

Whittlesey Pits - The Bradley Fen & Must Farm Sites

An Archaeological Desk-Based Assessment

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August 1997

Report No. 225

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Summary

This assessment was commissioned by David J. Sandbrook, Chartered Surveyors on behalf of their client Hanson Brick Ltd. It relates to new applications for planning permission for brick clay works in two areas of west Whittlesey: at Bradley Fen, and Must Farm.

Most of the assessment areas and any archaeology within them, are covered by peat and alluvium, providing limited opportunities for non-intrusive evaluation. However, existing records from the surrounding area indicates a strong possibility of at least some prehistoric, particularly Bronze Age activity, at Bradley Fen, possibly relating to nearby sites at Northey and Flag Fen. The southern side of the Must Farm site may also have significant remains, on the evidence of the many finds of bronze artefacts from the fen/river margins between Stanground and Must Farm. Significant areas of Roman activity also exist on the margins of both areas, both at Stanground and at the west end of Whittlesey island, with agricultural systems possibly extending into the Bradley Fen site and some potential for further settlements and water-front activities in the western half of the Must Farm site. More generally, the landscape as a whole, and particularly the fen-margins (albeit still to be exactly defined), forms a continuation of that at Fengate/Flag Fen, just to the north - an association of considerable importance. The proximity of an archaeological landscape of national, and indeed international importance leaves little doubt of the potential for further significant remains surviving in the assessment areas.

This notwithstanding, only one area within the Must Farm is currently known to have significant remains and fieldwork may demonstrate that the rest of the area is archaeologically blank or that remains are confined to unthreatened areas on the quarry margins. Archaeologically, such negative evidence will still be of considerable importance. An outline of an appropriate programme of field evaluation is suggested, including an essential element concerned with the environmental and landscape history of the area.

Introduction

This desk-based assessment was commissioned by David J. Sandbrook, Chartered Surveyors on behalf of their client Hanson Brick Ltd. The project relates to new applications for planning permission for brick clay works in two areas of western Whittlesey: the first being at Bradley Fen, an area with a lapsed IDO, and the second at Must Farm, an area with planning permission subject to new planning conditions (fig. 1). The first area falls within Whittlesey parish, the second also crossing into Stanground parish.

The application areas comprise a total of some 180 hectares. The two blocks are divided by an earlier working, the now waterfilled Bradley's Pit, while a further water-filled pit lies at the east end of the Must Farm site. The two areas will ultimately cover most of the land bounded by the existing King's Dyke/Central pits, Moreton's Leam, King's Dyke adjoining Stanground and the A605 Peterborough-Whittlesey road.

Following current standard practice (IFA n.d.) the assessment aims to identify the likely character, extent, quality and worth of the archaeological resource within the two areas in order that appropriate responses can be made in the event of future quarrying activities.

Sources

To create this desk-based assessment, a wide range of sources of archaeological information have been consulted while new work, specifically with aerial photographic records, has also been commissioned. The assessment areas were also visited and inspected, as far as was possible while they lay under crop.

The principal archaeological databases include the County Sites and Monuments record (SMR), Scheduled Ancient Monuments Lists and published county inventories. Each county maintains its own SMR, largely based on its own criteria but incorporating guidelines set by The Historic Buildings and Monuments Commission (English Heritage) and the Royal Commission on the Historic Monuments of England (RCHM(E)). This study is fortunate in that Cambridgeshire has a relatively well maintained SMR, although the existence of some biases must be recognised. The precursor to the SMRs was the Ordnance Survey, whose records were biased towards standing earthworks and single find spots. This emphasis has been recently supplanted by the use of the aerial photographic record, which in turn is biased towards lighter soils (e.g. river gravels) and arable land uses, but may be of little value in areas with heavy peat/alluvial cover. Resources for the systematic survey or excavation of sites have always been severely limited, so the majority of sites known in an SMR are of unknown extent, date or character.

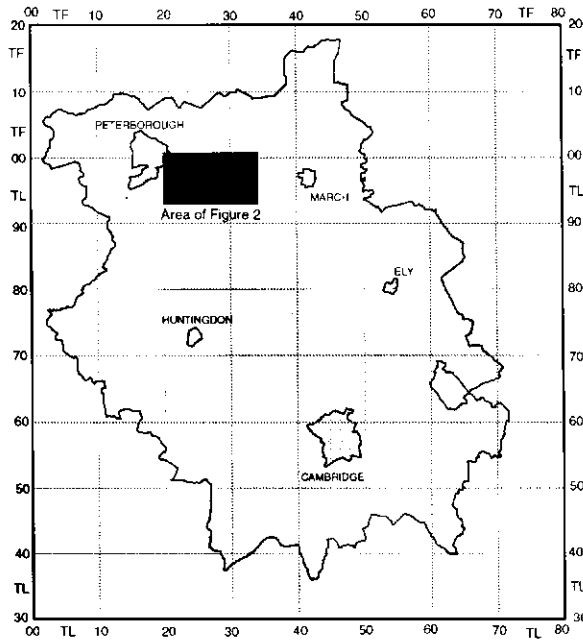


Figure 1 Location of Site in Cambridgeshire

In general the SMR does not constitute a comprehensive or representative record. While considerable archaeological fieldwork has been carried-out in the Fengate/Flag Fen area, Whittlesey is much less well explored, and large areas of the landscape here, and at Stanground have been overbuilt unrecorded. A significant proportion of the 'sites' are merely findspots of chance finds - often, on the fen-edge, representing material found during ploughing or dyke cleaning. The local museums in Peterborough and Whittlesey were also consulted, in

conjunction with a review of secondary studies of the region and a search of relevant local journals.

A range of historical and cartographic sources have been examined, including the major published histories of the region, published Ordnance Survey mapping and Enclosure Award maps; useful maps, with regard to scale and landscape detail only being available from the nineteenth century. However, it should be noted that the location of the evaluation areas, situated within the fen for most of the historic period, allows limited scope for historical research.

Aerial photographic sources, which have proved invaluable in past research in this region, were also examined in detail. Air Photo Services was commissioned to carry out a full search and interpretative plotting for the area, drawing on both the National Library of Air Photographs, RCHM(E)E housed in Swindon, and the Cambridge University Committee for Aerial Photography (CUCAP) archives.

During July-August 1997, the land was largely under a mixture of grain and root crops. Site visits were made however to assess some of the more subtle landscape features, but recorded archaeological features within the assessment areas were inaccessible at this time.

Topography - the landscape ancient and modern

As with any discussion of the archaeology of this fen region, developing an understanding of past settlement, and its archaeological traces, requires an awareness of its landscape, and the major changes it has undergone over time. This factor is crucial not only in determining

- 1) the nature and extent of past settlement in the region, but also
- 2) in determining the likely survival and recovery of archaeological remains.

On the fen margins this is particularly important with regard to predicting the extent to which past land surfaces and archaeological features may be sealed and hidden beneath later deposits of peat or alluvium.

The two evaluation areas, located on the western margins of Whittlesey island, lie on land gently sloping away to the west and south, with lowest areas near the line of the King's Dyke. The higher eastern side of the Bradley Fen site (c.5-6m OD) comprises First River Terrace deposits with overlying Nordelph peat covering its west side; the March gravels, which form most of the Whittlesey islands, not extending this far west (fig. 2). The peats continue south of the railway line across the Must Farm site, in the low-lying areas which extend as far as King's Dyke, on the edge of the sharply rising ground over the Oxford Clay at Horsey Toll and Stanground, with a band of alluvium dividing them. The fen-edge at Stanground is steep and well-defined compared with that seen in most fen areas. The southwestern field of the Must Farm site falls within this zone of alluvium, and represents the lowest part of the assessment area.

Their relatively marginal location in the 1824 Ordnance Survey maps which depicts virtually the whole area as featureless fen. At that time the only significant features were a cluster of buildings ('The Ball', latterly the 'Boat & Anchor') located at the northeast corner of the Bradley Fen site, further buildings in the area north of the current Sewage Works, and an early Horsey Toll Farm on the edge of the Must Farm Pit.

General topographic reconstructions of this and surrounding areas have been made in the course of the Fenland Survey Project (Hall & Coles 1993), with published maps showing landscape reconstructions and archaeological sites for different periods. As the most recent and detailed investigations of the ancient Fenland landscapes as a whole, these have been used as the basis for this study. However, it must be recognised that in most cases, such reconstructions have been based on quite generalised information, from a range of survey data, and may be subject to revision in some areas with the benefit of more detailed studies. The exact location of the (shifting) fen-edge period-based outline must be treated as only approximate in the absence of detailed local survey data.

Securing a more detailed understanding of the ancient land forms will be possible following additional fieldwork (e.g. test pits, boreholes), in order to determine the depth and contouring of peat and alluvium. Existing borehole logs from coring within the Bradley Fen area, focus on the underlying clay

deposits and do not record the character and exact depth of overlying deposits (i.e. peat and/or alluvium).¹

In the absence of profiles from bore holes, estimating the likely depth of peat and confirming the underlying contours which will have defined the prehistoric fen-edge, remains difficult and only a few general indicators are available at present, which suggest the presence of anything from 0.5-4m of such deposits. Examination of dyke sections on the western edge of Northey, some 400m to the north, recorded depths of up to 0.6m of peat over prehistoric land surfaces on the island, falling-away to the west (French & Pryor 1993). Recent work on the island edge a little to the east of the evaluation areas, at the Star Pit, King's Dyke 'Area C', revealed up to 2m depth of peat cover, overlying alluvial deposits relating to a river palaeochannel (Lucas 1997a). Within the evaluation areas it is also noteworthy that a Roman sword recovered from the old Must Farm Pit was reported as having been buried in peat 8-10ft (c.2.4-3m) deep.

The relationship between peat cover and past settlement depends on changing water levels within the fen, which are now reasonably well-understood, at least in broad terms. However, all quoted levels must be taken as only generalised indicators, and unusual local conditions, as perhaps has been found in the 'back-fen' Fengate/Flag Fen area, may have caused significant local variations. There may also have been significant 'within-period' fluctuations. The projected water level during different periods may be taken as a guide, but cannot automatically be used to determine the presence/absence of sites with any degree of certainty; such a prescriptive approach should be avoided.

With rising levels from the Mesolithic period (c.8500-4500BC), when the whole landscape was dry, by the middle of the Neolithic (c.4500-2200BC) the peat fen is assumed to have lain at the -0.3m contour, although reconstructions of its line must be seen as only approximate. The Bronze Age (c.2200-850BC) fen-edge lay close to Ordnance Datum. Coincidentally the present day peat, wasting away from its maximum height during the seventeenth century, lies at a similar level, and the present peat boundary provides a useful, if again approximate indication of the Bronze Age fen-edge (Hall 1987: 10). Rising water levels during the Bronze Age, around 1300-1400BC saw the lowest areas of the Flag Fen embayment, and the area between Whittlesey and Stanground, becoming seasonally flooded 'flood meadow' (Pryor 1992). As such, the landscape of the evaluation areas was undergoing very similar changes as those seen in the archaeologically well-known Flag Fen/Fengate area.

Water levels rose to the c.3m contour during the Iron Age (c.850-BC-42AD), falling back to the c.2m level for much of Roman period (Hall 1987: 10-11). However, as an illustration of the approximate nature of such levels, it may be

¹ Bore hole logs were kindly made available by Mr A. D. Corley of Hanson Brick.

noted that where excavated at Flag Fen, the Roman Fen Causeway was found to lie between c.1.3-1.7m OD (French & Pryor 1993: 96). Certainly, Roman (43-350AD) activity may well be found substantially lower than this notional 2m OD level, depending on local conditions, and the degree of peat shrinkage and erosion.

Rising water levels and flooding in the late and post-Roman periods are well-attested across the Fens (Bromwich 1970, Waller 1994). During the Saxon period, continued rise may have placed the fen-edge around 3.5m OD. Simple monocausal explanations may not be appropriate, but they may reflect generally worsening climatic conditions, a breakdown in drainage systems or the effects of intensified land-use and associated erosion during the Roman period, or a combination of such causes, perhaps with further localised factors (French & Pryor 1993: 19). Their effects have been recorded close-by in the Fengate-Flag Fen area, and some evidence for this was also recently found during fieldwork to the east within the King's Dyke pit where alluvial deposits cover parts of a Roman settlement (Mortimer 1995: 21). Relatively high water levels may have continued into the later Medieval period, until the cutting of Moreton's Leam in the late fifteenth century (Darby 1940), and virtually all the assessment area will have lain within the fen during this period.

As well as experiencing changing water levels, the course of the main river channels also appear to have changed over time. During the Bronze Age, some of the Nene waters were running north of Whittlesey island in a major channel (now seen as a roddon) crossing Thorney, with another major channel to the south of the island, again marked by a roddon (Hall 1987: fig. 38). Two smaller palaeochannels probably associated with this southern system were recently exposed during a field evaluation west of the Star Pit Quarry (Lucas 1997a: fig.1). During the Roman period a successor to this southern channel still appears to have been active across the south side of Whittlesey from the Stanground area.

An additional source of more detailed information relevant to the Bradley Fen area is the report of the Fen Dyke Survey (French & Pryor 1993), a project which has examined a number of dyke sections in the area east of Peterborough, aiming to enhance our understanding of the area through a combination of archaeological, environmental, geophysical and geochemical surveys. During the project, two east-west running sections were examined in Northey along dykes running just north of the present Nene channel, providing a transect across the 'island'. This showed the land surface at a height of c.1m OD at its west side, near the pumping station, rising towards the east with its highest point at c.3.15mOD (TF 5233 2984) apparently falling away quite steeply further east.

While similarly detailed data are not available south of the Nene and Moreton's Leam, it seems reasonably clear that until at least the late Roman period Northey 'island' should be seen as a peninsula at the northwest end of

Whittlesey island. As such, evidence for ancient settlement and landuse patterns from Northey may be directly relevant to areas immediately to the south, particularly in the Bradley Fen area, possibly forming a single landscape. In view of this, establishing possible southward associations of the known prehistoric complexes on Northey island (see below) is potentially of considerable importance in balancing and extending current perceptions of this area which have necessarily looked to the west and the Flag Fen/Fengate complexes. More generally, the assessment area may be considered as part of a backfen landscape, similar to, and indeed linking up with that of Flag Fen/Fengate

Previous archaeological work

A general and relatively up-to-date overview of existing archaeological knowledge of the area may be found in the reports combining both off-site research and field work, carried-out as part of the English Heritage (HBMC) Fenland Survey. The areas in question are not effected by Scheduled Monument constraints, although a site just to the north of Bradley Fen is currently in the process of being scheduled (see Northey Gravel - site 41).

An early major contribution to the archaeology of this region was made by George Wyman Abbott, the Peterborough antiquarian who first revealed the presence of significant prehistoric remains in gravel quarries in the Fengate area (1910). Recognition of the importance of the material recovered ensured the continuation of work during the inter-war years (Leeds 1922, Fox *et al.* 1926, Hawkes & Fell 1945), and this area has remained a major focus of research interest until today, with the discovery of a number of nationally and internationally important sites.

A major more recent impetus to work was the designation of Peterborough as a New Town, accompanied by the considerable development and expansion of the urban area associated with such a designation. As a response to this, the Royal Commission undertook a survey of development areas (RCHM(E) 1969). Such early work indicated significant archaeological remains in the Fengate, Fletton, Woodston and Stanground districts, areas now largely lost beneath new developments.

The scale and extent of the remains lost during this period of development remains difficult to assess, but was probably very considerable. As Francis Pryor has suggested, the ancient field systems preserved around Fengate may originally have extended all the way around the fen-edge embayments (Pryor 1992), but have only survived in very limited areas. Such patterns have been seen on the fen margins in both southern Cambridgeshire, and Lincolnshire, where recent work has revealed further extensive prehistoric field and drove systems, interspersed with ritual monuments (Evans & Knight 1997a, 1997b; Lane 1993).

Most of the assessment area was surveyed during 1982-3, during the Fenland Survey of Whittlesey parish (Hall 1987). A relatively small area to the west, on the margins of the urban area of Peterborough, was surveyed during 1986 (Hall 1992). The field work component of this project consisted of systematic field walking, of varying intensity (Hall 1987: 15-16). The coverage and documentation of the study areas is generally of good quality and likely to be quite reliable. During the course of the fieldwork the eastern part of the Bradley Fen site was walked in 30m transects under good conditions, while the western part (apart from a small area then under grass) and the Must Farm site were covered to a satisfactory level (Hall 1987: fig.37; 1992: fig.6). The results of other previous work in the vicinity of the assessment areas will be outlined below, prior to examining evidence for the two specific assessment areas.

The Whittlesey Environs

The environs of the assessment areas and their archaeology may be discussed in three main areas:

- Area 1* to the northwest, largely within Thorney parish, the area providing access across Northey 'island' through which communications towards the Flag Fen/Fengate fen-edge,
- Area 2* the 'high' ground of the Whittlesey islands to the east,
- Area 3* Horsey Toll and the Stanground 'peninsula' to the southwest.

A review of the patterns of settlement of these different areas, and their change over time, is a necessary element in establishing the broader context of the assessment areas, allowing us to identify possible factors which may have determined and constrained past occupation and land use. Similarly it is possible to identify the main gaps in our knowledge, which may also have a bearing on this evaluation.

Bold numbers included in the text indicate sites and/or findspots listed in the archaeological gazetteer in Appendix 1 at the rear of this report. Their location is shown in figures 3 and 4

Area 1 Northey and the northwest part of Whittlesey island

The low fen areas to the north and northwest of Whittlesey island, in the parish of Thorney, have a complex settlement history much affected by the shifting of the fen-edge. This is particularly important with regard to links between Whittlesey and the 'mainland' in the Flag Fen area, along a route running northwest from near Bradley Fen. A land route, the 'Fen Causeway',

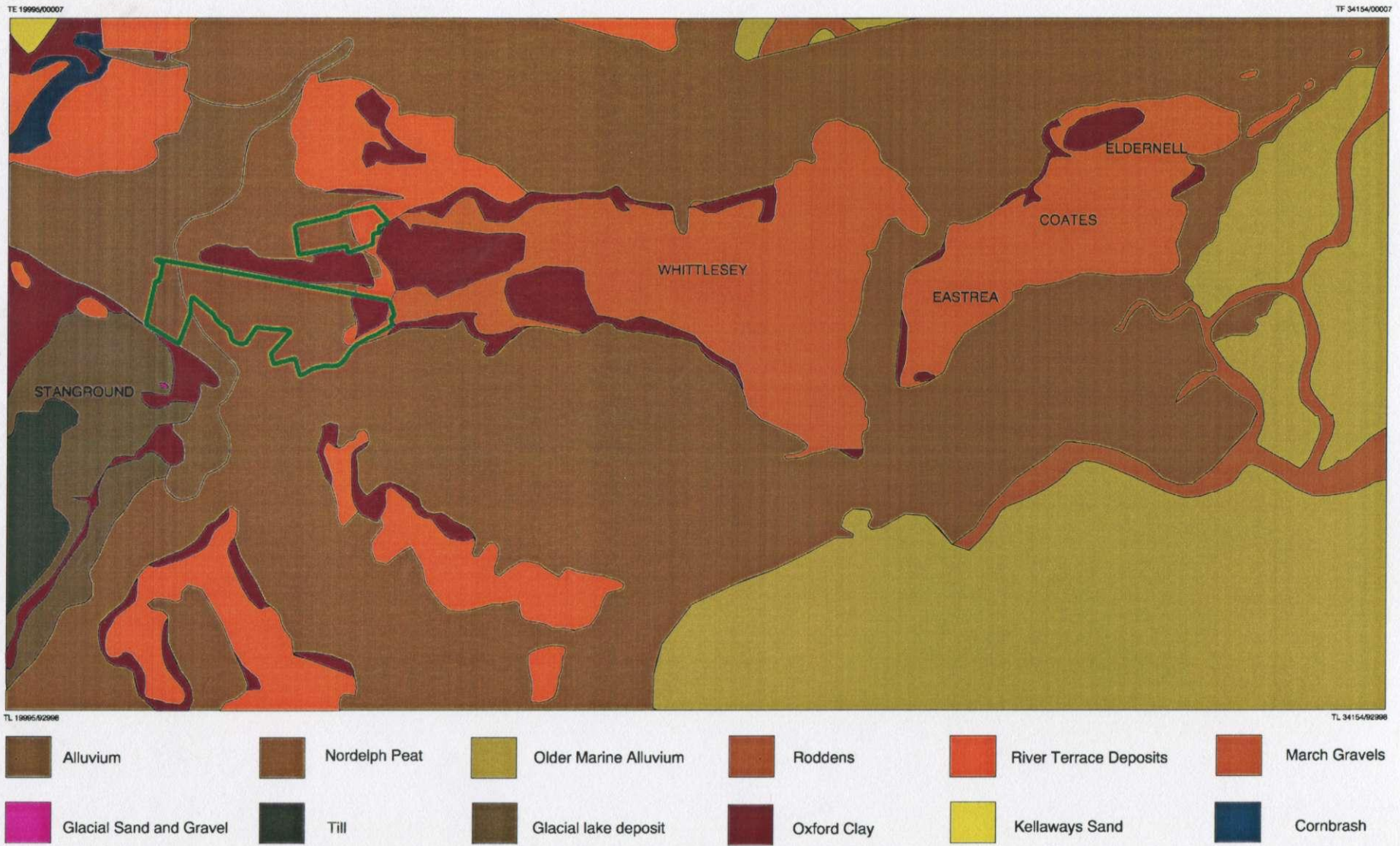


Figure 2- Geology of the Whittlesey area (after British Geological Survey 1984)

running through Northey, seems likely to have been open until the end of the Roman period and will have been a key point of access onto the Whittlesey islands. This probably only disappeared during the Medieval period when, with the exception of Thorney island, and a small area at Northey, the whole area reverted to shallow fen, with the western fen-edge lying on or near the line of the Cat's Water (Hall 1987: fig.35). To the north, Flag Fen proper consists of the large basin bounded by the Oxney peninsula to the north.

Most of the Neolithic landscape within Thorney remains masked by later deposits. A complex system of roddons has been plotted southeast of Thorney which unite in a large channel which appears to represent an early northern branch of the Nene which passed between Whittlesey and Eastrea; further extensive patterns of dendritic roddons are preserved from other branches passing south of the islands (*op.cit*: fig.38). Relatively little Neolithic material is known from Thorney, the main example being at Singlesole on the edge of the Eye gravel peninsula (Hall 1987: 48). Around Fengate, Peterborough, an important later Neolithic (Grooved Ware) settlement complex was excavated Storey's Bar Road (Pryor 1978a), also located on gravels; a Neolithic henge monument has recently been shown to have further structures (possibly ritual) located nearby (Pryor in press; Gibson pers. comm.). Occasional finds of Neolithic pottery and flint have come from Northey dyke sides (9) (French & Pryor 1993) indicating some activity of this period at this end of Whittlesey island.

Bronze Age activity is much better documented, both from survey results and following the extensive programmes of excavations in the Flag Fen area (8), and Fengate to the west. Survey data highlighted the presence of at least 17 ploughed-out barrows near the fen-edge on the west side of Thorney parish, part of a more extensive spread of such monuments extending into Eye and Borough Fen, and further barrow groups south of Whittlesey (the 'Suet Hills') and near Coates to the east (Hall 1987: 57). An isolated barrow is recorded on the high ground at Northey (11), with occupation activity, including a salt working site (12) close by (Gurney 1980) in an area quarried for gravel. The most recent work on Northey has suggested the presence of complex and long-lived Bronze Age field systems, comparable to those at Fengate (Pryor 1992: 521).

With regard to Whittlesey, particularly significant Bronze Age features of this landscape are the Flag Fen platform (8) (an artificial wooden platform covering c.1.4ha) and the 1km long alignment of posts linking it, and Northey, to the Fengate 'mainland'. This alignment/causeway is associated with an extraordinary group of metalwork, deposited on its southern side (Pryor 1992; Coombs 1992). Including spearheads, swords, knives and a variety of personal ornaments, these objects appear to be deliberate deposits within the Flag Fen embayment, representing an unusual manifestation of a more widespread phenomenon during the Bronze and, to a lesser extent, Iron Ages. Most of the many finds of Bronze Age metalwork from elsewhere in the region (see below and Gazetteer) represent such deposits.

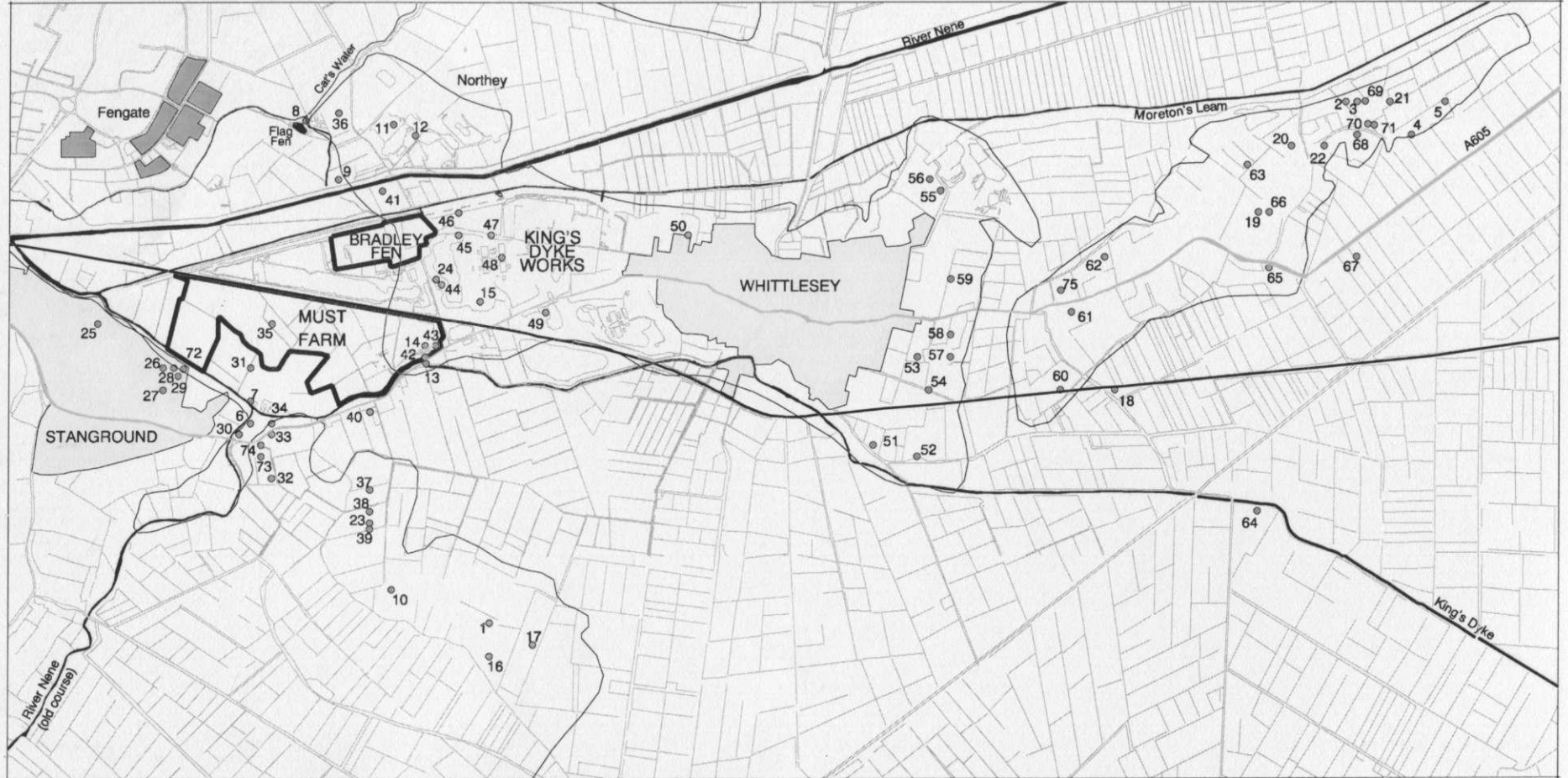


Figure 3 Location of archaeological sites and finds listed in the gazetteer

Further evidence for extensive prehistoric occupation of the 'island' along the north side of the present course of the Nene, was found during the Fen Dyke Survey of this area (French & Pryor 1993). Sections exposed during dyke cleaning east of the pumping station (Dyke 9) revealed extensive spreads of archaeological material with further elements of a Bronze Age (and Iron Age) complex seen further east (Dyke 8) by Northey Lodge (TF 5238 2985) and Four Chimneys Farm (TF 5245 2986) (French & Pryor 1993: 92).

The Iron Age saw major changes in landuse and associated settlements, associated with the shift away from a pastoral economy to a more mixed farming regimes during the second half of the first millennium BC. One major Iron Age settlement has been extensively excavated at the Fengate Cat's Water site, where a small nucleated settlement occupied an area of about 1 hectare. Elsewhere, Iron Age activity is less well-defined but several settlements have been identified to the northeast of Cat's Water, on the higher gravels (c.3m OD) on the western edges of the parish, with some further Late Bronze Age/Early Iron Age activity in the Tower Works area of Fengate (Lucas 1997b). To the north, three sites are known which may also relate to a series of cropmarks visible in aerial photographs, marking the presence of paddocks and enclosures of quite extensive field systems (Hall 1987: pl.IX).

Much of these preserved cropmarks system may be of later Roman date, but elements seem likely to date back to the third century BC. It remains possible that further Iron Age field systems are represented in other parts of the quite extensive cropmarks plotted in this area, but it is not possible to differentiate between sites of the two periods on the basis of air photos alone. In Northey, a square soilmark just to the north of the line of the Roman Fen Causeway very near the end of the island (*op.cit*: Pl.X) may be a temple site, possibly with Iron Age origins (36), although the high water levels may have much reduced the areas of dry land and may have separated Northey from the rest of Whittlesey island at times.

Roman period links to the north are probably dominated by the route of the Fen Causeway, providing access to the 'mainland' in the Fengate area. No precise date for the construction of the Fen Causeway has yet been established, although a date in the third quarter of the first century AD seems likely (Pryor 1980: 151ff). In the absence of any evidence linking the Cat's Water late Iron Age settlement and the Fen Causeway, running past the north side of the settlement, it seems likely that settlement here was abandoned by this date, with perhaps a shift in the focus of settlement to the Vicarage Farm Romano-British settlement which was occupied by the second half of the first century (Pryor 1984: 228).

As noted above, numerous area of cropmarks, probably largely of Roman date (but some possibly Iron Age) lie to the northeast. Plotted examples are illustrated by Hall (1987: fig.33). The presence of the probable Roman

(Romano-Celtic) shrine near the end of Northey island has been noted above, with further cropmarks visible close-by, near the roadline.

Area 2 Whittlesey and the Eastrea-Coates-Eldernell high ground

The evidence from Whittlesey and the islands to the east (Eastrea-Coates-Eldernell) appears markedly different to the distribution of known archaeological sites on the 'mainland' to the west. However, as will be reiterated below, little is known of settlement along the immediate margins of the islands - the shifting fen-edge. This is, of course, in marked contrast to the situation to the northwest (in the Fengate/Flag Fen area) where the bulk of our knowledge comes from such locations.

The importance of these areas around Whittlesey is heightened, however, in view of the disappearance of most of the western fen-edges under the Peterborough conurbation over recent decades. Its potential with regard to well-preserved remains is also not inconsiderable and, as was found during recent evaluation work by the CAU in the Star Pit expansion (Lucas 1997a), many peat covered areas may still remain waterlogged, although already severely effected by desiccation.

Prehistoric occupation on Whittlesey island is very poorly represented. Neolithic and earlier remains are restricted to a few chance finds, mainly in the Eldernell area. Bronze Age material is limited to the barrows at Coates (19) and a number of chance finds of metalwork. The recent discovery of bronzework in the Eldernell hoard (22) (French & Pryor 1993), an area which had previously produced several other pieces of metalwork, confirms that further finds may be made, most likely on the fen-edge, where such later Bronze Age votive/ritual deposits tend to occur. The distribution of such deposits and other hoards still remains poorly understood, but as noted above, the remarkable collection of metalwork recovered from Flag Fen and Fengate (Coombs 1992), provides an indication of the potential richness of such deposits. However, at present, it remains unknown to what extent such finds may be repeated elsewhere.

One of the only areas of the island fen-edge so far investigated lies immediately west of Star Pit, southwest of Whittlesey. Recent field evaluation revealed very little evidence for any prehistoric activity here, with only occasional lithics representing background, non-intensive activities. (Lucas 1997a: 7). The wider significance of this remains difficult to determine; the assessment area was relatively small while the location, facing onto the open fen, differs markedly from the enclosed 'backfen' on the west side of Whittlesey island, including the Flag Fen area.

Iron Age material is all but absent, although possibly late Iron Age material is reported from the area of Roman finds in the brick pits off Funtham's Lane (24). However, in the absence of further documentation, the significance of this material remains unclear and an early Roman date remains possible.

With widespread Roman period activity across the islands (see below) the possibility of an Iron Age basis for this cannot yet be discounted.

Numerous findspots of Roman material are known across the islands to the east, as well as several areas of cropmark features, most of which are likely to represent Roman-British field systems. This extensive Roman settlement of the islands may in part relate to the presence of the Fen Causeway, especially at the points of entry to the island ends, best seen in the cluster of (probably related) sites at Eldernell (67-71) (Hall 1987). Recent work indicates the presence of a substantial complex of settlements and enclosures/field systems, associated with the landfall of the Fen Causeway (Heawood, 1997).

Many of the cropmarks plotted across the islands may be associated with the known settlements and other findspots. It is assumed that most of these are agricultural settlements, perhaps serving both the Peterborough area to the west and the March area to the east, further along the Causeway. The closest of these lies just to the east of Bradley Fen (46); an area recently assessed in advance of further quarry extensions (Mortimer 1995, 1996), while a rare earthwork site just to the north, at Northey Gravel (41) seems likely to be of Roman origin. The aerial photographic survey commissioned for this work has demonstrated that the extent of the field/enclosure systems was even greater than previously thought, extending eastwards over more than a kilometre (Appendix 2: fig.3).

The projected line of the Fen Causeway, although well-established in the literature (and so plotted on OS maps) remains problematic and cannot be taken as secure. In the King's Dyke area, the general course of the Roman road towards Whittlesey remains uncertain although it has long been presumed to lie beneath the current track on the north side of the pits, continuing on a straight line through Whittlesey town; the straight alignment appearing to be the main factor supporting such a hypothetical route. However, recent investigation along this track line in the King's Dyke pit found no trace of an early road here, the pit-side track appearing to be of nineteenth century date (Mortimer 1995: 20). In view of this, it remains possible that the road alignments in Whittlesey are merely the result of nineteenth century 'town-planning'. Early nineteenth century maps certainly provide no suggestions that this line was a recognised landscape feature. Features which are probably to be associated with the Causeway are gravel quarry pits, of the type recently discovered in Stonald Field, on the east side of the King's Dyke 'Area A' site (Mortimer 1995: 18). Similar features may be expected elsewhere in the vicinity.

A review of the evidence suggests the possibility of a number of possible alternative routes. One possible line passes close to the northeast corner of the Bradley Fen quarry area. This alignment crosses the Northey Gravel site (41) just to the north, where a slightly sunken trackway skirts the east side of

the standing earthworks.² It then follows the line of Northey Road before swinging west across the Cat's Water towards Flag Fen. While the visible surface remains at Northey Gravel almost certainly represent a relatively recent track line, it is possible that it masks the line of the Roman track. If such is the case, the Fen Causeway may pass very close to or even across the extreme northeast corner of the assessment area. No traces of the Causeway have so far been seen in exposed sections along the Nene or adjoining dykes however.

A second potential route lies further east, linking in with an alignment, running approximately northwest-southeast, picked up during field evaluations within the King's Dyke 'Area A'. Such a projected line leaves the Northey road near Mason's Farm running southeast, following the highest parts of the gravel towards Whittlesey. Its projected course coincides with the metalled road with flanking ditches test excavated in the 'Area A' evaluation (Mortimer 1996: 18-19). Some 4m wide, but possibly originally somewhat wider prior to the recutting of the ditches, the gravel surface of the road was thin and poorly preserved. While narrower and less substantial than might be expected, in the absence of evidence from comparable sections of the road on the islands (as opposed to true 'Causeway' sections across the fen), this possibility cannot be excluded.

The subsequent line of this road remains unclear. However, no further traces of any road have been found further east in 'Area A' during a series of field evaluations, which suggests that it continued towards the southeast for some distance, into the area of the working King's Dyke brickworks. Such a route would run close to the Romano-British settlement once located north of Itter Farm (48), and indeed a road was recorded near the pit edge during excavations by local volunteers in 1983-84 (45) (TL 241 978), although unfortunately no details are given with regard to the road alignment in the only published note on this work (Moore 1984). If this is the road line it might be expected to swing eastwards from near Itter Farm, possibly joining the line of the Peterborough road on the west side of Whittlesey proper.

A third, although less probable route, might place the road further north, turning east along the north of the 'Area A' King's Dyke extension. Such a route could follow a similar line to the post-medieval track across this area, recorded on the first series Ordnance Survey map. This rejoins the putative 'Fen Causeway' line running through north Whittlesey, but again it should be noted that there is no corroborative evidence for this being of Roman date. In the absence of any confirmation as to where the Causeway crosses the Nene and Moreton's Leam, further evidence bearing on this problem is only likely to come from crop/fieldmarks on aerial photographs or from fieldwork.

² This substantial (3 hectare) earthwork site (Fenland Survey: Whittlesey 1), located on the north side of Moreton's Leam, is currently being surveyed by the RCHM(F), in advance of scheduling.

Area 3 *Horsey Toll and the Stanground peninsula*

To the southwest, Stanground, formerly part of Huntingdonshire, is a peninsula, surrounded by the medieval course of the river Nene, with Farcet Fen to the south and the fen area of Drysides on its north side, within which the Must Farm evaluation area is located.

Prehistoric activity in the Stanground area is again poorly represented. A Palaeolithic axe 'from Stanground' is in Peterborough Museum, but its exact source and context is unknown. Some isolated lithic finds represent Neolithic activity, while some Bronze Age pottery is reported from Stanground, with a complete beaker found on the site of the Old Manor House, and other pottery on the line of the Peterborough-Whittlesey road (Page & Proby 1926: 202-5). Museum objects in Peterborough, generally poorly contexted early finds, include several palstaves, spearheads, socketed axes as well as rough metal, most of which seem to come from the area of Horsey Bridge (*op.cit.*: 207).

The Stanground area (25-29) contains the largest known fen-edge pottery production area during the Roman period, probably sited to exploit the combined presence of Oxford Clay and peat fuel (Hall & Coles 1993: 113). This forms the eastern outlier of the major group of potteries of the Nene Valley. What are probably the main centres are now largely overbuilt in Stanground although further kilns may lie to the southeast around Bunding Drove (39) (TL 233 953).

The extent of associated settlement in Stanground remains unclear but it may extend over two or more hectares, and is reported to extend eastwards beneath the alluvial cover, perhaps east of the line of the present King's Dyke. Report elements include the pottery kilns themselves and related debris, field systems, limited structural remains and two or three groups of Roman burials (Meadows, Challands and Standen pers. comm.). The most recent field work in the area, carried-out in advance of the Park Farm developments suggest less intensity of activity towards the southeastern edge of the peninsula (Northants Archaeology 1994, 1995). Finds around Horsey Grange (34), including the building stone, tiles, fragments of mosaic pavements are important in indicating the presence of quite substantial buildings in the vicinity.

Reports of wharves and a causeway (25) in this area suggests that the Roman waterfront lay close to this line, and canalisation remains a possibility, and recent field inspection shows the presence of a low, but well-defined east bank of the channel, substantially to the east of the current bank. No other information has been found bearing on the east side of such a channel(s) and the lack of systematic recording of most of the Roman sites in this area prior to their destruction makes it difficult to determine their full extent and character, although their importance cannot be doubted.

The significance of two Anglo-Saxon bronze vessels recovered from the edge of Stanground (72) remains uncertain, but they appear to have been recovered from peat levels. Their location close to the old course of the River Nene, in an area likely to have been submerged beneath the peat at this time, contrast with the grubenhaus (75) (sunken featured building) from the dry slopes of Eastrea island, further east. While the metal work finds may represent lost items, or those deliberately placed in the wet context as an isolated event, further evidence of Anglo-Saxon activity cannot be discounted from the greater region of the Must Farm application area. Five Viking swords and spears were also recovered from the river in the Stanground area, but their exact provenance remains unclear (Salzman 1938: 326-7).

The Cromwellian fort at Horsey Toll (73) is an important feature of the more recent landscape of this area, and a Scheduled Ancient Monument (SAM 156). However, it forms a discrete monument and there is no evidence for any related features impinging onto the assessment area.

Aerial Photographic Survey

The plotting and interpretation of aerial photographic coverage has considerable potential for revealing elements of early settlement and landuse patterns, and has been used to considerable effect in many areas of the Fens and neighbouring regions (Palmer & Cox 1993). To extract the full potential of this valuable resource, we have examined existing surveys of the region, some previously commissioned by the CAU, as well as published reports, while a new study of available coverage was commissioned from Air Photo Services. The results of their work are summarised in the sections below, and included in full as Appendix 2.

Bradley Fen

The Bradley Fen site comprises some 29 hectares on the south side of Moreton's Leam, with previously quarried areas lying to the south (Bradley's Pit) and east.

Landscape projections for the Bronze Age and Roman periods suggests that much of the western part of the site, essentially the area with peat cover, lay within the fen (Hall 1987: fig. 40). The east side remained dry forming the west end of the Whittlesey island, extending into the fen in Northey. The fen-edge was probably situated close to the line of Funtham's Dyke and the Cross Drain linking the Nene and Moreton's Leam. However, in the absence of detailed evidence concerning the sub-peat topography, as well as the uncertainties inherent in estimating the exact location of the early fen-edge in different periods, it would be premature to attempt to define the likely boundary of areas with archaeological potential.

On the basis of the aerial photographic records, it seems likely that the higher east side of the site falls within the extensive Romano-British enclosure systems linked with the settlement located in the fields to the east (46). Some further relationship may exist with the earthworks site at Northey Gravel (41) lying just to the north. Interpretation of recent survey work on this site by the RCHM(E) suggests that this is a multi-period monument, probably of Roman origin.

As noted above, the uncertainty surrounding the course of the Fen Causeway from Northey to Whittlesey makes it impossible to suggest whether it may have had a particular impact on settlement here. In general terms, if no further evidence can be shown for a direct association with the road, the area of Bradley Fen lying above the fen during the Roman period may fall within outer field systems of the settlement at King's Dyke 'Area A' and the possibly associated earthwork site at Northey Gravel. Currently, little evidence exists to suggest more intensive activity in this area.

Must Farm

The larger area at Must Farm comprises some 151 hectares, currently under crop. Its eastern side lying on the edge of Whittlesey island, its southwest side adjoining the rising ground of the Stanground peninsula. Some 10 hectares of the east end of the area has already been quarried, with the loss of any archaeological remains apart from a small number of objects recovered from the vicinity (see Appendix 1). Due to the low-lying position of most of the area, there was little potential for aerial photographic analysis. However, a number of probable archaeological ditches were visible, which may be associated with the cluster of Roman sites at Stanground. Some further traces were apparent just to the east side of the old Must Farm pit, which may have some association with the cluster of archaeological material found in this area. Parts of these feature may survive on the eastern edge of the pit.

Known archaeological finds within, or in the immediate vicinity of the quarry area include significant, if poorly contexted finds of both Bronze Age and Roman date. These include a Bronze Age rapier and sword (14) from the old Must Farm Pit, another from Horsey Toll Farm (7), while a decorated flat axe was recently recovered from a private garden close to the A605 (Redding pers. comm.). Roman pottery and a sword has come from the area of the old Must Farm Pit (42), with further finds of Roman pottery from the centre of the area (35) and near Horsey Toll Farm (31) and Black House Farm (40) just to the south of the evaluation area. A further extensive site, or cluster of sites, lies near Bunding Drove to the south (37-39). In this last area, substantial ditches were traced over at least 600m, which were suggested to represent the edge of a large field system or even possibly an estate boundary (Hartley & Standen 1959).

Treated by broad periods, prehistoric material appears quite abundant. Early finds of prehistoric boats near Horsey Bridge (6), probably on the old Nene channel, highlight the potential for important waterlogged sites, particularly in the lowest areas. The Bronze Age weapons recovered from within the area of the old Must Farm Pit are poorly contexted, but seem likely to represent examples of deliberate deposits at the fen edge. To these may be added the late Bronze Age sword ploughed up at Horsey Toll Farm in 1964, while as noted above, the Horsey bridge area has produced many other bronze objects, now in Peterborough Museum. The location of the Horsey Toll sword would tend to place it close to the Stanground fen-edge and/or near the open Nene channel, like the Horsey Bridge finds. Bronze Age pottery is also reported from Field's End Bridge, close to the King's Dyke by Must Farm Pit, but this lacks any secure context and its significance remains uncertain.

Little Iron Age activity may be expected due to the relatively high water levels recorded during this period but by the early first millennium AD, the island fen-edge seems likely to have lain a little to the west of the area now occupied by Must Farm. Within the study area, most of the higher ground has already been removed during old quarrying operations at the Must Farm Pit. According to current landscape reconstructions, areas further west would largely have lain within the fen. However, the presence of Roman material from a number of locations within and around the Must Farm site, raises a number of questions concerning the topography of the area during this period. Three of the sites (31, 35, 40) are located in very low areas which we might expect to lie within the fen. If representing material disturbed by ploughing, these suggest that the peat is not very deep in these localities and the ancient topography of these areas certainly needs further study. While unlikely, the possibility that the material is redeposited on the fields must be considered.

During this period, there may have been one or more open channels in this area, flowing around the south side of the Must Farm site. The exact location of such a channel(s) remains unknown, but as was noted above, perhaps lies close to the line of the current King's Dyke on the south side of Whittlesey island, ultimately leading to the reported waterfront sites along the east side of Stanground. The possibility of some canalisation here cannot be excluded (Evans 1979). Further east, along the south side of Whittlesey the Roman course of the Nene probably follows that of a large roddon now visible (Hall 1987: fig. 40). Roman traffic along this channel is perhaps marked by finds of a group of Roman lamps c.1741 close to Whittlesey Dyke at Glassmoor (64) (TL 3140 9540), suggested to be a lost cargo.

As was seen above, this area has no direct association with the Fen Causeway. However, it must be noted that the status of the area between Must Farm and Horsey Toll, and the location of the presumed river channel, remains uncertain. The finds spots in the putative 'fen' areas certainly suggest some activity in this low area. This fact and the narrowness of the low-lying area, also raises the possibility of an east-west route, providing a direct link

between Whittlesey and Stanground. Certainly, the presence of a track or causeway (with or without a bridge crossing) cannot be excluded, perhaps somewhere quite close to the line of the present King's Delph road or King's Dyke.

The southwest part of the assessment area adjoins parts of Stanground (25-29) where the series of Roman sites, spread over at least 2 hectares, are known, including pottery workshops. There are reports of waterfront facilities, variously described as wharves and/or causeways, from here and to the northwest, and elements of the site(s) are covered by alluvial deposits on its east side (Hall & Coles 1993: 113). In view of the discovery of well-preserved prehistoric boats near Horsey Toll to the southeast of Stanground, the preservation of further Roman waterfront remains and/or other waterlogged remains in the general locality is an important possibility.

Later finds from this area give no clear indication of any significant activity in the area. An Anglo-Saxon cauldron and bronze vessel were found on the west side of the King's Dyke at Stanground in 1966 during the cutting of a pipe ditch. They are recorded as coming from peat deposits overlying substantial dumps of Roman kiln waste in alluvial deposits, but cannot be closely dated by style or context. A Viking spear and axe recovered early this century from close to Horsey Toll remain of unknown origin.

Conclusions

On the basis of the available data it is possible to highlight a number of key themes and research issues central to the archaeology of this region, which in turn may be used to define the relative potential of different parts of the assessment areas, which may be scaled according to their relative importance (appropriate mitigation schemes are suggested in the next section). It is convenient to again discuss the potential of the two sites in terms of their archaeological potential by period, and then in more general terms.

Bradley Fen

There are no direct indications of Bronze Age activity on the Bradley Fen area. However, the relatively 'busy' prehistoric landscape at Northey, just to the north, linking in with the Fengate landscape on the 'mainland', raises the possibility that related features may extend southwards along the western side of Whittlesey island. Determining the presence or absence of significant activity in this area has very considerable importance with regard to uniqueness of the Fengate/Flag Fen complex. Any traces of this early occupation is, however, sealed beneath the peat deposits which cover most of the area, and will require intrusive field evaluation to locate them.

Similarly, there is no direct evidence for Iron Age or Roman period occupation within the area, but the proximity of Romano-British settlements and field systems immediately to the north and east suggest that some elements of these may extend into this area. As found on the east side of Funtham's Lane, the presence of burials of this period remains a small, but not insignificant possibility. No significant later occupation is likely on the peat-covered western part of the site following the post-Roman rise in water levels.

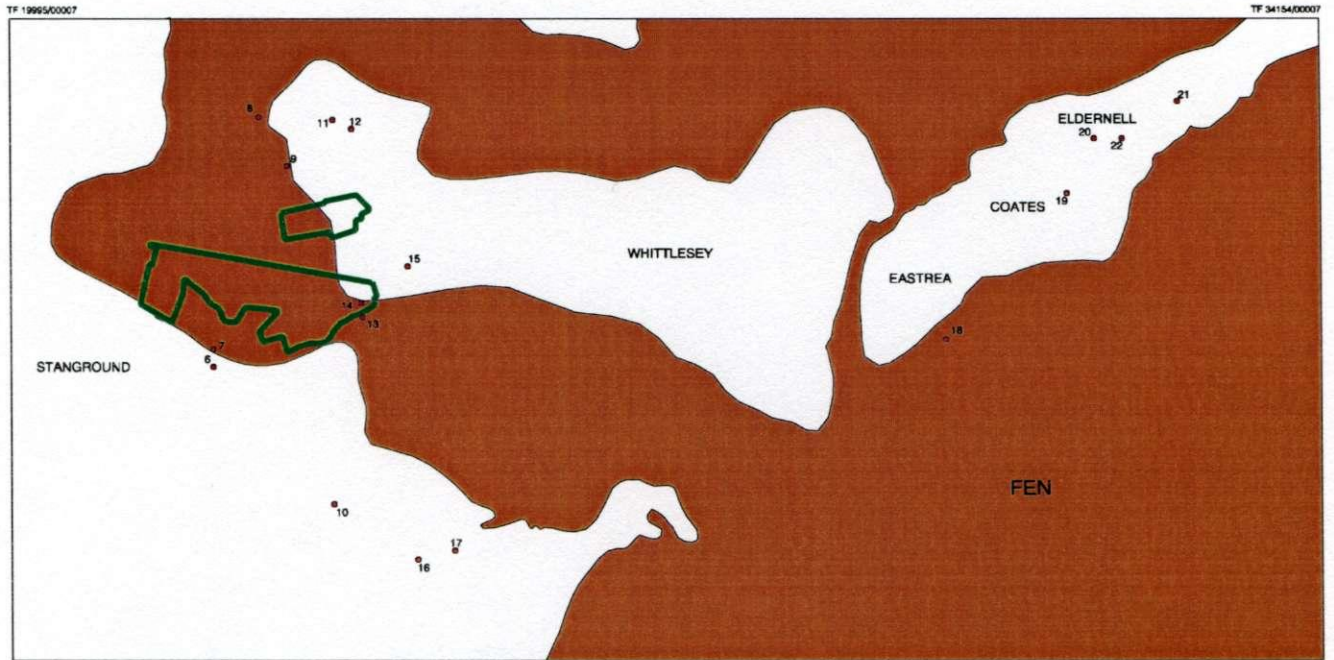
Must Farm

Three key areas may be highlighted within the Must Farm site, largely on the basis of past finds. These relate to the Whittlesey fen-edge on the east side near the old Must Farm Pit, the central area to the north of Horsey Toll farm, an area which has produced what appear to be significant quantities of Roman material, and the western edge of the site adjoining Stanground. All areas are masked by peat and/or alluvium, although the surface finds from the central region, apparently disturbed by ploughing, suggest that the peat deposits are not very deep.

In general terms, the evaluation areas must be seen to have considerable archaeological potential. Locally, these represent significant areas, albeit marginal, of Whittlesey island, much of which has already disappeared under housing or in quarry pits. As with the Bradley Fen area, they also represent important surviving areas of the fen-edge close to the nationally, and indeed internationally important Fengate/Flag Fen complex. With the destruction of so much of the ancient landscape of the Fengate environs in the Peterborough area, the potential importance of these areas has proportionally increased.

As has been stressed above, prehistoric activity on the Whittlesey islands is, to date, very poorly represented. However, the presence of Bronze Age barrows and occasional finds suggests that this may not accurately reflect the true situation, but instead more of the history and character of fieldwork. The presence of significant Bronze and Iron Age activity at Northey, at the northwest end of the island, (the one area which has seen some investigation), suggests that the absence of similar sites elsewhere may largely be due to the lack of exploration of the Whittlesey fen-edge.

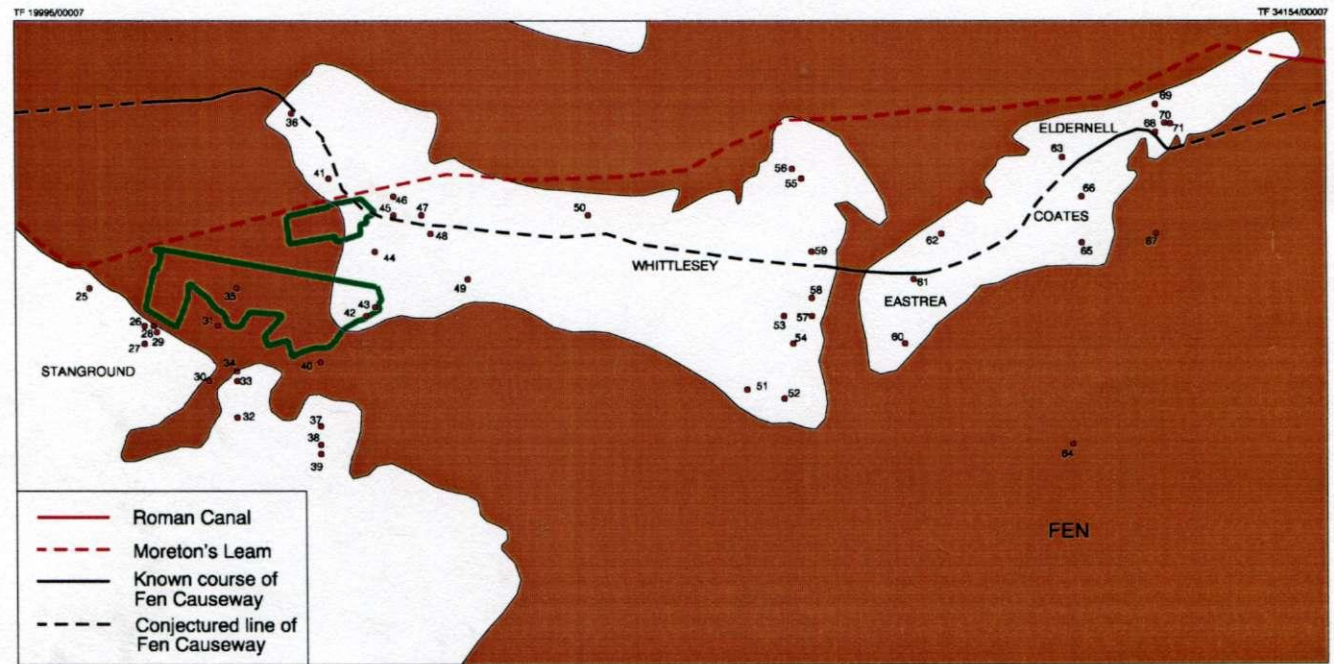
The numerous, if generally poorly contexted finds of bronzework close to the assessment area, highlights the potential for such deposits, at least in fen-edge areas. The Horsey Bridge area has produced the majority of these finds, but all areas close to the old river channel and fen-edge have the potential to produce such finds, either isolated objects or as hoards. It may also be noted that systematic metal-detection in the area has also removed a further unquantified but clearly substantial amount of material, especially from higher areas (Redding pers. comm.). In general, the substantial quantities of Bronze Age metalwork known to have come from the Horsey Toll-Whittlesey



TL 19995/02998

TL 34154/02998

Bronze Age



TL 19995/02998

TL 34154/02998

Roman

Figure 4- Location of sites, find spots from the gazetteer and extrapolated fen edge (after Hall 1987)

'crossing' must raise questions concerning the scale and character of activity at what is effectively the southern entrance of the Flag Fen embayment.

The proximity of parts of the Must Farm area to what are probably extensive Roman industrial as well as waterfront areas at Stanground, is clearly of great potential significance. However, the current lack of firm evidence concerning the river channel, and its possible canalisation, makes it difficult to predict the possible location and nature of any Roman remains within the assessment area. More definite conclusions may be drawn once the exact position and character of the east bank of the channel is better-documented.

More generally, it is worth noting that the CAU's recent fieldwork at the King's Dyke pit in Whittlesey has thrown up a number of interesting questions regarding the overall status of Whittlesey island in Roman times. Ambiguity now surrounds the location of the Fen Causeway - the late first century AD arterial route across the fen to Denver, Norfolk from Peterborough, yet it is evident that it was supported, or preceded by a canal, aligned roughly parallel to its route and traceable from the north-eastern tip of Eldernell - east of Whittlesey (close to sites 69 and 70 fig. 4). Here, the tip of the Eastrea-Coates-Eldernell island is remodelled by the present constructed flood plain and water meadows associated with Moreton's Leam and the canalised course of the River Nene, north and west of which all traces of archaeological remains are effectively concealed by the floodplain silts. But it is tempting to speculate on the likelihood of the Roman canal extending westwards, along the known course of Moreton's Leam as it continues westwards to Stanground. The question, therefore, arises, whether the course of Moreton's Leam in this area north of these 'Whittlesey islands' in fact re-cut an older course of a probably mostly infilled canal - the adjacent transport route parallel here to the Fen Causeway. If this is the case then it would divide the two Roman sites (41) and (46), and provide further, as yet speculative, evidence regarding the possible freight-related nature of site (46). The similarity of the reappraised aerial photographic plots of regular enclosures fringing the contour of the island at (46) and those more recently plotted at Eldernell (69) and (71) (Palmer 1997), lend some degree of support to a hypothesis that suggests that these dry land entry points formed chief loading bays/cargo points and similar, raising the possibility that related structures - sluices, crane hoists and so on may be evident in these areas. The Bradley Fen area lies, perhaps, just south of the main area of interest linking sites (41) and (46) but may provide some information regarding this suggestion.

The Eldernell entry points of canal and Fen Causeway are surrounded by an extensive area of Roman (and possibly earlier) archaeological sites, many of which survived as earthworks until very recent times (Hall and Palmer pers. comm.). Here are multiple road alignments, settlement areas, enclosure systems and a possible early Roman fort that indicate the sheer intensity of settlement and other activity at this important last landing point of dry land between the Whittlesey district and March, 8km to the east. Appraisal of the

quantity of reasonably closely spaced sites at Stanground, Horsey Toll and those situated above the levels of the peat at Whittlesey, could be indicative of a similar focus of activity but one which is also influenced by the old, southward oriented course of the River Nene, from which Roman metalwork and earlier boats are known.

Recommendations

Developing a strategy for dealing with the archaeological impact of such a development cannot be divorced from wider *research* frameworks and agendas, as explicitly acknowledged by, for example, English Heritage with regard to current best practice (Olivier 1996). With regard to local, regional and indeed national research frameworks, two main foci of interest may be identified, firstly relating to the multi-period Fengate/Flag Fen research programme, and secondly to regional patterns of the Roman occupation of the Peterborough area and the Nene Valley. No significant post-Roman activity is likely to be encountered within the area due to its location within the fen.

Any archaeological evaluation in the Peterborough area is almost bound to be heavily influenced by the remarkable results of the exploration of the prehistoric landscapes in the Fengate/Flag Fen area over the last 30 years. With exceptional preservation of organic remains in waterlogged conditions, and benefiting from long-term research strategies, the complex of sites investigated in this area is of international importance and reputation.

Much future research into the Fengate/Flag Fen complexes will be focused on trying to better contextualise them, in order to better understand their 'real' significance within a wider setting. Balanced assessment of the uniqueness of their different elements, or otherwise, can only be developed with the availability of far more detailed information concerning their surrounding landscapes. The evaluation areas, including extensive areas of buried fen-edge represent substantial blocks of land whose landscape history may be so compared with that of the Fengate/Flag Fen area to the north.

The wealth of information recovered over the decades at Fengate/Flag Fen must be balanced by the general dearth of information in the surrounding areas, including those under consideration here. While a significant number of archaeological 'sites' can be identified within the evaluation area and its immediate environs (see above and Appendix 1), the quality of information remains poor, reflecting the lack of systematic research at a more detailed level than that carried-out during the Fenland Survey. Thus, while an apparently 'busy' prehistoric landscape has been identified at Northey, at the northwest end of Whittlesey island, its southward extent in the largely 'blank' areas of the evaluation areas, masked by peat and alluvium, remains unknown.

With regard to Roman period activity in the area, the areas adjoining the King's Dyke and Stanground must be seen as having a high potential, while more intensive work will be required in areas to the east where surface collections have already been made. In view of the proximity of the workshops at Stanground, a more detailed than usual level of pottery study may be required should further significant Roman remains be found. Further data concerning the distribution of such local wares in the immediate locality of the kiln sites will have considerable interest with regard to research into Roman pottery use and circulation in this area of the fen-edge (Rollo 1995). Such work cannot be divorced from its wider context within the Nene valley and as part of the well-researched Roman pottery industry of the region.

A successful programme of work will also need to better define the ancient topography of two areas, during the course of field evaluation. This is particularly important with regard to establishing the location of the fen-edge and any associated river channels during the Bronze Age and Roman period, the periods of greatest activity in the area. This information will help better establish the need for any further fieldwork in any areas which may have significant archaeological potential. An integral part of such work will be palaeo-environmental research work which has been an essential element component of the Fenland Survey.

Given the archaeological profile of the investigated fen-edge to the northeast of Whittlesey island, the presence or absence of archaeological remains within the Bradley Fen and Must Farm assessment areas may have implications far beyond their immediate area. The demonstration of negative as well as positive results will, therefore, be of equal importance and require a sufficiently systematic and extensive preliminary field evaluation programme to allow a high degree of confidence to be placed on them. Such field evaluation strategies will need to provide both the necessary landscape coverage as well as to cope with the expected considerable depths of more 'recent' deposits which currently mask any archaeological remains. It remains to stress that predicting the presence of earlier prehistoric activity in the evaluation areas remains difficult prior to such work. The existence of significant activity cannot, therefore, be excluded, and the possibility of well-preserved and possibly still waterlogged material must be anticipated.

Field evaluation

At this stage, it may be useful to identify some of the likely requirements for further field evaluation of these areas. Various options may be considered, involving augur survey, field walking, test pits and more extensive test trenches. The varying extent to which these techniques may be used will depend greatly on first determining the nature of the ancient topography under the peat/alluvial cover.

Augur Survey - palaeoenvironmental/palaeolandscape testing

As previously noted, reconstructing the palaeo-topography and environment of this area is a necessary element within such a fieldwork programme. The topographical survey may best be achieved through an augering survey, at a sufficient level of detail to identify major underlying landforms which may have influenced past occupation within the assessment areas; particularly attention must be paid to areas falling on the shifting fen-edge. Additional samples for a necessary minimum of environmental data may be collected during subsequent trenching across the areas.

A systematic augur survey conducted well in advance of investigative fieldwork would thus result in the topographic reconstruction of the old land surface. English Heritage's Fenland Survey most recently demonstrated the variations in former ground surfaces sealed beneath blanketing layers of alluvium and peat (Hall and Coles 1994, Waller 1996). A GIS type model of the application areas could be built up using detailed borehole information which would indicate areas covered by considerable or negligible depths of alluvium and/or peat that would have concomitant effects on establishing types of investigation fieldwork and their relative costs. Such information, particularly with regard to the location of palaeochannels, would also better define potentially significant areas, or those with very low archaeological potential.

The CAU have been able to provide Clients with important information regarding soft spot or waterlogged areas that have direct ramifications regarding overall method of a quarry's site stripping or extraction process. This is particularly true for plotting the courses of former rivers which may retain running silts or provide hazardous slumping potential.

Fieldwalking

Further systematic fieldwalking may be valuable in the Bradley Fen area, particularly on the higher western part of the area but depending on soil type and cover, to provide confirmatory evidence regarding artefacts in the ploughsoil. This is particularly necessary for establishing the southwestward extent of the Roman sites that exist across Moreton's Leam to the north and across the Low Road/Funtham's Lane track to the east. The non-intensive character of the fieldwalking programme conducted during the Fenland Survey, while appropriate to the requirements of that project, cannot be seen to have provided definitive coverage or sufficient intra-site information which can be used to formulate effective field evaluation strategies. Comparability with methods used within 'Area A' to the east will help with interpretation of results.

On the Must Farm site, fieldwalking in the area of known surface scatters of Roman material, north of Horsey Toll Farm, may also be recommended to

confirm the full extent of the material and provide detailed information on its character and density. Similar techniques have been successfully used during past work in the King's Dyke 'Area A', and are valuable in providing better site-definition, which may in turn be used in determining areas for any further intrusive test investigation/excavations and/or preservation strategies. Since most of the archaeological levels in the Must Farm area lies submerged beneath later deposits, fieldwalking will be restricted to more 'exposed' higher lying areas as demonstrated in the augur survey-led GIS plot.

Test pits and trial trenching

Field evaluation (test pits, trenching) will be required to expose sub-surface features, particularly where the peat/alluvium cover has obscured them.

Intrusive sampling should be compatible with previous work on the King's Dyke 'Area A' site; the upper (eastern) part of the Bradley Fen area being close to and closely comparable to that area. This will ensure that more meaningful comparisons may be drawn between these two potentially associated areas.

Field assessment using the Unit's standard landscape evaluation methods would be appropriate. This involves the mechanical excavation, to archaeologically significant layers (or the natural substratum) of test stations (each 5 x 5 metres) laid out on a staggered grid across the site area. From each test station standard volumetric soil samples of topsoil (and subsoil/buried soil if present) will be hand sorted for artefact retrieval and their distributions subsequently mapped. In deep areas the test station size would necessarily increase to 10m x 10m (see below). This exercise has three functions: it is designed to provide information regarding the presence and density of artefacts within the soil horizons; where a site has been initially fieldwalked, it complements preliminary results by providing more detailed quantitative distributions through the plough zones thereby locating site fall-off patterns, and the stripped area (25m²) of the test stations has proved to be sufficient for the location of archaeological remains.

Coupled with this will be the excavation of test trenches by mechanical excavator. These would be located on the 'clear', alternate grid lines to the test stations and cover the width of each area. These trenches will enable assessment of present archaeological remains while minimising the disturbance to potentially valuable deposits. Additional trenching will then further investigate known cropmarks, other potentially important areas and to adequately cover likely axes of linear features extending down to the fen-edge.

The planning of both test pits and trenching will need to accommodate practical problems and Health & Safety considerations relating to the expected considerable depth of peat/alluvium, as well as flooding of deep

sondages in low lying areas. This may necessitate the excavation of larger test-pits, and wider (double bucket width) trenches, to allow for 'stepping-in' and other safety measures. Again it should be reiterated that archaeological material may be located at a considerable depth, which will require pumping facilities to maintain open working areas. The present lack of depth information of these deposits precludes a more positive design intent for investigation methods but since the overburden depth ranges between 0.40-4.0m, it is likely that a variety of methods will be used accordingly.

Controlled excavation

The landscape evaluation will identify areas of archaeological interest and, by using a consistent approach throughout, the results will enable the types of archaeological sites to be ranked in order of importance. Three main levels of importance, denoting types of constraint, will be ascribed following the results of the evaluation fieldwork which will suggest types of further response/investigation (see below) that may be required:

Constraint	Type of archaeology	Type of archaeological response
Nominal	Absent or sparse archaeological remains	No further work, or limited trenching/watching brief to check alignments of linear features <i>etc.</i> (usually conducted during the evaluation as part of a contingency programme)
Limited	Dense remains or those that indicate internal integrity that enables sound interpretation. Local and regional frameworks for archaeological information begin to dictate how these 'sites' should be investigated.	Sample or total excavation (usually open area) depending on the size and extent of the site. Attempts should be made to avoid duplication of information by excavating several examples of common types of site. Previous evaluation work should facilitate this decision.
Absolute	Sites of national importance - locally unusual or well-preserved examples (<i>i.e.</i> best of their kind)	Total excavation or consideration of preservation <i>in situ</i> schema.

In line with the approved code of practice set out by The Institute of Field Archaeologists (nd), the previous evaluation fieldwork will have determined the character, relative date, nature and extent of encountered archaeological remains. These results will be crucial in deciding their relative importance - both within the new quarry areas and within local/regional research agendas held in the County Archaeology Office. With these issues in mind, their further investigation will be designed in line with an appropriate, cost-effective framework.

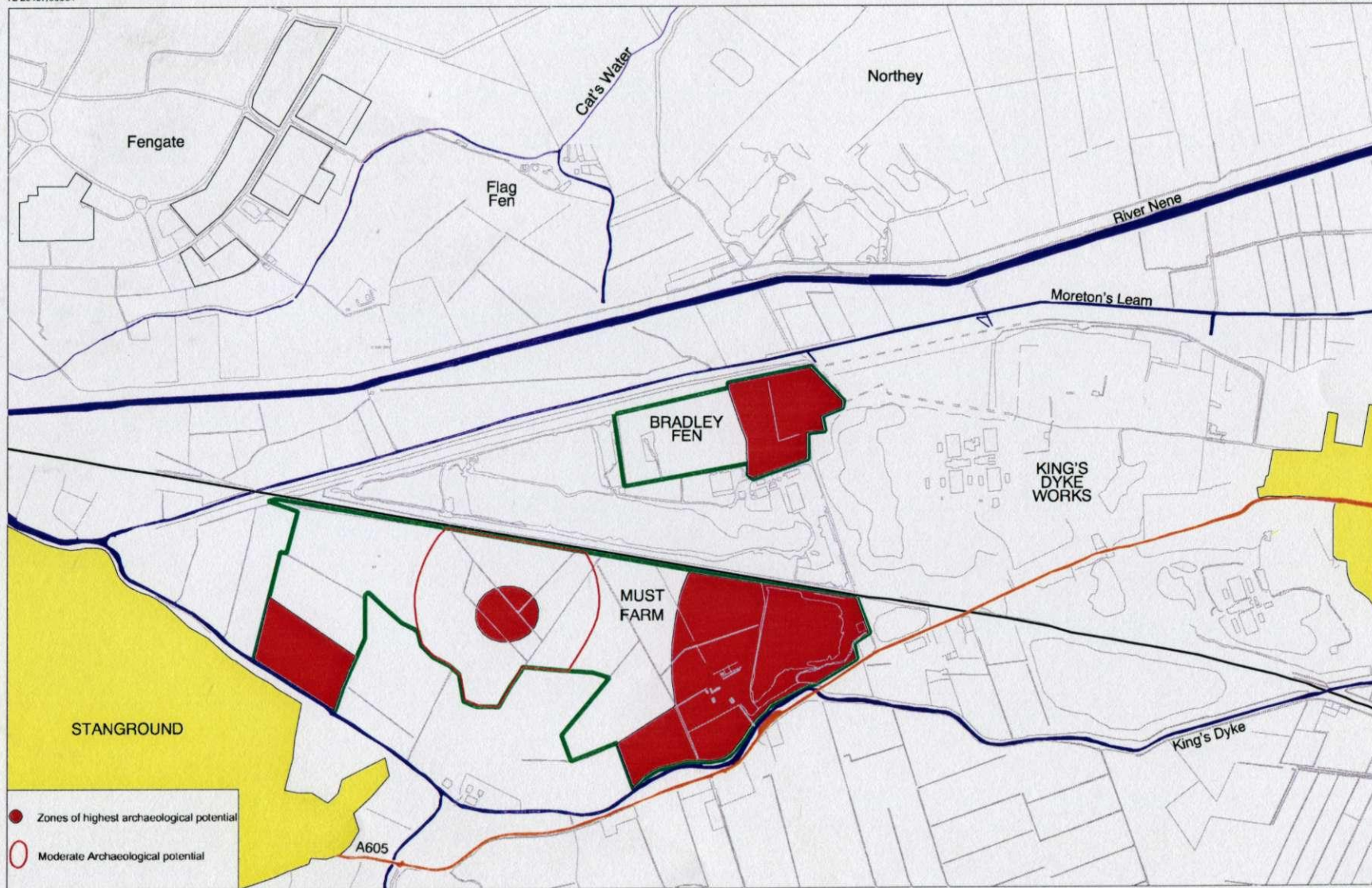


Figure 5- Area of archaeological potential

Further fieldwork entails a separate phase of controlled excavation, subject to monitoring by the County Archaeology Office and/or any Client-assigned Archaeological Consultants. Excavation will be followed by an adequate phase of post-excavation which will include analysis of the stratigraphic and artefactual information and include any necessary conservation work. The results of such excavations and analysis will be published in appropriate archaeological journals or separate monographs.

Phasing of work

The auguring survey directed at determining the palaeo-topography should commence the fieldwork commitment in the two areas. Subsequent fieldwalking, where necessary, may be carried-out independently of any intrusive field evaluations, the primary requirement being its scheduling around harvesting and/or ploughing.

The results of this combined work, together with the air photographic information supplied here, will allow the production of a more detailed plan for test-pitting and trenching, which may be conducted in several phases. Bradley Fen could be easily assessed in a single operation, while the substantially larger areas of the Must Farm site could probably be covered either as a single operation or divided into annual phases; again this will form the subject of future discussions.

Excavation periods will be scheduled to prevent unnecessary farming compensation costs as far as is possible and will precede the main phases of quarry stripping/preparation.

Other information

Any recommendations with regard to mitigation strategies will also require more detailed information regarding the planned layout and landscaping of the new quarries, for example with regard to the location of bunds and 'closed' areas bounding existing dykes and such like. This may, for example, be an important consideration with regard to the western side of the site bounding the Stanground area of King's Dyke, with its high potential for Roman period and/or waterlogged remains (fig. 5), and the south side of the evaluation area along the Horsey Toll-Whittlesey road. Of particular interest will be the pit margins where increased drainage may severely effect waterlogged peat-covered areas. Both extraction operations and drainage activities accelerate the desiccation processes (which already effect this region from existing quarries) and will have a rapid and destructive effect on waterlogged organic remains. Information will be sought regarding proposed drainage schemes designed to facilitate clay extraction in the two new areas. Additional areas of suspected high archaeological potential lie in the region around site 35 at Horsey Hill, from where extensive field scatters of Roman

pottery and tile are known. Surprisingly indicated as being beneath peat levels from previous research (fig. 4), this site provides an intriguing localised high spot of dry (ish) terrain. Given the proximity of Roman settlement (of fairly high status) to the south of site 35, there is a strong possibility that settlement extended further north than has previously been supposed.

Expected and customary practice ensures the provision of project design specifications for the phases of fieldwork. These will be updated as more is known of the archaeological landscape, and be subject to revision following consultation with the Client and the archaeological curators of Cambridgeshire County Council Archaeology Office.

Acknowledgements

Thanks are due to Tamsyn Howard at David J. Sandbrook, Andy Corley at Hanson Brick and Tim Claxton at ARC for their co-operation and assistance. Also to Mr Bernard Smith of Must Farm for allowing early access to the investigation areas. Among the archaeological community, a special thanks is due to Mr. Ian Meadows, Eric Standen and Adrian Challands, for information concerning rescue archaeology in the Stanground area, and staff at the RCHM(E) office Cambridge for helpful discussions regarding the Roman and Post-Medieval earthwork site to the north of Bradley Fen. Paul White (CAU) prepared the graphics. Dr Tim Reynolds of the Cambridgeshire County Council Archaeology Office kindly supplied additional information and suggestions concerning the archaeology of this area.

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Appendix 1

Gazetteer of archaeological sites by period

This selective gazetteer lists known archaeological sites (excluding some standing buildings and Medieval/post Medieval monuments) from the investigation area and its immediate environs. The sites are listed by general period, arranged by grid reference, proceeding from west to east (see accompanying distribution maps). References for sites include SMR (Sites and Monuments Record) numbers, where available, grid reference and, where appropriate, Fenland Survey site numbers (in Hall 1987, 1992). Note that this list excludes a number of findspots of archaeological material distant from the evaluation areas as well as a number of objects in Museum collections for which there are only vague or uncertain provenances. A small number of sites, which lie outside the mapped area, are also listed here, marked (*).

Neolithic

- | | | | |
|---|---|------------|--------------|
| 1 | King's Delph | | (TL 244 944) |
| | Find spot of Neolithic blade tool. (Hall 1987: Whittlesey A4) | | |
| 2 | Eldernell | SMR 07729 | (TL 322 991) |
| | Find spot of polished stone axe. (Hall 1987, Whittlesey A2) | | |
| 3 | Eldernell | SMR 01728a | (TL 323 991) |
| | Find spot of polished stone axe, now in Whittlesey Museum. (Hall 1987: 56). | | |
| 4 | Eldernell | SMR 03755 | TL 328 988) |
| | Find spot of flint flakes from fieldwalking. | | |
| 5 | Eldernell | SMR 03757 | (TL331 991) |
| | Find spot of Neolithic flints on gas pipeline route, 1976. (Hall 1987: Whittlesey 6). | | |

Bronze Age

- | | | | |
|---|--|-----------|--------------|
| 6 | Horsey Bridge | SMR 02955 | (TL 222 962) |
| | Find spot of prehistoric (Bronze Age?) boat and bronze spear. (Artis 1828; Hall 1987: 16) | | |
| 7 | Horsey Toll Farm | SMR 02937 | (TL 222 964) |
| | A leaf-shaped late Bronze Age sword was recovered here during ploughing in 1964. (CBA Group 7 Bulletin 11) | | |
| 8 | Flag Fen | SMR 08782 | (TL 227 989) |
| | A substantial artificial timber platform and associated 1km post alignment crossing fen from Fengate, Peterborough to the edge of Northey island. Substantial deposits of bronze metalwork were found along the post alignment. (Pryor 1992) | | |
| 9 | Northey | SMR 08783 | (TL 230 984) |

Area with Neolithic and Bronze Age cut features and finds identified during Fen Dyke Survey. (French & Pryor 1993)

- 10 King's Delph (TL 235 947)
Bronze Age barrow, 23m diameter; no associated finds. (Hall 1987: Whittlesey 12)
- 11 Northey SMR 02923 (TL 235 989)
Bronze Age barrow. (Hall 1987: Thorney: 12).
- 12 Northey SMR 02943 (TL 237 988)
Bronze Age occupation and salt workings. (Hall 1987: Thorney 46; Gurney 1980)
- 13 Field's End Bridge SMR 03154a (TL 238 968)
Find spot of Bronze Age pottery
- 14 Must Farm Pit SMR 02960 (TL 238 969)
Bronze Age rapier and sword found in clay workings (Pryor 1978b, Hall 1987: Whittlesey A7).
- 15 King's Dyke SMR 02740 (TL 243 973)
Poorly recorded Bronze age burial (see 1927 OS 6" map). (Hall 1987: 57)
- 16 'Suet Hills' SMR 02741 (TL 244 941)
Linear group of 5 Bronze Age barrows. (Hall 1987: Whittlesey 19)
- 17 'Suet Hills' SMR 02741 (TL 248 942)
Outlying Bronze Age group of barrows (see above). (Hall 1987: Whittlesey 20)
- 18 Janwell Eastrea SMR 03736 (TL 301 965)
Find spot of Bronze Age? dug out boat recovered from ditch. (Hall 1987: Whittlesey A9).
- 19 Coates SMR 03760 (TL 314 981)
Bronze Age barrow group. No associated finds. (Hall 1987: Whittlesey 11)
- 20 Coates SMR 07731 (TL 317 987)
Find spot of Bronze Age arrow head - bifacial asymmetric tanged arrowhead.
(Hall 1987: Whittlesey A3)
- 21 Eldermell SMR 01729 (TL 326 991)
Find spot of Bronze Age socketed and looped axe, 1982. (Hall 1987: Whittlesey A1).
- 22 Eldermell SMR 09746 (TL 320 987)
Find spot of Late Bronze Age hoard of 12 axes, spearhead, hammer and other material; found 1988. Location TL 325 987 in SMR record.(French & Pryor 1993: 25-30).

Iron Age

- 23 Bulling Drove SMR 01719 (TL 233 953)
Iron Age pottery recorded from area with Roman settlement remains, including probable pottery kiln debris, with further SMR numbers associated with this site (994, 999, a-b, 1364).
(Hall 1987: Whittlesey 3)
- 24 King's Dyke, Funtham's Lane SMR 03151 (TL 239 975)
Some Iron Age pottery is reported amongst predominantly Roman material from this settlement site. (Challands 1977; Phillips 1970: 188).

Roman

- 25 Stanground SMR 03153 (TL 208 971)
Roman pottery kiln site and perhaps wharf and causeway, found in 1901. (Hall 1992: 16)
- 26 Stanground SMR 03128 (TL 214 967)
Roman settlement, with generally late sherd material, burnt stone, bone and tiles. (Hall 1992: 17, Stanground 3)
- 27 Stanground SMR 03129 (TL 214 965)
Roman settlement remains, perhaps associated with Stanground 3 sites. (Hall 1992: 17)
- 28 Stanground SMR 10090 (TL 215 967)
Area of ditches and scattered Roman features, including group of 5 inhumation burials, probably part of a larger cemetery. Probably Roman, although Anglo-Saxon brooch (SMR 10090a) also recovered from this area.
- 29 Stanground SMR 03128 (TL 215 967)
Roman pottery workshops, excavated in 1965. (Dannell 1973; Hall 1992: 16, Stanground 3)
- 30 Horsey Toll Bridge SMR 04016 (TL 221 961)
Find site of Roman coin.
- 31 Horsey Toll Farm SMR 01369 (TL 222 967)
Sherd scatters, collected 1956-59, in Whittlesey Museum.
- 32 Horsey Grange SMR 04018 (TL 224 957)
Roman burial site. Burials ploughed out in 1960's.
- 33 Horsey Grange SMR 04017 (TL 224 961)
Roman settlement remains.
- 34 Horsey Toll Road SMR 04015 (TL 224 962)
Roman building remains including building stone, tile, tesserae and pottery. Part excavated in 1961. (Phillips 1970: 188).
- 35 Horsey Hill SMR 04019 (TL 224 971)
Sherd scatters south towards Horsey Toll Farm. (Phillips 1970: 188)
- 36 Northey SMR 08188 (TL 230 990)
Square soilmark recorded from aerial photographs, just to north of Fen Causeway. Romano-Celtic temple? (Hall 1987: Thorney 44)
- 37 Bunding Drove SMR 07735 (TL 233 956)
Roman settlement with occupation debris, bone sherds and tile fragments extending over 0.3ha. (Hall 1987, Whittlesey 4)
- 38 Bunding Drove SMR 00995 (TL 233 954)
Roman settlement debris including second-third century pottery and tile spread over 0.3ha among elements of an extensive field system. Finds in Norris Museum. (Hartley & Standen 1959; Phillips 1970: 188; Hall 1987, Whittlesey 2)
- 39 Bunding Drove SMR 07734 (TL 233 953)

Roman settlement remains, including probable pottery kiln debris, with further SMR numbers associated with this site (SMR 994, 999, a-b, 1364). (Hall 1987: Whittlesey 3)

- 40 Black House Farm SMR 02939 (TL 233 963)
Find spot of Roman pottery and ditches. (Phillips 1970: 188)
- 41 Northey Gravel SMR 07730 (TL 234 983)
Substantial earthwork site, probably Roman period; no finds known. (Hall 1987: 57, Whittlesey 1)
- 42 Field's End Bridge SMR 03154 (TL 238 968)
Finds spot of Roman pottery, coin, sword and strainer within clay pit, recovered in 1965. The context of the sword, probably an auxiliary cavalry weapon of late first century date, remains uncertain but possibly a deliberate (votive?) deposit. Apparently from peat deposits 8-10ft deep. (CBA 1965; Howe 1978; VCH 1978: 5).
- 43 Field's End Bridge SMR 02940 (TL 239 969)
Finds of Roman coins and pottery. Site of PMSAFS excavation 1962. (Phillips 1970: 188)
- 44 King's Dyke, Funtham's Lane SMR 03151 (TL 239 975)
To the east of the lane, 8 north-south burials (several mutilated) and 2 pits were recovered on the edge of the clay pit, with a large ditch on their west side. Quantities of first/second century pottery from the ditches and from among the skeletons suggest a Roman date for them, while some Iron Age pottery may also be present. (Challands 1977; Phillips 1970: 188)
- 45 Low Road SMR 03496 (TL 241 979)
Ditches and a pit were recovered in this area during 1983-1984 excavations by the Whittlesea Archaeological Field Unit, possibly relating to line of Fen Causeway? (Moore 1984)
- 46 King's Dyke SMR 10171 (TL 241 981)
Romano-British settlement marked by extensive surface scatters and cropmarks on aerial photographs. Also investigated areas, within SMR 11702. Landscape evaluation revealed finds-rich dark earth accumulations at core of system of 'paddocks' with more extensive field system. (Hall 1987: Whittlesey 14; Mortimer 1995, 1996)
- 47 'Low Road' SMR 02941 (TL 244 979)
Cremation from this area reported in PMSAFS records. (Phillips 1970: 188)
- 48 King's Dyke, Itter Farm. SMR 09662a (TL 245 977)
Excavations of a 28 x 15m area during 1958-1959 revealed a series of settlement-related ditches and pits of Roman date with material spanning the late first-fourth centuries. The site was clearly substantially larger with further features seen to the south and west, with pits, ditches and postholes to the north. (Challands 1978)
- 49 King's Dyke SMR 03126 (TL 249 972)
Romano-British settlement site, with ditches, burials and some worked flint, presumed site of Roman burial marked on 1929 6" OS map.
- 50 Whittlesey SMR 110457 (TL 262 979)
Area with cropmarks showing ring ditch, east of Stonald Field. Possibly Romano-British.
- 51 Whittlesey SMR 02949 (TL 279 960)
Find spot of Roman pottery.
- 52 Whittlesey SMR 02920 (TL 283 959)
Find spot of Roman pottery.

- 53 Whittlesey SMR 04335 (TL 283 968)
Area of cropmarks - possibly Roman period field systems.
- 54 Partridge Farm SMR 02938 (TL 284 965)
Find spot of Roman coins. (Phillips 1970: 188) - some 400m W of site below.
- 55 Bassenhally SMR 07728 (TL 285 983)
Romano-British settlement site; pottery 2nd-4th centuries. (Hall 1987: Whittlesey 10).
Cropmarks to SW
- 56 Bassenhally Field SMR 04280 (TL 284 984)
Area of cropmarks, possibly associated with site above.
- 57 Partridge Farm SMR 01062 (TL 286 968)
Romano-British settlement site, marked by scatters of sherds, tile and quern fragments. (Hall 1987: Whittlesey 15)
- 58 Whittlesey SMR 04154 (TL 286 970)
Area of cropmarks, possibly of Roman period.
- 59 Whittlesey SMR 04155 (TL 286 975)
Area of cropmarks possibly including line of Fen Causeway.
- 60 Lattersey Field Farm SMR 10163 (TL 296 965)
Romano-British settlement site, marked by spread of burnt stone, bone and sherds. (Hall 1987: Whittlesey 16)
- 61 Eastrea SMR 10593 (TL 297 972)
Romano-British settlement site, marked by extensive cropmarks with ditches, fields and track systems. (Hall 1987: Whittlesey 21).
- 62 Eastrea SMR 10164 (TL 300 977)
Small Romano-British occupation site. (Hall 1987: Whittlesey 18)
- 63 Coates SMR 03919 (TL 313 985)
Romano-British settlement remains including sherds and brick. (Phillips 1970: 197)
- 64 Glassmoor Farm SMR 03938 (TL 314 954)
Find spot in 18th century of group of Roman lamps, likely to be a lost cargo on now extinct river channel. (Phillips 1970: 196; Hall 1987: Whittlesey A8)
- 65 Coates SMR 03789 (TL 315 976)
Romano-British settlement located on glacial gravels, with cropmarks closeby. (Hall 1987: Whittlesey 5)
- 66 Coates SMR 03732 (TL 315 981)
Romano-British settlement remains including sherds and quern. (Phillips 1970: 197; Hall 1987: Whittlesey 17)
- 67 Kingsland farm SMR 03754 (TL 323 977)
Find spot of Roman pottery from fieldwalking.
- 68 Eldernell (TL 323 988)
Romano-British settlement site, part excavated in late 19th century. (Hall 1987: Whittlesey 7)

69 Eldernell SMR 01728 (TL 323 991)
Romano-British settlement site with gravel road linking to the Fen Causeway. Associated cropmarks. (Hall 1987: Whittlesey 8)

70 Eldernell, Chapel Farm SMR 01366 (TL 324 989)
Find spot of Roman pottery.

71 Eldernell SMR 03877 (TL 324 989)
Romano-British settlement with earthwork remains, associated with sites 7 & 8 above. (Hall 1987: Whittlesey 9)

Post-Roman - Medieval - post-Medieval

72 Stanground SMR 02972 (TL 215 967)
Find spot of Anglo-Saxon cauldron and bronze vessel in pipe trench, 1966. (Dallas 1976)

73 Horsey Toll SMR 02973 (TL 223 959)
Cromwellian fort guarding approaches to Stanground. Scheduled Ancient Monument 156. (Hall 1987: Stanground 2)

74 Horsey Toll (TL 223 960)
Find spot of Viking spear, with possibly associated skull; to Peterborough Museum in 1912. A poorly provenanced Viking axe is also from this area. (Howe 1984)

75 Eastrea SMR 02834a (TL 296 974)
Grubenhauser sunken Anglo-Saxon building - Scheduled Monument 109. (Hall 1987: Whittlesey 22).

Appendix 2

Aerial Photographic Assessment for the Must Farm and Bradley Fen area, King's Dyke, Whittlesey, Peterborough (TL 2196 - 2498)

Rog Palmer MA MIFA
Air Photo Services

Introduction

This assessment of aerial photographs was commissioned to examine an area of some 180 hectares between Stanground (TL214969) and Whittlesey Brick Works (TL239981), bordered on the south by modern roads and on the north by Morton's Leam, in order to identify and accurately map archaeological and natural features and thus provide a guide for field evaluation. Mapping was conducted at a scale of at 1:2500.

Archaeological and natural features from aerial photographs

In suitable soils, sub-surface archaeological features ñ including ditches, banks, pits, walls or foundations ñ may be recorded from the air in different ways in different seasons. In spring and summer these may show through their effect on crops growing above them. Such indications tend to be at their most visible in ripe cereal crops, in June or July in this part of Britain, although their appearance cannot accurately be predicted and their absence cannot be taken to imply evidence of archaeological absence. In winter months, when the soil is bare or crop cover is thin (when viewed from above), features may show by virtue of their different soils. Upstanding remains are also best recorded in winter months when vegetation is sparse and the low angle of the sun helps pick out slight differences of height and slope.

Grass rarely shows such marks but instead may reveal sub-surface features through the withering of the plants above them. These may occur towards the end of very dry summers and usually indicate the presence of buried walls or foundations. Such dry summers occurred in Britain in 1949, 1959, 1975, 1976, 1984, 1989 and 1990 (Bewley 1994, 25) and more recently in 1995 and 1996. This does not imply that every grass field will reveal its buried remains on these dates as local variations in weather and field management will affect parching. However, it does provide a list of years in which photographs taken from, say, mid July to the end of August may prove informative.

Natural faults and deposits can cause similar differences in crop growth and may also appear as startling colour changes in bare winter soils. In the area of this assessment area we may expect indications of the Fen edge on some winter photographs and there is the possibility of periglacial cracks ñ which

may be mistaken for archaeological ditches ñ on gravel deposits. The latter can affect the growth of crops and become visible at the same times as archaeological features.

The most informative aerial photographs of archaeological subjects tend to be those resulting from specialist reconnaissance. This activity is usually undertaken by an experienced archaeological observer who will fly at seasons and times of day when optimum results are expected. Oblique photographs, taken using a hand-held camera, are the usual product of such investigation. Although oblique photographs are able to provide a very detailed view, they are biased in providing a record that is mainly of features noticed by the observer, understood, and thought to be of archaeological relevance. To be able to map accurately from these photographs it is necessary that they have been taken from a sufficient height to include surrounding control information.

Vertical photographs cover the whole of Britain and can provide scenes on a series of dates between (usually) 1946-7 and the present. Unfortunately these vertical surveys are not necessarily flown at times of year that are best to record the crop and soil responses that may be seen above sub-surface features. Vertical photographs are taken by a camera fixed inside an aircraft and adjusted to take a series of overlapping views that can be examined stereoscopically. They are often of relatively small scale and their interpretation requires higher perceptive powers and a more cautious approach than that necessary for examination of obliques. Use of these small-scale images can also lead to errors of location and size when they are rectified or re-scaled to match a larger map scale.

Photo Interpretation and Mapping

Photographs examined

Cover searches were obtained from the Cambridge University Collection of Aerial Photographs (CUCAP) and the National Library of Air Photographs (NLAP), Swindon. Photographs included those resulting from specialist archaeological reconnaissance and routine vertical surveys.

Photographs consulted are listed in Appendix A following this report.

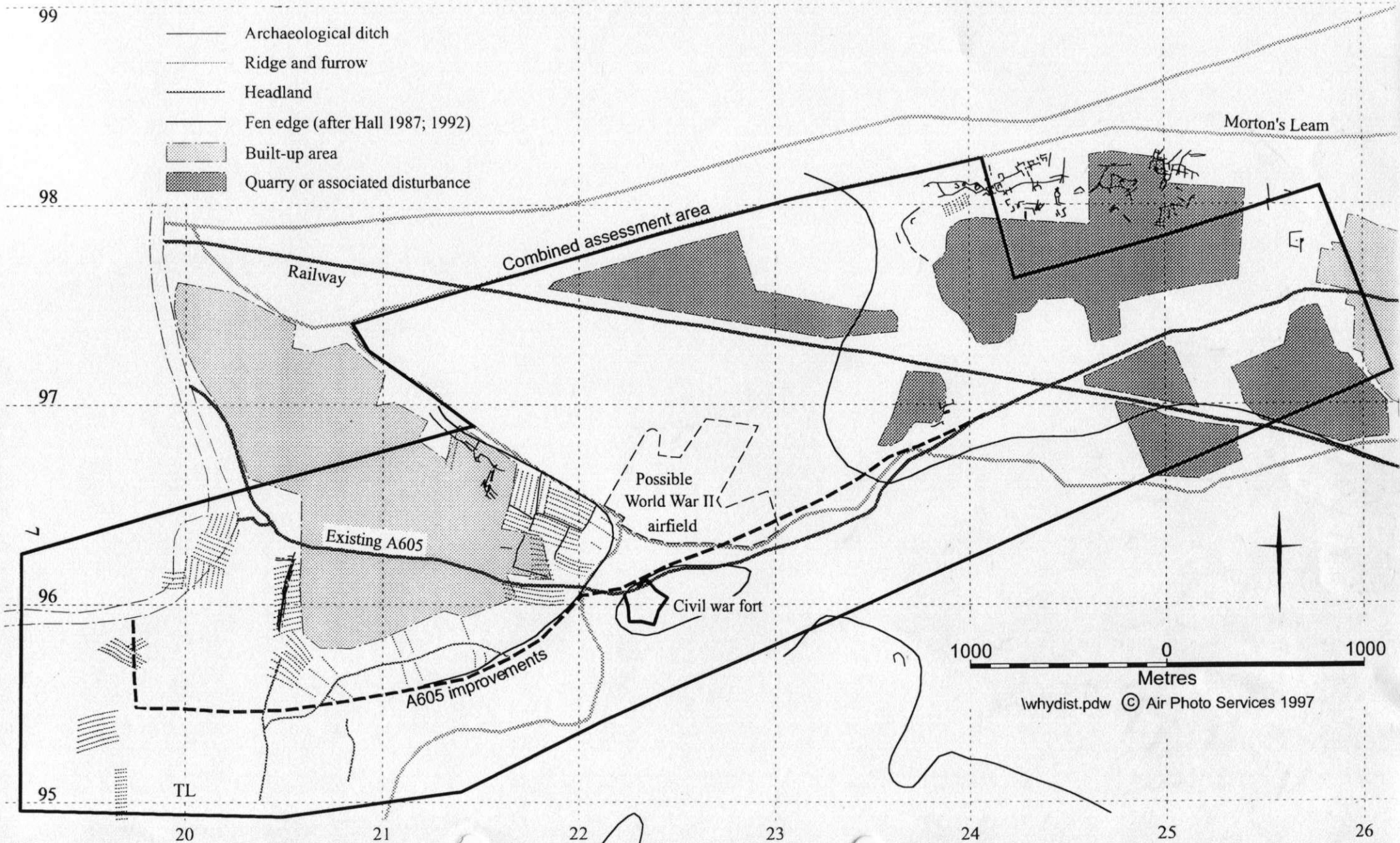
Base maps

A base maps at a scale of 1:10000 and 1:5000 were provided by the client. Parts were enlarged to provide the 1:2500 backgrounds for Figures 2 and 4 in this report.

Photo interpretation and mapping

All photographs were examined by eye and under slight (1.5x) magnification, viewing them as stereoscopic pairs when possible. All information relevant to this assessment has been interpreted and mapped from vertical photographs

Figure 1. Stanground to Whittlesey: combined context for road and extraction areas.
 Features identified from aerial photographs.



at 1:10000 or 1:7500 scale. Interpretations were marked on overlays to individual prints following procedures described by Palmer and Cox (1993). All rectification was computer assisted and carried out using AERIAL 4.2 software (Haigh 1993).

AERIAL computes values for error of control point match between the photograph and map. In the 1:2500 rectifications prepared for this assessment these were less than $\pm 2.0\text{m}$ (Figure 2) and $\pm 3.0\text{m}$ (Figure 4). Rectified and plotted output was combined to form the basis of the digital plans that illustrate this assessment.

Commentary

Soils

The Soil Survey of England and Wales (SSEW 1983) shows the area to include deposits of Chalky till (series 411d) and River terrace drift (series 573a) separated by a band of river alluvium over peat (series 813a). The first two deposits correspond to the west and east high ground shown in Figure 1 and provide the land on which most of the known archaeological features have been recognised. Hall (1987, 55-56; 1992, 15) provides more detail on the Flandrian deposits of the area.

Archaeological features (Figure 1)

The context map combines information interpreted for two current assessments that have a common boundary along the existing A605. It would seem logical for these to share the increased area of small-scale information shown in Figure 1.

Almost all of the information in the context map has been interpreted from vertical photographs taken between 1946 and 1982. Archaeological reconnaissance has taken place in the area (at very least by CUCAP, and RCHME plus myself) but although parts of the Whittlesey gravels have shown crop-marked features, there is little to be seen on the low ground (nor would it be expected) or in the immediate environs of east Peterborough. Within the area examined there has been a mass of recent development including the expansion of Peterborough and Stanground and the opening of new pits for the Whittlesey brick works. Many of the features recorded for the first time in this assessment had been destroyed before they were identified.

Figure 1 shows foci of activity on the high ground: prehistoric and/or Roman at Stanground and on Whittlesey island, and medieval at Stanground. The latter has been recorded as parts of a once-larger system of ridge and furrow (most of the area of present houses was formerly medieval fields, but these have not been mapped due, partly, to problems of matching 1940s

Figure 2. Whittlesey Pits: area TL2196. Possible archaeological features identified on aerial photographs

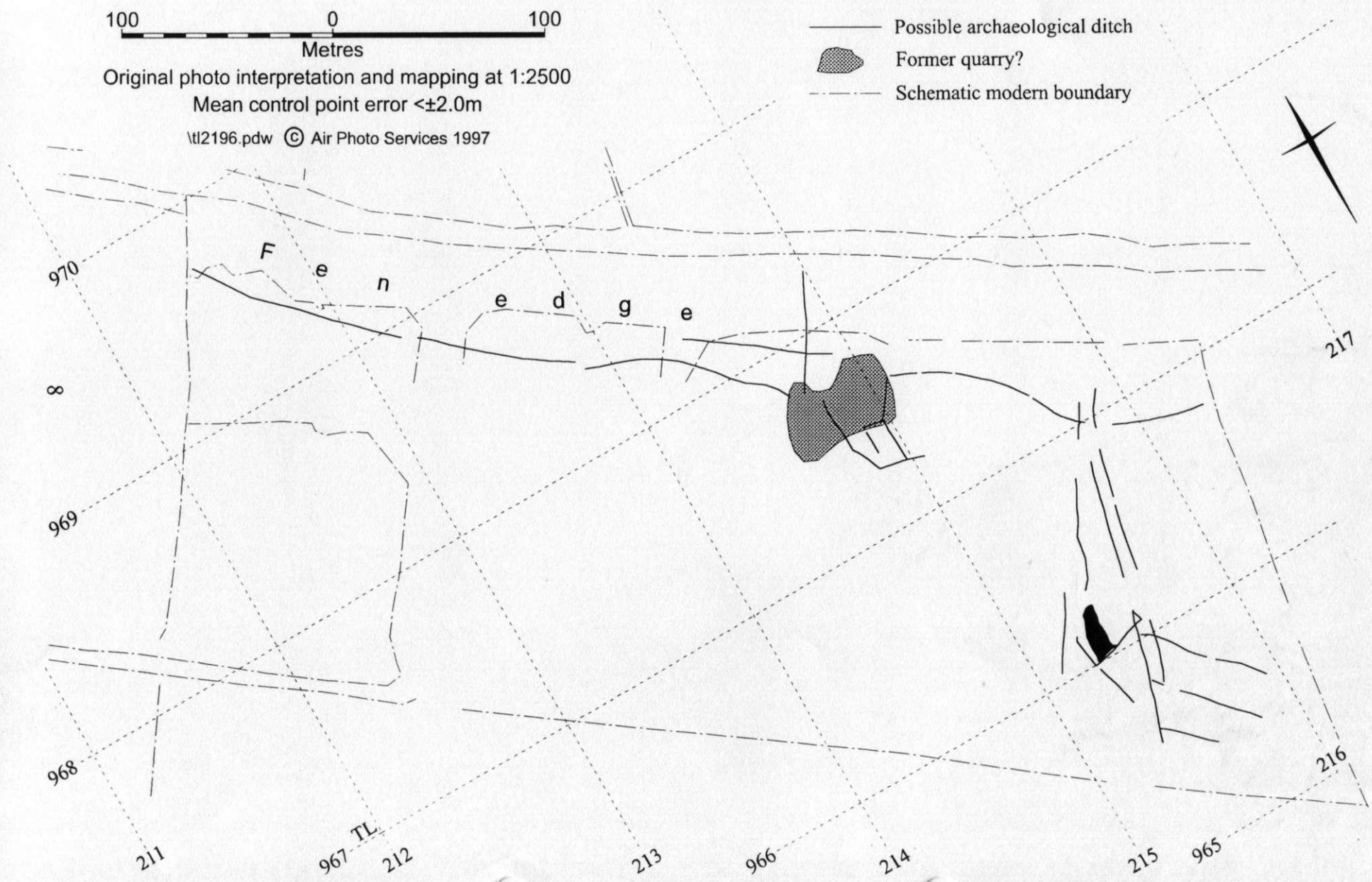


Figure 3. Whittlesey Pits. Features identified on aerial photographs adjacent to Whittlesey 14

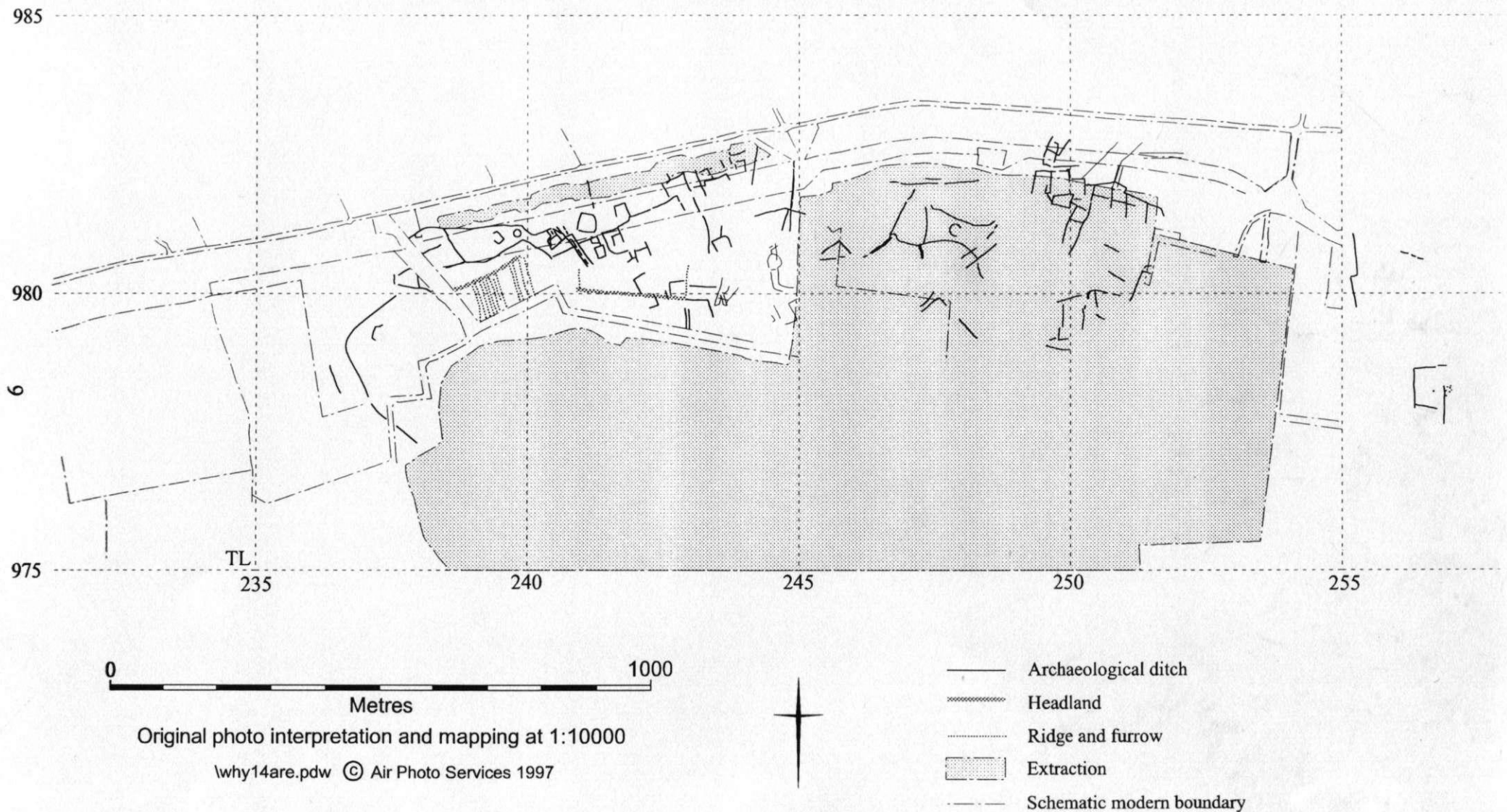
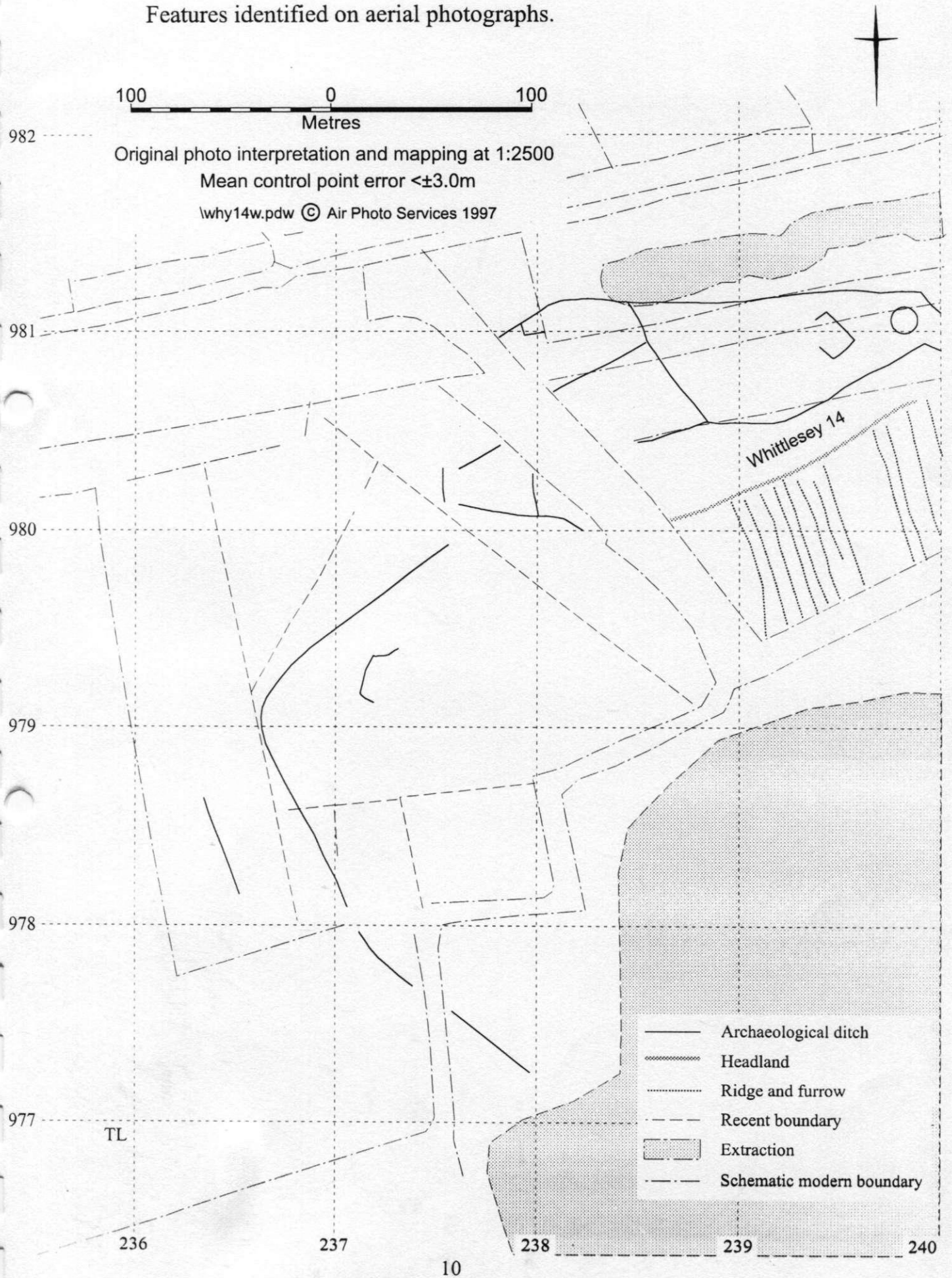


Figure 4. Whittlesey Pits. Area TL2397.
 Features identified on aerial photographs.



photographs with a 1990s map!). The medieval fields were likely to have been confined entirely to the high ground and not, therefore, to extend on to the adjacent low ground that lies within the current assessment area. The fen edge along the north side of Stanground is marked by a very steep (in Fenland terms) slope which was likely always to have been a natural boundary. One area, on the then-east edge of Stanground (TL219963) was the subject of an earlier APS aerial photographic assessment (Cox 1994) and the relevant information on Figure 1 was reduced from that mapping.

Notes on areas showing evidence for pre-medieval structures follow in a west-to-east order:

Area TL2196 (Figure 2)

The mapped features are on the high ground at Stanground and lie immediately south of the assessment area. They extend over and beyond the pottery scatter identified by Hall as Stanground 3 (Hall 1992, 16-17) and may be related to that Roman period of activity. Most of the features mapped were visible on only one set of photographs and have been shown as possible ditches. It is uncertain whether the long east-to-west alignment does show actual cut features or is a representation of the fen edge.

Most of this area is now lost under recent housing, but in view of Hall's reminder of the 1920s identification of a wharf and causeway there is a possibility that the features mapped have some bearing on what may lie within the assessment area on the low ground abutting the fen edge.

Area TL2397 (Figures 3 and 4)

Figure 3 provides context at 1:10000 for the small area north of Bradley's Pit on which have been identified probable archaeological features. Those features, mapped at 1:2500 in Figure 4, appear to include an arc of ditch that may have been a western boundary close to the fen edge (a relationship shown in Figure 1) which marks an effective enclosure to features on that part of Whittlesey island.

The features survived in earthwork form on early photographs, but had been levelled by 1964 when the field was converted from pasture to arable use. At that time several small fields were made into the present larger unit and traces of those former boundaries may be identified during field investigation.

Examination of photographs in, and around, this area revealed no traces of features likely to indicate the course of the Fen Causeway. If its course was as shown by the Ordnance Survey and Hall (1987, Figure 40) the road would cut roughly north-south across the features mapped and would separate the arc of ditch from Whittlesey 14 to the east.

Figure 3 shows many newly identified ditched archaeological features although a large percentage of these are now lost through mineral extraction or related processes. They may help locate or provide context for some of the pre-destruction field work that has taken place in the area. By the date of the earliest photographs examined for this assessment, a considerable extent of land had already been quarried and no information can be added in those parts. However, the additions made during this assessment point to a high density of occupation in an area where the course of a Roman road joins high ground with fen. A similar concentration of activity has been mapped recently on the east end of Whittlesey island (Palmer 1997) and another is known from personal research at Grandford, March: all three areas are linked by the Fen Causeway.

Non-archaeological features

Area TL225964, Possible World War II airfield (Figure 1)

This site abuts, but does not intrude into, the current assessment area.

Attention was drawn to this area on 1946 vertical photographs by the presence of a large circle, some 50m in diameter, marked with a light-toned (possibly concrete?) boundary. Other smaller 'spots' were also noticed, plus a small T, and the presence of uncharacteristically large 'barns'. Adjacent fields were in pasture, still ditch divided, and showed marks of much vehicular traffic. It is suggested that this may be the location of a former airfield of the type where aircraft were assembled rather than an operational unit. The large circle could be a compass swinging area, the smaller spots may indicate defensive positions and the T may be a moveable wind-direction indicator. Despite the numerous wheel marks, none suggested the position of a permanently marked runway. In 1947 the west, south and east parts of the perimeter were used for storage of unidentified, but large, items to which there was frequent vehicular access. This had been cleared by 1950 and the field ditches appeared to have been cleared or recut. The large circle remained and was later marked by a ring of shrubs or trees.

If this was an airfield, or some other military establishment there may be metal, or other, remains which may affect the clarity of any surface investigation.

Other non-archaeological evidence

There was little clear indication of the Fen edge on the photographs examined nor of any other features, except recently removed boundaries, that may affect archaeological understanding within the corridor.

Land use

Much of the land on Whittlesey island was pasture before quarrying. Remaining farmland in areas relevant to this assessment is managed as pasture. With such land use, features may only be recognised on aerial photographs if they remain as earthworks.

Fields on the lower fen ground have been mostly in arable use, with a small number being in pasture in 1945 and/or 1947. When conditions are suitable, arable land does show natural and archaeological features either in bare soil or through differential growth of crops.

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Appendix A

Aerial photographs examined

Source: Cambridge University Collection of Aerial Photographs

Oblique photographs

BHF 53-55

9 September 1971

Vertical photographs

RC8-AT 38-39	17 March 1975	1:13650
RC8-AT 94-96	17 March 1975	1:13650
RC8-AT 105-107	17 March 1975	1:13650
RC8-DR 205-214	26 November 1980	1:5000
RC8-EF 146-147, 149-150	25 March 1982	1:10000
RC8-EF 176-180	25 March 1982	1:10000
RC8-EF 251-252	25 March 1982	1:10000
RC8-KnBI 87-90, 92	13 June 1988	1:10000
RC8-KnBI 152, 154, 156	13 June 1988	1:10000
RC8-KnCP 186-187	19 July 1990	1:6000
RC8-KnDF 165-169	6 May 1992	1:10000

Source: National Library of Air Photographs

Vertical collection

106G/UK/928: 3052-3055	16 October 1945	1:10200
106G/UK/928: 4049-4056	16 October 1945	1:10200
106G/UK/928: 4066-4075	16 October 1945	1:10200
CPE/UK/1891: 1014-1019	10 December 1946	1:9840
CPE/UK/1891: 2157-2163	10 December 1946	1:9840
CPE/UK/1891: 4156-4163	10 December 1946	1:9840
CPE/UK/1925: 2076-2079	16 January 1947	1:9840
CPE/UK/1925: 4076-4077	16 January 1947	1:9840
CPE/UK/2317: 5002-5011	22 September 1947	1:4800
CPE/UK/2532: 5141-5146	24 March 1948	1:4600
CPE/UK/2532: 5183-5187	24 March 1948	1:4600
541/483: 4409-4413	7 April 1950	1:10100
540/1117: 98-99	30 March 1953	1:5000
82/796: 270-275	10 June 1953	1:5100
82/796: 289-293	10 June 1953	1:5100
F21.82/865: 140-146	8 March 1954	1:10000
F22.82/865: 180-187	8 March 1954	1:10000
F21.540/1312: 44-50	26 May 1954	1:10000
F22.540/1312: 14-20	26 May 1954	1:10000
F22.540/1312: 44-48	26 May 1954	1:10000
F21.58/2305: 99-103	8 November 1957	1:9360
F22.58/2305: 21-23	8 November 1957	1:9360
F22.58/2305: 99-103	8 November 1957	1:9360
1F41.543/1107: 239-249	5 November 1960	1:4000
1F42.543/1107: 238-249	5 November 1960	1:4000
V.543/1107: 60-65	5 November 1960	1:12000
OS/64199: 6-7	13 September 1964	1:7500

OS/64199: 34-38	13 September 1964	1:7500
OS/64199: 46-52	13 September 1964	1:7500
OS/64199: 71-75	13 September 1964	1:7500
MAL/65092: 39-43	29 October 1965	1:12000
MAL/65092: 80-84	29 October 1965	1:12000
OS/67033: 150	16 April 1967	1:7500
OS/67033: 164	16 April 1967	1:7500
OS/67033: 165	16 April 1967	1:7500
OS/68136: 831-837	1 June 1968	1:7500
OS/68136: 874-879	1 June 1968	1:7500
OS/68136: 896-902	1 June 1968	1:7500
MAL/68061: 181	12 August 1968	1:10000
MAL/68061: 182-183	12 August 1968	1:10000
MAL/68061: 199	12 August 1968	1:10000
MAL/69020: 184-190	6 March 1969	1:5000
MAL/69020: 196-201	6 March 1969	1:5000
MAL/69058: 151-153	10 June 1969	1:10500
MAL/69058: 154	10 June 1969	1:10500
MAL/69058: 155	10 June 1969	1:10500
MAL/69058: 209-213	10 June 1969	1:10500
MAL/69059: 1-5	10 June 1969	1:10500
58/0445: 7-9	24 April 1970	1:10000
58/0445: 50	24 April 1970	1:10000
58/0445: 51-53	24 April 1970	1:10000
OS/71455: 1	5 September 1971	1:7300
OS/73209: 49-50	1 June 1973	1:7500
OS/73209: 51	1 June 1973	1:7500
OS/73209: 99-100	1 June 1973	1:7500

Most informative photographs

Area TL2196:	82/796: 0272
Area TL2397:	OS/64199: 50 F22.540/1312: 17

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