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A249 IWADE BYPASS TO QUEENBOROUGH ROAD IMPROVEMENTS, KENT: ARCHAEOLOGICAL SURVEY

Stage 2 : Preliminary Field Evaluation

Prepared on behalf of:
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by
Wessex Archaeology
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A249 IWADE BYPASS TO QUEENBOROUGH ROAD IMPROVEMENTS, KENT: ARCHAEOLOGICAL SURVEY (STAGE 2)

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EXECUTIVE SUMMARY

The present report is the second of two stages of preliminary archaeological survey in advance of the proposed A249 Iwade to Queenborough road Improvements.

The first stage was a Desk Study which assessed the impact of the scheme on the archaeological and historic resources of the area. The principal result of that study was the identification of a relict medieval or post-medieval landscape largely formed by the drainage and reclamation of land from the sea. It is this semi-natural landscape on which much of the environmental sensitivity of the area rests.
This relict landscape is in the wetland zone and there is a high potential that it blankets other areas of archaeological interest.

The Preliminary Field Evaluation involved a rapid walk-over survey of the whole Study Area, fieldwalking of arable land and augering designed to assess the depth and character of the soils in the reclaimed areas. Upstanding monuments (earthworks) were surveyed. This work confirmed the principal results of the Desk Study but added considerable detail and identified a number of additional sites.

On the basis of this stage of work the principal ancient monuments surviving as upstanding monuments are medieval salterns (salt working sites). A summary of how they were used is presented.

The auger survey confirmed that the relict landscape would blanket any sites earlier than the medieval period. In the light of recommendations for the procedures for Environmental Assessments and the statutory legislation concerning the environmental dimensions of the Study Area, recommendations are made for a Third Stage of work; a minimally invasive evaluation of the preferred route option. On the basis of that work mitigation strategies should be prepared for any archaeological sites likely to be damaged or destroyed by the scheme.

ACKNOWLEDGEMENTS

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Data collection was undertaken by Mike Heaton, Rachael Seager Smith and Nick Wells. The report was compiled by Andrew Fitzpatrick and Rachael Seager-Smith drawing on contributions by Mike Allen, Mike Heaton, Rachael Seager Smith and Nick Wells; the figures were prepared by Linda Coleman, Julian Cross and S E James and the plates by Elaine Wakefield. The project was managed by Andrew Fitzpatrick.

The project archive including all paper, graphic and photographic records and finds is currently held at the offices of Wessex Archaeology in Salisbury.

1 INTRODUCTION

1.1 The project

This report is concerned with the Preliminary Field Evaluation of a Study Area within the north Kent marshes which will be affected by the proposed A249 Iwade Bypass to Queenborough road improvement scheme. The Preliminary Field Evaluation forms Stage 2 of an archaeological survey, which was commissioned by Ove Arup & Partners, acting on behalf of the Department of Transport (Arup reference 43912/05/CC). It follows on from the Stage 1 Desk Study of this area (Wessex Archaeology 1992). The boundaries of the Study Area remain unchanged (*op cit* 1992, 5, fig.1 (Fig. 1 here)).

As defined in the Stage 1 Desk Study (*op cit*, 17), the principal objectives of the Stage 2 Preliminary Field Evaluation were :

- 'to define more precisely the character, extent and date of the sites which are already represented in some form in the archaeological record
- to identify, define and evaluate areas of archaeological potential where further field investigations may be appropriate.'

2 METHODS

2.1 Introduction

In accordance with the *Specification* and the *Survey Brief* supplied by Arup and Wessex Archaeology's *Methods Statement*, the Project Design for the Stage 2 Preliminary Field Evaluation defined two phases of fieldwork. The second fieldwork phase would be undertaken if deemed necessary by the results of the first phase. These phases comprised:

Phase 1: a rapid field scan with three components; (i) surface examination of fields, (ii) scanning of arable fields, and (iii) limited augering. These components were directed towards;

(i) Surface examination of fields

- producing a simplified record of field conditions
- identifying earthworks and other previously unrecorded features.
- identifying surface features or earthworks associated with features identified during the Desk Study

(ii) Scanning of arable fields

- scanning arable plots for soil changes or variations that may have been caused by human activity
- scanning of arable plots for the distribution of artefact material

(iii) Limited auger survey

- identifying and recording sediment depths and subsoil conditions to assist in the identification of deposits such as alluvium that may seal archaeological sites or features.
- to provide a control on data collected in any Phase 2 fieldwalking
- to augment the pre-existing engineering bore-hole and test-pit data (Arup 1992, 2.16, fig.5)
- to augment the preliminary palaeo-environmental survey undertaken by Barham and Bates as part of the *North Kent Marshes Study* (Barham, Bates and Whittaker 1991).

Phase 2: gridded fieldwalking and artefact collection in suitable areas based on the line-walking system to identify potential buried archaeological remains and to determine the extent to which further field investigations may be appropriate (see Section 3.2 below).

3 PHASE 1 RAPID FIELD SCAN

3.1 Surface examination of fields

Each field within the Study Area was walked over and given an individual Plot number. A simplified record of current field conditions was made for each plot using Wessex Archaeology's Plot Record sheets and standard terminology. These sheets record details of topography, land use, the presence of earthworks or other surface features and soil changes or variations which may be related to anthropogenic activity (Appendix 1). The sites of earthworks and other surface features recorded during the Stage 1 Desk Study (Wessex Archaeology 1992) were visited and any upstanding remains recorded, numbered sequentially and cross-referenced with the Plot Record sheets. The nature and extent of previously unrecorded features and earthworks were also recorded. These surveys are presented on 1:2500 maps (Figs. 5-8).

3.2 Scanning of arable fields

Where the state of the crop permitted, the surface of arable plots was rapidly scanned for the distribution of artefacts using the line walking method at 50m intervals oriented north-south, based on the National Grid. The presence and extent of the material recognised was noted and recorded on the Plot Record sheets.

This information was used as the basis for determining any areas requiring Phase 2 systematic surface collection and to define the most appropriate sampling strategy for them. In the event no areas merited the implementation of Phase 2.

3.3 Auger survey

3.3.1 Scope of survey

The survey was designed to examine only the upper (later Holocene) alluvial sequence to provide a rapid assessment of the palaeo-environmental potential and the likelihood of buried, archaeologically important, remains in the area, and to characterise the sediment sequence. It was not designed to elucidate the entire Holocene sequence (broadly speaking the last 10,000 years) as reviewed by Barham, Bates and Whittaker (1991) nor to record major features such as old stream beds (palaeo-channels) probably of early Holocene date which are likely to lie more than 5m below the modern land surface. The detailed field descriptions of the auger holes (Appendix 2) characterise the deposits and their potential to seal buried, archaeologically important, remains.

3.3.2 Methods

Augering was undertaken using a 40mm diameter Dutch auger. Detailed sediment descriptions and Munsell colours were recorded in the field using standard Wessex Archaeology auger logs and are listed in Appendix 2. The augers were bored manually to a depth of 2m below the present ground surface with the exception of Auger 56/10 (Transect A) which was taken to 3m to examine the deeper deposits and the possibility of significantly different sediments at this depth.

The auger holes were numbered sequentially (01-15), prefixed by the number of the Plot in which they were located. For example, 33/03 is auger hole 3 situated in Plot 33. The locations of the auger transects and individual holes are shown in Fig. 3.

Two auger transects were surveyed in a part of the Study Area for which little pre-existing geo-technical information was available and where the potential for the preservation of buried deposits was considered to be high.

- Transect A: This 0.9km long transect comprised ten auger holes through the alluvium on the north-west side of the A249 to the north of the Kingsferry Bridge and running parallel with the road. The auger holes were spaced at approximately 100m intervals.

- Transect B: This 0.3km long transect comprised five auger holes through the alluvium on the south-east side of the A249 running at 90° to the road. The spacing of the auger holes along this transect was more irregular due to the presence of surface flood water.

4 RESULTS: PHASE 1 RAPID FIELD SCAN

4.1 Introduction

A total of 88 plots were found in the Study Area during the Rapid Field Scan. These are listed in Appendix 2 and their location is shown in Figs. 2 and 3. Three broad categories of present land-use were identified:

- **Category 1**
  Grazed marshland pasture or rough, ungrazed low-lying grassland. This is the dominant land use within the Study Area. Although this category might be subdivided on the basis of grazed/non-grazed, it is convenient to consider it as a single category for the purposes of this report. Where the length of ungrazed grass was a significant factor in the survey (eg **IQ.30**/117, Plot 77) this is noted. The pasture category included 75 plots (Plot nos. 01, 04-5, 12-23, 25-30, 32-34, 36-60 and 62-88).

- **Category 2**
  Arable land on the higher ground of Barrows and Furze Hills in the north of the Area. This category contained 7 plots (Plot nos.02- 3, 07-9, 11 and 31)

- **Category 3**
  Standing buildings, industrial complexes or areas of extensive modern ground disturbance, such as sewer works. This category contained 6 plots generally located on the western and north-western fringes of the Study Area (Plot nos. 06, 10, 13, 24, 35 and 61).

No further work was undertaken in the areas occupied by standing buildings, industrial complexes or extensive modern soil disturbance (category 3 above), the land-use in these areas having destroyed or obscured all traces of earlier activity. In order to ensure the ready compatibility of results, the results of the Rapid Field Scan are presented by method of assessment: (i) rapid field scan, (ii) scanning of arable areas, and (iii) auger survey. The implications of these results are presented in Section 5.

The gazetteer of the sites/areas of archaeological interest within the Study Area presented in the Stage 1 Desk Study (Wessex Archaeology 1992, 11-14) has been revised in the light of the results of the Preliminary Field Evaluation and is presented as Appendix 3. In order to place the Desk Study in a broader context it considered the immediate vicinity of the Study Area to a distance of approximately 1km.

In that report, all the sites were allotted an individual number (for example IQ.6). Sites within the Study Area were indicated by emboldened text (for example **IQ.7**). The same criteria apply in the text of the present report and they are distinguished on the figures by larger lettering.

4.2 Marshland and pasture

Areas of marshland pasture and rough grassland dominate the Study Area, especially across its topographically lower parts, below 10m OD. The Rapid Field Scan identified a number of well-preserved earthworks in these areas which may be considered in three broad groups, with a fourth group of miscellaneous sites:

- drains and ditches
- sea defences
- salt-workings.
- other types of site

4.2.1 Drains and ditches

Drains and ditches are the most common type of field boundary in the marshland areas of the Study Area. In most cases they are enhanced by wire and post fences. As they are still in use they have not been itemised within the Plot Records, however, some of the boundaries may be ancient landscape features.

For example in the vicinity of the group of sites **IQ.11** three linear features are on very similar alignments; (i) the old road (Ferry Road), (ii) the counter wall, (iii) and the large drain between the two of them in Plots 32, 33 and 48 (Fig. 2; OS ref: TQ 9270). This would suggest that the road and drain were established at a time when the counter wall was still in use. These features are now *c.* 1km inland. If inning (the recovery of the land from the sea) within the Study Area largely took place in the medieval period and particularly during the 11-13th centuries AD (Wessex Archaeology 1992, 15-16), then the fact that these features are some distance away from the modern sea wall may suggest that they features date to the earlier part of the 11-13th centuries AD.

4.2.2 Sea Defences

The most characteristic features of the medieval and post-medieval sea defences are the Counter Walls (protective dykes) which are marked on the most recent Ordnance Survey maps of the areas. The Counter Walls survive as grass-covered banks 2-3m wide which stand 1-2m above the marsh (Plates 1-2). It is very likely, but it has not been demonstrated, that the walls are made of earth. As some of the Walls are in still in use they have been marked on Figs. 2-8 but have not been allocated IQ. numbers.

Although much repaired and upgraded, the basis of the present sea defence system dates from *c.* 1570-1630 when a major revision of the earlier system which is likely to date between the 11th -13th centuries AD was undertaken. In addition to the walls which provide defence against The Swale, five lengths of earthen bank survive within the Study Area. On the Isle of Sheppey there are lengths in Plots 16, 19, 48 and 58, and on the mainland there are two lengths which traverse Plots 77, 79-81, Plots 83-5 and there is a short section of what may have been a Counter Wall within Plot 72.

4.2.3 Salterns

Wholly or partly within the Study Area, features interpreted as salterns (or salt-working sites; IQ.9, **IQ.11, IQ.19**) were identified during the Stage 1 desk study (Wessex Archaeology 1992). No traces of the IQ.9 group, the majority of which lies outside the Study Area, could be located, but the areas covered by **IQ.11** and **IQ.19**

were examined and recorded in greater detail during the Rapid Field Scan (Plates 3-5; Figs. 5, 7). Three further previously unrecorded salterns were also identified within the Study Area: **IQ.30** on Ridham Marshes (2 mounds; Fig. 8) and **IQ.32** (Fig. 6) on the island. A third previously unrecognised saltern was also identified but as it lies just outside the Study Area it was not recorded in detail (IQ.29). Other sites just outside the Study Area are well preserved (eg IQ. 16, Plate 6)

For clarity each site or group of sites continues to be referred to by the IQ number assigned during the Desk Study but each individual saltern has been given a unique number within a sequence starting at 100. For example **IQ.11**/102 is saltern 102 in the group of sites **IQ.11.**

The most characteristic features of these salterns are the low conical mounds (Plate 3) which vary in diameter from between 6-25m. They are commonly between 0.6-1.6m high although two individuals which form part of **IQ.11** (mound nos. 105-6) stand to heights of approximately 2.5m. In total, 18 mounds were identified. Their distribution is shown in Figs. 2-3. Mound nos. 100-107 form part of the group **IQ.11** identified during the Desk Study and mounds nos. 109-114 part of the group **IQ.19.**

One mound which *may not* be a saltern is **IQ.22**/115. It is in close proximity to the **IQ.30** group of salterns and is of a comparable size but the top of it has been hollowed-out, probably to support the post-medieval wind pump (**IQ.22**) recorded as having stood on the site. It is not known if the wind pump was erected on a disused saltern (Fig. 8).

Some examples, particularly mounds **IQ.19**/110-11 on the eastern edge of the Study Area on the boundary between Plots 44 and 46, appear to have survived in a more complete state than others (Fig. 7a). Here, the mounds can be seen to be positioned at the ends of elongated raised platforms approximately 60m long and some 20m-30m wide (Plate 5), situated within elaborate systems of ditches and drains. Where visible, the dimensions of the enclosing platforms appear to be consistent across the whole of the Study Area. Remains of similar platforms and associated systems of ditches and drains are also visible around mounds **IQ.11**/103-7 and **IQ.32**/108 (Figs. 5-6), while remains which may be related to this but which were not classifiable at the present level of survey were identified in Plot 43 (Appendix 1, No. 43).

Some larger mounds (notably mounds **IQ.11**/100 and 102; Plates 3-4) do not appear to have an associated platform or enclosing ditch and drain system. As these mounds are amongst those furthest inland and on relatively higher land, it is possible that platforms and ditches originally existed but have been destroyed by ploughing.

4.2.4 Other types of site

Sheepfolds

The sheep-fold locations recorded on the 1st series Ordnance Survey map (1858-73) and listed in the Desk Study (**IQ.8, IQ.10, IQ.12, IQ.18, IQ.23** and IQ.26) occur within the areas of marshland pasture. The locations of these were inspected for any surviving surface traces during the Rapid Field Scan. Sheep-fold **IQ.8** survives in almost exactly the same position but there is no trace of IQ.26 although a new fold is located *c.* 150m north-west of its original location, just outside the Study Area.

No surface traces of **IQ.10, IQ.12, IQ.18** or **IQ.23** were found. This is unsurprising as, like today's examples, these structures may well have been insubstantial, and once dismantled would leave little evidence either above or below ground level. Existing sheepfolds in the area generally consist of small, sub-rectangular enclosures, delineated by post and wire fences, gates, hurdles and/or pieces of corrugated iron, situated in the corners of fields, usually with access into at least one other field.

Industrial site

The location of the industrial site (**IQ.7** - 'Clay Mill Kiln', brickwork's and earthworks) in the northern part of the Study Area (Fig. 2), may be marked by a shallow depression, currently used for the dumping of farm rubbish. Brick and tile fragments, including a short section (*c.* 0.75m long) of mortared brickwork, were identified in the edge of the track just inside the gate between Plots 1 and 4. The mortared bricks may represent the *in situ* remains of a part of the brickwork's recorded here, but the possibility that all this material simply results from dumping in the gateway cannot be excluded.

Miscellaneous sites

Just beyond the northern limits of the Study Area, the tradition of the beacon recorded by 16th century sources (IQ.6) is continued today by a tall post capped with a fire basket situated on the highest point of Plot 1 (Fig. 2). However, no trace of the 'stone' recorded on Barrows Hill (IQ.4) could be found and consequently the precise nature of the 1st series of the 25" Ordnance Survey record remains uncertain.

Two further surface features were identified during the Rapid Field Scan. The first is a post-medieval or modern, brick-lined well (**IQ.28**) situated alongside a drain (Fig. 2). The second lies just beyond the limits of the Study Area. Near the junction of two drains, a key-hole shaped, brick-lined feature (IQ.31) was identified (Fig. 3) and is interpreted as part of a sheep dip.

4.3 Arable fields

No earthworks or other surface features were recognised in the arable plots although narrow bands of lighter coloured soil in Plots 7 and 8 indicate the recent removal of field boundaries shown on the most recent OS maps. These changes are plotted on Figs. 2-3.

Six arable fields (Plot nos. 2-3, 7-9 and 11; Fig. 2) were scanned for the distribution of artefacts. In general the surface visibility and degree of weathering was good although parts of Plot 7 were partially obscured by remnants of this year's root vegetable crop which were lying on the surface. The oil seed rape plants in Plot 31 (Fig. 2) had already reached 0.10-0.20m high, obscuring the surface of the field and making it impossible to examine this area.

All six fields examined contained a background scatter of natural, rounded flint pebbles and naturally-fractured flint nodules. These were especially common along the edges of the track separating Plots 2 and 3 and probably represent part of the metalling of the track itself. Fragments of non-local stone, which also may have been brought into the area for road metalling, were also noted in all the arable plots. Post-medieval (18th and 19th century) and modern material, including pottery, ceramic

building materials such as brick and tile, glass, and fragments of clay tobacco pipes, were observed in all the Plots. Occasional pieces of burnt flint, animal bone, oyster shell and slag were also recognised. Gun-flints were recovered from Plots 3, 7 and 8. In general the distribution of this material was concentrated around the edges of the fields and was especially heavy in the areas of gateways and tracks.

Three objects earlier in date than the post-medieval period were collected and form part of the Project Archive presently held by Wessex Archaeology. They are (i) a single prehistoric worked flint scraper of Neolithic or Bronze Age date from Plot 2, (ii) a small sherd of from the body of a Bronze Age or Iron Age, flint-tempered, pot from Plot 9 and (iii), a medieval flint tempered pottery sherd from Plot 7.

As no concentrations or generalised distributions of material earlier in date than the post-medieval period were observed, no areas were selected for detailed collection and analysis as a Stage 2 Fieldwalking of Cultivated Areas.

4.4 Auger survey

The auger survey comprised two transects (Fig. 4) and 15 auger holes. The main result was the identification of a sequence of soils compatible with deposition in an estuarine environment; an elementary stone-free fine-grained alluvial estuarine sequence (Table 1; Appendix 2).

Table 1: Summary of the sequence recorded in the auger survey

Topsoil	Humic loam
Subsoil	Where present: silts, over clays
Main alluvial component	Yellowish brown alluvial silty clay
Other alluvial components	localised gleying; iron mottles, grey laminations terrestrial/fresh-brackish water shell fragments darker (?organic deposits) below 2m.

The soils recorded in the auger transects were dark yellowish brown to dark brown humic loams consistent with the non-calcareous clayey pelo-alluvial gley soils of the Wallasea 1 Association mapped over much of the coastal marshes of north Kent (Jarvis *et al.* 1984). The main alluvial horizon recorded to 2m below ground surface was a yellowish brown silty clay with localised iron mottling (gleying) and contained both lenses of blue clay and shell fragments. The lenses of grey clay which occur within the other alluvial components may indicate localised hydromorphism and gleying or laminated inwashes.

Fragmentary shells were recorded, usually below 1m from the ground surface. These were probably terrestrial/fresh-brackish water species rather than marine shells, despite the occurrence of cockles (*Cerastoderma edule)* at, or near, the surface and in mole hills.

Within the main clay unit more compacted horizons were recorded in auger holes 58/06 and 45/15. These probably relate to local water table conditions, but might also indicate the presence of relict buried land surfaces.

The basal deposits recorded in all the auger holes show increased evidence of gleying and water logging. In a few instances, darker, possibly more organic deposits, were recorded at or below 2m (for example 57/09, 56/10, 43/13 and 45/15).

The entire augered sequence probably relates to the post-Neolithic (ie after *c.* 2,000 BC) (*cf* Barham, Bates and Whittaker 1991) and therefore relates to general accretion during the later prehistoric and historic periods. Accordingly it will entirely cover any earlier sites. No peat horizons, palaeo-channels or obvious buried land surfaces were recognised. The recorded sequence is wholly alluvial, relating to infill and general accretion of The Swale and the Medway estuary generally during the later prehistoric and early historic periods.

5 DISCUSSION OF RESULTS

5.1 Introduction

The results of the three parts of the Preliminary Field Evaluation are presented below according to the methods employed, before being summarised as a whole in Section 5.5.

5.2 Rapid Field Scan

The Rapid Field Scan has confirmed the presence of the relict medieval and post-medieval landscape over much of the Study Area as has been identified in the Desk Study. Sheepfolds in or still close to their 19th century positions indicate little changes in land use and farming practice in the area.

Detailed inspection and recording of the mounds suggests that these are the remains of more complicated salterns many of which originally incorporated level platforms set within and defined by ditch and drain systems. A more detailed consideration of the evidence for saltworking is presented in Section 5.6.3 below, and Appendix 4.

5.3 Scanning of arable plots

It is likely that most of the material observed in the arable plots derives from one of two practices. The first is the manuring of arable fields with domestic refuse. The second is the dumping of rubble and rubbish along tracks and at entrances to fields to prevent their becoming impassable in wet weather.

The very small number of objects earlier in date than the post-medieval period can only be held to suggest one or more episodes of prehistoric activity in the general area of these fields towards the northern edge of the Study Area. The evidence presently available suggests that archaeological activity areas or sites which might yield large numbers of artefacts do not exist within these fields or that if they do, in this instance surface collection is not an appropriate method of identifying them.

On the basis of these observations and conclusions, the option of detailed, systematic surface collection proposed for Phase 2 of the Preliminary Field Evaluation was not implemented.

5.4 Auger survey

5.4.1 Palaeo-environmental potential and archaeological implications

The estuarine alluvial silts within the two auger transects were not seen to mask, nor contain, any archaeologically significant horizons. The limited auger survey confirms the presence of relatively uniform horizons of probably (salt) marsh alluviation. This unit could be of palaeo-environmental significance *if* it could be directly related to archaeological activity as it is likely to preserve organic matter (both of vegetation and objects), pollen, diatoms and foraminifera which could allow a detailed reconstruction of past environments. Such a correlation has not yet been demonstrated.

The overall potential of the area remains high as it is capable of preserving organic material and containing significant palaeo-environmental data. It is likely that peat occurs in limited, discrete areas. In their own right the palaeo-environmental and archaeological potential of the sediments is restricted but will assume greater significance if it can be related to episodes of human activity and archaeological contexts. Any such evidence is likely to date between the end of the Neolithic and beginning of the medieval periods (*c.* 2,000BC - AD 1066), some 3,000 years.

Sites or deposits earlier in date than the late Neolithic are likely to be entirely masked by the deposits.

The area still retains the potential for:

- burial of archaeological deposits of Bronze Age to medieval date
- preservation of organic material
- general palaeo-environmental work

However, this potential can only be maximised where it can be specifically associated with archaeological contexts or episodes.

5.5 Summary of the Preliminary Field Evaluation

The Preliminary Field Evaluation has both confirmed details and added to our knowledge of the relict medieval and post-medieval landscape. The auger survey has confirmed the likely occurrence of well-preserved palaeo-environmental data in contexts associated with both the relict landscape (medieval and later) and with any earlier landscapes (Bronze Age to medieval).

5.6 medieval salt making - a summary

5.6.1 Introduction

The most important archaeological evidence presently identified in the Study Area relates to the medieval saltworking and further comments on its significance are appropriate.

Mounds similar to those identified in the Study Area are known from elsewhere in the north Kent marshes on the Seasalter Level near Whitstable, *c.* 16km to the east of the Study Area where they have been confirmed by excavation to be the remains of medieval salterns (Thompson 1956, 63-4). In that publication parallels were drawn with mounds on the Isle of Sheppey.

5.6.2 Date

Although all the sites survive in a relict landscape it should not be assumed that all are of the same date. In particular the number of Counter Walls in the Study Area and its immediate vicinity suggests a series of innings and it is possible to make some general inferences concerning the sequence. Those sites in the Study Area at a greater distance from the Swale may be the earliest, and represent an early stage in the process of reclamation.

The earlier stages of the progressive inning and the defence of the land secured by the Counter Walls and associated dykes is, on the basis of evidence from elsewhere, likely to date between the 11-13th centuries. It may be thought likely that those mounds are either earlier than, or contemporary, with the earliest stages.

Roman and earlier methods of salt extraction used different processes and it seems unlikely that any of the salterns date to these periods, although Roman salt extraction is well known in the Medway estuary (Miles 1975). It is possible that some charters refer to salterns in Kent in the 8th or 9th centuries (Loyn 1962, 106), while there are a number of references to salt extraction in Kent in *Domesday* (Darby 1962). In view of what is known of the history of the English salt industry and its decline after the mid-14th century it is possible that all the sites in the Study Area are of medieval date.

5.6.3 Methods of salt extraction

The precise operations used in the extraction of the salt at these coastal sites in Kent remain uncertain, as is generally the case in medieval England. It is likely, however, that the white salt method was used. In this method estuarine muds or sands were collected and water poured over them. This concentrated the brine and the resulting liqueur was strained before any remaining water was removed by boiling in large pans (Brownrigg 1748).

This operation required a location with ready access to estuarine muds and it is likely that the low platforms and associated ditches recognised in the Study Area were working platforms raised to protect them from flooding. The mounds are probably piles of discarded mud. Boiling pans and buildings to protect them probably also stood on the platforms but no trace of them is now visible. This interpretation is entirely consistent with what is known of the few comparable excavated sites of similar date (Thompson 1956; Holden and Hudson 1981)

6 ARCHAEOLOGICAL POTENTIAL AND IMPLICATIONS

6.1 Introduction

The Preliminary Field Evaluation has confirmed and added detail to the evidence gathered during the Desk Study. The principal visible archaeological remains comprise a relict semi-natural landscape in which salterns, counter walls, dykes and drains are the most important features. Sites or groups of sites ranked as B have the potential to be of local importance (Wessex Archaeology 1992, 11). There is the potential for other, earlier sites and deposits to exist, protected, and masked, by this semi-natural landscape.

6.2 Field survey

At sites where only mounds have been identified there is a possibility that they may only be the most immediately visible upstanding remains of the sites. The length of the grass at the time of the Rapid Field Scan (early November 1992) may have masked some features (Appendix 1, Plot 77; Appendix 3, IQ. 30), while other, less prominent ones, (Section 4.2.3 above; Appendix 1, Plot 43) may be more apparent to more sustained and detailed, analytical, field survey, particularly when vegetation has died back the in winter.

6.3 Further documentary sources

The possibility of further documentary sources amongst the records of the Commissioners for Sewers was identified in the Desk Study (Wessex Archaeology 1992, 15). Salterns associated with the inning of the land may well be mentioned in sources which consider sea defences on a national basis .

As it is now apparent that a considerable proportion of the land in the Study Area is owned by the Crown Estates Commission it is also possible that further sources may exist in the national records in the Public Record Office. Those institutions consulted in the Desk Study hold local records and would not necessarily be aware of national records in the Public Record Office. The fact that Queenborough was a royal foundation (by Edward III in 1368) also suggests that relevant records may be among the royal collections.

7 ANTICIPATED IMPACT

Until the preferred route options are defined it is not possible to assess the precise impact of the development proposals on the archaeological resource. It is generally the case that new drainage systems associated with developments lead to the lowering of the water table and to areas within and surrounding the route becoming desiccated. If this were to occur it would drastically reduce and eventually destroy their palaeo-environmental potential. All archaeological remains within the route corridor and any temporary takes of land will almost certainly be totally destroyed by earth moving and the movement of heavy plant.

8 FUTURE WORK

8.1 Preservation

The preferred archaeological option is the preservation of remains *in situ*. To a considerable extent this aim is compatible with the management strategies implemented as a consequence of the statutory protection afforded to the Study Area due to its incorporation within two Sites of Special Scientific Interest (SSSI) and policies 3.7.D-E of the Sheerness, Queenbrough and Minster Local Plan (1988) (Barham, Bates and Whittaker 1991, 97). The designation of the Swale SSSI as a Special Protection Area (SPA) and Ramsar site, and the status of the Medway Estuary and Estuary SSSI as a candidate SPA endorse the presumption of preservation.

8.2 Field Evaluation

In principle, all route options should be assessed by 'systematic analysis, using the best practicable techniques and best available sources of information' (DOE 1989, 7) so 'that the merits of practicable alternatives can be considered' (DOE 1989, 9).

In view of the ecological and environmental sensitivity of the Study Area non-invasive methods of archaeological assessment in the wetland zones are to be preferred. It was suggested in the Desk Study that Remote Sensing methods may have been applicable.

However, the uniform depth (*c.* 2m) and homogeneous character of the post-Neolithic deposits revealed by augering suggest that Ground Based Remote Sensing would not be successful (Brooke 1989, 6-7). The depth of the deposits also presumes against geophysical techniques, of which magnetic susceptibility would be the key one (Gaffney, Gater with Ovenden 1991). Remote sensing of satellite images may be valuable for the mapping of past environments (Donoghue 1989; Cox 1992) but in view of the character of the wetland deposits in the Study Area it is unlikely to be sensitive enough to detect individual sites.

In the present case the potential for the preservation of earlier archaeological deposits with high palaeo-environmental potential beneath the present medieval and post-medieval landscape is high. Further, less well preserved features may also be preserved in the landscape and may be detected by analytical field survey (Section 6.2 above). Consequently further work, both non-invasive and invasive, is recommended.

9 RECOMMENDATIONS FOR STAGE 3 FIELD EVALUATION

It is recommended that a Stage 3 Field Evaluation be undertaken when the preferred route option has been chosen. Its objectives will be to assess the presence, extent, character and date of any archaeological sites, features or deposits to enable an appropriate mitigation strategy to be prepared if preservation *in situ* is not practicable. The Stage 3 work should consist of the following elements:

- detailed, analytical field survey using an electro-magnetic distance measurement device (EDM) of sites or, where they are part of groups, those groups of sites, potentially affected by the route options. Following the best practice of the Royal Commission on the Historical Monuments of England, sites will be surveyed at 1:1000 scale;

- documentary research to define any sources at the Public Record Office;

- the evaluation of the route option using minimally intrusive mechanically excavated trenches. A series of approximately 2m wide trenches, of varying length, should be excavated at regular intervals along the length and across the width of the route corridor. Trenches along the length will be 50m long; those across the route corridor will be the width of the corridor. The trenches would be excavated at 40m intervals, alternating along and across the corridor. A toothless ditching bucket should be used;

  a sufficient sample of any archaeological features should be excavated by hand to allow the assessment of the nature, date and preservation of the deposits. Samples for environmental analysis will be taken and the opportunity to examine palaeo-environmental evidence exposed by the excavations should be taken;

- on the basis of the Stage 3 Evaluation a Mitigation Strategy should be prepared for any sites then known to lie on the final preferred route. As the incorporation of any site within a road corridor almost invariably leads to its total destruction it is in principle likely that preservation by record, that is to say excavation, will be proposed. A Watching Brief during construction works may also be appropriate. The precise excavation strategies should be formulated in the light of the results of the Stage 3 works.

It is recognised that the ecological and environmental sensitivity of the Study Area make the disturbances which would be caused by the evaluation of all the route options through machine excavation undesirable. As the archaeological evidence for the Study Area is comparatively uniform, in this instance it may be considered appropriate only to evaluate by field excavation the preferred route.

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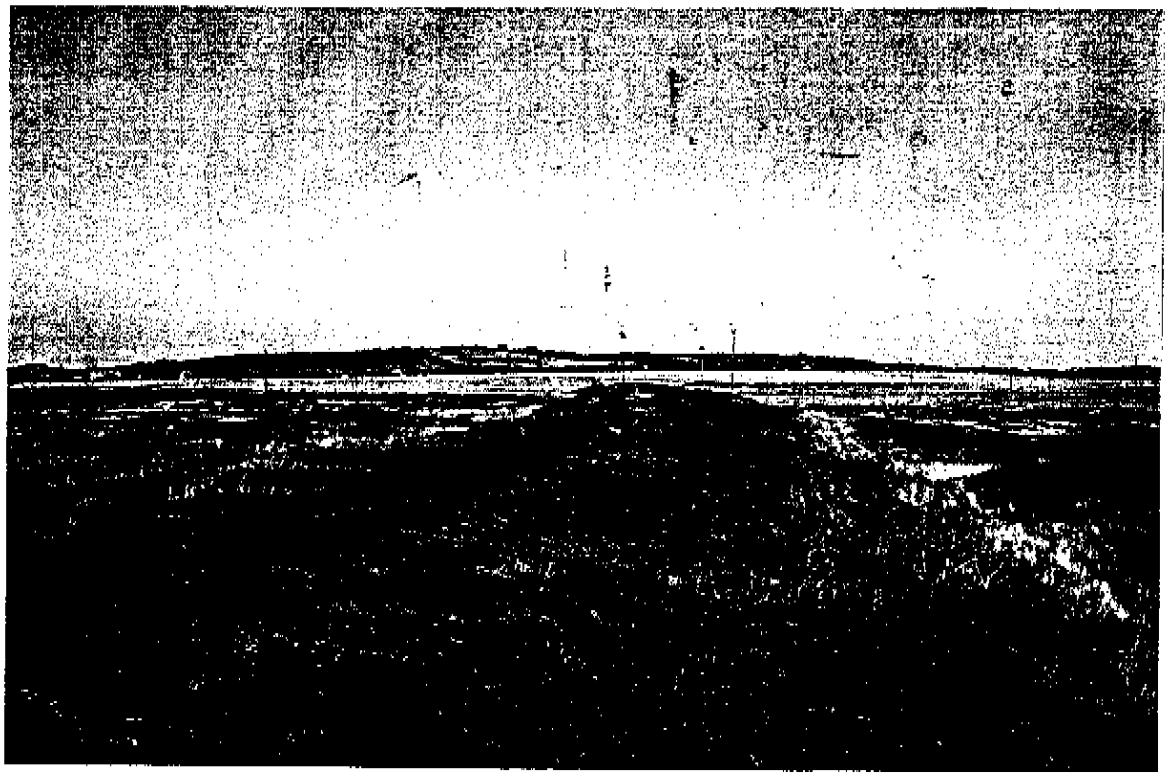
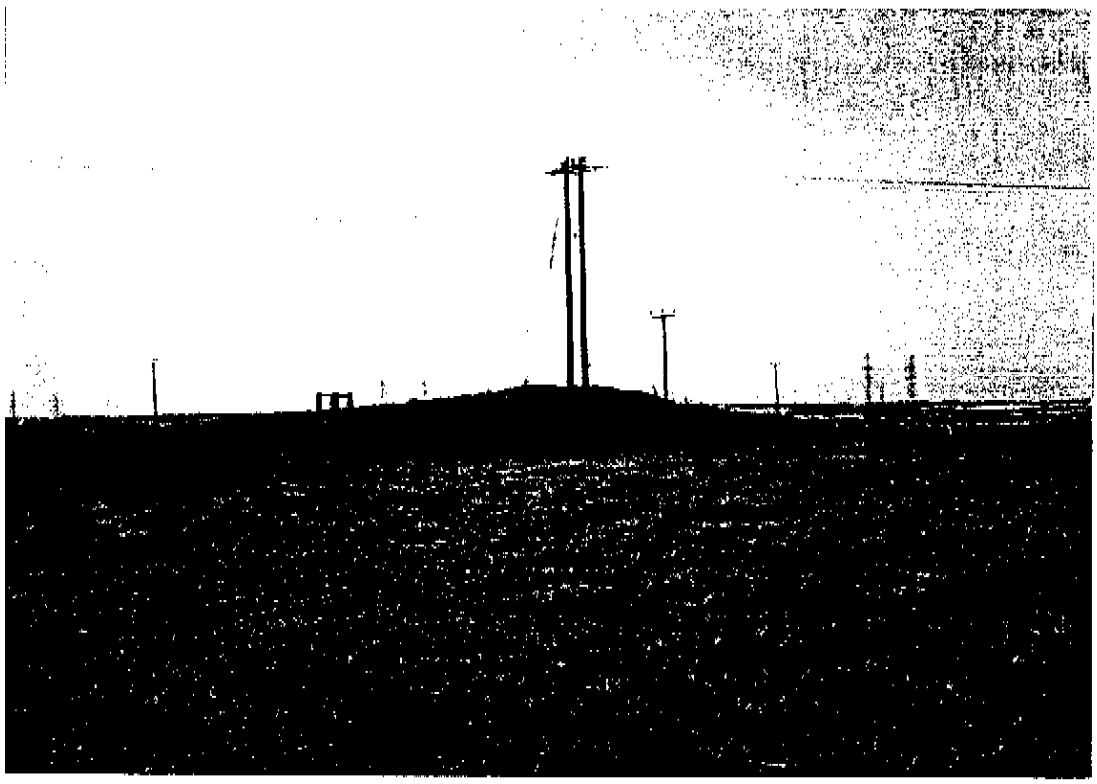


Plate 1: Study area from Barrow Hill. Counter Wall in middleground

Plate 2: Counter Wall. Furze Hill in background



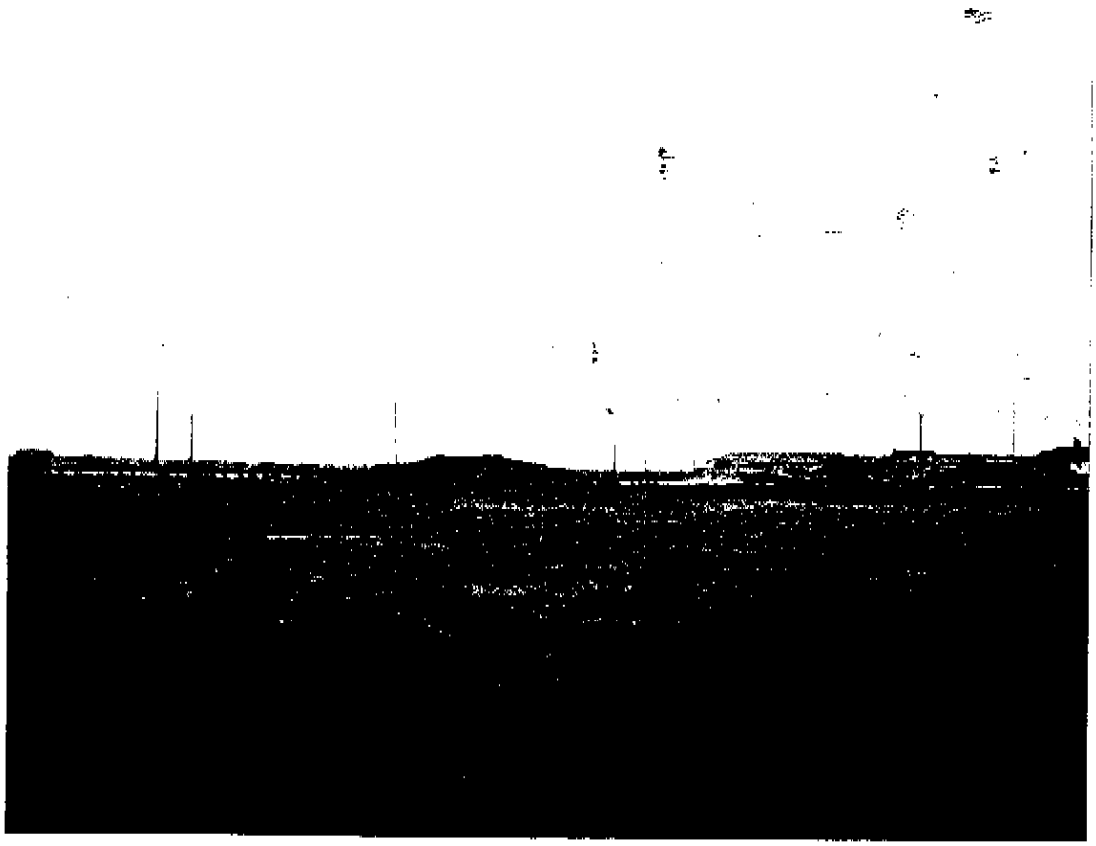
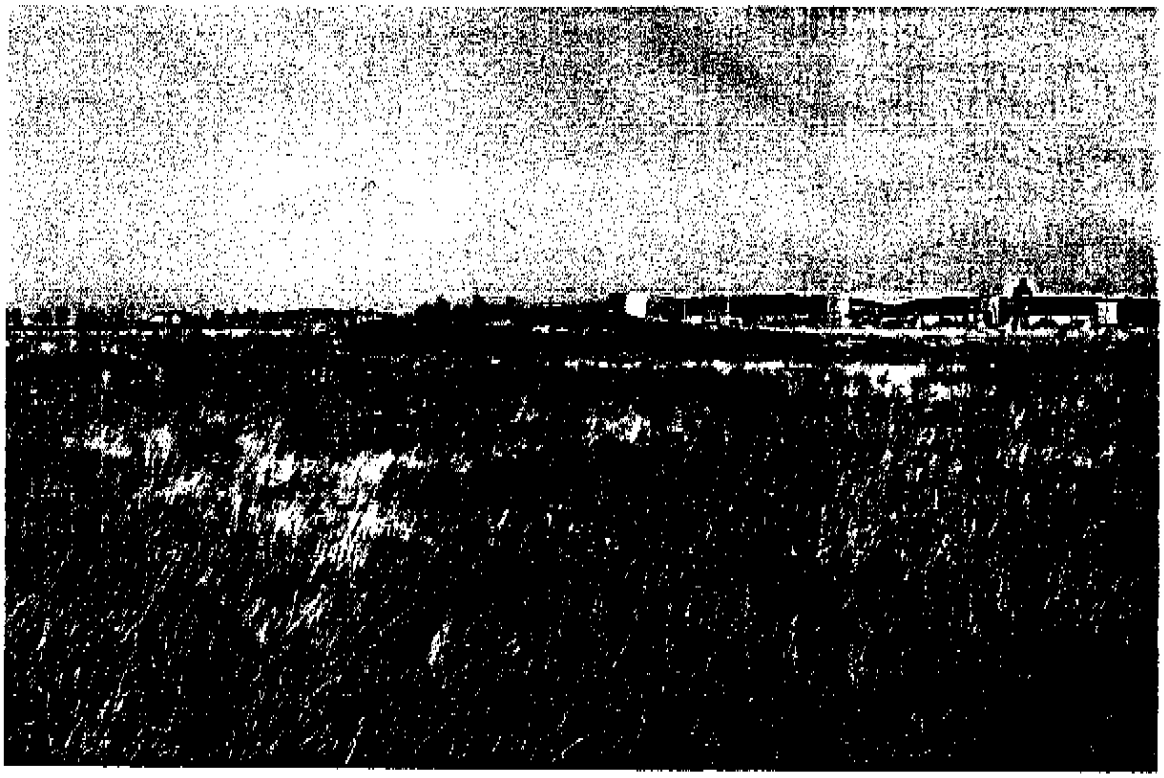


Plate 3: Saltern IQ.11/102

Plate 4: Saltern IQ.11/100



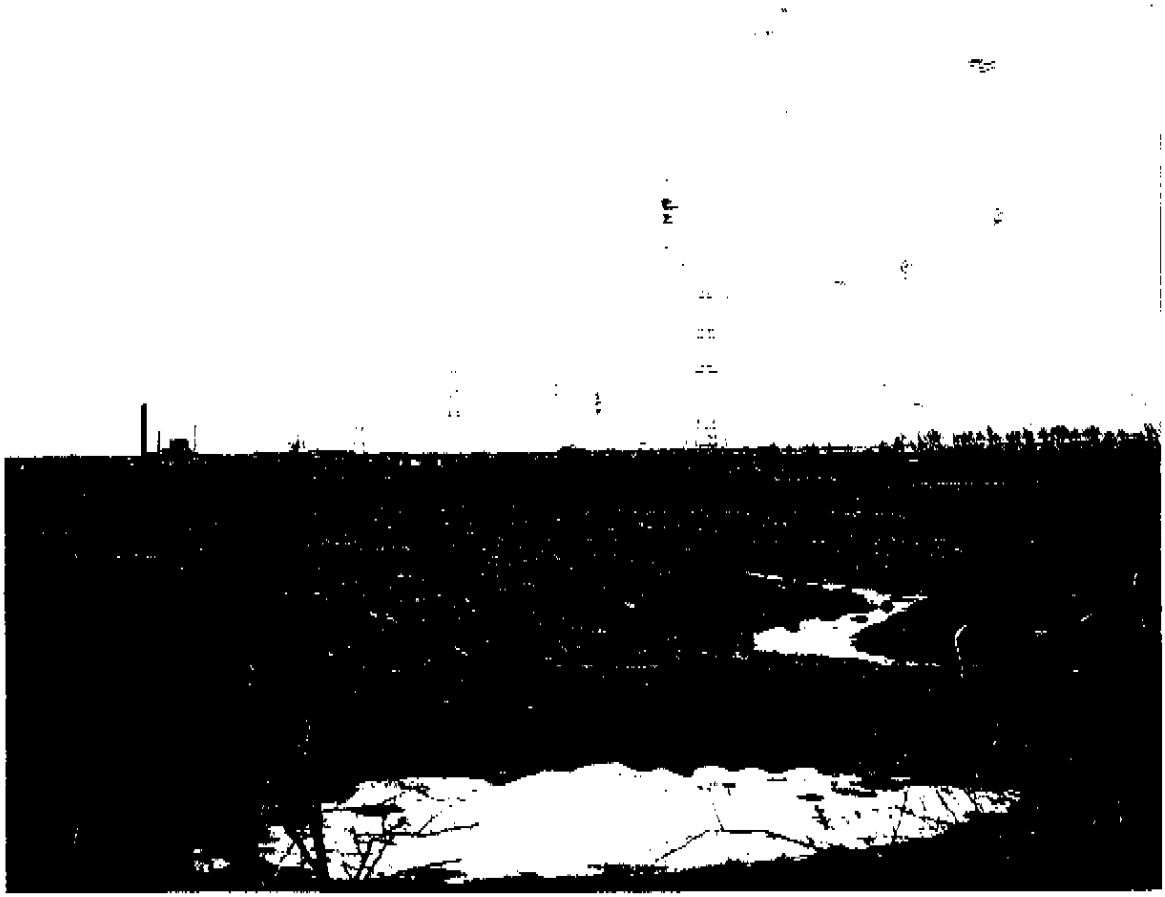


Plate 5: Saltern IQ.19/110

Plate 6: Saltern IQ.16

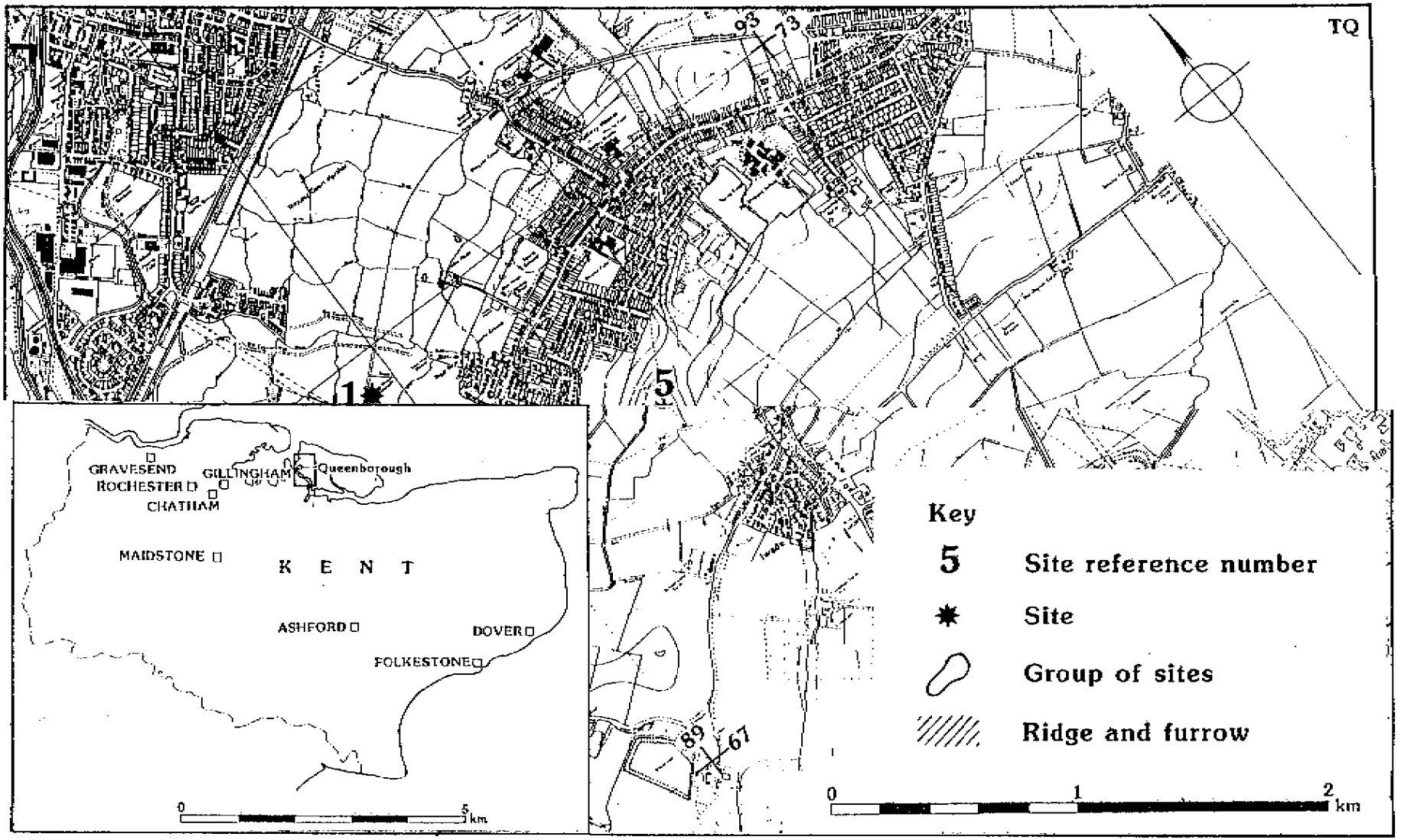


Fig. 1: Site location and the study area showing the collation of known sites and areas of archaeological interest

NORTHERN PART OF STUDY AREA

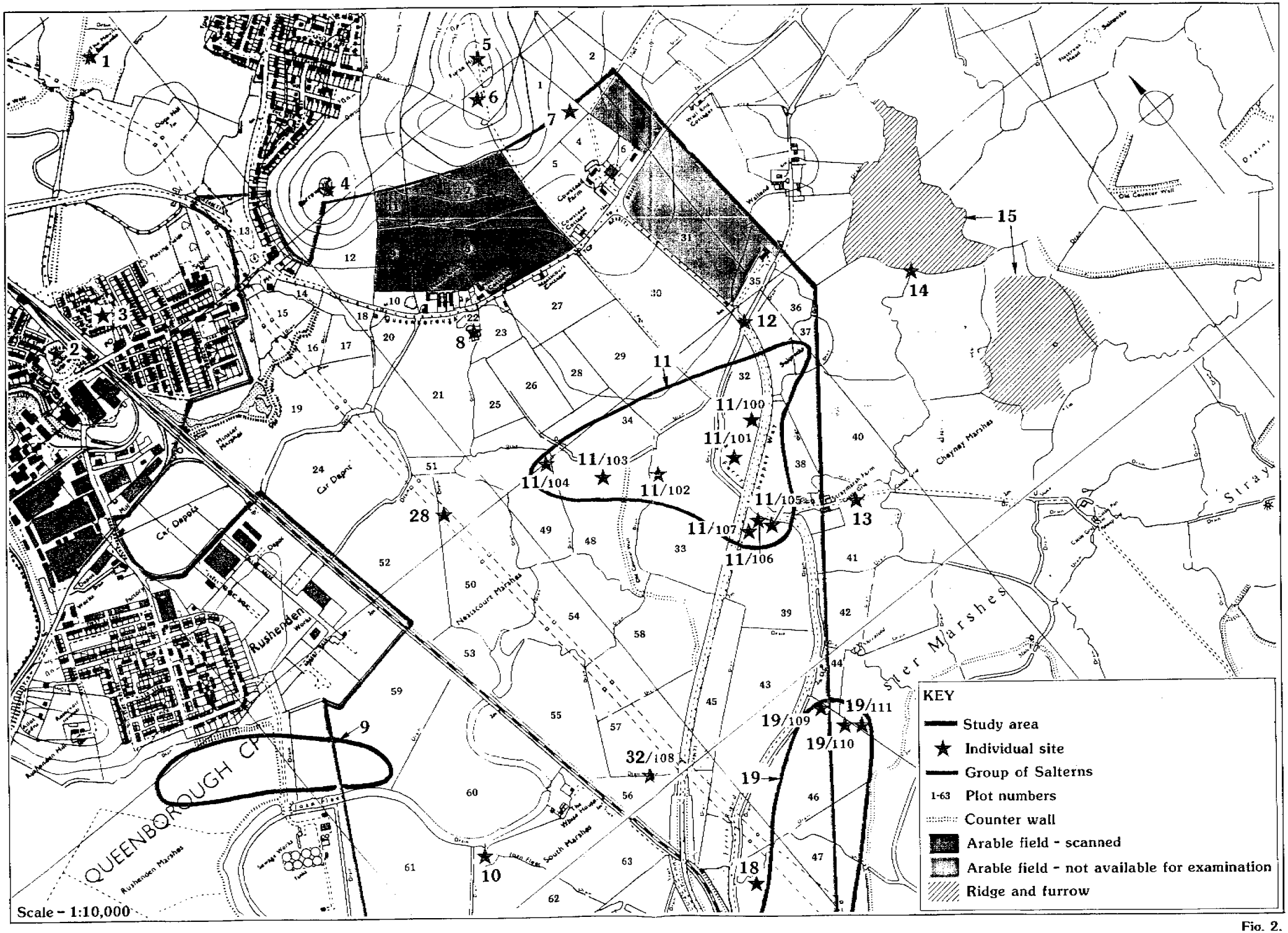


Fig. 2.

SOUTHERN PART OF STUDY AREA

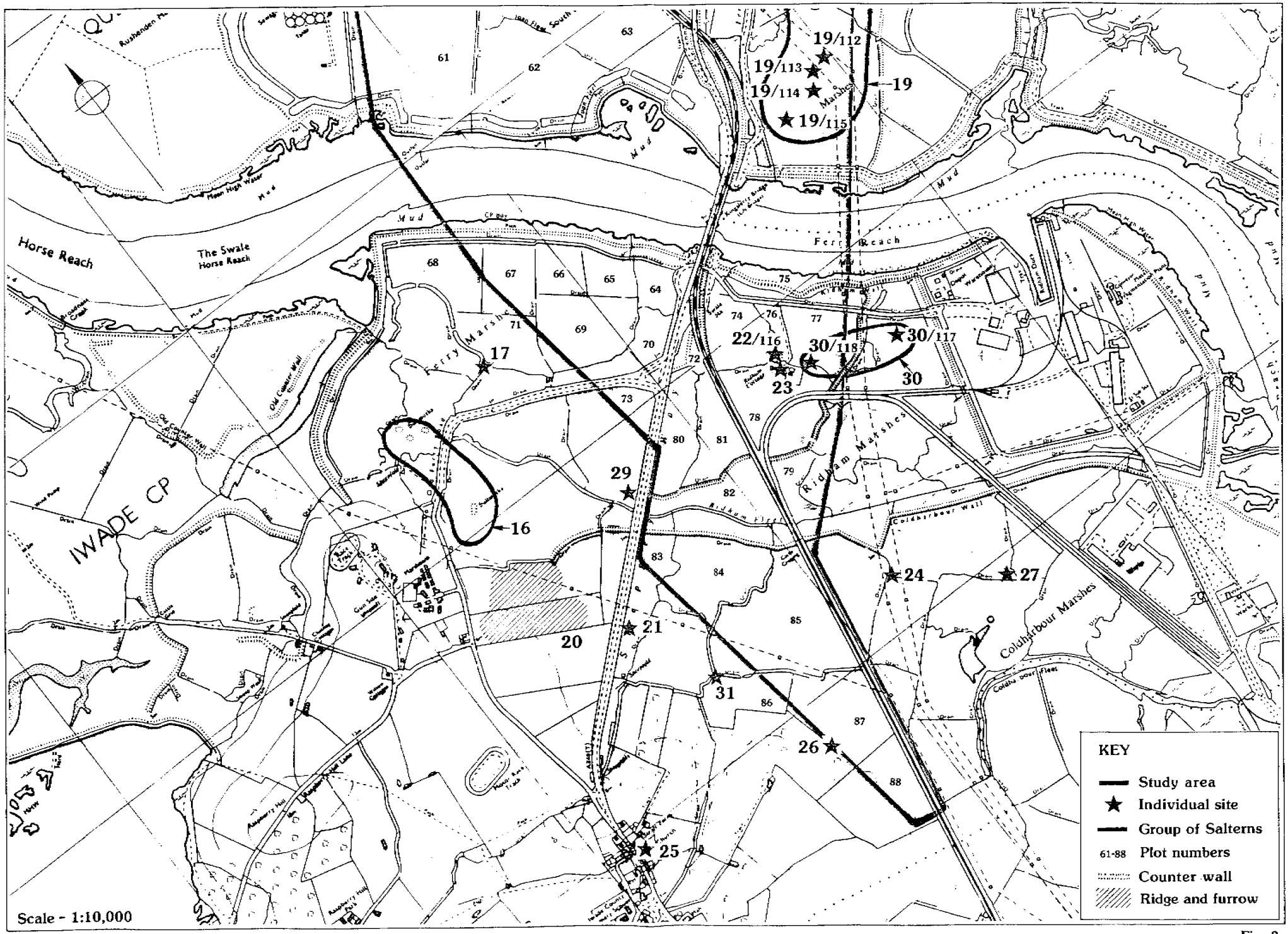


Fig. 3.

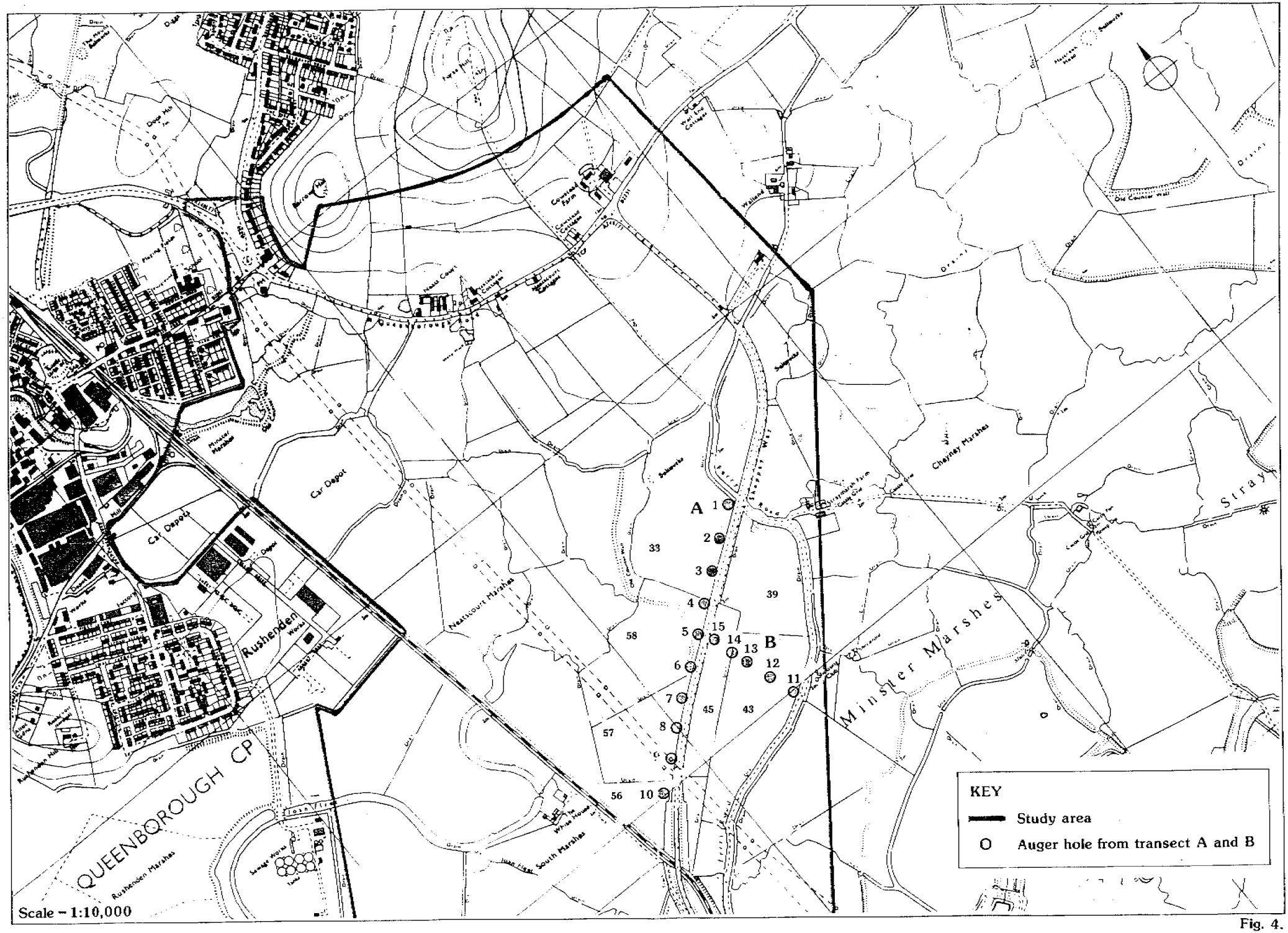

A
1
2
3
4
5
6
7
8
9
10
B
11
12
13
14
15
33
39
58
57
56
45
43
Rushenden
QUEENBOROUGH CP
Minster Marshes
Car Depot
Car Depots
Neatscourt Marshes
Chetney Marshes
Rushenden Marshes
South Marshes
Scale - 1:10,000
KEY
Study area
Auger hole from transect A and B

Fig. 4.

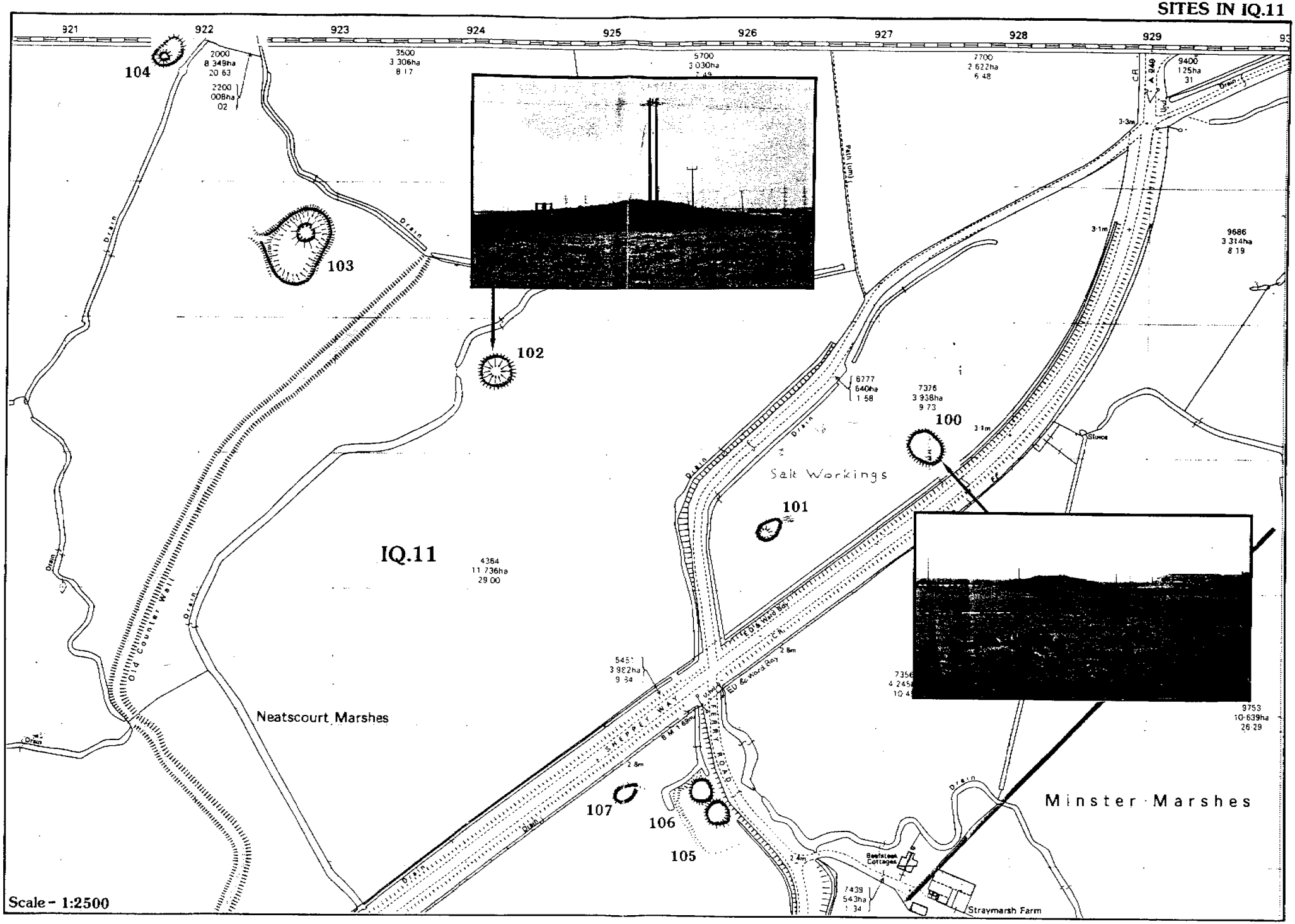

921
922
923
924
925
926
927
928
929
104
103
102
101
100
107
106
105
IQ.11
Neatscourt Marshes
Salt Workings
Minster Marshes
Old Counter Wall
Drain
Sluice
Straymarsh Farm
Scale - 1:2500

Fig. 5.

SITE IQ.32

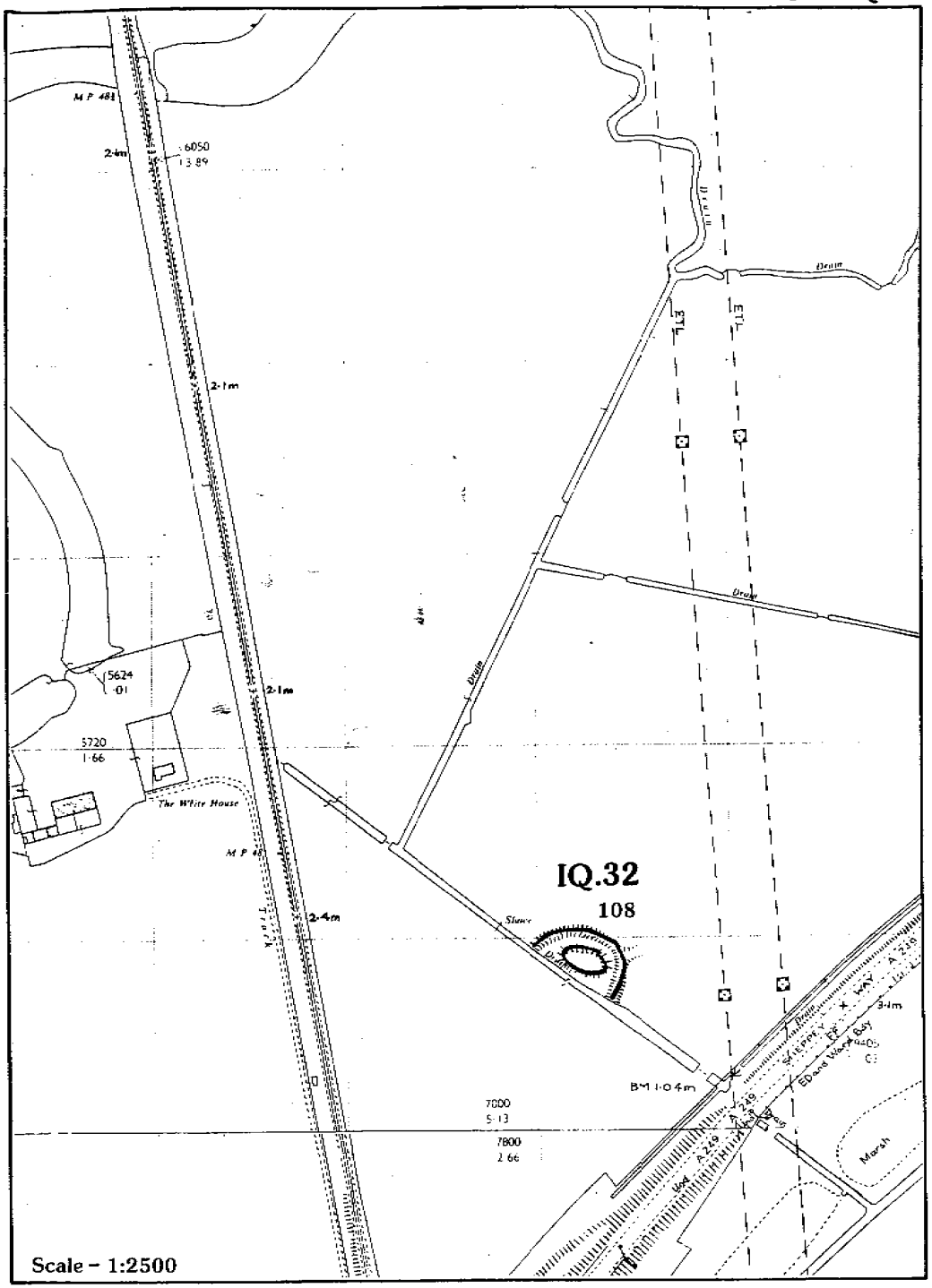
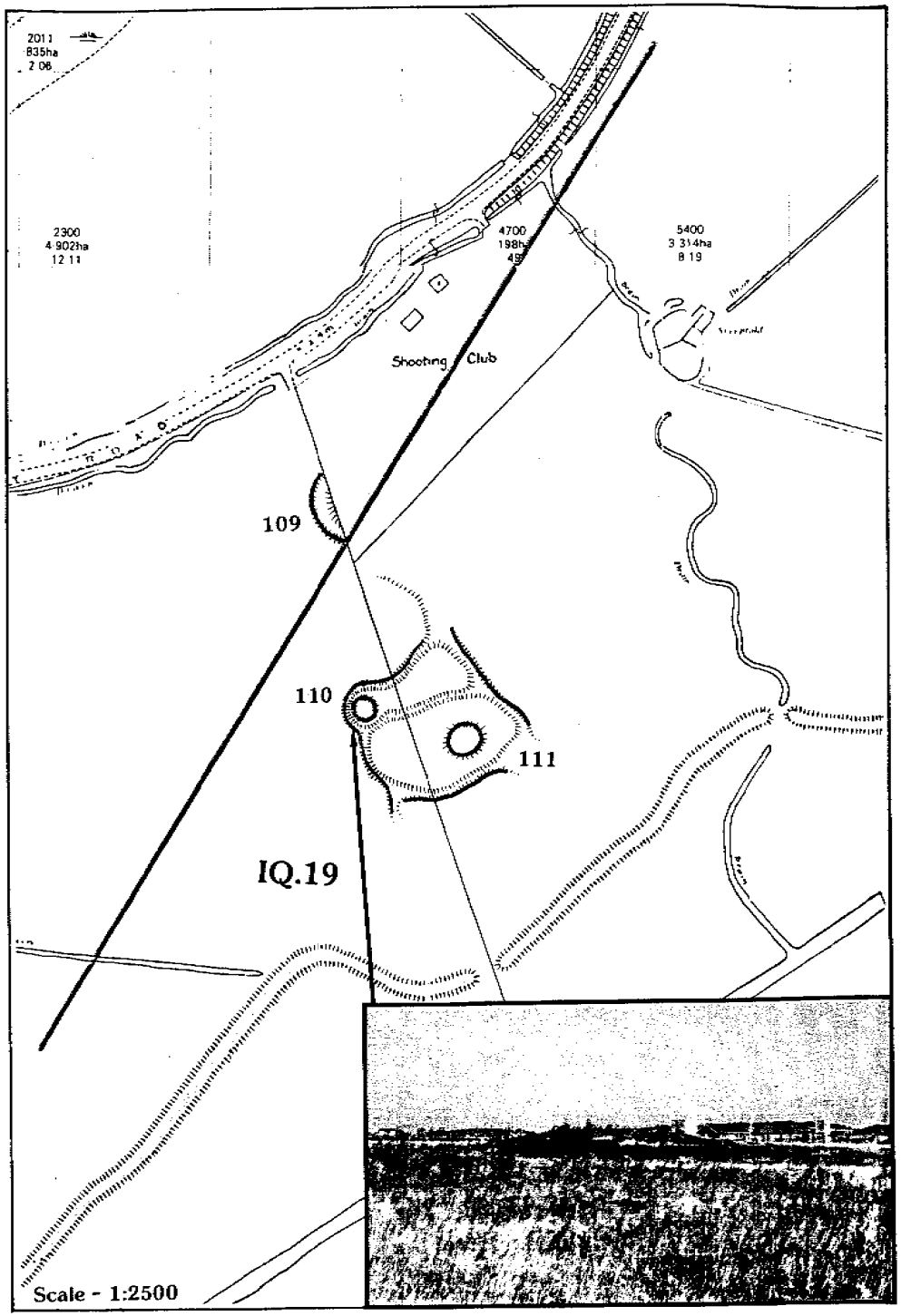


Fig. 6.


Shooting Club
109
110
111
IQ.19
Scale - 1:2500

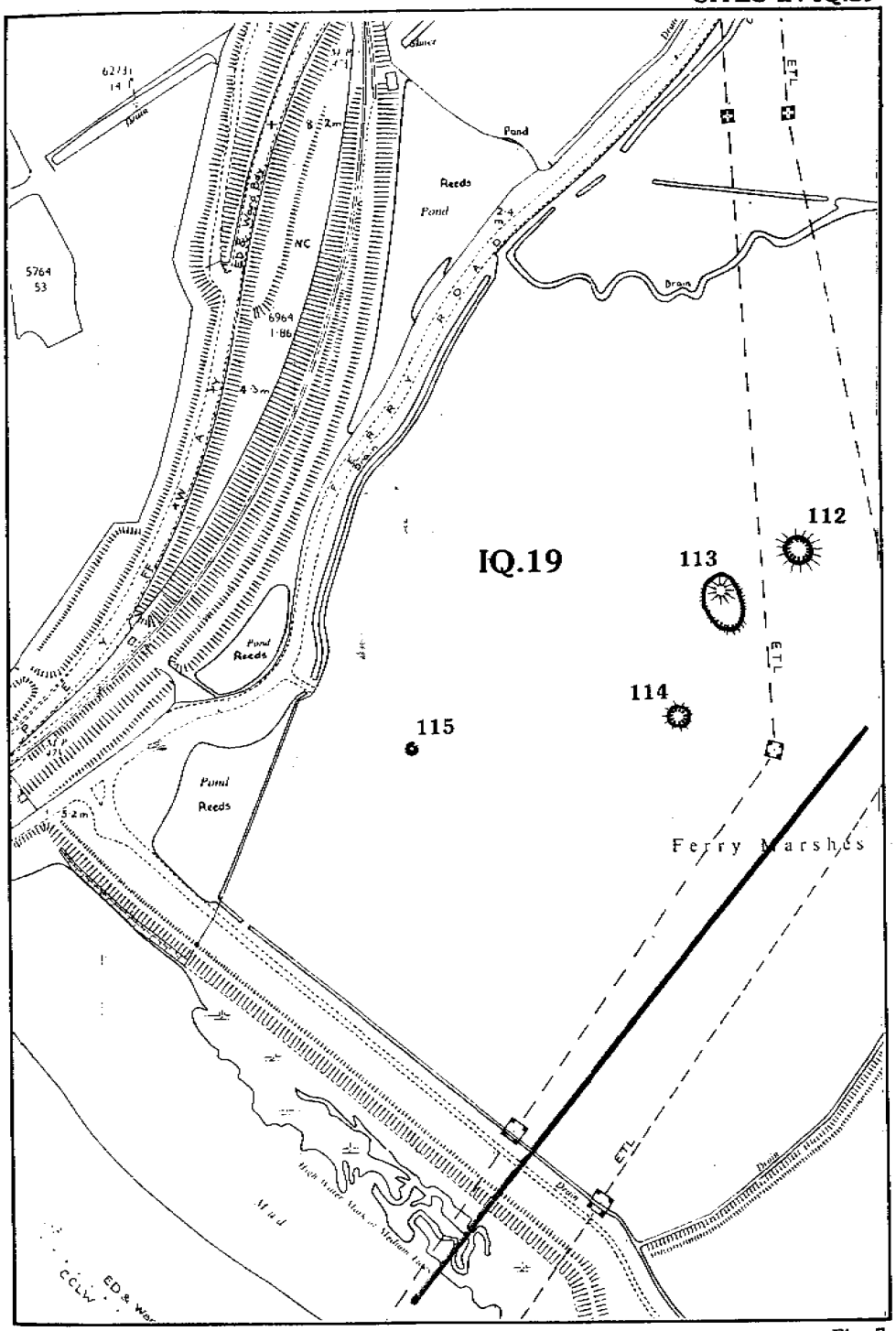

IQ.19
112
113
114
115
Pond
Reeds
Ferry Marshes
Mud
ETL

Fig. 7.

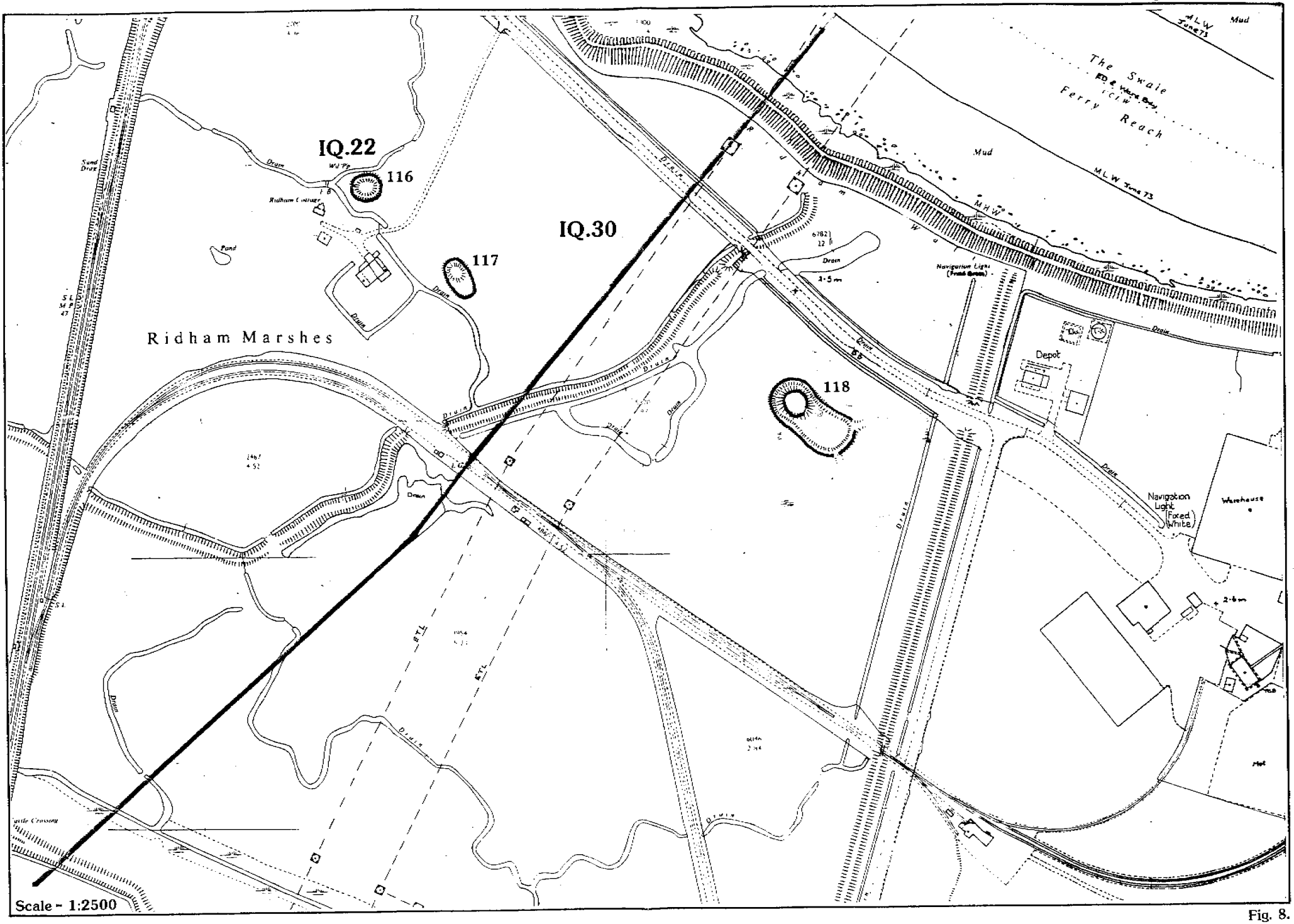

IQ.22
IQ.30
116
117
118
Ridham Marshes
The Swale
Ferry Reach
Mud
MLW Zone 73
MHW
Depot
Navigation Light (Fixed White)
Warehouse
Drain
Pond
Scale - 1:2500

Fig. 8.

APPENDIX 1

Plot Records

Introduction

The following is a summary of information held in full in the archive of field records. Plot locations and their principal topographic features are illustrated in Figs.2 and 3. National Grid References refer to a centre point of each plot, and approximate heights OD for the heighest part of the plot, are given. There is some variation in height across plots in the northern part of the Study Area otherwise heights are relatively similar.

Abbreviation

CBM: Ceramic Building Material, such as brick and tile.

Plot Records:

Plot No 01	Land use Pasture	NGR TQ718928	Height 30m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	A beacon post and fire basket stand on the highest point of this field, as recorded in 'Lambarde's Carde' (IQ.6). In the south-eastern corner a 'Clay Mill Kiln and brick and earth works' (IQ.7) is known to have existed, possibly now marked a depression in the ground being used for farm debris.		

Plot No 02	Land use Arable	NGR TQ718929	Height 20m OD
Earthworks	None.		
Surface finds	Post-medieval pottery, CBM, foreign stone, post-medieval glass, worked flint (one prehistoric scraper).		
Other Observations	Ploughed field, rapid scan at 25m intervals.		

Plot No 03	Land use Arable	NGR TQ716930	Height 10m OD
Earthworks	None.		
Surface finds	Burnt flint, oyster shells, post-medieval pottery, glass, clay pipe, CBM, foreign stone and one gun flint.		
Other Observations	Ploughed field, rapid scan at 25m intervals.		

Plot No 04	Land use Pasture	NGR TQ716929	Height 15m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	The pond immediately behind the farm buildings is prevented from flooding the field by a low bank.		

Plot No 05	Land use Pasture	NGR TQ716927	Height 14m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 06	Land use Farm	NGR TQ715929	Height 13m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Cowstead Farm and related buildings.		

Plot No 07	Land use Arable	NGR TQ718925	Height 30m OD
Earthworks	None.		
Surface finds	Oyster shells, slag, foreign stone, post-medieval pottery, glass, CBM , iron objects (ie. nails), burnt flint, a gun flint. One sherd of medieval pottery.		
Other Observations	Ploughed field, rapid scan at 25m intervals. Originally two separate fields - boundaries removed.		

Plot No 08	Land use Arable	NGR TQ717924	Height 8m OD
Earthworks	None.		
Surface finds	Foreign stone, burnt flint, animal bone, oyster shell, post-medieval pottery, glass, clay pipe, CBM, one gun flint.		
Other Observations	Ploughed field, rapid scan at 25m intervals. Originally 3 separate fields - boundaries removed.		

Plot No 09	Land use Arable	NGR TQ718922	Height 8m OD
Earthworks	None.		
Surface finds	Post-medieval pottery, burnt flint, oyster shell, CBM. One sherd of late prehistoric pottery.		
Other Observations	Ploughed field, rapid scan at 25m intervals.		

Plot No 10	Land use Buildings/Gardens	NGR TQ716922	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Neats Court Farm and associated structures together with a small area of pasture.		

Plot No 11	Land use Arable	NGR TQ719923	Height 15m OD
Earthworks	None.		
Surface finds	Oyster shell, slag, burnt flint, post-medieval pottery, glass, clay pipe and CBM.		
Other Observations	Ploughed field, rapid scan at 25m intervals.		

Plot No 12	Land use Pasture	NGR TQ719921	Height 15m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Has been ploughed in recent years. No trace of the 'stone' IQ.4.		

Plot No 13	Land use Residential	NGR TQ721919	Height 8m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Built up area.		

Plot No 14	Land use Pasture	NGR TQ719919	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 15	Land use Pasture	NGR TQ719918	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 16	Land use Pasture	NGR TQ717918	Height 4m OD
Earthworks	Old Counter Wall runs east-west through centre of this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 17	Land use Pasture	NGR TQ717919	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 18	Land use Pasture	NGR TQ717920	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 19	Land use Pasture	NGR TQ716916	Height 3m OD
Earthworks	Old Counter Wall runs east-west through this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 20	Land use Pasture	NGR TQ716920	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 21	Land use Pasture	NGR TQ714920	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 22	Land use Sheepwash/Storage	NGR TQ715923	Height 5m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Sheepfold in this area recorded in 1st series OS Survey Map (**IQ.8**).		

Plot No 23	Land use Pasture	NGR TQ714923	Height 6m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 24	Land use Industrial	NGR TQ714916	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Car depot.		

Plot No 25	Land use Pasture	NGR TQ712922	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 26	Land use Pasture	NGR TQ712923	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 27	Land use Pasture	NGR TQ714925	Height 9m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 28	Land use Pasture	NGR TQ 712925	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 29	Land use Pasture	NGR TQ712926	Height 8m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 30	Land use Pasture	NGR TQ712928	Height 8m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 31	Land use Arable	NGR TQ713931	Height 8m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Rapid scan could not be undertaken - surface of field completely obscured by growing crop. N/S and E/W field boundaries removed - field now extends to Wall End Cottages and Plot 35.		

Plot No 32	Land use Pasture	NGR TQ708927	Height 3m OD
Earthworks	Two salterns, the first [**IQ.11**/[100] is sub-circular, 30m in diameter, 1.6m high free standing in a flat field. The second [**IQ.11**/101] is also sub-circular, 12m in diameter, 1m high and located at the south-western end of a small ovoid platform.		
Surface finds	None.		
Other Observations	None.		

Plot No 33	Land use Pasture	NGR TQ706924	Height 3m OD
Earthworks	One salt mound [**IQ.11**/102], sub-circular, 30m diameter, 1.8m high and free standing.		
Surface finds	None.		
Other Observations	See Auger Survey, Transect A, Nos.01-04.		

Plot No 34	Land use Pasture	NGR TQ709923	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 35	Land use Industrial	NGR TQ710930	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Water pumping station. Sheepfold (**IQ.12**) is no longer in existance.		

Plot No 36	Land use Pasture	NGR TQ709930	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 37	Land use Pasture	NGR TQ708930	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 38	Land use Pasture	NGR TQ705927	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 39	Land use Pasture	NGR TQ703925	Height 2m OD
Earthworks	Three salterns, two of them together [**IQ.11**/105-6], each *c.* 22m in diameter and 2.5m tall, forming the twin peaks of a large platform *c.* 60m north-south long. The other mound [**IQ.11**/107] is ovoid, 20m by 15m. There is a distinct lump at the south-western end, rising to a height of 0.9m.		
Surface finds	None.		
Other Observations	None.		

Plot No 40	Land use Pasture	NGR TQ705929	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 41	Land use Pasture	NGR TQ703928	Height 1m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Sheepfold IQ.13 formerly located in this plot.		

Plot No 42	Land use Pasture	NGR TQ701927	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 43	Land use Pasture	NGR TQ700922	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	This plot contains surface undulations taking the form of irregularly shaped platforms of widely varying sizes surrounded by shallow channels. These may be associated with the salterns. See Auger Survey, Transect B, Nos.11-13.		

Plot No 44	Land use Recreational	NGR TQ699925	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Probably a National Service firing range, now in use for a gun club.		

Plot No 45	Land use Pasture	NGR TQ701922	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	See Auger Survey, Transect B, Nos.14 & 15.		

Plot No 46	Land use Pasture	NGR TQ697923	Height 2m OD
Earthworks	Three salterns; [**IQ.19**/109], subcircular, 30m in diameter and surrounded by a ditch. It is bisected by a field boundary, but does not appear in the adjacent Plot 44.[**IQ.19**/110], subcircular, 15m in diameter, 1.4m high. It is situated at the west end of a 60m long ovoid platform which is delineated by a network of ditches and banks. [**IQ.19**/111], subcircular, 25m by 30m east-west and 1.6m high and again delineated by ditches and banks.		
Surface finds	None.		
Other Observations	None.		

Plot No 47	Land use Pasture	NGR TQ694919	Height 2m OD
Earthworks	Four salterns; [**IQ.19**/112], subcircular, 25m in diameter and 1.3m high. [**IQ.19**/113], ovoid, 30m (north-south) by 25m (east-west) with a pronounced bulb at the northern end, rising to 1.4m in height. [**IQ.19**/114], subcircular, 15m in diameter and 0.6m high. [**IQ.19**/115] subcircular, 6m in diameter and 0.5m high.		
Surface finds	None.		
Other Observations	No surviving traces of sheepfold **IQ.18**.		

Plot No 48	Land use Pasture	NGR TQ708922	Height 2m OD
Earthworks	One subcircular saltern [**IQ.11**/103], 25m in diameter and 1.5m high situated at the north-eastern end of a trapezoidal platform delineated by ditch and banks. The Old Counter Wall runs SW/NE through this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 49	Land use Pasture	NGR TQ709921	Height 2m OD
Earthworks	One ovoid saltern [**IQ.11**/104], *c.* 20m by 15m south-west/north-east and 1.4m high, situated at the south-western corner of a platform 60m long running south-west/north-east.		
Surface finds	None.		
Other Observations	None.		

Plot No 50	Land use Pasture	NGR TQ709918	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Post-medieval or modern brick-lined well (**IQ.28**) situated alongside drain.		

Plot No 51	Land use Pasture	NGR TQ712919	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 52	Land use Pasture	NGR TQ710916	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 53	Land use Pasture	NGR TQ707916	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 54	Land use Pasture	NGR TQ706920	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 55	Land use Pasture	NGR TQ704917	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 56	Land use Pasture	NGR TQ700918	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	See Auger Survey, Transect A, No.10.		

Plot No 57	Land use Pasture	NGR TQ702919	Height 2m OD
Earthworks	Saltern [IQ.32/108].		
Surface finds	None.		
Other Observations	See Auger Survey, Transect A, Nos.07-09.		

Plot No 58	Land use Pasture	NGR TQ704920	Height 2m OD
Earthworks	The Old Counter Wall zig-zags along the eastern edge of this plot.		
Surface finds	None.		
Other Observations	See Auger Survey, Transect A, Nos. 05-06.		

Plot No 59	Land use Pasture	NGR TQ708913	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	No surviving traces of IQ.9.		

Plot No 60	Land use Pasture	NGR TQ704914	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 61	Land use Industrial	NGR TQ703910	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Water treatment works.		

Plot No 62	Land use Pasture	NGR TQ700913	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	No surface traces of sheepfold **IQ.10** survive.		

Plot No 63	Land use Pasture	NGR TQ700915	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 64	Land use Pasture	NGR TQ692912	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 65	Land use Pasture	NGR TQ693911	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 66	Land use Pasture	NGR TQ695910	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 67	Land use Pasture	NGR TQ695909	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 68	Land use Pasture	NGR TQ697907	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 69	Land use Pasture	NGR TQ693909	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 70	Land use Pasture	NGR TQ691910	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 71	Land use Pasture	NGR TQ694907	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	A sheepfold still exists in the location of sheepfold IQ.17.		

Plot No 72	Land use Pasture	NGR TQ690911	Height 3m OD
Earthworks	Two sections of a bank meet to form a V-shape; this may possibly be part of an old Counter Wall.		
Surface finds	None.		
Other Observations	None.		

Plot No 73	Land use Pasture	NGR TQ690909	Height 2m OD
Earthworks	Within the Plot but outside the Study Area, one previously unrecorded saltmound (IQ.29) was observed in the corner of the field near the junction of the A249 road and the NW/SE drain which forms the boundary of this plot. Not recorded in detail.		
Surface finds	None.		
Other Observations	None.		

Plot No 74	Land use Pasture	NGR TQ690913	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 75	Land use Rough grassland	NGR TQ690915	Height 2m OD
Earthworks	Earth bank continuing on the same line as the one in Plot 77 meets the Ridham Wall at 90 degrees just outside the boundary of the Study Area.		
Surface finds	None.		
Other Observations	This plot lies right on the edge of the estuary.		

Plot No 76	Land use Pasture	NGR TQ689914	Height 2m OD
Earthworks	Mound [**IQ.22**/116] lies near the border with Plot 78 and is probably associated with the wind-pump but may reuse a saltern. The mound is oval, 25m by 20m, aligned north-west/south-east and 0.8m high with a distinct depression in the centre.		
Surface finds	None.		
Other Observations	Only the foundations of Ridham Cottage remain. No surface traces of sheepfold **IQ.23** were observed.		

Plot No 77	Land use Pasture	NGR TQ688915	Height 2m OD
Earthworks	The grass was very long in this plot and may have obscured less prominent features. Saltern [IQ.30/117], subcircular, 20m in diameter, 1.2m high and situated at the north-western end of 35m long oval platform running north-west/south-east, and delineated by ditch and banks. A low earth bank between two drains forms the SW/NE boundary of this plot. A second mound, [IQ.30/118], oval, 30m by 20m north-west/south-east, 1.6m high and situated at the north-western end of a 60m north-west/south-east elongated platform, again delineated by poorly-defined ditchs and banks, occurs to the east of this boundary.		
Surface finds	None.		
Other Observations	None.		

Plot No 78	Land use Pasture	NGR TQ688912	Height 2m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 79	Land use Pasture	NGR TQ686912	Height 3m OD
Earthworks	An earth bank and drain cut E/W across this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 80	Land use Pasture	NGR TQ689910	Height 3m OD
Earthworks	An E/W earth bank flanked by a drain form the boundary between this plot and Plots 80 and 81.		
Surface finds	None.		
Other Observations	None.		

Plot No 81	Land use Pasture	NGR TQ688910	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 82	Land use Pasture	NGR TQ686909	Height 3m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

Plot No 83	Land use Pasture	NGR TQ686907	Height 3m OD
Earthworks	The earth bank of Coldharbour Wall runs NW/SE across this plot..		
Surface finds	None.		
Other Observations	One saltern, IQ.21, is located in this plot, but outside the limits of the study area.		

Plot No 84	Land use Pasture	NGR TQ685908	Height 3m OD
Earthworks	The earth bank of Coldharbour Wall runs NW/SE across this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 85	Land use Pasture	NGR TQ682909	Height 3m OD
Earthworks	Coldharbour Wall runs across the NE tip of this plot.		
Surface finds	None.		
Other Observations	None.		

Plot No 86	Land use Pasture	NGR TQ681907	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Inside this plot, but just outside the Study Area is a brick-lined 'key-hole shaped' feature, most probably a disused sheep-dip (IQ.31).		

Plot No 87	Land use Pasture	NGR TQ679909	Height 4m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	Sheepfold IQ.26 is no longer extant and appears to have been replaced by another on the corner of this plot, the orchard and Plot 86.		

Plot No 88	Land use Pasture	NGR TQ676708	Height 5m OD
Earthworks	None.		
Surface finds	None.		
Other Observations	None.		

APPENDIX 2

Auger Logs

All depths are given in metres beneath present ground levels. The location of the auger transects and individual holes is shown in Fig. 4.
The auger holes are numbered sequentially, prefixed by the number of the Plot in which they occur.

TRANSECT A

Auger 33/01	Depth	Description	NGR TQ706926
	0 - 0.05	10YR 4/4. Dark yellowish-brown humic topsoil.	
	0.05 - 0.25	10YR 5/3. Brown clay silt.	
	0.25 - 2.00	10YR 5/1. Grey clay with some brown iron staining, water was present from 1.30m and lenses of a grey clay (7.5YR N5/) were apparent throughout.	

Auger 33/02	Depth	Description	NGR TQ705925
	0 - 0.05	10YR 3/3. Dark brown dry, humic loam topsoil.	
	0.05 - 2.00	10YR 5/4. Yellowish-brown dry silty clay, becoming slightly damper at 0.80m and waterlogged at 1.20m. From 1.80m grey clay lenses (7.5YR N5/) became apparent.	

Auger 33/03	Depth	Description	NGR TQ704924
	0 - 0.05	10YR 3/3. Dark brown, dry humic loam topsoil.	
	0.05 - 2.00	10YR 5/4. Yellowish-brown silty clay, becoming slightly damp at 0.90m and waterlogged at 1.70m. Traces of grey clay (7.5YR N5/) were present at 2.00m.	

Auger 33/04	Depth	Description	NGR TQ704923
	0 - 0.05	10YR 3/3. Dark brown, slightly damp humic loam.	
	0.05 - 0.35	10YR 5/4. Yellowish-brown silty clay.	
	0.35 - 2.00	10YR 5/3. Brown silty clay with brown iron staining, becoming damp at 1.20m and waterlogged at 1.40m.	

Note: This auger bore lay immediately adjacent to a water drain.

Auger 58/05	Depth	Description	NGR TQ703922
	0 - 0.10	10YR 3/3. Dark brown dry humic loam topsoil.	
	0.10 - 2.00	10YR 5/4. Yellowish-brown silty clay, becoming waterlogged at 1.50m.	

Auger 58/06	Depth	Description	NGR TQ703922
	0 - 0.05	10YR 3/3. Dark brown, very dry humic loam topsoil.	
	0.05 - 2.00	10YR 5/4. Yellowish-brown, dry silty clay, becoming more compact at 0.60m - brown iron staining was also present. Traces of gleying occurred at 1.60m, increasing towards 2.00m.	

Auger 57/07	Depth	Description	NGR TQ702921
	0 - 0.10	10YR 3/3. Dark brown, dry humic loam topsoil.	
	0.10 - 2.00	10YR 5/4. Yellowish-brown silty clay, becoming damp at 0.75m and soft, wet and sticky at 1.70m.	

Auger 57/08	Depth	Description	NGR TQ701920
	0 - 0.05	10YR 3/3. Dark brown, dry humic loam topsoil.	
	0.05 - 2.00	10YR 5/4. Yellowish-brown silty clay with traces of brown iron staining from 0.30m, becoming damper and more compact at 0.80m. From 1.70m small fragments of shell were found and traces of gleying occurred at 2.00m.	

Auger 57/09	Depth	Description	NGR TQ701919

0 - 0.05	10YR 3/3. Dark brown, very dry humic loam topsoil.
0.05 - 1.80	10YR 5/8. Yellowish-brown silty clay, initially very dry, but becoming damper and more compact at 1.00m. Waterlogging occurred at 1.60m and small fragments of shell were present from this depth.
1.80 - 2.00	5BG 4/1. Dark greenish-grey gleyed silty clay.

Auger 56/10	**Depth**	**Description**	**NGR** TQ700918

0 - 0.05	10YR 3/3. Dark brown, dry humic loam topsoil.
0.05 - 1.80	10YR 5/4. Yellowish-brown silty clay with brown iron staining occurring at 0.80m, becoming much heavier at 1.00m. Shell fragments appeared from 1.20m while streaks of gley were present from 1.60m.
1.80 - 2.00	5BG 4/1. Dark greenish-grey gleyed silty clay.
2.00 - 3.00	5B 4/1. Dark grey gleyed silty clay mud with little shell present and becoming wetter as the depth increased.

TRANSECT B

Auger 43/11	**Depth**	**Description**	**NGR** TQ700923

0 - 0.05	10YR 3/3. Dark brown, dry humic loam topsoil.
0.05 - 2.00	10YR 5/4. Yellowish-brown silty clay becoming softer at 1.20m and waterlogged at 1.40m, with a hint of gleying at 2.00m.

Auger 43/12	**Depth**	**Description**	**NGR** TQ701923

0 - 0.20	10YR 3/3. Dark brown humic loam topsoil.
0.20 - 2.00	10YR 5/4. Yellowish-brown silty clay with brown iron staining apparent, becoming damp at 0.90m and waterlogged at 1.20m.

Auger 43/13	Depth	Description	NGR TQ701923
	0 - 0.13	10YR 3/3. Dark brown humic loam topsoil.	
	0.13 - 1.80	10YR 5/4. Yellowish-brown silty clay with brown iron staining present. Becoming very compact at 0.70m, but softening at 1.20m. Gley occurred at 1.60m.	
	1.80 - 2.00	7.5YR N2/ . Black silty clay.	

Auger 45/14	Depth	Description	NGR TQ702923
	0 - 0.15	10YR 3/3. Dark brown humic loam topsoil with shell fragments present.	
	0.15 - 1.60	10YR 5/4. Yellowish-brown, very compact silty clay with brown iron staining occurring at 0.30m. Shell fragments do not occur until 0.80m down, and the soil becomes more unstructured at 1.00m. Gley begins to appear at 1.50m.	
	1.60 - 2.00	5BG 4/1. Dark grey gley - its colour gradually darkening as it gets deeper. By 2.00m it is very soft and sticky.	

Auger 45/15	Depth	Description	NGR TQ703922
	0 - 0.15	10YR 3/3. Dark brown dark humic loam topsoil.	
	0.15 - 0.80	10YR 5/4. Yellowish-brown, very compact silty clay, with shell fragments and brown iron staining present.	
	0.80 - 0.85	10YR 5/2. Greyish-brown compact silty clay with fine grainy lenses.	
	0.85 - 2.00	10YR 5/4. A combination of the two previous layers - a yellowish-brown silty clay with lenses of greyish-brown grainy mud. Small fragments of shell occurred at 0.90m while it became damp and sticky at 1.60m. Tiny smears of grey gley (7.5YR N5/) were apparent at 2.00m.	

APPENDIX 3

Revised gazetteer of sites in the Study Area

Introduction

The following gazetteer is a compilation of all the archaeological information collected during the desk study and preliminary field evaluation of the study area. The IQ. (Iwade to Queenborough) reference code has been maintained for the sites and groups of sites listed in the Stage 1 Desk Study (IQ. 1-26). New sites located during the preliminary evaluation have been added to this list (IQ. 27-31). The origin of the evidence (ie identification from NAR, air photographs, rapid field survey etc.) for each site or group of sites is also indicated. For sites listed in the Desk Study, further details gathered during the rapid field scan have been added where appropriate. Approximate heights OD are given. Sites located within the Study Area defined by Arup are emboldened. All the sites are shown on Figures 2 and 3.

The three broad categories of 'ranking' used during the Desk Study to assess the significance of the sites/areas of interest are repeated here, and for ease of reference and extended to cover the newly identified sites :

A: Sites of high archaeological importance or potential. Known sites already recognised as or with the potential to be of national or regional importance such as to merit inclusion in the Schedule of Ancient Monuments.

B: Sites of medium archaeological importance or potential. Sites recognised as or with the potential to be of local importance. These may be defined as Areas of Archaeological Interest by Planning Authorities.

C: Sites of low archaeological importance or potential. Sites which, based on current data, appear to be of limited and/or localised archaeological value.

The code letter indicating the rank of the sites/areas of interest are included in the Gazetteer after the national grid reference.

Gazetteer

IQ.1 - TQ 9187 7283. B.
Sources of evidence: NAR information.
Medieval or post-medieval saltern on Diggs Marshes. (NAR no. TQ 97SW 4).
Below 8m contour.

IQ.2 - TQ 9123 7215. A.
Sources of evidence: NAR information.
Site of Queenborough castle. Built 1361-77, destroyed 17th century. (NAR no. TQ 97SW 1), *c.* 6m contour level.

IQ.3 - TQ 9145 7219. B.
Sources of evidence: NAR information.
Earthwork; irregular shaped enclosure with slight inner bank and outer ditch superimposed on an old counter wall. Date and purpose unknown. (NAR no. TQ 97SW 2). Below 8m contour.

IQ.4 - TQ 9217 7205. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
'Stone' on Barrows Hill. *c.*23-6m contour level.
No longer extant, there is no further information about this feature. It may be thought unlikely that it represents a prehistoric monument.

IQ.5 - TQ 927 720. C.
Sources of evidence: NAR information.
Site of 18th century telegraph station on Furze Hill. (NAR no. TQ 97SW 15). Between 23-30m contour.

IQ. 6 - TQ 9268 7199. C.
Sources of evidence: NAR information; Rapid field scan.
Site of beacon recorded on William Lambarde's 'Carde' of c. 1570. No visible remains. (NAR no. TQ 97SW 9), *c.* 38m contour level.
Tradition is continued by a modern beacon on Furze Hill, at the highest point of Plot 1.

IQ.7 - TQ 929 717. B.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of 'Clay Mill Kiln' and brickwork's and earthworks. Between 15-23m contour level.
Shallow depression in the corner of Plot 1, brick and tile fragments and a possible *in situ* section of brick walling near the gateway between Plots 1 and 4 may be the remains of this site.

IQ.8 - TQ 9225 7143. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. *c.* 5m contour level.
Location continues to be used as a sheepfold.

IQ.9 - TQ 909 708. B.
Sources of evidence: NAR information; Rapid field scan.
Group of three salterns (at TQ 9099 7080 and TQ 9075 7099, both now destroyed, and TQ 9118 7058). One saltern cut during recent sea defence construction revealing oyster shells, burnt clay and flints, wood and twigs

amongst the marsh clay of which it was composed. Probably of medieval date. (NAR no. TQ 97SW 6). Below 8m contour level.
No surface traces of these mounds now survive.

IQ.10 - TQ 9128 7020. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. Below 8m contour level.
No surface traces survive.

IQ.11 - TQ 927 706. B.
Sources of evidence: NAR information; Rapid field scan.
Group of nine salterns centred around TQ 927 706, on the Neatscourt/Cheyney Marshes. (NAR no. TQ 97SW 7), 2-4m spot heights. Eight of these salterns were located and planned (Plates 3-4; Fig. 2; 5, IQ.11/100-7). Extensive platform and ditch and drain systems associated with mound numbers IQ.11/103, 105-7 were noted.

IQ.12 - TQ 9291 7095. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold and guide post. Adjacent spot height 4m.
No visible surface traces.

IQ.13 - TQ 9280 7034. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73).
Site of sheepfold. Adjacent spot height 2m.

IQ.14 - TQ 9341 7078. C.
Sources of evidence: NAR information.
Angled section of a medieval dyke cut by a more recent drainage system. (NAR no. TQ 97SW 14), *c.*1-2m OD.

IQ.15 - TQ 936 706. C.
Sources of evidence: Air photographs.
Area of ridge and furrow centred around TQ 936 706 identified on aerial photographs 73048/44 and 73048/45. Adjacent spot heights 1-2m.

IQ.16 - TQ 903 692. B.
Sources of evidence: NAR information; Rapid field scan.
Group of four medieval or post-medieval salterns situated on the Ferry Marshes. (NAR no. TQ 96NW 16), *c.* 2-5 m OD.
All four salterns survive (Plate 6) and one small, additional mound was noted in the field on the south-west side of the Old Ferry Road. These salterns were not examined in detail during the rapid field scan as they lie outside the Study Area.

IQ.17 - TQ 9064 6958. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. Below 2m OD.
A sheepfold still exists in this location.

IQ.18 - TQ 9187 6963. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. *c.* 2m OD.
No surface traces survive.

IQ.19 - TQ 922 697. B.
Sources of evidence: Air photographs; Rapid field scan.
Group of five salterns centred around TQ 922 697 visible on aerial photographs 540/1699/20 and 21, *c.* 2-3m OD.
The rapid field scan indicates that the mounds in this area fall into two distinct groups, one group (mound numbers IQ.19/109-111; Fig. 7a located on the boundary of Plot 46, on Minster Marshes with associated earthworks extending eastwards as far as the drain and a further group of four mounds (mound numbers IQ.19/112-115) located in Plot 47, on Ferry Marshes to the south-west of these (Figs. 2-3; 7b).

IQ.20 - TQ 903 687. C.
Sources of evidence: Air photographs.
Area of ridge and furrow visible on aerial photographs 58/4626/1 and 2. Between 3-5m contour.

IQ.21 - TQ 9050 6849 and TQ 9073 6881. B.
Sources of evidence: NAR information; Rapid field scan.
Two medieval or post-medieval salterns on the Coldharbour Marshes. (NAR no. TQ 96NW 19), between 3-5m OD.
Only one of these salterns is now extant but it was not recorded in detail as it lies outside the limits of the Study Area.

IQ.22 - TQ 9131 6887. C.
Sources of evidence: NAR information; Rapid field scan.
Remains of post-medieval wind pump; used for land drainage. (NAR no. TQ 96NW 20). *c.* 2m OD.
No trace of the wind pump itself remains but an oval, hollowed-out mound (IQ.22/116, c. 20m and 25m across, *c.*08m high) in this location may be the platform for this structure and may originally have been a saltern (Fig. 7).

IQ.23 - TQ 9134 6986. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. *c.*2m OD.
No surface traces survive.

IQ.24 - TQ 9126 6816. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73).
Site of sheepfold. *c.* 2m OD.

IQ.25 - TQ 9012 6795. A.
Sources of evidence: NAR information.
All Saints Church, Iwade. Thirteenth century chancel, nave and tower; later medieval and post-medieval additions. (NAR no. TQ 96NW 2), *c.* 10m OD.

IQ.26 - TQ 9076 6790. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73); Rapid field scan.
Site of sheepfold. *c.* 5m OD.
No traces of the original sheepfold survive but a successor to it is now located in the corner of the field at TQ 9072 6804.

IQ.27 - TQ 9148 6795. C.
Sources of evidence: 1st series of 25" Ordnance Survey map (1858-73).
Site of sheepfold recorded on the 1st series of the 25" Ordnance Survey map (1858-73), *c.* 2m OD.

IQ.28 - TQ 9191 7121. C.
Sources of evidence: Rapid field scan.
Post-medieval or modern brick-lined well, *c.* 1.5m in diameter. *c.* 2m OD.

IQ.29 - TQ 9073 6818. B.
Sources of evidence: Rapid field scan.
Single saltern noted but not recorded in detail. *c.* 3m OD.

IQ.30 - TQ 9138 6880 and TQ 9165 6872. B.
Sources of evidence: Rapid field scan.
Two salterns with associated platforms (Figs. 3; 8) IQ.30/ 117 at TQ 9138 6880 and IQ.30/118 at TQ 9165 6872). Other associated earthworks possible in this area but masked by very long grass. *c.* 2m OD.

IQ.31 - TQ 9060 6822. C.

Sources of evidence: Rapid field scan.

Brick-lined key-hole shaped feature (c. 1.5m in diameter and 2.5m long, ate least 0.50m deep). Possibly a well or a structure for dipping sheep. Post-medieval or modern. *c.* 2m OD.

IQ.32 - TQ 9184 7008. B.

Sources of evidence: Rapid field scan.

Single saltern and associated platform (IQ.32/108) in Plot 57 (Figs. 2; 5).

Faint traces of associated ditch and drain system discernible. *c.* 3m OD.

Summary

Only two sites, both listed in the Desk Study, fall into the category of high archaeological importance/potential (A), Queenborough Castle (IQ.2) and All Saints Church, Iwade (IQ.25). Both of these lie outside the boundaries of the Study Area itself.

Eleven sites with medium archaeological importance/potential (B) have now been identified, the individual salterns or groups of salterns IQ.1, IQ.9, **IQ.11**, IQ.16, **IQ.19**, IQ.21, IQ.29, **IQ.30** and **IQ.32**, the earthwork IQ.3 and industrial site **IQ.7**. The five sites or groups located within the limits of the Study Area are emboldened.

The remaining 19 known sites are considered to be of low archaeological importance/potential (C), again those included within the Study Area are emboldened. These are the sheepfold locations **IQ.8**, **IQ.10**, **IQ.12**, IQ.13, IQ.17, **IQ.18**, **IQ.23**, IQ.24, IQ.26 and IQ.27, areas of ridge and furrow IQ.15 and IQ.20, and other locations of interest/potential IQ.4, IQ.5, IQ.6, IQ.14 and **IQ.22, IQ.28** and IQ.31.

APPENDIX 4

Medieval salt extraction

Very few coastal salt making sites of medieval (or post-medieval date) (as opposed in inland sites such as Droitwich) date have been exacavated (Healey 1975; Owen 1975; Rudkin 1975; Holden and Hudson 1981; Fawn *et al.* 1990, 15-17).

An 18th century treatise on *The Art of Making Common Salt* by W. Brownrigg (1748) identifies six methods of extracting salt of which two (Nos. 3-4) may have been used by sites within the Study Area. Method 3 used partial evaporation and then the boiling off of water to reduce the crystal. In Method 4 sand or mud was extracted from the margins of estuaries or creeks and washed and it is likely that this was the method employed at sites within the Study Area.

Sea water is more saline in shallow tidal waters than in the open sea and the regular deposition of salt in tidal mud flats further increases this salinity. Mud or sand, often from the surface of mud flats would be gathered and placed in pits lined with a filtration material, often of convenient local vegetation such as rushes. Vessels would be placed at the bottom of the pit to collect the brine. The brine was washed out by pouring water over the muds which also helped to concentrate the brine. This water could be either fresh- or sea water. The mud was then discarded - gradually forming a mound - and the strong brine would then be boiled either in shallow clay lined pits or in shallow lead pans to evaporate as much water as possible. The wet salt was then gathered up and dried, sometimes in wicker containers suspended near the boiling hearths or pans (Fig. 9). The salt produced by this method of sand or mud washing is known as white salt. It is likely that the boiling hearths were protected by a building, perhaps a hut or shed.

This method of extracting salt (Brownrigg's Method 4) would be compatible with the excavated evidence from Seasalter where organic material was found in one pit, while other pits may have been cisterns to hold the water used to wash the muds. The discarded mud would form the mounds visible both there and in the Study Area.

Observations made when one of the mounds of the **IQ.9** group was damaged during the construction of sea defences suggest that it was composed of marsh clay incorporating oyster shells, burnt clay, flints, 'and some pieces of wood and twig' (Wessex Archaeology 1992, 12). The wood and twigs may be the remains of revetments used to stabilise the mound and in general these finds are comparable to those made in the excavation of the Seasalter mounds.

A 16th century open-pan. A...Wooden ladle. B...Cask. C...Tub. D...The Master. E...Assistant. F...The Master's wife. G...Wooden spade. H...Boards. I...Salt baskets. K...Hoe. L...Rake. M...Straw. N...Bowls. O...Bucket for blood. P...Beer tankard. This well-known illustration from *De Re Metallica* by Agricola shows the salter scooping salt from the pan into wicker baskets while an assistant carries a full basket to the drying store in the background. Another assistant adds a straw bale to the pile used for fuel. Blood was used to clarify brine by carrying scum to the surface, and beer was often added at a later stage, supposedly to promote crystallation, although here it also seems to be for quenching thirsts.

Figure 9: A 16th century woodcut showing the boiling and drying of salt using an open pan. It is likely that these methods were used at the salterns within the Study Area.
Source; Fawn *et al* 1990, fig. 16 after G Agricola *De Re Metallica book 12*, Basle, 1556

It is likely that sites were located so as to take advantage of the tidal flooding of marsh and the tidal nature of streams which would ensure a good supply of saline muds and sands or waters. However, the need for a ready supply of fuel, probably wood, for boiling would favour a location at the boundary of two environments; close to tidal waters but also somewhere to where wood could be transported easily, probably by land. The platforms and the ditches around some mounds in the Study Area (eg **IQ. 19**/110-11) may be to prevent inundation by unexpectedly high waters. It is not known if large pans dug into the mud next to the sites would have existed as these have not been sought after in excavations. Such pans, which are known to occur elsewhere (Rudkin 1975, fig. 23), could have been used to collect the mud or the water used for filtration if the cisterns within the site could not hold sufficient water.