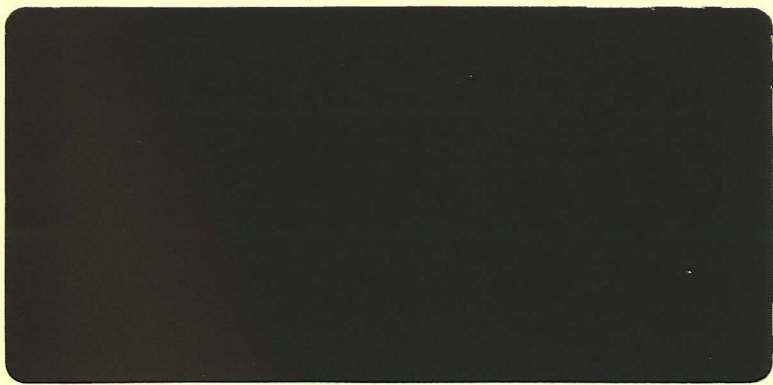


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**DESK-BASED ASSESSMENT AND
GEOPHYSICAL SURVEY AT
LAND SOUTH OF STATION ROAD,
WILLOUGHBY,
LINCOLNSHIRE
(WSR00)**



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ARCHAEOLOGICAL
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**DESK-BASED ASSESSMENT AND
GEOPHYSICAL SURVEY AT
LAND SOUTH OF STATION ROAD,
WILLOUGHBY,
LINCOLNSHIRE
(WSR00)**

Work Undertaken For
Barnhay Design Services

February 2000

Report Compiled by
James Albone BSc (Hons), PIFA

National Grid Reference: TF 4700 7190



A.P.S. Report No. **029/00**

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1. SUMMARY

A desk-based assessment was undertaken to determine the archaeological implications of a proposed residential development on land to the south of Station Road, Willoughby, Lincolnshire. A limited quantity of archaeological evidence dating from the prehistoric to modern periods has been identified within c.700m of the proposed development site.

Neolithic (4000 - 2250 BC), Bronze Age (2250 - 800 BC), Romano-British (50-410 AD) and Anglo-Saxon (410-1066 AD) sites and artefacts have all been discovered in, and immediately surrounding, Willoughby village. However, no archaeological remains have been identified at the proposed development site.

Medieval (1066-1485) cropmarks and earthworks have been identified around the village. The Dam Close earthwork enclosure lies only 50m southwest of the proposed development site. The function of this earthwork is uncertain but may have been a fortified enclosure or, as its name suggests, a fish- or mill pond. If the latter was the case the associated watermill would probably have been located on the south or southeast sides of the enclosure.

A fluxgate gradiometer survey was carried out at the site. Unfortunately, due to a large quantity of iron objects dumped on and around the site, no useful results were obtained (Appendix 2).

2. INTRODUCTION

2.1 Planning Background

Consultation with the Lincolnshire Sites and Monuments Records Office showed that the proposed development site lay within an area of considerable archaeological potential. As a result, the County Archaeological Officer recommended that a desk-based assessment be carried out to establish the known and potential archaeology of the assessment area and allow

appropriate mitigation measures to be implemented. In particular, the potential for further remains associated with the Dam Close earthwork was to be identified.

Archaeological Project Services was commissioned by Barnhay Design Services to undertake a desk-based assessment of the proposed development site. The archaeological assessment was undertaken in accordance with the Institute of Field Archaeologists *Standard and Guidance for the Preparation of Desk-Based Assessments* and a Project Specification approved by the County Archaeological Officer (Appendix 1).

2.2 Topography and Geology

Willoughby village is situated in the East Lindsey district of Lincolnshire, approximately 4km south of Alford (Fig. 1). The site is located on the west side of the village to the south of Station Road at NGR TF 4700 7190 (Fig. 2). It is broadly flat and has trees and rough grass covering the southern and central parts of the site. The northern part of the site was covered by a crushed stone hardstanding. It lies at a height of c10m OD on chalky till soil of the Holderness series (Hodges et al. 1984, 112).

2.3 Definition of a Desk-Based Assessment

A desk-based assessment is defined by the Institute of Field Archaeologists (IFA) as an 'assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written and graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate' (IFA 1999).

3. PROJECT AIMS

The purpose of the desk-based assessment is to obtain information about the known and potential archaeological resource within the vicinity of the proposed development site. The condition and extent of these archaeological remains is then clarified to enable suitable mitigation measures to be devised to minimise their disturbance. In addition to the above, statutory and advisory heritage constraints were identified.

The geophysical survey aimed to supplement the results of the desk-based assessment and identify any buried archaeological remains which may be present at the site.

4. METHODS

All archaeological remains or documentary evidence relating to the area within c.700m of the proposed development site were considered. Compilation of the archaeological and historical data relevant to the area of the proposed development site involved examination of all appropriate primary and secondary sources available. These have included:

- Historical documents, held in Lincolnshire Archives Office.
- Enclosure, tithe, parish and other maps and plans, held in Lincolnshire Archives Office.
- Recent and old Ordnance Survey maps.
- Lincolnshire County Council Sites and Monuments Record.
- Aerial photographs.
- Archaeological books and journals.

Information obtained from the literature and cartographic examination was supplemented by a geophysical (fluxgate gradiometer) survey of the site. Details of the methodology of this survey are contained within Appendix 2. The present land-use and ground conditions were also noted during the survey.

Results of the archival and field examinations were committed to scale plans of the area.

5. RESULTS

5.1 Historical Data

Willoughby is first mentioned in the Domesday Survey of 1086. At that time the manor of *Wilgebi* is recorded as belonging to Gilbert of Ghent. Included among his holdings were, a church, 40 acres each of marsh and meadow, 120 acres of woodland pasture and 60 acres of underwood (Morris ed. 1986, 24,54;59).

The place-name Willoughby is a Scandinavianisation of the Old English name *Wiligtun* and refers to the 'farmstead where the willows grow' (Cameron 1998, 139).

Relatively little is known about the medieval history of Willoughby village and its development. This lack of information is reflected in the uncertainty surrounding the origin of Dam Close.

Historically, Willoughby is best remembered as the birthplace of John Smith, the pioneer who was saved by Pocahontas from execution (Mee 1949, 418).

The parish was enclosed by Act of Parliament in 1838 although the associated map suggests that some fields had already been enclosed.

A station was built at Willoughby on the East Lincolnshire Railway. This line opened in 1848 to connect Boston and Grimsby. A junction for another line to Sutton on Sea was added just to the north of Willoughby and opened in 1886. Both of these railway lines closed in 1970 (Wright 1993, 112).

5.2 Cartographic Data

The proposed development site is located on the west side of the village of Willoughby. Appropriate maps of the vicinity were

examined.

The earliest map examined which is relevant to the area under investigation is Armstrong's 'Map of Lincolnshire', which dates from 1788 (Fig. 3). This map is of a small scale and does not show any detail for the assessment site. However, a rectangular enclosure flanked by trees, which presumably represents the Dam Close earthwork, is shown. The surviving enclosure is trapezoidal in plan and has only two entrances, not the four shown on Anderson's map. The accuracy of Armstrong's map is questionable as the relative positions of Sloothby and Cumberworth illustrates (cf. Fig.3 & Fig.6).

The enclosure map for Willoughby (LAO Lindsey Award 144) is dated 1838, but unfortunately shows very little detail (Fig.4). Only some fields are represented on this map, suggesting others had already been enclosed, and no information relating to the site or Dam Close is shown. The map does provide some details about the surrounding area. Station Road was formerly called *Field Gate* and an area to the west was called *The Brick Close*. It is possible that a brickworks was, or had been, located at that site.

A map of the proposed route of the East Lincolnshire Railway produced in 1845 (LAO TP.5) is the first to show the field boundaries to the west of the site in detail (Fig. 5). Only part of the site itself is shown although its boundaries appear to be the same as they survive at present. The area of Dam Close is shown as a field of a slightly different shape to the surviving earthwork. A stream is shown running through the area. It forks just to the west of the line of the proposed railway, with one branch running along the north side of Dam Close and past the southern end of the proposed development site. The second branch flowed south towards and then approximately along the present course of Burlands Beck. The eastward slope of the land, shown on later maps (e.g Fig. 7) suggests that the stream would have flowed from the west, towards Dam Close. A path is indicated along part of the northern and western sections of the

stream.

The first edition Ordnance Survey map provides the first accurate representation of Willoughby village (Fig. 6). Although originally published in 1824, these maps were revised several times during the 19th century to include major changes, particularly the construction of railways, and Fig.6 dates to the 1880s. The map is of too small a scale to show any detail for the assessment site. The Dam Close earthwork is represented and simply labelled '*The Dam*'.

The second edition 6" Ordnance Survey map section showing the assessment area was surveyed in 1887, although a 1906 revised edition was examined (Fig.7). The site is shown as part of a rectangular field with a small extension to the north. Two buildings are shown in the northwest corner of the site which were not shown in 1845. The path along the stream indicated on the railway map is shown running from the road junction in the centre of Willoughby, westwards across the site, past Dam Close through Hoplands Wood to Claxby village. The southern branch of the stream shown on the 1845 map has been replaced by the present course of Burlands Beck.

Later Ordnance Survey maps such as the 1973 1:100000 map (Fig.2) shows significant changes to the site and its surroundings. Although the site boundaries have remained the same, the buildings on the site have disappeared. Many of the small fields in the area have been amalgamated into larger land units. The railway line had been closed and the stream to its west had been removed. The small earthwork located to the south of Dam Close on the 1906 map had also been destroyed. The footpath which crosses the site is not marked on the 1:10000 map but is shown on the 1982 edition of the 1:25000 Ordnance Survey map.

5.3 Aerial Photograph Data

Only one aerial photograph relevant to the

Map Code No.	RCHME Ref.	Interpretation	National Grid Reference
1	Li.436.14.1	Probable unknown medieval earthwork enclosure	TF 4689 7172
2	Li.436.14.2	Probable unknown medieval cropmark and earthwork enclosure	TF 4696 7161
3	Li.436.15.6	Possible late medieval earthwork croft	TF 4680 7182
4	Li.436.15.8	Probable late medieval earthwork ridge and furrow	TF 4683 7163
5	Li.436.15.3	Possible late medieval earthwork tofts	TF 4714 7196
6	Li.436.15.5	Probable late medieval earthwork croft	TF 4705 7167
7	Li.436.15.7	Probable late medieval earthwork ridge and furrow	TF 4714 7167
8	Li.436.16.1	Probable post-medieval earthwork moat	TF 4730 7184
9	Li.436.15.1	Probable late medieval earthwork tofts	TF 4708 7213
10	Li.436.15.2	Probable late medieval earthwork enclosure	TF 4708 7215
11	Li.436.15.4	Possible late medieval earthwork crofts	TF 4745 7235

Table 1: Known earthwork and cropmark sites in the vicinity of the proposed development site.

assessment area was held at the Lincolnshire SMR. This photograph (RCHM TF4671/3) showed the Dam Close earthwork enclosure and part of the proposed development site. The site was under arable agriculture but no archaeological features were visible.

Known cropmarks and earthworks within the assessment area had recently been plotted onto map overlays by the RCHME (Sheet TF47SE) drawing on the resources of all major national and local aerial photograph collections. Relevant features are detailed in Table 1 and plotted on Figure 2.

All of the recorded cropmarks and earthworks have been interpreted as being of medieval or post-medieval date. The most substantial of these is the Dam Close earthwork enclosure (Fig.2, No.1) which lies less than 50m southwest of the site. A smaller enclosure to its south survives as cropmarks and earthworks but appears to have been largely removed during the 20th century. Dam Close has been

interpreted as a fortified enclosure. However, as its name suggests, it may have been a mill dam or fishpond. 'Dam' place-names are often associated with features of this type (Field 1993, 52). The presence of the stream flowing towards the enclosure on the 1845 map lends some support to these interpretations.

Other cropmark and earthwork evidence relates to the medieval settlement and includes the boundaries of crofts and tofts as well as the remains of ridge and furrow. The western boundary of a late medieval croft earthwork (Fig.2, No.6) appears to form a continuation of the western boundary of the proposed development site. This may indicate the date of the site boundaries.

5.4 Archaeological Data

Records of archaeological sites and finds are held in the Lincolnshire County Sites and Monuments Record. Details of archaeological

Map Code No.	SMR Ref.	Description	National Grid Reference
----	----	Neolithic greenstone axe	Unlocated
12	43503	Bronze Age axe fragment	TF 4725 7200
13	TF 47 SE-W	Romano-British site. Pottery, tile, etc.	TF 4655 7223
14	TF 47 SE-P	Romano-British pottery and glass	TF 4650 7250
15	TF 47 SE-S	Romano-British pottery	TF 4750 7180
16	TF 47 SE-S	Unidentified Saxon finds	TF 4750 7180
1	TF 47 SE-D	Dam Close earthwork enclosure	TF 4689 7172
17	TF 47 SE-Y	St Helen's Church	TF 4734 7195
18	TF 47 SE-S	Medieval pottery	TF 4750 7180
8	42003	Post-medieval moat	TF 4730 7184
19	42009	Post-medieval moat, fishponds and gardens	TF 4745 7235
20	43514	Railway station	TF 4667 7195

Table 2: Known archaeological sites and finds from within c.700m of the proposed development site in chronological order.

and historical remains falling within c.700m of the proposed development site are collated in Table 2 and located on Figure 2.

Prehistoric Archaeology

A Neolithic (4000-2250 BC) greenstone axe represents the earliest find from the assessment area. It appears that this artefact was found in the village, but the exact findspot is not recorded as a grid reference. A fragment of a Bronze Age (2250-800 BC) axe has also been found off Church Lane (Fig. 2, No.12).

Romano-British Archaeology

Three Romano-British (AD 50-410) sites are located within the assessment area. A large site was discovered to the northwest of the village during the construction of the railway line in 1885 (Fig.2, No.13). Roof and flue tiles, pottery, bronze patera fragments and a coin of Hadrian (117 - 138 AD) were found at the site. A small quantity of Roman pottery and fragments of a 4th century glass vessel were found c.200m to the north of this site (Fig.2, No.14). If these finds are associated, it

suggests that the site is very extensive.

Romano-British pottery has also been found c.500m to the east of the proposed development site (Fig.2, No.15).

Saxon Archaeology

The Saxon period (410-1066AD) is represented by a single uncertain reference in the SMR. 'Saxon finds' are recorded to the east of the village but the exact nature of these, whether pottery or metalwork, is unknown (Fig.2, No.16).

Whites *Directory of Lincolnshire* (1882, 810) records that, 'near the church are the vestiges of a Danish camp and two coins were found of the time of Edward II [1307-1327]'. This is probably a reference to the Dam Close earthwork, although it is not particularly close to the church or likely to be of this date (Fig.2, No.1).

Medieval Archaeology

The principal medieval site (AD 1066-1500)

in Willoughby is the earthwork enclosure of Dam Close (Fig.2, No.1). It consists of a banked enclosure with north and south entrances with no evidence of any structures having been inside. The smaller enclosure to the south, which no longer exists, had a well within it. The only dating evidence which may be associated with them are the two early 14th century coins already mentioned. The function of these enclosures is not certain but possibilities include a fortified enclosure, fishpond or mill pond.

Medieval pottery, including an aquamanile spout in the form of a dog's head, has been found to the east of the village (Fig.2, No.18).

Willoughby church, which is dedicated to St Helen, is located to the east of the proposed development site (Fig.2, No.17). It is largely built in the Perpendicular style dating to the early 14th century and was restored and rebuilt several times during the 19th century (Pevsner 1995, 799-800).

Post-medieval Archaeology

Two post-medieval moated sites are recorded at Willoughby. One of these surrounds the 18th century Rectory on three sides (Fig.2, No.8). It does not appear to have ever formed a complete enclosure and is probably an ornamental and drainage feature contemporary with the Rectory.

The second moated site is located to the northeast of the village at the Manor House (Fig.2, No. 19). A fishpond and garden remains are also recorded and it is likely that they are all associated with the Manor House.

5.5 Historic Buildings Data

A number of listed historic buildings are located in Willoughby village within the area of the assessment (DoE 1987, 37-40). The parish church of St. Helen is of early 14th century date and of grade I status. All of the other listed buildings in the village are of grade II status.

The Rectory is of mid- 18th century date with early 19th century alterations and later extensions. It is constructed of red and yellow brick with a slate roof. A late 18th century red brick bridge over the moat in the grounds of the Rectory is also grade II listed.

The Manor House on the northeast side of the village dates from the late 18th century with mid- 19th century alterations. It is built of red brick with a slate roof on an L-shaped plan. The rear wing has a Venetian window.

Covells Farm House is situated to the east of Chapel Lane. It originally dates from the late 16th century, with early 18th century rebuilding and later alterations. It is built of red brick with a late 16th century axial stack and a pantile roof.

5.6 Geophysical Survey

A fluxgate gradiometer survey was undertaken on 10th February 2000. Serious problems were encountered due to the presence of large quantities of ferro-magnetic material on the ground surface, particularly in the north and west parts of the survey area. This seriously affected the quality of the results and no archaeological features were identified, even in the areas not influenced by the magnetic disturbance (Appendix 2).

6. CONSTRAINTS

6.1 Heritage Constraints

Statutory and Advisory Constraints

No Scheduled Ancient Monuments protected by the Ancient Monument and Archaeological Areas Act of 1979 (HMSO 1979) are located within the assessment area. All archaeological remains are protected only through the implementation of PPG16 (DoE 1990).

Other Constraints

Although no specific checks were carried out for this assessment it is not expected that any extant services cross the site. This conclusion

appears to be supported by the geophysics results which did not identify any linear features.

7. ASSESSMENT OF SIGNIFICANCE

For assessment of significance the *Secretary of State's criteria for scheduling ancient monuments* has been used (DoE 1990, Annex 4; See Appendix 3).

Period

Activity dateable from the Neolithic period to the modern day has been recognised within the assessment area.

Neolithic and Bronze Age artefacts have been recovered from within Willoughby village. No evidence of Iron Age activity was identified within the assessment area.

Romano-British activity is represented mainly by the site discovered to the northwest of the village during the construction of the railway. Roman pottery has also been found to the east of the village.

The Anglo-Saxon period is not meaningfully represented by the archaeological records. The type of artefacts that constituted the 'Saxon finds' from the east side of the village is not known. The evidence from the Domesday Book proves the existence of a late Saxon settlement with a church.

The medieval period is very well represented by earthwork and cropmark remains throughout the assessment area. The Dam Close earthwork is located 50m to the southwest of the proposed development site. Other medieval remains include St. Helen's Church and pottery found to the east of the village.

Rarity

Finds of isolated prehistoric stone artefacts, such as the axes from Willoughby, are not especially uncommon in Lincolnshire.

The Romano-British site at Willoughby appears

to be a villa or farmstead and as such is not uncommon. The pottery finds from the east side of the village are probably part of another site and but cannot be considered rare in their own right.

Medieval evidence at Willoughby is generally of relatively common types. Earthwork and cropmark remains of crofts, tofts and ridge and furrow are located around the periphery of the present village. Evidence for medieval settlements and churches is widespread, both locally and nationally. The Dam Close earthwork is more unusual either as a fortified enclosure or a large and well preserved fish- or mill pond.

Documentation

Records of archaeological sites and finds made in the assessment area are kept in the Lincolnshire Sites and Monuments Record. No archaeological investigations have previously been carried out within the assessment area.

This report provides the first detailed review of the archaeological and historical aspects of the assessment area.

Group value

The two prehistoric artefacts recovered from Willoughby are from different periods and have no group value.

The potential relationship between the Romano-British site and isolated pottery finds gives them a moderate group value as they show that there was widespread activity in the landscape during that period.

The variety of the medieval archaeology within the assessment area, including settlement, religious and agricultural activity, has a moderately high group value.

Survival/Condition

Both of the prehistoric artefacts from Willoughby were surface finds and it is impossible to tell whether these were associated with buried remains.

The Romano-British site to the north west of

the village was discovered during the construction of the railway and was probably extensively disturbed at that time. The pottery found to the east of the village may be associated with buried remains of unknown extent and condition.

Any archaeological deposits associated with the documented late Saxon settlement at Willoughby may have been disturbed to some extent by later settlement activity and may not be well preserved.

A number of well preserved medieval remains survive in the village. These include earthworks of tofts, crofts and ridge and furrow as well as the Dam Close enclosure.

Fragility/Vulnerability

None of the known archaeological remains at Willoughby lies within the site boundaries and consequently they are not at risk from the proposed development. However, as none of the sites are covered by statutory protection, they could be damaged by other developments or agricultural activity. The medieval earthwork remains around the village would be particularly susceptible to changes in land-use or development.

Diversity

A high period diversity is represented by the identification of prehistoric, Romano-British, Saxon and medieval archaeology within the assessment area. Sites relating to settlement, religion, agriculture and communications were identified, representing a high functional diversity.

Potential

The two prehistoric axes found in the village show that there is some potential for further discoveries within the assessment area, although this is relatively low.

The Romano-British remains from Willoughby village illustrate that there was significant human activity around the assessment area during this period. The distance of the proposed development site from the previous finds indicates a low to moderate potential for

further discoveries of this period.

Willoughby church and the Anglo-Saxon finds are both located on the east side of the village away from the proposed development site. In view of this the potential for remains of this period being discovered at the site is low.

The extent of the medieval archaeology within the assessment area means that there is a moderate potential for the discovery of further remains at the proposed development site. The alignment of the late medieval croft boundary (Fig.2, No. 6) with the western boundary of the site, may indicate that it is part of a medieval landholding.

The function of the Dam Close earthwork to the southwest of the site remains uncertain. The three suggestions for its origin are either as a fortified enclosure or a fish- or mill pond. Although its name and the former presence of the stream to the west suggest it may have been a mill pond, the lack of other evidence makes it difficult to be certain. As a result of this it is unclear whether any unidentified remains surround the earthwork remains. However, if Dam Close was a mill pond it could be expected that the watermill had been sited on its downhill side, to the east or southeast.

8. CONCLUSIONS

The assessment has identified a variety of archaeological remains within c.700m of the proposed development site. These remains represent a very diverse assemblage, both in terms of its date range (Neolithic to post-medieval) and site types (settlement, religious, communication and agricultural).

Although evidence for prehistoric, Romano-British and Saxon activity has been recorded at Willoughby, none of this lies in or close to the proposed development area.

Willoughby village contains a range of remains of medieval date including cropmarks and earthworks relating the settlement and its

fields. A late medieval property boundary (Fig. 2, No.6) aligns with the western boundary of the site and may indicate that it is a contemporary landholding. The function of the Dam Close earthwork to the southwest of the site remains uncertain. It is possible that it was a fortified enclosure or a fish- or mill pond. If it was a mill pond it could be expected that a watermill was located on its east or southeast side. Irrespective of its function it is not clear whether any other remains would be expected surrounding the earthwork or at the proposed development site.

Two buildings are shown in the northeast corner of the site on the second edition Ordnance Survey map of 1906 (Fig. 7). These were not depicted on the 1845 railway map (Fig. 5) and are likely to be of mid to late 19th century date.

The geophysical survey of the site was hampered by the presence of large quantities of ferrous material on the surface of the site. Consequently no archaeological features were identified.

9. ACKNOWLEDGEMENTS

Archaeological Project Services would like to acknowledge the assistance of Barnhay Design Services who commissioned this report. The work was coordinated by Denise Drury who edited this report with Tom Lane. Maps were drawn by David Hopkins and computerised by Phil Mills. Access to the County Sites and Monuments Record was kindly provided by Mark Bennet and Sarah Grundy of the Archaeology Section, Lincolnshire County Council. Thanks are also due to the staff of the Lincolnshire Archives Office and Lincoln Central Library.

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11. ABBREVIATIONS

- | | |
|-------|---|
| APS | Archaeological Project Services |
| DoE | Department of the Environment |
| HMSO | Her Majesties' Stationary Office |
| IFA | Institute of Field Archaeologists |
| LAO | Lincolnshire Archive Office |
| RCHME | Royal Commission on the Historical Monuments of England |
| SMR | County Sites and Monuments Record Office |

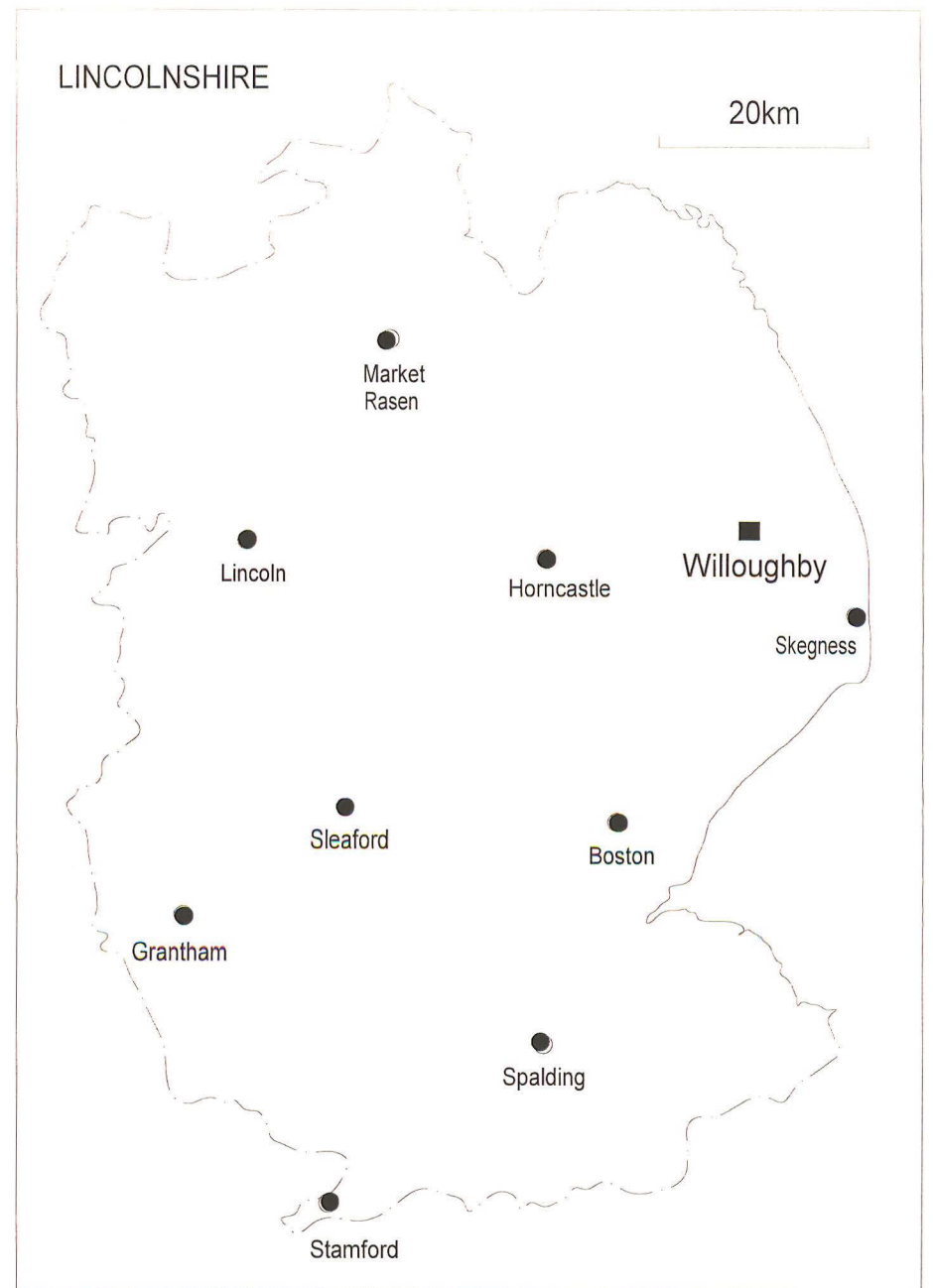


Figure 1 General Location Plan

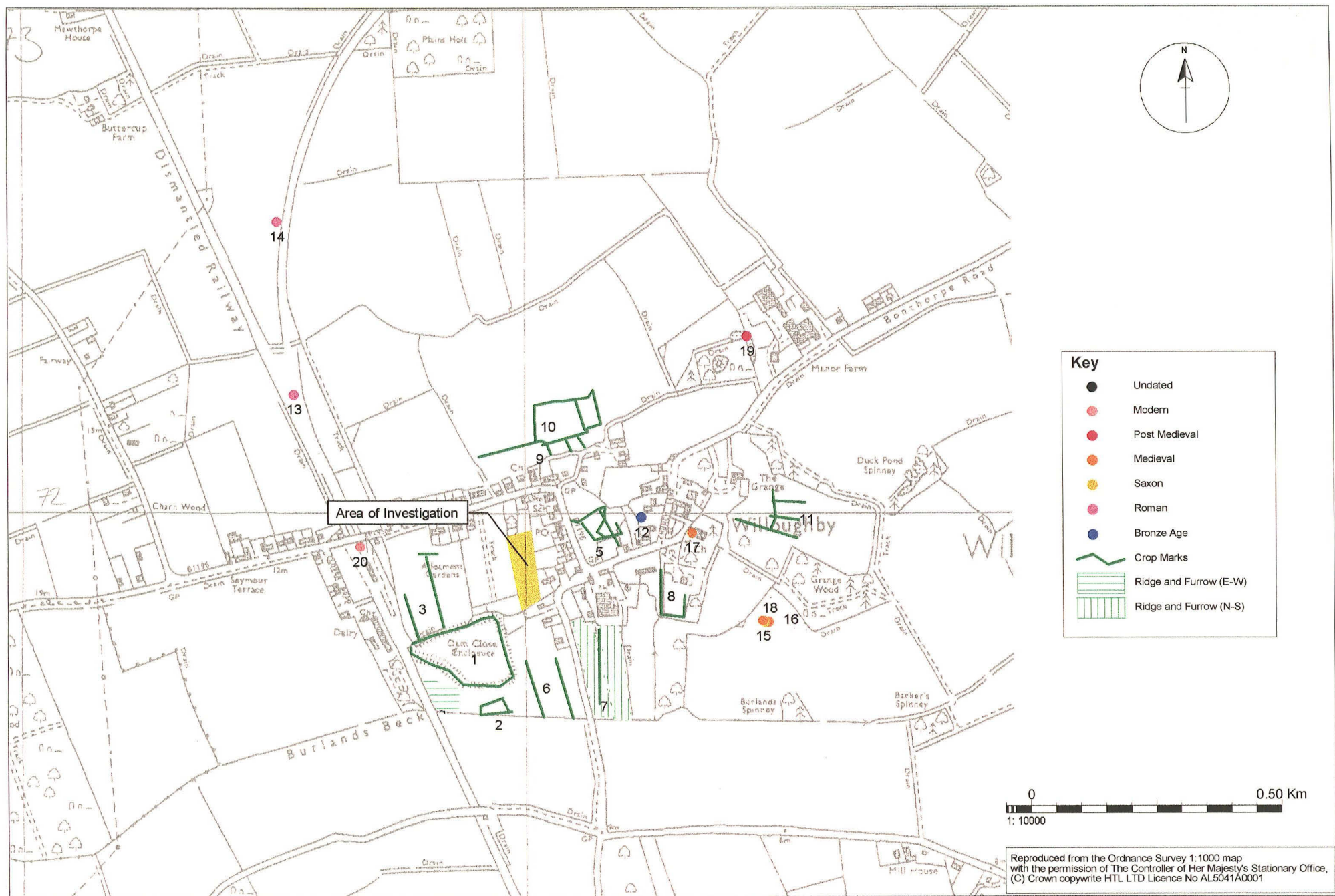


Figure 2 Site location plan and archaeological setting

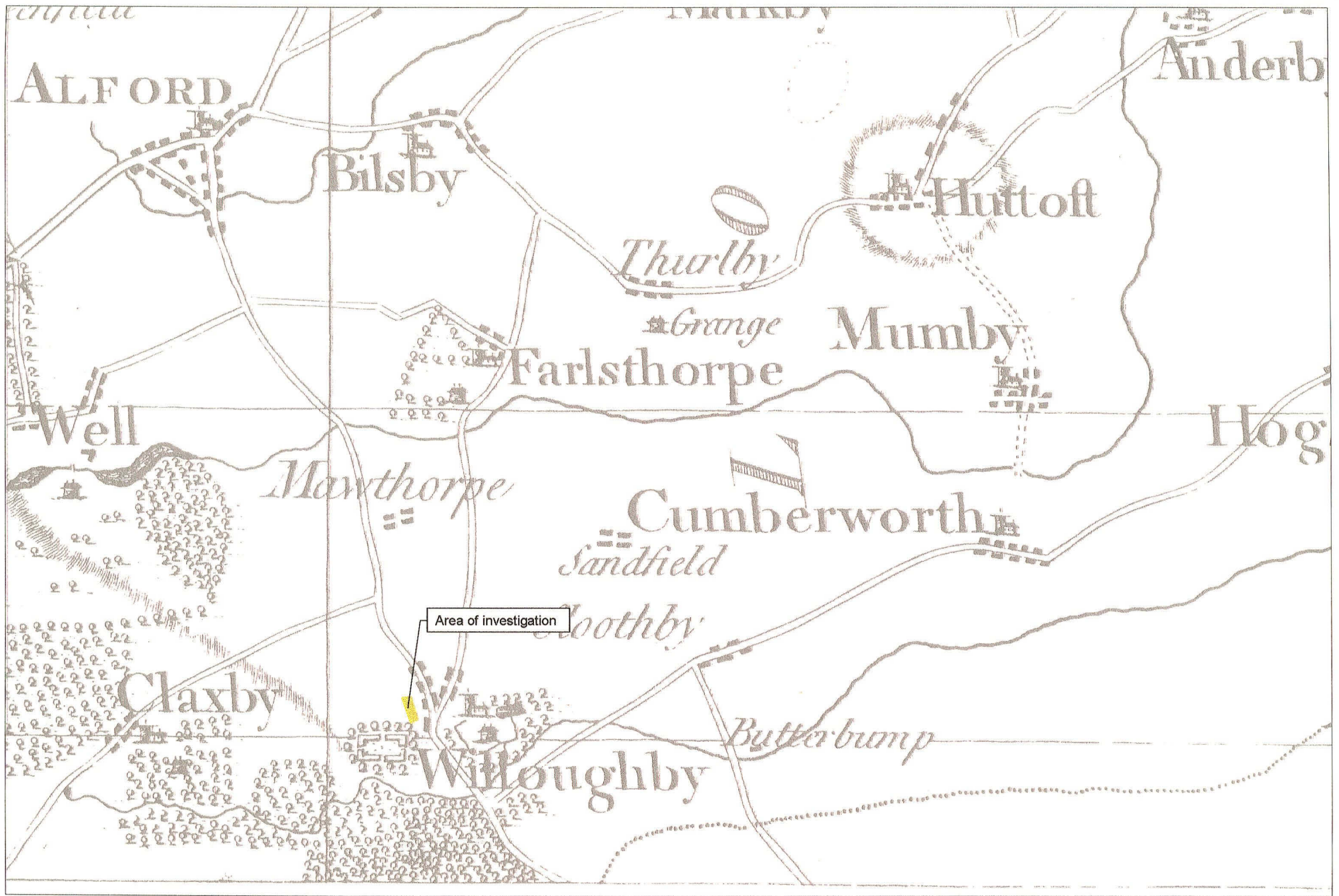


Figure 3 Extract from 'Armstrong's map of Lincolnshire 1788' showing approximate site location

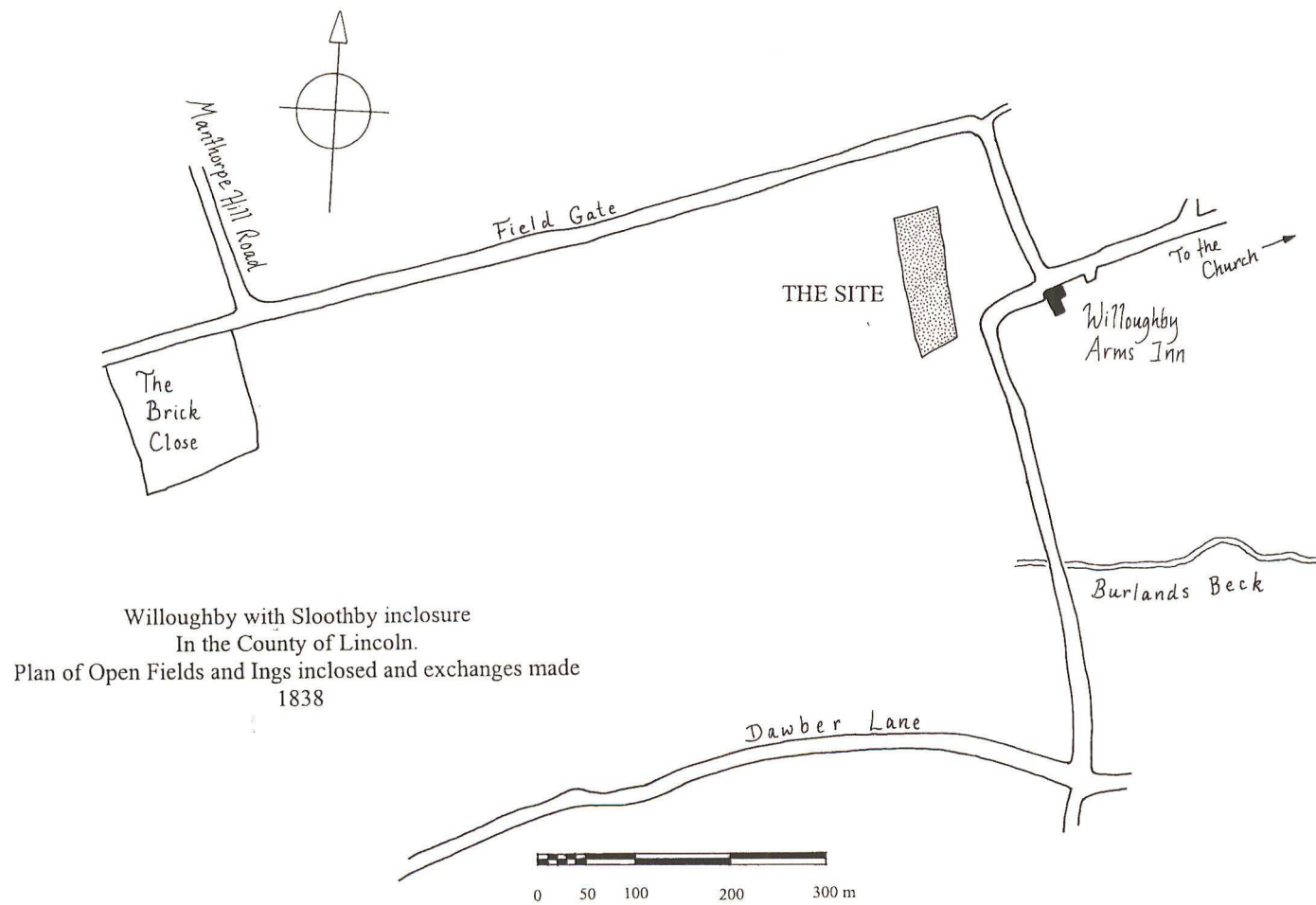


Figure 4 Extract from Willoughby with Sloothby inclosure in the county of Lincoln.

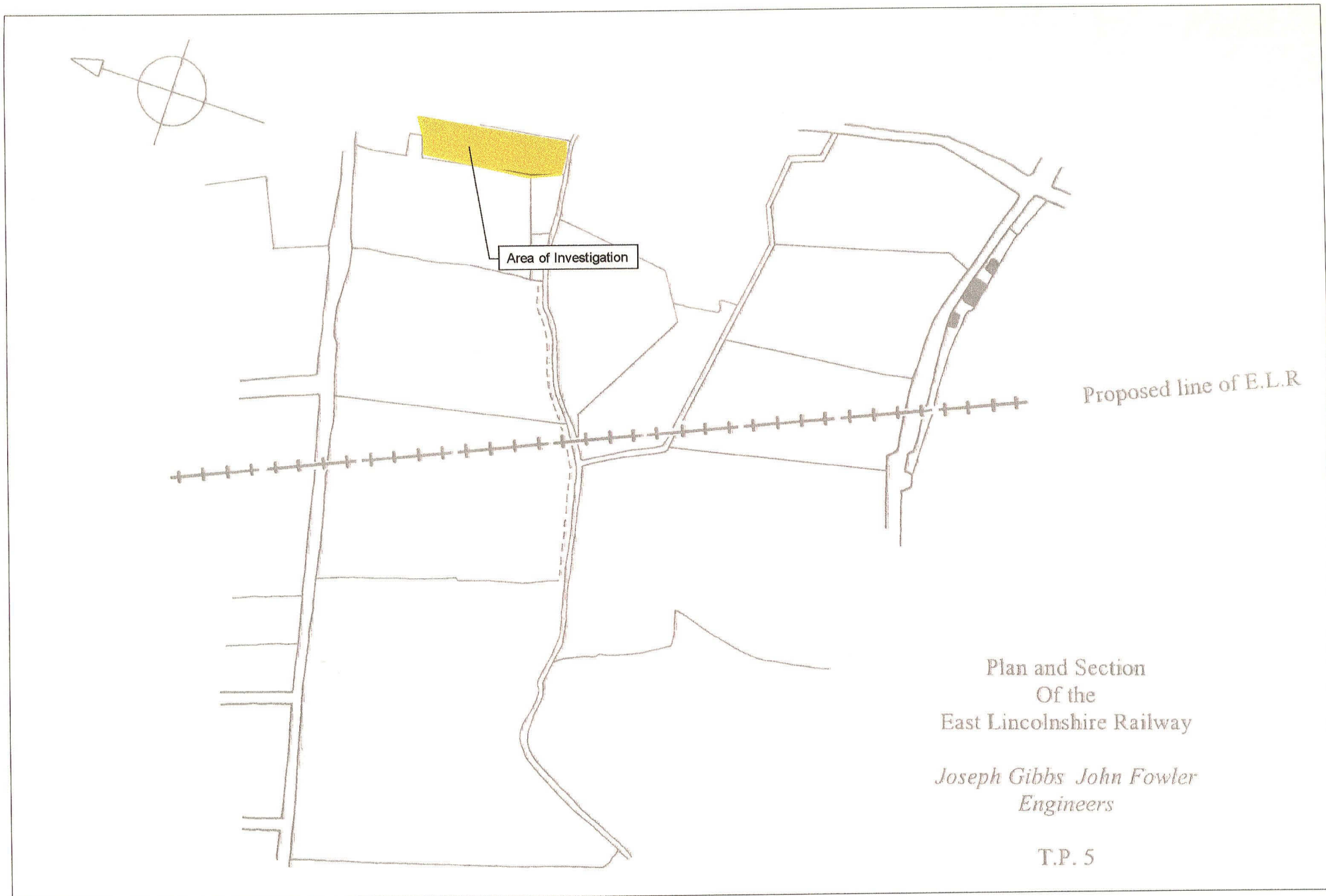


Figure 5 Extract from 'Plan and section of the East Lindsey railway 1845



Figure 6 Extract from the 1st edition Ordnance Survey map showing approximate site location

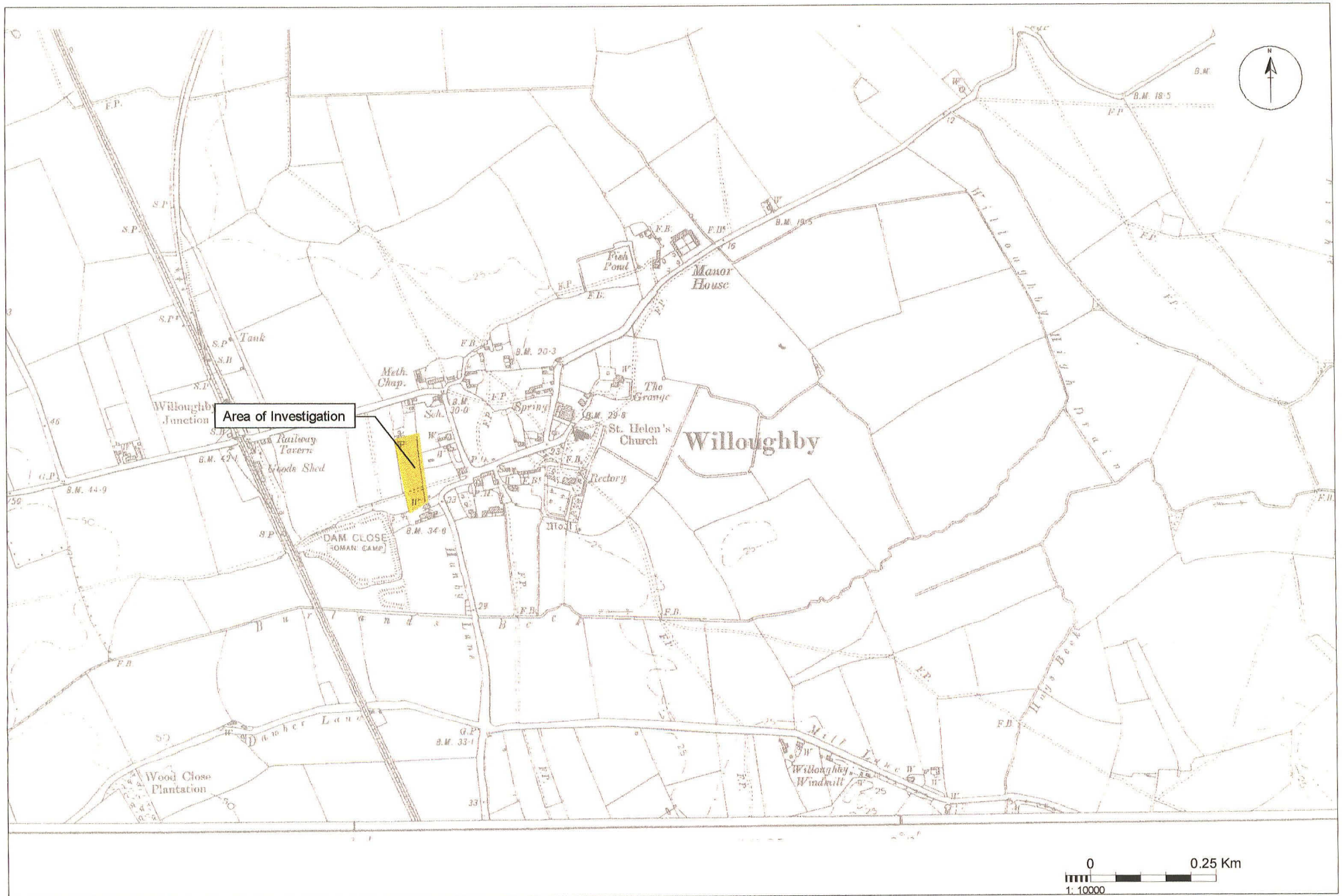


Figure 7 Extract from the 2nd edition Ordnance Survey map showing site location

Appendix 1

**SPECIFICATION
FOR THE
DESK-BASED ASSESSMENT
AND GEOPHYSICAL SURVEY
OF LAND AT
STATION ROAD
WILLOUGHBY**

**PREPARED FOR
BARNHAY DESIGN SERVICES**

JANUARY 2000

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1 SUMMARY

- 1.1 *This document comprises a specification for the desk-based assessment and geophysical survey of land at Station Road, Willoughby, Lincolnshire.*
- 1.2 *The site lies in the village of Willoughby, close to an earthwork known as Dam Close. Archaeological remains associated with the earthwork and/or the medieval settlement may survive within the application area.*
- 1.3 *The desk-top assessment will collate all readily available data relating to the previous archaeological discoveries in the area.*
- 1.4 *The complete extent of the investigation area will be subject to geophysical survey using a fluxgate gradiometer. On completion of the fieldwork the geophysical results will be analysed by computer and a report giving a summary of the results will be produced.*
- 1.5 *The results of the assessment and the geophysical survey will be presented in a written report describing the nature of the remains, with supporting illustrations showing their location and extent.*

2 INTRODUCTION

- 2.1 This document comprises a specification for the desk-based assessment and geophysical survey of land off Station Road, Willoughby, Lincolnshire. The site is centred on national grid reference TF 4700 7190.
- 2.2 The document contains the following parts:
 - 2.2.1 Overview
 - 2.2.2 The archaeological and natural setting.
 - 2.2.3 Stages of work and methodologies to be used.

3 SITE DESCRIPTION

- 3.1 Willoughby is located 56km east of Lincoln and 5km south of Alford in the administrative district of East Lindsey. The site is located in the village on the south side of Station Road, and is centred on national grid reference TF 4700 7190. The site covers an area of 0.63ha and is currently under pasture.

4 PLANNING BACKGROUND

- 4.1 An outline planning application (number S/208/01808/99) has been submitted to East Lindsey District Council for development on land at Station Road, Willoughby. The Lincolnshire County Council Archaeology Officer has requested that a desk-based assessment and geophysical survey be undertaken to provide information required for the determination of the application.

5 SOILS AND TOPOGRAPHY

- 5.1 The site is located in the village of Willoughby and lies at approximately 9m OD. Local soils are of the Wick 1 Association, mainly fine loamy and coarse loamy soils and Holderness Association, coarse loamy typical brown earths on chalky till and glaciofluvial drift (Hodge *et al.* 1984, 214, 345). The site is covered with grass.

6 ARCHAEOLOGICAL OVERVIEW

- 6.1 The site is located in the village of Willoughby, a settlement recorded in the Domesday Survey as possessing a church. An earthwork known as Dam Close, thought to date from the medieval period, lies a short distance to the south west of the application area.
- 6.2 There is potential for archaeological remains survive on the site perhaps associated with the nearby earthwork and/or the medieval occupation of the village.

7 AIMS AND OBJECTIVES

- 7.1 The aim of the work will be to gather sufficient information to enable the curatorial archaeologist to formulate a policy for the preservation of the archaeological remains present on the site.
- 7.2 The objectives of the desk-based assessment and geophysical survey will be to establish:
- 7.2.1 The type of archaeological activity that may be present within the site.
 - 7.2.2 The form of the archaeological features present within the site.
 - 7.2.3 The spatial arrangements and density of archaeological features present on the site.
 - 7.2.4 The likely extent of archaeological activity present within the site.
 - 7.2.5 The extent to which the surrounding archaeological features extend into the application area.

- 7.2.6 The way in which the archaeological features identified fit into the pattern of occupation and land-use in the surrounding landscape.

8 DATA COLLECTION

- 8.1 To enable an effective assessment of the archaeological setting of the site and the remains contained within it, the desk-top assessment will examine the site and surrounding 500 metres.
- 8.2 The following sources will be consulted:
- 8.2.1 Lincolnshire Sites and Monuments Record: to obtain details of previous archaeological finds and sites within the study area, and other data, including reports of previous archaeological work.
 - 8.2.2 The Lincolnshire Archives: to provide historical documentation relating to the site, including tithe maps, enclosure awards and parish maps.
 - 8.2.3 Ordnance Survey maps; current and past editions.
 - 8.2.4 Aerial photographs held in national and local collections. Archaeological data will be plotted using the Mobius network technique.
 - 8.2.5 Archaeological books and journals with information relevant to the site.
 - 8.2.6 Data relating to the geotechnical investigation of the site to provide information regarding the potential depth of topsoil and other overburden as this may affect the feasibility of any subsequent phases of work should these be required.
 - 8.2.7 Any other sources with relevant information, located during the work.
 - 8.2.8 Identify any other constraints on the proposed development area.
 - 8.2.9 As part of the study a field visit will be undertaken to establish the following:
 - 8.2.9.1 To identify any earthworks not previously located and to verify the state of preservation of any earthworks that have been previously recorded.

9 GEOPHYSICAL SURVEY

9.1 Reasoning for this technique

9.1.1 The geophysical survey of the site will use fluxgate gradiometer. This technique enables large areas to be investigated rapidly and the results facilitate the rapid identification of the likely archaeological potential of the site.

9.1.2 The effectiveness of the technique is limited by background magnetic susceptibility and the ground cover which ideally should be minimal.

9.2 Methodology

9.2.1 The entire area of the site will be surveyed by an experienced operator to identify areas of enhanced magnetic activity. The survey areas will be divided into 20m squares and 800 readings will be logged per square.

9.3 Report

9.3.1 A report will be prepared on completion of the survey detailing the methodologies used and the results of the work. The areas and nature of archaeological activity will be shown on a series of computer generated plots and the anomalies encountered will be interpreted. The report will be prepared in accordance with the English Heritage (1995) document *Geophysical Survey in Archaeological Field Evaluations*, Research and Professional Services Guideline 1.

10 **REPORT**

10.1 The findings of the desk-based assessment and geophysical survey will be presented in a written report supported by illustrative material reproduced on appropriate scale site plans. The text will summarise all the data collected and the sources consulted will be referenced. The results will be interpreted and, as far as possible, the various types of activity, *eg* barrows or medieval field systems, will be individually discussed.

10.2 The plans will show the location of the various archaeological sites and finds located during the assessment. The features identified during the search of the relevant aerial photographs will be plotted onto similar scale plans. Additionally, any areas of disturbance or destruction to potential archaeological deposits will be plotted.

10.3 The report will incorporate the results of the geophysical survey and the methodologies used. The areas and nature of the archaeological activity will be shown on a series of computer generated plots and the anomalies encountered will be interpreted. The results will be presented in accordance with English

Heritage (1995) document *Geophysical Survey in Archaeological Field Evaluations*, Research and Professional Services Guidelines 1.

10.4 Any information that is collected from geotechnical reports will also be incorporated into the report.

10.5 The report will attempt to place the results of the study into a local, regional and national archaeological context, and will identify any specific research priorities that may be may be addressed by the site.

11 REPORT DEPOSITION

11.1 Copies of the report of desk-based assessment and geophysical survey will be sent to the Client; the Lincolnshire County Council Archaeology Officer; East Lindsey District Council Planning Department; and the Lincolnshire County Sites and Monuments Record.

12 ARCHIVE

12.1 The documentation and records generated during the assessment and survey will be sorted and ordered into the format acceptable to the City and County Museum, Lincoln. This will undertaken following the requirements of the document titled *Conditions for the Acceptance of Project Archives* for long term storage and curation.

13 PUBLICATION

13.1 A report of the findings of the evaluation will be published in Heritage Lincolnshire's annual report and a short note presented to the editor of the journal of the Society for Lincolnshire History and Archaeology.

14 CURATORIAL RESPONSIBILITY

14.1 Curatorial responsibility for the archaeological work undertaken on the site lies with the Lincolnshire County Council Archaeology Officer. Written notice will be given to the curator prior to the commencement of the project.

15 VARIATIONS

15.1 Variations to the proposed scheme of works will only be made after written confirmation from the Lincolnshire County Council Archaeology Officer that the changes are acceptable.

15.2 Should the Lincolnshire County Council Archaeology Officer require any additional investigation beyond the scope of the brief for works, or this specification, then the cost and duration of those supplementary examinations

will be negotiated between the client and the contractor.

16 PROGRAMME OF WORKS

- 16.1 The desk-based assessment will be undertaken by a supervisor experienced in such work.
- 16.2 The geophysical survey will be undertaken by an external specialist contractor, Engineering Archaeological Services. The fieldwork will be undertaken in one day and a report on the findings will then be compiled.

17 INSURANCES

- 17.1 Archaeological Project Services, as part of the Heritage Trust of Lincolnshire, maintains Employers Liability Insurance of £10,000,000, together with Public and Products Liability insurances, each with indemnity of £5,000,000. Copies of insurance documentation can be supplied on request.

18 COPYRIGHT

- 18.1 Archaeological Project Services shall retain full copyright of any commissioned reports under the *Copyright, Designs and Patents Act 1988* with all rights reserved; excepting that it hereby provides an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project as described in the Project Specification.
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19 BIBLIOGRAPHY

English Heritage, 1995 *Geophysical survey in archaeological field evaluation*, Research and Professional Services Guideline 1

Hodge CAH, Burton, RGO, Corbett, WM, Evans, R and Seale, RS, 1984 *Soils and their use in Eastern England*, Soil Survey of England and Wales No. 13

Specification: Version 1, 28/01/2000

Appendix 2

*Survey Commissioned
by
Archaeological Project Services*

*Surveyed
by
I.P. Brooks
Engineering Archaeological Services Ltd.*

*registered in England
Nº 2869678*

*Station Road, Willoughby
Geophysical Survey*

February 2000

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NGR

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*Techniques of
Geophysical Survey*

Instrumentation

Methodology

Copyright

Willoughby Geophysical Survey - Introduction:

NGR

Centred on TF 47007197

Location and Topography

The area surveyed lies behind "Old Orchards", Station Lane, Willoughby, Lincolnshire. It forms an extension to the rear garden now used to store agricultural equipment. The southern 25 m of the plot has been planted with trees within the last 15 years. The northern area is under a crushed stone hard stand and the middle area was under rough grass. The area was flat.

Archaeological Background

The upstanding earthwork of Dam Close lies approximately 50m to the south west of the survey area.

Aims of Survey

To locate and define any magnetic anomalies of possible archaeological origin.

SUMMARY OF RESULTS

No archaeological features were recorded. A number of anomalies were located, however these would appear to relate the presence of abandoned agricultural equipment in the hedges.

Willoughby Geophysical Survey -Results:

Survey Results:

Area

An area approximately 35 x 85 m was investigated to the south of the rear garden of "Old Orchard" (Figure 1). The northern end of the survey was defined by the presence of a stone hard stand and agricultural equipment. The western boundary was partly defined by abandoned agricultural equipment dumped in the hedge.

Display

The results are displayed as Grey Scale Image and as X-Y Trace Plots. (Figures 2 and 3)

Results:

Detailed Survey:

Nine 20 x 20 m grids were investigated at the southern end of the available area. (Figure 1)

No anomalies were located within the survey area. Large areas, particularly along the western boundary were disturbed with ferromagnetic responses (shown in blue on Figure 4) largely reflecting the quantity of agricultural machinery and debris along this boundary.

The areas shown in green on Figure 4 are the locations of trees within the survey area.

Magnetic Susceptibility

Soil samples were taken from the area of detailed survey in order to assess the magnetic susceptibility of the soils. It was not possible to obtain a subsoil sample for comparison .

Sample	Volume susceptibility χ_v	Mass susceptibility χ_m
Grid 2	33	33.7
Grid 4	12	13.6
Grid 6	43	48.3
Grid 8	16	18.8

The susceptibilities as measured are generally low, however there would appear to be a significant difference between the southern grids (Grids 2 and 6) and the northern half of the survey area (Grids 4 and 8). This would possibly suggest increased activity in the southern end of the site.

Willoughby Geophysical Survey -Conclusions:

Conclusions

It is a fundamental axiom of archaeological geophysics that the absence of features in the survey data does not mean that there is no archaeology present in the survey area only that the techniques used have not detected it.

It is likely that all magnetic anomalies located were the result of the quantity of metal dumped within the hedges surrounding the site.

Willoughby Geophysical Survey - Technical Information:

Techniques of Geophysical Survey:

Magnetometry:

This relies on variations in soil magnetic susceptibility and magnetic remanence which often result from past human activities. Using a Fluxgate Gradiometer these variations can be mapped, or a rapid evaluation of archaeological potential can be made by scanning.

Resistivity:

This relies on variations in the electrical conductivity of the soil and subsoil which in general is related to soil moisture levels. As such, results can be seasonally dependant. Slower than Magnetometry this technique is best suited to locating positive features such as buried walls that give rise to high resistance anomalies.

Resistance Tomography

Builds up a vertical profile or pseudosection through deposits by taking resistivity readings along a transect using a range of different probe spacings

Magnetic Susceptibility:

Variations in soil magnetic susceptibility occur naturally but can be greatly enhanced by human activity. Information on the enhancement of magnetic susceptibility can be used to ascertain the suitability of a site for magnetic survey and for targeting areas of potential archaeological activity when extensive sites need to be investigated. Very large areas can be rapidly evaluated and specific areas identified for detailed survey by gradiometer.

Instrumentation:

- 1. Fluxgate Gradiometer - Geoscan FM36***
- 2. Resistance Meter - Geoscan RM4/DL10***
- 3. Magnetic Susceptibility Meter - Bartington MS2***
- 4. Geopulse Imager 25 - Campus***

Methodology:

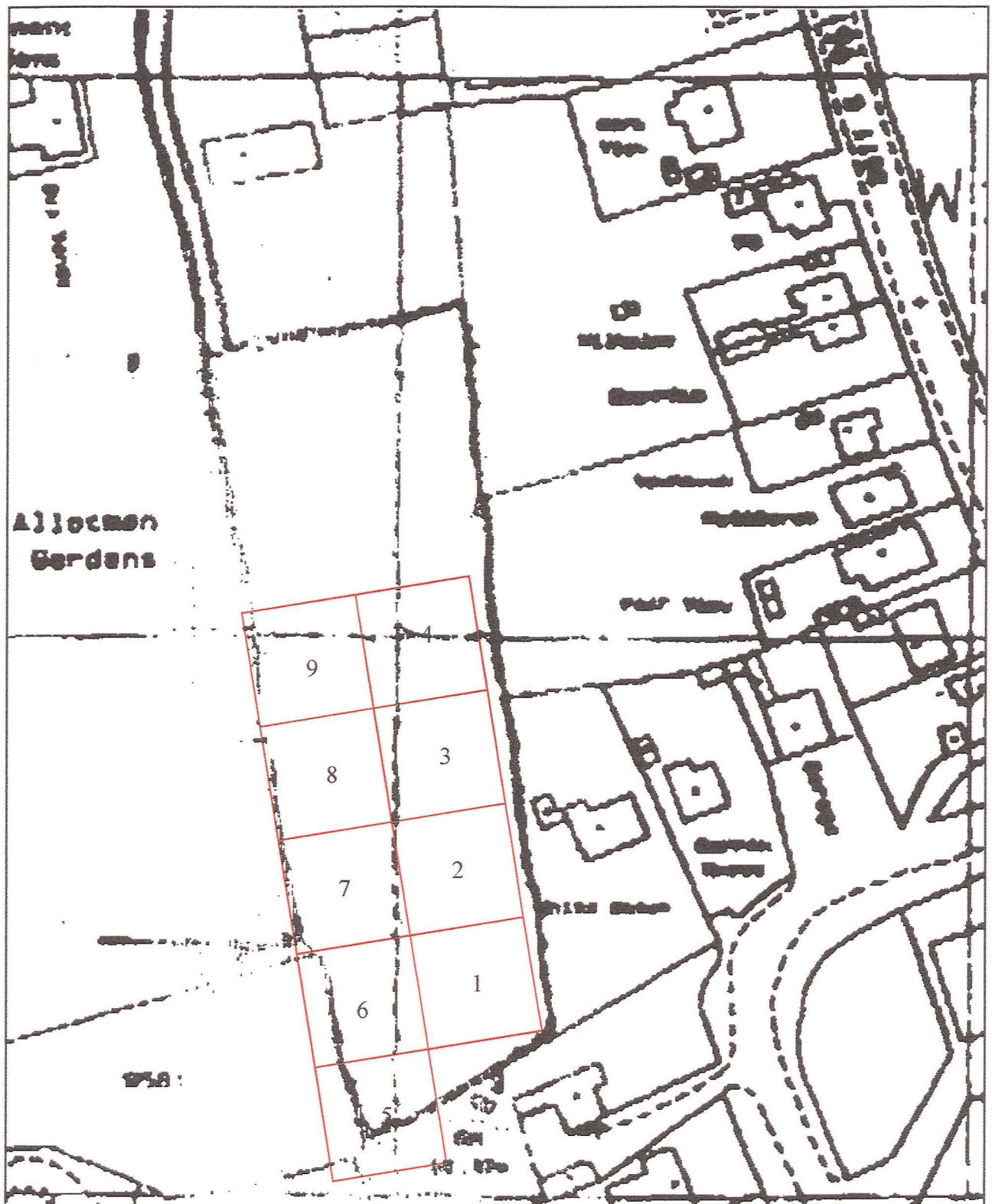
For Gradiometer and Resistivity Survey 20m x 20m or 30m x 30m grids are laid out over the survey area. Gradiometer readings are logged at either 0.5m or 1m intervals along traverses 1m apart. Resistance meter readings are logged at 1m intervals. Data is down-loaded to a laptop computer in the field for initial configuration and analysis. Final analysis is carried out back at base.

For scanning transects are laid out at 10m intervals. Any anomalies noticed are where possible traced and recorded on the location plan.

For Magnetic Susceptibility survey a large grid is laid out and readings logged at 20m intervals along traverses 20m apart, data is again configured and analysed on a laptop computer.

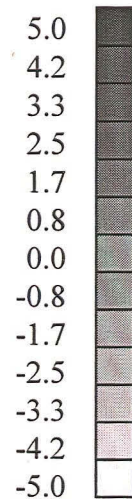
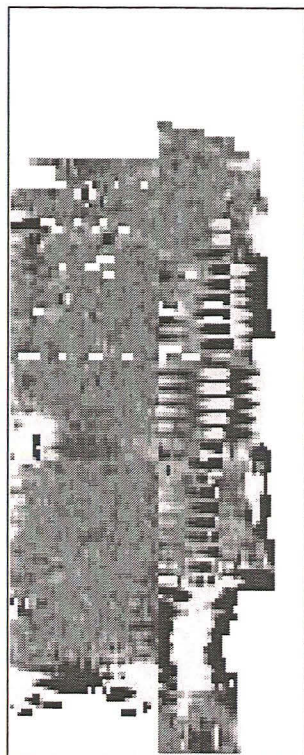
Copyright:

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Station Road, Willoughby
Figure 1 Location Map
Scale 1:1000

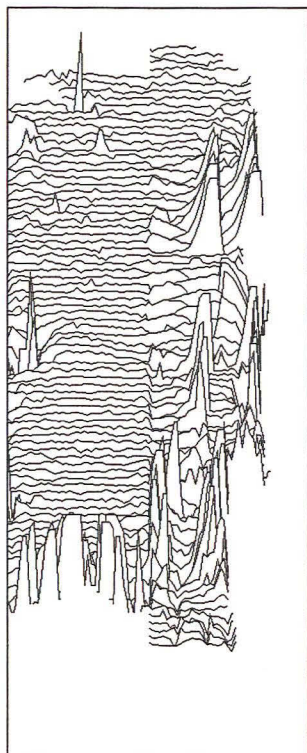
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nT



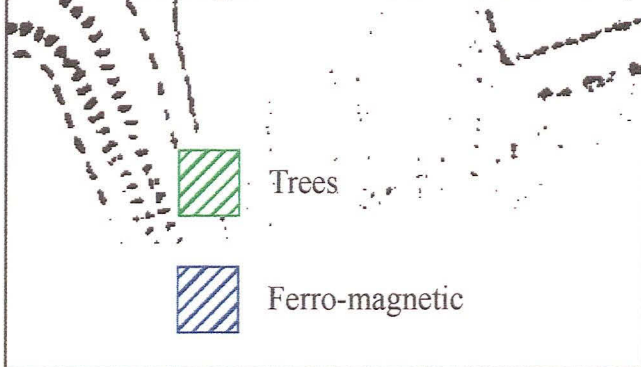
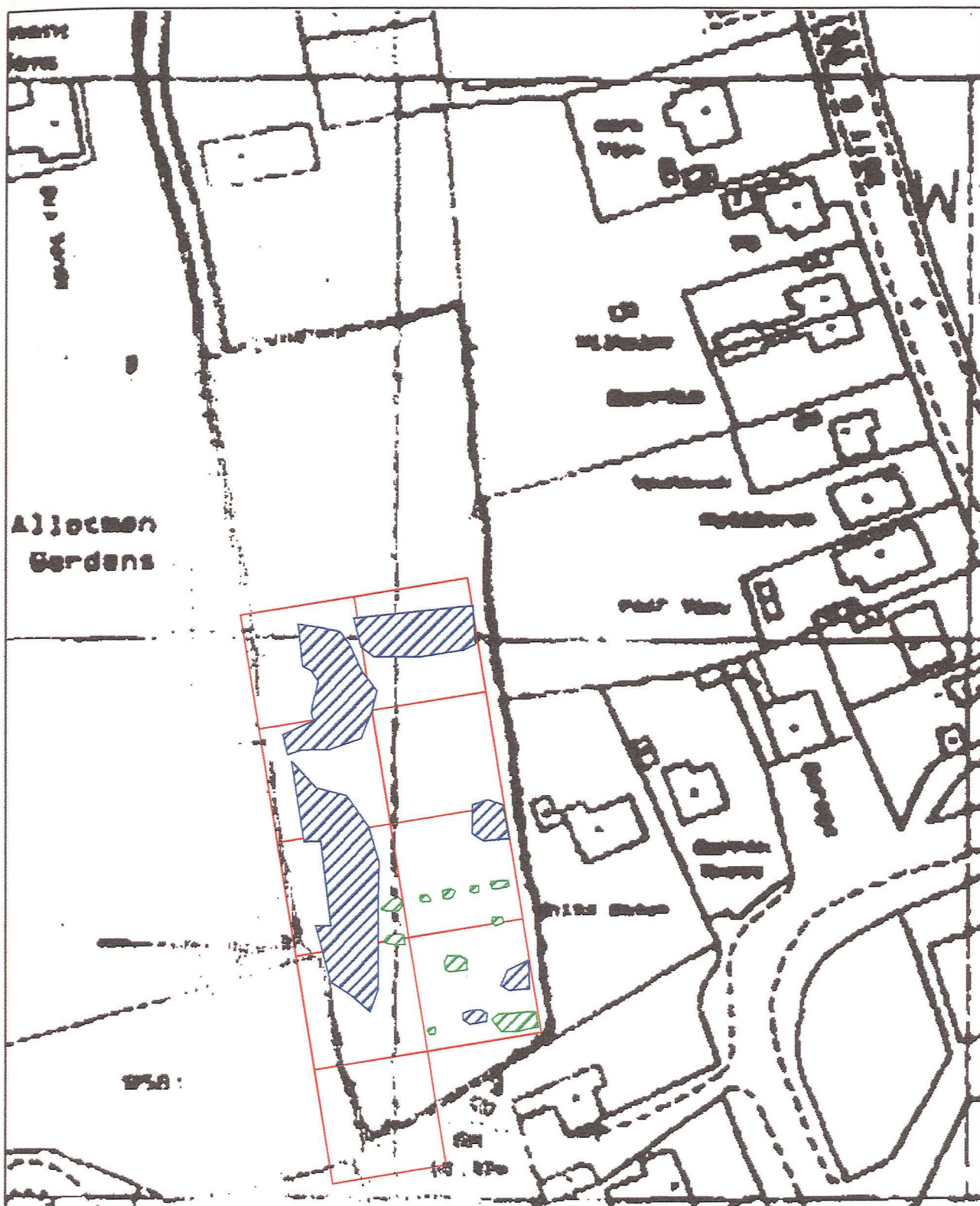
Figure 2: Station Road, Willoughby:
Grey Scale Plot. Scale 1:1000



50 nT |



Figure 3: Station Road, Willoughby::
X - Y Plot. Scale 1:1000



Station Road, Willoughby
 Figure 4 Interpretation
 Scale 1:1000

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Appendix 3

Secretary of State's criteria for scheduling Ancient Monuments - Extract from *Archaeology and Planning* DoE Planning Policy Guidance note 16, November 1990

The following criteria (which are not in any order of ranking), are used for assessing the national importance of an ancient monument and considering whether scheduling is appropriate. The criteria should not however be regarded as definitive; rather they are indicators which contribute to a wider judgement based on the individual circumstances of a case.

i *Period*: all types of monuments that characterise a category or period should be considered for preservation.

ii *Rarity*: there are some monument categories which in certain periods are so scarce that all surviving examples which retain some archaeological potential should be preserved. In general, however, a selection must be made which portrays the typical and commonplace as well as the rare. This process should take account of all aspects of the distribution of a particular class of monument, both in a national and regional context.

iii *Documentation*: the significance of a monument may be enhanced by the existence of records of previous investigation or, in the case of more recent monuments, by the supporting evidence of contemporary written records.

iv *Group value*: the value of a single monument (such as a field system) may be greatly enhanced by its association with related contemporary monuments (such as a settlement or cemetery) or with monuments of different periods. In some cases, it is preferable to protect the complete group of monuments, including associated and adjacent land, rather than to protect isolated monuments within the group.

v *Survival/Condition*: the survival of a monument's archaeological potential both above and below ground is a particularly important consideration and should be assessed in relation to its present condition and surviving features.

vi *Fragility/Vulnerability*: highly important archaeological evidence from some field monuments can be destroyed by a single ploughing or unsympathetic treatment; vulnerable monuments of this nature would particularly benefit from the statutory protection that scheduling confers. There are also existing standing structures of particular form or complexity whose value can again be severely reduced by neglect or careless treatment and which are similarly well suited by scheduled monument protection, even if these structures are already listed buildings.

vii *Diversity*: some monuments may be selected for scheduling because they possess a combination of high quality features, others because of a single important attribute.

viii *Potential*: on occasion, the nature of the evidence cannot be specified precisely but it may still be possible to document reasons anticipating its existence and importance and so to demonstrate the justification for scheduling. This is usually confined to sites rather than upstanding monuments.

Appendix 4

GLOSSARY

Aquamanile	Ceramic or metal water jug often in the form of a figure or animal.
Boulder Clay	A deposit formed after the retreat of a glacier. Also known as till, this material is generally unsorted and can comprise of rock flour to boulders to rocks of quite substantial size.
Bronze Age	A period characterised by the introduction of bronze into the country for tools, between 2250 and 800 BC.
Croft	A piece of enclosed ground used for tillage or pasture, often an arable field near a house.
Cropmark	A mark that is produced by the effect of underlying archaeological features influencing the growth of a particular crop.
Domesday Survey	A survey of property ownership in England compiled on the instruction of William I for taxation purposes in 1086 AD.
Geophysical Survey	Essentially non-invasive methods of examining below the ground surface by measuring deviations in the physical properties and characteristics of the earth. Techniques include magnetometry and resistivity survey.
Iron Age	A period characterised by the introduction of Iron into the country for tools, between 800 BC and AD 50.
Medieval	The Middle Ages, dating from approximately AD 1066-1500.
Neolithic	The 'New Stone Age' period, part of the prehistoric era, dating from approximately 4500-2250 BC.
Perpendicular	Division of English Gothic architecture in use from c.1350 - c.1530.
Post-medieval	The period following the Middle Ages, dating from approximately AD 1500-1800.
Prehistoric	The period of human history prior to the introduction of writing. In Britain the prehistoric period lasts from the first evidence of human occupation about 500,000 BC, until the Roman invasion in the middle of the 1st century AD.
Ridge and Furrow	The remains of arable cultivation consisting of raised rounded strips separated by furrows. It is characteristic of open field agriculture.
Romano-British	Pertaining to the period dating from AD 43-410 when the Romans occupied Britain.
Saxon	Pertaining to the period dating from AD 410-1066 when England was largely settled by tribes from northern Germany.
Toft	The site of a house or former house.