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ARCHAEOLOGICAL DESK TOP STUDY AND FLUXGATE GRADIOMETER SURVEY

SITES A - C, HOLBEACH HURN LINCOLNSHIRE

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ARCHAEOLOGICAL DESK TOP STUDY AND FLUXGATE GRADIOMETER SURVEY

SITES A - C, HOLBEACH HURN LINCOLNSHIRE

Report prepared for GR Merchant
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Contents

Summary

- *An archaeological desk top assessment and fluxgate gradiometer survey were undertaken for approximately 3 hectares of land at Holbeach Hurn, South Lincolnshire (TF 392 271) during February 2000*

- *In view of proposed development, the land (designated Areas A – C) was assessed for its archaeological potential by integrating a study of all available record sources with the geophysics data.*

- *It is concluded that groundworks associated with the proposed development are likely to disturb a number of archaeological deposits identified by gradiometer and general site survey. There is an additional possibility of disturbance to related, unquantified deposits, given the close proximity of medieval salt-making remains. In view of this it is considered prudent to explore methods for further evaluation of the archaeological resource.*

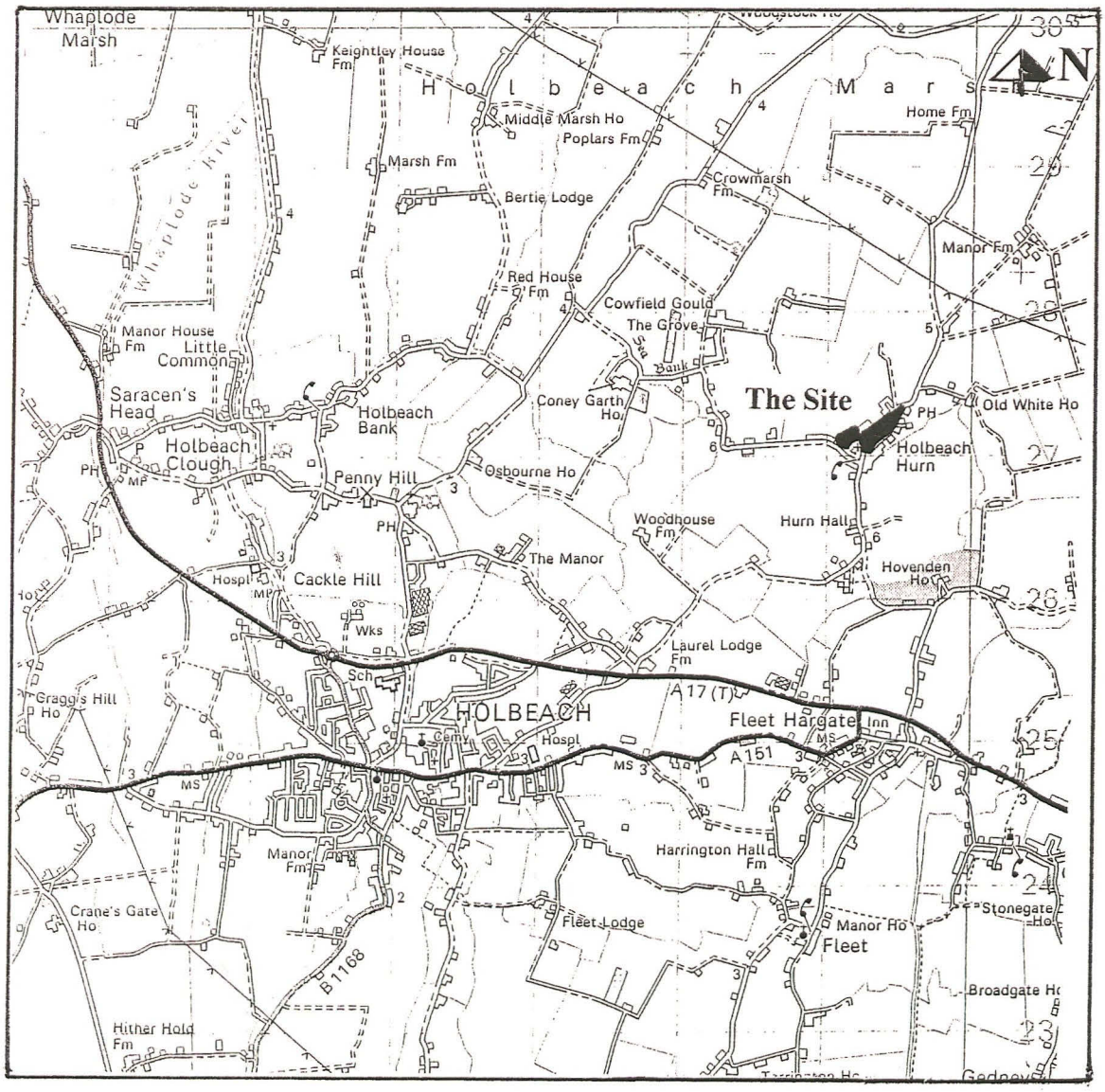


Fig. 1 Site location, scale 1: 50 000

1.0 Introduction

1.1 Pre-Construct Archaeology (Lincoln) were asked by G R Merchant to undertake a desk-based assessment and to commission a detailed geophysical (gradiometer) survey of approximately 3 hectares of land at Holbeach Hurn, South Holland, Lincolnshire. This report collates all available information relating to the three site units and their immediate environment, together with the results of the gradiometer survey, conducted 22 – 24 February 2000 (Appendix II).

1.2 This assessment has been prepared to meet the requirements of a project brief issued by the Built Environment Section of Lincolnshire County Council and of the client company. It has also made use of the guidelines set out in the LCC Archaeology Section document '*Lincolnshire Archaeological Handbook: A Manual of Archaeological Practice*', 1998.

2.0 Site description and planning background

2.1 Holbeach Hurn is within the administrative district of South Holland in the south Lincolnshire fens, approximately 5km north-east of Holbeach and 10km south of the Wash.

2.2 The proposed development area comprises three units, A to C, in the north-east part of the village, covering a total area of approximately 3 hectares (Fig. 2).

2.3 Area's A and C currently comprise one unit of common land with low grass cover, bounded by Marsh Road to the north-west and Low Road to the south-east. Area B is currently a playing field and tennis court immediately north-west of Area A, close to St Luke's Church.

2.4 The three sites are the subjects of a planning application submitted to South Holland District Council. Site A (1.4 hectares) is proposed for change of use to a recreation area and associated car park. Residential development is proposed for site B (0.74 hectares) and site C (0.82 hectares).

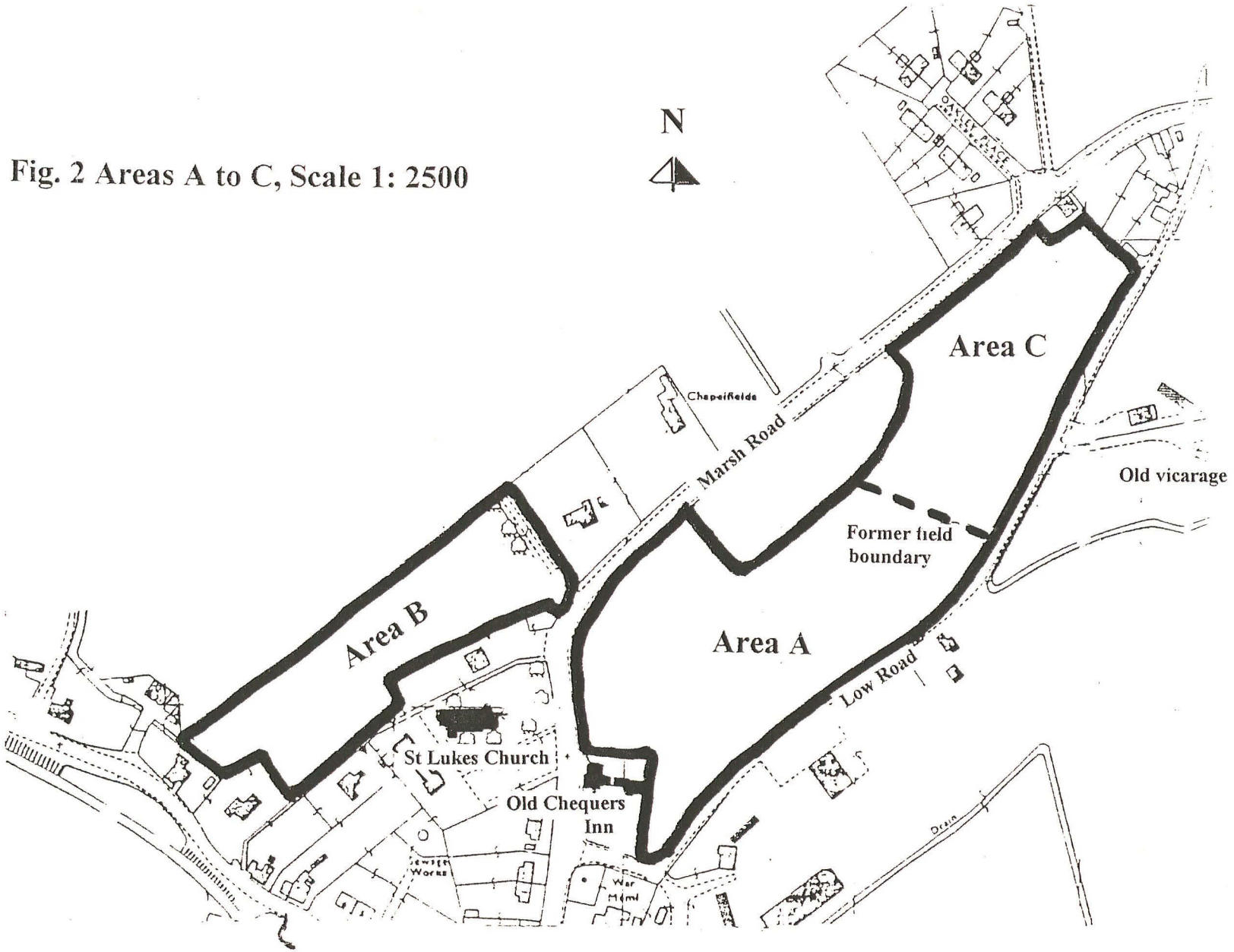
3.0 Methodology

3.1 *Desk-top assessment.*

An archaeological desk-based assessment comprises a thorough search of existing sources of information relating to a proposed development area. Its intent is to assess the known and potential archaeological deposits in the locality, collating written and graphic information in order to draw conclusions as to their possible nature and extent. Consideration is given to the importance of any such deposits in a local, regional or national context.

3.1.1 The desk-based element of this report was undertaken by Mr A. Hardwick over a period of four working days during February 2000. The following sources were consulted:-

Fig. 2 Areas A to C, Scale 1: 2500



Records, including aerial photographs and unpublished archaeological reports, held at the Lincolnshire County Sites and Monuments Record

Records, including Tithe information and Ordnance survey maps, held at the Lincolnshire Archives Office

Records, including books and newspaper articles, held at the Lincolnshire Local Studies Library

Information derived from discussion with local residents.

Additionally a site walkover survey, including colour photography, was conducted.

3.2 Fluxgate Gradiometer Survey

The gradiometer survey was conducted over three working days by Mr D. Bunn and Mr A Hardwick of Pre-Construct Geophysics. Work was carried out in accordance with the English Heritage document '*Geophysical Survey in Archaeological Field Evaluation*', 1995. A separate report has been compiled (Appendix II) and some of the major points have been integrated into this study.

4.0 Geology and topography

4.1 South Holland belongs to a relatively flat tract of land bounded by the River Welland to the west, the Wash to the northeast, the River Nene to the east and the Shire Drain to the south. The 1: 50 000 series Solid and Drift Geology map (British Geological Survey, sheet 144) indicates that the area is almost entirely covered in alluvial deposits.

4.2 The central portion of South Holland, covering an approximate area of 10km, is enclosed by ancient sea banks, constructed in the Roman period. Between then and the present day, considerable deposits of silt were deposited on the coast and large scale land reclamation has taken place, with the result that the previously coastal Holbeach Hurn is now some 10km inland.

4.3 These silt deposits are likely to be quite deep in proximity to the village. Excavations at Holbeach St. John, approximately 12km to the south-west in the 1960's (D.Kaye) exposed a stratigraphic sequence of 0.18m of silt over 0.05m of peat preceded by 0.4m of alluvial clay. It is likely that Holbeach Hurn, on the coastal edge until at least the Elizabethan period (Speede, 1610, Appendix 1) has experienced a far greater degree of silt deposition than has its inland neighbour.

4.4 The geological map additionally indicates that the village is built on made-up ground resulting from its association with salt-making in the medieval period.

4.5 This is particularly apparent in the topography of Area B, which undulates irregularly over a relatively small area. Changes in height of between 0.5 and 1m are apparent over distances of 10 – 20m. Of particular note are a low mound

approximately 10m in diameter and 0.4 – 0.5m high near the western limit of Area B, and the ground rising up to approximately 1m higher from south to north at the eastern end of the site.

4.6 Relatively recent landscaping is evident in Area B in the form of a c.2m high ridge of trees running north-west to south-east, adjacent to a tennis court to the east end of the site. Hedge lines of equally modern date contain much of the area.

4.7 Uneven topography is evident in Area A. Two built up (turfed over) tracks are apparent, one running approximately north-east to south-west, the other approximately north-south). Much of the site apparently contains a turfed-over destruction layer associated with its former use as a glasshouse nursery. The modern ground surface is generally uneven, falling away towards Marsh Road to the north, a change in height of approximately 0.9m.

4.8 Area C is lower-lying and undulates more gently, falling away slightly to the north, south and north-east.

4.9 The topsoil over the three site areas is a very dark brown clayey silt. The vegetation cover is typical of a marsh/fen environment.

5.0 Archaeological and historical background

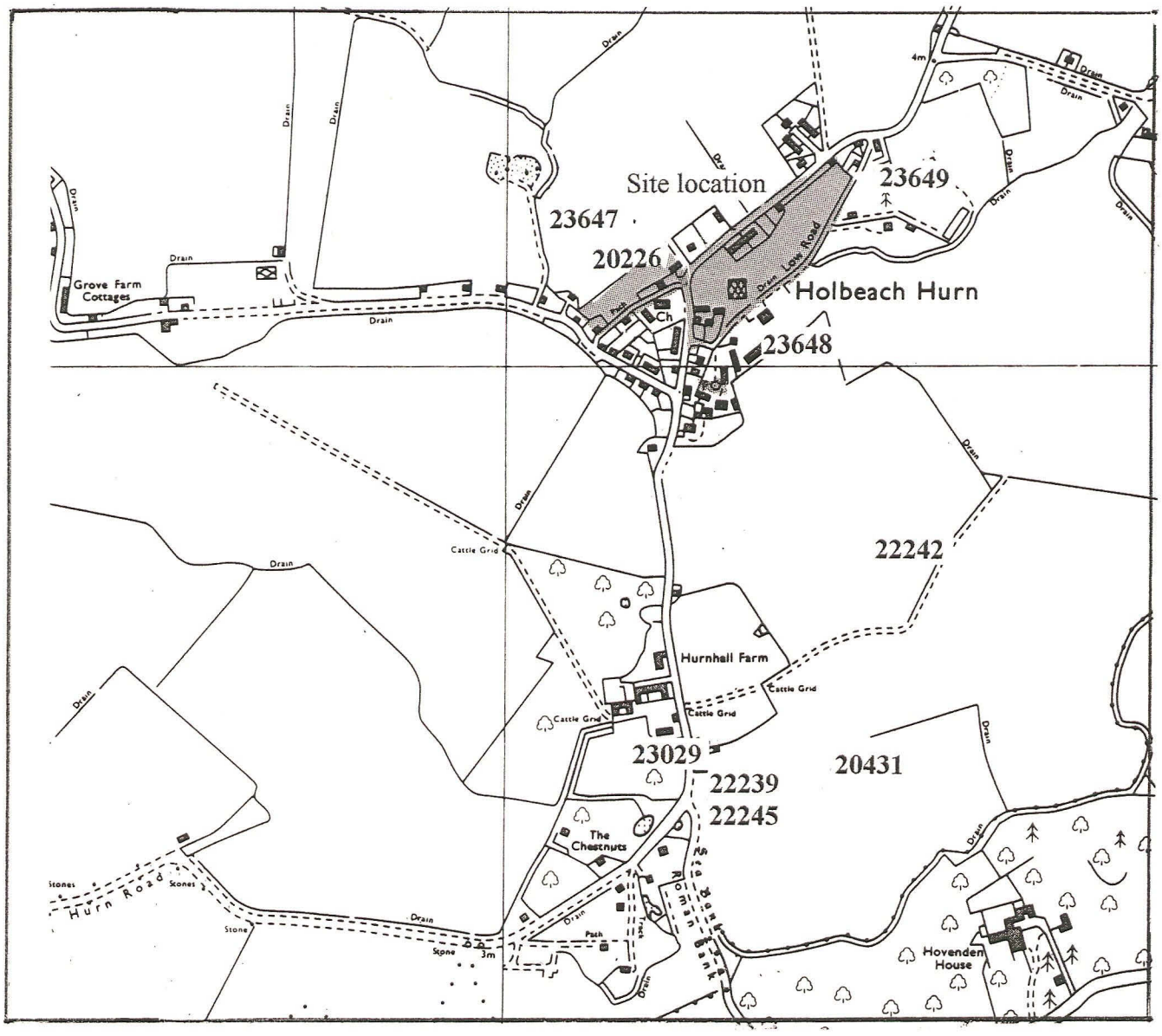
5.1 The Wash, to the east of South Holland, originally reached inland almost as far as Spalding. Extensive land reclamation initially took place in the Roman period, and Holbeach Hurn lies immediately north and east of the resulting sea defences. Documentary evidence suggests that the village occupied a coastal position throughout the Anglo-Saxon and medieval periods.

5.2 Extensive cropmarks dated to the Romano-British period are known in the district, for instance in proximity to Holbeach St John to the south-west. Large quantities of Romano-British pottery were recovered between the 1960's and 1980's during successive excavations in the Lammings Bridge area of that settlement (the Boston Archaeological Society, David Kaye and the Central Excavation Unit of English Heritage respectively).

5.3 Similar cropmarks, perhaps Romano-British field systems, are noted approximately 4-5km west of Holbeach Hurn. There is however no indication of such remains in proximity to the village itself.

5.4 Early English settlement of South Holland is believed to have begun around the 7th century A.D. Despite neglect of the sea defences left by the Romans, and the resulting influx of water, Holbeach Hurn appears to have occupied relatively dry, and potentially valuable, higher ground.

5.5 The place name Holbeach Hurn appears to be Anglo-Saxon in origin. Holbeach is interpreted variously as meaning 'hole' or 'hollow place' and Hurn appears to mean a corner of land. The village name may mean an island or peninsula (Cameron) or 'a corner of land bounded by water courses' (Gooch).



20226	Post-medieval settlement	TF 392 271
20431	Medieval salt-making site	TF 3950 2640
22239	Medieval chapel	TF 3927 2633
22242	Undated mound	TF 397 267
22245	Medieval cross	TF 3927 2633
23029	Medieval artefacts	TF 392 264
23647	Undated salt-making site	TF 3914 2717
23648	Undated salt-making site	TF 3946 2705
23649	Undated salt-making site	TF 3959 2726

Fig. 3 Extract from 1: 10 000 scale Ordnance Survey map incorporating details of Sites and Monuments Records

5.6 In the early Anglo-Saxon period South Holland is believed to have been something of a 'no mans land' between the kingdoms of the East Angles, Lindsey and the Middle Angles. Its first few early English inhabitants were believed to be pagan criminals and outlaws (Tennant, 1997). By the 10th century the area had been secured as part of the kingdom of Mercia.

5.7 South Holland offered a considerable expanse of potentially rich agricultural land, and access to the coast. This is reflected in the large-scale land reclamation which took place over the next 400 years.

5.8 The Domesday Book of 1086 records the settlements of Holebech, Holeben, Holobech, Holobec and East Holobech, as lands belonging to the King. The Anglo-Saxon 'hol' (hole) indicates the proximity of these villages to inlets along the Roman bank.

5.9 The Chantry Chapel of Sir Hugh de Daker is mentioned in 1379 and is believed to lie within the manor of Holbeach Hurn. This is likely to be the same thatched chapel of St Mary referred to in 1534 and the 'Chapel of the Blessed Mary at Holbeche Hirne' noted in 1547. The chapel is believed to have been suppressed by Edward VI and sold about 1550 (SMR Ref. 22239). Its lands are recorded in the nineteenth century as being at various times three acres and one road, then eleven acres and later eight acres. A Terrier of 1653 refers it to as 'the late Hurn Chapel'.

5.10 The medieval Hurn Cross (SMR Ref. 22245) is recorded as having stood close to the site of the chapel.

5.11 Saltmaking is known to have played a significant role in the local economy at least between the 12th and 15th centuries. The process had already been established during the Roman occupation, and evidence of its continued existence is noted in the Domesday Book of 1086. There is therefore a reasonable possibility that salt-making also took place along this part of the Lincolnshire coast in the intervening Anglo-Saxon period. Firm evidence of this has, however, proven elusive (Healey, 1993).

5.12 The proximity of Holbeach Hurn to the coastline, beyond the Roman bank, would have made it an ideal place for the collection of tidal silts, subsequently filtered through shallow ponds to collect salt crystals. Desalinated silt waste mounds associated with the medieval industry are visible as earthworks very close to the proposed development area along the line of the sea bank. These include at least three pronounced mounds, SMR Ref. 23647-49 and significant undulations on arable land less than 1km to the south/ southeast (SMR Ref. 22242, 20431) .

5.13 Salt production along the coast appears to have declined and ultimately ceased by the early 1600's. This decline has been attributed to cheaper salt being imported from the Firth of Forth through the port of Boston. The imported salt was more competitively priced due to the removal of taxes in 1601.

5.14 In the early post-medieval period Holbeach Hurn appears still to have been relatively close to the coastline, as indicated on Speede's map of 1610, where the village is referred to as Holbichthurne. Two hundred years later, as indicated on the

first edition one inch Ordnance Survey map of 1824 (Appendix I), ' Holbeach Hirne' was significantly inland.

5.15 The medieval village may well have declined in association with its salt-making industry. Present day buildings surrounding the sites incorporate one or two examples of possible 16th/17th century date, although the majority appear to be late 19th and 20th century structures. This might simply reflect the possibility that medieval occupation was centred further inland, away from the marshy coastline. However a period of decline is suggested in the absence of a village chapel until the current Church of St. Lukes in 1869. Perhaps further emphasising a decline in status, the Lincolnshire Directory refers to Holbeach Hurn in 1842, along with Holbeach Drove, Penny Hill and Holbeach Clough, as elements of the larger Holbeach.

5.16 The post-medieval settlement of Holbeach Hurn appears to have been built over the remains of silt mounds. Its most obvious features are St. Lukes Church and Hurn Hall, approximately 400m south of the proposed development area.

5.17 Sites A, B and C lie in the heart of this post-medieval settlement. Immediately west of Area A is a derelict single storey building, possibly of sixteenth/seventeenth century date. This may be, or be associated with, the building noted on the 1902 Ordnance Survey map as the 'Chequers Inn'. A compound appears to extend out from it approximately 60m into area A. Both are still present on the edition revised in 1930.

5.18 Approximately 100m east of Area C is the Old Vicarage, which appears to be of similar date to the Chequers Inn.

5.19 The recent history of Area A has been based on its function as a nursery, occupied by a number of glasshouses (Lovell, pers. comm.). A later, metal-framed, glasshouse occupied the middle of Area A and is recorded on the most recent ordnance survey of the locality (Fig 2). Its plan has also been defined by gradiometry (below).

5.20 The 1930 revision of the Ordnance Survey map indicates that Area B was, at that time, one with the unit of land that currently lies to its north, rather than a separate playing field. Area B now appears to retain undulating topography similar to that in the upper field, perhaps related to possible salt-making earthworks identified there.

5.21 Area C appears to have been pasture until very recent times, and there is no obvious evidence of cultivation. It is likely to be one of the common land areas referred to in the nineteenth century tithe records, possibly 'a piece of common in the Hurn field by the highway'. The 1824 O.S. map shows a probable building or structure on the site.

5.22 Archaeological information relating to Holbeach Hurn is currently very limited. The earthworks believed to be associated with medieval salt-making are undated *apriori*, and little is understood of the character of the local industry.

5.23 A supposed Roman pitcher was dug up on the site of Hurn Cross in 1828, although it is now believed to have been medieval. Just north of the chapel site, a

large quantity of late medieval pottery was found circa 1970, including about forty sherds of Bourne D ware, twenty sherds of Toynton ware, six sherds of sandy ware and one grey Saxo-Norman sagging base (SMR Ref. 23029).

6.0 The archaeological potential

6.1 The proposed development areas lie in close proximity to earthworks identified as being of archaeological significance. This, alongside geophysical evidence of buried features (Appendix II), suggests a strong possibility that archaeological remains will be disturbed by the proposed groundworks.

6.2 Discussion of the results of the gradiometer survey (refer to Appendix II)

6.2.1 The gradiometer survey results indicate that a network of linear features are present in Area C. Assessment of how far these features extend to the south and west is limited by quantities of relatively modern material. One linear feature on an east-west orientation at least appears to continue to the west of the modern greenhouse remains, but this is by no means certain. The strong rectangular anomaly of the greenhouse equally inhibits identification of the access tracks noted on the surface in Area A.

6.2.2 No pits or filtration units associated with the salt waste mounds are apparent, although such features may be undetectable by magnetic survey. However, there are some very clear anomalies in Area C which appear to be characteristic of burnt deposits. These could reflect hearth deposits found previously on salt-making sites (eg Albone, 1998), although this cannot be determined solely on the basis of present data.

6.2.3 The circular earthwork noted at the south-western edge of Area B does not register with any clarity in the geophysical data. However, a faintly defined circular area of the same diameter is visible. Whilst this data may have a non-archaeological origin, it could reflect the earthwork. Some features relating to salt-making may not be capable of producing a significant magnetic contrast against the surrounding geology. The excavation of filtration units at Wainfleet determined that the filter bed material was very similar to the surrounding silts (Albone, 1998).

6.2.4 The frequency of modern 'noise' across the sites, and the comparatively limited area of site B, equally inhibit the identification of anomalies other than long linear features.

6.2.5 Little artefactual material associated with the geophysical anomalies was recovered from site. This is consistent with the observation that very little ground disturbance that might draw such materials to the surface, particularly ploughing, appears to have occurred in the area.

6.3 Prehistoric and Romano-British

6.3.1 Evidence suggests that much of South Holland was heavily flooded prior to the Roman period, which would obviously limit occupation potential. Significantly,

excavation in the district indicates that a layer of alluvium in excess of 0.4m deep was deposited prior to Roman occupation. Almost certainly, any prehistoric settlement evidence would be sealed beneath this level and is unlikely to be disturbed by the proposed development.

6.3.2 The date of the 'Roman' sea bank is not known, though it is important to note that Holbeach Hurn lies just beyond its outer edge and therefore possibly beyond the Romano-British occupation limits (during at least the late Romano-British period).

6.3.3 Buried remains relating to Roman occupation are at least a possibility, given the proximity of other such remains in South Holland, perhaps relating to utilisation of the coast itself.

6.3.4 There is again the probability that any such remains will lie sealed beneath later deposits. The absence of Roman artefacts and cropmarks in the locality may be indicative of the depth at which such deposits are sealed. Approximately 0.2m of mud/silt and 0.05m of peat are known to have formed over the Roman layers at Holbeach St. John, and it is probable that deposits at Holbeach Hurn, closer to the coast and beyond the sea bank, are considerably deeper. Additionally, potentially deep silts have been deposited on the site of the village as a result of salt-making, which is particularly evident in the form of earthworks to the north of, and possibly within, Area B.

6.4 Anglo- Saxon

6.4.1 Place name evidence suggests that the area was settled during the Anglo-Saxon period. It appears to have been a tract of high ground surrounded by water, close to the coastline.

6.4.2 Particular potential lies in the possibility of recovering evidence of Anglo-Saxon salt-making. Regional information regarding salt-making in the period between the end of Roman occupation and the medieval period is currently very limited.

6.5 Medieval

6.5.1 Earthwork remains clearly indicate that Holbeach Hurn was a significant focus for salt making during the medieval period. Salt waste mounds are recorded c. 100m southeast of areas A and C, and c. 200m northwest of Area B. Possible mounds are also visible immediately north of Area B. The undulating topography adjacent to that site clearly continues into the area, with at least one low mound c.10m in diameter and c.0.5m high apparent to the southwest of the site.

6.5.2 The proximity of all three sites to these probable waste mounds raises at least the possibility that buried remains associated with salt making (and not readily defined by geophysical survey) may be present. Area B appears to be on the edge of, if not actually within, an area of waste mounds, whilst Area C at least appears to be a relatively flat plot of land close to known waste mounds.

6.5.3 How far medieval activity, excluding salt making, may have extended into the proposed development areas is uncertain. The sites may have been a little close to the edge of the coast, low lying and waterlogged, as suggested by the names 'Marsh Road' and 'Low Road', during this period. They may have been reserved primarily for non-occupational use.

6.5.4 SMR evidence locates the medieval chapel approximately 700m south of the proposed development areas, and this may have been the focus for the medieval village. However, at its height the chapel held land of at least 11 acres in the village, some of which could possibly be within the site catchment area. There may be physical remains relating to associated land use.

6.5.5 The main road through the settlement lies immediately northwest of Areas A and C. The periphery of this road is another potential focus for activity.

6.6 Post-medieval

6.6.1 The sites are situated immediately northeast of the post-medieval settlement of Holbeach Hurn. Areas A and C lie between two post-medieval buildings, the Chequers Inn and the Old Vicarage. The inn, and the adjacent main road through the village, border Area A and are potential foci for settlement activity of this period. Mole disturbances close to Marsh Road in Area A exposed lumps of charcoal, shell and clay pipe, supporting this possibility.

7.0 The archaeo-environmental potential

7.1 The environmental evidence taken from silt mounds and filtration units at Wainfleet St. Mary yielded valuable data concerning the provenance of raw materials used in the process, and the evolution of activity on the sites.

7.2 Vegetation cover in the present locality indicates that Areas A to C lie within a typical fen environment. This suggests that there is considerable groundwater, indicated by the highly humic and probably poor draining clayey topsoil, and by the drainage dyke east of Areas A and C. The ground in Areas A and C is also comparatively low-lying. These factors suggest the potential for the preservation of waterlogged remains, such as wood or leather.

7.3 During survey of the present area, mollusc shells were occasionally noted, indicating calcareous soils favourable to the survival of molluscan and possibly animal bone assemblages. Land snail shells can provide data on climatic change and the evolution of microenvironments such as pits and ditches. Additionally, animal bones can be analysed to assess local land use, animal husbandry, diet and butchery.

7.3 It is also possible that deposits of alluvium and silt have sealed early occupation surfaces and associated data on the contemporary environment.

8.0 Impacts to the archaeological resource, past and present

8.1 Area A

8.1.1 Much of Area A is known to have contained a number of glasshouses during the last century, and additionally two buried trackways cross the area. However topographical evidence suggests that the nursery area has been built up rather than truncated, being between 0.5 and 0.9m higher than the surrounding land. As a result minimal truncation of potential archaeological deposits may have occurred, although this is difficult to assess. Clearly there has been structural activity on the site in the post-medieval period. In particular the enclosed area in front of the Chequers Inn, marked on early O.S. maps, and the trackways, may have involved ground disturbance for levelling.

8.1.2 As there seems to be some depth of modern destruction material over a large part of this area, sealing possible deposits, and it is proposed for change of use to a recreation area and related car park, the development may have limited impact on the archaeological resource. The lower lying area to the north, which does not appear to contain the same degree of destruction material, is most likely to be at risk depending on how intrusive development activity is likely to be.

8.2 Area B

8.2.1 Earthwork evidence suggests that deposits relating to medieval salt-making may have survived with minimal disturbance where turf remains. The 1956 O.S. map shows the area as part of the larger plot of land to its north, which has at least in recent times experienced ploughing.

8.2.2 The hedge lines and possible related ditches bordering the area may have truncated some remains, as may levelling prior to the construction of the tennis court and entrance trackway to the northeast. However, there remains a significant area of relatively undisturbed deposits that will be truncated by the foundation trenches for residential development.

8.3 Area C

Area C seems to have suffered minimal modern disturbance, and there seems to be relatively little demolition material across the site. The gradiometer survey indicates that buried remains of possible archaeological interest lie distributed across much of the site, and these are likely to be disturbed by foundation trenching.

9.0 Conclusions

9.1 The information available as a result of the desk-based assessment and geophysical survey suggests that there is a strong possibility of significant archaeological deposits being disturbed by the proposed development.
The geophysical survey identified a number of linear anomalies in Area C that may relate to the medieval or post-medieval occupation of the locality. The survey was unable to resolve the full extent of these features.

9.2 The three sites occupy relatively unique and largely undisturbed ground close to the heart of the medieval/ post-medieval settlement. There would seem to be particular potential for the recovery of information relating to the medieval, and possibly pre-medieval, salt-making industry. Topographical information establishes that this was present in the locality, adjacent to, and possibly extending into, the development areas. However detailed information regarding its extent and date has yet to be recovered.

10.0 Recommendations

10.1 This report has been able to establish the presence of probable archaeological features at least in Area C. Further investigation of these remains would ideally establish their nature, including date and type, and their extent. This information is currently elusive due to the 'masking' effect of relatively modern geophysical anomalies in the adjacent Area A.

10.2 There is significant potential for their being waste deposits and related features associated with the salt-making process. Beyond a possible silt mound in Area B, the presence of such features has not been established.

10.3 It is suggested that a programme of selective trial trenching would identify the nature and extent of the linear features identified in Area C.

10.4 Selective trenching could also assess the presence or absence of possible archaeological features that cannot be resolved by geophysical survey.

10.5 Residential development is likely to level the topographical features noted in Areas B and C. Elements of these earthworks are likely to relate to adjacent sites recorded in the Sites and Monuments Record, and an earthwork survey may be an appropriate means of preserving these features by record.

11.0 Acknowledgements

Pre-Construct Archaeology (Lincoln) would like to extend thanks to G.R Merchant for this commission, and to the staff of Lincolnshire County Sites and Monuments Record and Lincolnshire Archives office respectively.

12.0 Bibliography

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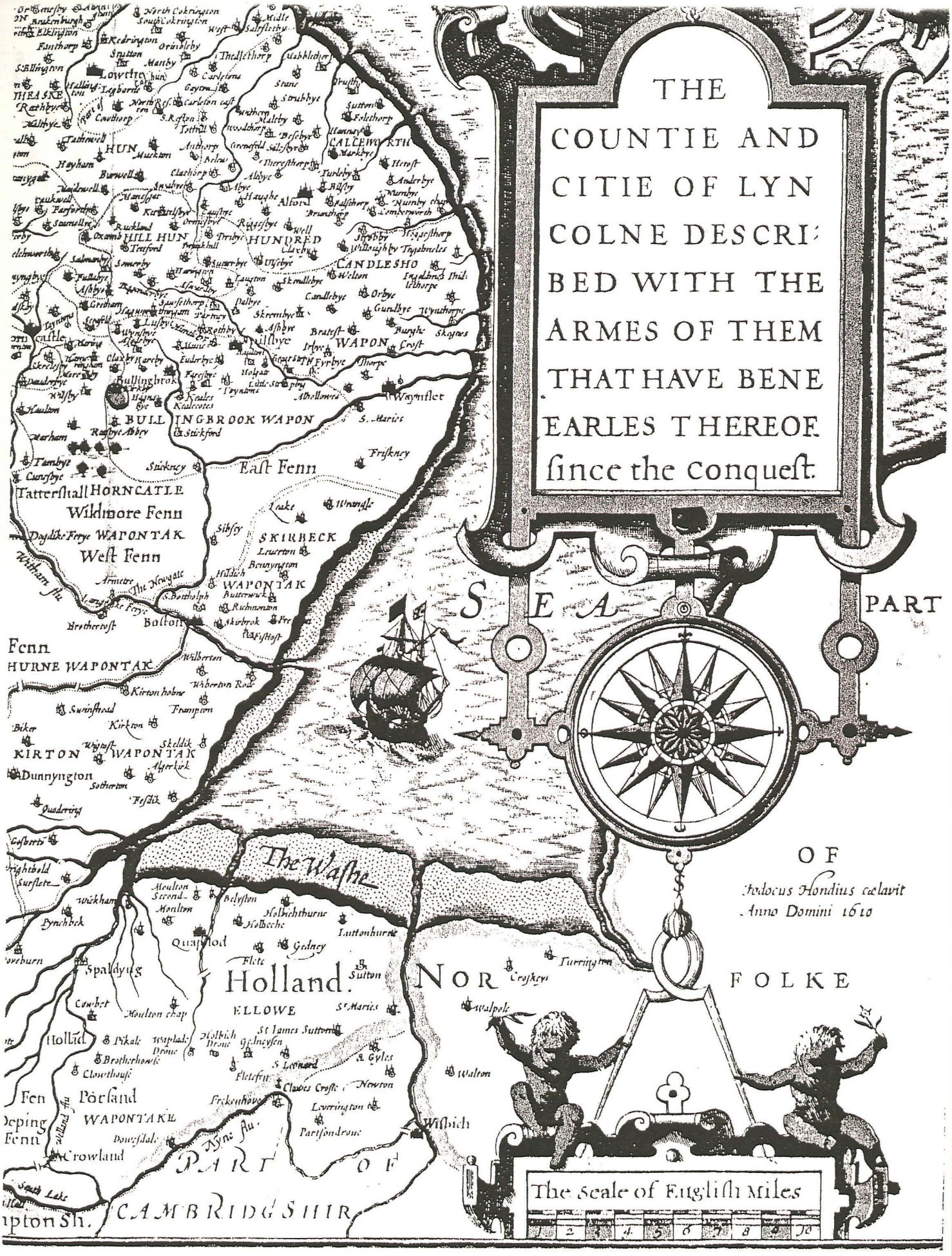
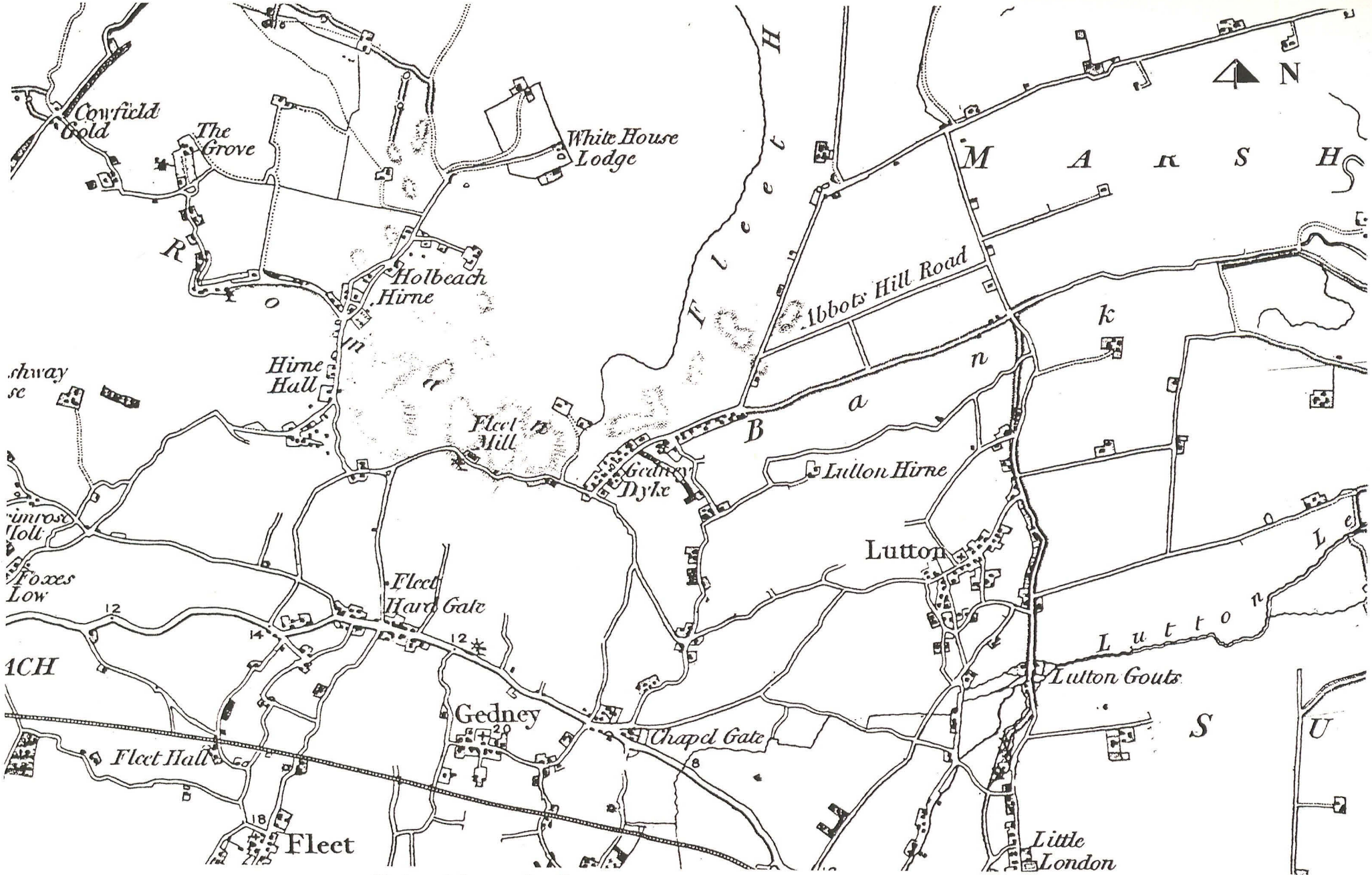
South Holland District Council Official Guide

Palmer-Brown, C. *Specification for an archaeological desk top study and field evaluation (gradiometer survey) Sites A-C, Holbeach Hurn, Lincolnshire*

Appendix I



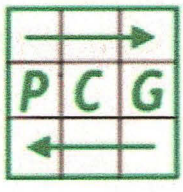
Extract from John Speedes' map, 1610



Extract from the first edition Ordnance Survey map, 1824
Scale 1 inch to 2 miles

APPENDIX II

FLUXGATE GRADIOMETER SURVEY
LAND AT HOLBEACH HURN
LINCOLNSHIRE



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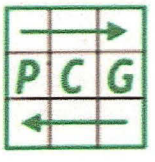
Illustrations

Summary

- *A fluxgate gradiometer survey was undertaken to evaluate the archaeological potential of land at Holbeach Hurn, Lincolnshire*
- *A large degree of magnetic variation was detected on the site, the majority of which was almost certainly the result of human intervention*
- *The site of former horticultural buildings was detected*
- *A large area of magnetic variation, possibly associated with settlement remains, was detected to the north-east. Linear anomalies, possibly land boundaries relating to the settlement, were also detected to the north and east*
- *A large diffuse linear anomaly (possibly traversing all three areas) may be of natural origin*
- *A series of localised positive anomalies may represent areas of burning*



1.0 Introduction

A Fluxgate Gradiometer survey was commissioned by GR Merchant as part of an archaeological evaluation of the proposed development sites.

The three sites were surveyed as two units: area B and area A/C (as denoted on site plan supplied by the client).

The survey was carried out to fulfil a requirement issued by South Holland District Council and a specification prepared by Pre-Construct Archaeology. The work follows the guidelines set out in the English Heritage document 'Geophysical Survey in Archaeological Field Evaluation', 1995.

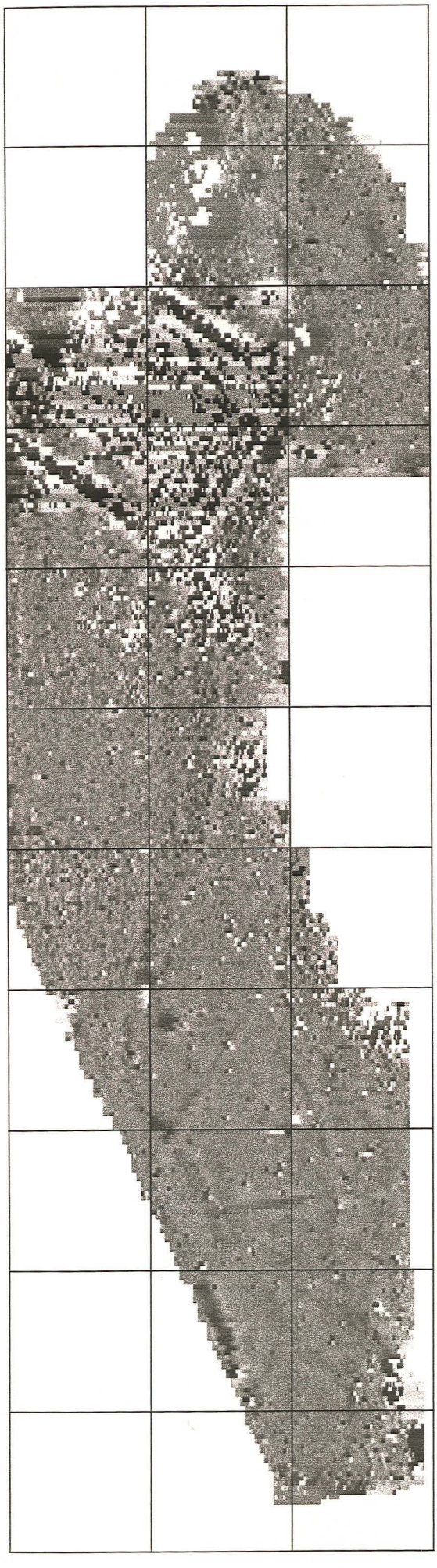
2.0 Methodology

Detailed area survey using a fluxgate gradiometer is a non-intrusive means of evaluating the archaeological potential of a site. The fluxgate gradiometer detects magnetic anomalies caused by areas of high or low magnetic susceptibility. These areas are caused by changes in the composition of the subsoil or the underlying geology. Archaeological features are the result of man-made changes to the composition of the soil and the introduction of intrusive materials such as brick and stone. These features create detectable magnetic anomalies. In addition, activities which involve heating and burning will create magnetic anomalies, as will the presence of ferrous metal objects. By examining the anomalies detected by a fluxgate gradiometer survey, geophysicists can often translate the data into archaeological interpretation.

The area surveys were conducted using a *Geoscan Research* fluxgate gradiometer (model FM36) with an electronic sample trigger set to take 4 readings per metre (a sample interval of 0.25m). The zigzag traverse method of survey was used, with 1m wide traverses across 30m x 30m grids. The base line in area AC was established by measuring 2m out from the drain along the south-eastern edge of the site and 2m south-west of the easternmost corner. In area B the base line was established 3m from the south-west corner, extending 2m north of the hedge that divided the site. Pegs were placed along the base lines and at grid corners elsewhere. The sensitivity of the machine was set to detect magnetic variation in the order of 0.1 nanoTesla.

The data from the survey was processed using *Geoplot* version 3.0. It was desloped (a means of compensating for sensor drift during the survey by subjecting the data to a mathematical bias sloping in the opposite direction of the bias created by sensor drift), and clipped to reduce the distorting effect of extremely high or low readings caused by ferrous metals on the site. The results are plotted as greyscale and trace images.

The survey was carried out by David Bunn and Andrew Hardwick on the 22nd- 24th February 2000. The weather was sunny and mild.



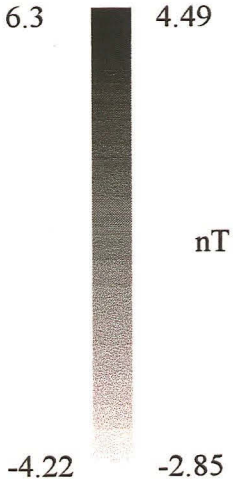


FIG.2

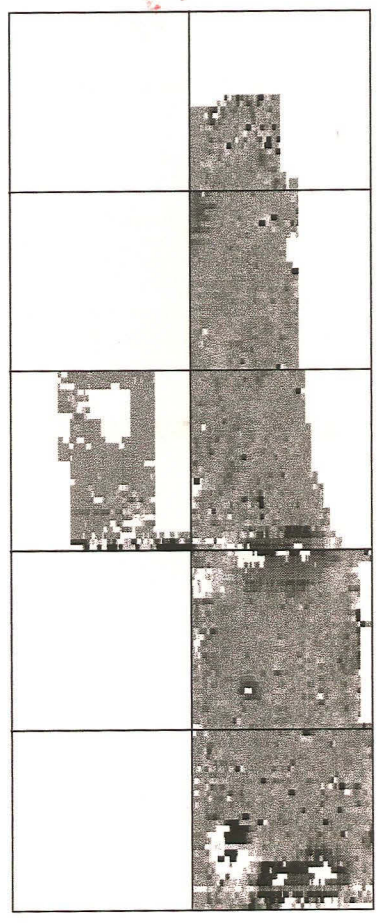


FIG.3

SCALE 1:1250

3.0 Results

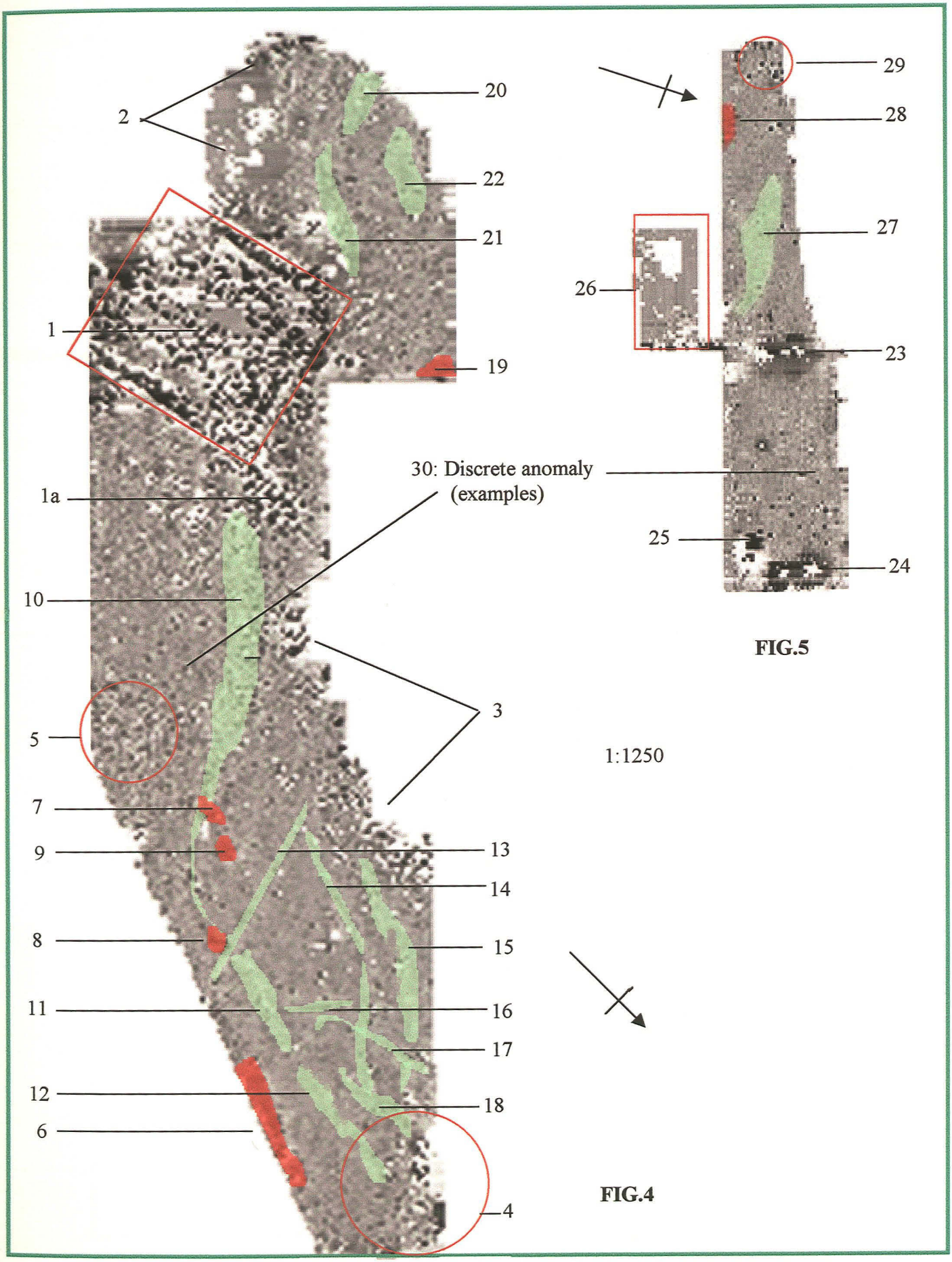


FIG.4

FIG.5

3.1 Area A/C (Figs. 2,4,6,7)

The site displayed a wide range of magnetic response; the strongest corresponding to the location and vicinity of the horticultural structures and a raised access road which was noted during the survey (Figs.2, 4:1,1a). Anomaly 2 (Fig.4), to the west, similarly reflects the effect and proximity of modern activity. The perimeter of the site to the north-west and north-east adjoin houses which probably account for anomalies 3 and 4: areas containing rubble and evidence of burning were noted during the survey.

Area C and the eastern part of Area A (Fig.6: raw data trace plot shown below) were magnetically quieter and contain anomalies of potential archaeological significance. Anomaly 5 represents a cluster of relatively weak discrete anomalies (no iron spikes) possibly representing pre-modern activity. However the proximity of the drain, and any associated maintenance, may be relevant. Linear anomaly 6 (Figs.4,6), which extends along the edge of the drain to the east of the survey, may be of a similar origin.

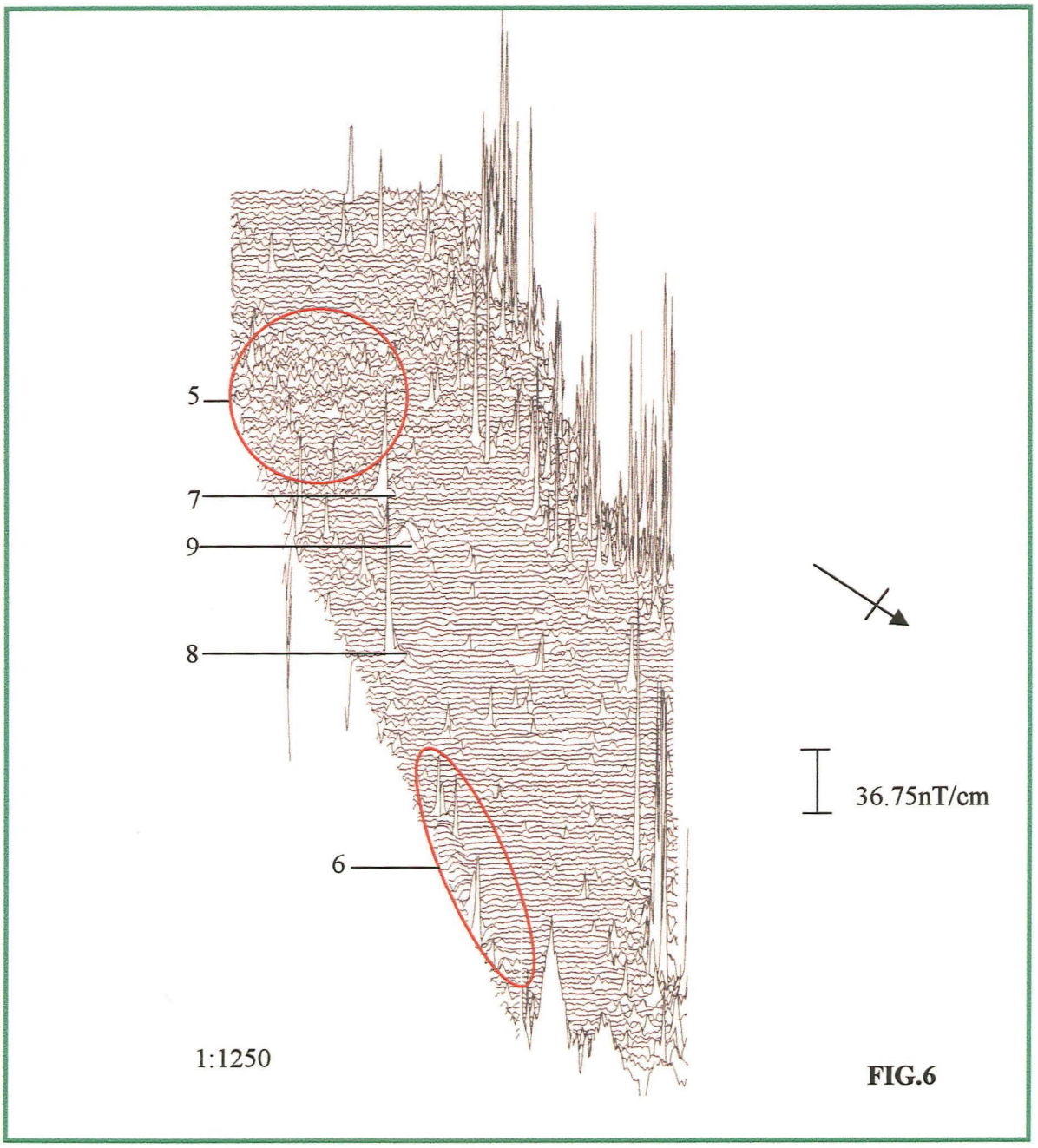


FIG.6

Positive anomaly 7 reflects the presence of building debris that was noted on the surface. Anomaly 8 is similar, although remains hidden. Anomaly 9, adjacent to 7, displays different characteristics (Fig.6) and may be evidence of burning.

A number of diffuse, possibly composite, linear anomalies were detected in the eastern part of the site (Figs. 2,4 & 6). The largest, anomaly 10, possibly extends (as a curvilinear) across the site to the north-east as anomalies 11 and 12, and to the south-west as anomalies 22 and 20, although this interpretation is tenuous, given that anomalies 1 and 1a potentially mask underlying, weaker, features.

Anomaly 13, which bisects area C, is a weak positive linear. The orientation and direction of this feature respects the access road to the old vicarage which lies to east of the site.

Anomalies 14 and 15 extend roughly parallel to the existing site boundary and may be related. Curvilinear anomaly 17 similarly may be associated with 18. However, the weak magnetic definition of these features makes interpretation difficult. A better defined positive feature (16) extends between these faint anomalies and anomaly 11 to the south.

Anomaly 19 is similar to anomaly 9 (Figs.6&7). However, its location at the edge of the survey (close to houses) means that the extent of the feature was not determined.

Diffuse anomalies 20-22 may be associated with anomaly 10, which extends north-eastwards beyond modern anomaly 1.

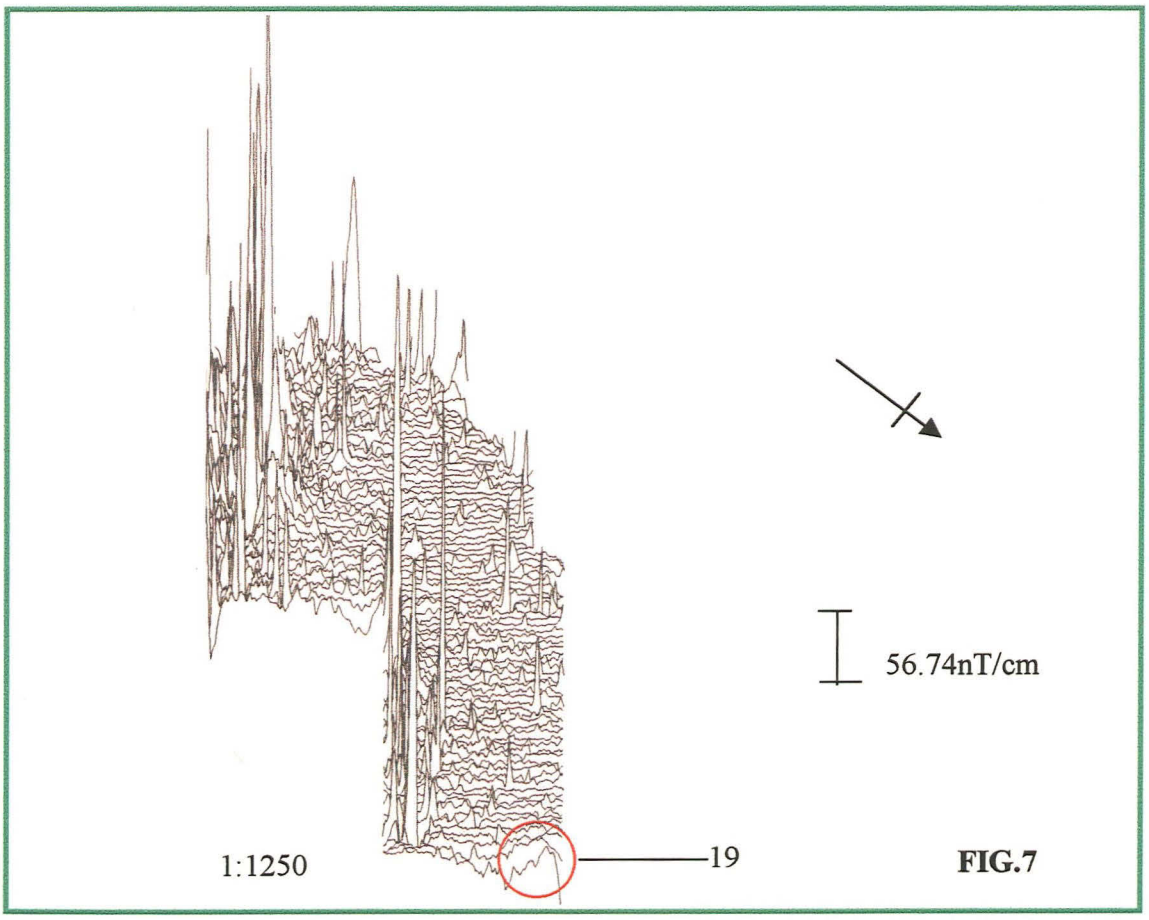


FIG.7

3.2 Area B (Figs. 3,5,8)

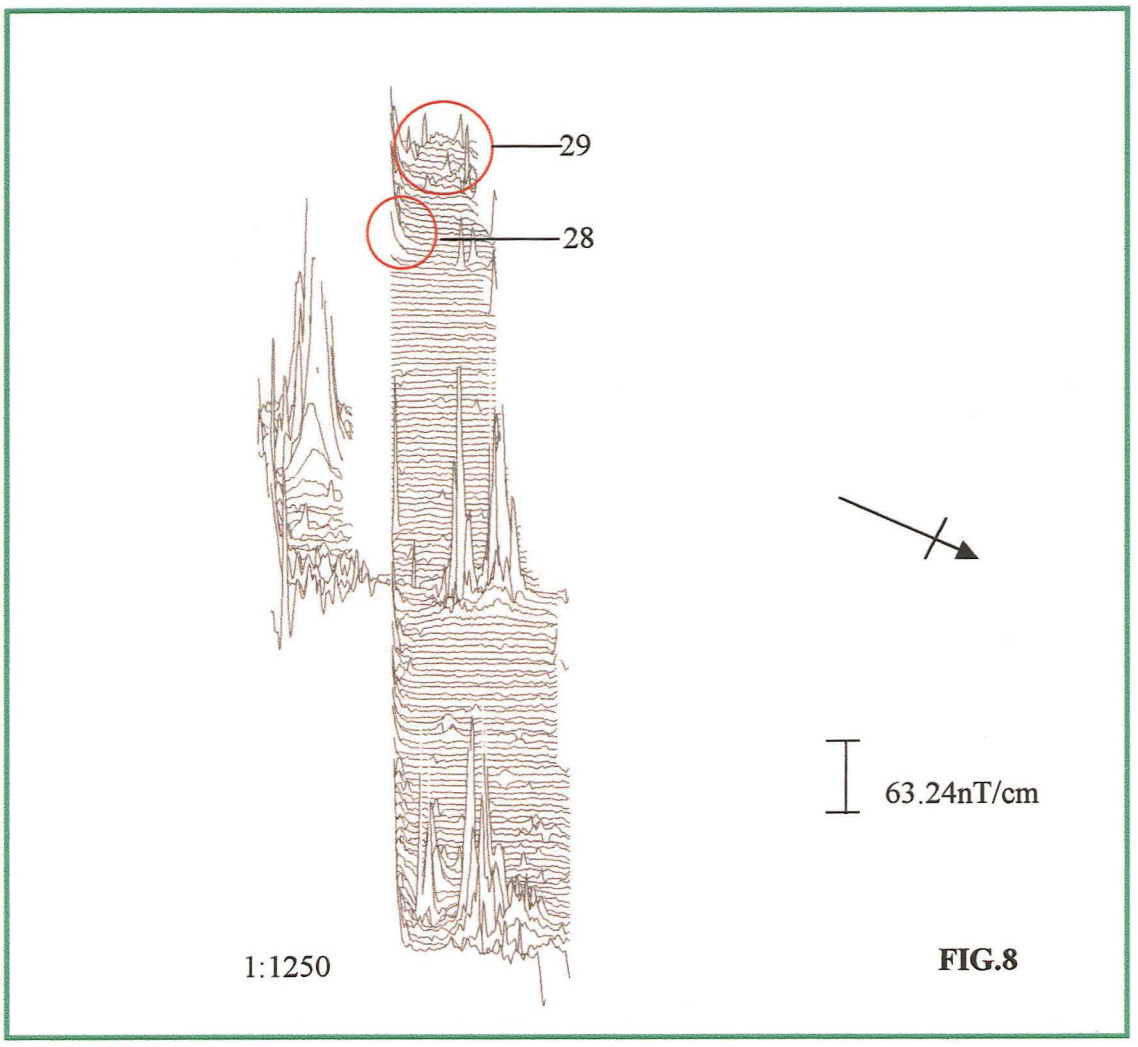


FIG.8

Area B, to the west of A/C, also showed a wide range of magnetic variability. The strongest were the result of modern activities: anomalies 23 and 24 were caused by football posts, 26 by playground facilities. Anomaly 25, close to the site entrance, is sub-surface and probably recent.

Weaker features were detected to the west of the site: a large irregular and slightly positive anomaly (Fig.5: 27) lies on a similar bearing to anomalies 10, 20 and 22 (Area A/C) and may be part of the same feature. Anomaly 28 bears some similarity to 9 and 19, although the trace plot (Fig.8) indicates that it may be the effects of an existing property boundary.

A small cluster of discrete anomalies (29) on the west edge of the site possibly reflects the presence of a low circular mound that was noted during the survey, although the proximity of houses (and related debris) may be relevant.

Discrete positive, negative and dipolar anomalies of varying magnetic strength (30) were detected on both sites. These may represent rubble (brick/tile), areas of burning or ferrous debris etc.

4.0 Conclusions

Both sites produced evidence of potential archaeological significance, particularly area A/C. A large part of area A incorporates remains of recent horticultural activity (which may be masking magnetically weaker features).

Anomaly 10, a large diffuse and ill-defined linear, possibly extends across both survey areas and may be of natural origin (e.g. a paleochannel). This feature may resolve as linears 11 and 12, which appear to abut some of the shorter linear anomalies to the north-east. Given that, in the past, the coastline extended further inland and that extensive drainage has since taken place, the group of anomalies to the east of the site may represent drainage features, possibly for agricultural or industrial purposes. However, the complexity and distribution of these linears could indicate that several phases of development have taken place .

The survey detected areas of possible burning (anomalies 9, 19 and possibly anomaly 6). If the site contains salt making remains these features could possibly represent salters mounds (if, for example, they incorporate briquetage or charcoal). However, this interpretation is tenuous, and is influenced by the fact that salt making is known to have taken place in the general vicinity.

An area of densely grouped weak anomalies (5) south-west of the linears may similarly have archaeological potential and correspond with an earlier field boundary.

Anomaly 13 aligns with the existing access to the old vicarage which lies to the east and may be the remains of an earlier road and/or property boundary.

Site B contains anomalies that reflect modern activity (recreational facilities), particularly to the east and south. To the west of the site, magnetic readings were similar to area C. Anomaly 27 possibly relates to the natural linear anomalies described above.

Anomaly 28, not fully defined, appears to extend further west (Fig.8) along the survey boundary and may be of modern origin. Similarly, anomaly 29 occurs close to an existing boundary (adjoining houses) and, although a low mound was observed during the survey, it could be the result of modern activity.

5.0 Acknowledgements

Pre-Construct Geophysics would like to thank GR Merchant for this commission.

6.0 References

Clark, A J — 1990 *'Seeing beneath the soil.'*

David, A — 1995 *Research & Professional Services Guidelines No 1; 'Geophysical Survey in Archaeological Field Evaluation.'*

Gaffney, C, Gater, J & Ovenden, S — 1991 *IFA Technical Paper No 9; 'The use of Geophysical techniques in archaeological evaluations.'*

7.0 Summary of survey parameters

Instrument:	Geoscan Research Fluxgate Gradiometer FM 36 with Sample Trigger ST1.
Resolution:	0.1 nT
Grid size:	30m x 30m
Sample interval:	0.25m
Traverse interval:	1m
Traverse method:	Zigzag

Appendix III Colour plates

P.1 Area A, facing north.

P.2 Area C, facing north-east.

P.3 South-west limit of Area B, facing north-west, showing the low mound noted during site survey.

P.4 The field immediately north of Area B, facing south-west. A mound is visible in the background.

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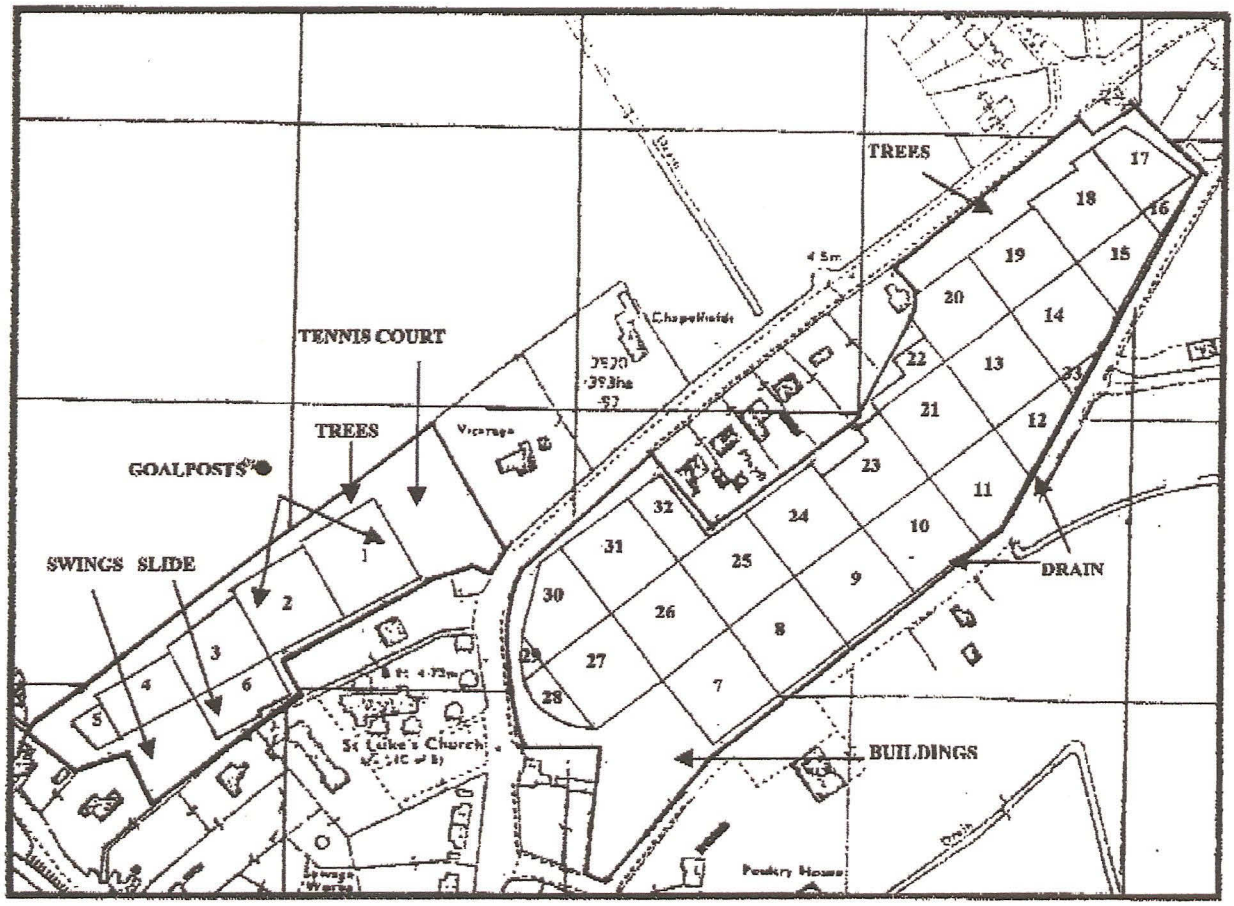

Fig.1 Location of survey grids. Scale 1:2500