Archaeological Services & Consultancy Ltd

FIELDWALKING AND GEOPHYSICAL SURVEYS: LAND NEAR MARGETTS PIT BURHAM KENT

for
Faber Maunsell Ltd
on behalf of
Aylesford Newsprint Ltd

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December 2007

ASC: 1005/BMP/02

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REGISTERED IFA ORGANISATION

Site Data

ASC site code:	BMP	*Project no:*	1005
SMR Event No:	-		
County:	Kent		
Village/Town:	Nr Burham		
Civil Parish:	Burham		
NGR (to 8 figs):	TQ 7205 6222		
Extent of site:	6.58 hectares		
Present land use:	Arable		
Planning proposal:	Water Balancing Lagoon		
Local Planning Authority:	Medway		
Planning application ref/date:	Pre-determination		
Client:	Faber Maunsell Ltd on behalf of Aylesford Newsprint Ltd Newsprint House Bellingham Way Aylesford, Kent, ME20 7DL		
Contact name:	Helen Maclean		

Internal Quality Check

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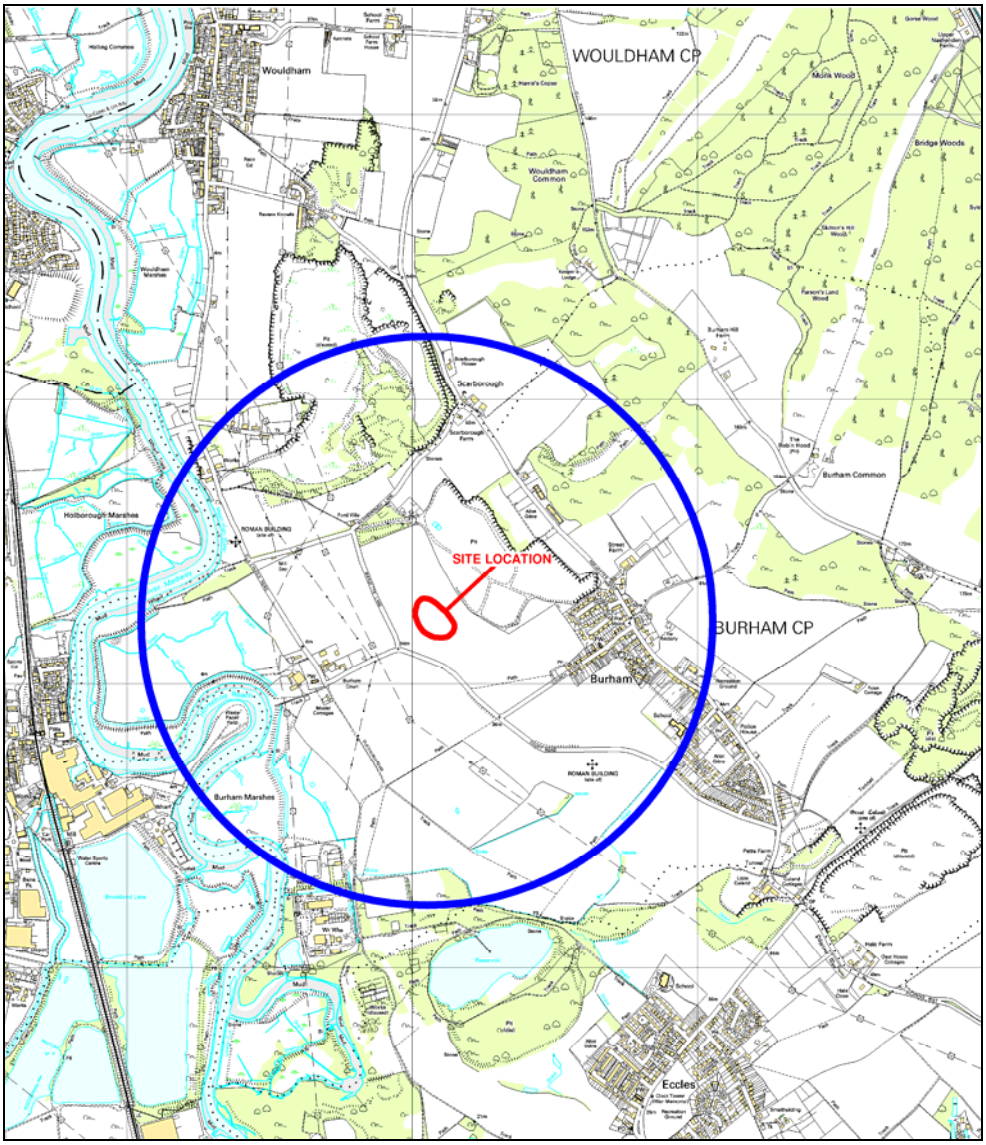

Figure 1: General location *(scale 1:25,000)*

Summary

In October 2007 ASC Ltd was commissioned to undertake fieldwalking and detailed magnetometer survey over a 6.58 hectare parcel of arable land located immediately east of Margetts Pit, Burham, Kent. Seventy struck flints were recovered during the fieldwalking, two are tentatively dated to the Neolithic period and the remainder are probably Bronze Age/Iron Age. A small assemblage of other artefacts predating the late post medieval and modern eras was recovered but, other than illustrating past manuring regimes, is not considered archaeologically significant.

The geophysical survey has located two parallel curvilinear alignments of pits or ditch segments, which could define part of a Neolithic causewayed enclosure previously identified beyond the western limit of the survey area on an aerial photograph. The magnetometer data also defines the location of a rectilinear enclosure with ditches at the north and south that probably define a larger appended enclosure. Other magnetic anomalies to the west of the enclosure ditches may define further cut and infilled features although an archaeological origin for these anomalies is less certain.

1. Introduction

1.1 *General*

Archaeological Services and Consultancy Ltd (ASC) was commissioned by *Faber Maunsell Ltd* on behalf of *Aylesford Newsprint Ltd* to undertake fieldwalking and geophysical surveys over a parcel of arable land on which construction of a balancing lagoon is proposed (Fig 1).

The work described in this report forms the initial phase of a programme of archaeological evaluation required to inform the location of the balancing lagoon and aid the design of an archaeological mitigation strategy, if appropriate. Fieldwork commenced on the 29th October 2007 and was completed on the 5th November 2007. Prevailing weather conditions during the fieldwork were mild although frequently overcast.

1.2 *Planning Background*

The surveys were requested by *Faber Maunsell* as part of predetermination archaeological work. The scope of the work was defined in a specification (Faber Maunsell 2007a) agreed with the *Kent Heritage Conservation Group*, archaeological advisor (AA), of the Local Planning Authority, (LPA), *Medway Council*.

1.3 *Proposed Development*

The development will consist of the creation of a balancing lagoon. Associated works will include excavation of a feeder drainage ditch, establishment of an access track and construction of boundary fencing. All work would be carried out as part of the closure and reinstatement of Margetts Pit landfill site.

1.4 *Location, Description and Constraints*

The site was located *c.*400m west of the northern limit of the village of Burham, Kent, and consisted of a roughly rectangular parcel of arable land encompassing an area of 6.58 hectares centred on NGR: TQ 7205 6222 (Fig 1). The survey area had been shallow ploughed four weeks prior to commencement of fieldwork and was suitable for the surveys. However, three NW-SE aligned unploughed strips of set aside, *c.*150m long and *c.*9m wide, encroached into the site from the north and prevented full survey of the designated area. The survey area was expanded to the northwest and the southeast to compensate for the lost area and a total of *c.*6.8 hectares was eventually examined.

1.5 *Services, Buildings, Access, Etc*

Buildings were absent and the presence of services was unknown. The site was accessed from the eastern side of Margetts Lane.

1.6 *Geology & Topography*

The solid geology of the site was chalk overlain by soils of the *Coombe 2 Association*, which are described as "*well drained calcareous fine silty soils over chalk or chalk rubble. Shallow soils in places especially on brows and steeper slopes"* (Soil Survey 1983, 511g). The site is located on the lower slopes of the North Downs within the Medway Valley at *c.*20m-*c.*10m AOD. The site slopes, dropping by *c.*10m from NNW-SSE.

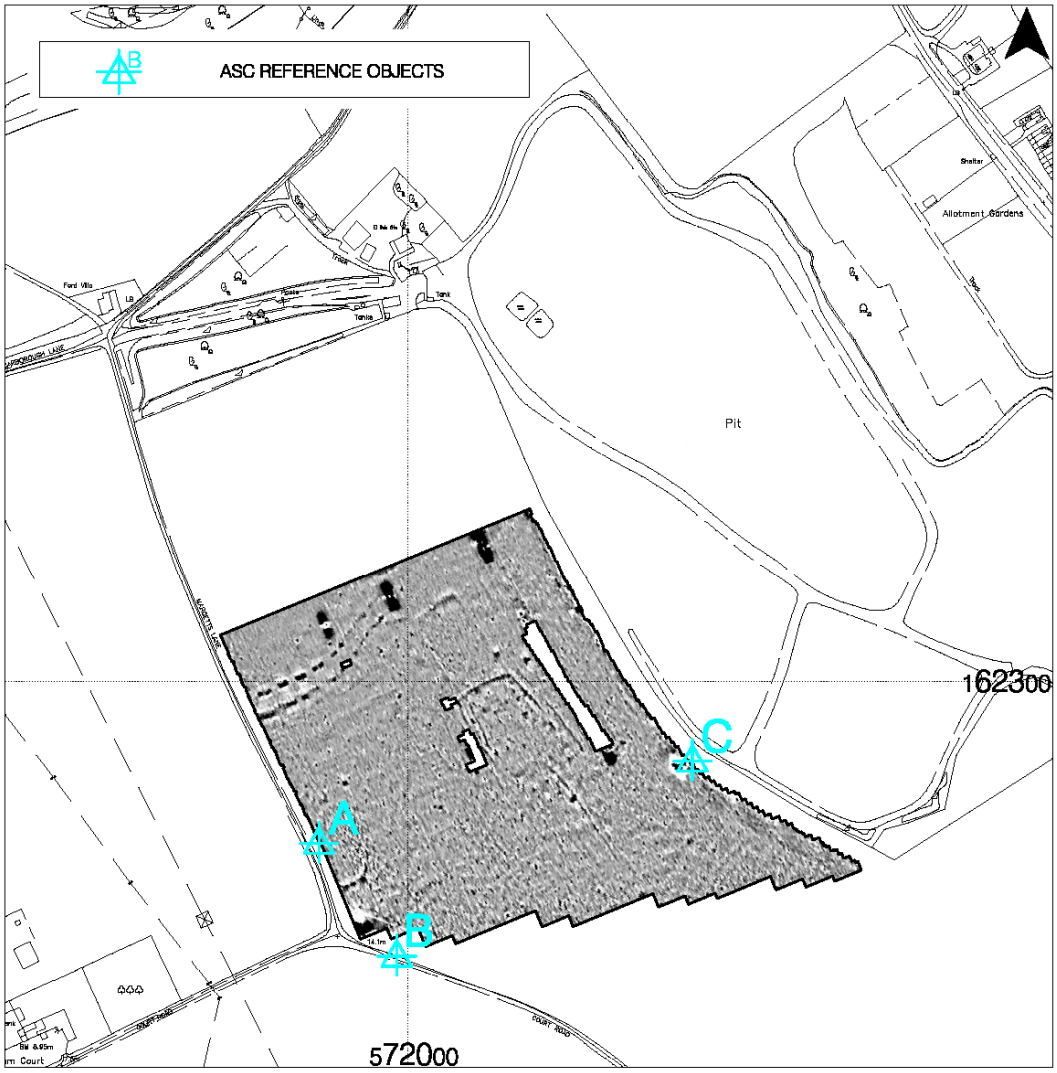

Figure 2: Survey location showing greyscale gradiometer data *(1:5000)*

2. Archaeological & Historical Evidence

2.1 *Introduction*

The local and regional settings of archaeological sites are factors that are taken into consideration when assessing the planning implications of development proposals. The study area lies within an area of archaeological and historical interest and the site has the potential to reveal evidence of a range of periods. The following sections summarise the findings of an archaeological desk-based study that examined an area lying within a 1km radius of the site (Faber and Maunsell 2007b).

2.2 *Early Prehistoric (before 4000BC)*

The findspots of two Palaeolithic flint handaxes are noted within the study area. Artefacts of this date are usually recovered from relict gravel river terraces and it is anticipated that archaeology of this period is unlikely to be present at the site itself as relict terraces are not present within it. No evidence of Mesolithic activity is recorded within the study area. Isolated Mesolithic finds are noted from Eccles and Aylesford slightly further south.

2.3 *Neolithic (c.4000BC-2200BC)*

A significant level of Neolithic settlement and ritual activity is recorded in this part of Kent. Sites of this period are not definitively known within the study area yet a large number of Megalithic monuments, including chambered tombs, are recorded within the surrounding area. Examination of an aerial photograph has suggested the presence of a causewayed enclosure a few hundred metres northwest of the site.

2.4 *Bronze Age (c.2200BC-600BC)*

Recovery of a single socketed axe is the only evidence of activity of this period within the study area. Findspots of bronze axes, swords, gold torcs and the locations of ring ditches and burials are recorded in the wider area.

2.5 *Iron Age (600BC-AD43)*

The location of a settlement of this period are suggested by pits, gullies and post holes discovered at the north of the study area. Outside the study area an Iron Age hut has been recorded at Eccles and an extensive Belgic cemetery is noted at Aylesford Pit.

2.6 *Romano-British (AD43-c.450)*

Extensive evidence of Romano-British activity is noted within the study area. A Mithraic Temple, since reinterpreted as a storage cellar and wharf were discovered *c.*700m WNW of the site on the eastern bank of the river Medway in 1893. A small building of this period was discovered *c.*400m SE of the site in 1896, the presence of decorated wall plaster, paved floors and hypocaust tile suggest that it was relatively well appointed. The location of a farmstead of this period is indicated by archaeological work *c.*1km NW of the site. The sites of several villas are located slightly outside the study area

2.7 *Early Medieval (c.450-1066)*

Early medieval sites are not recorded within the study area. An Anglo-Saxon cemetery at Eccles, slightly south of the study area, illustrates the presence of early medieval populations, although possibly at densities that have so far remained archaeologically invisible.

2.8 *Medieval (1066-1500)*

Burham is recorded in the Domesday Survey suggesting that a settlement may have existed here in the later, early medieval period. The medieval village was located to the west of the current village in the area of the 12th century St Mary's Church but relocated to higher and drier ground where the modern village is now situated in the 16th century. The site is likely to have fallen within the field system of the medieval village.

2.9 *Post-Medieval (1500-1900)*

Burham Common was inclosed in 1813 and largely became part of the holdings of the now defunct Burham Street Farm. Quarries and pits were dug to supply raw material for the burgeoning 18th/19th century cement and lime industries of this part of Kent and form the major post medieval monument form. Other sites of this period within the study area largely comprise the remains of built heritage, *e.g.* two timber framed and weather boarded 18th century barns to the northwest of Burham Church. The site continued as agricultural land during this period.

2.10 *Modern (1900-present)*

Recorded sites of this period consist solely of remains of homeland defences of the Second World War and include a concrete pillbox and the site of a heavy anti-aircraft battery.

2.11 *Uncertain date*

Rectilinear, circular and linear cropmarks are recorded *c.*1km northwest and south of the site. The large number of sites of different periods identified within the study area suggests that some if not all of the cropmarks will define the locations of settlement or agricultural features predating the medieval period.

3. Aims, Methodology and Report Presentation

3.1 *Aims*

The aims of the surveys were:

- To gather sufficient information to establish the location and extent of any archaeological features within the proposed site of the balancing lagoon and, where possible, to characterise the archaeology thus located.

- To inform any requirement for further archaeological work.

3.2 *Methods*

The methods adopted for this project were those set out in the project design (Hancock 2007) and consisted of:

3.3.1 *Fieldwalking*

- Collection of surface artefacts from an area 1m either side of transects spaced 5m apart across the 6.58 hectare survey area (Fig 3). The spatial resolution for recording the position of finds along a transect was no greater than 10m.

3.3.2 *Geophysical Survey*

- A detailed magnetometer survey of 6.58 hectares (Figs 4 and 5). The detailed magnetometer data was collected in 20m x 20m grids at 0.25m sample interval along zig-zag traverses 1m apart.

3.3 *Standards*

The work conformed to the requirements of the, to the *project design* (Hancock 2007), to the relevant sections of the Institute of Archaeologists' *Standard & Guidance Notes* (IFA 2001) and *Code of Conduct* (IFA 2000a) and to MAP2 (EH 1991). The work also conformed to the relevant sections of ASC's own *Operations Manual,* to English Heritage geophysical survey guidelines (David 1995) and to IFA geophysical survey guidelines (Gaffney *et al* 2002). Data from the magnetometer survey was treated and archived in accordance with Archaeology Data Service guidelines (Schmidt 2003).

3.4 *Report Presentation*

3.4.1 A general site location plan incorporating 1:25,000 Ordnance Survey mapping is presented in Fig. 1. Fig. 2 (1:5,000) shows the position of the geophysical survey block. The distribution of fieldwalking finds is presented in Fig. 3 at a scale of 1:1500. The processed greyscale gradiometer data and accompanying interpretation are presented in Figs. 4 and 5 at a scale of 1:1250. An XY trace plots (1:1250) of the unprocessed "raw" gradiometer data is presented in Appendix 4 (Fig. 6).

3.4.2 Comprehensive technical details on the underlying principles of magnetic survey, the equipment used and general geophysical survey methodology are given in Appendix 1. Details on data processing and display are also given in

Appendix 1. Survey location information is presented in Appendix 2 and the composition of the archive described in Appendix 3.

3.4.3 The geophysics interpretation was produced following analysis of the geophysical data in 'raw' and processed formats and over a range of different display levels. All figures are presented to most suitably display and interpret the data from this site based on the experience and knowledge of ASC staff.

4. Fieldwalking Survey: Results and Discussion

4.1 The range and quantity of artefacts recovered are summarised in Appendix 6. Other than struck flint, relatively few finds pre dating the modern period were observed and collected. Quantities of diagnostic archaeological material were insufficient for statistical analysis by standard deviation from the mean (Medlycott & Germany 1994), and finds are plotted directly on the basemap using their fieldwalking grid co-ordinates (Fig. 3).

4.2 The following paragraphs contain comment on the quantity, range, condition and location of the finds recovered in the survey.

4.3 ***Prehistoric***

Assessment of the collected flint (Bevan 2007. Appendix 5) has determined that the assemblage is largely unworked and consisted of fifty-five unretouched flakes, plus one core, five scrapers, and ten retouched flakes.

The raw material used for producing the struck flint was mid/dark brown or grey in colour, often corticated and usually of poor quality, factors which suggest that it was acquired from a secondary source rather than being extracted directly from the local chalk. A later prehistoric date (Bronze Age/Iron Age) is tentatively suggested for the core, scrapers and majority of the unretouched and retouched flakes. One retouched blade and an unretouched flake possessed attributes suggesting that they may date to the Neolithic period.

The majority of flint artefacts were recovered over and west of archaeological pits and ditches located by geophysical survey (Section 5). The tentative attribution of the majority of the flint assemblage to later prehistoric periods could suggest a date for some of the buried archaeological features.

A notable absence of recovered flint artefacts is observed at the southeast of the fieldwalked area, although deeper soils are probably present here and recent shallow ploughing may have left lithics undisturbed.

4.4 ***Iron Age/Romano-British***

A small (*c.*1cm), abraded sherd of thin, grog tempered pottery of Iron Age (IA) or Romano-British (RB) date was recovered from the southeastern quadrant of the site. The sherd has a reduced grey core and thin, oxidised (red/brown) rough surfaces.

Two small, heavily abraded pieces of possible Romano-British ceramic building material (cbm) were collected during fieldwalking. Both were made of a soft, smooth, light orange fabric and contained a small amount of shell temper.

The pieces of cbm are probably present due to manuring activity of the RB or later periods rather than signifying the presence of structural features of this period. The pot sherd was recovered slightly south east of a rectilinear enclosure located by geophysical survey although a date for the enclosure should not be inferred from a single pot sherd.

4.5 ***Medieval***

Two small sherds of unglazed and untempered earthenware of the later medieval period were recovered at the southeast of the survey area. The sherds were probably deposited during manuring activity.

Four small, heavily abraded pieces of ceramic building material may date to the later medieval period. Three of the pieces of cbm were collected from locations near the eastern field boundary and may be present due to relatively modern activity associated with Margetts Pit. However, deposition of this material as a consequence of medieval manuring regimes is possible.

4.6 *Post Medieval and Modern*

Small fragments of clay pipe and oyster shells were noted scattered across the survey area. A small assemblage of post medieval cbm was recovered during fieldwork. Only pieces that could date to early post medieval period were collected (Fig 4).

Sherds of late post medieval and modern ceramics and fragments of cbm were also observed distributed widely across the survey area but were not collected.

Fragments of glass were collected for subsequent examination. The collected glass dated to the late post medieval and modern periods and its distribution has not been plotted.

It seems likely that all of the post medieval and modern objects are present as a consequence of recent manuring practices.

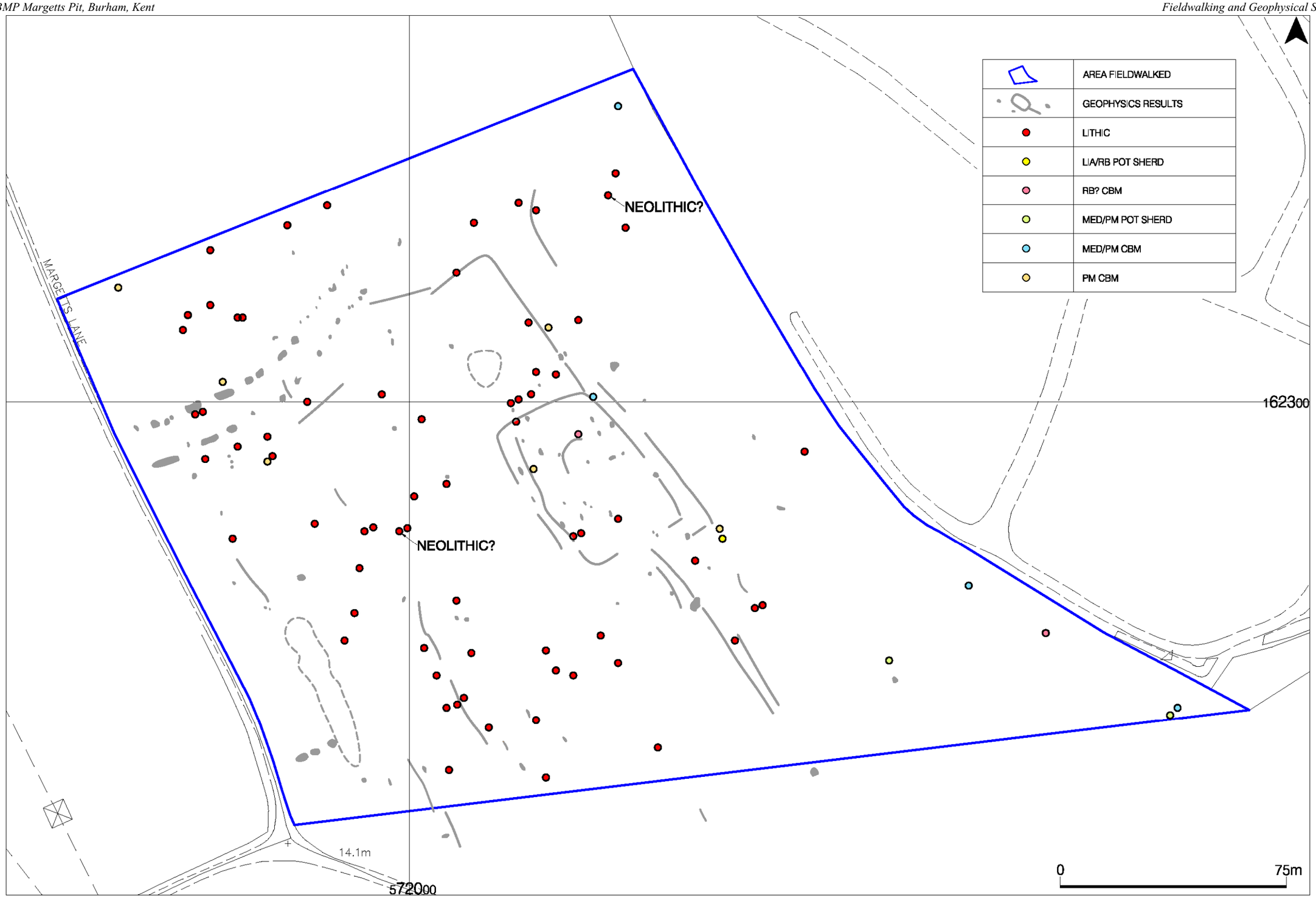

Figure 3: Spatial distribution of fieldwalking finds *(1:1500)*

5. Geophysical Survey: Results and Discussion

Non Archaeological Anomalies

5.1 A strong negative magnetic anomaly was present adjacent to the northeastern perimeter of the survey block. This type of anomaly is characteristic of magnetic disturbance resulting from modern activity and is consistent with the presence of buried landfill within Margetts Pit. The anomaly was processed out of the greyscale data presented in Figure 4 using a high pass filter and is not shown on the interpretation (Fig 5).

5.2 Discrete dipolar anomalies ("iron spikes" – Appendix 1) are identified distributed across all parts of the site. These "iron spikes" are usually indicative of ferrous objects or other strongly magnetic material incorporated into the topsoil/subsoil and they are often caused by modern cultural debris. Archaeological artefacts may manifest this type of anomaly and significant clusters associated with other substantiating evidence may be included in the discussion of archaeological anomalies.

5.3 A large area of magnetic disturbance is visible at the extreme southwest corner of the survey block. This type of magnetic anomaly is characteristic of modern ferrous or fired/heated objects and is probably caused by a subsurface ferrous service pipe.

5.4 Five discrete areas of magnetic disturbance caused by ferrous gas monitoring pipes are present at the north (three), and immediately adjacent to overgrown and unsurveyed areas of set aside (two), located at the centre and east centre of the block.

5.5 Four, north-northeast - south-southwest aligned, weak negative linear trends are present at the north of the survey block. Their locations are coincidental with the eastern edges of three identically orientated strips of set aside. They have a modern agricultural origin resulting from the presence of lines of shallower topsoil at the edge of ploughing. A NE – SW aligned linear negative anomaly at the southwestern corner of the survey block is also caused by a shallower line of topsoil located at the edge of a band of unploughed ground that ran parallel with Court Road.

5.6 Weakly positive, NNE–SSW orientated, linear magnetic trends are identified at the centre and south-centre of the survey block. The orientation of the trends is similar to the observed direction of ploughing and a modern agricultural origin caused by slight variations in the thickness of topsoil possessing strong magnetic contrast with the underlying geologies is suspected.

Archaeological Anomalies

5.7 A large discrete area of magnetic disturbance is present adjacent to the northeastern limit of the survey block (**A**) and may be caused by a large, deeply buried, modern ferrous object. However, a smaller, shallower thermoremanent feature, *e.g.* a kiln, could cause a similar anomaly and this anomaly may have an archaeological origin.

5.8 Linear, NNE–SSW orientated, positive anomalies are identified at the west of the survey block (**B**). They are similarly aligned to the positive trends discussed in Section 5.6, but are slightly stronger anomalies and thus appear more archaeological

in character. However, their alignment suggests that they may prove to have a relatively modern agricultural origin.

5.9 A large, diffuse area of magnetic disturbance (**C**) is identified at the southwest of the survey block. The proximity of this area to the entrance to the field could indicate that modern dumping/consolidation activity is the cause. However, the proximity of this area to three possible archaeological pits (**D**) suggests that the disturbance may have an archaeological origin.

5.10 Three discrete areas of strong magnetic enhancement (**D**), and a further discrete area of enhancement (**E**) located *c.*70m north of (**D**), are identified at the southwest of the survey block. These anomalies are characteristic of those caused by cut and infilled pits and are likely to have an archaeological origin. Smaller and magnetically weaker areas of enhancement are identified distributed throughout the survey block and their origins are more tentatively attributed to the presence of cut and infilled pits.

5.11 Positive rectilinear and linear anomalies (**F** and **G**) are characteristic of those caused by cut and infilled archaeological ditches. The anomalies locate a rectilinear enclosure (**F**) that appears to be bounded by double ditches on its southwestern and northeastern sides. Anomaly **G** locates a probable trackway or boundary ditch that extends southeast of the enclosure. A large discrete area of magnetic enhancement intersects **G** and is characteristic of the type of anomaly caused by a cut and infilled pit. Magnetically weaker linear and curvilinear positive magnetic anomalies, plus discrete areas of magnetic enhancement are identified within and without the ditches, and may identify the positions of other cut and infilled archaeological features.

5.12 A weak linear positive anomaly (**H**) extends *c.*55m NW from the NE corner of enclosure **F**, then returns to run along a SW-NE alignment for *c.*25m. A further weak positive linear anomaly may extend WSW from the return to run toward two parallel lines of discrete areas of magnetic enhancement (**K**) discussed in Section 5.15. A weak linear anomaly (**H?**) may define a further western section of anomaly **H**. Parts of anomaly **H** are magnetically weak and are tentatively identified, yet **H** appears to locate the remnants of a cut and infilled ditch that suggests the presence of a large rectilinear enclosure appended to enclosure **F**.

5.13 A weak positive curvilinear anomaly (**I**) is identified *c.*20m east of anomaly **H**. It is a less pronounced magnetic anomaly than **H** and its orientation suggests that it could be caused by modern agricultural activity. However, an archaeological origin is not discounted, and it may define part of an opposing trackway ditch.

5.14 A small area of weak magnetic disturbance (**J**) is identified southwest of possible ditch **H** and northwest of enclosure **F**. The disturbance may be caused by the presence of a small number of cut and infilled archaeological features although a modern origin is equally probable.

5.15 Two parallel, curvilinear alignments of discrete areas of magnetic enhancement (**K**) are visible at the northwest of the survey block. The anomalies are characteristic of those caused by cut and infilled archaeological features and define the position of pits or ditch segments that may locate part of a suggested causewayed enclosure which is tentatively identified from an aerial photograph.

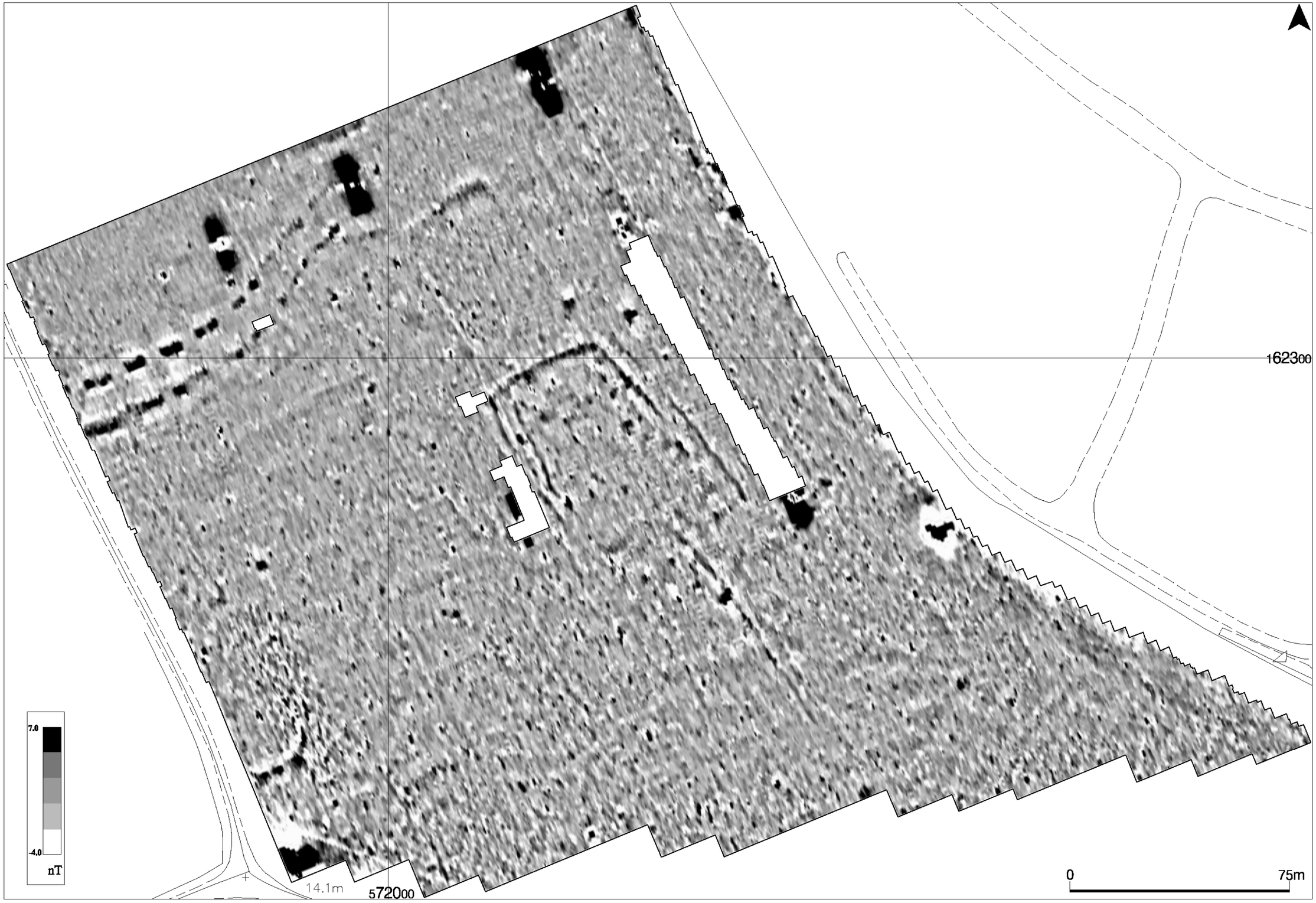

Figure 4: Greyscale plot of gradiometer data *(1:1250)*

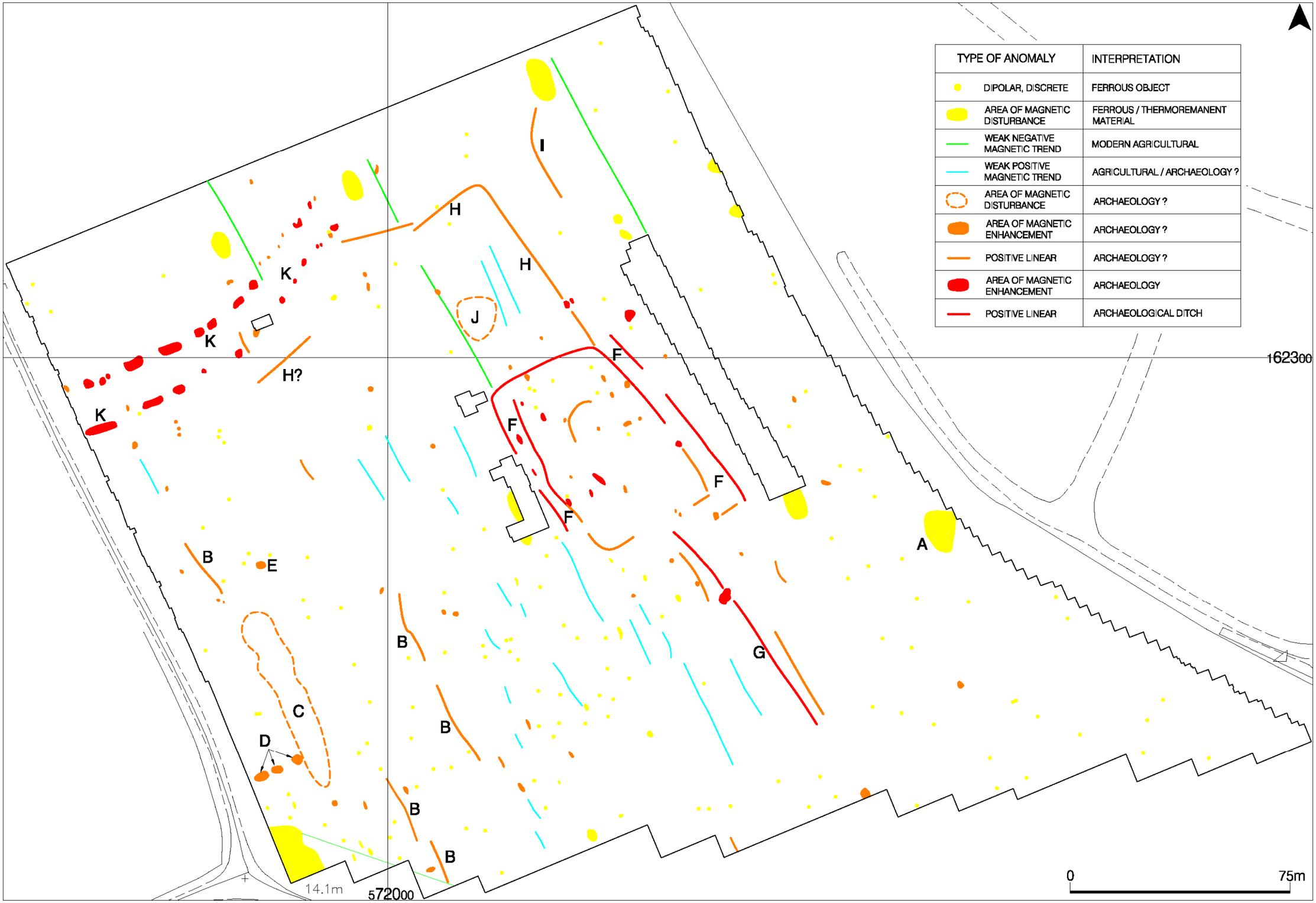

Figure 5: Interpretation of gradiometer data *(1:1250)*

6. Conclusions

6.1 Seventy flint artefacts were recovered during the fieldwalking. A Bronze Age/Iron Age date is tentatively suggested for the majority of the flint assemblage. Few other artefacts were collected during the fieldwalking and those that were probably result from past manuring regimes.

6.2 The magnetometer survey has defined the position of two parallel, curvilinear alignments of pits or ditch sections (**K**), that may confirm the presence of a Neolithic causewayed enclosure, tentatively identified at the western side of Margetts Lane from an aerial photograph (Faber Maunsell 2007b). The form of this monument cannot be inferred from the geophysics results as only a small part of it falls within the area surveyed. Its date also remains uncertain, only two flints tentatively dated to the Neolithic period were collected and they were recovered some distance from it.

6.3 Cut and infilled archaeological ditches of a rectilinear enclosure (**F**), an appended trackway/boundary ditch (**G**) and other associated archaeological features are identified at the east centre of the survey area. The strength of the magnetic anomalies caused by the enclosure ditch fills suggests that they define an area of settlement. The date of the enclosure is uncertain, although its rectilinear shape and the probable late prehistoric date of the majority of the recovered lithic assemblage could suggest that it defines the location of an Iron Age settlement.

6.4 A further ditch (**H**) is identified extending *c.*55m NW from the northeastern corner of enclosure (**F**) until it returns to run SW-NE. The magnetic anomaly caused by the fill of ditch **H** is considerably weaker than those presented by the ditches of enclosure **F** and may suggest that it is shallower, more truncated or encloses an area used for agricultural purposes rather than settlement

6.5 Three strong, discrete magnetic anomalies (**D**), suggesting the positions of three large cut and infilled archaeological pits, are present at the southwest of the survey area. Area of disturbance **C**, which is located immediately adjacent to **D**, is characteristic of disturbed or consolidated ground and could result from relatively recent activity although the proximity of area **C** to **D** could indicate an archaeological origin for **C**.

6.6 NW-SE orientated weak positive linear trends are distributed across the survey area and magnetically stronger examples are shown on the interpretation (Fig 5). The alignment of these trends is similar to the direction of ploughing and they may be caused by slight variations in the thickness of topsoil possessing significant magnetic contrast with the underlying geologies. Similarly aligned but slightly stronger linear anomalies that appear more archaeological in character (**B**) are identified at the southwest of the survey area. Whether these anomalies are caused by modern agricultural activity or archaeological features is uncertain

6.7 The archaeological potential of all but the southeastern corner of the survey area is considered high.

The results and subsequent interpretation of data from geophysical surveys should not be treated as an absolute representation of the underlying archaeological and non-archaeological remains. Confirmation of the presence or absence of archaeological remains can only be achieved by direct investigation of sub-surface deposits.

7. References

Standards & Specifications

Allen J L & Holt A St J, 1986 (with later updates) *Health & Safety in Field Archaeology.* Standing Conference of Unit Managers (London).

EH 1991 *The Management of Archaeological Projects, 2nd edition.* English Heritage (London).

EH 1995 *Geophysical Survey in Archaeological Field Evaluation*. English Heritage (London).

Faber Maunsell 2007a Proposed Development at Margetts Pit, Burham, Kent. Specification for an Archaeological Geophysical and Fieldwalking Survey.

Faber Maunsell 2007b *Margetts Pit, Proposed Lagoon Development. Culturla Heritage Desk-Based Assessement.* Unpublished client report. Ref: 031 RE-01

Ferguson L.M. & Murray D.M. 1997 *Archaeological Documentary Archives: Preparation, Curation and Storage.* Institute of Field Archaeologists' Paper **1** (Manchester).

Gaffney C, Gater J and Ovenden S 2002 *The Use of Geophysical Techniques in Archaeological Evaluations.* Institute of Field Archaeologists Paper **6** (Reading).

Hancock A 2007

IFA 2000a Institute of Field Archaeologists' *Code of Conduct.*

IFA 2000b Institute of Field Archaeologists' *Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology.*

IFA 2001 Institute of Field Archaeologists' *Standard & Guidance* documents *(Desk-Based Assessments, Watching Briefs, Evaluations, Excavations, Investigation and Recording of Standing Buildings, Finds)*.

McKinley J.I. & Roberts C. 1993 *Excavation and Post-Excavation Treatment of Cremated and Inhumed Human Remains*. Institute of Field Archaeologists Technical Paper **13**.

Medlycott M & Germany M 1994 'Archaeological Field Walking in Essex 1985-1993: Interim Results', *J. Essex Archaeol. Hist. Soc.* **25**.

MGC 1992 *Standards in the Museum Care of Archaeological Collections.* Museums and Galleries Commission (London).

Schmidt A. 2003 *Geophysical Data in Archaeology: A Guide to Good Practice.* Arts and Humanities Data Service.

SMA 1995 *Towards an accessible archaeological archive - the transfer of archaeological archives to museums: guidelines for use in England, Northern Ireland, Scotland and Wales.* Society for Museum Archaeologists (London).

Walker, K. 1990: *Guidelines for the preparation of excavation archives for long-term storage.* United Kingdom Institute for Conservation, Archaeology Section (London).

Watkinson D & Neal V 1998 *First Aid for Finds* (third edition). Rescue (Hertford & London).

Secondary Sources

Soil Survey 1983 *1:250,000 Soil Map of England and Wales, and accompanying legend* (Harpenden).

8. Acknowledgements

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Fieldwork was carried out by the author and Ralph Brown BA and the report was edited by D. Fell MA MIFA.

Fieldwork

A Hancock BSc PgDip
R Brown BA

Report

A. Hancock

Graphics

A. Hancock

Appendix 1: Magnetic Survey: Technical Information

1. Magnetic Susceptibility and Soil Magnetism

1.1 Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed ***magnetic susceptibility***. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms. These effects are often observable by measuring the magnetic susceptibility of the topsoil, which can enable identification of areas where human occupation or settlement has occurred by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently fills features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

1.2 In general, it is a contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of the surrounding matrix, i.e topsoils, subsoils and rocks, into which these features have been cut that causes the most recognisable archaeological responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected. Less magnetic material such as masonry or plastic service pipes that intrude into the topsoil may give a negative magnetic response relative to the background level.

1.3 An alternative method of enhancement to the magnetic properties of soil or archaeological features is through sustained heating. This can lead to the detection of features such as hearths, kilns or burnt areas through thermoremanent magnetism.

2. Types of Magnetic Anomaly

2.1 In the majority of instances anomalies are termed ***'positive'***. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as ***'negative'*** anomalies that, conversely, means that the response is negative relative to the mean magnetic background. Such negative anomalies are often very faint and are commonly caused by modern, non-ferrous, features such as plastic water pipes. Infilled natural features may also appear as negative anomalies on some geologies.

2.2 Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

2.3 It should be noted that some anomalies that are interpreted as modern in origin might be caused by features that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the origin of the anomaly.

2.4 The types of response mentioned above can be divided into five main categories which are used in the graphical interpretation of the magnetic data:

Isolated dipolar anomalies (iron spikes)

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

Areas of magnetic disturbance

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. This type of anomaly is characterised by very strong, 'spiky' variations in the magnetic background. A modern origin is usually assumed unless there is other supporting information.

Linear trend

This is usually a weak or broad linear anomaly of unknown cause or date. An agricultural origin, either ploughing or land drains is a common cause.

Areas of magnetic enhancement/positive isolated anomalies

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an X–Y trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic of an area of magnetic disturbance or of an 'iron spike' (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post holes or by kilns, with the latter often being characterised by a strong, positive double peak response. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

Linear and curvilinear anomalies

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.

3. Methodology

3.1 Gradiometer Survey

There are two main methods of using the fluxgate gradiometer for commercial evaluations. The first of these is referred to as ***scanning*** and requires the operator to visually identify anomalous responses on the instrument display panel whilst covering the site in widely spaced traverses, typically 10-15m apart. The instrument logger is not used and there is therefore no data collection. Once anomalous responses are identified they are marked in the field with bamboo canes and approximately located on a base plan. This method is usually employed as a means of selecting areas for detailed survey when only a percentage sample of the whole site is to be subject to detailed survey. In favourable circumstances scanning may be used to map out the full extent of features located during a detailed survey.

The second method is referred to as ***detailed survey*** and employs the use of a sample trigger to automatically take readings at predetermined points, typically at 0.5m intervals, on zig-zag traverses 1m apart. These readings are stored in the memory of the instrument and are later dumped to computer for processing and interpretation.

A Bartington Grad 601-2 fluxgate gradiometer was used for the detailed gradiometer survey. Readings were taken, on the 0.1nT range, at 0.25m intervals on zig-zag traverses 1m apart within 20m by 20m square grids.

3.2 Data Processing and Presentation

The detailed gradiometer data has been presented in this report in X-Y trace and greyscale formats. The former option shows the 'raw' data with no processing other than grid biasing whilst in the latter the data has been selectively filtered to remove spurious errors such as striping effects and edge discontinuities caused by instrument drift and inconsistencies in survey technique caused by poor field conditions.

An X-Y plot presents the data logged on each traverse as a single line with each successive traverse incremented on the Y-axis to produce a 'stacked' plot. A hidden line algorithm has been employed to block out lines behind major 'spikes' and the data has been clipped at 5nT. The main advantage of this display option is that the full range of data can be viewed, dependent on the clip, so that the 'shape' of individual anomalies can be discerned and potentially archaeological anomalies differentiated from 'iron spikes'. ArchaeoSurveyor was used to create the X-Y trace plots.

ArchaeoSurveyor was used to process the data and produce the greyscale images and XY trace plots. All greyscale plots are displayed using a linear incremental scale.

Appendix 2: Survey Location Information

1. The fieldwalking and geophysical survey grid was established using a Pentax R-326EX total station. Survey block points were set out at 60m intervals with the total station and points at 10m and 20m intervals were set out as required using 100m tapes.

2. The survey grids were superimposed onto an Ordnance Survey digital map base. Overall there was a good correlation between the local survey and the digital map base and it is estimated that the average 'best fit' error is better than ±2m. It should be noted that Ordnance Survey 1:2500 mapping data have an error of ±1.9m at 95% confidence. This potential error must be considered if co-ordinates are measured off for relocation purposes from points other than those listed below or if anomalies are relocated using GPS technology.

Station	Easting	Northing
A (wooden stake)	571938.178	162187.363
B (wooden stake)	571992.248	162109.085
C (wooden stake)	572197.745	162244.598

ASC Ltd cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party or for the removal of any of the survey reference points.

Appendix 3: Archive

1. The geophysical archive comprises:-

    - an archive disk containing compressed (WinZip 8) files of the raw data; plot meshes, composites, report text (Word 2000), and graphics files (CorelDraw12 and AutoCAD 2006) files.
    - a full copy of the report.

2. The fieldwalking archive comprises:-

    - Finds, field records and photographs.

At present the archive is held by ASC Ltd although it is anticipated that the geophysical archive may eventually be lodged with the Archaeology Data Service (ADS). Brief details may also be forwarded for inclusion on the English Heritage Geophysical Survey Database after the contents of the report are deemed to be in the public domain (*i.e*. available for consultation in the relevant Sites and Monument Record Office). An online OASIS form will be completed.

In the event that deposition of the fieldwalking archive cannot be concluded, ASC will store the archive to a suitable standard until deposition can be arranged. However, if suitable deposition arrangements cannot be agreed ASC reserves the right to dispose of the archive after a period of five years from completion of the final report and following consultation with the relevant Archaeological Advisor.

Appendix 4: XY Trace Plots of Raw Gradiometer Data (1:1250)

Figure 6: XY trace plot of "raw" gradiometer data *(1:1250)*

Appendix 5: Specialist Reports

Assessment of the Worked Flint by Lynne Bevan

Introduction

A small flint assemblage recovered during fieldwalking on land near Margetts Pit, Burham, Kent was examined with the aid of a hand lens at x10 magnification for purposes of identification and assessment. A total of 71 flints, weighing c. 770 grams, appear to have been humanly struck, despite their generally poor quality, since the majority of pieces had sustained breakage and abrasion. In addition, a rough, recorticated chunk weighing 73 grams was probably natural, although plough-damaged, and, as such, is not included in the quantification in Table 1 below.

Following identification, a summary listing was made of the flints by tool or waste category. Noteworthy and/or datable items discussed below are referred to by individual grid co-ordinates.

This assessment was undertaken in cognisance of the procedures of assessment as set out in MAP 2 (English Heritage 1991), to provide both a quantification of the assemblage and a qualitative overview of its potential for further analysis.

Raw Material

The flint was generally mid-to-dark brown and grey in colour with, when present, the thin compacted cortex characteristic of flint from secondary deposits such as river gravels or boulder clays rather than flint from a primary mined source. However, a primary source cannot be ruled out for at least some of the flint due to the location of the site on the chalk.

Much of the flint was of a poor quality, with a high incidence of hinge fractures apparent, as well as edge damage and abrasion. Many pieces had also become totally or partially white in colour, the result of recortication (or patination), a process which tends to obscure the characteristics of worked flint, including edge retouch where present.

Summary of the Assemblage

The artefactual breakdown of the assemblage, which was comprised mainly of struck flakes and a small number of marginally retouched tools, is shown in Table 1.

Flake	Core	Scraper	Other Retouched
55	1	5	10

Table 1: Artefactual Breakdown of Assemblage

One core was identified: an exhausted flake core weighing 37 grams (72083/62392), with wear traces suggestive of its reuse as a hammerstone. A small number of possible tools was identified, including five rough side and end scrapers, a notched flake, a retouched blade and eight other marginally retouched pieces. None of these was chronologically-diagnostic, although the retouched blade (71996/62248) may be of Neolithic date, in common with an unretouched flake with blade-like detachments from its dorsal (72080/62383). The flake core

(72083/62392) is likely to date to the Bronze Age period, in common with the majority of the flakes, including the retouched flakes, which tended to be broad and squat and typical of Later Neolithic - Bronze Age industries (e.g. Pitts 1978). An Iron Age date may also be possible for some of this material since the existence of Iron Age flintworking assemblages is now a well established idea in lithic studies (e.g. Young and Humphrey 1999; Humphrey and Young 2003) and Iron Age flints differ little in technological terms from those of Middle to Later Bronze Age date.

Conclusions

This fieldwalking assemblage will represent a very small portion, c. 10% or less, of the original flintwork present in the soil. Its unstratified nature means that close chronological contemporaneity cannot be assumed between any of the items.

Dating information is virtually absent, apart from two potentially Neolithic items being present, most of the flint being assigned a generally later prehistoric date. One of the main problems in this case is the difficulty in distinguishing between flint from various phases of the Bronze Age or even the Iron Age.

Therefore, due to the small size of the collection, the high incidence of undiagnostic waste material and the small number of artefacts, none of which is closely datable, no possible chronological patterning was discerned in the on-site distribution of any of the material. The presence of scrapers and certain other retouched tools has been regarded as indicative of occupation *foci* (Schofield 1987, 280), although the small amount of scrapers in the assemblage and the difficulty of relating them in chronological terms, either to each other or to other flints from the site, precludes any detailed analysis of past activities in the landscape.

Recommendations

In view of the results detailed above this assemblage appears to be of very limited value in reconstructing past prehistoric activity in this particular area of Kent. No further action is recommended apart from depositing a copy of this report in the County Sites and Monuments Record Office.

Bibliography

English Heritage 1991 *MAP 2. Management of Archaeological Projects*. Second Edition. English Heritage, London.

Humphrey, J. and Young, R. 2003 Flint Use in Later Bronze and Iron Age England? Some Criteria for Future Research. In Moloney. N. and Shott, M.J. (eds) 2003 *Lithic Analysis at the Millennium.* Institute of Archaeology, University College London, 79-89.

Pitts, M. 1978 On the Shape of Waste Flakes as an Index of Technological Change in Lithic Industries. *Journal of Archaeological Science* 5, 17-37.

Schofield, A.J. 1987 Putting Lithics to the Test: Non-Site Analysis and the Neolithic Settlement of Southern England. *Oxford Journal of Archaeology* 6 (3), 269-285.

Young, R. and Humphrey, J. 1999 Flint Use in Later Bronze Age and Iron Age England – Fact or Fiction? *Lithics* No. 20, 57-61.

Appendix 6: Fieldwalking Finds

Site ; 1005 BMP Field Walking Finds						
Co-ordinates	C.B.M.	Pipe	Pottery	Glass	Flint	Shell
71883/62346	1 (PM)					
71909/62329					1	
71911/62335					1	
71917/62296					2	1
71918/62277					1	
71920/62339				1	1	
71920/62361					1	
71925/62308	1 (PM)	1				
71929/62245				1	1	
71931/62334					1	1
71931/62282					1	
71933/62334					1	1
71938/62244					1	
71943/62276	1 (PM)			1		
71943/62286					1	
71950/62317		1				
71951/62200				2		
71951/62356					1	
71951/62371					1	
71958/62242						1
71959/62300		1			1	
71962/62208				1		
71962/62251					1	
71963/62190				1		
71963/62262				1		
71966/62217						1
71966/62196		1		1		
71967/62379				1	1	
71970/62214				1		
71971/62221				1		
71974/62204					1	
71978/62215					1	1
71980/62233					1	
71982/62248					1	
71989/62303					1	
71996/62248					2 (1 retouched NEO?)	
72002/62262					1	
72005/62293					1	
72006/62201					1	
71008/62291					2	
72010/62235						1
72010/62293		1				
72011/62190					1	
72012/62244						1
72012/62283				1		
72015/62177					2	
72015/62267					1	2
72016/62152					1	
72019/62220		1			1	
72019/62352					1	
72022/62181					1	
72024/62229				1		

72025/62199		1			1	
72026/62372					1	
72031/62259				1		
72032/62169					1	
72041/62357		1				
72043/62292					1	
72044/62301					3	2
72044/62380					1	
72048/62332					1	
72050/62273	1 (PM)					
72050/62307						1
72051/62172					1	
72051/62312					1	
72051/62377					1	
72055/62149					1	1
72055/62200					1	
72056/62330		1				
72059/62192		1			1	
72059/62311	1 (PM)					
72060/62266		1				
72063/62412				1		
72064/62268						1
72066/62190					1	
72066/62246					2	
72068/62287	1 (RB)					
72068/62333		1			1	
72074/62279		1				1
72074/62302	1 (M/PM)					
72077/62206					1	
72080/62383					1 (Flake NEO?)	
72083/62392					1	
72084/62195					1	
72084/62253					1	
72084/62419	1 (M/PM)					
72087/62370		1			1	
72088/62278				1		
72088/62311						2
72100/62161					1	
72107/62291				1		1
72115/62236					1	
72124/62205	1 (PM)					
72126/62245			1 (LIA/RB)			
72127/62197					1	
72127/62262		1		1		
72131/62204					1	
72136/62324						1
72139/62217					2	
72156/62224				2		
72159/62280					1	
72193/62196			1 (M)			
72225/62262	1 (M/PM)					
72256/62207	1 (RB)	1				
72306/62174			1 (M)			
72309/62177	1 (M/PM)				1	1

Appendix 7.: ASC OASIS Form

PROJECT DETAILS						
Project Name:	Fieldwalking and Geophysical Surveys: Margetts Pit, Burham, Kent					
Short Description:	*In November 2007 ASC Ltd was commissioned to undertake fieldwalking and detailed magnetometer survey over a 6.58 hectare parcel of arable land located immediately east of Margetts Pit, Burham, Kent. Seventy struck flints were recovered during the fieldwalking, two are tentatively dated to the Neolithic period and the remainder are probably Bronze Age/Iron Age. A small assemblage of other artefacts predating the late post medieval and modern eras was recovered but is not considered archaeologically significant.* *The geophysical survey has defined the location of two parallel curvilinear alignments of pits or ditch segments, which could define part of a Neolithic causewayed enclosure previously identified beyond the western limit of the survey area on an aerial photograph. The magnetometer data also defines the location of a rectilinear enclosure with ditches at the north and south that probably define a larger appended enclosure. Other magnetic anomalies to the west of the enclosure ditches may define further cut and infilled features although an archaeological origin for these anomalies is less certain.*					
Project Type: (indicate all that apply)	DBA	**FW**	**Geophys**	Survey	Bldg Rec	Post-Exc
	WB	Strip&Rec	Trenching	Test pits	Exc	Other
Site status: (eg. none, SAM, Listed)	None		Previous work: (eg. SMR refs)		DBA	
Current land use:	Arable		Future work: (yes / no / unknown)		Yes	
Monument type:	Parallel pits/ditch segments. Rectilinear enclosure		Monument period:		Neo?, IA?	
Significant finds: (artefact type & period)	Lithics (Late prehistoric?)					
PROJECT LOCATION						
County:	Kent		OS reference: (to at least 8 figures)		TQ 7205 6222 (site centre)	
Site address: (with postcode if known)	Margetts Pit, Burham, Kent					
Study area: (sq. m. or ha)	*6.58*ha		Height OD: (metres)		*c.*20m-*c.*10m	
PROJECT CREATORS						
Organisation:	Archaeological Services & Consultancy Ltd					
Project brief originator:	Faber Maunsell Ltd		Project design originator:		A Hancock	
Project Manager:	A Hancock		Director/Supervisor:		A. Hancock	
Sponsor / funding body:	Aylesford Newsprint Ltd					
PROJECT DATE						
Start date:	29th Oct 2007		End date:		5th Nov 2007	
PROJECT ARCHIVES						
	Location (Accession no.)		Content (eg. pottery, animal bone, files/sheets)			
Physical:	ASC Ltd		Lithics			
Paper:	ASC Ltd		Fieldwork records, report and Project Design			
Digital:	ASC Ltd		Report text, geophysical data, illustrations, basemap			
BIBLIOGRAPHY (Journal/monograph, published or forthcoming, or unpublished client report)						
Title:	Fieldwalking and Geophysical Surveys: Margetts Pit, Burham, Kent					
Serial title & volume:	Unpublished client report					
Author(s):	A Hancock					
Page nos	1 - 32		Date:		10th Dec 2007	