

ANCIENT MONUMENTS LABORATORY GEOPHYSICS SECTION

REPORT ON MAGNETOMETER SURVEY

**SURVEY:** KENCHESTER (3)

**DATE:** 19-23.9.77

**Report no.** G 31/77

**1. SITE**

**OS grid reference:** SO 449421 (general)

**Field no.** 7735  
1414  
3535/4437

**Location:** flat valley bottom to the SE of Magnis Roman town.

**Geology:** alluvium - gravel

**Archaeological evidence:** proximity to the Roman town and to known archaeological activity to the S of the Roman road in field no. 7254.  
Favourable valley-floor location. Some weak crop-marks?

**2. SURVEY**

**Object:** to locate any buried archaeology in the area proposed for an extension of the present gravel workings.

**(a) Magnetic survey**

**Type of survey:** automatic

**Magnetometer:** fluxgate

**Range:** 100  $\gamma$

**Initial chart recorder settings -** Y: 10  $\gamma/cm$   
X: 1:200 scale

**Logged for computing:** yes/no

**(b) Other tests**

**(i) Magnetic susceptibility:** see list, following.

**topsoil:** **subsoil:** **fill:**

$\times 10^{-6}$  emu/gm  
(ac bridge readings)

**(ii)**

**Survey grid measured to:** National Grid, and field boundaries.

**Plans/charts enclosed:** 1 - location plan  
2 - magnetic susceptibility survey  
3 - magnetometer traces

### 3. RESULTS

The area proposed for extension of the gravel pit, to the south and west of the present workings, is so large that geophysical prospecting had to be limited to a coarse sampling for soil susceptibility measurement, along with magnetometer scanning and the detailed plotting of selected areas.

#### Magnetic susceptibility:

Soil samples were taken from 30 - 40 cms depth with a 1" hand coring auger at 34 sampling stations based on the National Grid hectare squares (see plan 1). Values of magnetic susceptibility (in electromagnetic units  $\times 10^{-6}$ ) are shown on plan 2 as circles of directly proportional diameter. The units and NG references for each sample are listed below:

Sample no.	NG Ref.	Value (emu $\times 10^{-6}$ )	Mean = 14.7
1	SO 4470 4230	20.4	
2	SO 4480 4230	17.0	
3	SO 4475 4225	24.0	
4	SO 4485 4225	17.6	
5	SO 4495 4225	14.2	
6	SO 4505 4225	14.4	
7	SO 4470 4220	19.1	
8	SO 4480 4220	24.5	
9	SO 4490 4220	14.5	
10	SO 4500 4220	12.5	
11	SO 4510 4200	9.3	
12	SO 4520 4200	10.6	
13	SO 4530 4200	11.9	
14	SO 4540 4200	12.9	
15	SO 4475 4215	21.3	
16	SO 4485 4215	20.4	
17	SO 4495 4215	14.4	
18	SO 4505 4215	11.6	
19	SO 4515 4215	10.9	
20	SO 4525 4215	14.5	
21	SO 4480 4210	21.3	
22	SO 4490 4210	14.6	
23	SO 4500 4210	20.3	
24	SO 4510 4210	8.6	
25	SO 4520 4210	14.7	
26	SO 4485 4205	15.2	
27	SO 4495 4205	10.0	
28	SO 4505 4205	9.7	
29	SO 4515 4205	10.6	
30	SO 4545 4235	12.0	
31	SO 4540 4230	15.9	
32	SO 4550 4230	10.9	
33	SO 4535 4225	13.3	
34	SO 4545 4225	9.7	

Susceptibility measurements not only give useful information as to the feasibility of magnetic detection methods on the site, but can also in themselves suggest the location of areas of localized occupation activity. The enhancement of magnetic susceptibility of soil depends principally on:

- the iron oxide content of the soil, and hence the geological base from which the soil is derived, and
- the conversion of these oxides to more strongly ferrimagnetic forms by processes

cont/

principally of burning, and to a lesser extent decomposition - resultant on activities so often associated with human occupation. The intensity and duration of such occupation will in turn vary the susceptibility accordingly. Values vary from very nearly nil on some Chalk soils up to about 1000 on Jurassic limestone and certain sand deposits. The soils at Kenchester lie on relatively uniform alluvial gravel probably of multiple derivation, but with a generally low magnetic strength. The mean value for topsoil over the area investigated is  $14.7 \times 10^{-6}$  emu/gm which immediately suggests that occupation activity might be slight, and where present, unlikely to manifest as strongly detectable magnetic anomalies.

Examination of plan 2 shows a notable bias toward higher values to the west in field no. 7735, and this coincides broadly with an area of increased magnetic activity noted during the magnetometer survey. This area is also not far distant from known and suspected Roman and Iron Age activity due west of the gravel workings. With the exception of the reading at point no. 23 (significantly coinciding approximately with scanned anomaly F), most of the remaining measurements are at a fairly constant level.

#### Magnetometer survey:

The entire area was scanned with the magnetometer with traverses running N - S at 15 metre intervals. In accordance with the susceptibility values, the magnetic response was found to be very low, and much of the entire area apparently devoid of magnetic activity. The principal exception to this general impression was in field no. 7735 where a concentration of anomalies was detected and examined in detail. Three 30 m. squares (A, B and C on plan 1) were covered by 30 m. traverses at 1 m. intervals and plotted on the automatic recording system. The magnetometer traces are shown on plan 3 where possible archaeological anomalies are outlined in red, and those located by scanning marked as G - P (other scanned anomalies are D - F on plan 1).

The anomalies in A, B and C indicate discrete features circular or oval in shape, most probably representing pits or perhaps hearths. No ditches were detected.

#### 4. CONCLUSIONS

Throughout the larger part of the area covered by the survey there appears to be little or no magnetic evidence of archaeological significance. Due to low background magnetic susceptibility strengths and the generally variable response of gravel sites to magnetometer surveys, the negative evidence must be considered as tentative only. The magnetometer evidence for the substantial Roman site examined in 1977 due west of the gravel pits in field no. 7245 was relatively slight (report no. G 6/77), and it must be assumed that less distinct buried features could escape undetected. Scanning, for instance, showed no evidence for the suggested Roman road leading southwards from this site. Similar evidence, particularly relating to buildings or minor ditch systems can escape detection, especially where a survey has necessarily been so coarse.

Despite these reservations, however, a considerable scatter of pits possibly relating to occupation has been located and these coincide well with relatively higher local susceptibility values. The general lack of anomalies elsewhere may well reflect a genuine absence of archaeology. Should further investigation, such as excavation, become necessary then the priority areas can at least be suggested from these results.

Scanned anomalies - approximate sizes and magnetic strengths:

D - 1.0 x 1.5 m.	15	gamma
E - 2.0 x 1.0 m.	8	"
F - 1.0 x 3.0 m.	15	"
G - 1.0 x 1.0 m.	6	"
H - 1.0 x 1.0 m.	14	"
I - 3.0 x 1.0 m.	8	"
J - 1.0 x 1.0 m.	8	"
K - 3.0 x 2.0 m.	14	"
L - 0.5 x 0.5 m.	6	"
M - 1.0 x 1.0 m.	6	"
N - 1.0 x 1.0 m.	6	"
O - 2.0 x 1.0 m.	12	"
P - 1.0 x 1.0 m.	6	"

**Surveyed and reported by:** A. David.

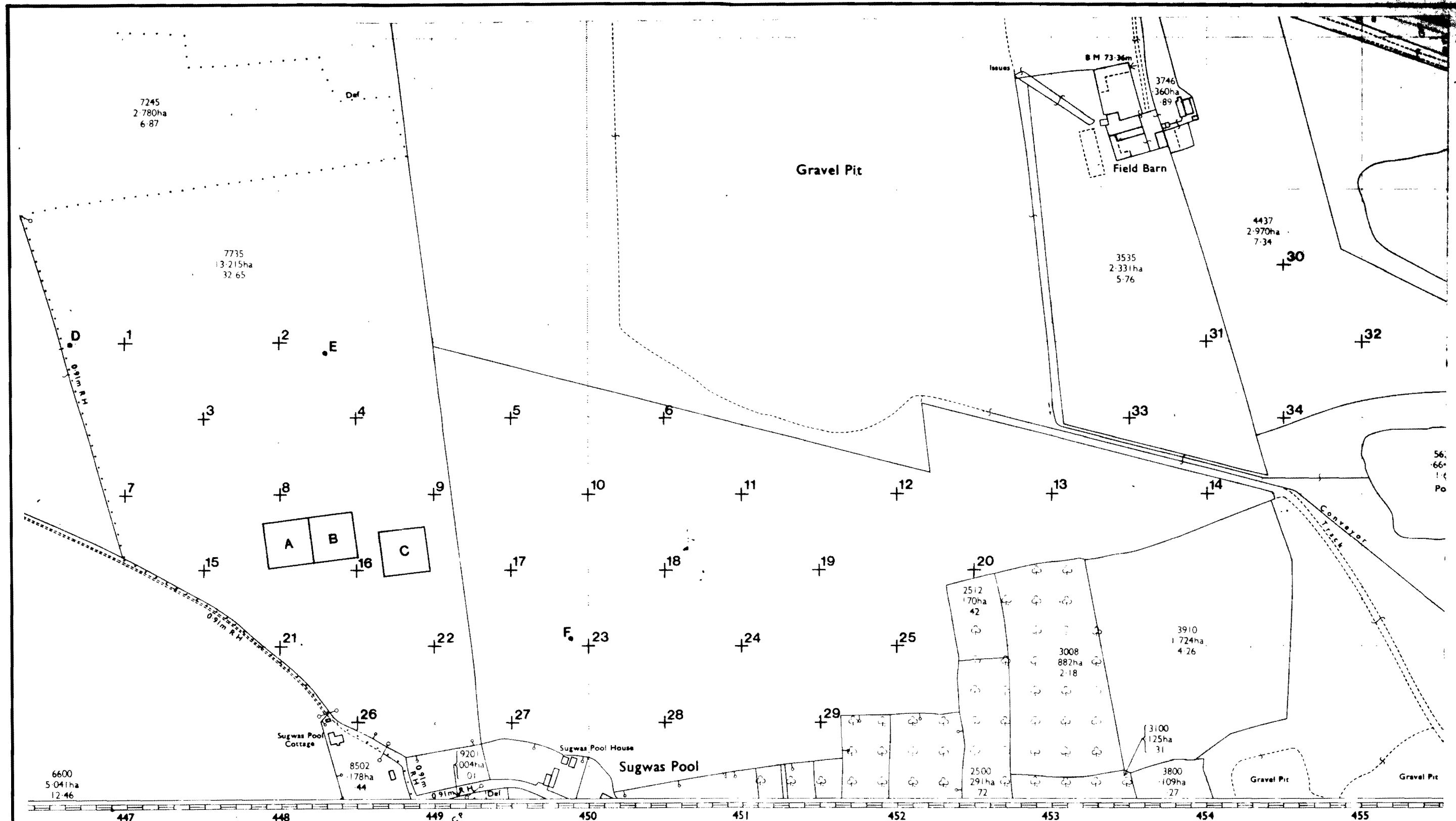
**with:** C. Tucker.

**For:** P. Rahtz  
J. J. West.



**Date of report:** 26.10.79

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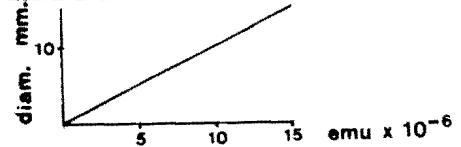
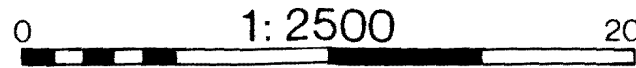
**01-734 6010 ext 591**



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<p>Survey no. 31/77 Plan no. 1 of 3</p>	<h2>KENCHESTER</h2>	<p>NG ref. SO 449421</p>
<p>D - F : anomalies found in scan 1 - 34 : sampling stations</p>	<h2>MAGNETOMETER SURVEY</h2> <h3>Location</h3>	<p>A - C  magnetometer squares</p>
<p>Based on 1:2500 OS sheets SO 4441 SO 4541</p>	<p>0  200m</p>	<p>DoE Ancient Monuments Laboratory Geophysics Section</p>



Survey no. 31/77 Plan no. of 3	<h1>KENCHESTER</h1>	NG ref. SO 449421
	<h2>MAGNETIC SUSCEPTIBILITY SURVEY</h2>	
Based on 1:2500 OS sheets SO 4441 SO 4541		DoE Ancient Monuments Laboratory Geophysics Section



G•

H•

I•

J•

L•

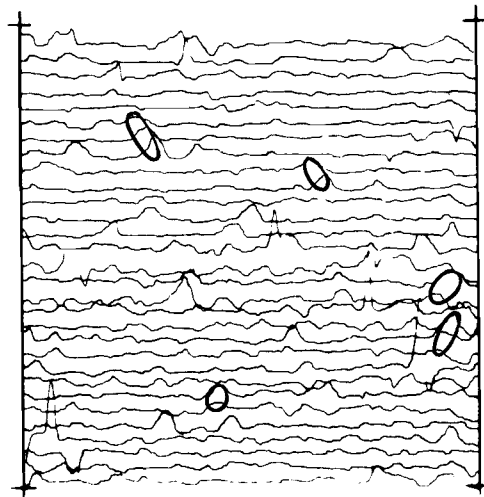
M•

K•

N•

P•

O•



# KENCHESTER

## MAGNETOMETER SURVEY

○ : ?archaeological anomalies

G - P : anomalies found in scan

30m grid squares

Survey no. 31/77  
Plan no. 2 of 3



DoE A.M. Laboratory  
Geophysics Section