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Suffolk

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Botany Farm, Farnham, Suffolk

Geoarchaeological Survey Report

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Summary

In August 2010 Oxford Archaeology South (OAS) were commissioned by Environment Agency and Royal Society for the Protection of Birds to undertake a geoarchaeological field survey at a proposed 48h wetland habitat site at Botany Farm, Farnham, Suffolk. The purpose of the survey was to provide baseline data on the underlying sedimentary sequence at the site, which lies partly on the floodplain just to the west of Snape. This work forms part of an initial phase of archaeological investigation aimed at assessing the archaeological potential of the site prior to a proposed planning application.

The survey utilised an electromagnetic survey combined with an auger survey that has helped to define a model of geomorphological development, which can be used to predictively model archaeological potential. Five different geomorphic zones were identified within the site and these provide an indication of the palaeotopography and localised sedimentary sequences present. No significant archaeological deposits were encountered during the survey, but limited traces of burnt flint and charcoal were recorded.

The model suggests that in prehistory the site would have been located at the interface of an important ecotonal zone, between the confluence of the Rivers Alde and Fromus. Topographically these areas are known to have been a focus of activity in the past due to the abundance of wetland resources available for exploitation, as well as the close proximity of dry ground suitable for more permanent settlement. The site therefore has high potential to contain archaeological features and deposits associated with buried landsurfaces, along with evidence for the exploitation of the wetland resources. The waterlogged condition of the sediments also have excellent potential to preserve organic remains suitable for palaeoenvironmental reconstruction and dating.

The impact of the proposed scheme is still not currently fully defined, as archaeological features could potentially be located within the site. The proposed scheme therefore could potentially impact archaeological deposits. This impact may be a greater in areas of former higher ground within the site, where the archaeology is likely to be located closer to the surface.

Botany Farm, Farnham, Suffolk

GEOARCHAEOLOGICAL SURVEY REPORT

1 INTRODUCTION

1.1 Project Details

1.1.1 Oxford Archaeology South (OAS) has been commissioned by the Environment Agency (EA) and the Royal Society for the Protection of Birds (RSPB) to undertake a targeted geoarchaeological field investigation at a 48 hectare wetland habitat site at Botany Farm, Farnham, Suffolk. The aim of the work was to map the sediment architecture over the site using geophysical techniques combined with auger sampling. This mapping of different sediment types provides a framework within which the archaeological and preservation potentials of the site can be evaluated.

1.1.2 The geoarchaeological site investigation utilised an electromagnetic survey to measure the bulk geoelectrical properties of the near surface sediments (up to 3.00 m in depth) and define the distribution of geomorphological features. This EM survey was combined with hand auguring to characterise the sediment architecture of geomorphological features, providing a pseudo 3D model of the sediment sequence within the study area. A programme of augerholes were undertaken to investigate the deposits within the areas of the proposed ponds and also to ground truth the geophysics.

1.1.3 The work was undertaken from the 16th to 24th August 2010 by Dr. Martin Bates and Dr Chris Carey. This report describes the results of the survey to help inform the planning process.

1.2 Location, Geology and Topography

1.2.1 The site lies to the west of Snape, Suffolk, and is surrounded by Burnt House Farm and Botany Farm to the north (NGR 638000, 258200). The river Alde defines the meandering southern boundary of the site.

1.2.2 The study area is composed of open pasture, dissected by drainage ditches and field boundaries. The area is reclaimed marshland which was cultivated from the Medieval period onwards and was reverted to grassland only recently. It lies between c 0.40 – 1.40 m OD, and slopes down from north-west to the south-east corner (Fig. 1).

1.2.3 The geology of the area is mapped as floodplain deposits, comprising peats and minerogenic alluvium to the south and east (BGS sheet 207 1:50,000).

1.3 Archaeological and Historical Background

1.3.1 The archaeological background to the site was outlined in the desk-based assessment (Rolfe 2009). In this report the site was considered to have a moderate to high potential to contain archaeological material from most periods. There is greater potential in the north western part of the site to encounter Roman and later material associated with known occupation sites at the edge of the Alde floodplain. Documentary sources have also highlighted the potential for Anglo-Saxon and medieval watermills to be located close to Langham Bridge. The site also has a high potential to contain well-preserved waterlogged archaeological and palaeoenvironmental remains associated with organic/peat deposits located on the floodplain.

1.4 Proposed Scheme

1.4.1 The creation of bird habitat zones at Botany Farm will involve the creation of ten ponds and associated drainage ditches. The impact depths of the proposed ponds are listed below in Table 1 and their locations are shown in Figure 2:

Ponds	Average depth (m)	Required depth (m)	Area (ha)	Sediment Zone	Deposits impacted	Archaeological environment
A	0.78	1.38	0.32	I	clay/sands/gravel	Buried landsurface
B	0.75	1.35	0.24	I	clay/sands/gravel	Buried landsurface
C	0.5	1.1	0.21	I / II	clay/sands	Channel edge
D	0.6	1.2	0.24	I / II	sands/peats	Channel edge
E	0.68	1.28	0.24	I	clay/sands/gravel	Buried landsurface
F	0.6	1.2	0.05	I / II	silts/peat	Channel edge
G	0.55	1.15	0.05	II	silts/peat	Channel
H	0.58	1.18	0.16	I	clay/sands/gravel	Buried landsurface
I	0.5	1.1	1.48	I / II / III / V	sands/silts/peats	Channel/channel edges
J	0.55	1.15	0.13	I / III	sands/silts/peats	Backwater edge

Table 1: Impact summary table

2 Project Aims

2.1 Project Aims and Objectives

2.1.1 The aim of the field investigation was to investigate the sediment sequence in the locations of the proposed ponds, in order to evaluate the archaeological potential across the site. Through understanding the underlying topography and stratigraphy of the study area, it is possible to define different geomorphic zones, indicating different deposition and preservation environments.

2.1.2 The specific objectives of the work were:

- to describe and interpret the sediment sequence from the auger samples in the areas of impact;
- to identify the location and extent of any waterlogged organic deposits and address the potential and likely locations for the preservation of archaeological and palaeoenvironmental remains;
- to identify any archaeological remains (if present) or deposits that the development may remove or impact during any future work;
- to re-assess the archaeological significance of the site and whether any further mitigation should be recommended;

3 Project Methodology

3.1 General Approach

3.1.1 As described above, the fieldwork utilised an electromagnetic survey combined with an auger survey. The methodology was developed in order to provide a rapid, cost effective, evaluation of the floodplain sediments in order to supply the client with information that help defines the archaeological potential of the study area.

3.2 Geophysical mapping

3.2.1 A surface ground conductivity survey was conducted using a Geonics EM31. The Geonics EM31 uses a varying electromagnetic field to measure changes in near surface conductivity. This near surface conductivity can be related to sediment architectures, for example clays and silts are more conductive to electrical currents than sands and gravels. Through measuring variation in conductivity it is possible to produce a 2D map as a proxy for the distribution of sands, gravels and finer grained sediments in the near surface zone (up to 3.00 m in depth). Such techniques can be used for the location of features such as buried channels and the below ground topographic template of sand and gravel islands within the alluvium.

3.3 Auger survey

3.3.1 The auger survey used a 0.02 m gouge corer for sediment recording. Each location was augured to impact depth (2.00 m BGL) unless impenetrable sand and gravel deposits were encountered, or deposits of high archaeological or palaeoenvironmental potential were seen continuing below this arbitrary cut off. The sample holes were backfilled with the excavated material following recording.

3.3.2 The sediments at each location were recorded using English Heritage guidelines (EH 2002 and 2004). The profile at each location was recorded on a summary proforma sheet and significant layers identified. Relative depths were noted according to borehole ground level (BGL) and a description of the deposits using standard geological terminology were made (colour, texture, compaction, inclusions). Samples were retained, bagged and numbered according to depth and context for preliminary environmental assessment where appropriate. Finds were retained, bagged and labelled according to depth and context. Procedures followed standard guidelines for field recording and the treatment of finds (IFA 2001).

3.3.3 Each sampling point was surveyed using GPS. Coordinates relative to Ordnance Survey and Ordnance Datum were obtained for each sampling location.

3.3.4 All results was entered and correlated using computer modelling software (Rockworks14©), to investigate the stratigraphic and lithology relationships within the data. The auger locations and geophysical data were integrated within ArcGIS© to allow analysis of multiple data sources and for mapping of archaeological potential.

4 Results

4.1 Geophysical survey results

4.1.1 The results of the geophysical survey identified significant variations within the sedimentary sequence, characteristic of distinctive areas of sedimentation. The conductivity (shown in mS, millisiemens) across the site, has been used to sub-divide the area into four geomorphic zones (Figs. 3 and 4). These have been designated:

Zone I: An area of low conductivity/high resistance (red colours) that occupies much of the central part of the site.

Zone II: An area of medium conductivity (yellow colours) that follows a sinuous path along the northern part of the site.

Zone III: An area of medium conductivity (yellow/blue colours) that occupies an ‘embayment' like feature in the south eastern part of the site.

Zone IV: A area of medium conductivity (yellow colours) that joins up with zone I and occupies a strip along the eastern boundary of the site.

Zone V: A high conductivity/low resistance area (cool or green/blue colours) that occurs as a linear strip through the central part of the site.

4.1.2 The different zones appear to reflect variations within the palaeotopography of the site, where very localised sedimentary sequences accumulated during the Holocene. These zones will have very different types and levels of archaeological potential.

4.2 Auger Survey

4.2.1 The results of auger survey have helped to confirm the inferences made based on the geophysical plot.

4.2.2 As a hand auger was used it was not always possible to penetrate into thick sand and gravel dominated sediments. As a result it is likely that mainly Holocene sediment sequences have been encountered. The key stratigraphic units identified are summarised as:

- Holocene alluvial sequence: This is composed of a mix of clay, silt and organic rich, peat dominated sediments, invariably lying above a basal sand deposit. The composition of the Holocene alluvium varies considerably between the different geomorphic zones.
- Basal sands: This deposit invariable lies beneath the alluvial sequence and was found within all the zones. It is composed of a grey sand, derived from reworking of the adjacent Pleistocene sand deposits. The date of this basal sand deposit is currently undetermined. It could either represent a late Pleistocene deposit or have been formed in the Holocene.
- Sand and gravel: Occasionally a gravel dominated sediment was recorded beneath the basal sand deposit and probably dates to the Pleistocene.

4.2.3 These stratigraphic units are composed of different lithologies. Of key significance is the composition of the Holocene deposits, which are made up of these key generic types:

- Highly organic sediments: Thick peat dominated units occurred within zones II and IV, containing abundant, well preserved wood remains. Thinner peat deposits occurred on zones I and III.

- Silt dominated sediments: Silt dominated sediments were occasionally seen in some of the palaeochannel fills in zones II and IV and were invariably organic rich.
- Clay dominated sediments: These were mainly seen in zones I and III.
- Sand dominated sediments: These were seen as the basal units across all zones. The date of this unit is currently undetermined and may represent a late Pleistocene or Holocene accumulation.

4.2.4 From the auger survey the stratigraphy of each of the pond locations was investigated. This data set has been subsequently entered into computer modelling software (Rockworks14©) to correlate the deposits between auger holes. This can be related to the major geomorphic zonation detailed by the geophysical survey to provide a description of the main stratigraphic sequences for each zone, combined with identification of key lithological units.

4.2.5 **Zone I:** This zone was investigated by the Q series transect (Fig. 5). The transect describes a relatively uniform sediment sequence, with a shallow covering of Holocene alluvium above the basal sand, at c. 0.70 m BGL. This Holocene sequence consisted of an old plough zone (Ap) invariably between 0 – 0.30 m, a silty clay, c. 0.20 m thick and a thin peat deposit, c. 0.2m thick, just above the basal sand. In general the organic units of this part of the sequence are very thin, with minerogenic units dominating the shallow profile.

4.2.6 **Zone II:** The key aspects of this sequences are summarised by a transect through pond D, consisting of auger holes D1, D2, D5, D8 and D9 (Fig. 6). The transect shows a rapid deepening in the Holocene alluvium, with movement south into the palaeochannel. On the palaeochannel edge to the north of pond D, the depth of the Holocene deposits onto the basal sand is 0.20 m BGL. In the palaeochannel, the deposits deepen to c. 2.50 m BGL of alluvium above the basal sands. The sequence is dominated by sediments of high organic content such as thick peat and organic silts.

4.2.7 Sampling through the palaeochannel sequence revealed a series of dark grey silt and silty sand deposits between 2.5 m and 1.84 m BGL. These were overlain by a dark brown organic rich silt and wood peat between 1.84 m and 0.50 m BGL (-1.42 m and -0.08 m OD). A reddish mottled brownish grey silty clay overlay the organic sequence. This sequence was sealed by 0.28 m of brown silty/sandy peaty topsoil.

4.2.8 The base of the palaeochannel extended beyond the maximum sampling depth and therefore the lower sequence could not be fully characterised.

4.2.9 The auger holes from the other ponds within zone II penetrated similar deposits with a shallow alluvium above the basal sands rapidly becoming deeper alluvial fills within the palaeochannel.

4.2.10 The peat dominated sediment units within the palaeochannel often contained, or were divided by, thin sand lenses resulting from fluctuating channel flow within the palaeochannel. The thin sand lens represent periods of increased channel activity (energy) and erosion of the peat surfaces.

4.2.11 At the edge of the palaeochannel (Zone II) a small concentration of burnt flint and charcoal was recovered from auger hole C8 from the upper alluvial clays at a depth of between 0.28 m BGL. The date of these deposits are currently unknown.

4.2.12 **Zone III:** There are no ponds directly located within zone III, although part of pond I clips the edge of this zone, straddling the interface between zones I and III. Therefore, a single auger hole provided the only indication of the stratigraphy for this zone, although this is caveated by the small number of boreholes within zone III. The limited impact in this zone is the reason for the low sample coverage.

4.2.13 This sequence was only characterised by auger hole I14, which was located at the edge of the possible embayment. A light grey medium sand with traces of clay was identified at the base of the sampled sequence between 1.30 m and 1.06 m BGL. This was overlain by 0.64 m of dark grey clayey sand. A thin band of brown clayey peat was encountered just below the topsoil between 0.30 m and 0.40 m BGL. The sequence was sealed by 0.30 m of stiff brownish grey silty/sandy clay topsoil.

4.2.14 **Zone IV:** Pond I slightly impinges on this zone, although this is a small zone located on the eastern edge of the study area. Again, due to the limited impact in this zone, only a small number of boreholes have been used to ascertain the sediment sequence, and P16 provides the best indication of the sediments in this zone.

4.2.15 A light grey fine to medium sand was encountered between 3.30 m and 3.07 m BGL at the base of the sampled sequence. This was overlain by 1.03 m of dark grey brown organic clayey sand, with silt and shell inclusions. A 1.00 m deep dark brown peaty clay deposit was encountered between 1.05 m and 2.04 m BGL, with whole acorns recovered at 1.97 m BGL. The peat became increasing clayey between 0.84 m and 0.77m BGL, with sandy lens possible representing increased channel flow and possible estuarine inundation. A gradual transition to a stratified sequence of minerogenic silty clay and silts occurred after 0.77 m BGL; these exhibited increasing signs of oxidation and root disturbance. The sequence was sealed by 0.20 m of brown grey silty clay topsoil.

4.3 Ground truth transect

4.3.1 Auger transects P and Q were located in key areas of the sequence in order to help ground truth the geophysics results. Transect P in particular traverses zones I, II and IV, enabling the interfaces between the different geomorphic zones to be investigated. These are often areas of high archaeological potential (Fig. 6).

4.3.2 The transect starts at the northern edge of the palaeochannel within zone II. In common with the augerholes from ponds B, C, D, F, I and G which sampled the palaeochannel, a relatively deep Holocene alluvial sequence was encountered, to a maximum depth of c. 3.6 m of Holocene deposits above basal sand. This sequence includes thick deposits of both peat and minerogenic clay. Both deposits have a high potential for palaeoenvironmental preservation; the peat deposits have high organic content and well preserved wood fragments.

4.3.3 The palaeochannel sequence of the River Alde is represented between augerholes P1 to P10 (zone II). It is evident from the sequence that multiple channels are present, with a deeply incised channel identified between P8 and P9. The edge of the channel is characterised by a 0.80 m deep alluvial sequence. The sequence within zone I, is dominated by alluvial sity clays, with only a thinly inter-stratified peat deposits.

4.3.4 The sequence south from augerhole P14 is moving across the transition from the channel sequences of the River Alde to the River Fromus (zone II to zone IV). The Holocene alluvium gets progressively deeper within this channel, reaching a maximum depth of 3.30 m BGL in P15. The alluvium is dominated by a peaty clay/clayey peat from 0.50 m to to 3.00 m BGL, showing this zone to have particularly high potential for organic preservation.

4.3.5 The results from the EM31 survey was further tested by comparison to the 2D surface model of the basal sands unit. This interpolation of the auger data must be heavily caveated, due to the heavily skewed distribution of auger holes to the pond locations. However, the auger survey reveals a similar model to the electrical conductivity survey, with the topographic template at the basal sand. The lowest topographic areas clearly correspond to zones II and IV from the conductivity survey (Fig. 7). Due to the relative depth of the Holocene sediment sequence the electrical conductivity survey produces a higher resolution model than that of the auger survey for overall site coverage, with a good correlation between the two data sets.

5 Discussion

5.1.1 The geoarchaeological field assessment of the deposit sequence at Botany Farm has utilised an approach of electrical conductivity survey to produce a 2D spatial model, with specific targeting of 2D temporal data via the auger survey. This has allowed construction of a model of geomorphological development in the study area, which can be used to predictively model archaeological potential. The survey area has been sub-divided into five different geomorphic zones based on this data:

5.1.2 **Early Holocene landsurface (Zone I):** This area is composed of relatively shallow minerogenic and organogenic alluvial deposits above the basal sands. The depth of these deposits is relatively thin, at c. 0.70 m BGL, although in places even shallower. This zone undoubtedly contains a late Pleistocene / early Holocene land-surface in its basal sand deposit. This surface would have originally stood above the river floodplain and would subsequently have been inundated. This combination of low energy alluvium overlying an early Holocene landsurface describes a scenario with high potential for archaeological remains dating from the early Holocene through to the period of inundation, with a moderate potential for the preservation of organic materials dating from the period of subsequent burial under a layer of thin alluvium.

5.1.3 **Channel sequence (Zone II):** This area represents the course of a palaeochannel running roughly west to east across the survey area. This palaeochannel contains relatively thick peat deposits, with a very high preservation potential for ecofactual and artefactual remains. The state of preservation of organics within the peat deposits appeared on visual inspection to be exceptional, and these can be analysed as palaeoenvironmental proxies. In addition to the high palaeoenvironmental potential, preservation of archaeological resources is also potentially high, with preservation of features such as fish traps, eel baskets, wooden walkways and river craft possible. The presence of the fine sand lenses also indicates a fluctuating depositional environment, with the channel holding occasional flowing water between standstill periods of peat accumulation.

5.1.4 **Backwater embayment (Zone III):** This area represents a possible large embayment or backwater area at the edge of the main river confluence. This area contains relatively shallow sediment sequences, slightly deeper than zone I, with a generally higher alluvial clay content. Again a basal deposit of sand suggests an early Holocene template that subsequently became inundated by rising water-levels during the later Holocene. Preservation potential is moderate, although some thin peats are visible, and these are liable to get thicker towards the centre of the embayment.

5.1.5 **Channel sequence (Zone IV):** This area represents the edge of the channel of the River Fromus, running north to south on the east of the study area. Although a relatively small zone, the Holocene sequences were moderately deep at c. 2.00 m - 3.00 m BGL and contained a high potential for ecofactual and artefactual remains.

5.1.6 **Drainage ditch (Zone V):** This is a very straight linear feature, noted within an area of generally high conductivity. This is likely to represent a former infilled drainage ditch running NE-SW across the site. It runs on the same alignment as the current field systems and may therefore be fairly modern in date. The archaeological potential of this ditch is considered lower than zone II, as the potential drainage ditch follows a similar alignment to the modern field systems.

5.1.7 The distribution of different ground conductivity values describes a pattern of floodplain topography varying between linear areas of channel and larger, more diffuse areas of relatively higher topography that previously stood on the floodplain margin. At present it is difficult to ascertain the chronostratigraphic framework for the different geomorphic zones.

5.1.8 Further to the different zones described above, the model of landscape evolution must be addressed within the study area, in order to understand its archaeological potential. The presence of the palaeochannel indicates, in effect, a confluence zone between the rivers Alde and Fromus. The palaeochannel (zone II) is interpreted as the former course of the river Alde, with the palaeochannel (zone IV) interpreted as a palaeochannel of the river Fromus. The confluence of these rivers has migrated southward downstream. Recent work on river confluences (Howard *et. al.* 2008) has shown that such downstream migrations occur as sudden jumps or avulsion events. This in effect cuts up the landscape of floodplain, leaving islands of extant alluvial material in-between active avulsing channels. Such a model of an avulsive confluence zone describes a pattern of high archaeological potential, due to the preservation of land parcels between the different channels.

5.1.9 Evidence of Roman and Saxon settlement activity has been identified recently at Barber's Point, further downstream within similar topographies along the banks and islands of the River Alde (Suffolk County Council 2005). Late Iron Age through to Medieval salterns (commonly called Red Hills) are also extremely common around the estuaries, with sites recorded along the Alde and Blyth (Suffolk County Council 2003). In fact several salterns have been recorded just to the east of the site near to Snape. Evidence of fish traps and other water management and trapping features have been widely recorded within the inter-tidal creeks and mudflats.

5.1.10 The sediment sequence varies noticeably between the different zones. Both zones I and III contain minerogenic dominated sediments, with a high clay component. These deposits are derived from overbank alluviation, which forms a preserving environment overlying the basal sands. Thus, any archaeological materials contained within or on the basal sands are liable to be well preserved, through subsequent burial by alluvium. In addition, the minerogenic sediment sequence is likely to contain stabilisation horizons during times when the overall water levels dropped. The presence of thin peat deposits attests to periods of vegetation growth on stabilisation surfaces, indicating periods of lower water tables before further inundation, causing the formation of the organic rich sediments. These sediments will have a low potential for the preservation of palaeoenvironmental proxies, unless these proxies are contained within specific archaeological deposits. The potential for the preservation of archaeological deposits is, however, high.

5.1.11 In comparison, zones II and IV are river palaeochannels, with much deeper Holocene sediment sequences than zones I and III. The sediment architecture of the palaeochannels indicates generally alternating clay and thick peat deposits. The presence of these types of sediments indicates an infilling process within the palaeochannel during periods of low to stagnant water flow combined with inundation events. Whilst zones I and III can be surmised as having extant landsurfaces from the early Holocene, the date of the formation of these palaeochannels and their subsequent infilling are unknown. The potential for the preservation of both palaeoenvironmental and archaeological resources is high.

5.2 Potential scheme impact

5.2.1 The shallow nature of majority of the proposed ponds would indicate that the main peat deposit located in the two main palaeochannel sequence (zones I and IV) will only have its upper surface disturbed by the digging of the ponds. However the greatest areas of potential archaeological impact will be within zone I, or more specifically ponds A, B, E, H and to a less extent I and J, where the archaeological horizon is well above the impact depth. Within zone I there is the potential to reveal extensive archaeological features during the construction of many of the proposed ponds. Without further archaeological survey work it is not possible to ascertain the extent and distribution of potential archaeological areas and this remains a high risk to the proposed scheme.

5.2.2 In addition to the Holocene sediments described by the auger survey, the Holocene deposits are located on Pleistocene drift geologies. Within zones I and III where ponds are excavated to c. 1.0 m BGL, there could also be an impact on the Pleistocene geologies. Such deposits have the potential to contain both ecofactual and artefactual resources from the Lower, Middle and/or Upper Palaeolithic, and as such should not be treated as archaeologically sterile deposits.

5.3 Summary of archaeological and palaeoenvironmental potential

5.3.1 The survey has identified very high archaeological and palaeoenvironmental potential across the study area. The salient points are summarised as:

- Zones II and IV represent avulsed palaeochannels. These channels have infilled with peat deposits and minerogenic clay dominated deposits. Both deposits have a high potential to contain palaeoenvironmental proxies. Archaeological deposits such as boats, wooden walkways and fish baskets are liable to be preserved.
- Zones I and III represent slightly higher points in the early Holocene landscape, which would have provided a dry landsurface during the early Holocene and would have provided good access to the riverine resources of the floodplain. Such areas are known to contain rich and diverse archaeological deposits (Howard *et. al.* 2008).
- Both zones I and III contain minerogenic sediments deposited on top of a sand landsurface, creating a high potential for archaeological preservation. The sequence above the basal sand is interpreted as overbank alluviation with occasional higher magnitude flood events causing thin peat formation. It is probable that stabilisation horizons occur in the sequence, indicating periodic returns to 'dryland' conditions. The original landsurface probably dates from the early Holocene, but this requires further confirmation.
- The tentative model of landscape evolution describes an avulsive river confluence, preserving land parcels in between channels. Previous work has shown that river confluences often are foci for human activity, frequently ritual in nature, in both the prehistoric and historic periods (Brown *et. al.* 2007).
- The digging of ponds in zones I and III to c. 2.00 m BGL has the potential to impact on ecofactual and artefact remains contained within Pleistocene drift geologies.

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Suffolk County Council Archaeological Service, 2005 Annual Report 2004 - 2005 , (Suffolk County Council, Ipswich)

Appendix A. Auger Logs

Name	Easting	Northing	(m OD)	Top: Holocene alluvium	Base: Holocene alluvium	Top: Basal sand	Base: Basal sand	Top: Sand and gravel	Base: Sand and gravel
A1	637,768.23	258,310.49	0.81	0.81	0.03	0.03	-0.09	-0.09	
A2	637,768.23	258,293.99	0.76	0.76	0.28	0.28	0.26		
A3	637,768.23	258,277.49	0.72	0.72	0.2	0.2	0.17		
A4	637,748.23	258,264.89	0.78	0.78	0.21	0.21	0.08		
A5	637,758.23	258,264.89	0.76						
A6	637,768.23	258,264.93	0.74	0.74	0.07	0.07	0.04		
A7	637,781.85	258,264.89	0.67	0.67	-0.38	-0.38	-0.4		
A8	637,768.23	258,244.49	0.76	0.76	0.16	0.16	0.14		
A9	637,768.23	258,228.00	0.84	0.84	0.08	0.08	0.04		
B1	637,788.23	258,464.89	0.64	0.64	-0.86	-0.86	-1.36		
B2	637,788.23	258,454.89	0.83	0.83	0.48	0.48	0.43		
B3	637,778.23	258,444.89	0.85	0.85	0.45	0.45	0.4		
B4	637,788.23	258,444.89	0.78	0.78	0.58			0.78	0.53
B5	637,798.23	258,444.89	0.76	0.76	0.56			0.56	0.51
B6	637,808.23	258,444.89	0.73	0.73	0.43			0.43	0.38
B7	637,788.23	258,434.89	0.67	0.67	0.02	0.02	-0.08	-0.08	-0.13
B8	637,788.23	258,424.89	0.67	0.67	0.32			0.32	0.27
B9	637,788.23	258,414.89	0.62	0.62	0.22			0.22	0.17
C1	637,878.23	258,514.89	0.77	0.77	-1.23				
C2	637,878.23	258,504.89	0.71	0.71	-1.29				
C3	637,868.23	258,494.89	0.67	0.67	-1.33				
C4	637,878.23	258,494.89	0.5	0.5	-1.5				
C5	637,888.23	258,494.89	0.43	0.43	-2.07				
C6	637,898.23	258,494.89	0.43	0.43	-1.19	-1.19	-2.37		
C7	637,878.23	258,484.89	0.53	0.53	-1.12	-1.12	-1.87	-1.87	-1.97
C8	637,878.23	258,474.89	0.59	0.59	0.29	0.29	0.09		
D1	638,048.23	258,454.89	0.69	0.69	0.49			0.49	0.44
D2	638,048.23	258,444.89	0.66	0.66	-1.06	-1.06	-1.34		
D3	638,028.23	258,434.89	0.57	0.57	0.27				
D4	638,038.23	258,434.89	0.5	0.5	-2.67	-2.67	-2.9		
D5	638,048.23	258,434.89	0.56	0.56	-1.38	-1.38	-1.44		
D6	638,058.23	258,434.89	0.6	0.6	-1.26	-1.26	-1.4		
D7	638,068.23	258,434.89	0.54	0.54	-0.51				
D8	638,048.23	258,424.89	0.43	0.44	-1.81	-1.81	-2.06		
D9	638,048.23	258,414.89	0.42	0.42	-1.68				
E1	638,018.23	258,334.89	0.43	0.43	0	0	-0.09		
E2	638,018.23	258,319.89	0.44	0.44	-0.06	-0.06	-0.16		
E3	637,988.23	258,304.89	0.72	0.72	0.05	0.05	0.02		
E4	637,998.23	258,304.89	0.63	0.63	0.11	0.11	0.04	0.04	-0.07
E5	638,008.23	258,304.89	0.53	0.53	-0.11	-0.11	-0.17		
E6	638,018.23	258,304.89	0.4	0.4	-0.11	-0.11	-0.3		
E7	638,028.23	258,304.89	0.49	0.49	-0.01	-0.01	-0.11		
E8	638,018.23	258,294.89	0.63	0.63	-0.17	-0.17	-0.22		
F1	638,178.23	258,404.89	0.51	0.51	-0.81	-0.81	-1.09		
F2	638,168.23	258,394.89	0.45	0.45	-1.65	-1.65	-1.95		
F3	638,161.73	258,377.28	0.52	0.52	-0.58	-0.58	-0.63		
F4	638,157.58	258,368.53	0.6	0.6	-0.05	-0.05	-0.1		

F5	638,152.97	258,359.78	0.6	0.6	-0.07	-0.07	-0.4		
G1	638,293.99	258,373.59	0.57	0.57	-1.93				
G2	638,293.99	258,363.59	0.46	0.46	-2.14	-2.14	-2.54		
G3	638,293.99	258,353.59	0.51	0.51	-1.49	-1.49	-1.59		
G4	638,293.99	258,343.59	0.49	0.49	-2.01				
G5	638,291.86	258,328.40	0.41	0.41	-1.59				
H2	638,368.23	258,314.89	0.65	0.65	-0.9	-0.9	-1.35		
H3	638,348.23	258,304.89	0.51	0.51	-0.8	-0.8	-1.19		
H4	638,358.23	258,304.89	0.47						
H5	638,368.23	258,304.89	0.69	0.69	-1.02	-1.02	-1.21		
H7	638,368.23	258,294.89	0.52	0.52	-0.75	-0.75	-0.98		
H8	638,368.23	258,284.89	0.53	0.53	-0.67	-0.67	-0.72		
I10	638,263.52	258,160.15	0.51	0.51	-0.32	-0.32	-0.34		
I11	638,253.46	258,133.94	0.53	0.53	-0.13	-0.13	-0.17		
I12	638,242.85	258,107.95	0.64	0.64	-0.26	-0.26	-0.31		
I14	638,203.94	258,064.19	0.41	0.41	-0.65	-0.65	-0.89		
I15	638,211.19	258,060.26	0.42	0.42	-0.48	-0.48	-0.73		
I17	638,229.90	258,052.58	0.42	0.42	-0.54	-0.54	-0.58		
I18	638,239.25	258,048.74	0.41	0.41	-0.34	-0.34	-0.44		
I30	638,296.46	258,245.04	0.41	0.41	-2.69	-2.69	-2.79		
I32	638,281.03	258,200.00	0.41	0.41	-0.37	-0.37	-0.39		
I33	638,272.83	258,176.37	0.41	0.41	-0.21	-0.21	-0.29		
I34	638,264.60	258,152.65	0.41	0.41	-0.4	-0.4	-0.49		
I35	638,256.31	258,128.73	0.41						
I36	638,246.47	258,100.35	0.41	0.41	-0.29	-0.29	-0.39		
I37	638,238.15	258,076.38	0.41						
I39	638,219.84	258,024.31	0.41	0.41	-0.57	-0.57	-0.69		
I5	638,289.27	258,223.78	0.4	0.4	-2.05	-2.05	-2.2		
I6	638,220.54	258,056.42	0.28	0.28	-1.74	-1.74	-1.87		
I8	638,274.25	258,215.27	0.54	0.54	-0.16	-0.16	-0.26		
I9	638,268.89	258,187.71	0.54						
J1	638,035.52	258,124.89	0.42	0.42	-0.46	-0.46	-0.58		
J2	638,035.52	258,114.89	0.43	0.43	-0.41	-0.41	-0.57		
J3	638,035.52	258,104.89	0.41	0.41	-0.44	-0.44	-0.59		
J4	638,028.23	258,094.89	0.45	0.45	-0.53	-0.53	-0.65		
J5	638,038.23	258,094.89	0.42	0.42	-0.5	-0.5	-0.58		
J6	638,048.23	258,094.89	0.44	0.44	-0.5	-0.5	-0.66		
J7	638,035.52	258,084.89	0.45	0.45	-0.54	-0.54	-0.55		
J8	638,035.52	258,074.89	0.43	0.43	-0.56			-0.56	-0.57
P1	638,308.03	258,363.82	0.5	0.5	-0.58	-0.58	-0.7		
P10	638,308.03	258,183.82	0.41	0.41	-0.39	-0.39	-0.49		
P11	638,308.03	258,163.82	0.4	0.4	-0.25	-0.25	-0.4		
P12	638,308.03	258,143.82	0.39	0.39	-0.14	-0.14	-0.31		
P13	638,308.03	258,123.82	0.38	0.38	-0.4	-0.4	-0.52		
P14	638,308.03	258,103.82	0.37	0.37	-0.87	-0.87	-0.93		
P15	638,308.03	258,083.82	0.36	0.36	-2.94	-2.94	-3.24		
P16	638,308.03	258,063.82	0.35	0.35	-2.72	-2.72	-2.95		
P2	638,308.03	258,343.82	0.49	0.49	-2.16	-2.16	-2.31		
P3	638,308.03	258,323.00	0.48	0.48	-1.36	-1.36	-1.62		
P4	638,308.03	258,303.82	0.47	0.47	-1.38	-1.38	-1.53		
P5	638,308.03	258,283.82	0.47	0.47	-1.63	-1.63	-2.33		
P6	638,308.03	258,263.82	0.45	0.45	-1.55	-1.55	-1.8		
P7	638,308.03	258,243.82	0.44	0.44	-1.71			-1.71	-1.81
P8	638,308.03	258,223.82	0.43	0.43	-3.17	-3.17	-3.47		

P9	638,308.03	258,203.82	0.42	0.42	-2.23	-2.23	-2.58
Q1	638,058.61	258,268.31	0.5	0.5	-0.2	-0.2	-0.3
Q2	638,028.93	258,275.11	0.5	0.5	-0.19	-0.19	-0.3
Q3	637,999.80	258,281.79	0.5	0.5	-0.31	-0.31	-0.5
Q4	637,971.38	258,288.30	0.5	0.5	0	0	-0.1
Q5	637,941.65	258,295.12	0.5	0.5	0.02	0.02	-0.1

Appendix B. Summary of Site Details

Site name:	Botany Farm, Farnham, Suffolk.
Site code:	SNBOFEV
Grid reference:	TM 638000, 258200
Type:	Geoarchaeological Survey
Date and duration:	16th -24th August 2010
Area of site:	48 Ha
Summary of results:	A combined electromagnetic survey and 112 augerholes were undertaken across the site to help assess the archaeological potential. The site was found to be located between the confluence of the Rivers Alde and Fromus, with higher dry landsurface present in between during the early Holocene. These areas are considered to have higher archaeological and palaeoenvironmental potential.
Location of archive:	The archive is currently held at OA, Janus House, Osney Mead, Oxford, OX2 0ES, and will be deposited with the Museum of Suffolk in due course, under the following accession number:

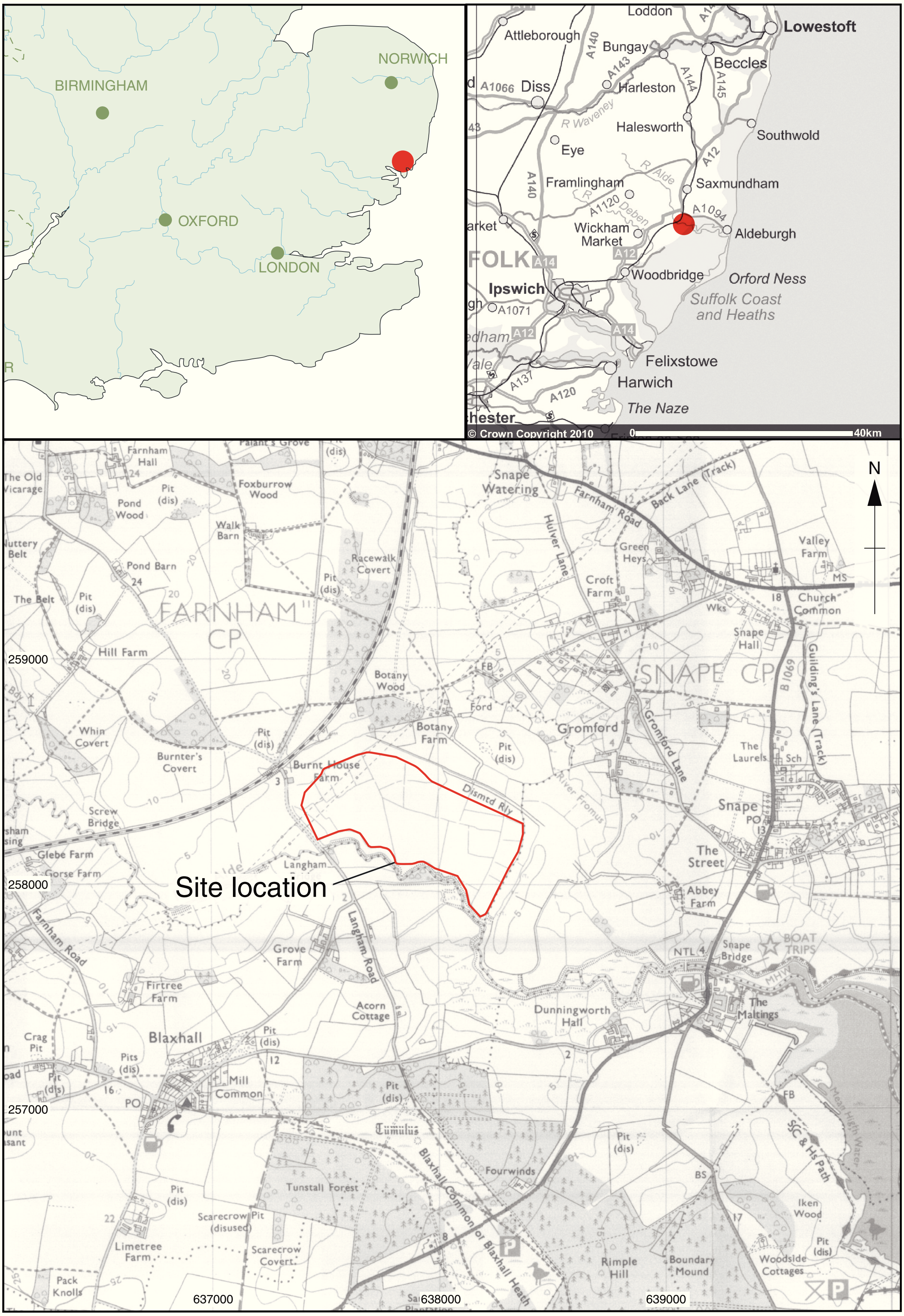
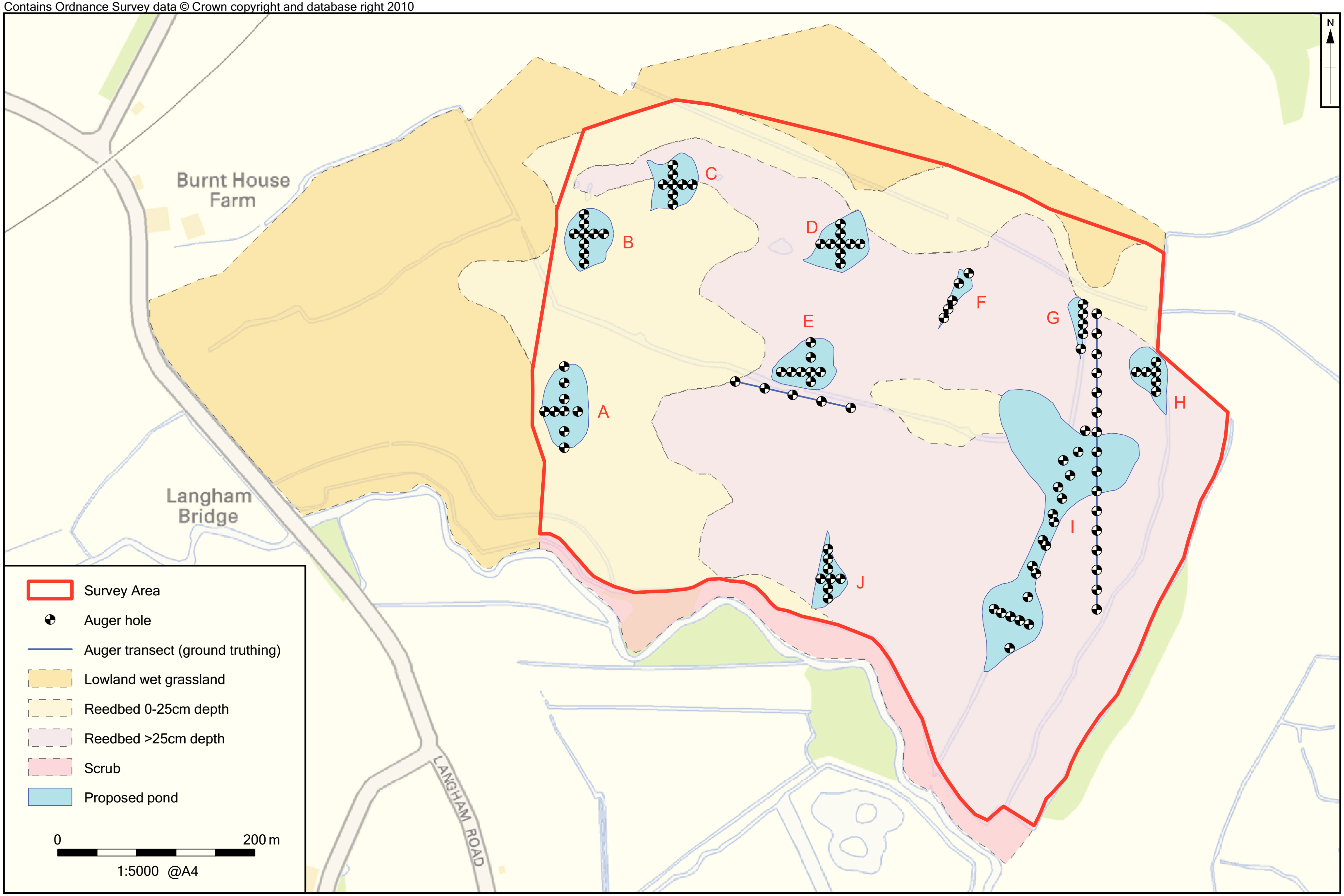


Figure 1: Site location



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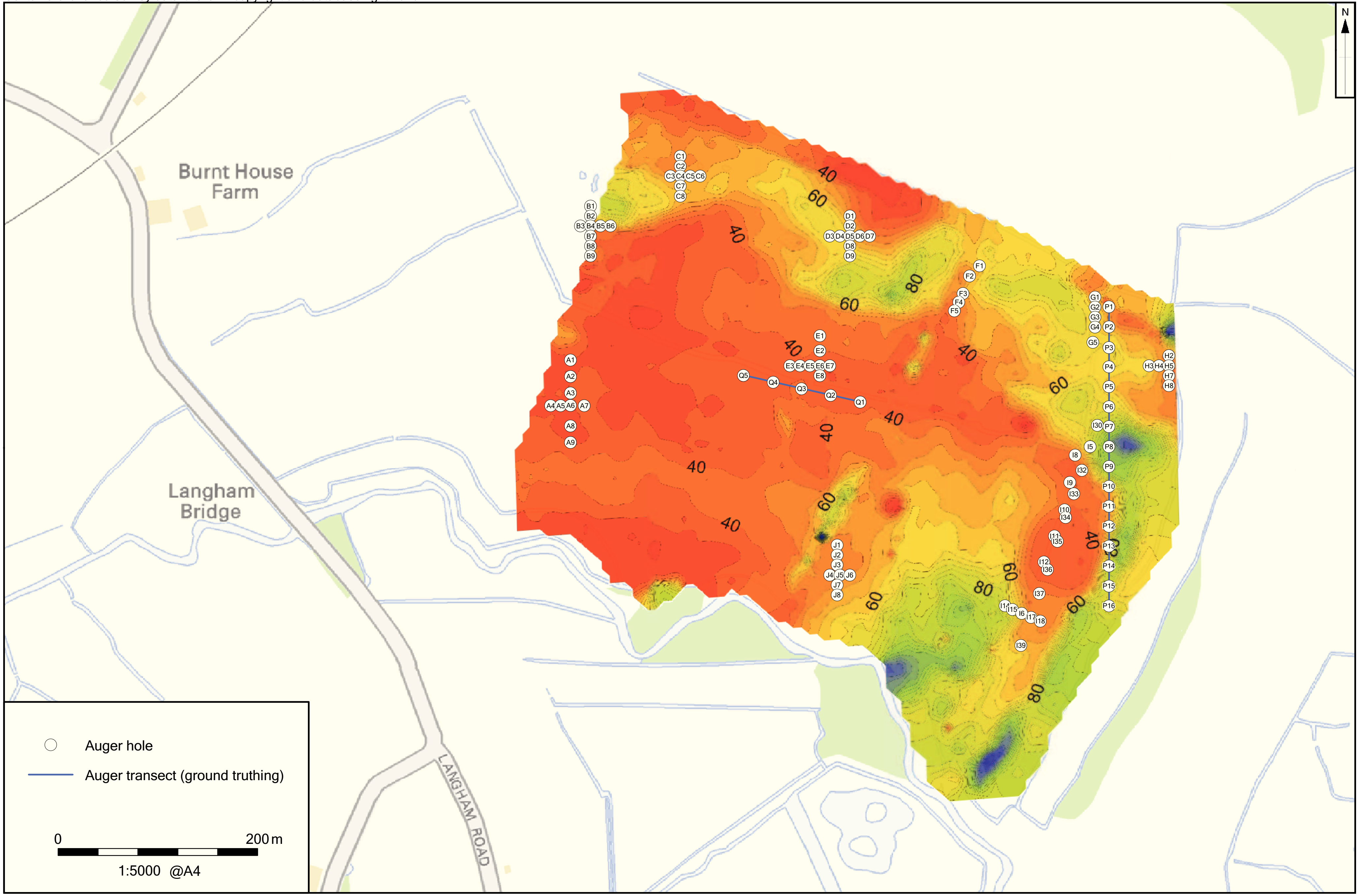
QA by: Survey data supplied by: OA

Figure 2: Proposed ponds and auger locations



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QA by: Survey data supplied by: OA

Figure 3: Results of geophysical survey

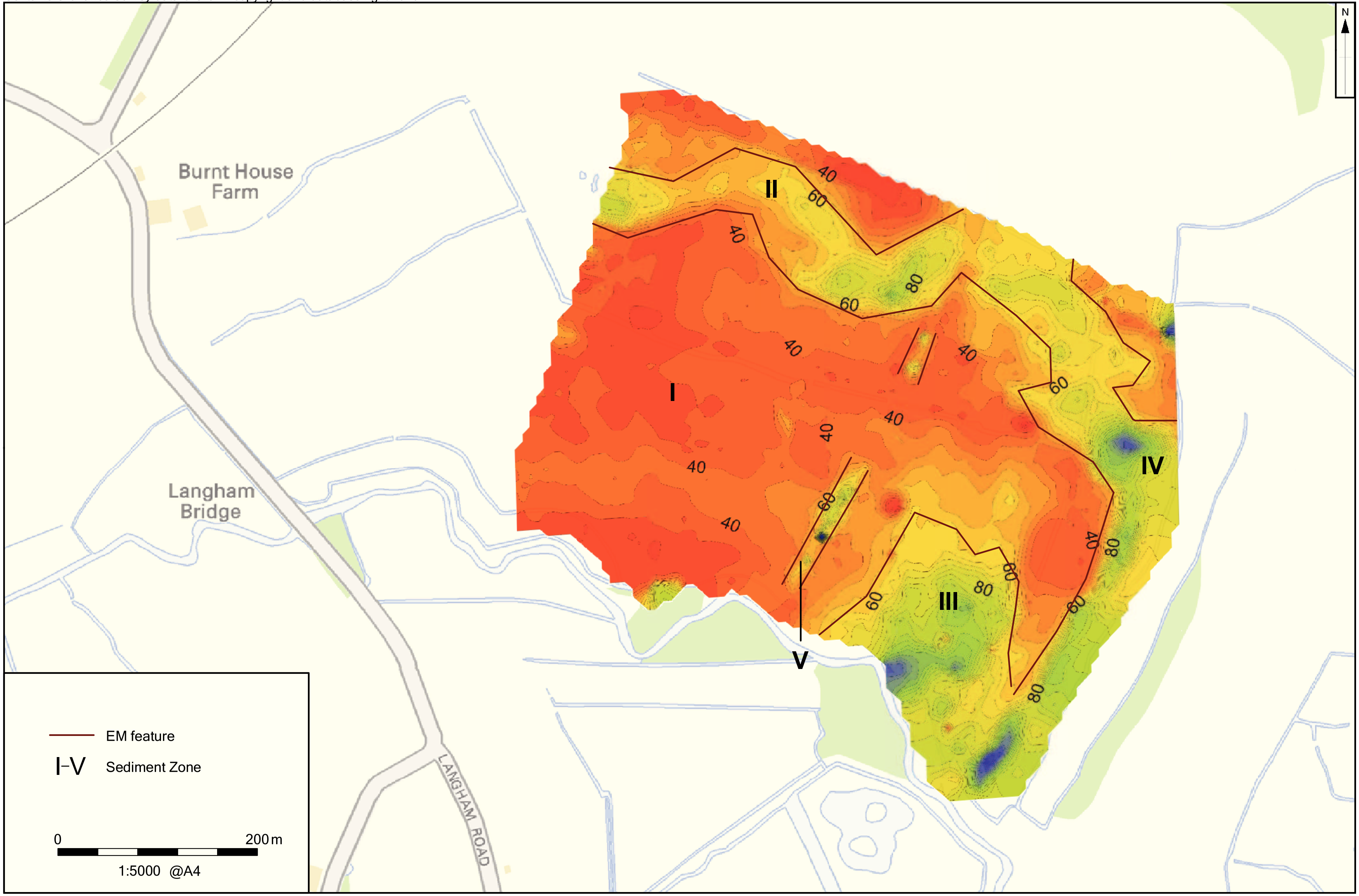

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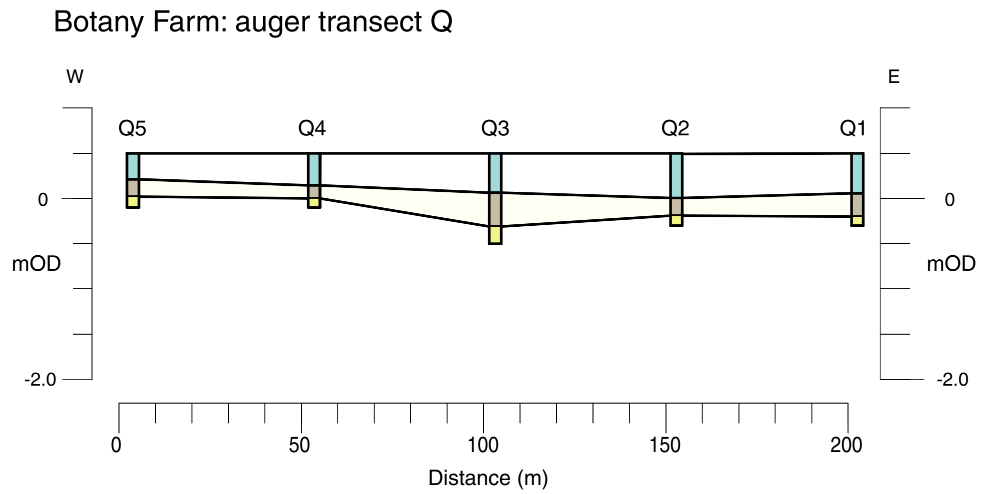
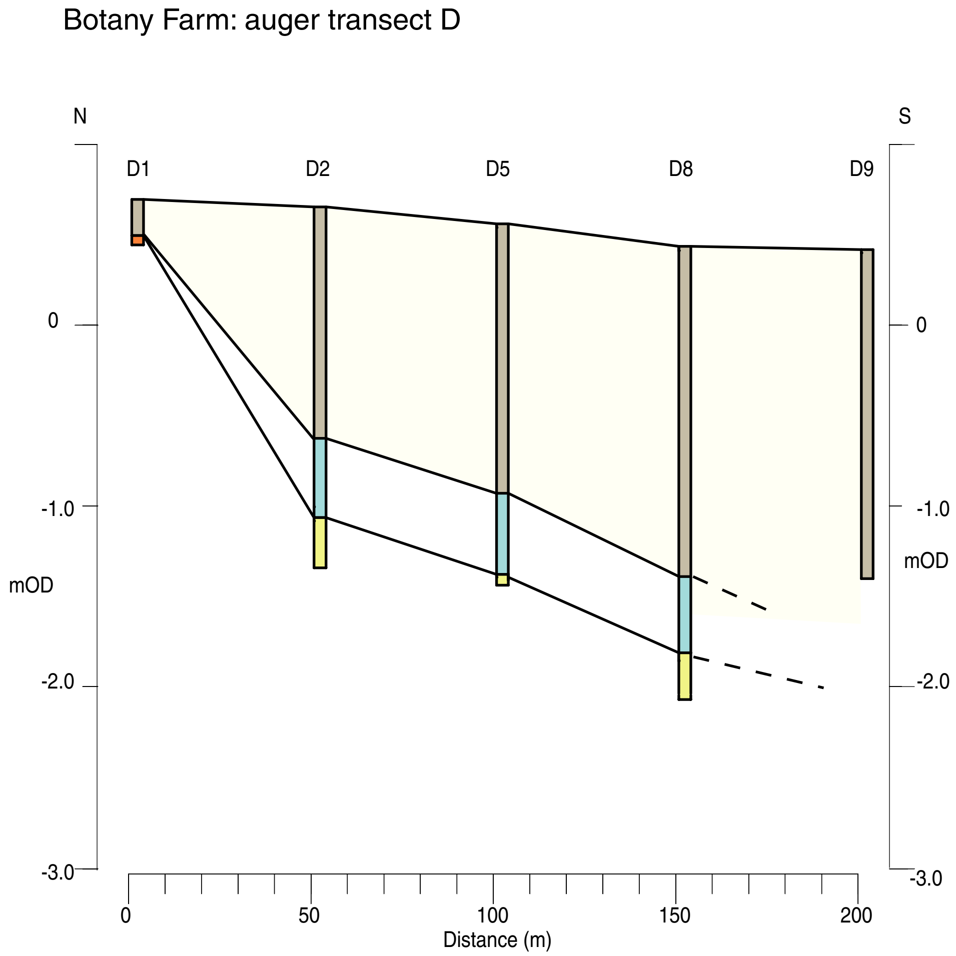
Figure 4: Geophysical sediment zones





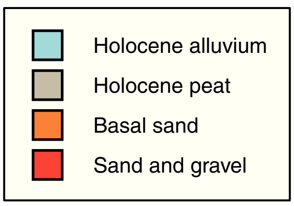


Figure 5: Auger transect Q and D

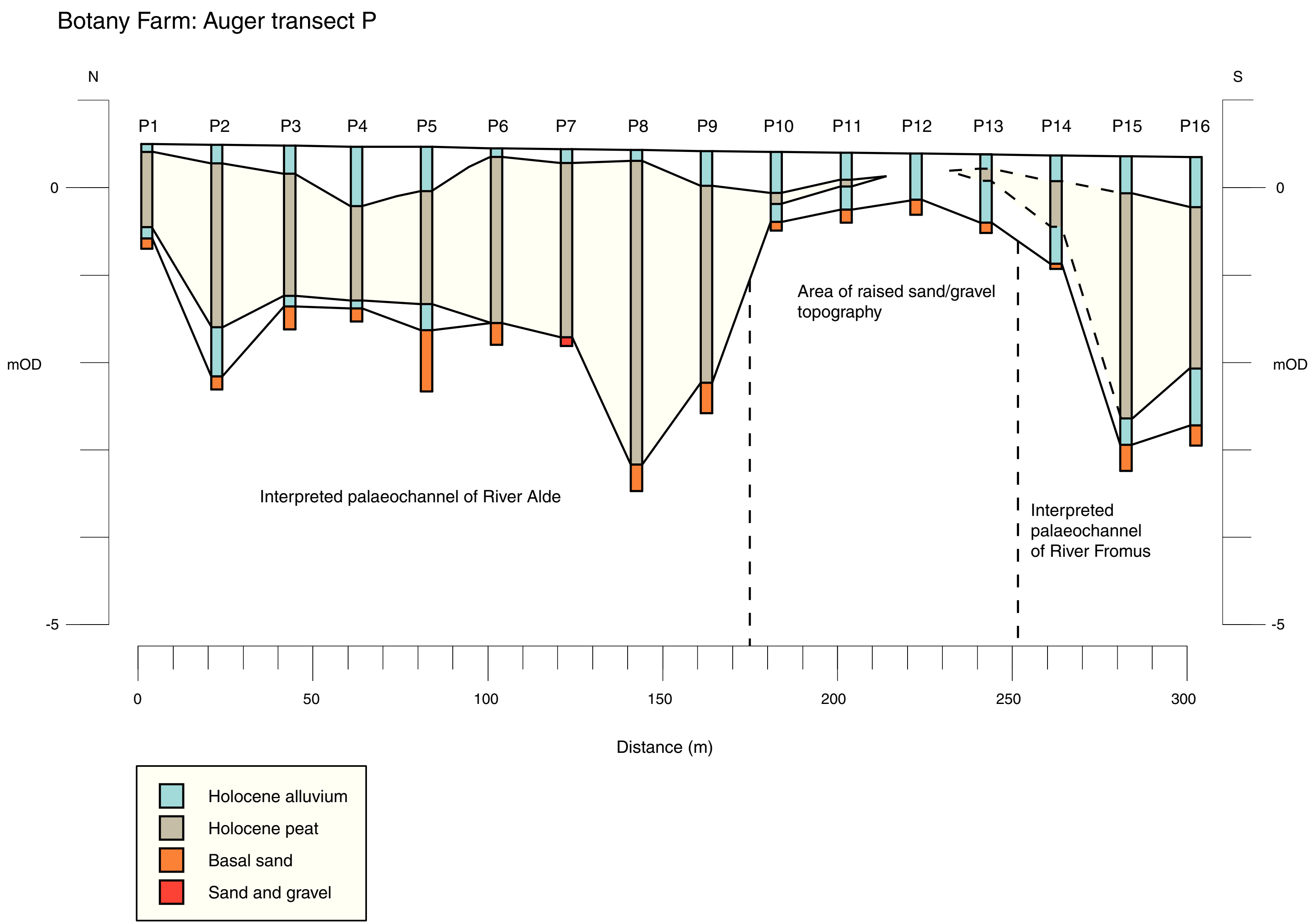


Figure 6: Auger transect P

- Y:\Georchaeological Services\GEOARCH REPORTS\SUFFOLK\SUFFOLK_BOTANY FARM\010Geomatics\03 GIS\current\001_projects\270910\SNOFEV_Surface_Georectification_Figure7_270910.mxd*GJ*28 September 2010

QA by: Survey data supplied by: OA

Figure 7: Topographical template of basel sand

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