of Beaker type pottery (Late Neolithic – Early Bronze Age, *c.*2600-1800 BC). Pottery of this type was also noted at the nearby Longham excavation (see 3.5 above) and was typical of the Beaker assemblages present in East Anglia. It is also interesting to note that Bronze Age ceramics (including a spindle whorl) were also discovered in the lower portion of the overburden in Trench 56 (*c.* 30m to the east of Trench 55). This material was likely moved from *situ* by modern agricultural practices (ploughing).

The flint material found in context 7505 was undiagnostic, this context did not contain any ceramic material.

Furthermore, the upper fill (5505) of ditch **5502** also contained the broken base of a Late Roman pot. This sherd was mixed into the upper fill (along with beaker ware) and did not appear to be part of a later re-cut into this fill, although it is possible that a small discrete feature cut into this upper fill may not have been recognised, particularly if the fill of such a hypothetical feature was similar to the material around it. Alternatively the sherd may have been intrusive. The latter hypothesis is, in some ways, less likely as if there was enough Roman material lying scattered across the site for a substantially sized sherd to become ploughed into a feature (i.e. a manuring spread) then more material of this date should have been recovered from other features and from the field walking. Only one other, small sherd, of Roman date was discovered from within the subject site – during the field walking.

The pit in Trench 81 also contained a large amount of burnt flint, as well as a quantity of quite fine worked flint tools, including a blade. The pottery recovered from this feature was of an Earlier Neolithic date. One of the sherds recovered from this feature showed impressed dot and incised line decoration and appeared to be from a Mildenhall type bowl. Parallels to this material have been found at Spong Hill *c.* 7km to the south. The struck flint material recovered from this feature consisted of a number of flakes as well as a few blade pieces. This material has been given a Mesolithic / Early Neolithic date.

These features indicated that the southern edge of the subject site, at least, was subject to some degree of continued occupation during the prehistoric period and possibly through to the Roman period. The nature of the artefacts discovered are discussed in further detail in appendices 2, 4 and 5

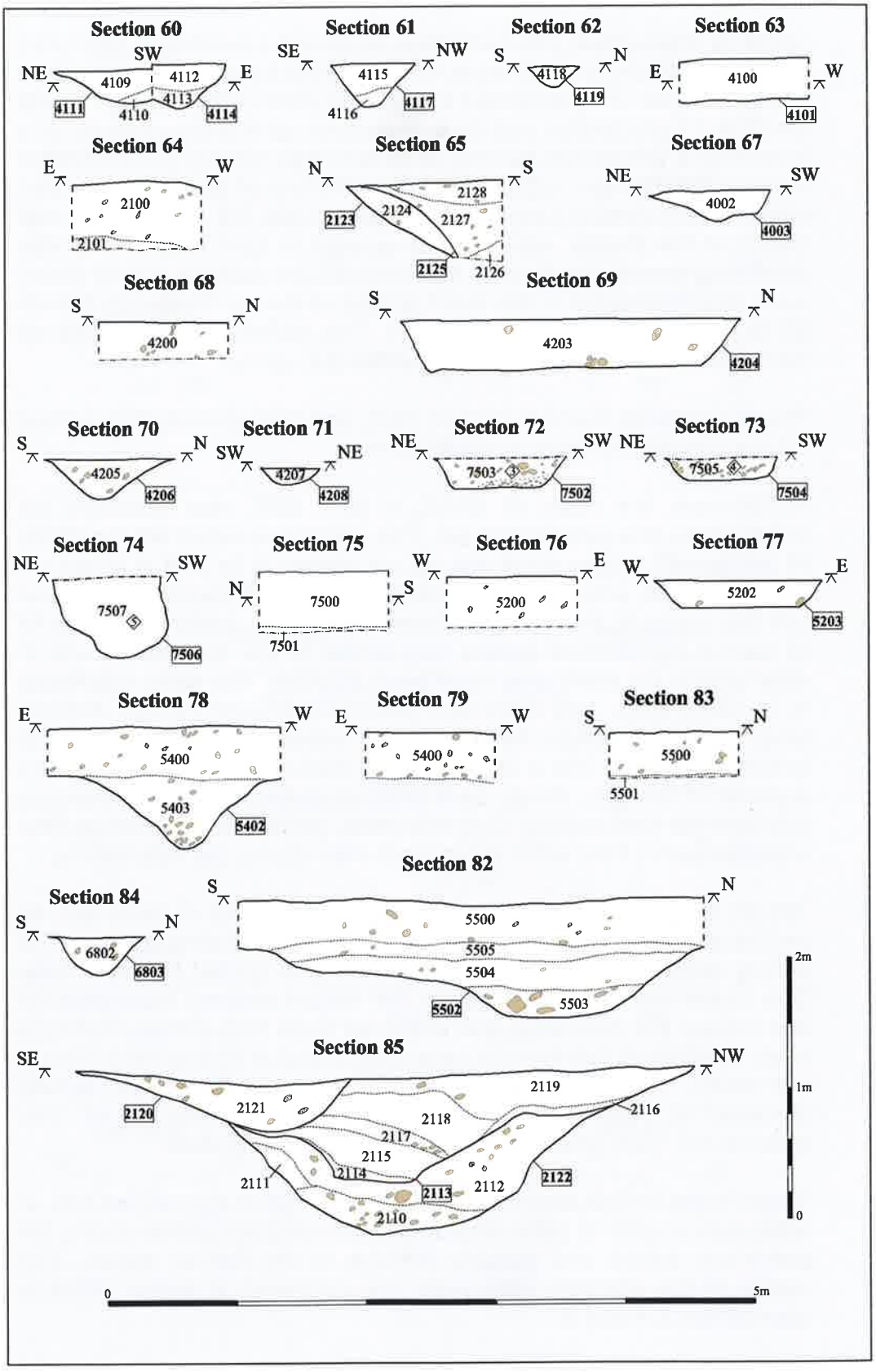

Figure 7: Section drawings

c) *'Sterile' Features.*

The archaeological features noted within the remaining trenches contained deposits that did not yield any artefacts.

Trenches 27, 28, 29, 39, 40, 41 and 42 represented a cluster of trenches in the central / eastern part of the subject site that all contained fairly substantial, linear, ditch features (Figures 2 and 3). These are tabulated below.

Trench Number	Cut Number	Fill Number	Length X Width X Depth (Metres)
27	**2714**	2713	>10.90 x 1.42 x 0.60
	2712	2711	>14.65 x 0.90 x 0.31
28	**2804**	2802 (upper) 2803 (basal)	>7.50 x 1.12 x 0.44
39	**3903**	3902	>2.20 x 0.95 x 0.35
40	**4003**	4002	>2.10 x 0.93 x 0.24
41	**4117**	4115 (upper) 4116 (basal)	>8.80 x 0.64 x 0.32
	4105	4104	>9.20 x 0.69 x 0.29
42	**4204**	4203	>2.50 x 2.60 x 0.34
	4206	4205	>2.50 x 1.00 x 0.29

Greater detail on the exact nature of these features can be found in Appendix 1.

It is interesting to note that these ditches shared a number of similar elements. Firstly, while width and depth were variable (albeit over a fairly narrow range) virtually all of these ditches showed a very similar profile – that of a slightly irregular wide V - or U - shape, typically with fairly straight sides and a narrow, concave base. The only real exception to this was ditch **4003,** which had a more irregular and asymmetrical profile (Section 67, Figure 7). Secondly the fills of these features were all very similar – moderately compact, mid to dark brown silty sands, containing occasional to moderate amounts of small gravel inclusions. All of these fills appeared to be the result of infilling via natural processes (as opposed to deliberate backfilling).

Finally, all of these features showed a general similarity in alignment across the site. They were consistently aligned slightly off true north – south (NNE – SSW) or slightly off true east – west (WNW – ESE) i.e. the two types of alignment followed by these ditches were perpendicular to each other. This was best demonstrated by the intersecting linear features in Trench 27 (Figure 3). Here, Ditch **2714** was aligned WNW – ESE across one arm of the trench, while **2712** was aligned NNE – SSW across the other. Excavation at the point where these two ditches intersected revealed that **2712** truncated **2714** (noted via minor colour and composition differences between the fills). In Trench 41 ditch **4117** was seen to turn through 90° along its length.

The feature emerged from the trench baulk and ran on a NNE – SSW alignment for 5.50m before turning to become aligned WNW - ESE and vanishing beyond the limit of excavation. This appeared to create the NW corner of a larger square/rectangular enclosure.

Indeed, it was likely that all of the ditch features seen in this cluster of trenches formed part of some larger boundary / enclosure complex that was very sharply delineated, not extending much beyond the 250m x 100m rectangle of land occupied by these seven trenches. The dearth of finds from these features also implied that whatever boundary / enclosure complex these features formed was situated well away from any contemporary occupation. This paucity of finds also made dating the features difficult, and thus how contemporary they may have been to the datable, prehistoric, features was unclear. The profile of many of these features was reminiscent of typical Late Iron Age / Romano-British boundary / enclosure ditches. A single sherd of Roman pottery was discovered during the field walking exercise and a Roman pot base was also discovered in the upper (latest) fill (5505) of ditch **5502**. However, as has been noted above there is no evidence for any Roman occupation anywhere within the vicinity of the site.

In addition to this main 'cluster' of linear features four further ditches were also noted, three in Trench 23 and one in Trench 54;

Trench Number	Cut Number	Fill Number	Length x Width x Breadth (Metres)
23	**2304**	2303	>2.50 x 1.97 x 0.39
	2306	2305	>2.50 x 0.69 x 0.24
	2308	2307	>2.50 x 1.16 x 0.24
54	**5402**	5403	>2.50 x 1.40 x 0.55

In form, alignment and fill characteristics these features followed the patterns identified in the ditches already discussed – this suggests that the features seen in these trenches, and those noted above may have been similar in both date and function, despite the spatial separation.

How theses more 'isolated' trenches fitted into the pattern of boundary / enclosure features already discussed is unclear. However, the intensity of features in Trench 23, combined with its location suggests that it *may* have been on the very edge of, but still part of, this complex. The modern quarry / pond may have been obscuring any direct link between the main area of the complex and this trench. At the very least these trenches did serve to indicate that while the focus of more intensive use of the subject site may have been to the east the rest of the area was not entirely unused.

In addition to these ditch features a number of discrete pit type features were also noted in some of the trenches:

Trench Number	Cut Number	Fill Number	Length x Width x Breadth (M)
3	**302**	315 (basal) 316 317 318 319 (upper)	>1.00 x 1.90 x 0.77
	303	305	>1.00 x 0.96 x 0.42
	308	304 (basal) 306 307 (upper)	>1.00 x 2.38 x 0.68
	310	309	>1.00 x 0.25 x 0.12
	312	311	>1.00 x 0.17 x 0.08
	314	313	5.75 x 0.93 x 0.12
	320	321	>1.00 x0.64 x 0.15
	322	323	>1.00 x 0.82 x 0.58
	324	325	>1.00 x0.80 x 0.49
Trench Number	**Cut Number**	**Fill Number**	**Length X Width X Depth (Metres)**
	328	329	>1.00 x 0.35 x 0.10
	330	331 (basal) 332 (upper	>1.00 x 0.55 x 0.59
4	**403**	402	>0.65 x 2.20 x 0.40
	407	406	0.65 x 0.65 x 0.05
	409	408	0.30 x 0.30 x 0.03
	411	410	>1.50 x 1.08 x 0.09
	413	412	>0.35 x 1.00 x 0.22
5	**503**	502	0.22 x 0.23 x 0.16
	505	504	0.35 x 0.36 x 0.20
7	**702**	703	0.35 x 0.35 x 0.18
13	**1302**	1303	0.35 x 0.35 x 0.15
29	**2902**	2903 (basal) 2904 2905 (upper)	0.40 x 0.30 x 0.40
41	**4119**	4118	0.45 x 0.40 x 0.16
42	**4208**	4207	0.77 x 0.55 x 0.17
52	**5203**	5202	1.14 x 1.45 x 0.17

Excavation of these features demonstrated that while the form of these features was variable, they were all typically sub - circular / oval features with relatively shallow, wide U - or V - shaped profiles and concave bases. These fills were usually mid to dark grey / brown sand

silts with occasional small gravel inclusions. Again these features did not yield any artefacts – making dating extremely difficult.

The nature / function of these features was, in the main unclear. Neither the form, fill nor layout / alignment of the features was suggestive of any function, from rubbish dumps to structural elements. This is possibly due, in part, to the probable truncated nature of these features. These pits, as seen, represented the truncated remains of once much more substantial features (cut from ground level). It is possible that many of these features were structural (e.g. postholes) but the truncated nature of the remaining evidence combined with the lack of finds and the nature of the fills (like natural infill) makes identifying this, or any other function, now virtually impossible.

The exceptions to this general pattern were the pits noted in Trenches 3 and 29. Trench 3 (Figure 2) contained a cluster of inter-cutting pits, some of which were quite substantial. Typically these were filled with a single mid / dark brown sandy silt that appeared to indicate natural infilling (as opposed to deliberate backfilling). A number of the features demonstrated more than one fill, the earliest or 'basal' fill typically being lighter in colour and more sandy / gravelly – representing the re-deposition of a natural geology type material back into the feature via slumping. There was no evidence for any form of dumping or tipping into any of the features. The fills of a number of the later features cut into this complex (primarily small features – **328**, **314**, **312** and **310**) contained some material (including shotgun cartridges and the remains of broken, iron, agricultural implements) that indicated a post-medieval to modern date. However, the majority of the fills did not contain any artefacts. Again this made the dating of the (earlier) features difficult. The form of the larger features were indicative of (gravel) quarry pits, however the nature of the remains meant that it was difficult to be sure of any function.

The single pit in Trench 29, **2902** contained three fills (Section 26, Figure 5) and, while all of these appeared to represent infilling via natural processes, the form of the feature, which was circular in plan with a deep, steeply sloping, narrow, U-shaped profile and narrow very concave base, indicated that it was almost certainly a post hole. No post pipe or post remains were present. This feature was, however, as observed in the area exposed by the trial trench, isolated and so was not apparent as part of a larger structure.

It was interesting to note that these pits were mainly clustered in two areas. Three of the pits (**2902**, **4119** and **4209**) were associated with the ditches in the main boundary / enclosure complex area (above), where they respected the ditches (not truncating, or being truncated by, them) possibly indicating a contemporary date. All but one of the remaining pits were clustered within a group of five Trenches (3, 4, 5, 7 and 13) at the central / northern edge of the site. Pit **5203** was located

on its own toward the SW of the subject site and did appear to be associated with any other single, or group of, features.

Finally both Trenches 19 and 68 contained features that appeared to be natural in origin. Feature **1902** appeared to be a large natural hollow of some sort while **6802** was probably a tree throw.

6 Discussion and Conclusions

This evaluation has served to demonstrate that, while the subject site had only a low level archaeological presence that which was present was of some significance at a local and regional level.

The archaeological presence was clustered in three main 'zones' within the subject site. To the central / northern edge of the site there was an area dominated by pitting. While a small number of these remains could be given a post-medieval / modern date many could not be dated due to the lack of diagnostic artefacts. The function of these features was also largely unclear. It may, however, be significant for both date and function, that these features were located just to the south east of the ring ditch and associated linear features known to be present in Field 1 from cropmarks.

On the central / eastern edge of the site an area of *c* 250m x 100m contained seven trenches that revealed a number of very similar, linear, ditch-type features. It seemed clear that these features represented some sort of significant boundary / enclosure system that, due to the lack of finds associated with the features, was probably removed from any occupation. This dearth of dateable evidence also meant that these features could not be positively dated.

Finally, but possibly most significantly, the central / southern part of the site appeared to have seen some, continued, prehistoric use. A number of pits and a single ditch from this area revealed artefacts (flints and ceramics) that were able to date these features to the Early / Late Neolithic period and Early Bronze Age. There was also evidence to indicate that this area may have seen some limited use in the Roman period.

Outside of these three zones the archaeological presence was very low, restricted to a single pit and ditch.

Environmental samples were taken from a number of the archaeological contexts throughout the works. However these have not yielded any significant information, merely indicating a low level agricultural background (see Appendix 5).

Thus, in conclusion this evaluation has shown the presence of substantial and significant prehistoric activity, possibly industrial use and/or occupation, in the southern (higher) area of the subject site. This area may have also have seen some limited use in the Roman period. In addition, there was substantial but as yet un-datable, use of the site further to the east and north (more low lying areas), including a probable enclosure complex as well as features possibly associated with the known archaeology in Field 1.

In part this evidence accords with the pattern of known archaeological / historic remains for the wider area (see Background, 2.3 - above), the prehistoric pits discovered in this work were very similar in character (almost identical in fact) to the prehistoric pits discovered by the Norfolk archaeological unit (NAU) in their 1978 and 1990 works. The linear features (both the dateable and undatable ones) are, however, a previously unknown component. The NAU investigations did not discover any features similar to this, although their works did point to low level Roman use of the area. However, it is worth noting that during this evaluation the NAU were undertaking a strip, map and record exercise at another mineral extraction site at Longham *c.*1km to the east. This work, as well as revealing a number of small prehistoric pits, also discovered a number of linear ditch type features. These were almost identical in character (profile, fill and alignment) to those noted in this evaluation – possibly indicating that the boundary system of which these features were a part was present over a much larger area of the landscape. The linear features uncovered by the NAU were also bereft of artefacts and so could not aid in dating the similar features noted in this work.

These results mean that this evaluation can be seen has having been successful within its remit of establishing the character, date, state of preservation and extent of any archaeological remains.

Recommendations for any future work based upon this report will be made by NMAS.

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Appendix 1: Context Summary

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
1	100	0	Redeposited material	0.69	Light yellow orange	Sand	occasional small to medium stones	loose & friable	
1	101	0	redeposited ploughsoil	0.7					
1	102	0			Dark black (manganese) / orange	70% small to moderate gravel / 30% sand			
2	200	0	redeposited	0.17	grey brown	sandy silt		loose	
2	201	0	redeposited	0.66	light yellow orange	clean sands	occasional small to medium stones	loose & friable	
2	202	0	buried redeposited ploughsoil	0.64					
2	203	0			dark black (manganese)/ orange	sand (30%) / gravel (70%)			
3	300	0		0.4	same as (1000)	same as (1000)	same as (1000)	same as (1000)	
3	301	0			light yellow orange with dark grey/ black mottling (manganese staining) + areas of red, iron pan staining	sand / silty sand mottling	moderate gravel - frequent pea gravel	soft	303, 330, 302
3	302	302	possible quarry / use	0.77					
3	303	303	quarry / use	0.42					
3	304	308	quarry / disuse	0.06	mid greyish brown	silt/ sand		mod. Loose	
3	305	303	quarry/	0.42	dark greyish brown	silt sand	occasional gravel	moderately loose	[308]
3	306	308	disuse	0.32	mid yellowish brown	silt sand		mod. Loose	
3	307	308	disuse	0.53	mid brown	silt sand		mod. Loose	[310], [312], [314]
3	308	308	quarry/use?	0.68					
3	309	310	disuse? Plough scar?	0.13	dark greyish brown	silt sand	occasional gravel	moderately loose	
3	310	310	nature unclear- possible plough scar, poss small pit	0.12					
3	311	312	disuse	0.08	dark brownish grey	silt sand	occasional gravel	mod loose	
3	312	312	Plough scar	0.08					
3	313	314	unclear possible plough scar	0.12	dark brownish grey	silty sand	occ small stone	moderately loose	
3	314	314	possible plough scar	0.12					
3	315	302	possible quarry pit	0.16	mid grey brown	silty sand	occasional gravel	moderately loose	
3	316	302	possible quarry	0.06	mid orange brown	silty sand	occasional small stone	moderately loose	
3	317	302	poss. Quarry	0.15	dark brown	silty sand	occasional gravel	moderately loose	
3	318	302	poss quarry	0.34	mid brownish	silty sand	very occasional	moderately	

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
					orange		gravel	loose	
3	319	302	poss quarry	0.45	mid brown	silty sand	occasional gravel	moderately loose	320
3	320	320	poss quarry	0.15					
3	321	320	poss quarry	0.15	dark brown	silty sand	very occasional gravel	moderately loose	322
3	322	322	poss quarry	0.58					
3	323	322	poss quarry	0.58	Mid Orange Brown	silty sand	occasional gravel	moderately loose	324
3	324	324	poss quarry	0.49					
3	325	324	unclear / poss quarry	0.49	dark brown	silty sand	moderate gravel	moderately loose	328
3	326	326	plough scar remnant	0.13					
3	327	326	poss. plough scar remnant	0.13					
3	328	0	poss. Plough scar	0.1					
3	329	302	poss quarry pit	0.1	Dark brown	silty sand	very occasional gravel	moderately loose	
3	330	330	unclear / poss. Quarry pit	0.59					
3	331	330	unclear, poss quarry pit	0.2	dark brown	Silty Sand	occasional gravel	moderately loose	
3	332	330	poss quarry pit	0.35	mid yellow brown	silty sand	occasional gravel	moderately loose	
4	400			0.45					
4	401	0			mid grey	sand	occasional small gravel	moderately loose	403, 405, 407, 409, 411
4	402	403	unclear	0.4	Mid grey	sand	occasional gravel	loose	
4	403	403	unclear	0.4					
404	404	405	enclosure / boundary	0.17	mid grey	sand	occasional small gravel	moderately loose	403
4	405	405	hollow / rooting area	0.26					
4	406	407	structural	0.06	mid grey	sand		moderately loose	
4	407	407	structural	0.05					
4	408	409	structural	0.03	dark grey sand	sand		moderately loose	
4	409	409	structural	0.03					
4	410	411	unclear	0.09	mid grey	sand		moderately compact	
4	411	411	possible quarry	0.09					
4	412	413	possible quarry	0.22	mid grey with orange mottling	sand	occasional flint gravel	moderately loose	
4	413	413	unclear	0.22					
	414	415	root damaged - structural	0.32	mid grey	sand		moderately loose	
4	415	415	rooted structural	0.35					
5	500	0		0.33					
5	501	0							
5	502	0	storage / posthole ??	0.16	black	sandy silt		loose	
5	503	503		0.16					

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
5	504	0		0.2	black	silty sand	occasional flint	loose	
5	505	505	poss storage	0.2					
6	600	0		0.35					
6	601	0							
7	700	0		0.3					
7	701	0							
7	702	702	structural	0.18					
7	703	702	structural	0.18	dark orange brown	sandy silt	occasional gravel	soft	
8	800	0		0.35					
8	801	0							
9	900	0		0.4					
9	901	0							
10	1000	0	ploughsoil	0.3	dark brown	slightly clayey silt	frequent gravels and flints	moderately loose	
10	1001	0	natural geology		orange brown to mid yellow	40% sand, 60% clay and gravel	frequent flints and gravels	moderately loose	
11	1100	0		0.42					
11	1101	0							
12	1200	0		0.4					
12	1201	0							
13	1300	0		0.4					
13	1301	0							
13	1302	1302	structural	0.15					
13	1303	1302	structural	0.15	mid orange grey	silty sand		soft and loose	poss machine
14	1400	0		0.38					
14	1401	0							
15	1500	0		0.4					
15	1501	0							
15	1502	0							
16	1600	0		0.38					
16	1601	0							
17	1700	0		0.33					
17	1701	0		0.07					
18	1800	0		0.37					
18	1801	0		0					
18	1802	0							
18	1803	0							
19	1900	0		0.42	dark brown	silty sand	frequent gravel	moderately loose	
19	1901	0							
19	1902	1902	possible pond or hollow	0.3					
19	1903	1902	possible pond / hollow	0.3	dark brown	silty sand	moderately gravel	moderately compact	
20	2000	0		0.4					
20	2001	0							
21	2100	0		0.5					
21	2101	0							
21	2102	2102	boundary / enclosure (modern)	1.2					
21	2103	2102	enclosure / boundary	0.05	dark grey brown	silty sand	frequent gravel	soft and loose	
21	2104	210	possible	0.4	light grey brown	silty sand	occasional gravel	soft and loose	

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
		2	boundary						
21	2105	2102	boundary	0.1	light grey brown	silty sand	occasional gravel	soft and loose	2106
21	2106	2106	boundary / drainage; recut	1.2					
21	2107	2106	boundary	0.25	dark grey brown	silty sand	occasional gravel	soft / loose	
21	2108	2106	possible boundary	0.1	mid grey brown	sandy silt	occasional gravel	soft / loose	
21	2109	2106	boundary / enclosure	0.5	mid grey brown	silty sand	occasional gravel	soft	2120
21	2110	2122	boundary	0.25					
21	2111	2122	boundary	0.4	light grey brown	silty sand	occasion gravel	soft	
21	2112	2122	boundary / enclosure	0.8					
21	2113	0	boundary	0.8					
21	2114	2113	boundary	0.1	light yellow orange	sand	moderate gravel	soft / loose	
21	2115	2113	boundary	0.3					
21	2116	2113	boundary	0.8	light yellow orange	sand	occasional gravel	soft	
4	2117	2113	boundary	0.15	dark grey brown	silty sand	occasional gravel	soft / loose	
21	2118	2113	boundary	0.5					
21	2119	2113	boundary	0.4					2120
21	2120	2120	boundary / drainage ??	0.36					
21	2121	2120	boundary	0.4	mid grey brown	sandy silt	occasional gravel	soft	
21	2122	2122	boundary	1.4					
21	2123	2123	boundary	0.7					
21	2124	2123	boundary	0.7					
21	2125	2125	boundary	0.7					
21	2126	2125	boundary?	0.15					
21	2127	2125	boundary	0.7					
21	2128	2125	boundary	0.2					2120
22	2200			0.32					
22	2201	0							
22	2202	0							
23	2300	0		0.37					
23	2301	0							
23	2302	0							
23	2303	2303	unclear, poss drainage / boundary	0.39	dark grey brown	silty sand	frequent flint	loose	
23	2304	2304	boundary / enclosure	0.39					
23	2305	230	unclear	0.23	dark grey brown	silty sand	frequent small flint	loose	

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
		6	drainage / boundary						
23	2306	2306	unclear, drainage / boundary	0.24					
23	2307	2308	unclear / drainage / boundary ??	0.24	dark grey brown	silty sand	occasional flint gravel	loose	
23	2308	2308	unclear	0.24					
24	2400	0		0.3					
24	2401	0							
25	2500	0		0.28					
25	2501	0							
26	2600	0		0.4					
26	2601	0							
26	2602	0							
27	2700	0		0.34					
27	2701	0							
27	2702	2704	boundary / enclosure	0.34	dark grey brown	clayey silt	occasional sand and moderate small stones	moderately compact	
27	2703	2704	boundary / enclosure	0.11	Light brown yellow	sand		loose	
27	2704	2704		0.45					
27	2705	2706	boundary and enclosure	0.61	Light grey brown	sandy silt	occasional sand and occasional small stone	moderately loose	2712
27	2706	2706	boundary / enclosure	0.61					
27	2707	2708	boundary / enclosure	0.6					
27	2708	2708	boundary / enclosure	0.6					
27	2709	2710	boundary / enclosure	0.31					
27	2710	2710	boundary / enclosure	0.31					
27	2711	2712	boundary / enclosure	0.31					
27	2712	2712	enclosure / boundary	0.31					
	2713	2714	boundary / enclosure	0.6					
27	2714	2714	boundary / enclosure	0.6					
28	2800	0		0.42					
28	2801	0							
28	2802	2804		0.32	dark brown	silty sand	moderate gravel, occasional chalk	moderately compact	
28	2803	2804	boundary / enclosure	0.1	mid brown orange	slightly clayey sand	frequent small - med gravel	moderately compact	
28	2804	2804	boundary / enclosure	0.44					
29	2900	0		0.3					
2901	2901	0							
29	2902	2902	structural	0.4					
29	2903	2902	structural	0.32	light brown grey	sand		soft and loose	

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
29	2904	2902	structural	0.05	Light brownish orange	sand		loose	
29	2905	2904	structural	0.1	mid grey brown	sand	occasional charcoal	loose	
29	2906	0							
30	3000	0		0.44					
30	3001	0							
31	3100	0		0.37					
31	3101	0							
32	3200	0		0.36					
32	3201	0							
33	3300	0		0.31					
33	3301	0							
34	3400	0		0.4					
34	3401	0							
35	3500	0		0.38					
35	3501	0							
36	3600	0		0.36					
36	3601	0							
37	3700	0		0.45					
37	3701	0							
38	3800	0		0.4					
38	3801	0							
39	3900	0		0.41					
39	3901	0							
39	3902	3903	boundary / drainage	0.35	mid brown	silty sand	moderate gravel	moderately loose	
39	3903	3903	boundary / drainage	0.35					
40	4000	0		0.38					
40	4001	0							
40	4002	4003	boundary / drainage	0.24	mid grey	silty sand		moderately loose	
40	4003	0	boundary / drainage	0.24					
41	4100	0		0.32					
41	4101	0							
41	4102	4103	boundary / enclosure	0.21	mid greyish brown	silty sand	occasional gravel	moderately loose	
41	4103	4103	boundary / enclosure	0.21					
41	4104	4105		0.29					
41	4105	4105	enclosure / boundary	0.29					
41	4106	4108	enclosure / boundary	0.19	mid greyish brown	silty sand	occasional gravel	moderately loose	
41	4107	4108	enclosure / boundary	0.01	mid brown	silty sand	occasional gravel	moderately loose	
41	4108	4108	boundary / enclosure	0.2					
41	4109	4111	enclosure / boundary	0.24					
41	4110	4111	enclosure / boundary	0.1					
41	4111	4111	boundary / enclosure	0.26					
41	4112	411	enclosure /	0.2					

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
		4	boundary						
41	4113	4114	enclosure / boundary	0.13					
41	4114	4114	boundary / enclosure	0.34					
41	4115	4117	boundary / enclosure	0.25					
41	4116	4117	boundary / enclosure	0.14					
41	4117	4117	boundary / enclosure	0.32					
41	4118	4119	structural	0.16	light brownish grey	silty sand		moderately loose	
41	4119	4119	structural	0.16					
42	4200	0		0.3					
42	4201	0							
42	4202	0							
42	4203	4204	boundary	0.34	Mid brown	silty sand	frequent flint	loose	
42	4204	4204	boundary / enclosure	0.34					
42	4205	4206	boundary / enclosure	0.29	mid brown	silty sand	frequent flint	loose	
42	4206	4206	boundary / enclosure	0.29					
42	4207	4208	unclear	0.17	Black	sandy silt	occasional flint	moderately loose	
42	4208	4208	unclear - possibly storage	0.17					
42	4300			0.35					
43	4301	0							
44	4400	0		0.36					
44	4401	0							
45	4500	0		0.36					
45	4501	0							
46	4600	0		0.4					
46	4601	0							
47	4700	0		0.4					
47	4701	0							
48	4800	0		0.4					
48	4801	0							
49	4900	0		0.33					
49	4901	0							
50	5000	0		0.35					
50	5001	0							
51	5100	0		0.34					
51	5101	0							
52	5200	0		0.37					
52	5201	0							
52	5202	5203	storage	0.17	dark brown / black	silt/sand	infrequent flint	loose	
53	5300	0		0.38					
53	5301	0							
54	5400	0		0.36					
54	5401	0							
54	5402	0		0.55					

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
54	5403	5402	boundary ditch	0.55	mid grey brown	sandy silt	frequent gravel	loose	
55	5500	0		0.35					
55	5501	0							
55	5502	0	boundary	0.6					
55	5503	5502	boundary	0.2	Dark grey brown	Sandy silt	Occasional gravel, pebbles; moderate charcoal	Soft	
55	5504	5502		0.25	Mid grey brown	Sandy silt	Occasional gravel	Soft	
55	5505	5502	boundary / disuse	0.18	light grey brown	sandy silt	occasional gravel & charcoal	soft	
56	5600	0		0.45					
56	5601	0							
57	5700	0		0.4					
57	5701	0							
58	5800	0		0.3					
58	5801	0							
59	5900	0		0.36					
59	5901	0							
60	6000	0		0.3					
60	6001	0							
61	6100	0							
61	6101	0							
62	6200	0		0.35					
62	6201	0							
63	6300	0		0.3					
63	6301	0							
64	6400	0							
64	6401	0		0.4					
65	6500	0		0.4					
65	6501	0							
66	6600	0		0.35					
66	6601	0							
67	6700	0		0.32					
67	6701	0							
68	6800	0		0.38					
68	6802	6803	storage	0.3	Black	silt sand	very frequent flint	very compact	
68	6803	0		0.3					
69	6900	0		0.37					
69	6901	0							
70	7000	0		0.3					
70	7001	0							
71	7100	0							
72	7200	0		0.4					
73	7300	0		0.37					
73	7301	0							
74	7400	0		0.3					
74	7401	0							
75	7500	0	ploughsoil	0.43					
75	7501	0							
75	7502	7502	ritual/rubbish disposal	0.24					
75	7503	7502	use	0.24	dark brown/black	gravelly sand	freq gravel, freq pot boilers, mod charcoal	moderate	

Trench	Context	Cut	Function	Depth	Colour	Fine component	Coarse component	Compaction	Truncated by
75	7504	7504	ritual/rubbish disposal	0.17					
75	7505	7504	use	0.17	dark brown/black	gravelly sand	freq gravel, freq pot boiler, mod charcoal	moderate	
75	7506	7506	ritual/rubbish disposal	0.62					
75	7507	7506	use	0.62	dark brown/black	gravelly sand	freq gravel, freq pot boilers, mod charcoal	moderate	
76	7600	0		0.4					
76	7601	0							
77	7700	0		0.32					
77	7701	0							
78	7800	0		0.28					
78	7801	0							
79	7900	0		0.33					
79	7901	0							
80	8000	0		0.41					
80	8001	0							
81	8100	0		0.37					
81	8101	0							
81	8102	8105	ritual	0.11	mid greyish brown	silty sand	moderate gravel, occ charcoal	moderate	
81	8103	8105	ritual	0.08	dark brown/black	silty sand	mod gravel, freq charcoal	compact	
81	8104	8105	primary/discoloured natural	0.06	greyish orange	gravelly sand	freq gravel	compact	none
81	8105	8105	ritual	0.23					
82	8200	0		0.35					
82	8201	0							
83	8300	0		0.35					
83	8301	0							

Appendix 2: Finds Summary

By Carole Fletcher

1 Quantification

The table below indicates the finds discovered during the archaeological field work at the Bittering Quarry site. All weights are in kilograms. Context 99999 represents unstratified material i.e. artefacts not recovered from within a feature but located within the topsoil or subsoil.

Context	Bone	Ceramic	Flint	Glass	Organic	Stone
703			0.009			
2104	0.001					
2112			0.001	0.031		
2121	0.07					
2303	0.007					
5503		0.283	0.038			0.459
5504		0.098	0.014			
5505		0.116	0.071		0.001	0.013
6802			0.007			
7503		0.253	4.603			
7505		0.018	6.621			
7507		0.185	13.472			
8102		0.046	0.044			
8103		0.354	0.051			
99999		0.074	0.009			

Appendix 3: The Prehistoric Pottery

By Sarah Percival

1 Introduction and Methodology

One hundred and fifty four sherds weighing 1090g were recovered from eight excavated contexts and one unstratified deposit. The assemblage includes earlier Neolithic, later Neolithic, earlier Bronze Age, Iron Age and Roman pottery. The sherds are moderately well preserved. No complete vessels were recovered.

The assemblage was analysed in accordance with the Guidelines for analysis and publication laid down by the Prehistoric Ceramic Research Group (PCRG 1992). The total assemblage was studied and a full catalogue was prepared. The sherds were examined using a binocular microscope (x10 magnification) and were divided into fabric groups defined on the basis of inclusion types present. Fabric codes were prefixed by a letter code representing the main inclusion present (F representing flint, G grog and Q quartz). Vessel form was recorded; R representing rim sherds and U undecorated body sherds. The sherds were counted and weighed to the nearest whole gram. Decoration and abrasion were also noted. The pottery and archive are curated by the Archaeological Field Unit, Cambridgeshire County Council.

2 Earlier Neolithic

Thirty-three sherds of earlier Neolithic pottery weighing 395g were recovered from two contexts (Table A3 1).

Context	*Quantity*	*Weight (g)*
8102	5	44
8103	28	351
Total	*33*	*395*

Table A3 1: Quantity and weight of earlier Neolithic pottery by context

2.1 Fabric

All the earlier Neolithic sherds are made of flint tempered fabrics. Three fabrics were identified based on density and size of flint inclusions (see Table A3 2). F1 is fine and well finished with highly smoothed or burnished exterior and contained flint pieces below 4mm

in size. F2 is the medium fabric with mixed flint pieces up to 8mm and a smoothed surface finish. F3 is coarse, again with a mixture of inclusion sizes but including those above 8mm.

Fabric code	*Quantity*	*Weight (g)*
F1	14	177
F2	6	94
F3	13	124
Total	*33*	*395*

Table A3 2: Quantity and Weight of earlier Neolithic pottery by fabric

2.2 Form

The earlier Neolithic assemblage includes both decorated and undecorated sherds representing a minimum of four vessels. The rim forms were classified following the rim typology used for Hurst Fen, Suffolk, (Longworth 1960, 228) Windmill Hill, Wiltshire (Smith 1965), and Spong Hill, Norfolk (Healy 1988 Fig.57) and other assemblages (see Table 2 below). One large rim sherd from a Mildenhall bowl has a thickened rim, short curved neck and angular shoulder. The sherd is decorated with impressed dots and incised lines covering the rim and upper body. A second body sherd also features bands of impressed dots. Similar bowls have been found at the earlier Neolithic site at Spong Hill (Healy 1988, fig. 72, P144) which lies c.7k to the south west of Longham. Mildenhall Ware is a style of earlier Neolithic decorated bowl which dates to around 3500BC (Gibson 2002, 75). The remaining two rim sherds are from undecorated vessels, one is externally thickened and has a hole pierced below the rim (*cf* Healy 1988, fig. 66, fig.67 P69, 82), the second is a rolled rim from a long necked vessel.

2.3 Deposition

All the earlier Neolithic sherds were recovered from the fills of a single feature, a medium sized circular pit which contained three fills.

2.4 Discussion

The small earlier Neolithic assemblage is of interest as it is one of a number of finds of such pottery in this area of central Norfolk. Contemporary pit deposits have been noted on sites at Spong Hill (HER 1012), Sparham (HER3023) and Weasenham Lyngs (HER3661) which all lie along the Nar and Blackwater valleys (Healy 1984). Previous excavations at Longham have also produced small quantities

of earlier Neolithic pottery, from scattered isolated features (HER 739, Her 13025), though little Mildenhall wear is recorded.

Recent excavations at Kilverstone, near Thetford produced over two hundred earlier Neolithic pits, some of which contained Mildenhall Ware. Radiocarbon dates taken on samples from seven pits produced dates ranging from c.3650-3400 cal BC (Garrow et al 2005) and it is likely that the Longham site is contemporary with this. However, unlike the large multi-pit sites at Kilverstone or Broome Heath, activity a Longham may have been much more transient leaving only insubstantial archaeological evidence (Ashwin 1998, 24). The nature of activity is unclear as both the present site and Longham 13025 produced pits with multiple fills unlike the single fill, rapidly back-filled sites which characterise many earlier Neolithic sites (Healy 1995, 174; Thomas 1999,64).

2.5 Recommendations for Further Work

- Select four sherds for illustration.
- Produce a catalogue of illustrated sherds
- Produce text for publication

3 Later Neolithic earlier Bronze Age

One hundred and eighteen sherds weighing 1090g were recovered from five excavated contexts comprising the fills of a ditch and two pits. All of the sherds are from Beakers, a style which dates to c. 2600-1800BC. The sherds are in a range of sizes including a complete base as well as smaller vessel pieces. No complete vessels were present.

Context	Quantity	Weight (g)
5503	43	261
5504	14	91
5505	18	50
7503	19	146
7507	24	133
Total	**118**	**681**

Table A3 3: Quantity and weight of later Neolithic earlier Bronze Age pottery by context

3.1 Fabric

Six fabrics were identified from three fabric groups. The most common fabrics contain grog or crushed pot as the main inclusion. Grog tempered fabrics represent 61% of the assemblage (416g). The remaining sherds contain sand (105g) and flint (160g). The fabrics are

similar of those within the Beaker assemblage found during previous excavations at Longham (Site 13025 Ashwin 1998) and are typical of Beaker assemblages in East Anglia (Healy 1988).

3.2 Form and Decoration

The Beaker assemblage contains the remains of around fifteen vessels. Unusually the assemblage includes a high proportion of base sherds. These are usually underrepresented in Beaker assemblages. The vessels have long necks and globular lower bodies. Decorative forms include fingertip, fingernail impressed and comb impressed designs and exhibit a similar range of motifs to the Beakers recovered in the 1990 excavations (Ashwin 1998).

3.3 Deposition

The pottery was recovered from three features. Seventy-five sherds weighing 402g came from three fills of a single ditch [5502]. This large assemblage includes substantial sherds such as a complete base and seven rim sherds. The sherds appear in all three fills of the ditch and are large and well preserved suggesting that the feature is of Later Neolithic Earlier Bronze Age date. Beaker sherds are rarely found in ditch fills, being more commonly deposited in pits or surface dumps.

The remaining Beaker sherds were recovered from single fills of two pits. These assemblages are similar in size and composition to pit deposits found in previous excavations (Ashwin 1988). The use and origin of these pits are unclear however it is certain that the vessels found here are not funerary and perhaps represent evidence for occupation at the site.

3.4 Discussion

This assemblage is of interest as it was recovered from an unusual context, the fills of a linear feature. The assemblage appears to be broadly contemporary with the assemblages found during the 1990 excavations, though more detailed examination of both assemblages would be required for this to be established. The Beaker pits differed markedly from the multi fill earlier Neolithic pits as they contained a single fill, perhaps representing a dump of material from a curated deposit containing a mix of pottery along with other artefacts (Garrow 2005).

3.5 Recommendations for Further Work

- Select ten sherds for illustration.
- Produce a catalogue of illustrated sherds

- Produce text for publication to include further analysis comparing the present assemblage with that from previous excavations at the site.

4 Iron Age

Two sherds of Iron Age date were recovered from unstratified context (99999). The assemblage comprised a simple everted rim in a quartz sand tempered fabric and a body sherd in a micaceous sandy fabric. It is likely that these sherds are contemporary with substantial mid to late Iron Age assemblages uncovered during previous excavations at Longham (Percival 1999).

4.1 Further work

No further work required.

5 Roman

(Identified by Alice Lyons)
Three joining sherds from a black surfaced red ware bowl were recovered from the upper fill of a ditch (5505). The bowl dates to the early mid first to mid second century AD.

5.1 Further work

No further work required.

6 The Fired Clay

Fifteen pieces of fired clay weighing 175g were recovered from three excavated and one unstratified context (Table A3 4).

Context	Quantity	Weight (g)
5505	1	18
7503	11	88
7507	2	42
99999	1	27
Total	**15**	**175**

Table A3 4: Quantity and weight of fired clay pieces by context

Three fabrics were identified. One, fabric G10, is a poorly fired vesicular fabric with moderate medium sub rounded grog. The second fabric is well fired and contains common small angular white flint (fabric F10). The third is sandy containing moderate quantities of quartz sand (fabric Q10).

The majority of the fired clay has no surviving surfaces. One piece has smoothed surfaces and a possible perforation perhaps from a loom weight (99999). Two pieces have possible wattle impressions (5505, 7507) suggesting that they may have been from a structure or oven. All the pieces from stratified contexts were found alongside later Neolithic earlier Bronze Age pottery. Scatters of fired clay 'bricks' have regularly been found associated with pottery on Later Neolithic Early Bronze Age sites (Healy 1986 101).

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Appendix 4: Lithic Assessment

By Barry Bishop

1 Introduction

This report quantifies and describes the lithic material recovered from the Field Evaluation at the above site, offers some preliminary interpretations of its significance and recommends any further work required. It also comments on the struck flint recovered from the fieldwalking exercise.

No statistically based technological, typological or metrical analyses were attempted and a more detailed examination may alter or amend any of the interpretations offered here.

The majority of the material from the Field Evaluation was recovered from four pits and a ditch, with small quantities recovered from unstratified deposits.

2 Field Evaluation

2.1 Quantification

Context	Feature	Decortication Flake	Irregular Flake	Blade	Blade-like Flake	Flake	Chip	Minimal Core	Multiplatformed Flake Core	Edge retouched blade	Edge Retouched Flake	Serrated Blade	Total Struck	Burnt Flint (no.)	Burnt Flint (Wt.:g)	Comments
703 Tr 7		1											1			Undiagnostic
Tr 56						2							2			Undiagnostic
Tr 68						2							2	1	4	Undiagnostic
5503	5502	2	4	1		10		1					18	95	1183	Bronze Age, a few earlier pieces?
5504	5502	2	2	1		4	8						17	5	60	Bronze Age
5505	5502	2	2		1	6							11			Late Neolithic/Early Bronze Age
7503	7502	11	10			19	3	1	1		4		49	1188	8950	Bronze Age: retouched all minimally worked side scrapers?
7505	7054			1		2	5						8	1871	15640	Undiagnostic
7507	7506	2	4			12	5						23	2428	23815	Bronze Age
8102	8105		2	8	1	2	6					1	20	9	31	Meso/Early Neo
8103	8105	1		5	1	2	3			1			13	16	81	Meso/Early Neo
Total		21	24	16	3	61	30	2	1	1	4	1	164	5538	49764	

2.2 Burnt Flint

Almost 50kg of burnt flint was recovered, virtually all of it from just three pits, [7502], [7054] and [7507]. A reasonably large quantity was also recovered from the primary fill of ditch [5502]. The burnt flint from these features had nearly all been heated to a very high temperature, resulting in it becoming heavily 'fire-crazed', attaining a uniform grey-white colour, and undergoing considerable shattering, although individual fragments frequently exceeded 100g in weight. It was apparent that large alluvial cobbles had been selected and intentionally burnt, characteristic of 'pot-boilers'. The significant quantities involved,

combined with the uniform degree of burning, would suggest that this material had been intensively and systematically produced, comparable to the deposits that accrue as the residues from large-scale cooking (eg Hedges 1974-5), although many other possibilities for the production of burnt flint have been suggested (e.g. Barfield and Hodder 1987; Barfield 1991).

2.3 Struck Flint

2.3.1 Raw Materials

The raw materials used consisted exclusively of flint or cherty flint. It was predominantly fine-grained and mottled translucent black/opaque grey in colour, although a variety of other flint colours were represented, some of which were notably cherty and coarse-grained. Cortex invariably was heavily weathered, smooth-rolled or battered. The variety of flint types and the weathering of the cortex would suggest the raw materials were obtained from derived sources, probably alluvially transported gravel deposits.

Although a variety of flint types was present in all of the larger assemblage groups, the material from pit [8105] was predominantly fine-grained, whereas in the other pits there was a much higher proportion of coarse-grained material present. The dating of these pits (see below) suggests that this may represent a change in the care taken in choosing raw materials over time, with earlier flintworkers exercising greater care in selecting better quality raw materials than their later counterparts.

2.3.2 Condition

The material from all of the features was predominantly good with many sharp pieces and only occasional slight edge chipping or abrasion. The majority of struck flint at least is likely to be contemporary with the infilling of the pits and, although it may not represent primary deposition, it is unlikely that it had been 'kicking around' for any length of time.

2.3.3 Description

Few truly diagnostic pieces were present although overall the struck material could be divided into at least two basic technological traditions. The earliest consisted of the systematic production of blades and narrow flakes, typically with narrow prepared platforms, parallel dorsal scars, and conchoidal fracture characteristics compatible with soft-hammer percussion. Associated with these were two retouched pieces, a serrated blade from fill [8102] and an edge-retouched blade from fill [8103]. Although one or two pieces displaying these characteristics were present in ditch [5502] and pit [7054], probably

residually, they dominated the assemblages from pit [8105]. Such techniques are characteristic of Mesolithic or Early Neolithic assemblages predating c.3000 (cal) BC.

The second technological tradition was represented by a number of broad thick flakes, usually with wide unmodified platforms and often retaining significant cortex. Many mis-hit and irregular flakes were present and the high number of pronounced bulbs of percussion, developed Hertzian cones and incipient cones suggests an exclusive use of hard hammer percussion. These pieces were most notably represented in the assemblages from ditch [5502] and pits [7502] and [7506]. The smaller quantities from pit [7054] were less diagnostic but broadly comparable. Three cores were also recovered from these features. They included an extensively worked multiplatformed flake core from pit [7502] and two minimally worked cores from pit [7502] and ditch [5502], both of which consisted of angular thermal chunks with a short series of flakes removed along one edge. The only retouch pieces recovered from any of these features consisted of three flakes, each with one lateral edge blunted. All three are likely to have been used as scrapers.

The general lack of sophistication in the manufacture of the assemblages from these features was undoubtedly partially due to the less-reliable raw materials selected, which afforded less control over reduction. However, the basic technological strategy followed was simple and opportunistic, employing an ad-hoc and expedient approach to obtain serviceable edges, and was most characteristic of Bronze Age industries (Ford *et al.* 1984; Brown 1991; Herne 1991), and would be easily compatible with the Beaker date suggested by the pottery recovered.

2.3.4 Discussion

The paucity of diagnostic artefacts hampers precise and reliable interpretation of the worked flint. Nevertheless, at least two broad technological styles were apparent, suggesting that the features may be divided into two groups. The earliest group included [8105], which was of probable Early Neolithic date, and the later group comprised the other features, which most likely dated to the Early Bronze Age. Their dating and contents are comparable to similarly dated pits identified during excavations immediately to the north of the site (Ashwin 2001).

No evidence of *in situ* knapping was evidenced from any of the features although most of the material recovered consisted of knapping waste. The earliest feature, pit [8105], contained reasonably large assemblages of struck flint and small quantities of burnt flint in its two upper fills, but no lithic material at all from its primary fill. Much of the struck material consisted of knapping waste but there were also a number of complete, well made and, presumably, useable blades

present, as well as two retouched blades. The ditch produced reasonably large assemblages of struck material from all of its fills, including a number of chips and other pieces of knapping waste and, although not *in situ*, would suggest that flint reduction remained a significant activity in the vicinity of the ditch throughout its use. Pits [7502] and [7506] also provided reasonably large assemblages, predominantly of knapping waste, indicating the deliberate dumping of this material. Pits [7502], [7054] and [7506] also contained remarkably large quantities of burnt flint. Samples taken from these features confirmed that, unlike ditch [5502] and pit [8105], which had filled mostly with natural pebbles and gravel, they were almost exclusively filled with burnt material. The quantities involved were much more substantial than may be expected to accrue from casual hearth use, and indicate the deposition of material from specific activities which may include communal cooking or craft/industrial activities.

None of the features contained prestigious or elaborate items, and there is little direct evidence for structured or ritualised depositional practices. However, the deposition of everyday items, including material perceived as 'rubbish', as part of ceremonial activity is well documented in the prehistoric record (e.g. (Needham 1993; Hill 1995; Pollard 2001) and may have been an integral and critical aspect of broader patterns of living (Hill 1993; Brück 1999; Bradley 2003).

3 Field Walked Material

The struck flint recovered during the fieldwalking was not extensive in quantity but was broadly comparable to that recovered from the pits. No typologically diagnostic pieces were present but technologically much of the material consisted of thick, broad and often cortical flakes, probably of Bronze Age date and easily comparable to the material from ditch [5502] and pits [7502] and [7506]. However, a not insignificant proportion of the worked flint was represented by an assortment of blades and blade-like flakes. These are technologically characteristic of Mesolithic or Early Neolithic industries and can be closely compared to the assemblages from pit [8105]. A total of five cores were also recovered. Four were systematically reduced and produced blade cores, three of which had single platforms, and one was multi-platformed. Again, these would be characteristic of Mesolithic or Early Neolithic industries and may easily be associated with the blades recovered. The remaining core was unusual and consisted of a large fragment of tabular flint that had many small flakes removed from around its fractured edges. It was technologically most comparable to the minimal cores recovered from ditch [5502] and pit [7502], although may in fact represent a core tool.

4 Recommendations

The struck flint indicated activity at the site during the Early Neolithic and Bronze Age, complementing that identified during earlier archaeological investigations (Ashwin 2001). The nature of settlement or associated flint use during either of these periods in East Anglia is not well understood (Ashwin 1996; Brown and Murphy 2000), and adds significance to the material recovered here. It is therefore recommended that a short description of the assemblage, preferably including illustrations of a selection of the more technologically diagnostic pieces, should be included in any published account of the fieldwork. The publication should concentrate on a describing the material from both periods within their regional context and with full considerations to context, both within individual features and spatially across the site, and with regard to the material's relationship with other deposited materials. The publication should also include some consideration of local geology, raw material sources and previous finds and research in the local area.

Should further fieldwork be considered attention should focus on obtaining as large and closely contexted lithic assemblage as possible, in order to attempt to understand the nature, extent and chronology of any prehistoric lithic-based activities. Should sufficient quantities of lithic artefacts be procured from any future work, full metrical, typological and technological analysis may be warranted and, through consideration of other recovered artefact groups and environmental based evidence, this information should be incorporated into establishing as detailed and complete an understanding as possible of the prehistoric exploitation of the area.

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Appendix 5: Environmental Appraisal

By Rachel Fosberry

1 Introduction and Methods

Eight bulk samples were taken from features within the evaluated areas of the site in order to assess the quality of preservation of plant remains and their potential to provide useful data as part of further archaeological investigations.

Ten litres of each sample were processed by bucket flotation for the recovery of charred plant remains, dating evidence and any other artefactual evidence that might be present. The flot was collected in a 0.5mm nylon mesh and the residue was washed through a 1mm sieve. Both flot and residue were allowed to air dry. The flot was examined under a binocular microscope at x16 magnification.

2 Results

Sample No.	Context No.	Cut No.	Feature Type	Sample Size (L)	Cereals	Modern Seeds	Charcoal <2mm	Charcoal > 2mm	Flot comments	Pottery	Burnt flint	Flint debitage
1	8102	8105	pit	10	0	+	+	+	Charred hazelnuts fragments	0	+++	+
2	8103	8105	pit	10	+	+	+	0		+	+++	+
3	7503	7502	pit	10	0	+	+	++		0	+++	+
4	7505	7504	pit	10	0	+	+	+		0	+++	+
5	7507	7506	pit	10	0	+	+	0		+	+++	+
6	5503	5502	ditch	10	+	+	++	++	several charred hazelnut fragments	+	+++	+
7	5504	5502	ditch	10	+	+	++	++		+	+++	+
8	6802	6803	ditch	10	0	+	+	0		0	+	0

Key to Table
+ = 1 – 10 specimens ++ = 10 – 100 specimens +++ = 100+ specimens

2.1 Plant macrofossils

Preservation is by charring and is generally poor. Charcoal fragments are present in all of the samples in varying quantities.

Modern contaminants in the form of rootlets and a few common seeds such as *Chenopodium* sp., *Polygonum aviculare* and *Urtica* sp. are present in most of the samples.
Charred fragments of hazelnut shells are present in samples 1 (Context 8102) and 6 (Context 5503).

2.2 Cereals

Cereal grains are present in small quantities in samples 2, 6 and 7.

2.3 Other Finds

Prehistoric pottery was recovered from Samples 2,5,6 and 7. All of the samples except Sample 8 were almost completely comprised of burnt flint. Many of the samples also contained worked flint and debitage.

3 Conclusions and Recommendations

The general lack of plant remains is not unusual for a site of this period. The charred cereal grains indicate cultivation of crops but in the absence of chaff, it is not possible to determine whether the cereals were grown locally. The presence of wood charcoal suggests that there is some potential for preservation of charred seeds however only hazelnut fragments are present. Although a common foraged food, Hazelnuts may have been burnt accidentally with fuel or they may have derived from clearance by burning.

Appraisal of these samples has shown the potential of recovery of plant remains that may enhance interpretation of the site. It is recommended that future excavation should include an extensive sampling programme with bulk samples of 40 litres where possible. Pollen analysis could potentially provide information on the local environment and agriculture.

Appendix 6: Geophysics Report

By Peter Masters (Pre-Construct Geophysics)

Summary

Magnetic Susceptibility and Fluxgate Gradiometer surveys were undertaken at Bittering Quarry, Longham, Norfolk. This formed part of an archaeological evaluation of land that is designated for the extension of the existing quarry for mineral extraction.

The survey identified few significant archaeological anomalies and Field 1 appears to partially correlate with the cropmark evidence.

Other diffuse linear anomalies resolve as probable cultivation marks and features of natural origin.

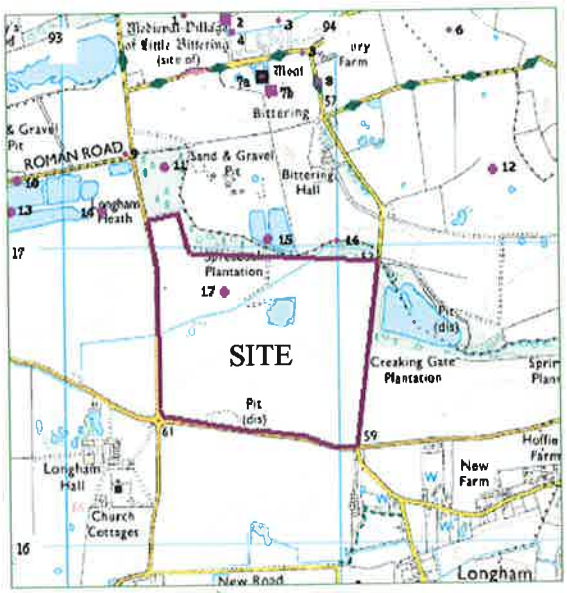

Figure A6 1: General location of site

1.0 Introduction

Pre-Construct Geophysics were commissioned by Cambridgeshire County Council Field Archaeology Unit to undertake magnetic susceptibility and fluxgate gradiometer surveys at Bittering Quarry, Longham, Norfolk. This work was carried out as part of a proposed scheme to extend an existing quarry into adjacent agricultural land.

Sections 2 and 3 are based upon information contained in a specification by the Cambridgeshire County Council Archaeological Field Unit (Clarke 2005).

2.0 Location, description and geology (Figs A6 1-2)

The proposed development involves an extension, of approximately 45ha, to an existing quarry site in Bittering, in the parish of Longham, Norfolk.

The site is situated c. 5 miles to the north-west of Dereham and *c.* 1 mile north of Longham village. The proposed quarry extension, which extends to approximately 45ha, is situated to the immediate south of the existing quarry (CNGR: TF 93720 16705). The site is currently under arable cultivation.

Aerial photographic evidence show cropmarks of a number of linear ditches, a square enclosure and a possible ring ditch (Norfolk Sites and Monuments Record).

The geology of the area is comprised of glacial sand and gravel (BGS 1981, Sheet 161).

3.0 Methodology

The survey methodology is based upon guidelines set out in the English Heritage document *'Geophysical Survey in Archaeological Field Evaluation'* (David, 1995).

Gradiometry is a non-intrusive scientific prospecting technique that is used to determine the presence/absence of some classes of sub-surface archaeological features (e.g. pits, ditches, kilns, and occasionally stone walls). By scanning the soil surface, geophysicists identify areas of varying magnetic susceptibility and can interpret such variation by presenting data in various graphical formats and identifying images that share morphological affinities with diagnostic archaeological remains.

The use of gradiometry is used to establish the presence/absence of buried magnetic anomalies, which may reflect sub-surface archaeological features, and therefore form a basis for a subsequent scheme of archaeological trenching, if required.

Ten percent (c.4.5ha) of the total development area was targeted for detailed geophysical survey.

The gradiometer survey was undertaken using a Bartington Grad-601 Dual Fluxgate Gradiometer. The zigzag traverse method of survey was used, with 1.0m wide traverses with readings taken at 0.25m intervals across 30m x 30m grids.

The data was processed using *ArcheoSurveyor 1.3.0.7*. It was clipped to reduce the distorting effect of extremely high or low readings caused by discrete pieces of ferrous metal on the site. The results are plotted as greyscale and trace images (Figs. A6 4-8).

The measurement of topsoil magnetic susceptibility as a means to identify areas of past occupation is dependent on establishing distinctions between naturally produced magnetic variation within geologies and soils and those induced by human activity. Intensive occupation tends to increase the magnetic susceptibility of soils. For example, a significant magnetic enhancement of the soil can result from burning, by the introduction of fired material, such as brick and tile or by bacterial decomposition of domestic refuse. Consequently, a localised increase in magnetic strength may be evidence of settlement or industrial activities. Prolonged arable cultivation can produce similar, though less intense variation.

The Bartington Magnetic Susceptibility Meter temporarily magnetises the ground by creating a low intensity, alternating magnetic field. It then measures the response. The susceptibility is measured in SI volume susceptibility units (x 10^{-5}). The usefulness of this system is confined to the top few centimetres of topsoil, but its wider range (measurement intervals of up to 30m) enables rapid coverage of large areas. This is, of course, at the expense of detailed resolution, and is recommended primarily as a preliminary prospecting technique used to highlight areas for detailed survey using different techniques, such as gradiometry, which can identify buried features (ditches, pits etc.). However, on sites where archaeological features have been completely ploughed out, magnetic susceptibility measurement may produce the only clear evidence of earlier activity.

The level of topsoil magnetic susceptibility was measured at 20 m intervals across the site. The data was recorded by hand and subsequently inputted into Archeosurveyor 1.3.1.0 for analysis and plotting.

Instrument	Bartington Grad – 01 – 1000 fluxgate gradiometer with DL601 data logger; Bartington Magnetic Susceptibility Meter with MS probe
Grid size	Gradiometer: 30m x 30m
Sample interval	Gradiometer: 0.25m Magnetic Susceptibility: 20m
Traverse interval	Gradiometer:1.0m
Traverse method	Zigzag
Sensitivity	Gradiometer: 0.1nT Magnetic Susceptibility: SI units
Processing Software	ArcheoSurveyor v.1.3.0.7
Weather conditions	Sunny, warm
Area Surveyed	45ha mag sus, 4.5ha gradiometer
Date of survey	5, 8, 13 September and 14 October 2005
Survey personnel	Peter Masters
Central NGR	TF 93720 16705

Table A6 1: Summary of survey parameters

4.0 Results

Field 1 (Figs. A6 2, 3, 4 and 5)

The magnetic susceptibility of this field produced low to medium values. Zones of high magnetic susceptibility (shown as orange-red) can be seen along the western field boundary and along the northern edge of the field where a trackway still exists. These high readings tend to reflect magnetic enhancement caused by modern magnetic materials such as tarmac, stone etc and also may well be influenced by recent agricultural practices such as manure spreading.

Two specific areas of enhanced magnetic susceptibility can be seen in Figure A6 3. One area is located in the vicinity of the known cropmarks and a second zone of high magnetic susceptibility lies to the west. A detailed gradiometer survey was located over the two zones of enhancement.

A series of diffuse linear and curvilinear anomalies (red lines) were detected in the area of the known cropmarks. These are likely to represent probable ditch-like features and some of these appear to

correlate with the air photographic evidence. A larger diffuse curvilinear anomaly (Fig. A6 5, **1**) may indicate the partial outline of probable ring ditch, however it is uncertain whether this represent the remains of the barrow identified from cropmark evidence. In addition, the survey did not extend over as far as the square shaped enclosure. Therefore, there is no confirmation of its existence except from the cropmark information.

A number of discrete individual pit-like anomalies (circled red) were detected across the whole survey area possibly indicating the remains of pit-type features or even areas of burning.

The survey recorded a number of regularly aligned weakly magnetic parallel linear anomalies; these almost certainly indicate cultivation scores (orange lines).

The survey has also detected widespread discrete and grouped strong dipolar anomalies (examples circled/outlined in pink). These almost certainly indicate miscellaneous modern ferrous/ceramic materials.

Field 2 (Figs. A6 2, 3, and 6)

The magnetic susceptibility results produced low values. Zones of high magnetic susceptibility (shown as red) lie along the field boundaries that may well have been influenced by recent agricultural practices such as soil enhancement. An isolated zone of high magnetic susceptibility was recorded close to the eastern side of the former quarry pit and it is more likely that this enhanced topsoil magnetism is related to this relatively modern activity.

Two gradiometer sample areas measuring 60m x 60m were surveyed in this field.

Area 1

Few anomalies of archaeological significance were detected in this area and it appears to correlate with the magnetic susceptibility results. However, a series of individual pit-like anomalies (circled red) were recorded and may indicate the remains of pit-type features or areas of burning. Other discrete anomalies (circled pink) denote ferrous-like remains of modern origin such as ceramic debris (brick/tile). Two diffuse linear anomalies (orange lines) are likely to reflect the magnetic response from cultivation scores.

Area 2

This sample survey area was undertaken after the Cambridgeshire Archaeological Field Unit completed a surface collection survey. The fieldwalking survey results indicated a scatter of burnt flint on the north side of the former quarry pit.

The gradiometer results produced relatively few anomalies of archaeological significance. Few discrete anomalies (circled red) possibly indicate pit-like features or areas of burning. However, a zone of yellowish orange sand mixed with magnetite was noted at the time of the survey in an area close to the edge of the former quarry pit, which could also be responsible for these anomalies.

Immediately to the east of these anomalies, a group of discrete dipolar anomalies were recorded possibly indicating ferrous-like remains such as ceramic/ferrous debris (tile, brick, gun cartridges).

Field 3 (Figs. A6 2, 3, 7 and 8)

The magnetic susceptibility values are low-medium but the distribution appears to show a general patterning. Zones of high magnetic susceptibility shown as red-orange in the resultant plot are concentrated in the eastern and southern half of the field. This distribution of topsoil enhancement may well be influenced by recent agricultural practices such manure spreading. The low values, shown as blue, tends to indicate low-lying areas. Topographically, the western half of the field slopes down gradually towards the north-west and is more prone to water logging, which appears to be reflected in the results.

The gradiometer survey area was located centrally over the zones of magnetic enhancement and the results produced relatively few anomalies of an archaeological nature. Two small curvilinear anomalies (red lines) recorded in the eastern half of the survey area may indicate ditch-like anomalies. A discrete group of individual anomalies (circled red) possibly denotes pit-type features or areas of burning. Other discrete dipolar anomalies (circled pink) probably indicate ferrous-like remains such as ceramic/ferrous fragments (brick/tile etc) or could possibly represent naturally occurring iron concretions in the underlying geological deposits.

A number of diffuse linear and curvilinear anomalies recorded are likely to indicate features of natural origin such as reticulations, which is typical of this of geology.

5.0 Conclusions

The survey has identified relatively few anomalies that indicate the remains of archaeological features and both techniques have also identified large areas of the site, which appear to be archaeologically barren.

Field 1 produced the main group of magnetic anomalies of any archaeological significance and they appear to partially correlate with some of the known cropmarks.

Other anomalies recorded tend to reflect features of modern or natural origin.

Acknowledgements

Pre-Construct Geophysics would like to thank Cambridgeshire County Council Archaeological Field Unit for this commission.

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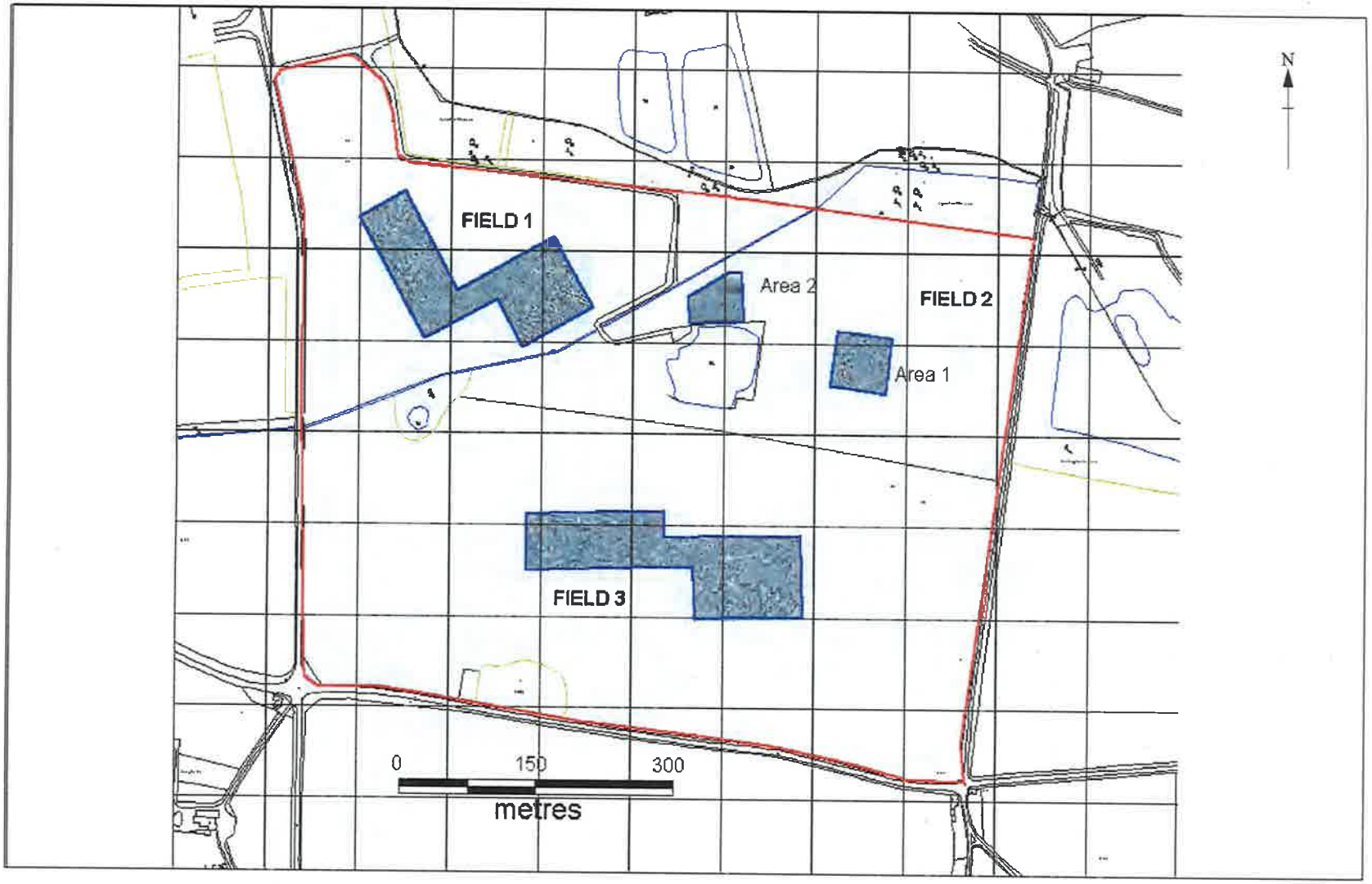

Figure A6 2: Location of survey areas

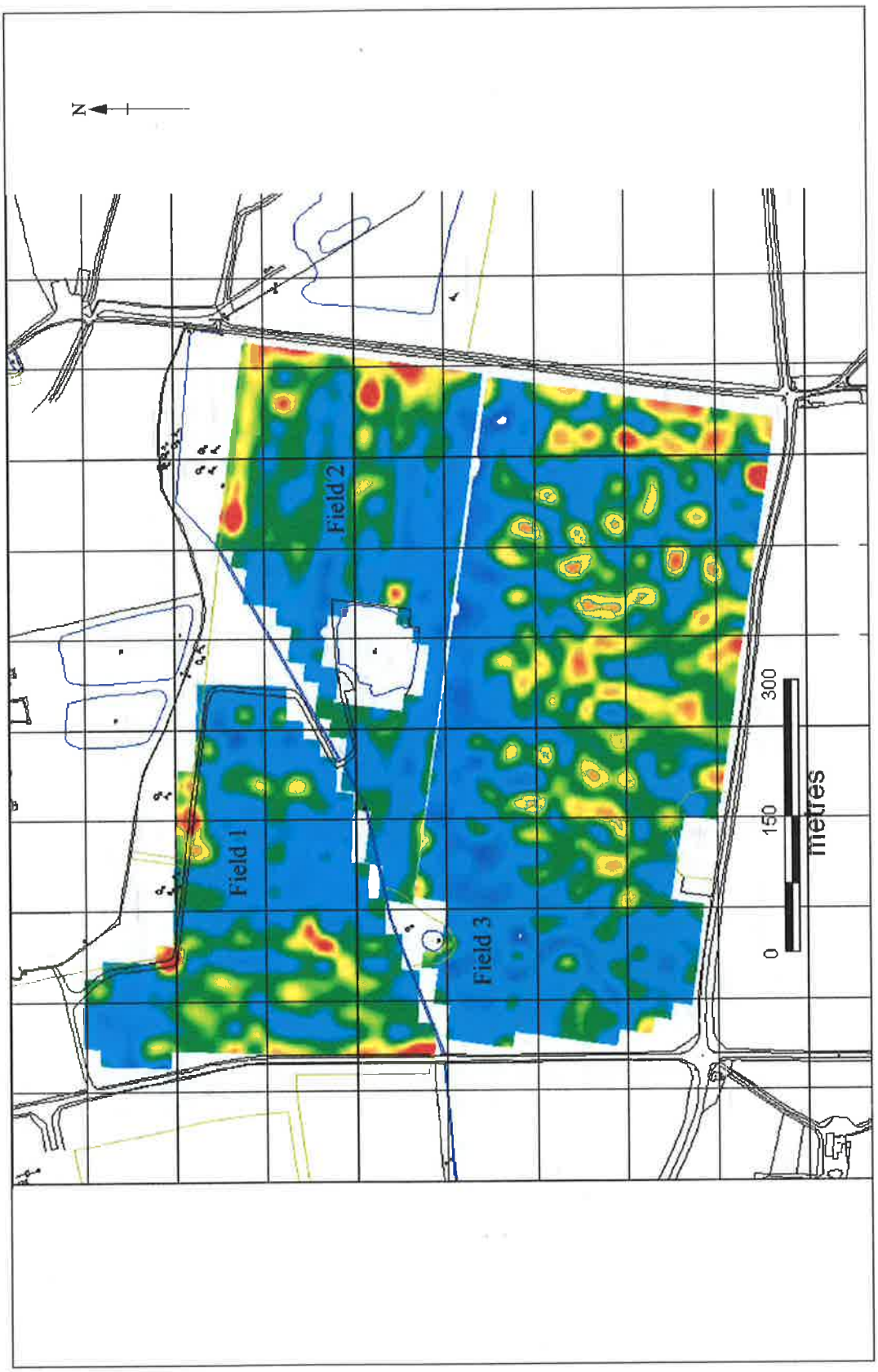

Figure A6 3: Magnetic susceptibility survey areas

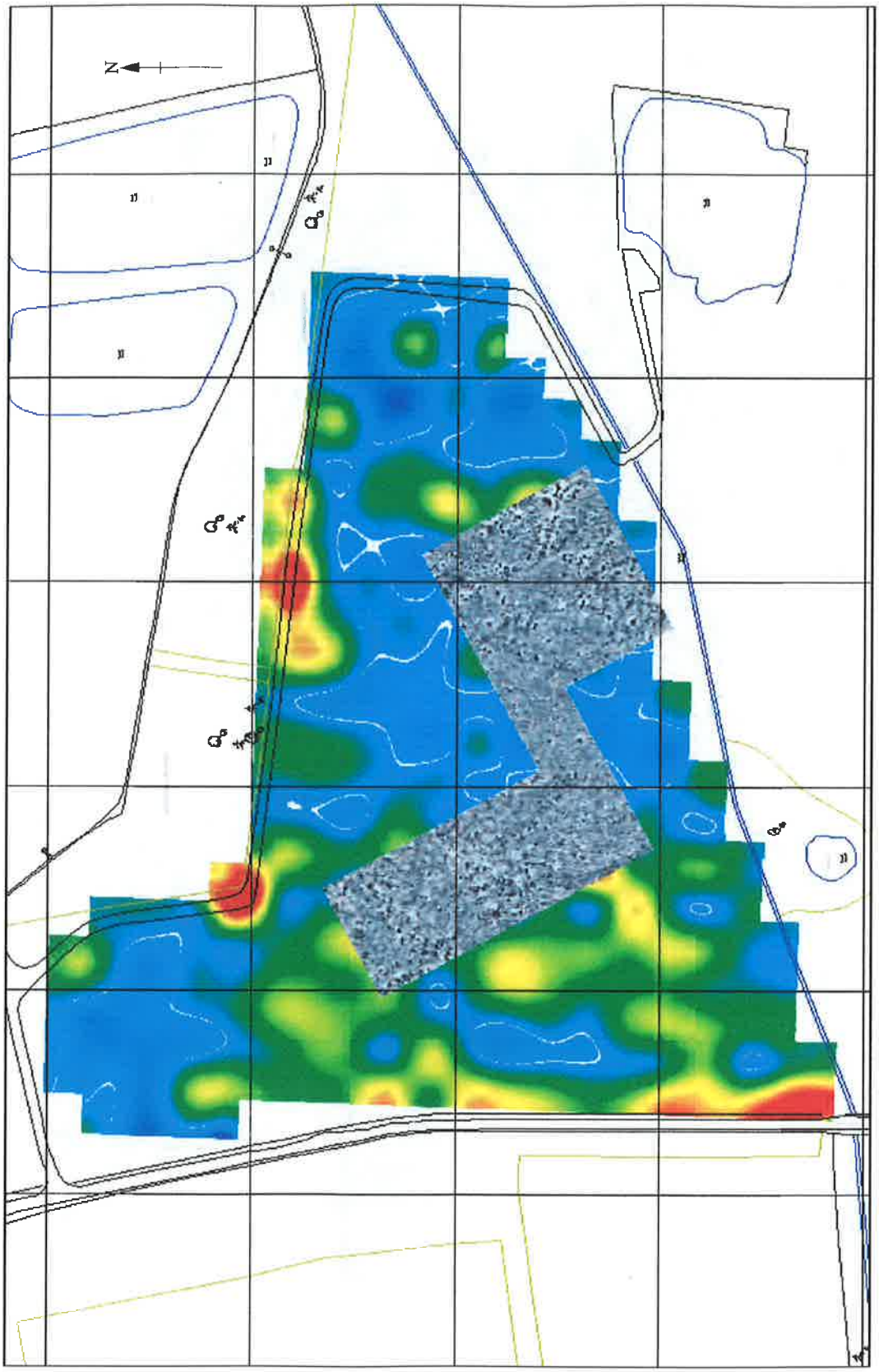

Figure A6 4: Field 1

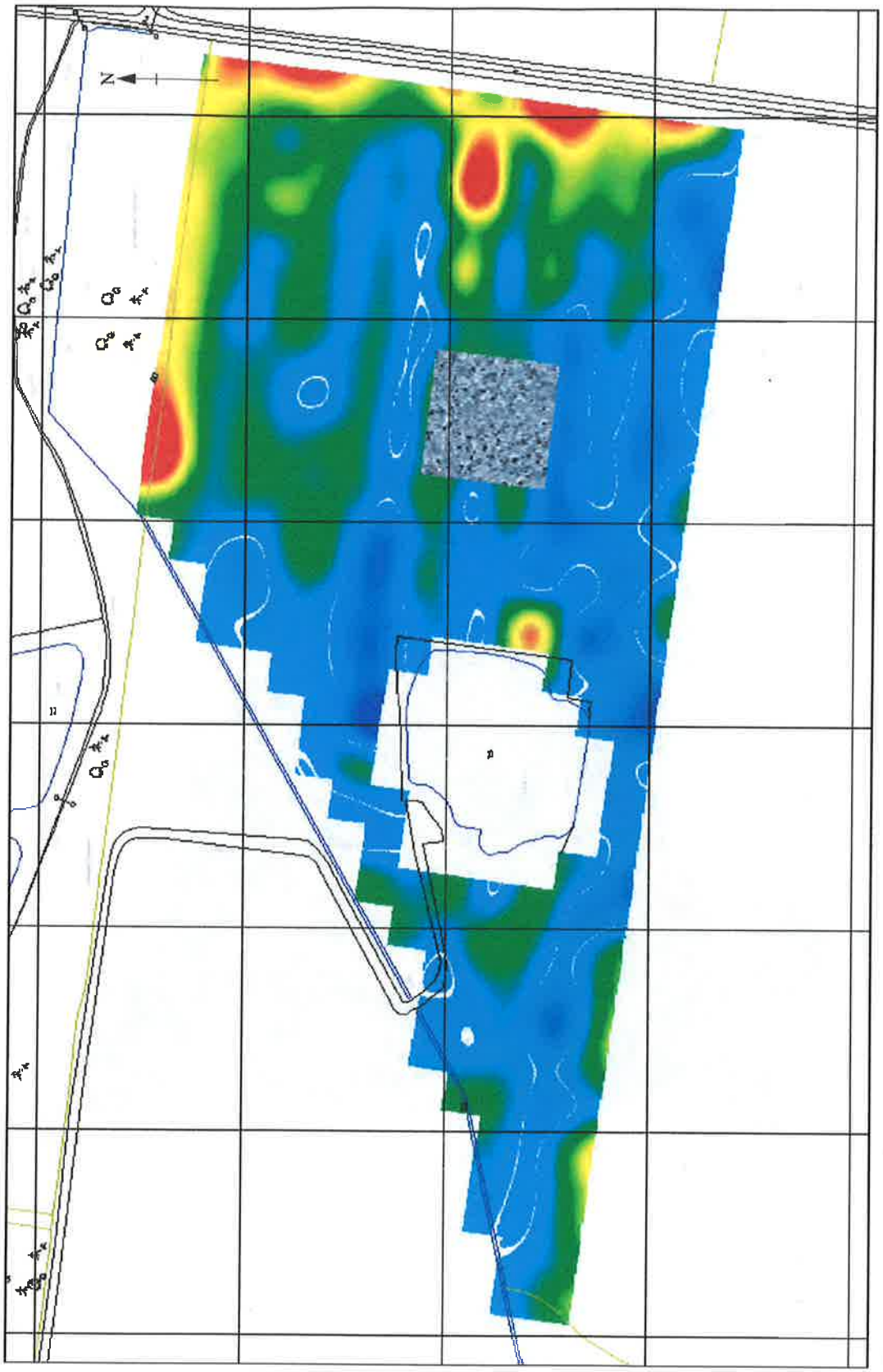

Figure A6 5: Field 2

Figure A6 6: Grad survey plots

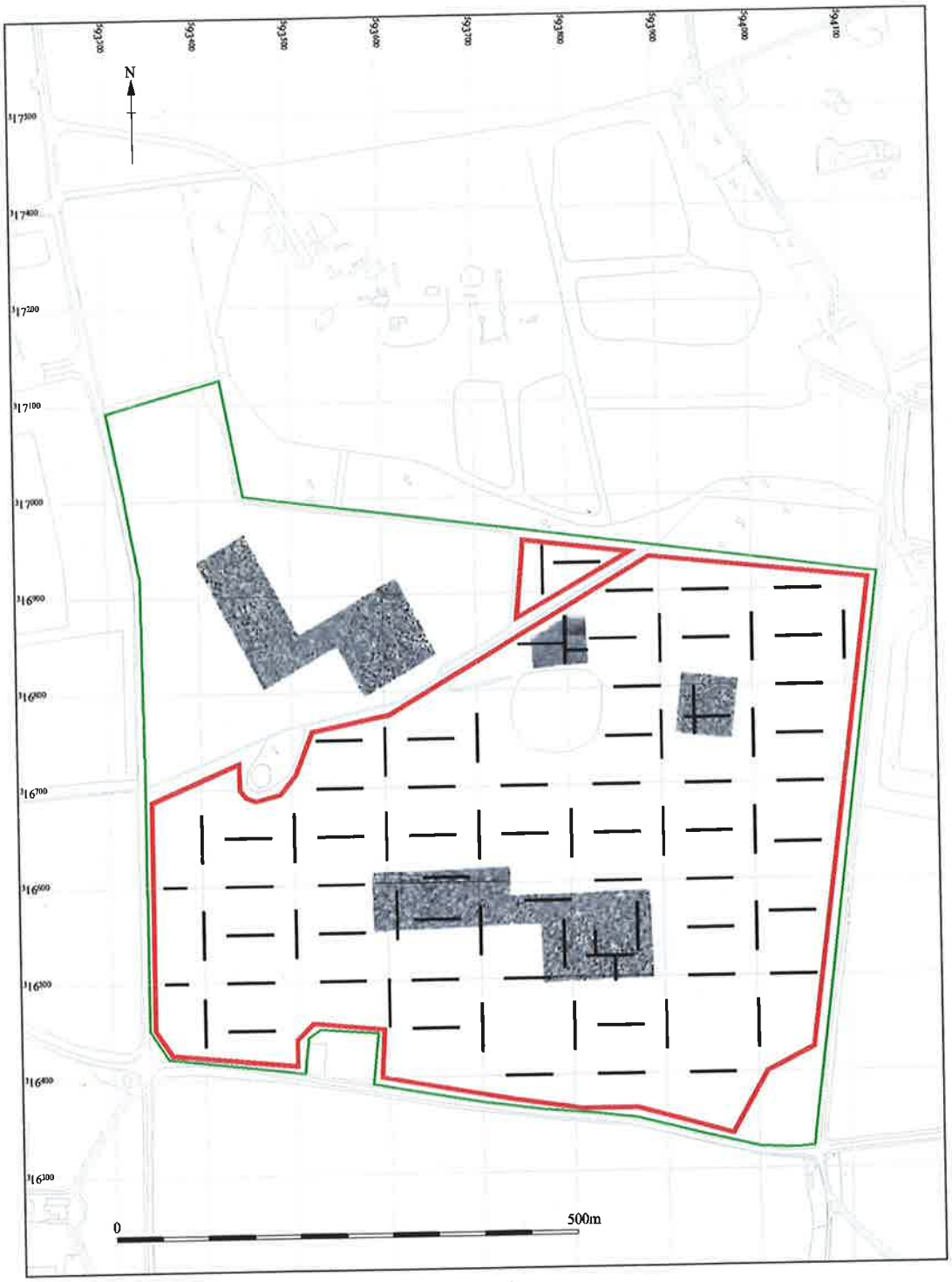

Figure A6 7: Trench plan overlying geophysical plots

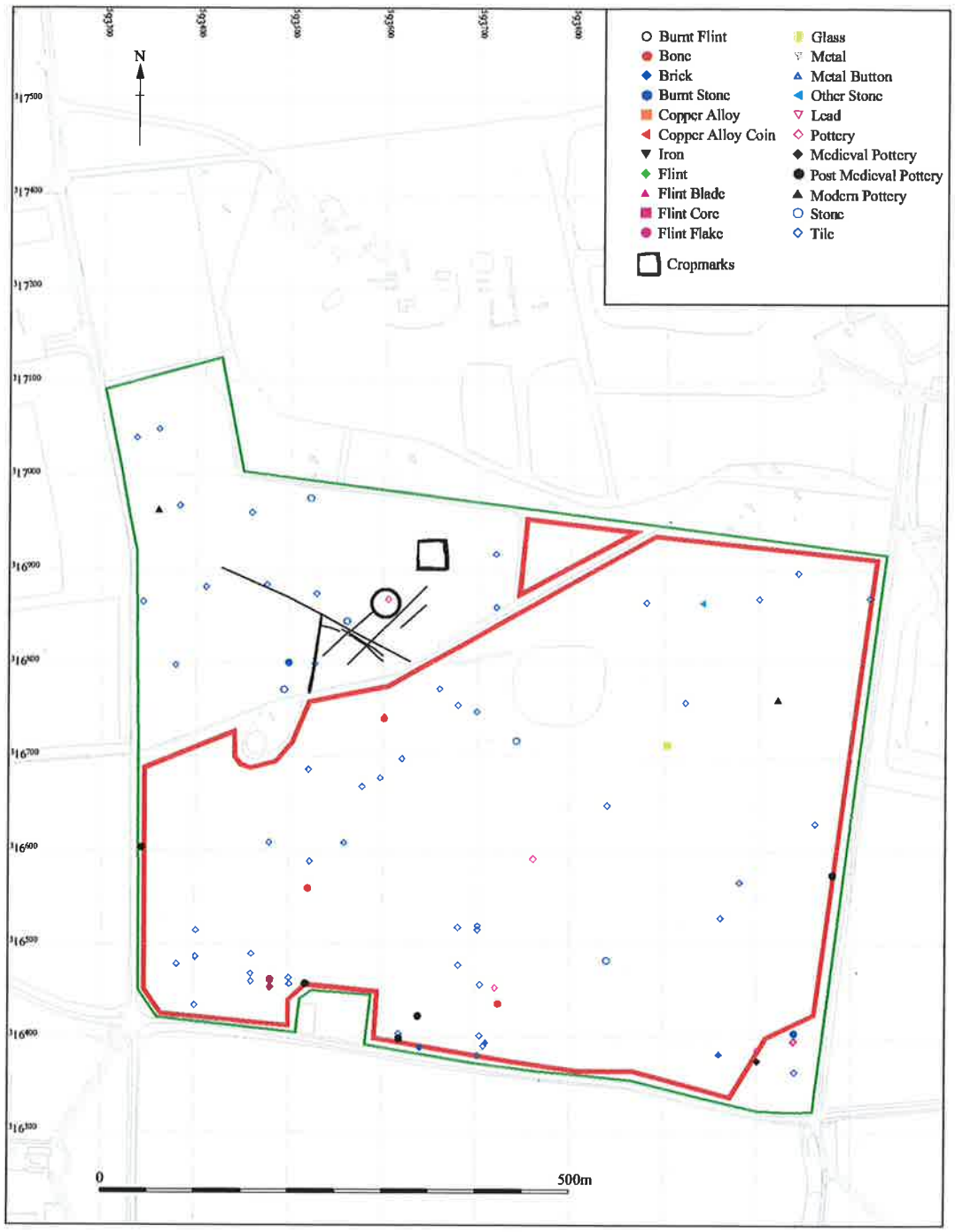
N
Burnt Flint
Bone
Brick
Burnt Stone
Copper Alloy
Copper Alloy Coin
Iron
Flint
Flint Blade
Flint Core
Flint Flake
Glass
Metal
Metal Button
Other Stone
Lead
Pottery
Medieval Pottery
Post Medieval Pottery
Modern Pottery
Stone
Tile
Cropmarks
0
500m

Figure A6 8

Appendix 7: Fieldwalking Summary

Rachel Clarke

1. Introduction

1.1 This report comprises an interim summary of the fieldwalking survey of an area of approximately 45ha at Bittering, near Longham in the county of Norfolk.

1.2 Archaeological field survey, comprising geophysical survey and fieldwalking, has been undertaken on the site of a proposed quarry extension.

1.3 The proposed development, currently under arable cultivation, was divided into two areas for this stage of the project:

Field 1 (previously referred to as the 'barley field') comprises approximately 20ha in the northern half of the area, bisected by a ditched stream/field boundary and bounded to the north by Spreadoak Wood. A large pond/former quarry lies towards the centre of this field. The terrain is generally flat.

Field 2 (previously referred to as the 'beet field') comprises an area of approximately 25ha to the south of Field 1, bounded by roads to the south, east and west. The ground rises gently to the south from *c.* 56m to *c.* 62mOD; an area of hardstanding is located close to the southern boundary.

1.4 Both fields had been harrowed and allowed to weather for up to two weeks prior to fieldwalking. Field 1 was walked during the week of 14/10/05 following geophysical survey, Field 2 was walked in the week beginning 31/10/05, following harvesting of the beet crop and once the geophysical survey had been completed. The weather during both weeks was fairly unsettled, but the conditions were on the whole quite good.

2. Methods

2.1 The AFU is an Institute of Field Archaeologists Registered Organisation and follows IFA By-Laws, Standards and Policy. All work was carried out in full accordance with the appropriate sections of

Standards for Field Archaeology in the East of England' (Gurney 2003).

2.2 Field survey by systematic field walking and metal-detecting was undertaken concurrently to determine the extent, date and significance of artefactual evidence within the ploughsoil.

2.4 The survey grid was aligned on the national grid, and comprised north-south transects laid out at 20m intervals. The grid was set out precisely with the aid of a Leica GPS 1200 System; a number of base stations have also been established to ensure consistency in the survey between all stages of fieldwork.

2.5 Individual finds and concentrations of artifacts were bagged and labeled with the site code and unique surface find number. The location of each bag and associated number was accurately plotted and logged using the GPS, which records 3-D positions to sub-centimeter accuracy. Preliminary finds identifications were also made in the field and logged on the GPS.

2.6 The fieldwalkers generally observed a 2-metre wide strip along each transect, thereby examining a minimum 10% sample of the field surface.

2.7 Systematic metal-detecting was also undertaken concurrently with, but separately from, the fieldwalking; finds were recorded in the same manner as for the fieldwalking.

3 Preliminary Results

3.1 ***Burnt Flint*** (Fig. A7 1)

One of the most significant finds of the fieldwalking, in terms of quantity and distribution, was burnt flint, of which almost 7kg was recovered. The main concentration was located to the north of the large pond in Field 1, in the vicinity of (and to the south of) the palaeochannel identified by the aerial photographic survey (Josephs 2005, Fig. 8). A more general scatter was also recorded to the east of this, in an area covering approximately 5ha to the south of Spreadoak Plantation. Burnt flint was also recovered from Field 2 to the south and south-west of the pond, with a slight concentration on an area of rising ground towards the centre of the field.

Interestingly, relatively little burnt flint was found in Field 1, to the north of the ditch. A ring-ditch, square enclosure, a number of probable

ditches and a palaeochannel have been identified in this area from aerial photographs (Josephs 2005, Fig. 8).

3.2 *Worked Flint* (Fig. A7 2)

Approximately 35 worked flints were recovered during the fieldwalking, including at least two cores and a small number of blades and utilised flakes. These will need to be examined and more closely dated by a specialist. The somewhat dispersed distribution of the flints (most of which are small flakes) appears to be largely distinct from that of the burnt flint as most were found in the northern part of Field 1, where the ring ditch and palaeochannel are located. A small number (including one of the cores) were found in the vicinity of the large pond/former quarry in the south of Field 1.

3.3 ***Metal Objects*** (Fig. A7 3)

A small number of metal objects (*c.* 25) were identified by metal detecting, comprising four copper alloy objects, including a coin, a lead scrap, two metal buttons and several iron items. Almost all of these objects are post-medieval or modern and largely comprise horse fittings, nails and 'chance losses'. Some of the corroded iron objects may require X-raying.

3.4 ***Pottery*** (Fig. A7 4)

A small quantity of pottery (13 sherds) was recovered, most of which is of post-medieval and modern date. A small sherd of possible Roman pottery was found in the south-east corner of Field 2.

3.5 ***Miscellaneous finds*** (Fig. A7 4)

Small amounts of animal bone, post-medieval brick and tile, bottle glass and unworked stone were also found. These (and the pottery) are likely to be associated with manuring scatters, especially as most were found in Field 2, in relative proximity to the hall and farmyard to the south-east.

4 Summary Conclusion

The preliminary results seem to support the conclusions of the Cultural Heritage Assessment (Josephs 2005), which suggested that prehistoric remains are likely to be present within the development area. The distribution of burnt flint, combined with the presence of worked flint of possible Neolithic to Bronze Age date (further analysis of the flint is required) is of particular interest, especially when combined with the presence of the possible ring ditch and palaeochannel identified on aerial photographs.

The distribution of the remaining finds (pottery, tile, bone etc) does not seem to be of significance at this stage, and probably represents post-medieval/ modern manuring and agriculturally related activities.

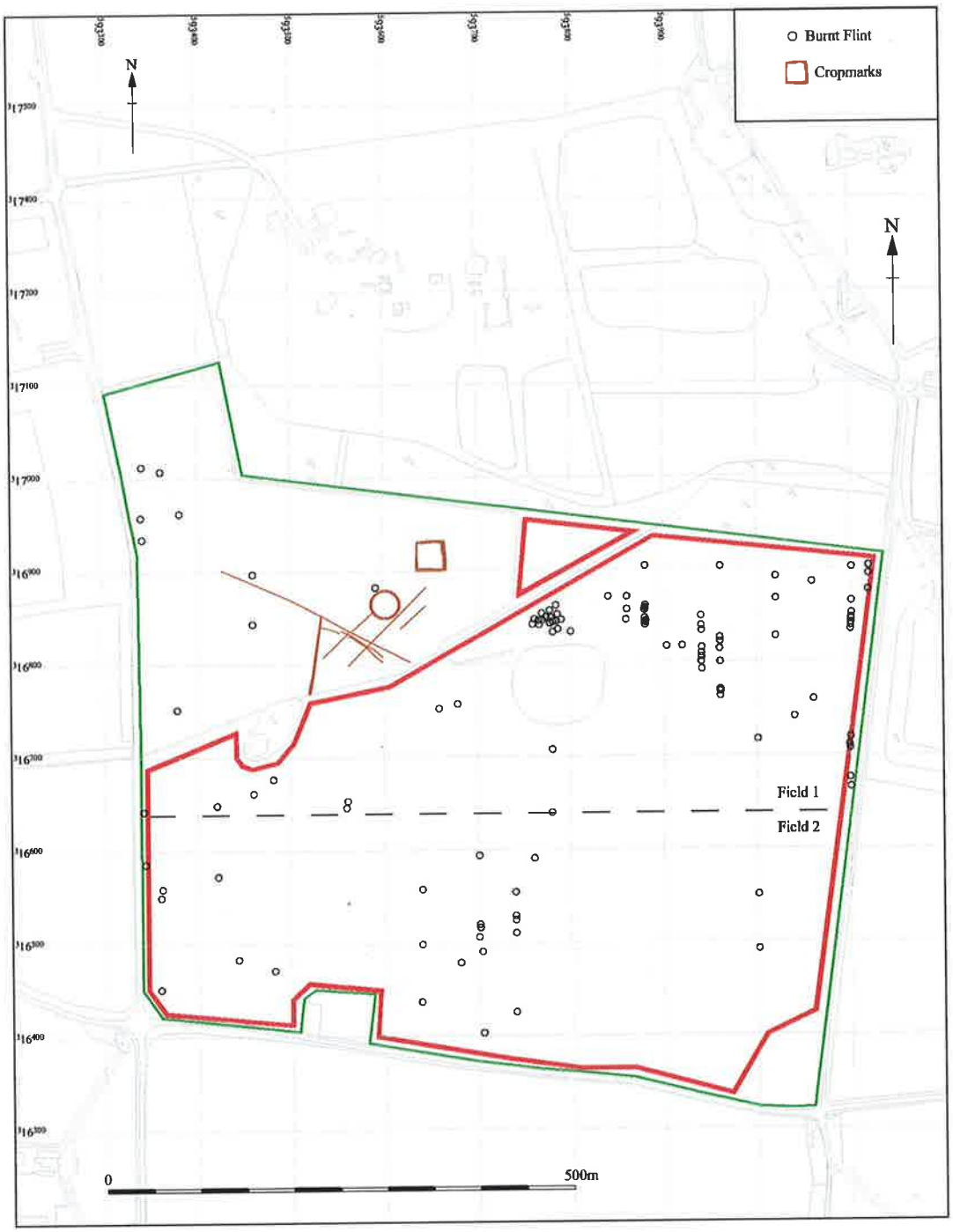

Figure A7 1: Burnt flint distribution

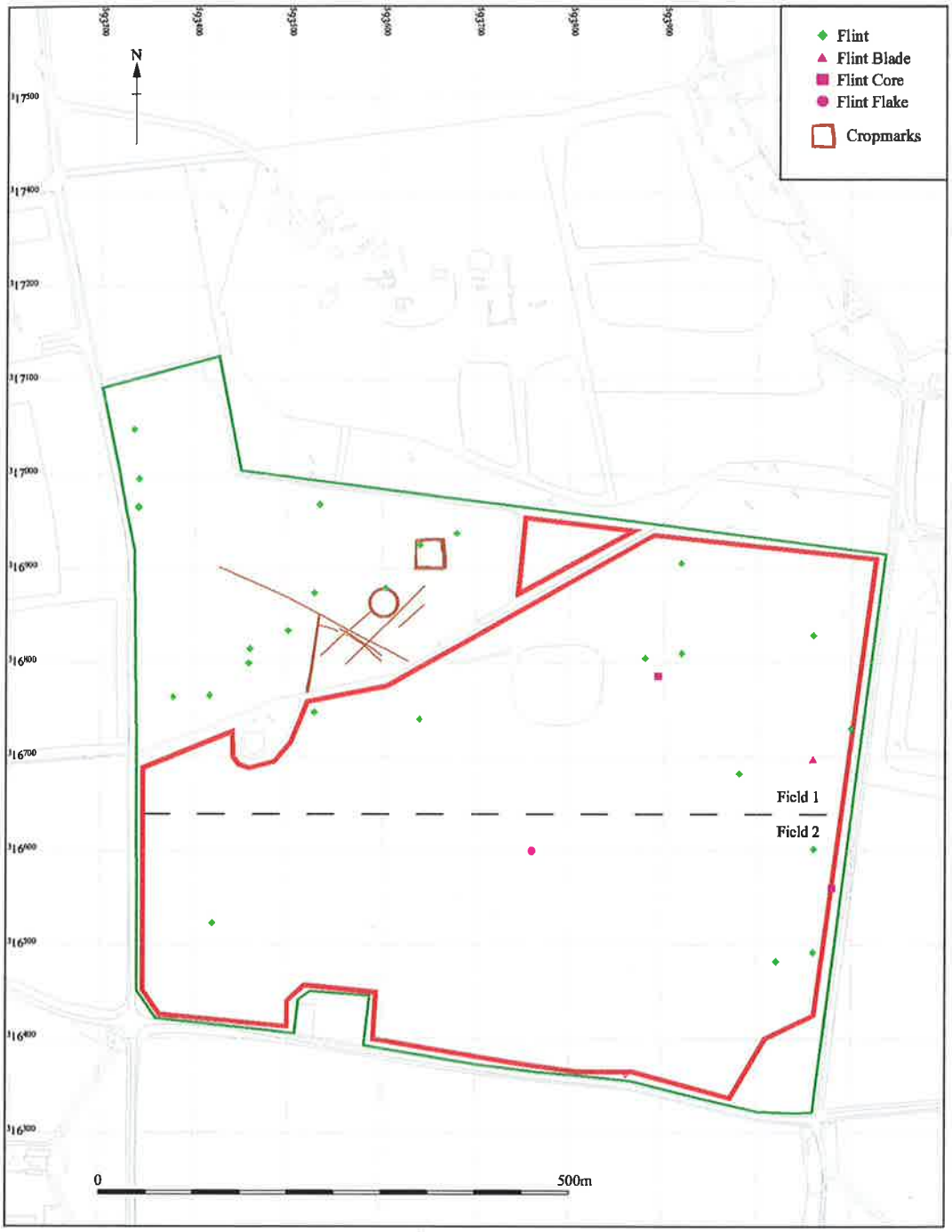

Figure A7 2: Worked flint distribution

Figure A7 3: Metal objects distribution

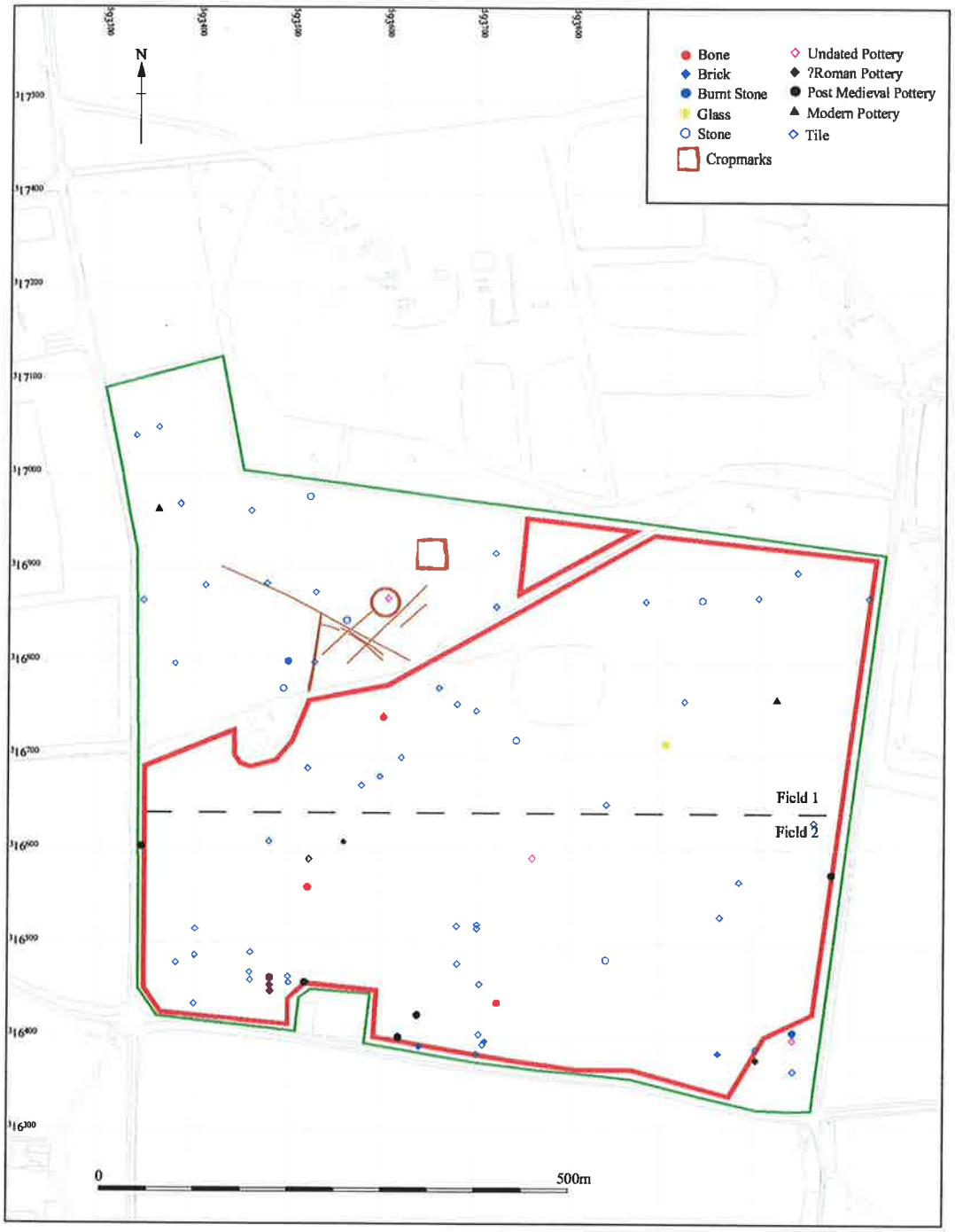

Figure A7 4: Miscellaneous (pottery, brick, tile, glass and stone) distribution

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