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GREAT PONTON QUARRY, LINCOLNSHIRE

ARCHAEOLOGICAL EVALUATION REPORT (phase II)



PRE-CONSTRUCT ARCHAEOLOGY

Site Code: GP 94
CCM Accession No.: 122.94

**GREAT PONTON QUARRY, GREAT
PONTON, LINCOLNSHIRE
AN ARCHAEOLOGICAL EVALUATION REPORT**

FOR

**SMITH VINCENT & Co.
(ON BEHALF OF STAR QUARRIES plc)**

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JANUARY 1995

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Fig. 1 Site Plan 1.0 Non-Technical Summary

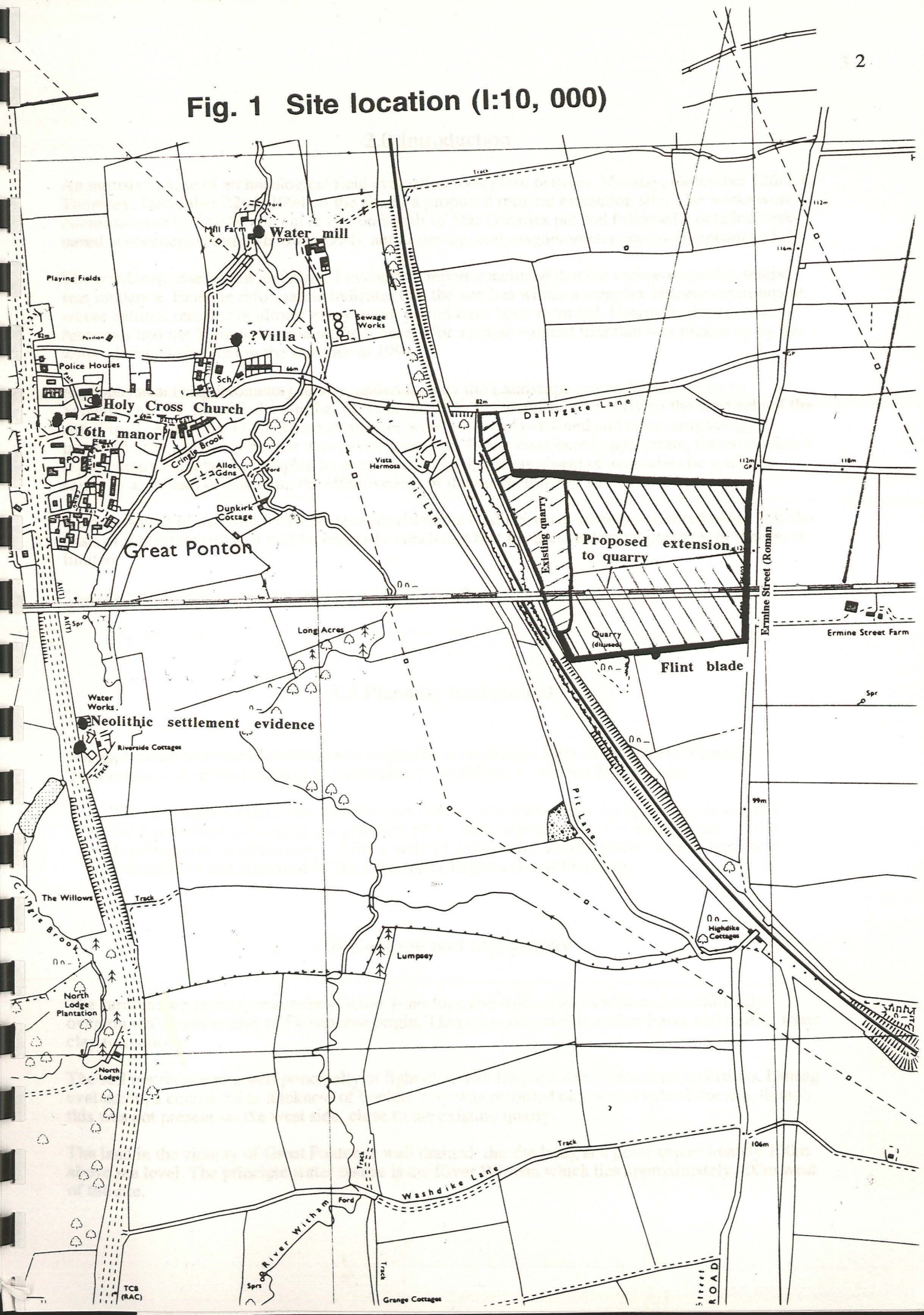
Star Quarries plc are seeking full planning consent to extend Great Ponton Quarry (Fig. 1). Approval has been granted, subject to conditions; one of which requires a scheme of investigation, designed to establish the presence/absence of archaeological resources and, if necessary, an appropriate mitigation strategy to record or preserve such resources prior to mineral extraction (ie destruction).

A combined desk top study and non-intrusive scheme of investigation demonstrated that the site was of moderate archaeological potential (Palmer-Brown 1994), though it emphasised a need for limited intrusive investigation as a basis of assessing real (ie physical) potential.

This report follows a nine day trenching programme, designed to assess impacts which may be caused by the proposed scheme. Fourteen trenches were sited within the proposed quarry extension; both to sample magnetic anomalies identified during geophysical (magnetometer) survey, and to assess areas which (on the basis of that survey) appeared to be archaeologically sterile.

Taken together, the combined desk-based and field-based surveys at the Great Ponton site have demonstrated that the archaeological potential is limited. It is the opinion of the writer, therefore, that no further archaeological investigations are necessary prior to development.

Fig. 1 Site location (1:10, 000)



2.0 Introduction

An intrusive phase of archaeological field evaluation took place between Monday, December 12th and Thursday, December 22nd, 1994 on the site of a proposed mineral extraction site. The works were commissioned by Smith Vincent & Co. on behalf of Star Quarries plc and followed a detailed desk-based assessment (Palmer-Brown 1994), aerial survey, and magnetometer survey (Appendix 11.2).

The combined assessment and phase I evaluation report concluded that the archaeological potential was moderate. Existing information indicates that the site lies within a complex historic environment where cultural remains of almost every major period have been recorded. However, site-specific resources had not hitherto been identified, except for a single worked flint that was picked up by the writer during a site visit in the summer of 1994.

A geophysical (magnetometer) survey, undertaken by the Landscape research Centre Ltd. in September 1994, identified a number of weak magnetic anomalies, principally on the west side of the site (Fig. 2, Appendix 11.2). These anomalies were not clearly-defined and their morphology provided little insight as to their date or interpretation. It was considered appropriate, therefore, that a representative number be sampled by excavation; and that areas absent of anomalies be similarly sampled as a basis of assessing the effectiveness of the magnetometer survey.

An assessment of material remains exposed within the evaluation trenches is presented below. On the basis of this information, it will be variously concluded that the archaeological potential of the site is limited.

The site central national grid reference is SK 9375 3008.

3.0 Planning background

An application to extract limestone was originally submitted in 1991 (S38/595/91). Planning permission was granted, subject to a number of conditions. Condition No. 4 reads:

“No development shall take place within the permitted area until the operator has secured the implementation of a programme of archaeological work for each phase of the development in accordance with a written scheme of investigation which has been submitted to and approved by the Director of Highways and Planning.”

4.0 Geology and topography

The surrounding geology comprises Oolitic limestone and calcareous sandstone, intermittently overlain with boulder clay of Pleistocene origin. These deposits overlie earlier lower and middle liasic clay formations.

The soil matrix is composed principally of light clay with frequent small limestone inclusions. During evaluation, a considerable thickness of boulder clay was recorded on the east side of the site, though this was not present on the west side, close to the existing quarry.

The land in the vicinity of Great Ponton is well drained, the site lying at a point approximately 100m above sea level. The principle water course is the River Witham which lies approximately 400m west of the site.

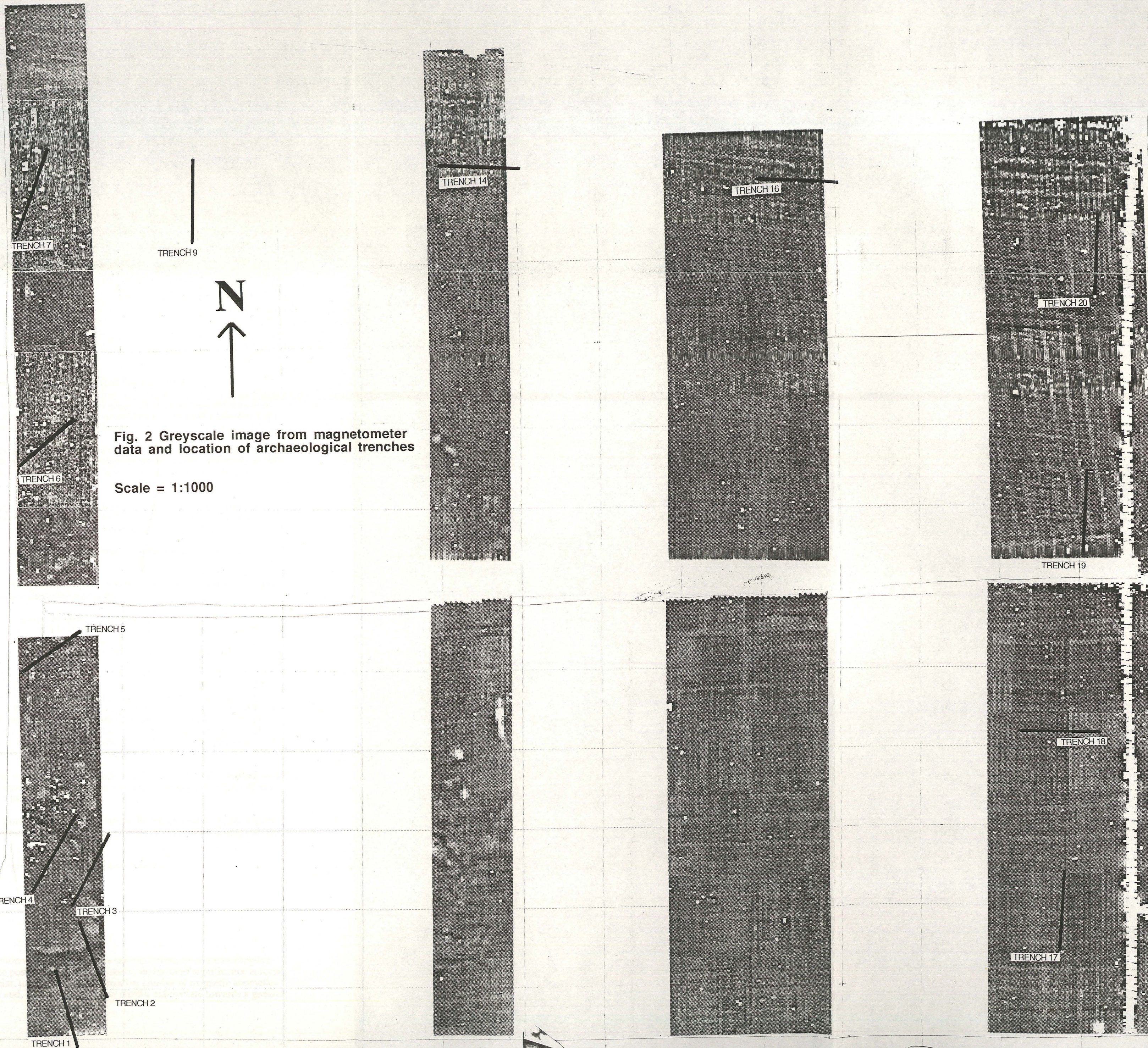


Fig. 2 Greyscale image from magnetometer data and location of archaeological trenches

Scale = 1:1000

Ermine Street

5.0 Archaeological and historical background

The archaeological and historical significance attached to the proposed scheme was established and described in the preceding desk top report and is only summarised below. The reader interested in a more detailed account is referred to the earlier document therefore.

The parish of Great Ponton has yielded evidence of the human past from the earlier prehistoric periods to the present day. Perhaps the most famous archaeological discovery was that made in 1933 during construction of the Great Ponton Water Works: a Neolithic settlement site (in terms of its rarity) of national importance.

In 1959, a large Middle Bronze Age barrow cemetery was discovered in neighbouring Stroxton parish; sadly, the find was made during the destruction of one barrow as it disappeared whilst ironstone quarrying - several of the monuments have since received statutory protection.

Within fields c. 1.0km north-west of the proposed development lies a cropmark site: further barrows or, perhaps, prehistoric enclosures.

Site-specific resources dating to within the prehistoric periods rest on a single flint blade which was collected by the writer during a visit to the site in the summer of 1994.

At a point approximately 3.0km south of proposed quarry extension, adjacent to Ermine Street, lies a major Roman settlement of unknown origin. Of closer proximity is a tessellated pavement that was exposed on the north side of the playing field, approximately 600m north-west of the quarry. It has been suggested that the pavement relates to a villa, perhaps relating to a well-defined group in the Grantham region.

Historically, Great Ponton is first mentioned to in the Domesday Book of 1086: *Magna Pamptune* (Mills 1993). The parish church dates from the C13th, though its perpendicular tower has been credited as being the work of Antony Ellys, a C16th wool merchant of the Staple of Calais (Pevsner & Harris 1989): Green, writing in the earlier part of the present century, interpreted Ellys act of apparent benevolence as the work of a man incapable of fathering a child - and, therefore, an heir (Green 1910). Ellys's manor was built close to the church where, in 1980, a remarkable series of late medieval wall paintings were revealed beneath layers of whitewash.

During the Civil War (1642 - 46) there was considerable conflict in the Grantham area, though there is no evidence to suggest direct involvement at Great Ponton: Cromwell distinguished himself as a cavalry leader on Gonerby Moor, c. 9.0km to the south.

During the mid-C19th, Great Ponton (along with other smaller and larger settlements in the region) increased in population, largely as a result of the employment possibilities that arose during railway construction (Beastall 1978).

There have been no previous archaeological excavations at Great Ponton.

6.0 Aims

The principal aims of the field evaluation were to establish the presence/absence of archaeological deposits dating from the prehistoric to post medieval periods and to assess their significance at local, regional and national level: in particular, to interpret a representative number of magnetic anomalies identified during geophysical survey and, on the basis of these results, extrapolate towards a general

statement regarding the likelihood or non-likelihood of there being important remains within the proposed mineral extraction site.

A revised project Specification, based around the above objectives, was jointly agreed between Pre-Construct Archaeology, the County Archaeologist and the Client.

7.0 Methodology

7.1 Aerial Survey

The results of this phase of non-intrusive investigation were discussed at length in the previous assessment report, though the main points are worth reiterating.

A fixed wing aircraft was commissioned to fly over the site on July 30th, 1994, at which time a maturing wheat crop was photographed from all angles at an altitude of c. 500 feet. No discreet cropmark groups were identified, though well-defined settlement plans were photographed en route; thereby demonstrating the suitability of the technique.

In some areas of the proposed quarry extension, green areas were identified, reflecting sub-surface moisture variation: in particular, in the south-west corner of the site, close to the existing quarry face. This variability was interpreted as possibly reflecting backfilled quarry areas - an old stone pit is recorded on modern Ordnance Survey maps of the area, immediately south-east of the existing quarry.

7.2 Magnetometer Survey

The Landscape Research Centre Ltd undertook a magnetometer survey on behalf of Pre-Construct Archaeology as a second procedural process towards identifying areas or concentrations of archaeological features which might be vulnerable to development (Appendix 11.2). Approximately 50% of the 13 hectare area was surveyed by this method, divided into four north-south transects. On the east side of the site, no anomalies were recorded, except for well-defined ridge and furrow cultivation scars (again, demonstrating the suitability of this technique). On the west side of the site, however (transects three and four), a series of weak amorphous anomalies were registered. The status of these anomalies could not be determined on morphological grounds: ultimate evaluation depended, therefore, on the use of intrusive techniques (ie trenching).

7.3 Evaluation Trenches

Following circulation of assessment and survey reports, the County Archaeologist requested, as a further necessary means of assessing the date, depth, nature, quality and extent of potential archaeological resources within the proposed development area, that a sample of the site be examined by trenching. Originally, this was to involve the excavation of some 20 trenches, each measuring approximately 1.5m in width, 30.0m in length. However, following an appeal by the Client, the requirement was reduced to fourteen trenches (Fig. 2): the excavation or non-excavation of the other six trenches was to remain dependent largely on the results obtained during the initial trenching programme.

A team of seven experienced field archaeologists excavated and recorded features and deposits exposed within the fourteen evaluation trenches (under the supervision of Mr R. Schofield). All deposits were recorded on standard pro-forma context sheets and contexts were drawn and, where necessary, photographed. All finds were washed and/or processed and were selectively presented to specialists for individual appraisal (Appendix 11.5).

In areas where no features of archaeological significance were present (Trenches 9, 14, 16, 17, 18, 19, 20), the level of work was restricted to cleaning, photography and context recording only.

A mechanical excavator fitted with a straight ditching bucket was used in each of the trenches to strip regular, level spits no deeper than 200mm. The process was repeated until the first archaeologically significant or natural horizons were exposed. All further excavation was by hand. All section and plan surfaces were meticulously cleaned stripping and a representative sample of each archaeological feature (where present) was excavated.

On December 21st, 1994, the site was inspected by the County Archaeological Officer (Mr I. George), the quarry manager (Mr L. Croydon-Fowler), Mr M. Jervis of Smith Vincent & Co. and the writer. An examination was made of each of the trenches under the guidance of the excavator, Mr R. Schofield.

8.0 Results

8.1.1 Trench 1 (Fig. 3)

A 30.0m trench, orientated broadly north-south, was marked-out in the south-west corner of the proposed quarry extension where a series of indeterminate magnetic anomalies had been recorded during geophysical survey; in particular, a tentative linear anomaly (L).

Mechanical stripping ceased at the interface of the topsoil [101] and the underlying bedrock [103], which lay approximately 30cm beneath the modern ground surface.

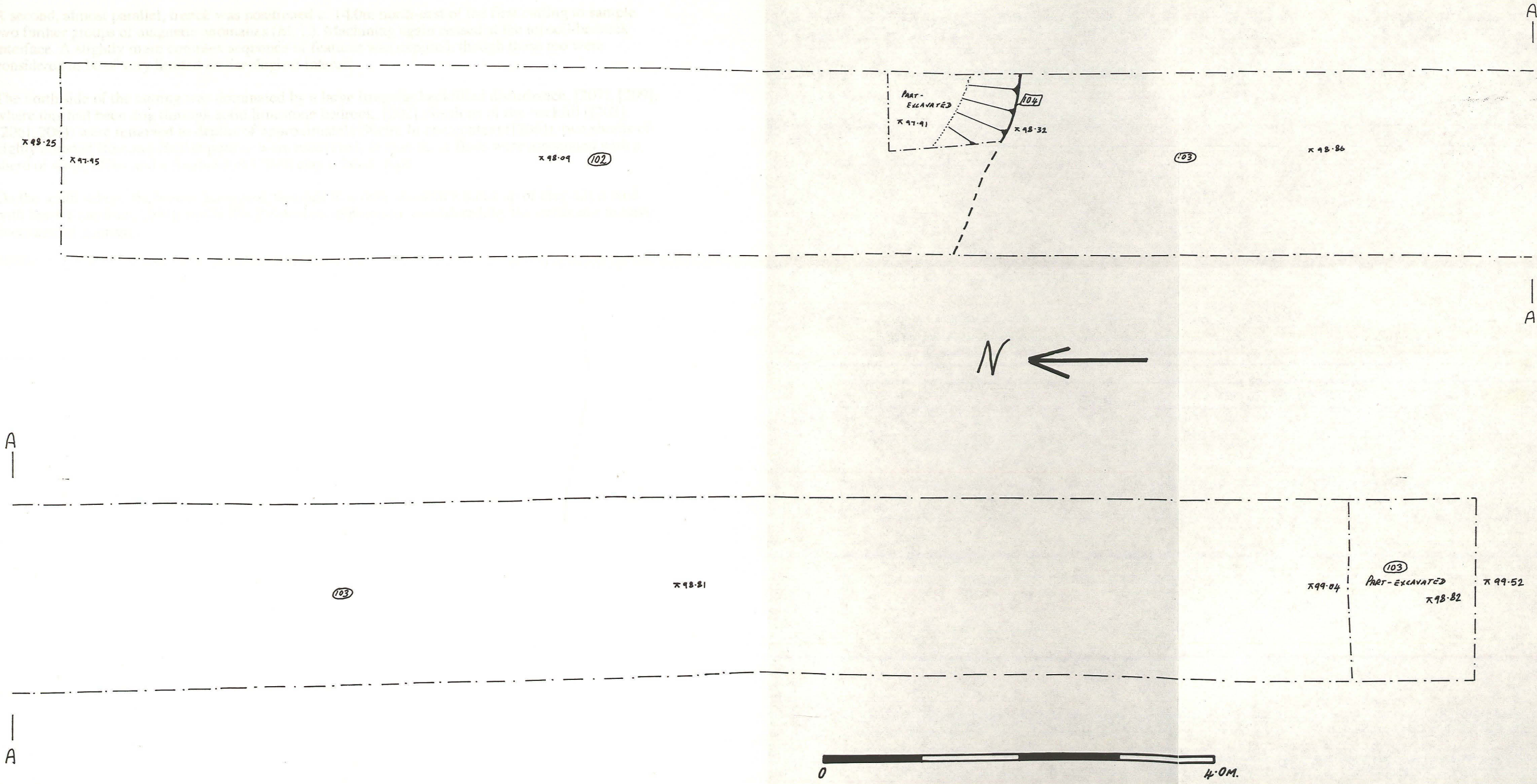
Cleaning of the trench sides and base revealed a very large disturbance on the north side, [104], at least 10.0m in extent. It was assumed that the disturbance was an old quarry pit and a small section of its fill, [102] was removed at the interface of the pit and the natural bedrock. It comprised lenses of redeposited limestone fragments mixed with yellow/brown gritty clay-silt; presumed to be quarry waste. No further excavation was deemed necessary, though a small section of natural limestone brash was excavated on the extreme south side of the trench to a point where the brash merged with solid limestone.

Fig. 3 Plan of features, Trench 1

8.1.2 Trench 2 (Fig. 4)

A second, almost parallel, trench was post-dated ... 140m north-east of the first ... in which two timber posts of diameter ... 50cm ...

The ... of the ... was ... by a ...



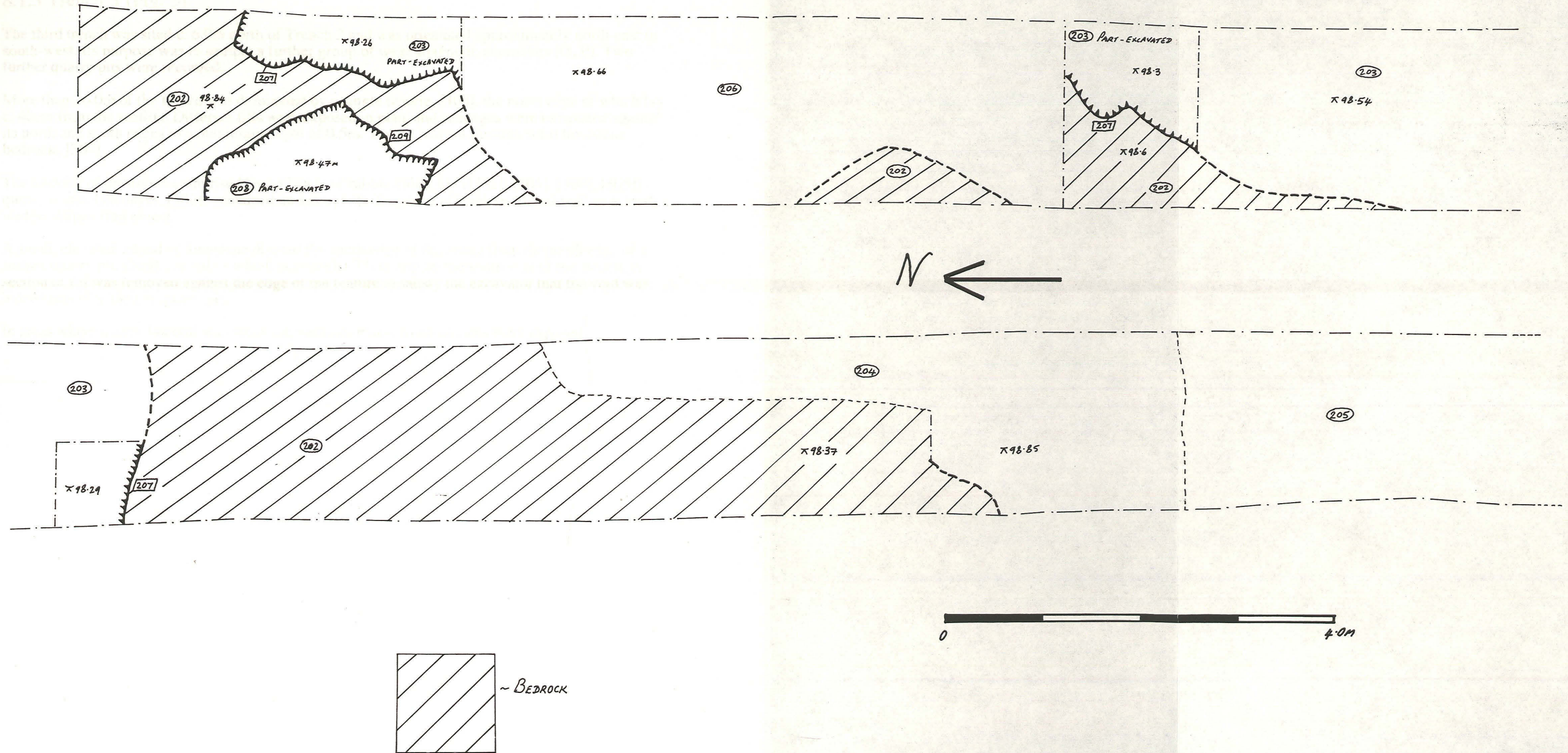
8.1.2 Trench 2 (Fig. 4)

A second, almost parallel, trench was positioned c. 14.0m north-east of the first cutting to sample two further groups of magnetic anomalies (M, L). Machining again ceased at the topsoil/bedrock interface. A slightly more complex sequence of features was exposed, though these too were considered to be of very limited archaeological interest.

The north side of the cutting was dominated by a large irregular backfilled disturbance, [207], [209], where this had been dug through solid limestone bedrock, [202]. Sections of the backfill ([203], [206], 208]) were removed to depths of approximately 30cm. In one context ([206]), two sherds of highly abraded Romano-British pottery were recovered, though these finds were associated with a sherd of white china and a fragment of C19th clay tobacco pipe.

On the south side of the trench, the parent bedrock was overlain with a build-up of clay-silt mixed with brash limestone, [204], which filled a distinct depression; considered, by the excavator to have been natural in origin.

Fig. 4 Plan of features, Trench 2



8.1.3 Trench 3 (Fig. 5)

The third trench was sited c. 6.0m north of Trench 2 and was orientated approximately north-east to south-west. Its purpose was to sample a further group of weak magnetic anomalies (O, P). Two further quarry pits were recorded.

More than 26.0m of the trench was dominated by a single feature, [308], the north edge of which lay c. 40cm from the section. Different fills were exposed in plan, and sondages were excavated against its north and south edges to a maximum depth of 0.5m. The pit had cut through solid limestone bedrock, [307].

The backfill of the above comprised broad bands of rubble-filled soil ([302], [303], [304], [305]) - quarry waste. One layer, [302], contained an amorphous fragment of brick or tile, as well as a small wedge-shaped iron object.

A small, elevated, island of limestone divided the south edge of the above from the north edge of a further quarry pit, [309], the fill of which occupied a 7.0m strip on the south side of the trench. A section of fill was removed against the edge of the feature to satisfy the excavator that the void was indeed that of a further quarry pit.

In areas where quarry backfill was removed, vertical or near-vertical faces were exposed.

Fig. 5 Plan of features, Trench 3

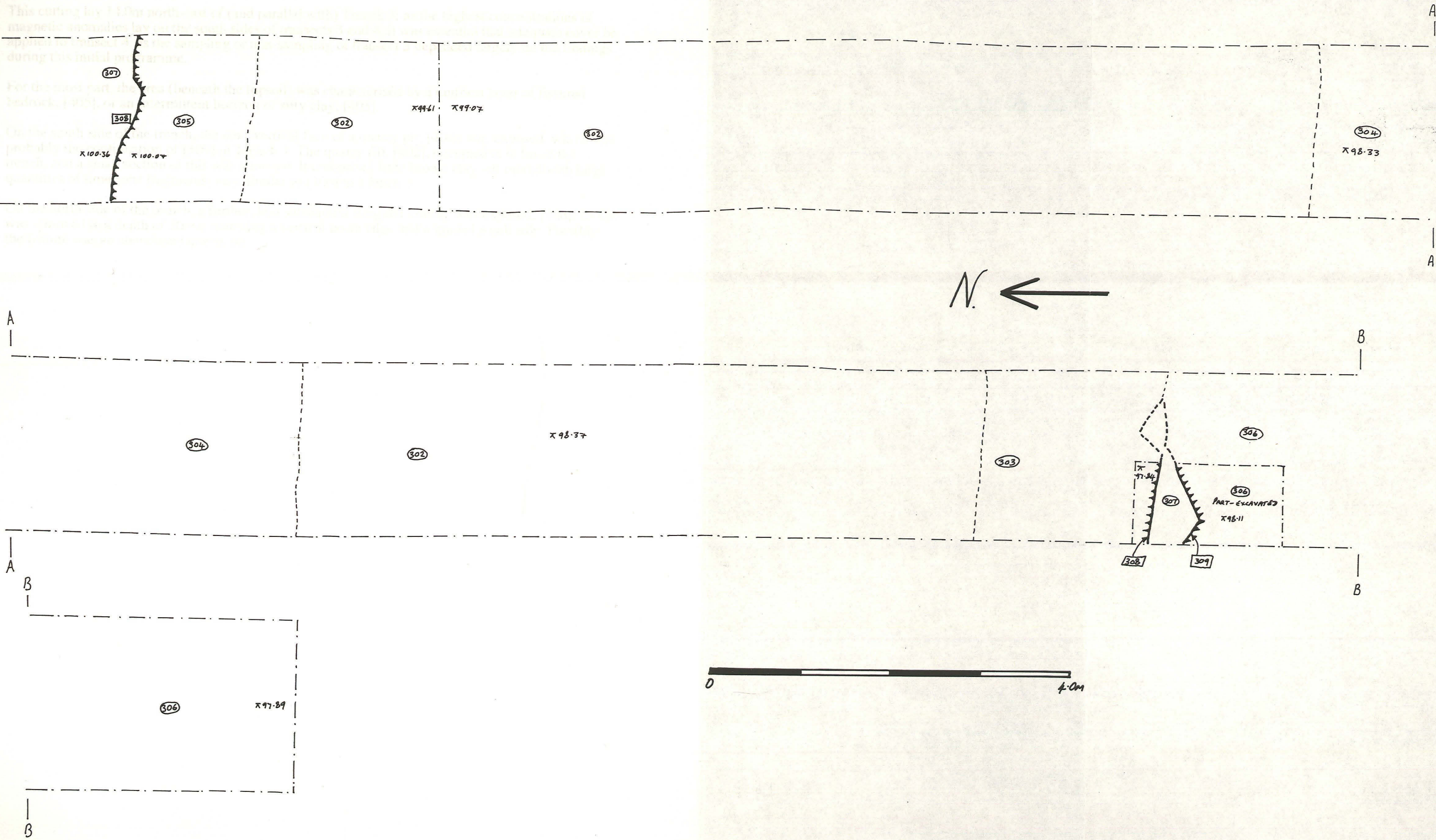
8.1.4 Trench 3 (Fig 5)

This cutting lay 1.1 km north-west of road parallel with Trench 2, and the highest concentration of magnetic anomalies lay along its length. The cutting was made during the initial magnetic survey.

For the most part the area beneath the cutting was the same as the area beneath Trench 2, but the cutting was made during the initial magnetic survey.

The cutting was made during the initial magnetic survey.

The cutting was made during the initial magnetic survey.



8.1.4 Trench 4 (Fig. 6)

This cutting lay 14.0m north-east of (and parallel with) Trench 3: as the highest concentrations of magnetic anomalies lay on the south sides of transects 3 and 4, it was essential that adequate cover be applied to transect 4. as the sampling or non-sampling of transect 3 depended largely on the findings during this initial programme.

For the most part, the area (beneath the topsoil) was characterised by a uniform layer of fissured bedrock, [405], or an intermittent horizon of silty clay, [403].

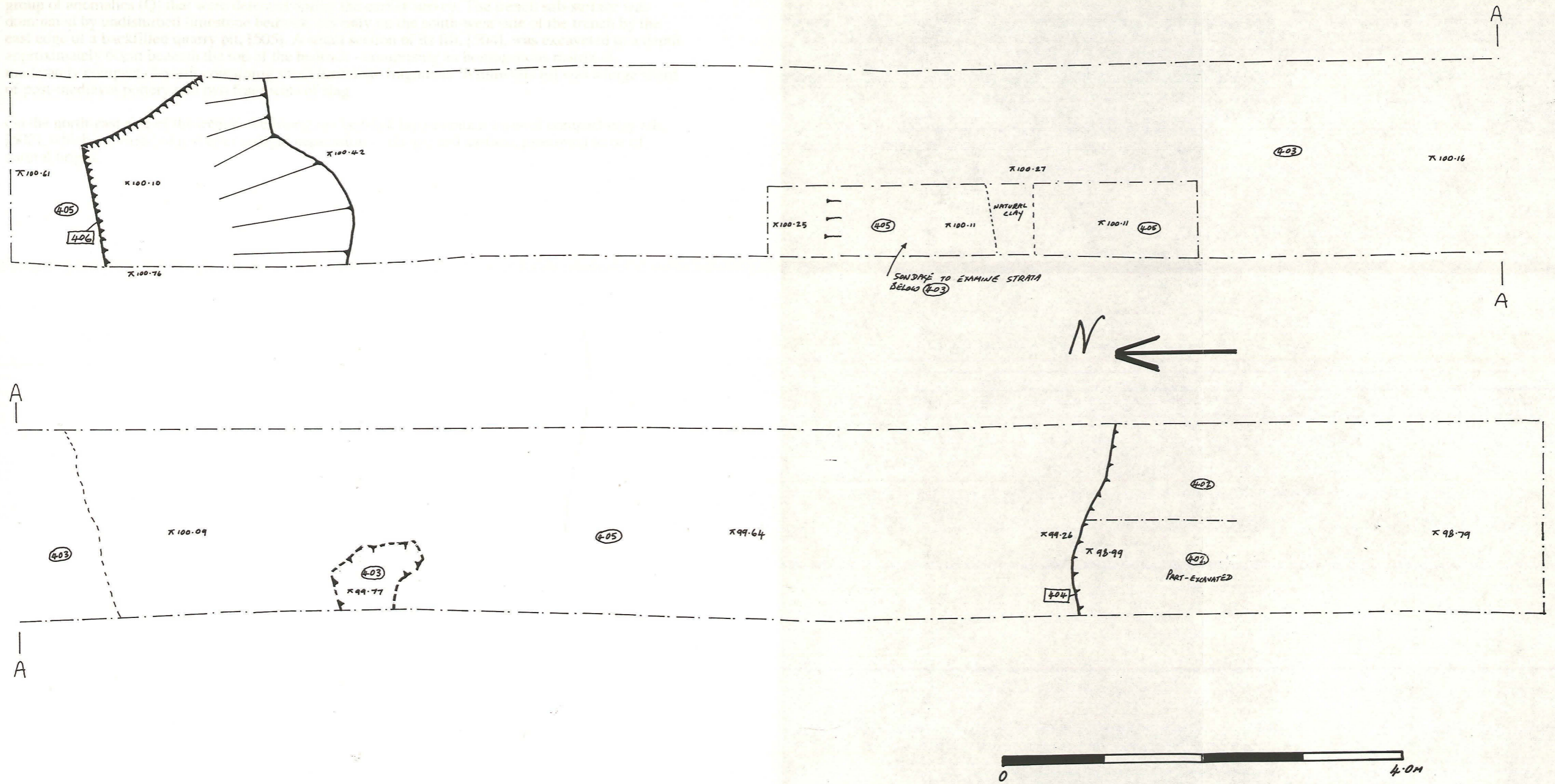
On the south side of the trench, the near-vertical face of a quarry pit, [404], was exposed, which was probably the continuation of [309] in Trench 3. The quarry fill, [402], occupied c. 4.3m of the trench, and a small section of this was removed. It comprised light brown clay-silt mixed with large quantities of limestone fragments, very similar to [306] in Trench 3.

On the north side of the trench, a further, less substantial irregular cutting was exposed, [406]. Its fill was removed to a depth of 50cm, revealing a vertical north edge and a graded south side. Possibly the feature was an abandoned quarry pit.

3.1.5 Trench 3 (Fig. 7)

Trench 3 was an early trial to test the soil and was planned to sample a small, discrete group of animals (1) that were deposited in the trench. The trench was situated in a natural depression in the ground, and was bounded on the south-west side by the east side of a brick-lined quarry pit. In 1974, a section of the trench, 1.5m long, was excavated to a depth of 1.5m to test the soil.

Fig. 6 Plan of features, Trench 4



8.1.5 Trench 5 (Fig. 7)

Trench 5 was orientated north-east to south-west and was positioned to sample a small, discreet group of anomalies (Q) that were detected during the earlier survey. The trench sub-surface was dominated by undisturbed limestone bedrock, cut only on the south-west side of the trench by the east edge of a backfilled quarry pit, [505]. A small section of its fill, [504], was excavated to a depth approximately 60cm beneath the top of the bedrock - comprising an homogenous matrix of moderately compact clay-silt containing small limestone fragments. Within this fill was a large sherd of post-medieval pottery and two fragments of slag.

On the north-east side of the trench, the limestone bedrock lay beneath a layer of compact clay-silt, [502], which appeared to rest over a slight depression in the ground surface, presumed to be of natural origin.

Fig. 7 Plan and feature section, Trench 5

8.1.6 Trench 6 (Fig. 8)

The sixth cutting was made on the north side of an area of heavy soil with a few stones and the geophysical survey, where a further small amount of soil was detected.

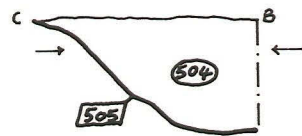
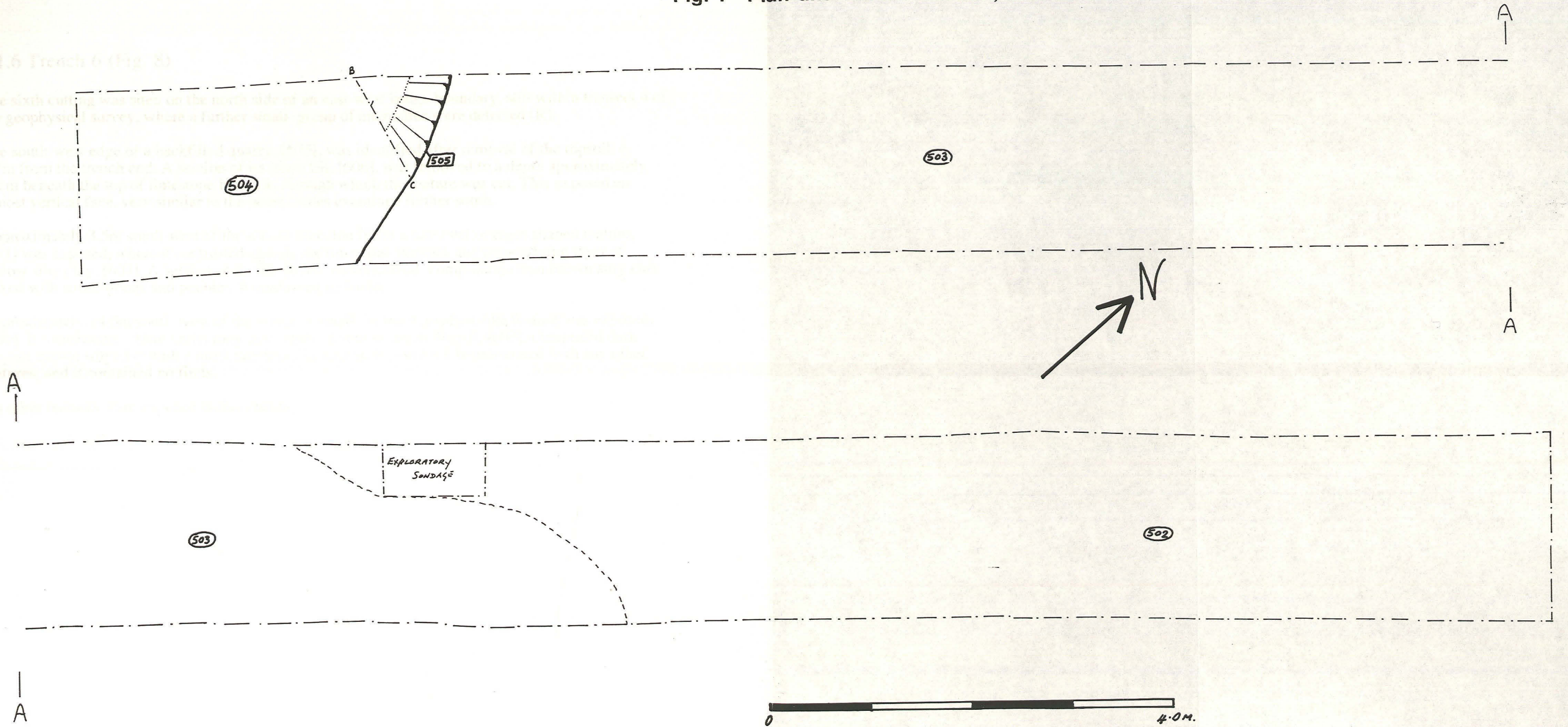
The south side of a bank of 1.5m x 0.5m was cut through the soil. The cutting was approximately 1.5m long and 0.5m wide. The soil was almost vertical and very hard to dig.

A small amount of soil was found in the cutting. It was a light brown color and contained a few small stones.

The soil was found to be a mixture of sand and silt. It was very hard to dig and contained a few small stones.

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8.1.6 Trench 6 (Fig. 8)

The sixth cutting was sited on the north side of an east-west hedge boundary, still within transect 4 of the geophysical survey, where a further small group of anomalies were detected (R).

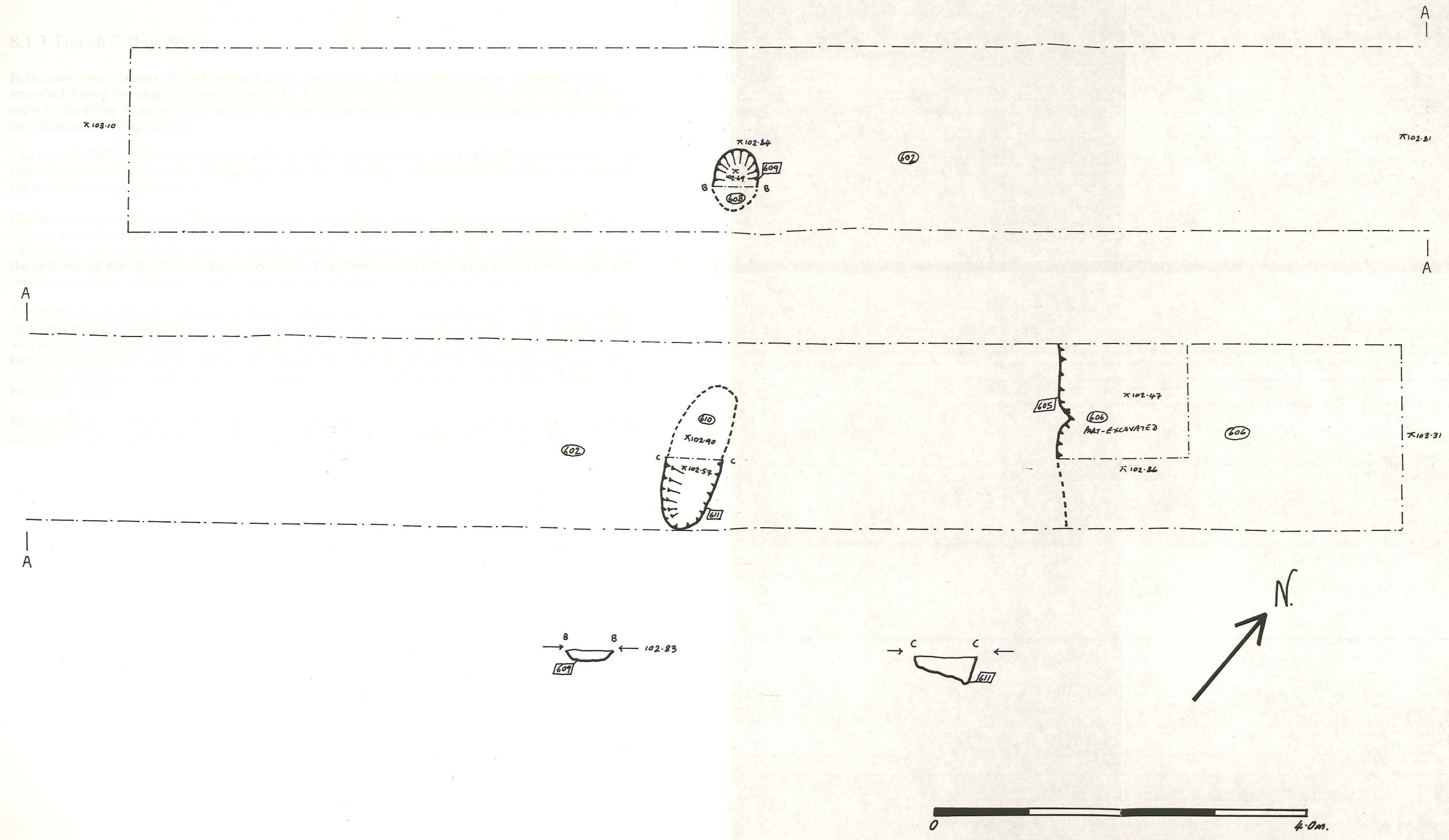
The south-west edge of a backfilled quarry, [605], was identified after removal of the topsoil, c. 3.7m from the trench end. A section of its stony fill, [606], was removed to a depth approximately 40cm beneath the top of limestone bedrock, through which the feature was cut. This exposed an almost vertical face, very similar to the quarry sides examined further south.

Approximately 3.5m south-west of the quarry face, the fill of a sub-oval or cigar-shaped feature, [611] was exposed, where it contrasted against the limestone bedrock and an overlying layer of yellow silty clay, [603]. A section of its fill, [610], was removed, comprising clean brown silty clay mixed with small stones and pebbles. It contained no finds.

Approximately 14.5m south-west of the above, a small, isolated, oval pit-like feature was exposed, [609]. It measured c. 70cm on its long axis, and c. 15cm in depth. Its fill, [608], comprised dark greyish-brown silty clay with a moderate stone inclusion. It could not be associated with any other features, and it contained no finds.

No other features were exposed in this cutting.

Fig. 8 Plan and feature sections, Trench 6



8.1.7 Trench 7 (Fig. 9)

In the north-west corner of the proposed quarry extension, a cluster of magnetic anomalies were recorded during the magnetometer survey (T). Trench 7 was orientated broadly north-south, with a view to sampling as many of the anomalies as possible (which, like most others on the site, were not morphologically diagnostic).

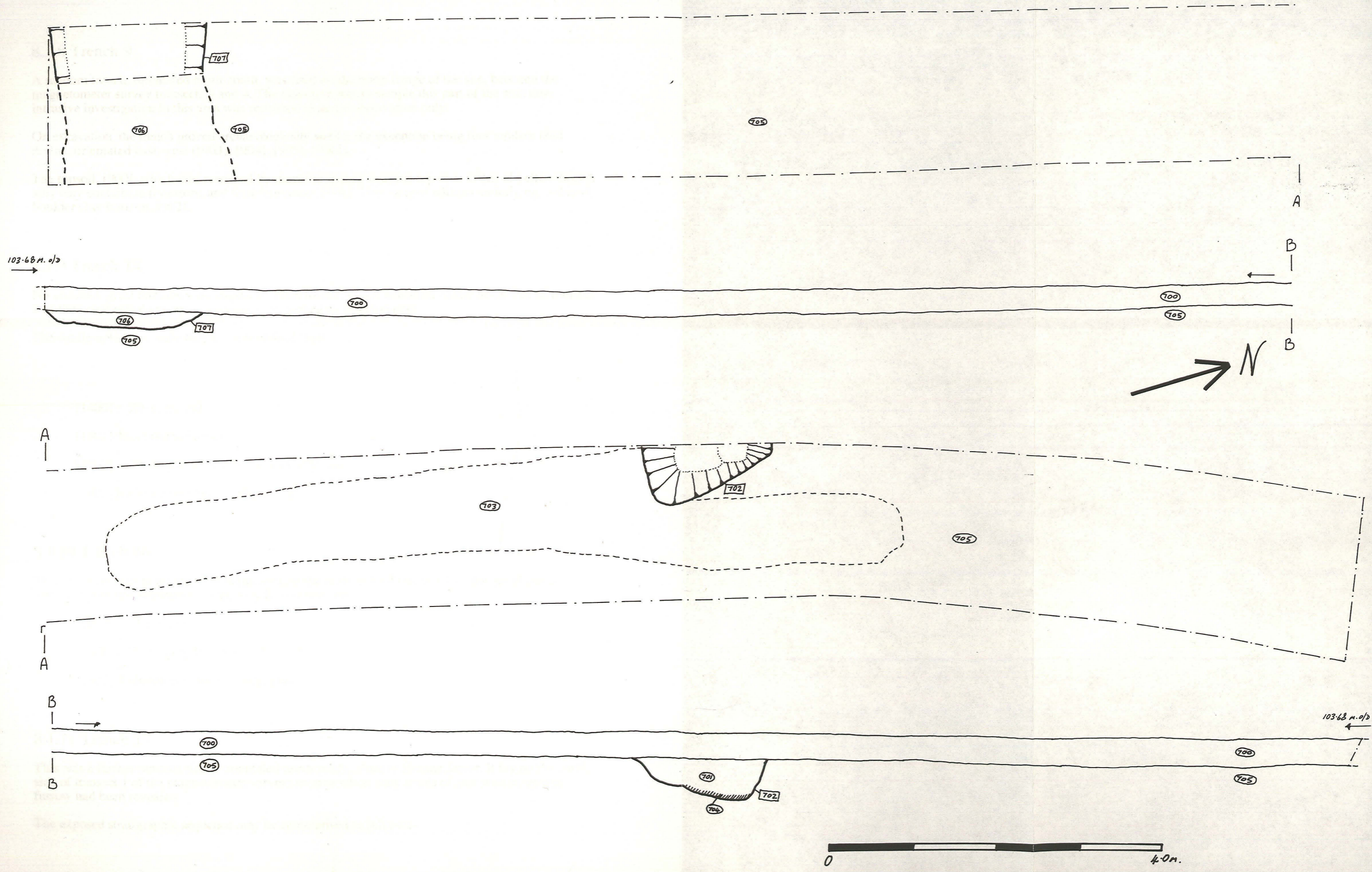
The topsoil [700], which was removed mechanically, measured approximately 30cm in thickness: the interface between this and the underlying strata was (as always) well-defined. Two discreet features lay within the excavation area.

On the extreme south side of the area sampled lay a shallow trench, orientated east-west, [707]. In form, it resembled the base of a furrow, of a type associated with medieval ridge and furrow cultivation - several such features are clearly-defined on the greyscale of the magnetometer survey on the east side of the site (Fig. 2, Appendix 11.2). The ?furrow was filled with yellow/brown clay-silt mixed with stones, charcoal fragments and one sherd of late post-medieval pottery.

At a point approximately 7.0m north of the south section, a sub-rectangular pit, [702], was exposed; obscured partially behind the west face of the trench. It measured approximately 1.5m in length and was dug to a maximum depth of 50cm. In the base of the feature was a lens of dark grey clay-silt mixed with stone and charcoal fragments. Above this, the bulk fill, [701] comprised mid-grey silty clay-sand mixed with small stones. Animal bone was recovered from this context, though there were no datable finds.

Both of the above features had cut through the top of an homogenous deposit of limestone brash and clay, [705] - probably the result of weathering (freeze-thaw) during the last glacial period.

Fig. 9 Plan and section drawing, Trench 7



8.1.8 Trench 9

A random trench, orientated north-south, was sited on the north fringe of the site, between the magnetometer survey transects 3 and 4. The objective was to sample this part of the site: non-intrusive investigation in this area was restricted to aerial observation only.

On excavation, the trench proved archaeologically sterile; the exception being four modern land drains, orientated east-west ([903], [904], [905], [906]).

The topsoil, [900], which was removed by machine, rested over the top of c. 25cm of yellow/brown silty clay containing limestone and flint fragments, [901]. This merged with an underlying, reduced, boulder clay horizon, [902].

8.1.9 Trench 14

No archaeological features were exposed in this trench, which was sited on the north side of transect 3 of the geophysical survey as a means of assessing its effectiveness.

The stratigraphic sequence may be summarised thus:

- [1400] c. 30cm topsoil
- /
- [1401] Modern land drain
- /
- [1402] c. 20cm grey/brown (oxidised) silty clay
- /
- [1403] Reduced grey/blue boulder clay

8.1.10 Trench 16

This also was sited in an apparent blank area on the north side of transect 2 of the geophysical survey. Again, the natural sequence may be summarised:-

- [1600] c. 30cm topsoil
- /
- [1601] c. 20cm grey/brown (oxidised) silty clay
- /
- [1602] Reduced grey/blue boulder clay

8.1.11 Trench 17

This was a further random siting, orientated north-south, close to Ermine Street. It lay on the south side of transect 1 of the magnetometer survey; an area where only traces of east-west ridge and furrow had been revealed.

The exposed stratigraphic sequence may be summarised as follows:-

[1700] c. 30cm Ploughsoil

/
[1701] Up to 50cm of fawn/brown oxidised stony boulder clay

/
[1702] Reduced blue/grey boulder clay

8.1.12 Trench 18

This also was located close to Ermine Street, approximately 52m north of Trench 17. It was orientated east-west, again within an area where only ridge and furrow cultivation scars were apparent on the greyscale image of the geophysical survey. No archaeological features were present, and the sequence of deposition was as follows:-

[1800] c. 30cm Ploughsoil

/
[1801] c. 50cm fawn/brown (oxidised) boulder clay

/
[1802] Reduced grey/blue boulder clay

8.1.13 Trench 19

On the east side of the site, close to Ermine Street, approximately 8.0m north of a dividing east-west field boundary, an east-west linear anomaly (D) was detected during the geophysical survey, extending westwards from a substantial north-south anomaly, (A) (now known to be a live electricity cable). Trench 19 was orientated north-south, therefore, with a view to intercepting anomaly D.

No features of archaeological significance were exposed: the linear anomaly that was recorded in the earlier survey almost certainly reflected the presence of a buried land drain [1903] that lay approximately 6.0m north of the south section. A second drain, [1904] was also present in the cutting, orientated north north west - south south east. With the exception of these features, the exposed stratigraphic sequence mirrored that examined in Trenches 9, 14, 16 and 17: topsoil over boulder clay.

8.1.14 Trench 20

The final cutting was placed in the north-east corner of the site, parallel with Ermine Street. Again, no archaeological features were exposed; the sequence being a continuation of that exposed within other cuttings on the east and north-east periphery of the proposed development site.

8.2 Environmental potential

It was suggested in the desk top study that environmental potential at the Great Ponton site was low, due largely to the reasonably good drainage afforded by the surface geology (and the unlikelihood, therefore, of conditions being suitable for the preservation of organic remains). In the course of events, trenching revealed substantial deposits of dense boulder clay, particularly on the east side towards Ermine Street. Under these conditions, had deeply-cut archaeological features been present, important remains (eg pollen grains, wood, insect remains) may have survived within anaerobic or semi-anaerobic conditions. However, in the context of the present site, the speculation is of academic value only.

9.0 Conclusions

The evaluation at Great Ponton has demonstrated that the archaeological potential of the site is low. Seven trenches excavated within transect 4 of the geophysical survey (where a reasonably dense pattern of magnetic anomalies were recorded) revealed a series of backfilled quarry excavation pits, all of which probably date to a period no later than the middle of the last century. In one area (Trench 7), a sub-rectangular pit of different form and character was recorded, though no associated dating evidence was found. Similarly, in Trench 6, two isolated pit-like features were examined, though these could not be associated with any other archaeological remains. Their significance, therefore, is questionable.

The seven trenches that were excavated on the north and east sides of the proposed quarry extension produced no archaeological remains at all, except for land drains of little or no archaeological value.

It is suggested (on the basis of the above) that the magnetic anomalies recorded in transect 3 of the geophysical survey reflect similar features to those exposed in Trenches 1 to 7 - backfilled quarry excavations. As such, it would seem unlikely that further excavation would yield important informative and useful results. Working on the basis that (on the east side of the site) the lines of medieval cultivation scars were detected during the magnetometer survey, it may be reasonably argued that this technique was appropriate to the Great Ponton site and that, if other, more significant, earth-cut remains were present, these should have been expressed as magnetic anomalies during geophysical survey.

It is concluded that the site of proposed mineral extraction at Great Ponton is of limited archaeological potential. It is unlikely, therefore, that important archaeological remains will be destroyed if permission to develop is granted.

10.0 Acknowledgements

Pre-Construct Archaeology wish to express their thanks to Star Quarries plc and to Smith Vincent & Co. for commissioning this company to undertake assessment and evaluation work at the Great Ponton site (in particular to Mr L. Croydon-Fowler and Mr M. Jervis).

Thanks go to Mr Ian George, the County Archaeological Officer, for providing all necessary guidance and direction, and for adopting a flexible stance on behalf of both the Clients and Pre-Construct Archaeology.

Finally, thanks are expressed to staff at the City of Lincoln Archaeology Unit for finds assessment, and to the excavation team: Wayne Livesey, Rob Schofield, Malcolm Otter, Adnan Baysal, Miles Ridsdale, Mike Garret, Simon Johnson (intermittently) and, lastly, D. Marshall.

11.0 Appendices

11.1 List of contexts (based on the table)

Trench 1

- [301] Dark grey, silty, medium to coarse sand with occasional siltstone fragments
- [302] Substratum 2 m from Trench below 1.00m, partially with grey to white silty clay

11.1 List of contexts

11.2 Magnetometer Survey Report

11.3 Colour photographs

11.4 Site Archive

11.5 Finds assessment

11.6 References

Trench 2

- [301] Fine to medium sand
- [302] Light grey, silty, medium to coarse sand with occasional siltstone fragments
- [303] Yellowish, medium to coarse sand with occasional siltstone fragments
- [304] Reddish-brown, medium to coarse sand with occasional siltstone fragments
- [305] Coarse to medium sand, silty clay, frequent siltstone fragments

11.1 List of contexts (classification only)

Trench 1

- [101] Top/plough soil: grey/brown clay-silt with moderate limestone inclusion
- [102] Redeposited natural brash below [101]: overlain with pockets of silty subsoil. Contained by [104]
- [103] Fill comprising redeposited limestone brash (sampled on sondage, south end of Trench 1): Fill of quarry pit
- [104] South edge of large cut. ?Edge of backfilled quarry

Trench 2

- [201] Ploughsoil, same as [101]
- [202] Fissured limestone bedrock; intermittently overlain with pockets of silty clay subsoil
- [203] Yellow/brown silty clay containing limestone fragments; filled stepped depression [207]. Sealed beneath [206]
- [204] Yellow/brown clay-silt containing brash limestone; fills depression on south side of trench
- [205] Light reddish-brown clay-silt, south end of trench.
- [206] Yellow/brown silty clay; occasional small limestone fragments. Natural deposit
- [207] Amorphous cut with vertical sides; largely hidden beyond west section. Contains
[203]
+ [206]
- [208] Loose deposit of shattered limestone below [206]; similar to [203] and probably contemporary
- [209] Cut for ?quarry pit, north end of trench. Contains material identical to [208]

Trench 3

- [301] Plough soil; same as [101]
- [302] Light brown clay-silt, intermingled with frequent limestone fragments. Fill of quarry pit [308]
- [303] Yellow/brown silty/gritty clay mixed with limestone brash. Lies within quarry pit [308], south side of trench. Redeposited natural
- [304] Redeposited natural yellow/brown clay-silt mixed with limestone fragments; fill within quarry [308]
- [305] Compact light brown gritty silty clay, frequent limestone fragments; fill within quarry pit [308]

- [306] Compact light orange/brown silty clay mixed with frequent limestone inclusion; fill within quarry pit [309]
- [307] Limestone bedrock; fissures filled with leached silty clay
- [308] Vertical east-west cut, north side of trench; south edge of backfilled quarry pit
- [309] Vertical east-west cut, north side of trench; south edge of backfilled quarry pit

Trench 4

- [401] Plough soil; same as [101]
- [402] Backfill of quarry pit [404]: light brown clay-silt with frequent limestone inclusion
- [403] Limestone bedrock, heavily fissured
- [404] Cut for quarry pit south side of trench

Trench 5

- [501] Plough soil (same as [101])
- [502] Firm light brown clay-silt containing frequent limestone inclusion; natural clay-silt filling depression
- [503] Limestone bedrock
- [504] Orange/brown clay-silt mixed with frequent limestone inclusion, south-west end of trench. ?Natural
- [505] Cut for quarry pit, south-west side of trench.

Trench 6

- [601] Plough soil (same as 101)
- [602] Natural limestone bedrock (intermittently overlain with pockets of silty clay subsoil)
- [603] Yellow/brown silty clay with occasional limestone fragments. Natural silty clay, intermittently overlying limestone bedrock [602]
- [604] Firm yellow/brown silty clay containing occasional limestone fragments - similar to [603]. Fill of natural depression
- [605] Vertical-sided cut, dug through bedrock on north side of excavation. Quarry pit cut
- [606] Firm silty clay containing limestone inclusion filling quarry at north end of trench
- [607] Limestone bedrock (same as [602])
- [608] Dark grey/brown clay-silt with moderate quantity of stone inclusion. Fill of small pit; probably modern, as fill resembles topsoil and no clear division between topsoil and feature

- [609] Cut for the above: small, bowl-shaped profile
- [610] Clean brown silty clay filling small cigar-shaped north-south cut [611]
- [611] Cut for the above: cigar-shaped in plan, vertical sides, base sloping towards the east

Trench 7

- [700] Plough soil {same as 101}}
- [701] Upper fill of small pit: grey/brown silty clay-sand containing small limestone fragments, occasional flecks of charcoal
- [702] Cut of small pit, south side of trench
- [703] Reddish-brown clay-silt filling depression in surface of natural
- [704] Lower fill of pit [702]: dark grey/brown clay-silt containing occasional limestone fragments, frequent charcoal fragments
- [705] Compact natural sub-soil layer of limestone brash/ natural out-cropping stone
- [706] Fill of ?modern linear feature [707]: firm yellow/brown clay-silt containing small limestone fragments, occasional charcoal flecks (one frag. of C19th white china)
- [707] Linear feature/natural depression in [705]: orientated broadly east-west

Trench 9

- [900] Plough soil: same as [101]
- [901] Natural, light brown, oxidised silty clay below topsoil
- [902] Blue/grey (reduced) silty boulder clay below [901]
- [903] Modern east-west land drain
- [904] Modern east-west land drain
- [905] Modern east-west land drain
- [906] Modern east-west land drain

Trench 14

- [1400] Ploughsoil
- [1401] Modern land drain, orientated N/W - S/E
- [1402] Natural, light brown, oxidised silty clay below topsoil
- [1403] Blue/grey (reduced) silty boulder clay below [1402]

Appendix 2

Trench 16

- [1600] Ploughsoil
- [1601] Natural, light brown, oxidised silty clay below topsoil
- [1602] Blue/grey (reduced) silty boulder clay below [1601]

Trench 17

- [1700] Ploughsoil
- [1701] Natural, light brown, oxidised silty clay below topsoil
- [1702] Blue/grey (reduced) silty boulder clay below [1701]

Trench 18

- [1800] Ploughsoil
- [1801] Natural, light brown, oxidised silty clay below topsoil
- [1802] Blue/grey (reduced) silty boulder clay below [1801]

Trench 19

- [1900] Ploughsoil
- [1901] Natural, light brown, oxidised silty clay below topsoil
- [1902] Blue/grey (reduced) silty boulder clay below [1901]
- [1903] Stone-filled land drain (probably corresponds to geophysical anomaly D)
- [1904] Stone-filled land drain, orientated NNW - SSE

Trench 20

- [2000] Ploughsoil
- [2001] Natural, light brown, oxidised silty clay below topsoil
- [2002] Blue/grey (reduced) silty boulder clay below [2001]

Appendix 2

Summary:

A magnetometer survey was carried out by the Landscape Research Centre Ltd for the Environment Agency, as part of an archaeological assessment of a proposed development of 100 dwellings at Great Ponton, Lincolnshire. The proposed development is a residential development which will be located on the site of the former Great Ponton Farm.

Executive Summary:

The magnetometer survey was carried out on the 5th-12th September 1994.

Landscape Research Centre Ltd

Magnetometer Survey

Great Ponton, Lincolnshire

5th-12th September, 1994

Summary :

A magnetometer survey was carried out by the Landscape Research Centre Ltd. for Pre-Construct Archaeology, as part of an archaeological assessment of a proposed quarry extension by Star Quarries at Great Ponton, Lincolnshire. The proposed development area had a number of magnetic anomalies which are discussed in detail below.

Enclosed :

The report consists of this document, several plans and images, and one table, numbered below. All plans have north pointing to the top of the page.

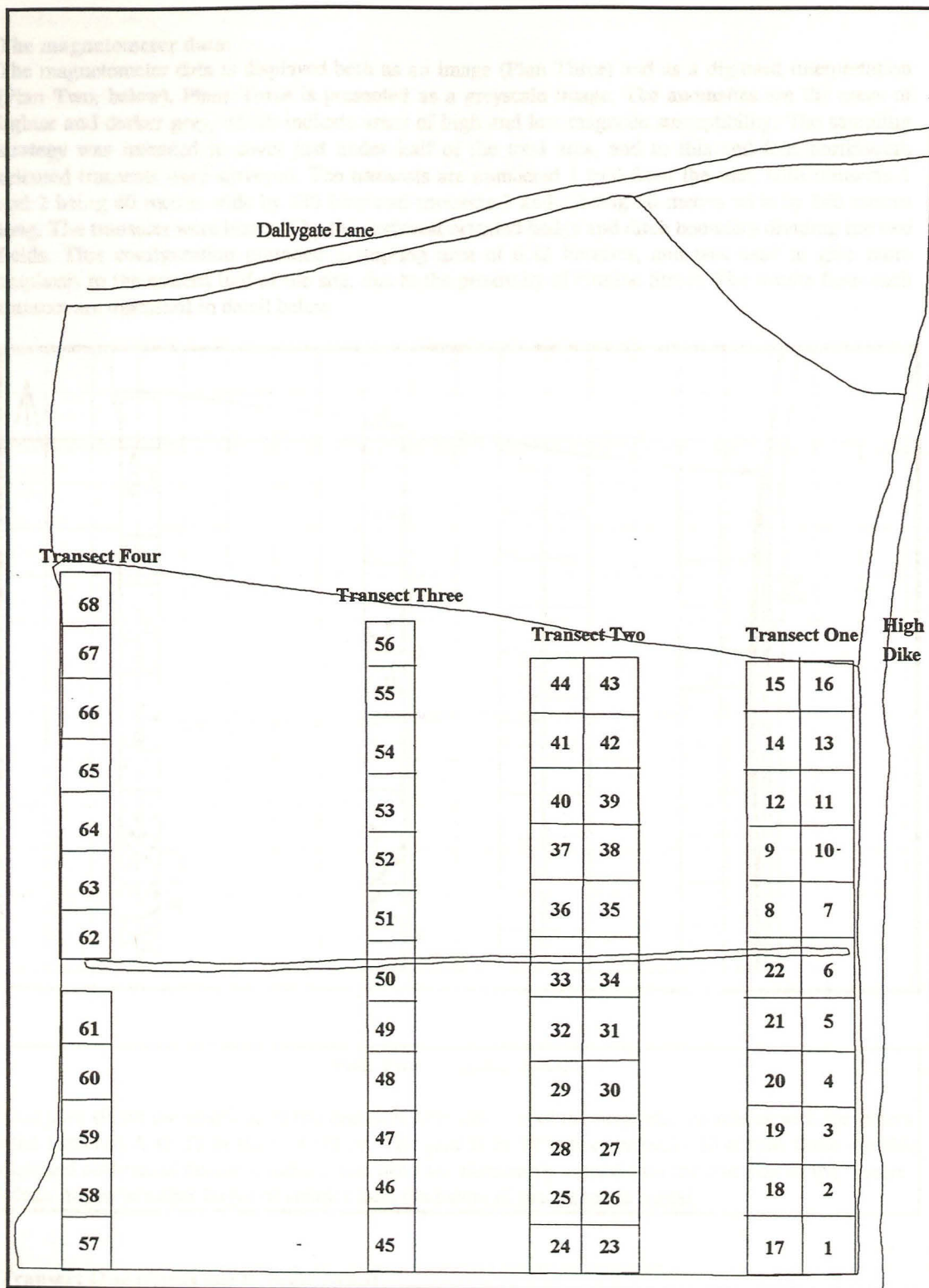
Plan Three is a plan of the magnetometer data displayed as a greyscale image. The plan is at a scale of 1:1000. The grid is at 30 metre intervals. Due to the extent of the area surveyed, the image could not be clearly displayed on A4 sheets and is thus included as a separate sheet. The plan shows the extent of the survey area and is backed by card to give greater stability.

Appendix One consists of a table giving the raw data in NanoTesla and the statistics of each individual grid. Included are the minimum and maximum values, the range, the average value and standard deviation for each of the sixty-eight grids.

Report :

The subject of this report is the discussion of the results of a magnetometer survey carried out on behalf of Pre-Construct Archaeology for Star Quarries. The site in question is a proposed quarry extension to the east of Great Ponton, Lincolnshire. The magnetometer survey was conducted using a *Geoscan Research* fluxgate gradiometer (model FM36), hereafter referred to as a magnetometer. Four north/south transects were surveyed in order to provide an adequate sample of the area. Because the eastern extent of the site runs parallel to Ermine Street, it was felt that this part of the site would require particular attention, thus the transects were divided into two 1.98 hectare surveys to the east and two 1.08 hectare surveys to the west. The zigzag traverse method of survey was used. The survey was conducted by taking readings every 25cm along the north/south axis and every metre along the east/west axis (thus 3600 readings for every 30m grid). The data has been processed and presented using the programs GeoImage (a program dealing with the processing of geophysical data) and GSys (a program which can display, process and present digitised plans and images).

The survey was carried out between the 5th and the 12th September, 1994. The personnel involved were James Lyall and Heather Clemence. The proposed site was 13.5 hectares in area and consisted of two fields, divided by an east/west oriented ditch and hedge boundary. The two fields were covered in stubble ranging from 15 to 35 cm in height, and the underlying soil had a high clay content with flint inclusions. The base geology is sandstone. Four transects covering a total area of 6.12 hectares were surveyed.

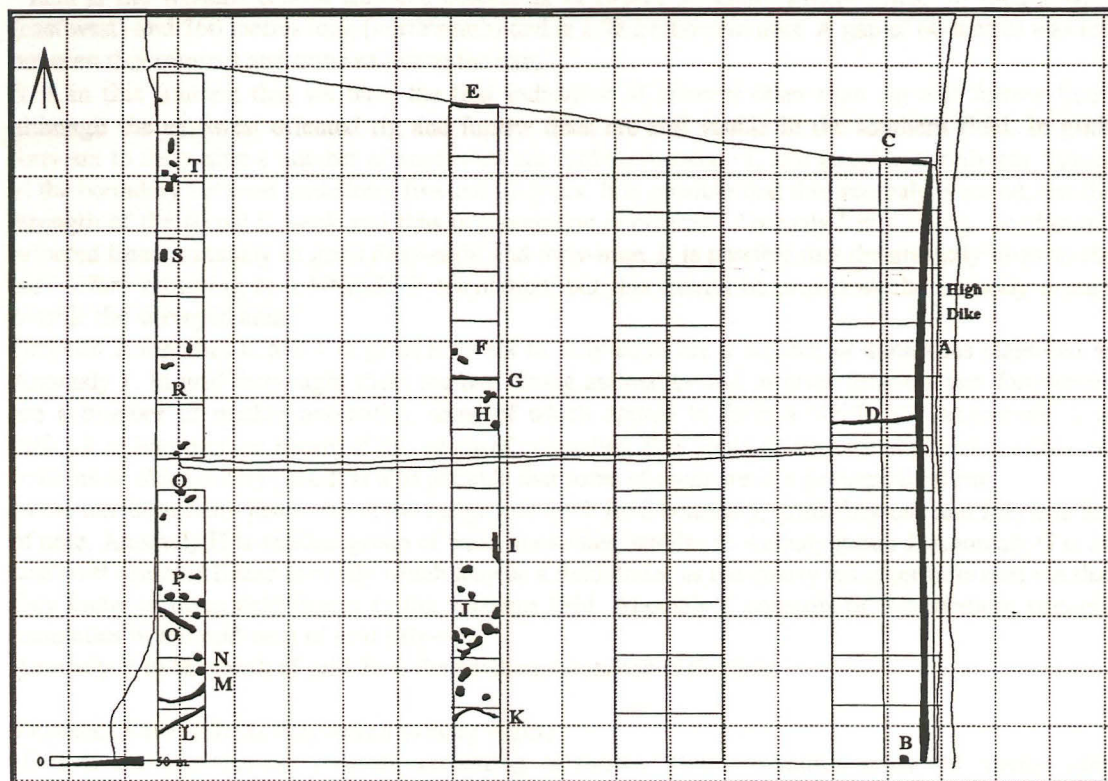


Plan One Scale 1:3300

This plan gives the position and numbers of the grid used in the magnetometer survey. The plan also shows the position of the two roads, Dallygate Lane and High Dike. Because the magnetometer image is presumed to be a flat surface, whereas the actual topography of the land has contour variation, it was necessary to stretch some parts of the image grid in order to provide a plan which has relevance to the ground topography.

The magnetometer data:

The magnetometer data is displayed both as an image (Plan Three) and as a digitised interpretation (Plan Two, below). Plan Three is presented as a greyscale image. The anomalies are the areas of lighter and darker grey, which indicate areas of high and low magnetic susceptibility. The sampling strategy was intended to cover just under half of the total area, and to this end four north/south oriented transects were surveyed. The transects are numbered 1 to 4 from the east, with transects 1 and 2 being 60 metres wide by 330 long and transects 3 and 4 being 30 metres wide by 360 metres long. The transects were bisected by the east/west oriented hedge and ditch boundary dividing the two fields. This configuration provided a sampling area of 6.12 hectares, and was used to give more emphasis to the eastern half of the site, due to the proximity of Ermine Street. The results from each transect are discussed in detail below.



Plan Two Scale 1:4000

This plan shows the positions of the digitised interpretation of the magnetic anomalies with the letters used (lettered A to T) in the text below. The grid is at 30 metre intervals. Note that these are the digitised outlines of magnetic signals and need not necessarily equate with the true size of the feature, which might be either larger or smaller than the extent of the magnetic signal.

Transect One (Grids one to twenty-two)

This is the easternmost transect, consisting of twenty-two 30 metre square grids, 60 metres wide (east/west) and 330 metres long (north/south) and is 1.98 hectares in area. This transect ran parallel to the existing road and along the line of Ermine Street.

The most obvious feature in this transect is the powerful signal oriented north/south (Anomaly A) which runs parallel with the existing road to the east. The signal is almost certainly caused by a cable laid by one of the utilities, although both the electricity board and British Telecom have no knowledge of any cables in this area. The strong signal visible in grid one (Anomaly B), is almost certainly caused by a lump of metal. The line of the field boundary in the north field is visible in grids twenty-one and twenty-two (Anomaly C). Probable rig and furrow lines are visible in the southern and northern halves of this transect. These plough lines were not digitised as they are clearly visible in the greyscale image (see Plan Three). In the south, the lines are east/west oriented, and in the north the lines are north/south oriented, although east/west lines are also visible (probably the remains of more

recent ploughing). No other anomalies are visible in this transect, although Anomaly D, situated just north of the existing field boundary, may be an older field boundary line or field drain.

Transect Two (Grids twenty-three to forty-four)

This is the eastern central transect, consisting of twenty-two 30 metre square grids, 60 metres wide (east\west) and 330 metres long (north\south) and is 1.98 hectares in area. A gap of 60 metres was left between this transect and transect one to the east.

The only anomalies visible in this transect are the continuation of the probable rig and furrow lines seen in transect one. Again they run east\west in the southern field and roughly north\south in the northern field, although in this transect they are turning slightly more to the east.

Transect Three (Grids forty-five to fifty-six)

This is the western central transect, consisting of twelve 30 metre square grids, 30 metres wide (east\west) and 360 metres long (north\south) and is 1.08 hectares in area. A gap of 60 metres was left between this transect and transect two to the east.

It is in this transect that we have the first indication of features other than rig and furrow lines, although the east\west oriented rig and furrow lines are still visible in the southern field. In grids forty-six to forty-nine a number of anomalies are visible. Anomaly K is a possible curvilinear feature at the boundary between grids forty-five and forty-six. It is possible that this anomaly is round, but the strength of the signal is weak and thus interpretation is difficult. Anomaly I is a strong north\south oriented linear anomaly in grids forty-eight and forty-nine. It is possible that the anomaly turns to the east before returning in a NNE\SSW orientation, but this cannot be proven as the anomaly is here outside the surveyed area.

Between Anomalies K and I in grids forty-six to forty-eight are a number of anomalies classified as Anomaly J. In grid forty-eight there are two strong anomalies and in grids forty-six and forty-seven are a number of weaker anomalies, some of which appear to form a NNE\SSW alignment. It is difficult to interpret the nature of this group of anomalies; they could be a group of pits or possibly the remains of older quarry pits. It is also possible that some of them are of a geological origin.

In the northern field, just north of the hedge and ditch field boundary, grids fifty-one and fifty-two are of note. Anomaly H is another group of weak anomalies, similar to Anomaly group J. Anomaly G is an east\west oriented linear anomaly which may be a field drain, as the quarry manager informed me that they know of three field drains in the northern field. Anomaly F consists of two medium strength anomalies in the mid-west of grid fifty-two.

Anomaly E in the north of grid 56 is the northern boundary of the field.

Transect Four (Grids fifty-seven to sixty-eight)

This is the westernmost transect, consisting of twelve 30 metre square grids, 30 metres wide (east\west) and 377 (a gap of 17 metres was left at the hedge boundary which bisects the two fields of the survey area) metres long (north\south) and is 1.08 hectares in area. The grid for the first three transects was based on the eastern edge of the survey area, and all measurements for these transects used the eastern field boundaries as a starting point. During the weekend of the 10th/11th September, the two fields of which the survey area consisted were almost completely ploughed and harrowed. Because all our grid pegs were thus removed, transect four was based on the western edge of the survey area, and runs parallel with the western edge of the field, which is delineated by the bank of spoil from quarry activities. The southern field was totally ploughed, but the northern field had a strip of unploughed land next to the quarry bank. The line in the image (particularly visible in grid sixty-four) on the eastern edge of the northern part of this transect is due to the fact that this part of the survey area was also ploughed.

Anomaly L is a NE\SE oriented linear anomaly, possibly a field drain, but this is not certain. Grids fifty-eight, fifty-nine and sixty contain an interesting anomaly (Anomalies O and M), apparently curvilinear. It is possible that this may be a geological feature, but it is of note that the topography in this area is a slight hollow with a steep rise to the north in grids fifty-nine and sixty. The area just to the east of these grids showed a high concentration of sandstone. Anomaly N appears to be a group of anomalies along the curvilinear line of Anomaly M/O.

79 Anomaly F is another group of relatively weak anomalies. It is possible that they are the result of quarry pits, but this interpretation cannot be verified by magnetometer data alone. It is particularly interesting to note that it is in this area that the highest concentration of high spots (shown as black and white on the image), occurs in this area, specifically in grids fifty-nine and sixty. These spots indicate scraps of metal. The rest of the surveyed area has a random distribution of high spots, and there may be significance in this higher distribution, although there is no way of telling the age of these metal fragments from geophysical data alone.

Anomaly O is another group of anomalies, occurring in grids sixty-one and sixty-two.

Anomaly R (Grid sixty-three) may be caused by the presence of metal, and the groups of anomalies noted to the south and east are not present in this part of the survey area.

Anomaly S is a strong signal, and although this may be a pit, it is also possible that this anomaly is caused by the presence of metal, albeit somewhat deeper than the other fragments.

Anomaly T is another group of weak anomalies, apparently having a north-south alignment. Again it is possible that they may equate to a field drain, but this interpretation cannot be certain, as the anomaly is not seen as a singular unit in the image, but rather a sequence of medium and weak magnetic anomalies.

Conclusion :

The eastern part of the site is dominated by the presence of a mains cable, which runs parallel to the existing road. Remnant plough lines in two orientations are also visible. No other magnetic anomalies are visible in the two eastern transects. The western transects are dominated by small groups of localised anomalies. These anomalies occur predominantly in the southern field, although some are visible in the northern field. It is not possible to interpret these anomalies with any degree of certainty from the magnetometer data alone, although one possibility is that they may be earlier quarry pits. Most of the anomalies occur in the western part of the surveyed area, interestingly away from the line of Ermine Street.

The plans should allow any archaeological investigation (if such is deemed to be necessary) of the area to concentrate in the specific areas believed to be significant. The United Kingdom latitudes are such that there can be a distortion of up to half a metre in position between the magnetic anomalies shown and the position of the actual features themselves.

Report by James Lyall

Landscape Research Centre Ltd.

APPENDIX ONE

GRID NO	MIN	MAX	RANGE	AVE	STD. DEV
1	-396	405	801	-3	56
2	-409	409	818	0	60
3	-405	403	808	-2	55
4	-392	404	796	-1	40
5	-397	380	777	1	41
6	-291	408	699	0	51
7	-401	396	797	3	51
8	-34	17	51	0	2
9	-31	58	89	-1	3
10	-401	394	795	0	45
11	-405	404	809	1	50
12	-14	15	29	0	2
13	-404	401	805	-1	49
14	-105	113	218	-2	5
15	-59	169	228	0	8
16	-394	399	793	2	51
17	-17	14	31	-2	2
18	-82	17	99	-1	2
19	-10	19	29	0	2
20	-9	23	32	-1	2
21	-105	24	129	-2	3
22	-24	42	64	0	3
23	-38	66	104	1	2
24	-19	55	74	-1	3
25	-22	27	49	0	3
26	-25	89	114	-3	4
27	-8	18	26	2	2
28	-25	37	62	2	2
29	-7	79	86	0	3
30	-21	36	57	-2	2
31	-16	16	32	1	2
32	-70	368	438	0	8
33	-15	25	40	-1	2
34	-7	13	20	0	2
35	-20	20	40	0	2
36	-65	45	110	1	3
37	-11	38	49	1	2
38	-11	18	29	1	2
39	-5	14	19	1	1
40	-3	13	16	2	2
41	-12	29	41	-2	2
42	-6	45	51	1	2
43	-10	17	27	-2	2
44	-18	36	54	-2	2
45	-13	24	37	-4	2
46	-11	15	26	-1	2
47	-12	194	206	-2	5

GRID NO	MIN	MAX	RANGE	AVE	STD. DE
48	-61	194	255	-2	7
49	-47	34	81	-2	3
50	-22	27	49	-3	3
51	-20	71	91	-2	3
52	-10	67	77	0	2
53	-8	21	29	2	1
54	-32	18	50	-2	2
55	-11	9	20	0	1
56	-24	42	66	-3	3
57	-364	30	394	-4	16
58	-19	32	51	-4	3
59	-84	291	375	2	10
60	-94	67	161	-1	5
61	-48	48	96	-2	3
62	-32	106	138	0	4
63	-36	123	159	2	5
64	-51	50	101	4	4
65	-34	117	151	1	4
66	-35	51	86	3	3
67	-16	76	92	2	3
68	-40	124	164	1	4

Table One

The table gives the statistics in NanoTesla for each of the 68 grids. Values shown are the minimum value, maximum value, range, average value and the standard deviation of each grid.

Appendix 11.3 Colour photographs



Photo. 1 Trench 2: excavated section of quarry pit [207], looking east

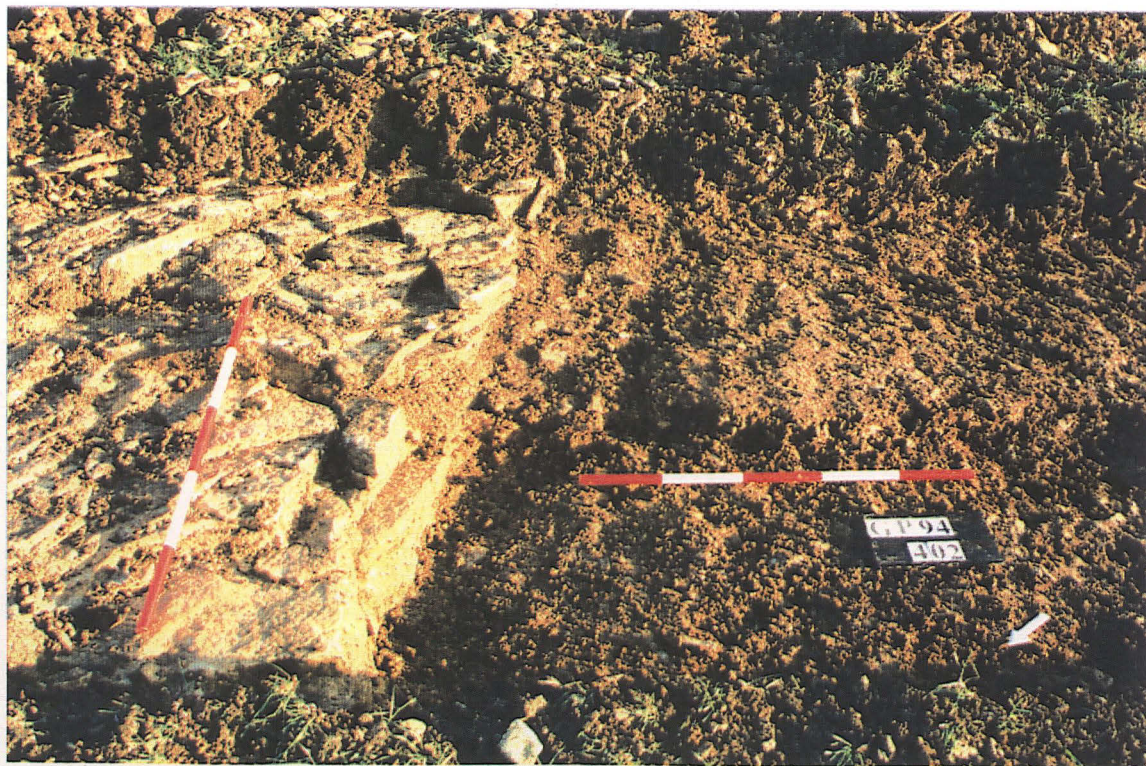


Photo. 2 Trench 4: edge of quarry pit [404], with upper fill [402] part-excavated, looking south-east



Photo. 3 Trench 5: excavated section of quarry pit [505], looking south



Photo. 4 Trench 7: sub-rectangular pit [702], looking east



Photo. 5 Trench 6: cigar-shaped pit, [611], sectioned, looking north from above



Photo. 6 Trench 19: modern stone-filled land drain [1903], looking west



Photo. 7 Trench 18: general view, looking west (boulder clay in section and base)



Photo. 8 Trench 1: General view prior to excavation of quarry pits, looking north (limestone/brash in section/base)

11.5 Finds Assessment

11.5.1 Component in the x12 1982-1983 context (302) by J. Coward (City and County Museum Unit)

11.4 Site Archives

The basic site archive comprises the following:

78 context record sheets

x5 colour print films, x1 colour slide film

8 scale drawings (plans and sections)

x1 box of finds

Primary records are currently with Pre-Construct Archaeology, though the paper and physical archive will be deposited with the City and County Museum within 1 year of completion of this report, together with a more detailed archive list.

The site accession number (CCM, Lincoln) is 122.94

11.5 Finds Assessment

11.5.1 Comment on the slag found in context [502] by J. Cowgill (City of Lincoln Archaeology Unit)

Two fragments from [502]; possibly smelting furnace slag (Roman or early medieval?). They contain impressions of large pieces of charcoal - typical of slag that has cooled in the furnace. Could be smithing slag but does not appear to have the correct structure. Larger sample needed for definitive interpretation.

11.5.2 Post-medieval pottery archive by J. Young (CLAU)

GP94 WARE TYPES BY CONTEXT

Context	Ware	Sherds	Form	Comments	Date of layer
203					late 15th to mid 17th-century
	BOU	1	JAR	RIM	
	BOU	2	JAR/JUG	BS	
	BOU	1	JAR/JUG	BS	
206					1720's to 1780's
	WS	1	PLATE/DISH	RIM;DEC	
502					mid 17th to late 18th-century
	SLIP	1	-	BASE;BUFF HARD FABRIC INT RED SLIP	

APPENDIX 1: CLAU LIST OF WARE TYPE NAMES

Ware code	Description
BOU	<i>BOURNE POST-MED WARE L15TH-M17TH</i>
SLIP	<i>SLIP WARE 1600-1800</i>
WS	<i>WHITE SALT-GLAZED</i>

11.6 References

Beastall TW 1978 *Agricultural Revolution in Lincolnshire: History of Lincolnshire Vol. VIII*

Green H 1910 *Lincolnshire Town and Village Life, Vol. 8, 172 -173 (1900 - 1910)*

Mills AD 1993 *English Place-Names*

Palmer-Brown C 1994 *Great Ponton Quarry, Lincolnshire* (unpublished archaeological desk top assessment and phase I field evaluation)