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PIPELINE CORRIDOR AT PINCHBECK, LINCOLNSHIRE

Topsoil Magnetic Susceptibility and Auger Survey

(Survey Ref : 0580495/PIL/LAS)

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APRIL 1995

Produced by

OXFORD ARCHAEOTECHNICS LIMITED

under the direction of

A. E. Johnson *BA (Hons)*

Commissioned by

LINDSEY ARCHAEOLOGICAL SERVICES

On behalf of

ANGLIAN WATER

OXFORD ARCHAEOTECHNICS

Source: L16955

Ev: L12263 Auger

L12267 magnometry

L12266 magnetic susceptibility

Specialist Archaeological Field Evaluation

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CONTENTS

1. INTRODUCTION

1.1 A field evaluation programme, comprising topsoil magnetic susceptibility field sensing, soil profiling by hand augering and fluxgate gradiometer scanning was commissioned by Lindsey Archaeological Services on behalf of Anglian Water on part of the course of a pipeline route north of the village of Pinchbeck, Lincolnshire.

1.2 The fieldwork was carried out over three days, 10th - 12th. April, 1995.

1.3 The survey area, consisting of a 30 m wide corridor approximately 1 km in length runs east-west on the northern outskirts of Pinchbeck village (TF 23458 26305 to TF 24585 26215). The area lies on either side of the River Glen, at 2.5 m AOD. The location of the survey is shown on Fig. 1.

1.4 Landuse at the time of survey was predominantly ploughed or prepared seed bed, with a 130 m long stretch of abandoned horticultural plot; the easternmost (200 m) stretch of the survey area had already been topsoil stripped.

1.5 Local geology comprises Upper Fen silts of marine origin overlying the Upper fen peat. Lenses of estuarine Buttery Clay and peat levels are common throughout the silt. A 10 m depth of silt is common near the coast, but thins considerably inland.

2. TOPSOIL MAGNETIC SUSCEPTIBILITY SURVEY

2.1 Topsoil readings were taken at 10 m intervals along the centreline of the route using a Bartington MS2 meter with a 18.5 cm surface sensor loop, with parallel sets of readings taken 10 m to the north and south of the centreline (Figs. 2 & 3). Data are shown in Appendix 1. At the east end of the route, where the topsoil had already been stripped, only one northerly traverse was possible.

2.2 Soil contact was excellent along the entire route, eliminating possible effect of plant attenuation and inter-user variability.

2.3 Local soils are capable of producing an excellent response to heating events. A recent fire site near the survey area produced readings of 400-800 SI units. However, no areas of such substantial enhancement were evident within the survey area.

2.4 Soils showed a range of readings from 16 to 160 SI units, with a mean of 27.9 SI. the higher anomalies were commonly found next to roads, drains and farm buildings.

2.5 Higher and more variable readings within 60 m of the railway on the west side of the route were associated with localised soil darkening, clay and charcoal flecks and some putative stone footings at the field edge. No evidence of *in situ* masonry was seen at the surface or in drain cuttings.

2.6 On either side of the River Glen, built up levees and rubbish from dredging gave variable readings in association with Medieval and recent pottery sherds, iron pieces and glass fragments. In addition, on the eastern bank the route crosses the site of a former sewage works and tank, where small brick and concrete fragments are visible on the field surface.

2.7 The Gallery Walk drain and the drain alongside Church Street (A 16) produced similar variation in readings and surface evidence, possibly linked to drain clearances.

2.8 The most easterly section of the route showed topsoil magnetic enhancement only within 20 m of the existing farm buildings.

3. MAGNETOMETER (GRADIOMETER) SCANNING

3.1 Using a Geoscan FM36 Fluxgate Gradiometer, the route was scanned on three transects parallel to the centreline of the route, on the same grid as the topsoil magnetic susceptibility survey above.

3.2 An area of anomalies was detected in the most westerly field of the route. These were supported by a general variability in readings in the area and higher topsoil magnetic susceptibility results (Fig. 2).

3.3 No further anomalies were detected other than those in association with river banks, drains and the sewage works site. Most proved to represent responses to metal waste.

4. AUGER SAMPLING

4.1 The auger logs were constructed using a 20 cm long Dutch auger head with a 4 cm internal diameter, producing a double helix of a relatively undisturbed sample. Although the finest detail of sedimentary form will not always survive, the auger will still recover much sedimentary detail together with relatively fragile material up to 2 cm.

4.2 Auger profiles were taken at 30 m intervals along the centreline of the route, with denser sampling in areas of increased magnetic interest. Profiles of up to 3 m depth were produced during the project. The locations of auger holes are shown on Figs 2 & 3, and the recorded logs are set out in Appendix 2.

4.3 Weather over the three days of the survey was fine and dry, with little variation in lighting. Soil conditions were excellent, with dry clean profiles obtained. Profile logging was performed by one observer throughout to eliminate descriptive variations.

4.4 Auger results (from west to east)

Auger holes 1-3:

Although showing a clear ploughsoil/ subsoil change at c.40 cm, auger holes 1 and 2 produced a well mixed subsoil including fragments of shell and bone, with fired clay down to 110 cm. They also produced a black fibrous organic layer at 120 - 140 cm before reverting to the predominant yellow/brown silts typical of the area. Auger hole 3 proved to be clean and

also typical of the area, with a well mixed ploughsoil and an abrupt change to undisturbed yellow/brown silts at 40 cm depth.

Auger holes 4 & 34 - 36:

This series, in a small area between the railway and a small field drain investigated anomalies in the topsoil magnetic susceptibility results. Throughout, a 40 cm ploughsoil, well mixed with charcoal overlaid a further 20 cm of mottled brown soil containing charcoal, bone and shell. A gradual transition at 50 - 70 cm followed to a grey/brown laminated silt with some mottling. Auger hole 36, next to the drain, produced charcoal, brick and shell down to 1 m.

Auger holes 5 - 11:

The sequence across this field to the River Glen embankment produced very little variation or disturbance. Throughout there was a 40 cm ploughsoil with a clean and sharp transition to yellow/brown laminated silts, uniform to the water table at c.150 cm.

Auger holes 25 - 17:

This sequence produced similar results to the above, with a sharp boundary to yellow/brown silts but with an increase in grey sandy laminae from 60 to 150 cm, with concentrations at c.100 cm. An increased depth of topsoil disturbance connected with ditch cleanings and bank building was evident in auger holes 23 and 17. Standing water was found at c.180 cm.

Auger holes 16 - 12:

Within the area of an abandoned nursery, this sequence produced a deeper topsoil, with a change to yellow/brown silts at 60 - 100 cm. The topsoil contained brick and bone fragments. Some grey sandy laminae were present at c.110 cm throughout.

Auger holes 26 - 33:

All of this sequence has been given a nominal 30 cm depth topsoil. A consistent yellow/brown silt was produced throughout to a depth of 150 cm, with black/grey sand lenses of c.1 cm thickness at 110 - 160 cm, with some clay lenses at c.170 - 200 cm towards the east (auger holes 29 - 32). Auger hole 33, adjacent to the farm hardstanding area, produced considerable mixing and fired clay down to 80 cm.

5. TOPSOIL OBSERVATIONS

5.1 Ground visibility on the bare soil seed beds to the west of the Gallery Walk was good. Observations to the east of the Walk are less representative due to some ground cover and the topsoil stripping.

5.2 A number of ceramic fragments, possibly Medieval and later, were noted but not removed from the surface in the course of topsoil magnetic susceptibility mapping. A single piece of thin-walled black & red ware c.10 x 10 cm was found near auger hole 17, and several freshwater bivalve shell fragments were present within 50 m west of the River Glen.

5.3 The small number and wide spread of the fragments gave no indication of grouped scatters or concentrations. The density and spread is not inconsistent with repeated nightsoiling of fields near the village, and local periodic ditch cleaning.

6. CONCLUSIONS

6.1 Overall, the area showed remarkably consistent and even characteristics. However, both the topsoil magnetic susceptibility and gradiometer scanning showed a small degree of enhancement and magnetic anomaly at the extreme west end of the route. This is supported by the soil darkening and disturbances evident from auger profiles (auger holes 1 - 4 and 34 - 36). This zone may have some archaeological potential.

6.2 Elsewhere on the route, similar anomalous results can be associated with ditch cleaning build-up or past industrial sites, and are not similarly supported by auger results.

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ACKNOWLEDGEMENTS

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APPENDIX 1: - TOPSOIL MAGNETIC SUSCEPTIBILITY DATA

Topsoil magnetic susceptibility data collected at 10 m intervals, running from west to east. The auger hole sequence is shown in brackets.

10 M SOUTH OF CENTRELINE		CENTRELINE		10 M NORTH OF CENTRELINE
-		24		28
29		44		30
31		35	[1]	33
36		36		38
38		44	[2]	57
41		42		39
			[3]	
35		38		40
----------	--------RAILWAY-----			----------
37		27		38
	[35]		[34]	
28		160	[4]	30
30		DITCH	[36]	29
29		29		25
28		28	[5]	35
29		34		26
28		25		24
24		24	[6]	22
27		23		29
27		21		23
23		21	[7]	22
22		22		22
22		22	[8]	21

26	22		22
21	25		21
23	21	[9]	20
23	25		22
22	22		20
24	22	[10]	25
24	25		30
29	26		26
28	25	[11]	25
29	35		27
42	34		39
48	38		33

---------- -----RIVER GLEN----- ----------

24	28		33
18	20		21
16	18	[25]	17
16	17		21
19	21		19
19	21	[24]	20
22	20		24
18	18		19
20	19	[23]	21
19	22		20
20	20		20
20	20	[22]	25
16	21		16
21	19		19
19	18	[21]	22
20	17		26

21		25		23
23		24	[20]	25
21		23		25
26		26		25
25		24	[19]	24
25		26		26
25		23		26
22		21	[18]	20
24		22		27
29		23		27
25		46	[17]	27
DITCH		30		43
----------		GALLERY WALK		----------
29	[16]	27		28
32		28		29
29		27		31
28	[15]	26		30
28		31		27
25		26		28
26	[14]	29		30
28		27		29
28		31		33
27	[13]	32		33
29		27		26
30		28		30
29	[12]	41		50
----------		----------DITCH--------		----------
----------		--CHURCH STREET--		(A16)----------
			[33]	71
				119

[26] 25

20

26

[27] 20

26

20

[28] 26

23

24

[29] 22

21

21

[30] 20

18

18

[31] 19

21

19

[32] 29

------DITCH-----

APPENDIX 2: - AUGER LOGS

These brief descriptions record observations down-log in intervals measured in centimetres. The locations of the auger series are indicated on Figs. 2 and 3.

1.

0 - 40	Topsoil.
40 - 70	Fade to cleaner subsoil, some bone fragments.
70 - 110	Greying with sands and mottling. Fired clay or brick fragments.
120 - 150	Lens of black/grey fibrous organics.
150 - 170	Wet organics mixed with grey silts.
170	Water table.

2.

0 - 40	Topsoil.
40 - 70	Lighter coloured subsoil with charcoal and some shell.
70 - 140	Slight mottling followed by clean yellow/brown silts.
140 -150	Some organics.
150 - 180	Some darkening of silts to water table.

3.

0 - 40	Topsoil; some brick and charcoal flecks.
40 - 100	Abrupt change to clean yellow/brown silts. Some shell flecks.

4.

0 - 40	Topsoil with some charcoal flecks.
40 - 80	Lighter subsoil, still with shell, bone and charcoal.
80 - 90	Rich red/brown silts.
90 - 140	Grey/brown laminated silts.
140 - 150	Wet with organic blackening.
150 - 190	Darkening silts with black sand lenses.
190 - 240	Solid estuarine grey silt.

5.

0 - 40	Topsoil.
40 - 80	Yellow/brown silts.
80 - 180	Slight mottling above water table. Gradual greying.

6.

0 - 35	Topsoil.
35 - 70	Yellow/brown silts, clean laminae.
70 - 100	Slight black flecking (not charcoal).

7.

0 - 40	Topsoil.
40 - 80	Yellow/brown silts.
80 - 100	Some mottling to water table.

8.

0 - 45	Topsoil.
45 - 90	Yellow/brown silts with increasing mottling.
90 - 150	Clear laminations, redder irons to water table.

9.

0 - 35	Topsoil.
35 - 45	Yellow/brown silts.
45 - 70	Reddish coarser sands.
70 - 90	Yellow/brown silts.
90 - 130	Some black mottling, shell fragments.

10.

0 - 35	Topsoil.
35 - 80	Yellow/brown silts.
80 - 110	Slight greying.
110 - 120	Lenses of organics in silts.
120 - 150	Clean sand/silts.

11.

0 - 45	Topsoil.
45 - 140	Clean yellow/brown silts to water table.

12.

0 - 50	Topsoil.
50 - 100	Grey/brown mixed topsoil/subsoil, red mottling.
100 - 120	Brown with red sand inclusions.
120 - 200	Yellow/brown silts to water table.

13.

0 - 60	Topsoil with charcoal flecks.
60 - 140	Cleaner yellow/brown silts.
140 - 180	Increased red/grey mottling towards water table.

14.

0 - 80	Topsoil, lightening down profile.
80 - 120	Light and clean yellow/brown silts.
120 - 160	Increasing mottling to water table.

15.

0 - 60	Topsoil.
60 - 150	Gradual transition to yellow/brown silts.
150 - 180	Gritty grey sand laminae c.0.5 cm.

16.

0 - 60	Topsoil with stones.
60 - 75	Gradual transition to subsoil with clay/brick flecks.
75 - 130	Yellow/brown silts with increasing red mottles.
130 - 180	Grey sand laminae to water table.

17.

0 - 60	Well mixed topsoil with ceramic fragments and charcoal.
60 - 110	Sharp transition to clean yellow/brown silts.
	Red mottling increasing.
110 - 120	Grey micaceous laminae and grit.
120 - 160	Clean yellow/brown silt to water table.

18.

0 - 35	Topsoil.
35 - 110	Clean yellow/brown silts.
	Red/grey mottling increasing.
110 - 130	Grey sandy laminae.
130 - 150	Clean yellow/brown silts.
150 - 180	More grey sand laminae to water table.

19.

0 - 40	Topsoil.
40 - 90	Sharp transition to clean yellow/brown silts.
	Fine yellow and brown laminae c.0.5 mm.
90 - 100	Grey sand mottling.
100 - 180	Yellow/brown silts.
	Increasing red/grey mottling to water table.

20.

0 - 35	Topsoil.
35 - 160	Sharp change to yellow/brown silts. Grey mottling to water table.

21.

0 - 35	Topsoil.
35 - 100	Sharp transition to yellow/brown silts.
100 - 130	Red mottling and grey sandy laminae c.1 cm.
130 - 180	Many grey laminae to water table.

22.

0 - 40	Topsoil.
40 - 85	Less abrupt change to yellow/brown silt.
	Grey sandy laminae c.2 mm.
85 - 130	Solid grey laminae.
130 - 150	Grey/brown interleave laminae to water table.

23.

0 - 50	Topsoil.
50 - 80	Gradual transition to yellow/brown silts. Some clay/brick flecks.
80 - 100	Cleaner with laminae and mottling.
100 - 140	Grey sand mottling to water table.

24.

0 - 30	Topsoil.
30 - 100	Gradual lightening to yellow/brown silts.
	Some laminae.
100 - 120	Wetter brown/grey silts.
120 - 160	Cleaner yellow/brown silts.
160 - 200	Grey sand laminae up to 4 cm.

25.

0 - 35	Topsoil.
35 - 100	Well mixed yellow/brown silts, no laminae.
100 - 160	Clean laminated yellow/brown to water table.

26.

0 - 30	Topsoil removed.
30 - 150	Gradual transition to yellow/brown silts.
	Clean and laminated to water table.

27.

0 - 30	Topsoil removed.
30 - 130	Slight topsoil remnant.
	Sharp change to yellow/brown silts.
	Clean unlaminated yellow/brown silts.
130 - 180	Some greying towards water table.

28.

0 - 30	Topsoil removed.
30 - 170	Smooth yellow/brown silts with no laminations to water table.

29.

0 - 30	Topsoil removed.
30 - 110	Clean yellow/brown silts.
110 - 150	Some black/grey laminae.
150 - 190	Red mottling increasing to water table.

30.

0 - 30	Topsoil removed.
30 - 160	Clean yellow/brown silts.
160 - 180	Grey sand lenses to water table.

31.

0 - 30	Topsoil removed.
30 - 80	Disturbed yellow/brown silts, some organics.
80 - 110	Cleaner yellow/brown silts.
110 - 170	Wet with red mottling, increasing grey sands.
170 - 200	More plastic, some clay lenses.

32.

0 - 30	Topsoil removed.
30 - 80	Mixed clayey, ?ditch cleanings.
80 - 110	Clean yellow/brown silts.
110 - 180	Some red mottling.
180 - 200	Heavily mottled clays, ?Buttery Clay.

33.

0 - 30	Topsoil removed.
30 - 80	Very mixed, decomposed brick.
80 - 150	Clean undisturbed yellow/brown silts to water table.

34.

0 - 40	Topsoil, gritty with some charcoal flecks.
40 - 55	Good mixed black soil.
55 - 90	Rapid transition to yellow/brown silts.
	Some calcareous flecks and red/grey mottling.
90 - 110	Grey mottling giving way to clean yellow/brown silts.

35.

0 - 35	Rich brown topsoil.
35 - 70	Change to yellow/brown silts with gritty inclusions.
70 - 80	Greying, with orange mottling and laminae.
80 - 120	Grey sand lenses with brown and grey mottling.

36.

0 - 40	Dark mixed topsoil with brick flecks.
40 - 100	Well mixed subsoil with charcoal and brick. Calcareous fragments and shell.
100 - 120	Sandy yellow/brown silts with clay lenses.
120	Clean yellow/brown silts to water table.

APPENDIX 3:- MAGNETIC TECHNIQUES: GENERAL PRINCIPLES

A3.1 It is possible to define areas of human activity (particularly soils spread from occupation sites and the fills of cut features such as pits or ditches) by means of *magnetic survey* (Clark 1990; Scollar et al. 1990). The results will vary, according to the local geology and soils (Thompson & Oldfield 1986; Gale & Hoare 1991), as modified by past and present agricultural practices. Under favourable conditions, areas of suspected archaeological activity can be accurately located and targeted for further investigative work (if required) without the necessity for extensive random exploratory trenching. Magnetic survey has the added advantages of enabling large areas to be assessed relatively quickly, and is non-destructive.

A3.2 Topsoil is normally more magnetic than the subsoil or bedrock from which it is derived. Human activity further locally enhances the magnetic properties of soils, and amplifies the contrast with the geological background. The main enhancement effect is the increase of *magnetic susceptibility*, by fire and, to a lesser extent, by the bacterial activity associated with rubbish decomposition; the introduction of materials such as fired clay and ceramics - and, of course, iron and many industrial residues - may also be important in some cases. Other agencies include the addition and redistribution of naturally magnetic rock such as basalt or ironstone, either locally derived or imported.

A3.3 The tendency of most human activity is to locally increase soil magnetic susceptibility. In some cases, however, features such as traces of former mounds or banks, or imported soil/subsoil or non-magnetic bedrock (such as most limestones), will show as zones of lower susceptibility in comparison with the surrounding topsoil.

A3.4 Archaeologically magnetically enhanced soils are therefore a response of the parent geological material to a series of events which make up the total domestic, agricultural and industrial history of a site, usually over a prolonged period. Climatic factors may subsequently modify the susceptibility of soils yet again but, in the absence of strong chemical alteration (e.g. during the process of podzolisation or extreme reduction), magnetic characteristics may persist over millions of years.

A3.5 Both the magnetic contrast between archaeological features and the subsoil into which they are dug, and the magnetic susceptibility of topsoil spreads associated with occupation horizons, can be measured in the field.

A3.6 There are several highly sensitive instruments available which can be used to measure these magnetic variations. Some are capable, under favourable conditions, of producing extraordinarily detailed plots of subsurface features. The detection of these features is usually by means of a *magnetometer* (normally a fluxgate gradiometer). These are defined as passive instruments which respond to the magnetic anomalies produced by buried features in the presence of the Earth's magnetic field. The gradiometer uses two sensors mounted vertically, often 50 cm apart. The bottom sensor is carried some 30 cm above the ground, and registers local

magnetic anomalies with respect to the top sensor. As both sensors are affected equally by gross magnetic effects, such as diurnal variation, these are cancelled out. In order to produce good results, the magnetic susceptibility contrast between features and their surroundings must be reasonably high and thereby creating good local anomalies; a generally raised background, even if due to human occupation within a settlement context, will sometimes preclude meaningful magnetometer results. The sensitive nature of magnetometers makes them suitable for detailed work, logging measurements at a closely spaced (less than 1 metre) sample interval, particularly in areas where an archaeological site is already suspected. Magnetometers may also be used for rapid 'prospecting' within larger areas (where the operator directly monitors the changing magnetic field and pinpoints specific anomalies).

A3.7 *Magnetic susceptibility measuring systems*, whilst responding to basically the same magnetic component in the soil, are 'active' instruments which subject the sample area being measured (according to the size of the sensor used) to a low intensity alternating magnetic field. Magnetically susceptible material within the influence of this field can be measured by means of changes which are induced in oscillator frequency. For general work, measuring topsoil susceptibility *in situ*, a sensor loop of around 20 cm diameter is convenient, and responds to the concentration of magnetic (especially ferrimagnetic) minerals mostly in the top 10 cm of the soil. Magnetically enhanced horizons which have been reached by the plough, and even those from which material has been transported by soil biological activity, can thus be recognised.

A3.8 Whilst only rarely encountering anomalies as graphically defined as those detected by magnetometers, magnetic susceptibility systems are ideal for detecting magnetic spreads and thin archaeological horizons not seen by magnetometers. Using a 10 m interval grid, large areas of landscape can be covered relatively quickly. The resulting plot can frequently determine the general pattern of activity and define the nuclei of any occupation or industrial areas. As the intervals between susceptibility readings generally exceed the parameters of most individual archaeological features (but not of the general spread of enhancement around features), the resulting plots should be used as a guide to areas of archaeological potential and to suggest the general form of major activity areas; further refinement is possible using a finer mesh grid or, more usually, by detailing underlying features using a gradiometer.

A3.9 Magnetic survey is not successful on all geological and pedological substrates. As a rule of thumb, in the lowland zone of Britain, the more sandy/stony a deposit, the less magnetic material is likely to be present, so that a greater magnetic contrast in soil materials will be needed to locate archaeological features; in practice, this means that only stronger magnetic anomalies (e.g. larger accumulations of burnt material) will be visible, with weaker signals (e.g. from the fillings of simple ditches) disappearing into the background. Similar problems can arise when the natural background itself is very high or very variable (e.g. in the presence of sediments partially derived from magnetic volcanic rocks).

A3.10 The precise physical and chemical processes of changing soil magnetism are extremely complex and subject to innumerable variations. In general

terms, however, there is no doubt that magnetic enhancement of soils by human activity provides valuable archaeological information.

A3.11 As well as locating specific sites, topsoil magnetic susceptibility survey frequently provides information regarding former landuse. Variations in the soils and subsoils, both natural and those enhanced by anthropogenic agencies, when modified by agriculture, give rise to distinctive patterns of topsoil susceptibility. The containment of these spreads by either natural or man-made features (streams, hedgerows, etc.) gives rise to a characteristic chequerboard or strip pattern of varying enhancement, often showing the location of former field systems, which persist even after the physical barriers have been removed. These patterns are often further amplified in fields containing underlying archaeological features within reach of the plough. More subtle landuse boundaries and indications of former cultivation regimes are often suggested by topsoil magnetic susceptibility plots.

A3.12 Where a general spread of magnetically enhanced soils contained within a long-established boundary becomes admixed over a long period by constant ploughing, it can be diffused to such a point that the original source is masked altogether. Magnetically enhanced material may also be moved or masked by natural agencies such as colluviation or alluviation. Generally, it appears that the longer a parcel of land has been under arable cultivation, the greater is the tendency for topsoil susceptibility to increase; at the same time there is increasing homogeneity of the magnetic signal within the soils owing to continuous agricultural mixing of the material. Some patterns of soil enhancement derived from underlying archaeological

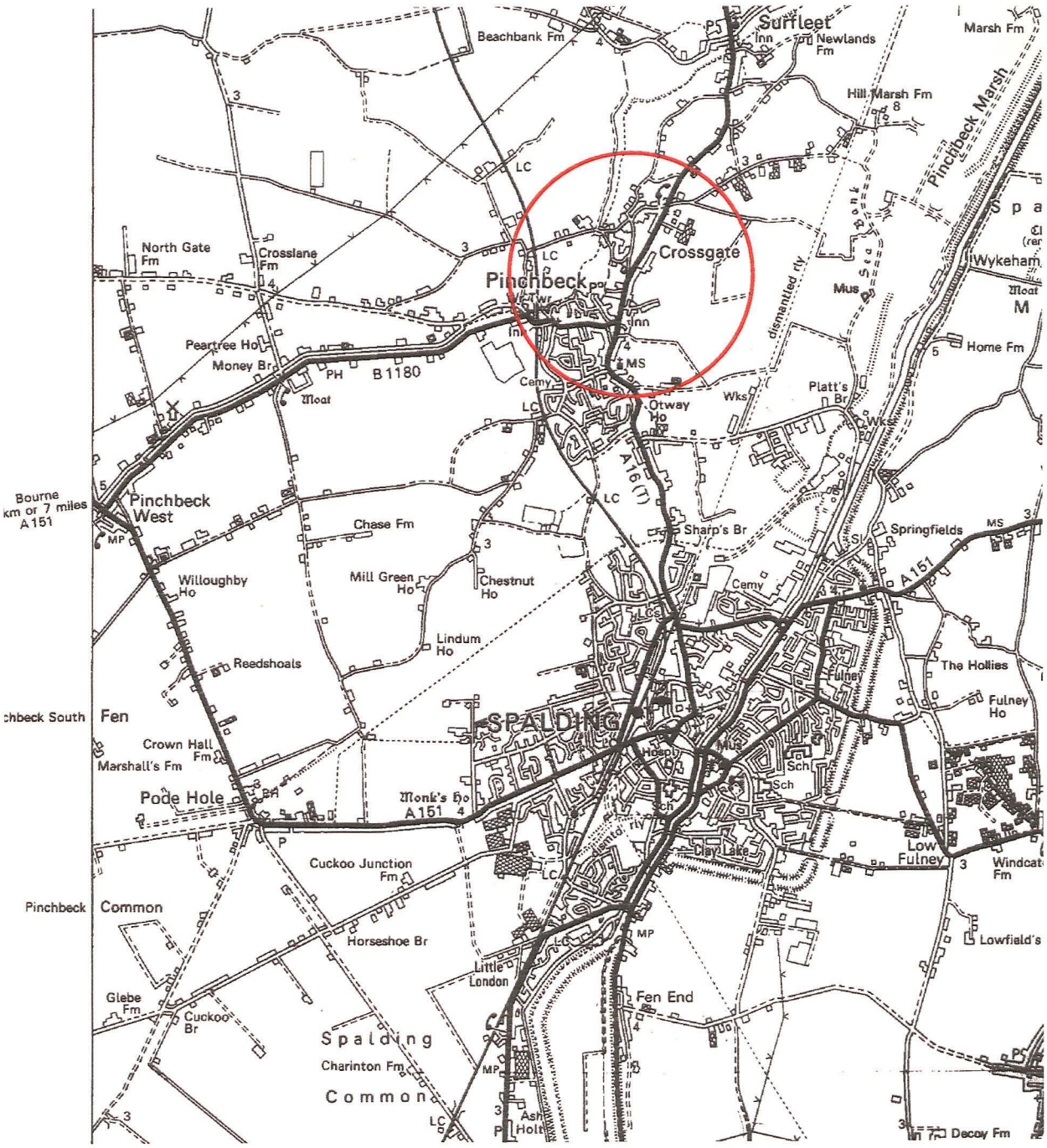
features are, however, apparently capable of resisting agricultural dispersal for thousands of years (Clark 1990).

FIGURE CAPTIONS

Figure 1.	Location map. Scale 1:50,000. Based upon OS 1:50,000 Map 131.
Figure 2.	Topsoil magnetic susceptibility survey and location of auger holes west of the River Glen. Scale 1:2500. Based upon OS 1:2500 Sheet TF 2326.
Figure 3.	Topsoil magnetic susceptibility survey and location of auger holes east of the River Glen. Scale 1:2500. Based upon OS 1:2500 Sheet TF 2426.

PINCHBECK, LINCOLNSHIRE

TOPSOIL MAGNETIC SUSCEPTIBILITY AND AUGER SURVEY



SCALE 1:50,000

Location of survey (for detail see Figs. 2 & 3)

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FIG. 1

PINCHBECK, LINCOLNSHIRE

TOPSOIL MAGNETIC SUSCEPTIBILITY AND AUGER SURVEY

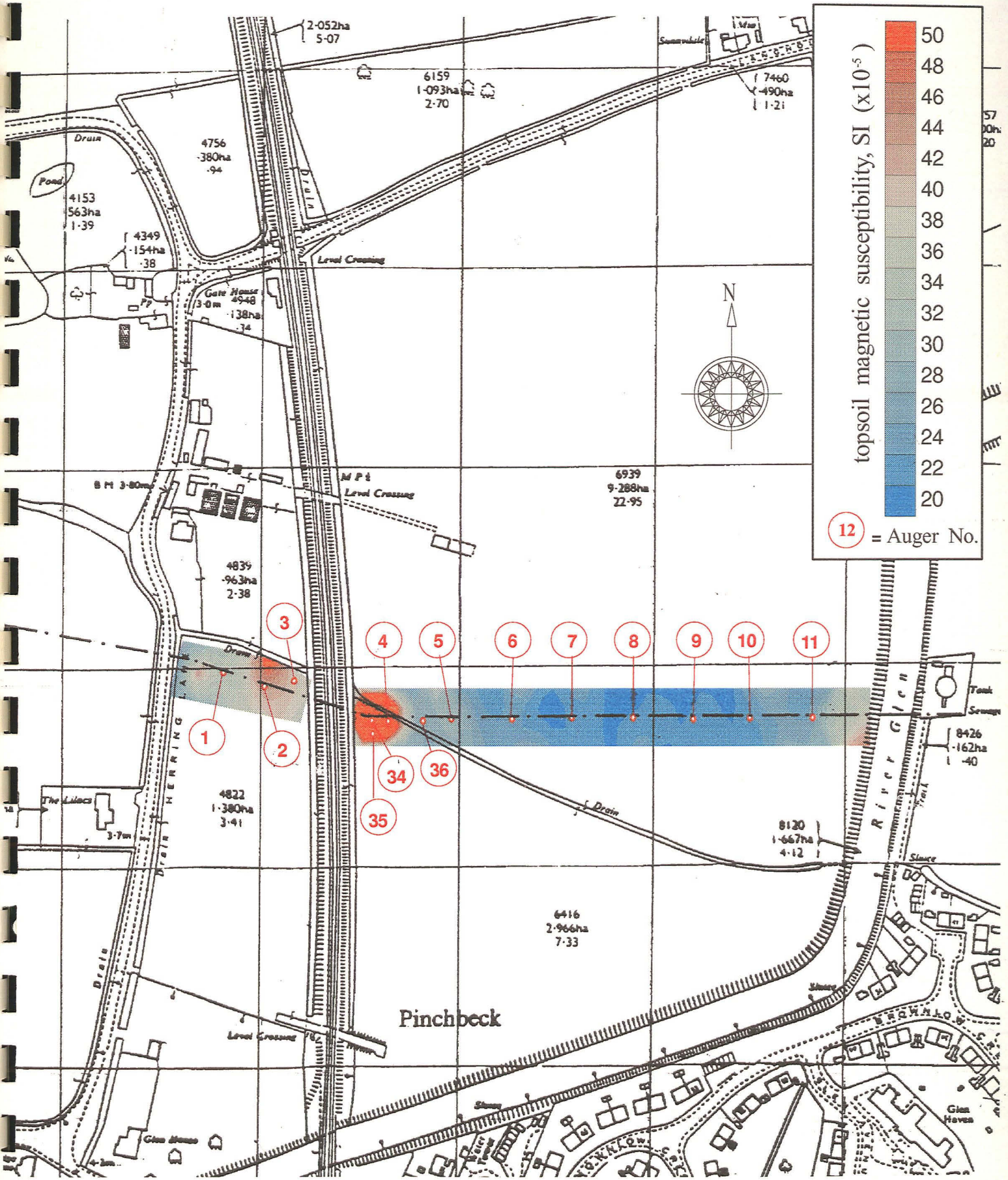

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FIG. 2

PINCHBECK, LINCOLNSHIRE

TOPSOIL MAGNETIC SUSCEPTIBILITY AND AUGER SURVEY

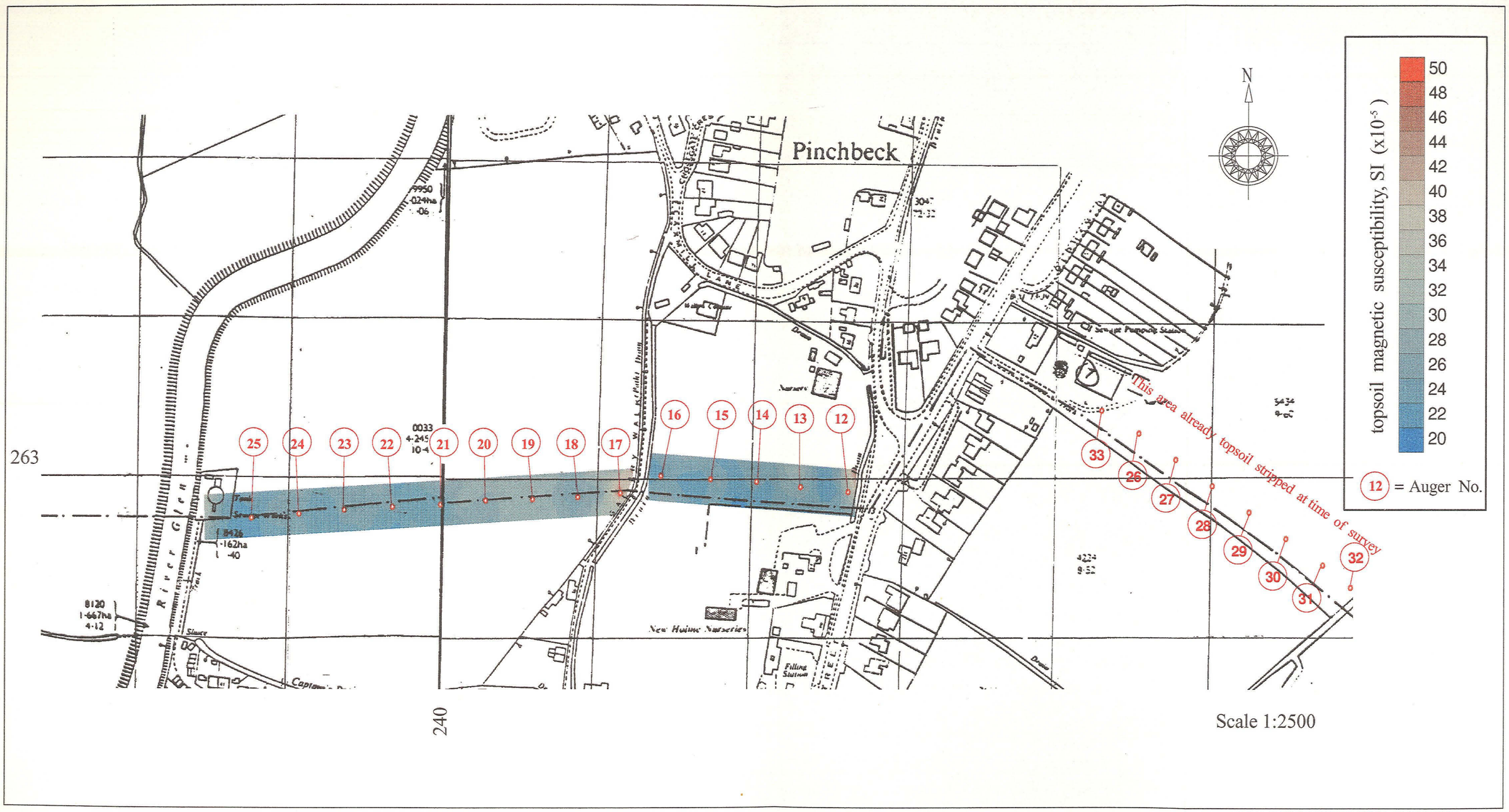

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FIG. 3

INTERNAL QUALITY CHECK

Survey Reference	0580495/PIL/LAS		
Primary Author	pp DC APJ	Date	9-5-95
Checked By	APJ	Date	9-5-95
Checked By		Date	
Further Corrections		Date	

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