An archaeological watching brief at the Knowledge Gateway, the University of Essex, Colchester, Essex September 2010-August 2011

report by
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on behalf of
the University of Essex

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1 Summary

The Colchester Archaeological Trust undertook a watching brief during infrastructure works for the University of Essex's new research park which is to be known as the 'Knowledge Gateway'.

The remains of a Bronze Age barrow cemetery are located at the western edge of the development site on the flood plain of the River Colne. The removal of topsoil from one of the barrows provided the opportunity to record the extant mound and undertake a magnetometer survey. Examination of the LiDAR image of the flood plain also revealed details of the layout of the barrow cemetery. A discrepancy between the size of the ring-ditch identified in the magnetometer survey and the mound and outer bank in the LiDAR image suggests that the barrow has been altered significantly since its initial construction

A trial-trenching evaluation undertaken by the Essex County Council Field Archaeology Unit in 2004 identified evidence for agricultural activity on the lower valley slope of the River Colne during the Late Iron Age-early Roman period. Further evidence for activity during this period was encountered during the watching brief and included a pit containing frequent Roman CBM fragments that probably derive from a nearby farm building. Burial activity in the middle Roman period was also uncovered on the lower valley slope, and further up the slope the recovery of late Roman pottery sherds suggests that this area was utilised throughout the Roman period.

Near the top of the valley, a dense concentration of medieval pottery has been attributed to domestic occupation in the area in the 13th-14th centuries, probably associated with a previously unknown medieval farmstead.

2 Introduction (Figs 1-2)

2.1 This report describes the archaeological work carried out by the Colchester Archaeological Trust (CAT) on behalf of the University of Essex between September 2010 and August 2011.

2.2 An archaeological watching brief was carried out during infrastructure works for the University of Essex's new research park which is to be known as the 'Knowledge Gateway'.

2.3 The site is situated within the campus of the University of Essex at Wivenhoe Park approximately 2.5 km east of Colchester town centre (at NGR TM 0242 2424) (Fig 1). The site is a block of land approximately 10.6 ha in size consisting mostly of undulating grassland sloping to the south-west towards the flood plain of the River Colne (Fig 1).

2.4 The west of the site is bounded by Salary Brook, while on the east and north are Elmstead Road and its continuation Boundary Road (Fig 2). The southern boundary mainly follows a hedge-line with some tree cover.

2.5 Following the submission of planning application (O/COL/05/2046) to Colchester Borough Council (CBC), a condition was attached to the consent (no 14) which required the applicant to commission an archaeological watching brief during the groundworks.

2.6 The archaeological watching brief was undertaken in accordance with a brief written by Martin Winter, the CBC Archaeology Officer (CBCAO 2006), and a corresponding written scheme of investigation (WSI) was prepared by CAT (CAT 2010).

2.7 All fieldwork and reporting was done in accordance with CAT's *Policies and procedures* (CAT 2008), Colchester Borough Council's *Guidelines on standards and practices for archaeological fieldwork in the Borough of Colchester* (CIMS 2008a) and *Guidelines on the preparation and transfer of archaeological archives to Colchester and Ipswich Museums* (CIMS 2008b), and the Institute for Archaeologists' *Standard and guidance for an archaeological watching brief* (IfA 2008a) and *Standard and guidance for the collection, documentation, conservation and research of archaeological materials* (IfA 2008b). The guidance contained in the documents

Management of Research Projects in the Historic Environment (MoRPHE) and *Standards for field archaeology in the East of England* (EAA 14) was also followed.

3 Archaeological background (Figs 1, 3 & 4)

This summary utilizes information held in the CBC Urban Archaeological Database (UAD), and in the Essex Historic Environment Record (EHER).

Located on the western edge of the development area is a probable cemetery of at least five barrows (EHER 2413) (Barrows A-E, Fig 4). These barrows are visible as cropmarks on aerial photographs taken in 1948 (EH NMR 58/69, Frames 5201 & 5203) and 1962 (frame 102.1 by RH Farrands).

Barrow E is located to the west of the railway line within the former site of the Moler Works, which is now the car park of B&Q (Fig 4). An evaluation undertaken on the site of the former Moler Works by Cotswold Archaeological Trust (report 98962) failed to find any trace of Barrow E, although the scale of the investigation was limited (CAT Report 232). The other four barrows are located east of the railway line, three of which are complete (Barrows A-C) and the fourth has had part cut off its western side by the diversion of Salary Brook during the construction of the railway in the 1950's (Barrow D) (Figs 3 & 4). An archaeological trial-trenching evaluation undertaken by the Essex County Council Field Archaeology Unit (ECC FAU 2004) confirmed that Barrows B and C were man-made and not recent in origin (ECC FAU T27 & T28- Fig 3).

St Andrew's Avenue follows the presumed line of a Roman road (EHER 2534) (Fig 1), and a concentration of Late Iron Age-early Roman boundary ditches, post-holes and other deposits were uncovered within the investigation area during the trial-trenching evaluation (ECC FAU 2004).

It is probable that the original 'Wivenhoe Park' was established in the medieval period. It was initially a deer park (EHER 16186), the area of which can only be postulated from historic map sources which are of a later date. The earliest such source dates to 1734 (ERO D/DU 27/1) and shows a park area enclosed by a park pale with a house or lodge on the southern boundary of the park (now Boundary Road) (ECC FAU 2003b). It is probable that the flood plain would have been used for grazing in this period.

Directly to the south of the development area are cropmarks of indeterminate date centred at NGR TM 0244 2396 (EHER 2419).

4 Aims

The aim of the watching brief was to identify and record any surviving archaeological deposits that may be disturbed during the groundworks. The requirement for frequent site visits included archaeological supervision of topsoil and subsoil stripping and any other invasive groundwork.

5 Results (Figs 2-8)

5.1 Introduction

The archaeological monitoring took place over a period of 11 months and consisted of 32 site visits at suitable intervals during the groundworks. For the purpose of the following discussion, the development area has been divided into three distinct geographical areas (Fig 2). Area A is located on the flood plain on the eastern side of the site (c 2m above sea level), Area B is located on the lower valley slope immediately west of Boundary Road (c 5m-10m above sea level), and Area C is located on the upper valley slope

between Boundary Road and St Andrews Avenue (15m-25m above sea level).

5.2 Area A (Figs 2-7 & 9)

5.2.1 Topsoil stripping

The flood plain was covered in grasses and sedges and was crossed by a number of field ditches and drains. By the time of CAT's first involvement in the project in September 2010, the removal of the vegetation and topsoil from the flood plain had already begun. The topsoil was scraped into piles by bull-dozers and then loaded into articulated dump-trucks by tracked excavators. The topsoil was stored on the eastern side of Area A (which already housed spoil heaps from previous construction projects on the university campus), and in the area to the north-east of Area A (Fig 3). Once the topsoil had been removed, clay was deposited on the flood plain to raise the ground level by approximately 0.75 m, creating a 'residential platform' onto which buildings are to be constructed. The de-silting of the two drainage ditches on Area A (Fig 3) was undertaken using 360 degree mechanical excavators and was also periodically monitored prior to their infilling with clay. Due to the dangers of working in close proximity to large earth moving machines, observations were made and photographs were taken either from a safe distance or whilst the machine operators were on their breaks. Similarly, all finds were collected whilst the machines were inactive.

The topsoil was a dark brown/grey clayey-silt (L1) and was relatively shallow (100-200mm) (Fig 10). Alluvial deposits beneath the topsoil consisted of a mixture of silty clays and gravels which were mostly grey and orange in colour. The topsoil stripping was undertaken whilst the ground was relatively dry and caused little disturbance to the underlying alluvial deposits.

Finds recovered during the topsoil strip in Area A consisted of prehistoric worked flints, pottery sherds dating to the medieval, post-medieval and modern periods, and post-medieval/modern glass and CBM fragments (finds numbers 1, 2 & 5 in Section 6). No archaeological features were observed cut into the alluvial deposits in Area A. However, modern services, natural features and post-medieval/modern field boundaries were all observed in this location during the 2004 evaluation (ECC FAU 2004). These features were not visible during the watching brief due to the uneven topsoil strip which results from the use of a bull-dozer.

On the western side of Area A, Barrows B, C and D had been fenced off to protect them from damage and were thus outside the development area (Fig 4 and the Frontispiece). However, Barrow A (labelled F1 during the fieldwork) was located within the area of the topsoil strip (Fig 4). The shallow topsoil (c 150mm deep) had been partially removed from the area of Barrow A with a bull-dozer. All subsequent topsoil removal in this area was undertaken under archaeological supervision using a 360-degree mechanical excavator equipped with a toothless ditching bucket.

The mound of Barrow A was visible on the ground and became particularly pronounced following a night of heavy rain (Plate 1). The top of the exposed mound stood c 0.15m higher than the surrounding alluvial deposits. Part of the mound was still covered in a thin layer of topsoil but, where all the topsoil had been removed, a light grey/brown silty clay with frequent gravel was exposed. This may have been the original mound material or it could have been an alluvial deposit washed onto the mound during a flooding episode. Photographs were taken of the exposed mound and its extents were surveyed using a total station (Fig 5). Finds were recovered from the surface of the mound during several walkovers (find numbers 1-5, 9 & 24 in section 6). The finds included numerous worked flints, post-medieval CBM and pottery sherds, and modern glass and CBM. It is probable that the post-medieval and modern finds derive from the overlying topsoil. The worked flints may also derive from the topsoil but, as there is no evidence that the flood plain was ever used for agriculture (and therefore ploughed), it is more likely that they derive from the deposits beneath the topsoil.

On the south-western edge of the mound, the topsoil was stripped using a mechanical excavator. A mottled grey/brown silty clay was exposed which was presumed to be the uppermost fill of the ring-ditch surrounding Barrow A (Plate 2). However, based on the findings of the subsequent magnetometer survey, it is probable that this was an alluvial deposit or the fill of a later ditch feature (see below).

Plate 1: The exposed mound of Barrow A (view NW).

Plate 2: The south-western edge of the exposed mound (view NW).

5.2.2 A magnetometer survey of Barrow A

with Dr Tim Dennis

Methodology

Before clay was deposited onto the flood plain to create the construction platform, a magnetometer survey was conducted in the area of Barrow A. This was undertaken by Dr Tim Dennis of the University of Essex assisted by Dr Patrick Spencer (also of the University of Essex) and the author.

The magnetometer survey used a Geoscan Research FM256 instrument. These are technically magnetic gradiometers designed to measure the gradient of the vertical component of the Earth's magnetic field rather than the absolute field magnitude. The gradiometer principle uses two fluxgate sensors spaced 0.5 m apart vertically, each of which generates a signal proportional to the absolute field strength. The difference between the two sensor outputs is the gradient, and it is this signal that is recorded digitally. Gradient amplitudes in rural areas of Essex typically lie in the range ±5 to ±10 nT but are frequently very much smaller. For a detailed description of fluxgate gradiometry principles see (Clark 1996).

The survey was carried out in two stages. The first covered an area of 40m x 80 m using traverses at 1m spacing based on a grid aligned to Ordnance Survey (Fig 5). This showed clear indications of a ring-ditch at the location of the slight mound. The second phase resurveyed the area of the ring-ditch at a higher resolution using 0.5 m track spacing over a 30m x 30m square (Fig 5 & Plate 3).

Computer software has displayed the variations as a greyscale image which required little processing (only background mean level subtraction), thanks primarily to the prior removal of the topsoil.

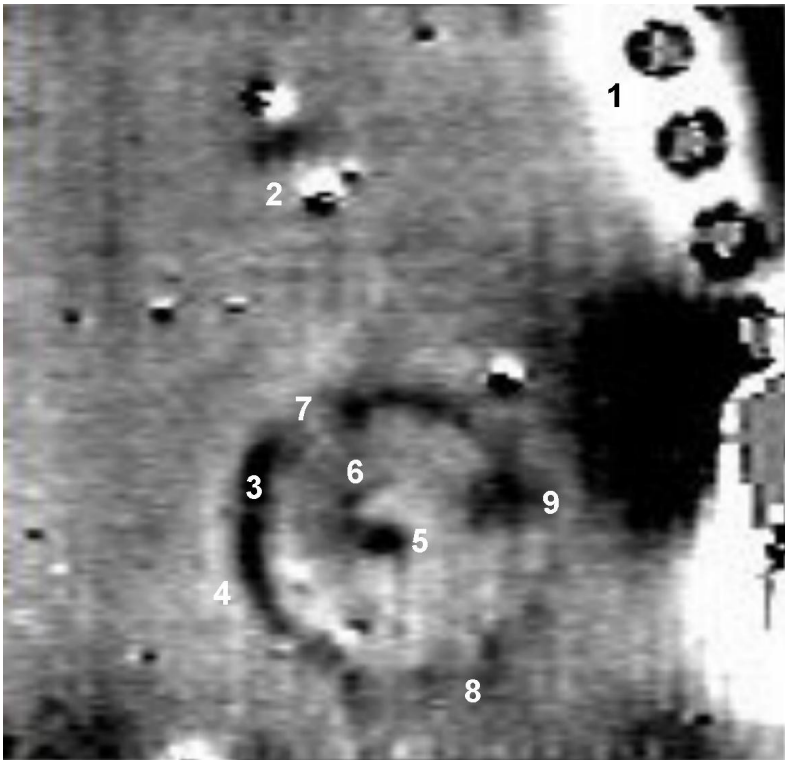

Plate 3: Results from stage 2 of the magnetometer survey (30m x 30m) (North is upwards).

Results

The most striking feature in the magnetometer plot is the straight overload-amplitude feature, which crosses the survey area on roughly a north-south alignment (Fig 5 & Plate 3, no 1). This is due to a water-main that is either made from iron pipes or has iron fittings. Other blobs which are 'bipolar' (adjacent black/white) are signals sufficient to exceed the dynamic range of the instrument and are caused by iron or steel debris (Plate 3, no 2). There may have been fragments of iron and steel in the thin layer of topsoil which remained in some places, or they may have been buried in features such as old drainage ditches or even previous archaeological evaluation trenches.

In the south-west corner of the magnetometer plot, a dark ring can be seen in the area of the low mound (Fig 5 & Plate 3, no 3). This is a source of positive variation which is created when a cut feature is backfilled with soil containing a high bacterial content (such as topsoil). Some bacteria can detect and react to magnetic fields (magnetotactic) and so are themselves slightly magnetic. Therefore, these features are more strongly magnetic than the surrounding natural and show up as dark, positive features. The dark ring on the magnetometer plot is interpreted as the ring-ditch which surrounds the barrow mound. It is probable that the mound was formed using the upcast soil from this ditch. On the magnetometer plot the ditch does not form a continuous circuit around the mound, with notable interruptions in the ditch circuit in the north-western and south-eastern corners (Plate 3). It is possible that these interruptions are the result of variable ground conditions affecting the magnetometer readings and that the ditch is in fact continuous.

Dr Tim Dennis has proposed that the 'interruptions' in the ditch circuit seen on the magnetometer plot represent significant features of the barrow. The gap in the north-western corner of the ditch circuit could be a causeway flanked by post-holes/pits or enlarged ditch terminals (Plate 3, no 7). Although uncommon, it is not unknown for barrows to have penannular encircling ditches (Lawson *et al* 1981, 30). It is also possible that interruptions in the eastern/south-eastern stretch of the ditch circuit may also be causeways. Barrows with multiple causeways have been termed 'henge-barrows' (Ashbee 1960, 132) but in East Anglia where the mounds have almost always been removed they are referred to as causewayed ring-ditches (Lawson *et al* 1981, 30). In the south-eastern corner of the circuit, there appears to be little evidence of a ditch. Instead there are five evenly spaced spot anomalies (Plate 3, no 8), which appear to be located just outside of the of the ditch circuit. It is possible that these anomalies could be post-holes from a peripheral post-circle (Ashbee 1960, 62). It would be expected that a post-circle would surround the ring-ditch rather than replace it. A low contrast version of the magnetometer plot suggests that more anomalies interpretable as post-holes may be present around the ditch in the north-western corner. There is also a large spot anomaly located within the ditch circuit (Plate 3, no 9).

The internal diameter of the ring-ditch identified by the magnetometer survey is only 9.5m, which is considerably smaller than the diameter of the mound surveyed with the total station during the watching brief (15m) and during the 2004 evaluation (16m) (Figs 5 & 6). Therefore, it would appear that at some point the circumference of the mound has increased covering the infilled ring-ditch. This may have been caused by denudation or by flooding events eroding the mound or depositing alluvial deposits on top of it. Alternatively, the mound may have been intentionally enlarged later in history, perhaps in association with the re-use of the monument.

Directly adjacent to the ring-ditch, and more pronounced on the western side, is a possible bank that can be seen as an arc of negative variation (Plate 3, no 4). However, a feature of the technique is that a strong positive anomaly usually has negative anomalies each side of it, though in theory they should be to the north and the south and the central anomaly is the strongest of all but doesn't show the effect (Plate 3, no 5).

In the centre of the barrow, there is another strong positive anomaly (Plate 3, no 5). It is probable that this oval shaped feature is either an inhumation burial in the centre of the mound or a pit excavated more recently in an attempt to loot grave goods from the barrow (Fig 6). It is also possible that a rectangular positive anomaly within the ring-ditch (Plate 3, no 6) is a satellite or secondary burial (Ashbee 1960, 41), which could have been inserted into the barrow during or following the construction of the mound. Other positive anomalies outside of the ring-ditch could be secondary burials located around and between the barrows. Similar burials have been recorded at other barrow cemeteries in north-east Essex, for example at Brightlingsea (2008) and Chitts Hill (Crummy 1977).

5.2.3 LiDAR image of the barrow cemetery

With Dr Tim Dennis

LiDAR (Light Detection And Ranging) is an optical remote sensing technology that can measure the properties of the ground surface by illuminating it with light from a pulsed laser beam. The laser beam is scanned from side to side as an aircraft flies over the survey area measuring between 20,000 to 100,000 points per second to build an accurate, high-resolution model of the ground and the features upon it. The dataset used in this report is the 'Digital Terrain Model' (DTM) which is specifically processed to remove the effects of surface features like buildings, trees and other vegetation.

The LiDAR image below (Plate 4) is a high-resolution dataset with the survey points spaced 25cm apart. The high areas show as lighter patches, with the tallest barrow (Barrow C) being a complete white out (Plate 4).

Two things in particular stand out about Barrow A in the LiDAR image. Firstly, as well as a pronounced mound, Barrow A appears to have an outer bank. The bank is particularly pronounced on the western side of the barrow and appears to be similar in height to the internal mound (Plates 4 & 5). Secondly, the mound is considerably larger than the ring-ditch identified in the magnetometer survey (Figs 6 & 7).

It is probable that the mound, bank and ring-ditch that are identifiable in the LiDAR image match the mound and ditch identified in T27 of the 2004 evaluation (Fig 6).

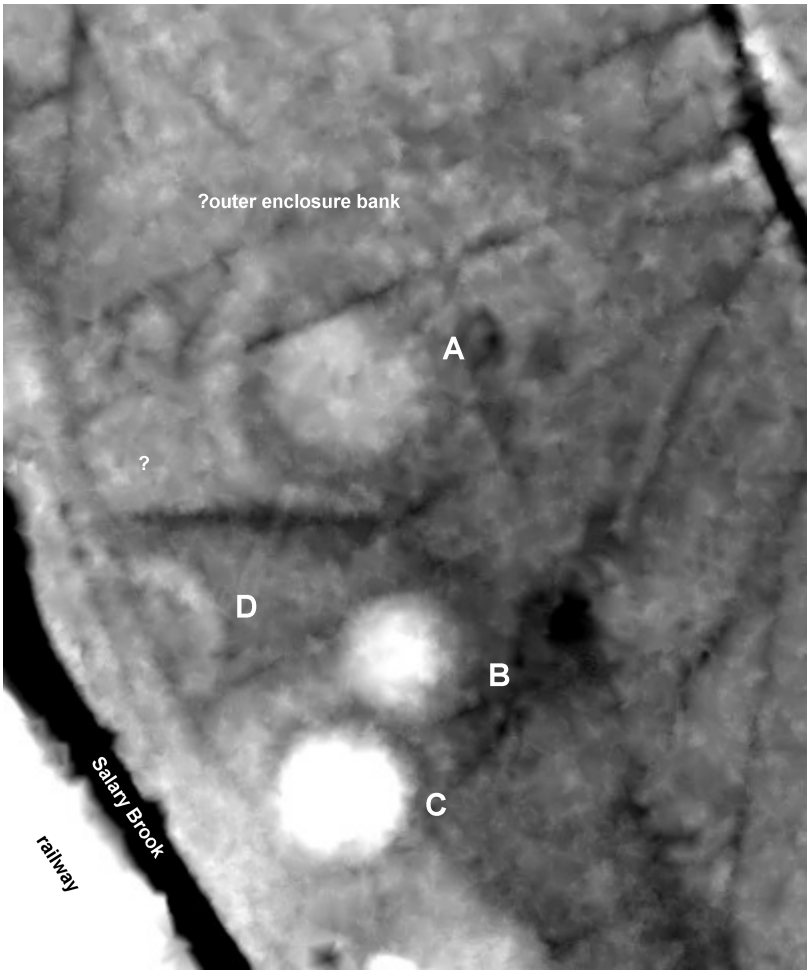

Plate 4: 100m x 120m LiDAR image with the four barrows labelled (North is upwards)

Two arcs of higher ground around the north-western and south-eastern edges of Barrow C appear to indicate that this barrow has an outer bank. However, this is improbable due to the close proximity of Barrow B. Although the extant mounds of barrows B and C could be artificially large in circumference (as indicated by the magnetometer plot of Barrow A) the ring-ditches that surround them would be to close to one another to accommodate an outer bank as well. The width and depth of the surrounding ditches could be estimated based on the volume of material in the mounds. However, it is not possible to tell without excavation if any of the surviving mounds deposits are alluvial or whether imported material was used in the creation of the mounds.

The interruption to the circuit of Barrow D indicates that a 12m wide corridor along the eastern side of Salary Brook was disturbed during its diversion (Plate 4). What remains of Barrow D appears to be an outer bank with no indication of an internal mound or ring-ditch.

A close examination of the LiDAR image suggests that there may be another barrow mound to the west-southwest of Barrow A (Plate 4, marked with a '?'), as well as a possible 'outer enclosure bank' to the north of Barrow A (Plate 4), which may have surrounded the whole cemetery group.

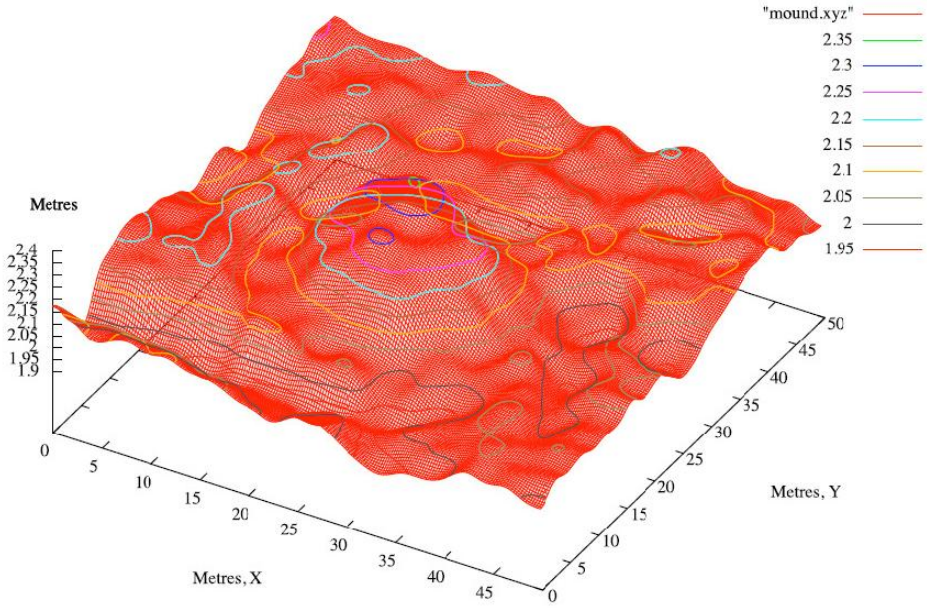

Plate 5: A '3d' plot of Barrow A created by Dr Tim Dennis using the absolute height values from the LiDAR file.

5.2.4 Other groundworks

The excavation of two Borrow Pits (Borrow Pit 1 & 2) was observed during October and November 2010 (Fig 3). 'Borrow Pit' is a term used in construction and civil engineering for an area where materials have been excavated for use at another location. In this instance the material was clay, and it was used to raise the ground level of the flood plain to create the construction platform.

In Borrow Pit 1, the topsoil (L1) overlay a medium grey/orange alluvial clay with rare gravel patches (L3) (Fig 10). The clay was excavated using 30 ton excavators equipped with toothed buckets and stockpiled on the field to the east of Area A (Fig 3). The clay varied in depth (300-900mm thick) and overlay an alluvial gravel in a silty-sand matrix (L4) (Plate 6). A close examination of the gravel resulted in the recovery of six worked flints (finds

Plate 6: Borrow Pit 1, the exposed surface of alluvial gravels L4 (view N).

no 7, section 6.5). During the excavation of the clay a large modern rubbish pit with a wet, organic fill was identified (Fig 3). The pit contained numerous early 20th-century bottles and jars and corroded metal tins.

Following a period of heavy rain, the half-excavated Borrow Pit filled with water and excavations were halted. The water was eventually pumped out but the material subsequently excavated from the pit was extremely wet and the pit was no longer safe to enter.

Opportunities to observe of the excavation of Borrow Pit 2 (Fig 3) were limited due to the substantial amount of standing water in this area. Alluvial clay was excavated from the Borrow Pit to a depth of c 4m below the surrounding ground level and no archaeological features or deposits were observed. Both Borrow Pits were left open as attenuation ponds.

In the meadow to the south-east of the main development area, a water drainage pipe was installed which was linked to the drainage beneath the new roadway (Fig 3). This pipe was installed in the lowest area of flood plain encompassed by the development (c 1.6m below sea level). There was significant standing water in this area and the ground was saturated. Therefore, only a short length of the trench was excavated at a time and once the new section of pipe was installed, it was quickly backfilled. This method was repeated the whole way along the length of the trench. A thin layer of topsoil (c 90mm) directly overlay a blue/grey alluvial clay, which in turn overlay alluvial gravel at a depth of roughly 3m below ground level. Due to safety considerations all observations were made from a distance and no attempt was made to closely examine the edges of the trench. During two monitoring visits, no archaeological features or deposits were observed and no finds were recovered.

The excavation of four large trial-holes to facilitate geotechnical analysis of the underlying deposits did not uncover any archaeological features or deposits (Fig 3). The topsoil had already been removed from Area A and the ditches, into which three of the trial-holes were excavated, had been de-silted. In all four holes alluvial clay overlay gravel, which in turn overlay a dense clay.

The water drainage pipes beneath the new roadway (Fig 3) were installed using the same methodology applied in the meadow to the south. Similar working conditions were also encountered, with the trenches quickly filling with water and the edges of the trenches becoming unstable. During four monitoring visits the trenches for the pipes were examined but no archaeological features or deposits were observed.

5.3 Area B (Figs 8 & 10)

5.3.1 Topsoil stripping

The removal of topsoil from Area B began in late September 2010 and was undertaken using the same methodology employed in Area A (see section 5.2.1). The medium grey/brown clayey silt topsoil (L1) was stripped off of a light orange/brown clayey silt colluvial deposit (L2) (Fig 10). In places this colluvium (otherwise known as hillwash) was removed exposing a firm mottled orange/grey clay (L5) (Fig 10). A north-south aligned band of gravel underlay the colluvium near to the eastern boundary of Area B. Close examination of the gravel indicated that it was a natural gravel seam and not a metalled road surface. Late Iron Age-early Roman pottery sherds, abraded Roman brick/tile fragments and worked flints were all collected form the interface between the topsoil and colluvium during the topsoil stripping (L2- see section 6). Occasional charcoal and daub flecks were also noted in the colluvium.

Despite substantial wheel-rutting in Area B, two possible pits (F2 & F3) were identified during the topsoil stripping (Fig 8). Both pits were cut into the colluvium and were identified due to the high volume of charcoal in their fills. F2 was almost square (600mm x 700mm) with a medium orange/brown silty-clay fill. A small ?Roman brick fragment was recovered from the upper fill of F2. F3 was either the remains of a fire or a pit containing mostly fire sweepings. The 'fill' was very similar to the colluvium with abundant charcoal & burnt clay. With the exception of occasional clay land drainage pipes, there appeared to be little modern disturbance in Area B.

5.3.2 Excavation of Borrow Pit 3

The largest Borrow Pit excavated during the development was located in Area B (Fig 8). There was a prolonged period of inactivity following the removal of the topsoil which was caused by localised flooding. Most of the water had drained away CAT were called to inspect the excavation of the colluvium (L2) and clay (L5) from Borrow Pit 3 (Fig 8). This material was excavated using used two 360 degree excavators equipped with toothed buckets and was transported in articulated dumper trucks to Area A.

The westernmost 15m of Area B had already been excavated to a depth of c 1m below the original ground level by the time the CAT archaeologist was called to site. Examination of the western edge of the Borrow Pit revealed a dense deposit of Roman tile and brick in what appeared to be a long, shallow pit (F4) (Fig 10). F4 had a soft, medium grey/brown clayey silt fill with rare charcoal inclusions. Forty-eight fragments of Roman brick and tile as well as Late Iron Age-early Roman pottery fragments were recovered from the section of pit F4 (finds no 14, section 6).

A dense deposit of charcoal (F5) was uncovered by the mechanical excavator (Fig 8). The large toothed bucket of the excavator removed almost all of the feature, but the remaining charcoal deposit appeared to contain tiny fragments of cremated bone suggesting that F5 was probably an unurned cremation burial (Plate 7).

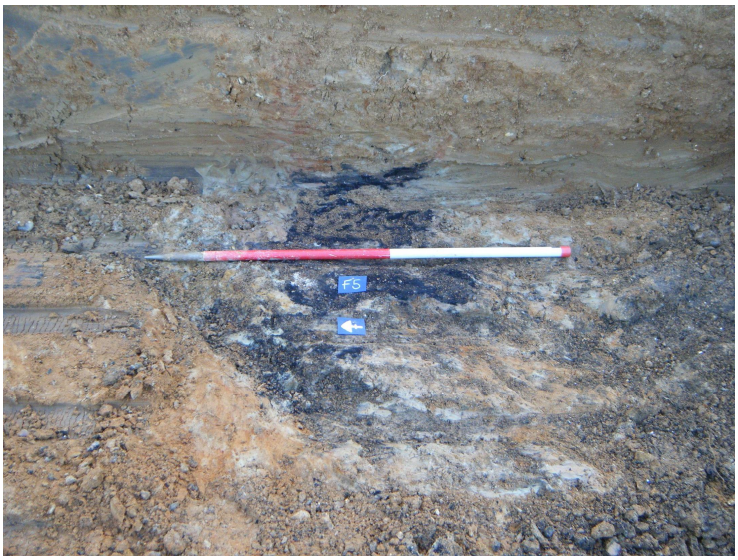

Plate 7: The probable unurned cremation burial F5 (view E).

In close proximity to F5, a dense deposit of pottery fragments was observed in section (F6) (Fig 10). Upon the discovery of F5 and F6, excavations at the southern end of Borrow Pit 3 were put on hold to allow time for archaeological recording to take place. A mechanical excavator equipped with a toothless ditching bucket was used to lower the ground level around the pit F6 and to scrape clean the surrounding area so that it could be examined for further archaeological features.

The pit F6 was steep sided with a flat base and contained a firm light orange/grey silty clay fill (Fig 10). Over 400 sherds from two, possibly three, very similar early 2nd-mid/late 3rd century pots were recovered from the base of the pit. This dense deposit of pottery sherds had the appearance of complete vessels smashed in the bottom of a pit. It was not possible to tell whether the pots had been broken post-deposition by pressure from machinery or whether they were broken before they were placed in the pit.

The pit F6 appeared to be overlain by the colluvium (L2). However, F4 appeared to be cut through this layer. The colluvium was found to seal most of the features identified in the ECC FAU evaluation (2004, 14), and the finds evidence from F4 and F6 suggests that L2 actually overlay F4. In the southernmost edge of the Borrow Pit, a distinct colluvial layer was discernable beneath L2 (L10). L10 was a medium grey/brown silty clay with occasional stones, charcoal inclusions and sherds of Late Iron Age-early Roman pottery (Plate 8). The recovery of pottery sherds of this date from the colluvial deposits across Area B indicates that this soil movement is not recent in date and that there is likely to be further archaeological remains or deposits further up slope from which all this material derives.

With the exception of clay land drainage pipes, no other archaeological features were uncovered during the excavation of the Borrow Pit. A deep channel was identified which was initially thought to be a backfilled ditch. However, the clay and gravel deposits that filled the channel suggested that it was probably a geological feature such as an infilled alluvial channel that once connected to the River Colne. Beneath the colluvial deposits, the clay L5 overlay a firm medium grey clay with a high gravel content (L8) which was interleaved with an orange/grey clay that contained no stones at all (L7) (Fig 10).

Plate 8: The southern edge of Borrow Pit 3. The white labels mark the locations of LIA-early Roman pottery in the colluvium (view S).

5.3.3 Other groundworks

The installation of water drainage pipes beneath the new roadway was monitored during three visits in January/February 2011. The pipe was installed using the same methodology as was used in Area A (see section 5.2.4) under similar waterlogged working conditions. No evidence of the archaeological features observed in ECC FAU Trench 23 were seen (Fig 8), nor were any other archaeological features of deposits. However, this is almost certainly due to the difficult conditions under which the work was being undertaken.

Large trial-holes excavated for the geotechnical engineer were also monitored but did not uncover any archaeological features or deposits (Fig 8).

5.4 Area C (Figs 9 & 10)

5.4.1 C1 Topsoil stripping

The removal of the topsoil from Area C was undertaken using 360 degree excavators. The topsoil was taken across Boundary Road in articulated dump-trucks and stored on the field east of Area A (Fig 2). At the eastern end of Area C, the dark grey/brown clayey silt topsoil (L1) directly overlay a variable sand and gravel natural. Further west down the valley slope, a medium brown clayey silt colluvium (L2) was uncovered (Fig 10). The colluvium overlay alluvial clays and gravels which were mottled in colour and consistency (L3). Towards the eastern end of Area C, a natural spring caused severe flooding and saturated the ground in an area roughly 40m² (Fig 9).

No archaeological features were observed during the topsoil stripping, but numerous sherds of medieval pottery (100 sherds, 1372g) were recovered from an area roughly 30m x 20m in size during numerous monitoring visits (Fig 9). The pottery fragments were mostly plain, unglazed body sherds dating to the 13th-14th centuries. Small trial-pits were hand-excavated beneath many of the sherds to ascertain whether or not they were from the upper fills of cut features. In each instance the alluvial clay L3 was encountered 50-100mm beneath the pottery sherds.

Plate 9: Medieval pottery from the colluvium L2.

5.4.1 C1 Groundworks (Fig 9)

Deep excavations were undertaken in Area C1 during the construction of the new roadway and the installation of water drainage pipes. Two possible features were identified near the northern edge of the site (?F7 & ?F8) (Fig 9). Both features appeared to be ditches. One was identified in the 45 degree batter on the edge of the site (?F8) and the other was parallel to the northern edge of the stripped area (?F7). Both features had shallow ditch profiles but their fills did not contain any discernable inclusions or finds.

Excavations near the eastern edge of the area containing the medieval pottery concentration were carried out under archaeological supervision. No cut features were observed in the clay confirming that the pottery came from the colluvium L2. It is probable that the medieval pottery is derived from a medieval site located to the north-east of the pottery concentration, probably on the ridge of the river valley.

A large water-main which crossed the line of the new road was replaced at greatly increased depth so that it was located below the level at which the road infrastructure would need to be installed. The route of the water-main was also altered slightly to ensure that its presence did not impact on future development in the area. Firstly, the topsoil was removed from the strip of land into which the new water-main was to be installed, then the main was constructed using the same methodology employed to lay the drainage pipes on Areas A & B. No archaeological features were observed during the groundworks. However, numerous finds were recovered from the colluvium during the topsoil stripping including more medieval pottery sherds and four sherds from a late Roman vessel (finds nos 26 & 27, section 6).

5.4.1 C2 Topsoil stripping (Fig 9)

The topsoil was stripped from Area C2 prior to the construction of a new junction linking Boundary Road to St Andrews Avenue (Fig 9). The topsoil was less than 100mm thick and directly overlay solid natural clay. It was evident that any alluvial or colluvial deposits which may have underlay the topsoil near the top of the valley slope had already been removed. Three modern features were identified cut into the clay. A rubbish pit near to Boundary Road, a small infilled drainage ditch alongside Boundary Road and

a large ditch roughly parallel to St Andrews Avenue which had a dark organic fill containing large lumps of tarmac. Two sherds of post-medieval pottery and three fragments of peg-tile were recovered from the topsoil near to the trees on the eastern edge of Area C2.

An examination of early Ordnance Survey maps shows that prior to the construction of Boundary Road and the dual carriageway stretch of St Andrews Avenue continued through this triangle of land (Plate 10). Therefore, Area C2 had already been heavily landscaped during the construction/removal of this stretch of the road and the subsequent construction of the dual-carriageway. It is probable that the modern features identified were associated with the former roadway.

Further excavations in Area C2 that were associated with the construction of the new junction were not monitored.

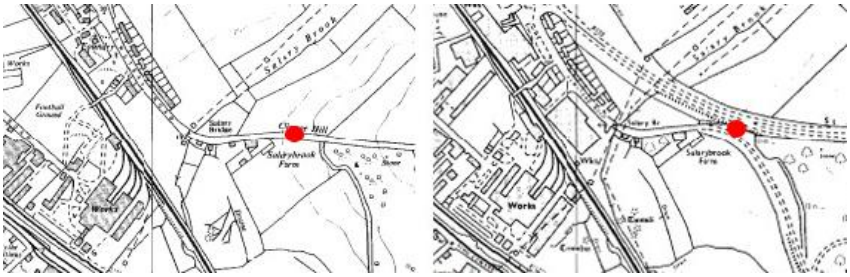

Plate 10: Extract from OS 1967 1:10,560 map (left) and OS 1986 1:10,560 map (right) with Area C2 marked as a red dot.

6 Finds

6.1 Late Iron Age and Roman pottery

by Stephen Benfield

A total of 495 sherds of Late Iron Age and Roman pottery, together weighing 3,496g, were recovered from a small number of contexts. These are two features (F4 & F6) and two colluvial layers (L2 & L10). Pottery of Late Iron Age-early Roman, mid Roman and late Roman dates was recovered. All of the pottery consists of coarse wares, almost all probably of local production, with one late Roman regional import. The pottery is listed in Table 1.

The majority (455 sherds weighing 3138g) came from one pit (F6) in Area B and appears to represent two, or possibly three, jars of the same type which are very broken up. Most of the pottery is abraded, although soil conditions on the site may be responsible for much of this as sherds from the similar (contemporary) vessels from F6 show a large difference in the degree of abrasion to surfaces. This suggests that any abrasion noted need not necessarily imply a significant depositional history.

The pottery was recorded using the Colchester Roman pottery fabric series, listed in *CAR* **10**, supplemented by additional fabric types for Late Iron Age-type grog-tempered ware (Fabric GTW) and Romanising coarse wares (Fabric RCW). The vessel forms refer to the Camulodunum (Cam) series for Roman pottery (Hawkes & Hull 1947; Hull 1958).

Area B

Much of the assemblage (discounting the pottery from F6) consists of sherds in grog-tempered ware (Fabric GTW) and Romanising fabrics (Fabric RCW). This pottery was recovered from contexts F4, L2 and L10 in Area B. The Romanising fabric is broadly distinguished from grog-tempered ware by the replacement of grog as the main tempering agent by fragments of burnt organic matter and by a thinner vessel wall thickness. Both these fabric types appear in the Late Iron Age and continue into the early Roman period,

although Romanising coarse wares are generally considered to be of post-conquest date. Romanising fabrics, together with Roman sandy coarse wares (Fabric GX) probably replace the grog-tempered wares soon after the conquest. It is noted that some of the grog-tempered sherds are slightly vesicular. These could represent heavily-tempered, small-medium sized storage vessels and the use of grog-temper in these vessels may have continued longer into the Roman period than for other grog-tempered wares. Also, the rim sherds from one jar/bowl in Fabric GTW are hooked which suggests a late dating in this fabric type. Only one vessel form could be identified, this is a cordoned jar of form Cam 218 (Fabric RCW) dated 1st-early 2nd century, although there is also a sherd from the edge of a lid (Fabric RCW).

The pottery from the pit F6 (find nos 10 & 14) consists of sherds from two, possibly three, jars of form Cam 278 (dated early 2nd-mid/late 3rd century) in a black surface sandy fabric (Fabric GB). A quick measurement of the Eve (estimated vessel equivalent) gave a total of 2.85, indicating nearly 3 whole rims (1.00 being a complete rim). However, the vessels are broken into numerous small sherds (estimated at a total of *c* 400+) giving an average sherd weight of about 7g. The rim sherds are small so it is possible that the Eve total is too high and the general appearance from the sherds is that two pots are represented. There is one near complete base (in sherds) and other base sherds insufficient to form a complete second base. The rim shapes suggest the vessels were very similar in appearance. A number of body sherds, probably from just one of the vessels, have faint acute lattice burnishing suggesting a dating of mid 2nd-early 3rd century. One abraded grey ware sherd (Fabric GX), dated as Roman, was also recovered from this context.

Table 1: Late Iron Age and Roman pottery In Area B by context and find Number.

cntxt	finds no.	Fabric	notes	no	wt(g)	abr.	spot dating
L2	6	GTW	hooked rim sherds from jar/bowl	3	18	*	LIA-?E Rom
L2	6	GX	base sherd	1	8	*	M1-E2C?
F4	14	DJ	probably 1-E2C	4	3	*	?LIA-E Rom
F4	14	GTW	vesicular	1	3	*	LIA-?E Rom
F4	17	GTW		2	27	*	LIA-?E Rom
F4	17	GX		1	5		Rom
F4	17	RCW	Cam 218 (1-?E2C)	1	6	*	?LIA-E Rom 1C
F6	10	GB	sandy, black-surface ware, body sherds	200	865		
F6	10	GB	sandy, black-surface ware, rim(s) Cam 278, Eve 0.75	11	111		E/M2-E/M3C
F6	10	GB	sandy, black-surface ware, almost complete base, other sherds from another base	10	199		
F6	10	GX		1	27	*	Rom
F6	13	GB	sandy, black-surface ware, body sherds, acute lattice decoration	200	1490		(E/M2-E3C)
F6	13	GB	sandy, black-surface ware, base sherds	5	34		
F6	13	GB	sandy, black-surface ware, rim(s) Cam 278, Eve 2.10	28	412		E/M2-E/M3C
L10	11	GTW/ RCW		13	110	*	?LIA-E Rom
L10	12	GTW		1	1	*	LIA-?E Rom
L10	12	GX		1	3	*	M1-E2C?
L10	12	RCW		4	6	*	M-L1C

cntxt	finds no.	Fabric	notes	no	wt(g)	abr.	spot dating
L2	15	GTW		3	34	*	LIA-?E Rom
L2	15	RCW		1	13		M-L1C

Area C
There are four sherds from a hooked rim jar in late shell-tempered ware (Fabric HD(late)) from L2. This is almost certainly a product of potteries in the South Midlands area. The jar, which has fine rilling on the shoulder, is of form *CAR* **10** Fabric HD Type 35/36 and can be dated to the late 3rd-4th century.

Table 2: Late Iron Age and Roman pottery In Area C.

cntxt	finds no.	Fabric	notes	no	wt(g)	abr.	spot dating
L2	26	HD(late)	rim, rilled shoulder, jar *CAR* **10** Type 35/36	4	121		Rom L3-4C

6.2 Roman ceramic building material (CBM)
by Stephen Benfield

Forty-eight pieces of brick and tile, together weighing 6427g, were recovered from F4 (find no 14) in Area B. All of this material appears to be of Roman date. Identifiable pieces are from roof tiles and Roman bricks. The roof tiles are mostly pieces of *imbrex*, but with two small pieces from *tegula* flanges and some flat pieces which are probably from *tegula* bases. The identifiable bricks consist of three corner pieces, although some other thick pieces can also be identified as from bricks. One piece, probably from a brick, appears over fired. No traces of mortar are associated with any of these brick or tile pieces.

The brick and tile from F4 can be divided visually and by feel between two broad fabrics. One fabric is orange in colour, with a silty, or fine sand fabric that is slightly soft and the surfaces are powdery. The other fabric is red throughout, or orange with darker red surfaces, has a fine sandy feel and is well fired. There are few visible inclusions in either fabric, other than occasional small stones and it may be possible that the differences in the two fabrics reflects the degree to which the clay has been fired rather than different clay sources. Soil conditions may also have adversely affected the soft (orange fabric) tiles if these were originally not so well fired. Both bricks and *imbrex* tiles are present in both fabrics, although both the *tegula* flanges are in the soft orange fabric. The possible *tegula* base pieces appear in both fabric types. The only Roman tile which was noted as in a significantly different fabric is a small unidentified piece that is in a soft powdery orange fabric that contains pale brown clay pellets.

The identified Roman brick and tile types from F4 are described below:

Imbrex tiles
Sixteen pieces (weight 2557g). The most complete piece suggests an apex height of about 110mm for that tile.

Tegula tiles
There are two small sections from *tegula* flanges. One is certainly from a tegula, the other is almost certainly so as one of the edges is rounded. A flat piece of tile (18mm thick) is also almost certainly part of a tegula base as there is the lower part of a rising edge on one side parallel to the faint surface scoring. A small deeper section of the scoring might be part of a tile signature. Three other flat pieces are probably parts of a tegula bases because of their thickness. One is 18mm thick, one 17mm and the other 16mm thick. The thickness of these pieces could suggest a possible mid-late Roman date as examples of early Roman *tegula* tiles in Colchester tend to

be relatively thick, at greater than 20mm (Black 2004). The combined weight of all of these pieces is 599g

Roman bricks
Three pieces (weight 1231g) can be identified as parts of bricks as they each preserve a plain, right-angled corner and are quite thick. One brick, in the soft orange fabric, is 40mm thick. The other two are in the hard red fabric of which one can be measured and is, is 35mm thick. The longest surviving edge on these bricks is 115mm. Five other pieces (weight 1146g) each 35mm or 40mm thick, also appear to be from Roman bricks.

One brick piece, 38mm thick (weight 111g), is hard and coloured a deep brownish-red with some pale grey. The piece may be slightly distorted and appears possibly to be over fired.

The Roman tiles and bricks from F4 are an interesting assemblage from a site away from the main Roman urban centre and the apparent limited variation in tile fabrics and the imbalance of flat roof tiles (*tegula*) pieces to the larger number of pieces from the curved (*imbrex*) roof tiles can be noted.

In addition to these, there are two abraded pieces of Roman brick/tile (weight 302g) from L2 (find no 6) in Area B, one very abraded, small piece of ?Roman brick or tile from F2 (find no 8), one piece of Roman tile (15mm thick 54g) and one piece of Roman brick (26mm thick 164g) from L2 (find no 27) Area C, and one small piece of ?Roman brick (weight 18g) from L2 (find no 20) Area C.

6.3 Medieval and later pottery

by Howard Brooks

This is the report on the medieval and later pottery (102 sherds, 1390g). Fabric descriptions are after *CAR* **7**. Fabrics present include: Fabric 13 (early medieval sandy ware); Fabric 20 (medieval sandy grey ware); Fabric 21 (sandy orange ware); Fabric 40 (post-medieval red earthenware - PMRE); and Fabric 48d (modern ironstone). A list of fabrics by area and context is given below.

Area A

L1
Finds number 1
Fabric 21, sandy orange ware, 1 sherd, 4g.
This is probably a Colchester product, ie Fabric 21a

L1
Finds number 2
Fabric 40 PMRE, 1 sherd, 11g.
Fabric 48d modern ironstone, 1 sherd, 2g.

?L1
Finds number 9
Fabric 40 PMRE, 1 sherd, 7g.

Area C (C1)

L2
Finds number 19
Fabric 20 medieval sandy grey ware, 18 sherds, 340g.

Interesting group. Unglazed, sandy fabric. Mainly cooking pot body sherds. Three rims. One flared A1 type, and two flat-topped H type, one with internal rilling (see Cotter fig 23.26). One body sherd has applied cordon (see Cotter fig 41.117). Local produce? Middleborough kilns? Late 12th-13th centuries.

L2
Finds number 20
Fabric 20 medieval sandy grey ware, 35 sherds, 496g.

Like the group in Finds number 19, this is also a good group of Fabric 20. Three base sherds and six rims, otherwise plain body sherds from cooking pots. Rims are everted and flat-topped. H1 squared rim, B2 thickened flat-topped, and H3 neck-less. 12th-13th centuries.

Fabric 21a Colchester-type ware, 2 sherds, 35g. Quite decayed, but looks like one at least has overall white slip under clear glaze showing as orange/brown. If this is early Colchester, then 13th century date for the group.

L2
Finds number 22
Fabric 21 sandy orange ware, 2 sherds 35g.
Included short necked, flat-topped H1 rim. 13th-14th?

L2
Finds number 23
Fabric 20 medieval sandy grey ware, 11 sherds, 59g.
Includes 2 simple everted rims.

Fabric 21 sandy orange ware handle fragment, 70g.
Jug handle, internal and external white slip, Very clear external glaze. 13th-14th.

L2
Finds number 27
Fabric 20 medieval sandy grey ware, 26 sherds, 209g.
Fabric 40 PMRE, 1 sherd, 3g.

Area C (C2)
L2
Finds number 25
Fabric 40 PMRE, 2 sherds, 19g.

The group of medieval pottery from Area C1 (100 sherds, 1,372g) is of interest given that it was found in an area of approximately 30m x 20m (TM 02547 24270). This is too dense a concentration to be derived from manure scatter. It would appear to be derived from a local medieval site, occupied in the 13th-14th centuries. The range of vessels present, mainly cooking pots, with some jug fragments, indicates a domestic site. All the pottery could be of local manufacture from the kilns at Middleborough (CAR **7**) or Mile End, Colchester (Drury and Petchey 1975), and the lack of any imported material, such as Hedingham or Mill Green wares, may indicate that this was a fairly low-status site.

The post-medieval and later pottery is of little of interest.

6.4 Medieval and later ceramic building material (CBM)

by Howard Brooks

One complete U-shaped land-drain tile (weight 1251g) was recovered from L5 (find no 16). This is in a well-fired, red, slightly coarse sandy fabric. The tile is 280mm long, 95mm wide at the base and the apex height is about 80mm. The tile is probably of post-medieval or modern date and was retained for reference purposes. The rest of the post-Roman CBM is dominated by peg-tile that could be medieval in date but becomes more common from the later medieval period onwards. This material has been catalogued and discarded.

Area A
L1
Finds number 4
4 post-medieval or modern tile fragments. 124g.
1 peg-tile fragment, 12mm thick. 33g.

L1
Finds number 9
2 brick fragments, abraded. 49g.

Area C (C1)
L2
Finds number 20
2 peg-tile fragments, one with circular peg-hole, 13mm thick. 100g.

L2
Finds number 23
1 peg-tile fragment, 13mm thick. 126g.

L2
Finds number 27
2 peg-tile scraps. 8g.

Area C (C2)
L2
Finds number 25
3 peg-tile fragments, 8mm thick, 12mm thick (circular peg hole), 13mm thick.
76 g.

6.5 Worked flints (lithics)

by Adam Wightman

Area A: Barrow A

Thirty-three worked flints (finds nos 1-5, 9 & 24) were collected from within a 40m radius of the centre of Barrow A following the removal of the topsoil (L1). At least twenty-three of these (finds nos 3, 4, 9 & 24) were collected from within the area of the barrow as indicated by the LiDAR image. As it is possible that some, if not most, of these worked flints are likely to be contemporary with the barrow, they are considered separately below.

The flakes from the area of the barrow are generally quite squat (short, wide and relatively thick) and over half have breaks or hinge fractures obtained during the knapping process. Almost all of the flakes have been struck using a hard hammer without any preparation of the striking platform. Overall, the characteristics of the flake assemblage is indicative of the declining ability of flintknappers in the Bronze Age when an intensification in farming activities and the emergence of a wider range of metal tools led to an increasing decline in the quality of flintworking techniques.

Five of the flakes appear to have been retouched for utilisation as a tool. Three of the flakes have small notches in their distal and lateral edges and two flakes have small lines of retouch (which is not classifiable as scraper retouch). One of the retouched flakes is heavily patinated and the retouch scars cut through the patination exposing fresh flint. This suggests that a struck flake of greater antiquity has been found and retouched later in prehistory for utilisation as a tool. The quality and types of retouched tools recovered is consistent with a Bronze Age date for the majority of the assemblage.

Only five flakes exhibit evidence of edge damage or usewear. Edge damage could easily have occurred during the topsoil stripping, but as the flood plain is unlikely to have ploughed it is probable that in most instances the damage noted is usewear.

Three cores were recovered. One heavily utilised cube-shaped core is typical of Early Neolithic flake production. Another is almost cube-shaped buts appears to be the bi-product of a fairly *ad hoc* knapping strategy and is probably Late Neolithic or Early Bronze Age in date. The third core is a river pebble that has only been knapped on one face and from two opposing platforms. This core is probably Bronze Age in date. Three core fragments were also recovered.

Two definite blades were recovered from the area of the barrow. Both are relatively large, have been knapped with a soft hammer or punch and exhibit evidence of platform preparation. One may be retouched, although it is possible that it is edge damage or usewear. The other is heavily patinated. Both blades probably date to the Early Neolithic period but could date to the Mesolithic. Two other pieces could also be blades but may have resulted from poorly controlled flake production

Area A: Borrow Pit 1

Six worked flints were recovered from on top of a layer of river gravel (L4). These include three blades. The smallest blade is heavily patinated but appears to have been struck using a hard hammer. Another was knapped using a soft hammer or a punch and exhibits platform preparation. This blade may also be retouched along one lateral edge creating a serrated blade. The other three pieces are all secondary hard hammer flakes. The presence of blades and the presence of platforms preparation would indicate that these flints are of considerable antiquity, probably Early Neolithic but possibly Mesolithic.

Table 3: Worked flints from Area A (EN- Early Neolithic, LN- Late Neolithic, EBA- Early Bronze Age, BA- Bronze Age)

context	finds no.	artefact type	cortex %	soft/hard hammer	retouch	date
L1	1	flake	15	soft		
		flake	10	hard		
		flake	15	either		
L1	2	flake	50	hard		
		flake	0	hard		
		flake	15	either		
		flake-notched	0	hard	semi-abrupt	LN-EBA
L1	3	flake	20	hard		
		flake	0	hard		
		flake	0	hard		
		flake	35	hard	usewear/edge damage	
		flake- notched	20	hard	abrupt	
		core fragment/ waste piece	45			BA
		core fragment	0			
		core	15			EN
		flake-notched	40			LN-EBA
L4	4	flake	70			
		flake	100	hard		
		flake	0	hard		
		?flake	0			
		flake	15	hard		
		flake- retouched	5		abrupt	
		blade	15			EN
		core fragment	30			BA
		core	20	hard		?LN-EBA
		blade ?retouched	5	either	Probably usewear/ edge damage	EN
L1	5	flake- retouched	0	hard	semi-abrupt	?N flake ?BA retouch
		blade	0	soft		M/N
		core	45			BA
L4	7	flake	75	hard		
		flake	80	hard		
		flake	5	either	usewear/edge damage	

		blade	0	hard		
		blade	100			
		blade ?retouched	20	soft	abrupt	EN
L1	9	flake	55	?soft	edge damage	
L2	24	?blade	0	hard		
		flake	0	hard		
		flake	15	hard		

Area B

Seventeen flints were recovered from Area B. These flints were collected from over a large area and include a variety of pieces of different dates. Fourteen were recovered from the colluvial deposits L2 and L10 (finds nos 6, 12 & 15) and three were residual in Late Iron Age/Roman contexts (F4 & F6). One of the three residual pieces is a retouched blade that has been made using bullhead flint that was probably procured from the Thames basin. Another may be an Early Neolithic axe-thinning flake. The flakes recovered from the colluvium are all relatively large hard hammer flakes. One flake has a small notch on one edge, another has notches removed from two edges and another has an edge of semi-abrupt scraper retouch. A core fragment appears to have been retouched and used as a tool.

Table 4: Worked flints from Area B (EN- Early Neolithic, LN- Late Neolithic, EBA- Early Bronze Age, BA- Bronze Age)

context	finds no.	artefact type	cortex %	soft/hard hammer	retouch	date
L2	6	flake	55	hard	usewear/edge damage	
		flake	60	hard		
		flake	15	hard		
		flake	100	hard	edge damage	
		flake	20	hard	usewear/edge damage	
		flake	20	hard		
		waste piece	0			
		flake-notched	5	either	abrupt	
		retouched core fragment	2		abrupt	BA
F6	10	flake(axe thin?)	5	soft		EN
L10	12	blade	0			EN
F4	14	flake	95	hard		
L2	15	flake	25	hard	usewear/edge damage	
		?flake	95		usewear/edge damage	
		flake-notched	95	hard	semi-abrupt	
		flake-scraper	30	hard	semi-abrupt	LBA-EN
F4	17	retouched blade	20	soft	abrupt	EN

Conclusions

Based on the knapping characteristics of the flakes, tools and cores recovered from the area of Barrow A, it is likely that most of the flints date to the Early Bronze Age. However, the cube-shaped cores and blades recovered are almost certainly Early Neolithic in date and attest to activity which predates the creation of the barrow cemetery. The quantity of flints recovered suggests that activities other than just burial were taking place on this part of the flood plain during the Bronze Age.

The presence of worked flints in the alluvial gravel L4 suggests that the River Colne had a shore in this location in the Early Neolithic (or possibly Mesolithic) period. Unfortunately, the assemblage is not large enough to make inferences as to what activities were being carried out in this location. However, based on the riverine nature of the raw materials used to create

most of the worked flints in the assemblage, it is possible that flint procurement and knapping may have occurred on the river shore.

The mixed flint assemblage from Area B was mostly collected from the colluvium on the valley slope and is probably indicative of prehistoric activity further up the valley slope to the east of Area B.

6.6 An assessment of the charred plant macrofossils and other remains

by Val Fryer

The Roman pottery from F6 was extremely fragmented and fragile. Therefore, the pottery was recovered with the surrounding soil. Once as many pottery sherds as possible had been recovered from the soil, it was processed by manual water flotation/washover and the flots were collected in a 300-micron mesh sieve. The dried flots were scanned under a binocular microscope at magnifications up to x 16 and the plant macrofossils and other remains noted are listed below in Table 1. All plant remains were charred. Modern fibrous roots were also recorded within both assemblages. The non-floating residues were collected in a 1mm mesh sieve and sorted when dry. All artefacts/ecofacts were retained for further specialist analysis.

Both assemblages are extremely small (<0.1 litres in volume) and are very limited in composition. Charcoal/charred wood fragments are recorded along with small pieces of burnt or fired clay (possibly from the smashed jars) and minute fragments of burnt bone. The coal fragments, which are present within both assemblages, may be intrusive within the pit fills.

In summary, as both assemblages are so limited, it is presumed that the remains may be largely derived from detritus which was either present within the soil or was accidentally incorporated within the pit fill. However, it should be noted that the pit was situated close to a cremation burial, and it is entirely possible that some material may be derived from that source.

Table 5: Charred plant macrofossils and other remains from the University of Essex

Key to table
x = 1-10 specimens
b = burnt

Sample No.	**1**	**2**
Finds No.	**10**	**13**
Feature No.	**F6**	**F6**
Feature type	**Pit**	**Pit**
Other plant macrofossils		
Charcoal <2mm	x	x
Charcoal >2mm	x	x
Charcoal >5mm	x	
Other remains		
Black porous ' material	x	
Bone	xb	
Burnt/fired clay	x	
Small coal frags.	x	x
Sample volume (litres)	**16**	**16**
Volume of flot (litres)	**<0.1**	**<0.1**
% flot sorted	**100%**	**100%**

7 Discussion

Although the development area was divided into three areas geographically (Areas A, B and C), these areas have proved to also be archaeologically distinct. Evidence of prehistoric activity dominates the archaeology of the

flood plain (Area A), Late Iron Age-Roman archaeological deposits were excavated on the lower valley slope (Area B) and medieval activity has been identified on the upper valley slope (Area C). Therefore, the results of the watching brief are further discussed by broad chronological period below.

Prehistoric

No archaeological deposits or features dating to the Mesolithic or Neolithic periods were uncovered during the watching brief. However, the small assemblage of worked flints of this date recovered from the surface of a deeply stratified alluvial gravel suggests that the shore of the River Colne was being used in this area during these periods. Mesolithic and Neolithic flints recovered from across the investigation area suggest that the valley slope was also exploited, or maybe even intermittently occupied, during these periods.

During the Bronze Age, a barrow cemetery was created on the flood plain. Three of the five known barrows have surviving mounds which is rare in the Essex landscape because most have been levelled for agricultural purposes. The ring-ditches associated with the levelled barrows often survive the affects of agricultural practices and a large number have been have been recorded in north-east Essex, for example at Ardleigh (Brown 1999), Brightlingsea (Clarke & Lavender 2008), Elmstead Market (ECC FAU 2003a) and at Chitts Hill (Crummy 1977). Most of the barrows in north-east Essex have been assigned Middle-Late Bronze Age dates (Lawson *et al* 1981) and it is probable that the barrows at the University of Essex are of a similar age. The worked flint assemblage recovered from the area of Barrow A during this watching brief was mostly Bronze Age in character but did not contain many closely datable pieces and was not well stratified.

There is an indication of an additional barrow in the LiDAR image of the flood plain, although further investigations would be required to confirm this. Moreover, further barrows may have been destroyed during the construction of the railway in the 1950's or during the construction of the B&Q car park (Fig 4). If this is not the case, then Barrow E would have been significantly isolated from the cluster of barrows to the east (Fig 4),and may perhaps have had some symbolic importance. Aerial photographs show Barrow E to have been the largest and most complex barrow in the cemetery (Plate 11). It had a mound surrounded by two concentric ditches with a bank between the two ditches. There is also a possible indication of another bank surrounding the outer ring-ditch (Fig 4 & Plate 11). Elsewhere in Essex, double ring-ditches have been excavated at Langham and East Tilbury and further afield in East Anglia extant barrows with double-ditches have been excavated at Flempton in Suffolk and Little Cressingham and Witton in Norfolk (Lawson *et al* 1981, 23). The presence of two ring-ditches around the barrow mound probably attests to the enlargement or re-use of the barrow rather than implying a more sophisticated monument (Lawson et al. 1981, 23).

Barrows B and C both have approximately hemispherical mounds surrounded by ring-ditches and are classifiable as ditched bowl barrows (Ashbee 1960, 24-27). It is possible that Barrows C and D may have been the focus of the barrow cemetery as they have very prominent mounds and are located very close to one another. There is no indication of a mound in Barrow E, although there is a prominent outer bank (Plates 4 & 11). If there is no ring-ditch in Barrow D, then this barrow could be a pond barrow, which is a circular depression surrounded by a banked rim (Ashbee 1960, 24-27).

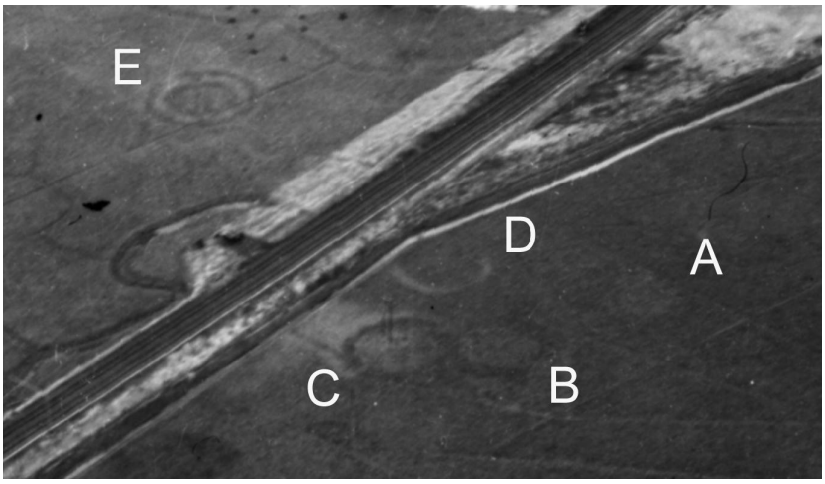

Plate 11: Aerial photograph taken by RH Farrands (frame 102.1) with the five known barrows labelled (view NW).

Classifying Barrow A is difficult due to the discrepancy between the results of the magnetometer survey and what was seen on the ground and in the LiDAR image. If the barrow observable in the LiDAR image is Bronze Age in date, it would be classifiable as either a bowl barrow with an outer bank or a saucer barrow (Ashbee 1960, 25-26). A saucer barrow has a relatively low, approximately hemispherical, internal mound, an adjacent ring-ditch and an outer bank that surrounds the ring-ditch and is similar in height to the internal mound. However, the outer bank identifiable in the LiDAR image is not reconcilable with the ring-ditch identified in the magnetometry survey. Therefore, it is possible that Barrow A was originally a ditched bowl barrow, the same as Barrows C and D, and that the outer bank identified in the LiDAR image was a later addition.

Despite the high probability that alluvial material has been deposited over the barrow cemetery, it is hard to conceive how such a pronounced bank could have formed if there was no bank there to begin with. The bank may have been added later in the Bronze Age, perhaps associated with the enlargement of the barrow to accommodate more burials. However, no evidence of a second ditch, which could have supplied the material needed to create an outer bank and enlarge the mound, was identified in the geophysics results. However, a possible ring-ditch located just outside of the ring-ditch identified by the magnetometer survey was identified during the evaluation phase (T27- ECC FAU 2004, 8 & 14) (Figs 5 & 6). Numerous Roman pottery fragments were recovered from the possible ditch suggesting that the re-use of the barrow could have occurred in the Roman period. Evidence for Roman activity has been identified on the lower valley slope and the re-use of prehistoric monuments in the Roman period is not uncommon (Williams 1997). For example, Roman burials were excavated into an extant Bronze Age burial mound nearby at Ardleigh (Brown 1999, 183) and also further a field in Pakenham in Suffolk and White Horse Hill in Oxfordshire (Williams 1997). However, the addition of an outer bank and the possible enlargement of the mound area would represent a significant alteration to an earlier monument beyond re-use for burial.

Barrows and other funerary monuments are commonly positioned in elevated locations so as to be best viewed from below. However, the location of the University of Essex barrow cemetery on a flood plain at a height of only c 2m above sea level is paralleled elsewhere in Essex. The cropmarks of a barrow cemetery at Lawford are located on the River Stour flood plain at a similar height above sea level (EHER 002) and, only 4.5miles east of the University at Fen Farm in Elmstead Market, a barrow cemetery has been recorded in a similarly low-lying location directly adjacent to Sixpenny Brook

(ECC FAU 2003a). It is probable that a settlement associated with the barrow cemetery would have been located nearby on the valley slopes looking down onto the cemetery, but no evidence of this settlement was revealed during these investigations.

Late Iron Age and Roman

The pottery evidence from three contexts on the lower valley slope suggests that there was probably activity in this area during the Late Iron Age. Activity was more certainly occurring in the early Roman pre-Flavian/early Flavian period, contemporary with the industrial site of Sheepen on the outskirts of Roman Colchester (Hawkes and Hull 1947; Niblett 1985; *CAR* **11** 70-84). Archaeological features dating to these period were also identified in four of the trial-trenches excavated in this area (Fig 8) and were interpreted as evidence for Late Iron Age-Roman agricultural activity (ECC FAU 2004, 13). It is probable that a farmstead was located on the valley slope and that the large deposit of Roman brick and tile recovered during the watching brief is from a building associated with this farmstead. The farmstead probably occupied the land between the Roman road, which is presumed to follow the rough alignment of St Andrews Avenue and the River Colne.

A pit containing the smashed remains of two, possibly three, complete vessels that date to the middle Roman period was excavated on the lower valley slope. Complete pots are frequently associated with burials or other special circumstances of deposition. Moreover, pots that had been intentionally smashed prior to deposition have been found in association with high status burials in the Colchester area such as at Stanway (Crummy *et al* 2007, 424-26) and the Lexden Tumulus (Foster 1986, 166-9). The remains of a probable unurned cremation were found close to the pit containing the smashed pots, but it was probably not close enough to be directly associated. The use of the lower valley slope for burial in the middle Roman period may indicate that this area is peripheral to the main centre of activity as marginal land was often utilised for burials.

Four pottery sherds from a late 3rd-4th century jar recovered from the upper valley slope indicate that Roman activity in the area probably continued into the late Roman period.

Medieval

Although the depositional history of the medieval pottery concentration on the upper valley slope is not properly understood, the quantity of pottery recovered suggests that a medieval domestic site is located in close proximity. The pottery evidence suggests the site would have been of relatively low status and was occupied in the 13th-14th centuries. It is probable that during the medieval period the deer park (later to become Wivenhoe Park) was established. The extents of the park can only be postulated from historic map sources which are later in date (ECC FAU 2003b, 9), but it is probable that the area of the pottery concentration would have either been just within the park or just to the north-west. Therefore, a domestic site in this location in the 13th-14th centuries is likely to have either been connected to the deer park or have been a farmstead which preceded its formation. There are no farms or other buildings marked on this spot on any old maps of the area (ECC FAU 2003b, plates 2-6) suggesting that any occupation in the vicinity had ceased by the post-medieval period.

8 Archive deposition

The finds and paper archive are currently held by CAT at Roman Circus House, Circular Road North, Colchester, Essex, but will be permanently deposited with Colchester and Ipswich Museums under accession code COLEM 2010.64.

9 Acknowledgements

CAT is grateful to the University of Essex for commissioning and funding the investigation and to Chris Shimmon and Graham Joyner of Jackson Civil Engineering for their support and cooperation throughout the duration of the project. The fieldwork was managed and undertaken by A Wightman assisted by N Rayner. The magnetometer survey was undertaken by Dr Tim Dennis of the University of Essex assisted by Dr Patrick Spencer (also of The University of Essex) and the author.

10 References

Note: all CAT fieldwork reports are now available online in .pdf format at http://cat.essex.ac.uk

Also consulted were a selection of aerial photographs from the National Monuments Record RAF collection (1945-1975) and from the collection of R Farrands (1962) of which copies are held at the CAT offices.

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11 Glossary and abbreviations

alluvial	of, relating to, or found in sediment deposited by flowing water
barrow	a large mound of earth or stones placed over a burial site
Bronze Age	period when metals (bronze) were introduced into Britain, *c* 2,000-700 BC
CAT	Colchester Archaeological Trust
CBA	Council for British Archaeology
CBC	Colchester Borough Council
CBM	ceramic building material, ie brick and tile
CIMS	Colchester and Ipswich Museums
colluvial	applied to sediment that has moved down a hillslope either by creep or by surface wash
context	specific location on an excavation, usually relates to finds
cut	an excavation of unspecified purpose
EAA	East Anglian Archaeology
ECC FAU	Essex County Council Field Archaeology Unit
feature	something excavated, ie a wall, a floor, a pit, a ditch, etc
IfA	Institute for Archaeologists
Iron Age	period during which iron was introduced and used in Britain, *c* 700 BC - AD 43
LiDAR	Light Detection And Ranging

medieval	the period from AD 1066 to Henry VIII
Mesolithic	after melting of ice sheets: 10,000 BP – 4,000 BC
modern	19th century to the present
natural	geological deposit undisturbed by human activity
Neolithic	period which saw the introduction of farming practices into Britain *c* 4,000- 2,500 BC
NGR	national grid reference
post-medieval	after Henry VIII and up to Queen Victoria
prehistoric	the years BC
Roman	the period from AD 43 to c AD 430
RRCSAL	Report of the Research Committee of the Society of Antiquaries of London
sx	section
UAD	Urban Archaeological database held by CIMS
worked flint	any flint, discarded waste or used piece, which has been worked as part of the process of producing usable flint pieces or tools
U/S	unstratified, ie without any context

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Checked by: *P Crummy*
Date: *18th June 2012*

12 Appendix 1: contents of archive

One A4 document wallet containing:

1 Introduction
1.1 Copy of the evaluation brief issued by the ECC HEM team
1.2 Copy of the WSI produced by CAT
1.3 Risk assessment
1.4 Copy of ECC FAU Report 1328
1.5 Copy of ECC FAU Report 1214
1.6 5 x site plans and drawings (A4 & A3)
1.7 2 x A3 tithe maps

2 Site archive
2.1 Digital photograph record
2.2 Attendance register
2.3 Context sheets (F1-F6, L1-L10)
2.4 Finds register
2.5 Site photographic record on CD
2.6 2 x A4 section sheets

3 Research archive
3.1 Monitoring (client) report
3.2 Finds reports

Finds
The finds occupy less than one box

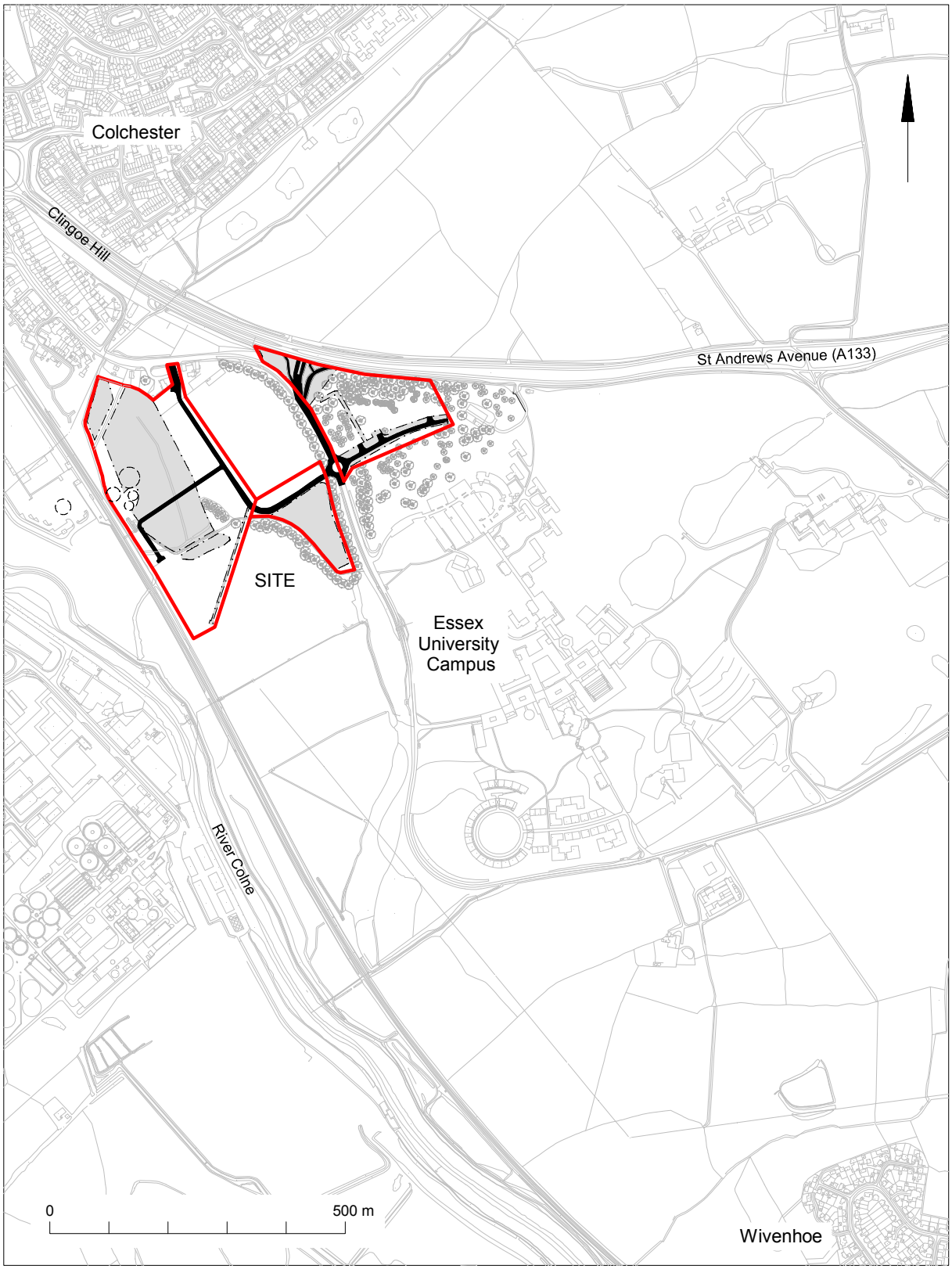


Fig 1 Site location.

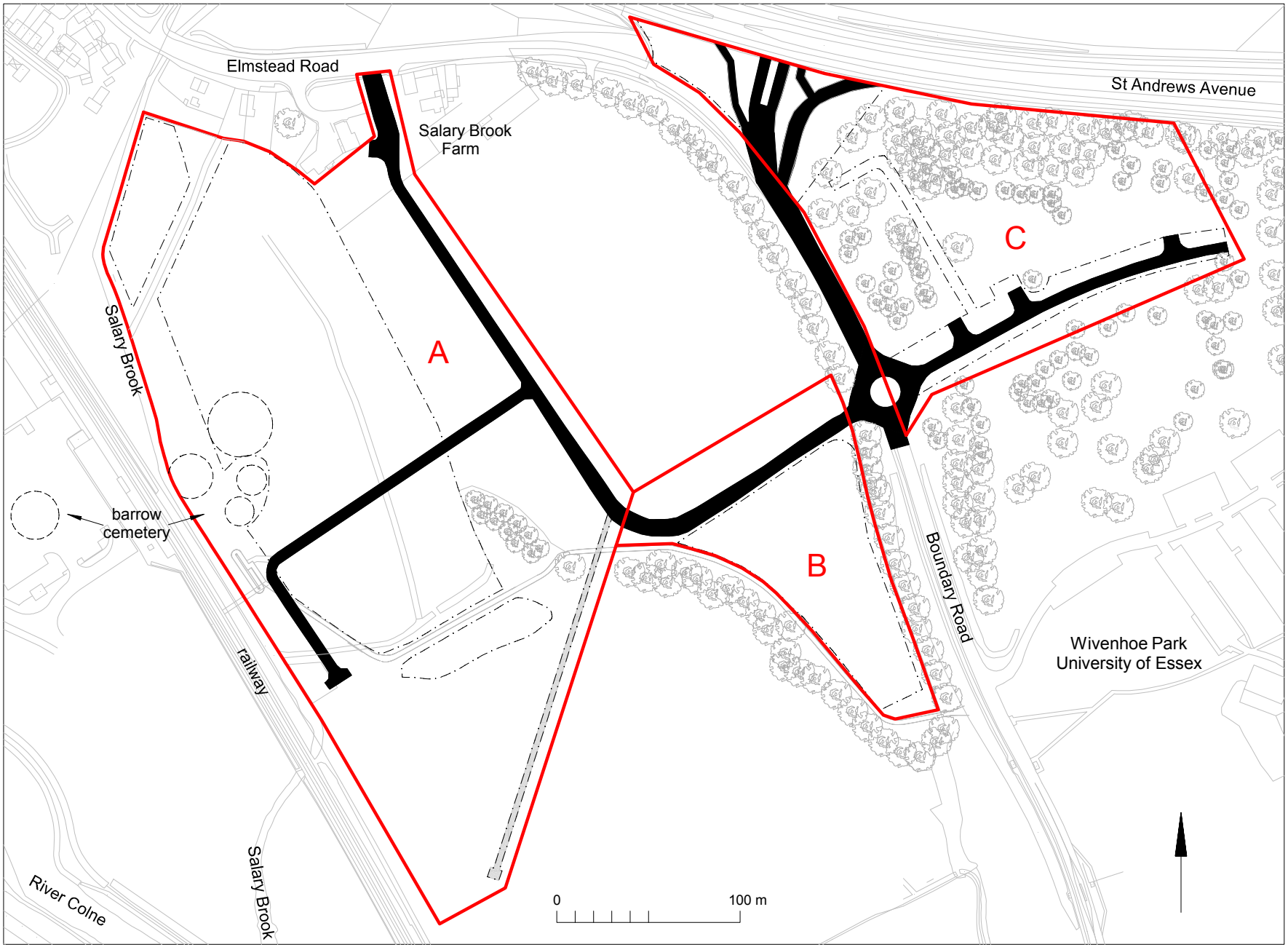


Fig 2 Site plan showing Areas A-C and the new roadways (shaded black).

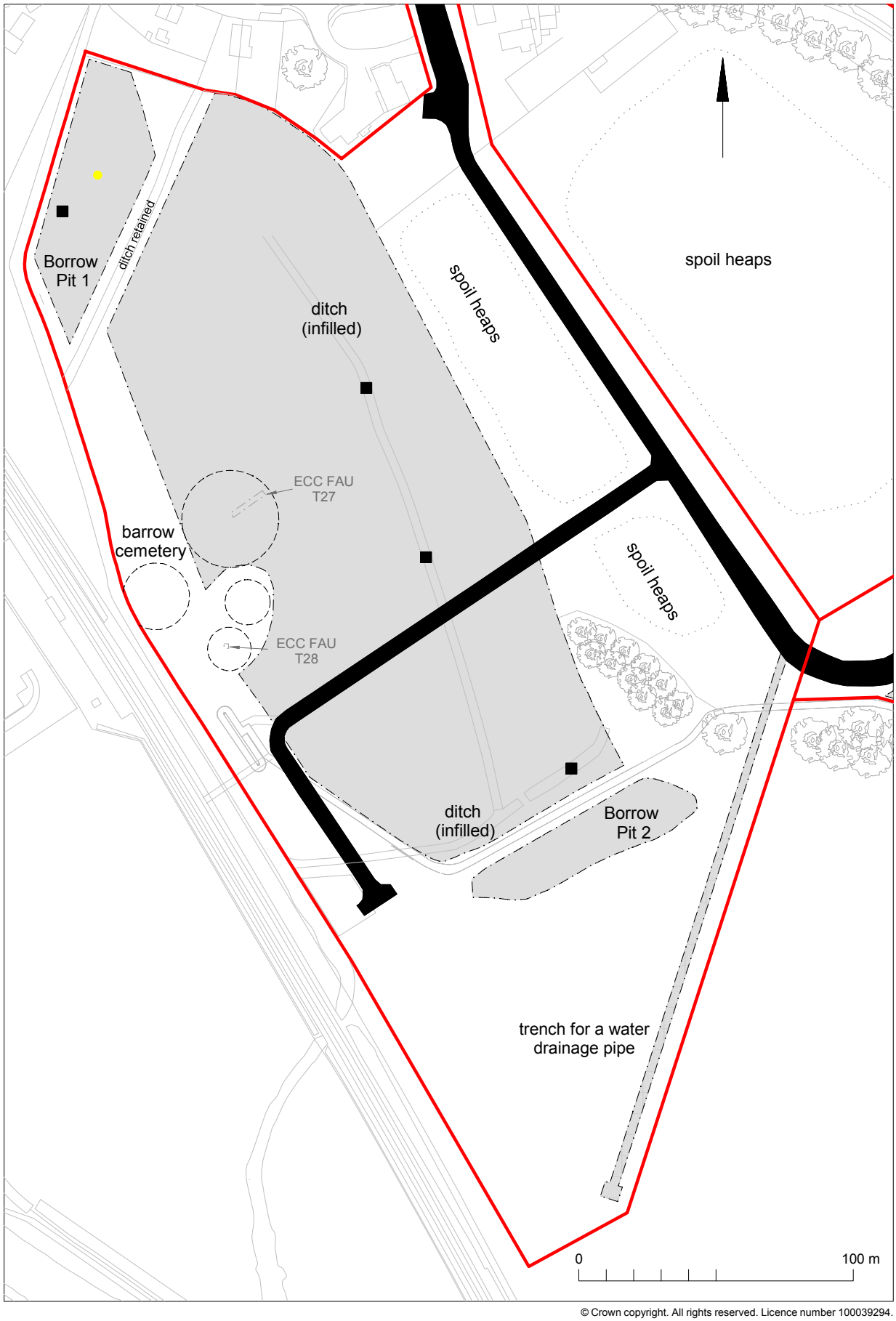


Fig 3 Area A: the areas shaded grey are where the topsoil stripping was observed.

key: ● modern pit ■ geological trial-hole

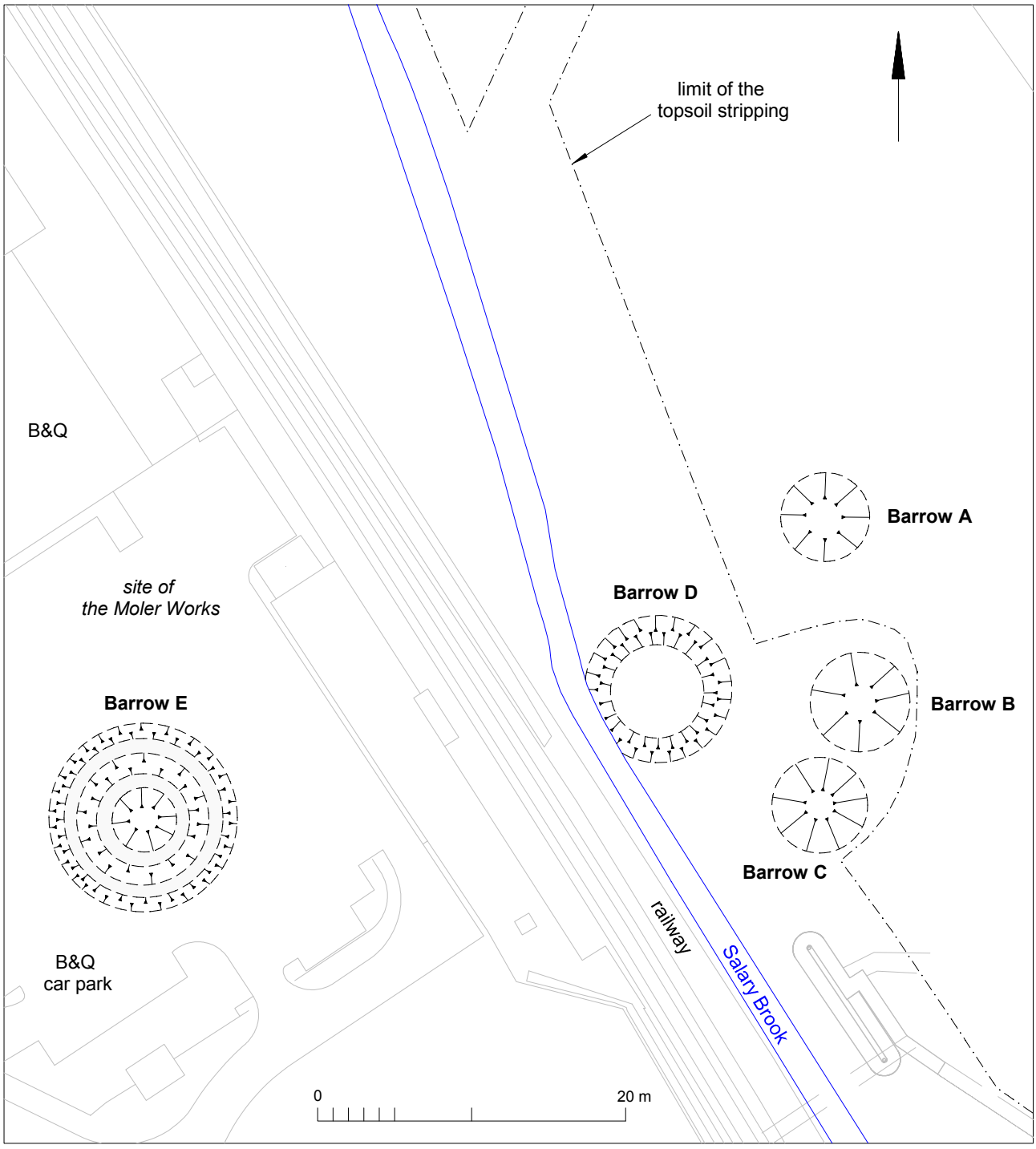


Fig 4 The barrow cemetery based on an aerial photograph taken in 1948 (NMR 58/69 frame 5201).

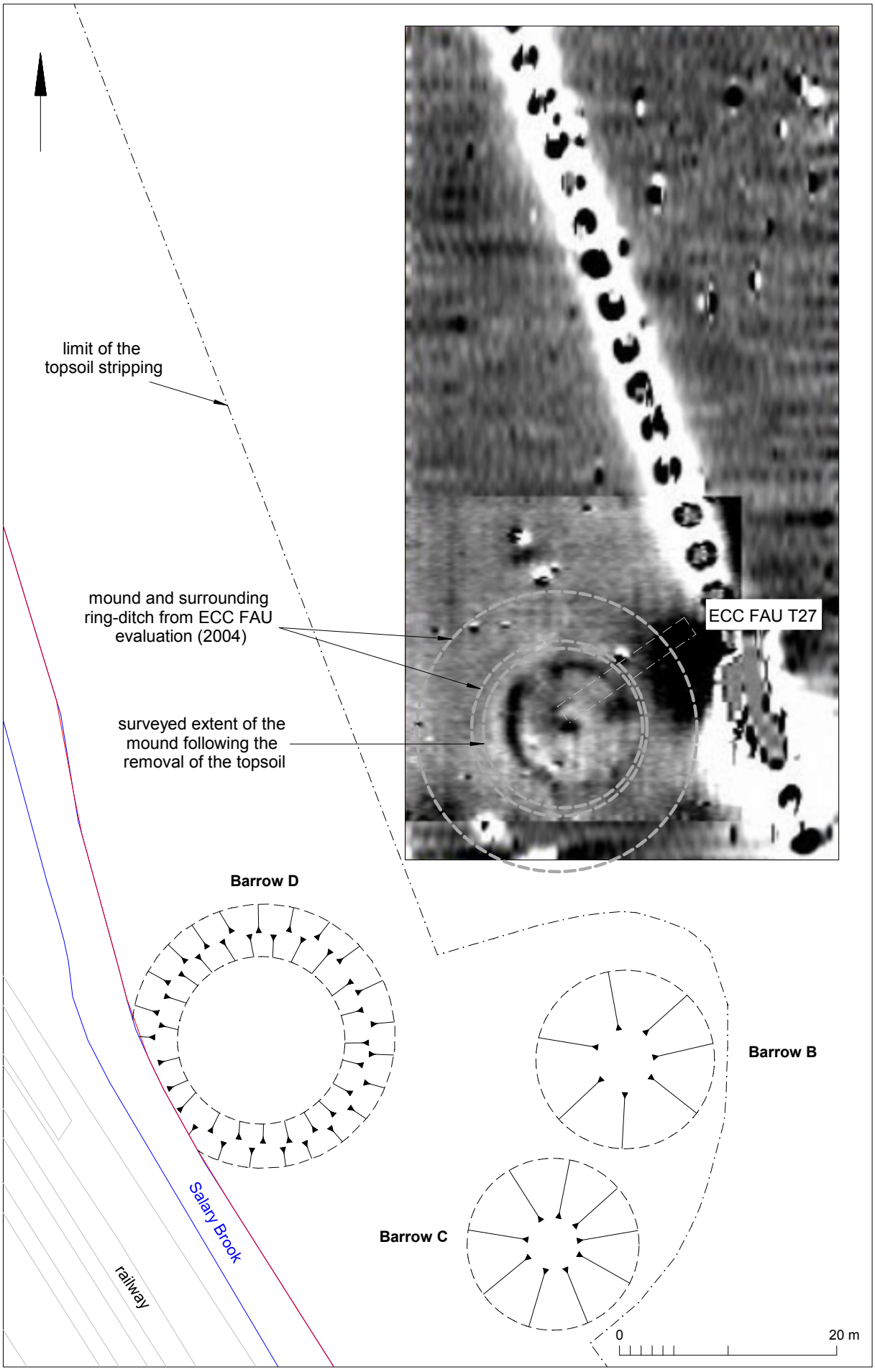


Fig 5 Location of the magnetometer survey.

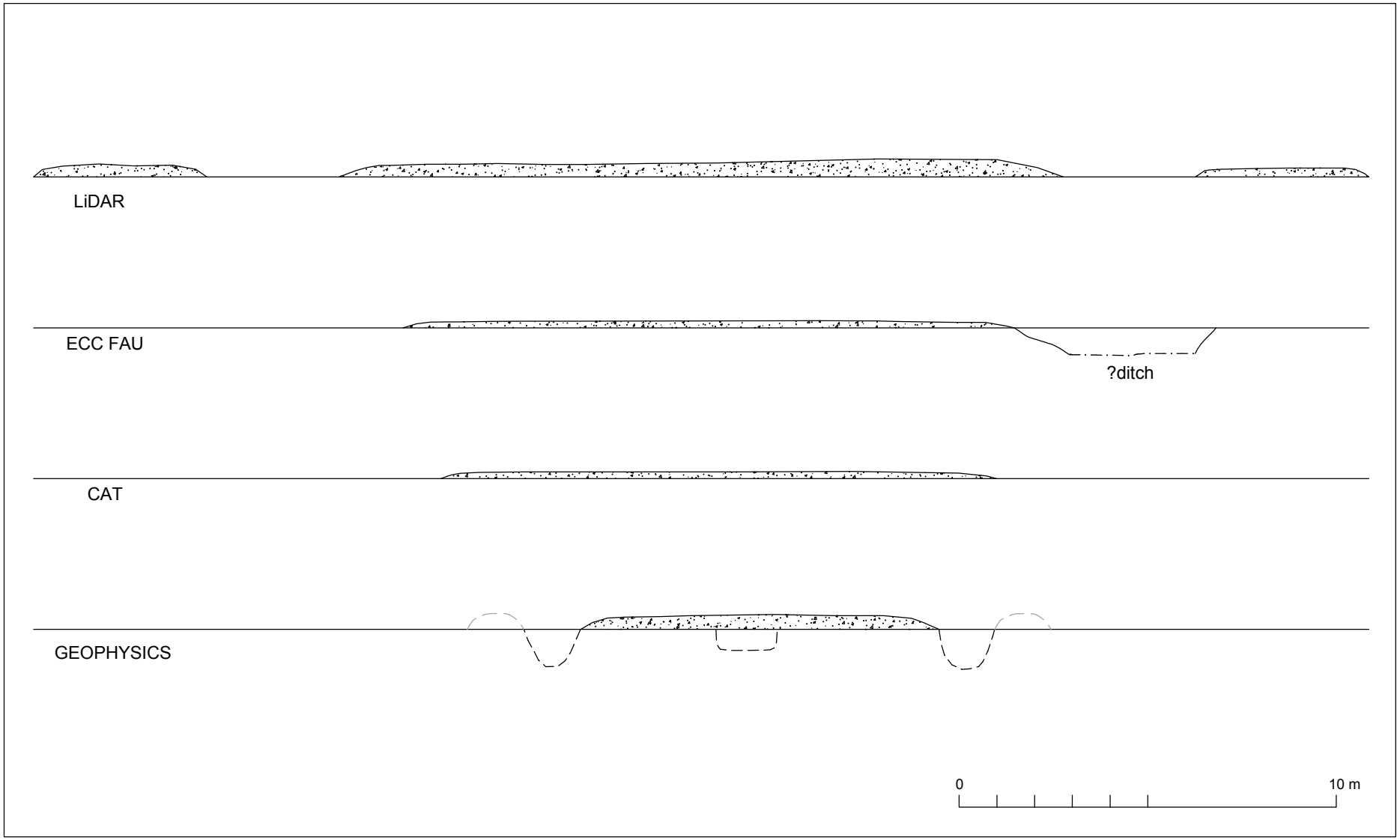
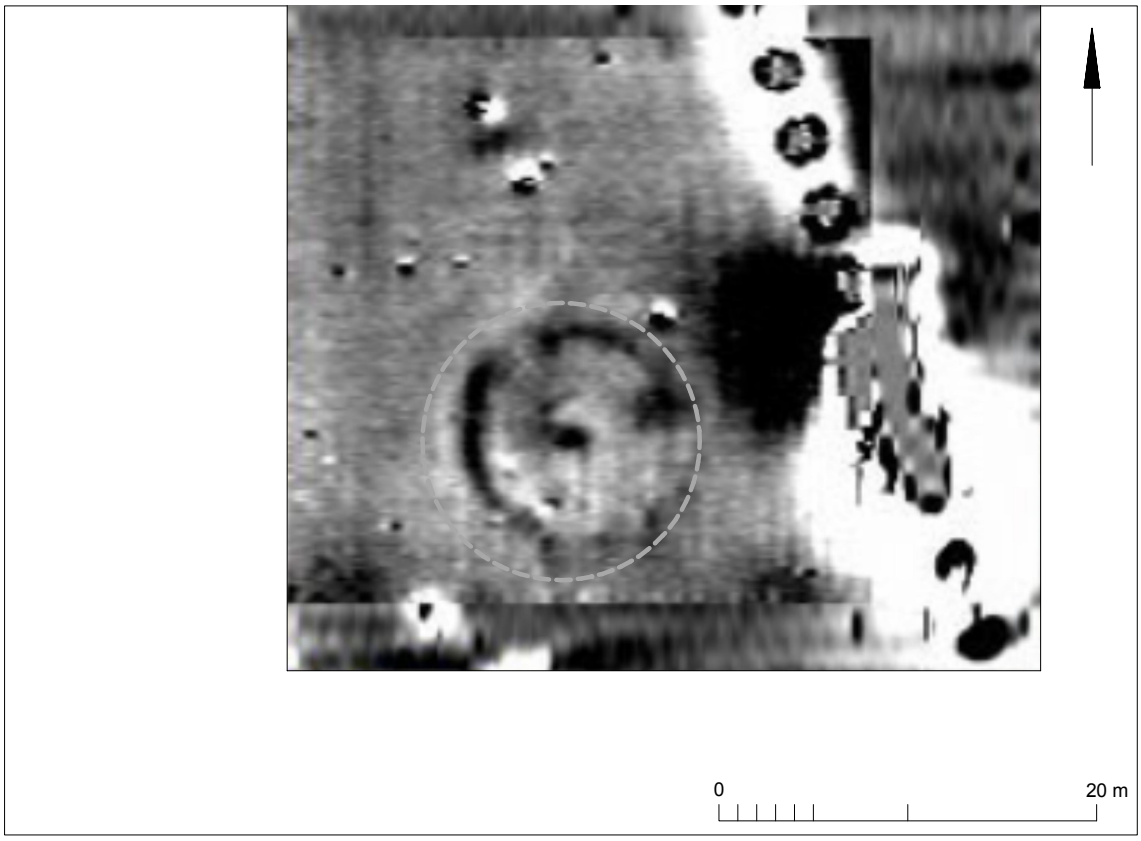
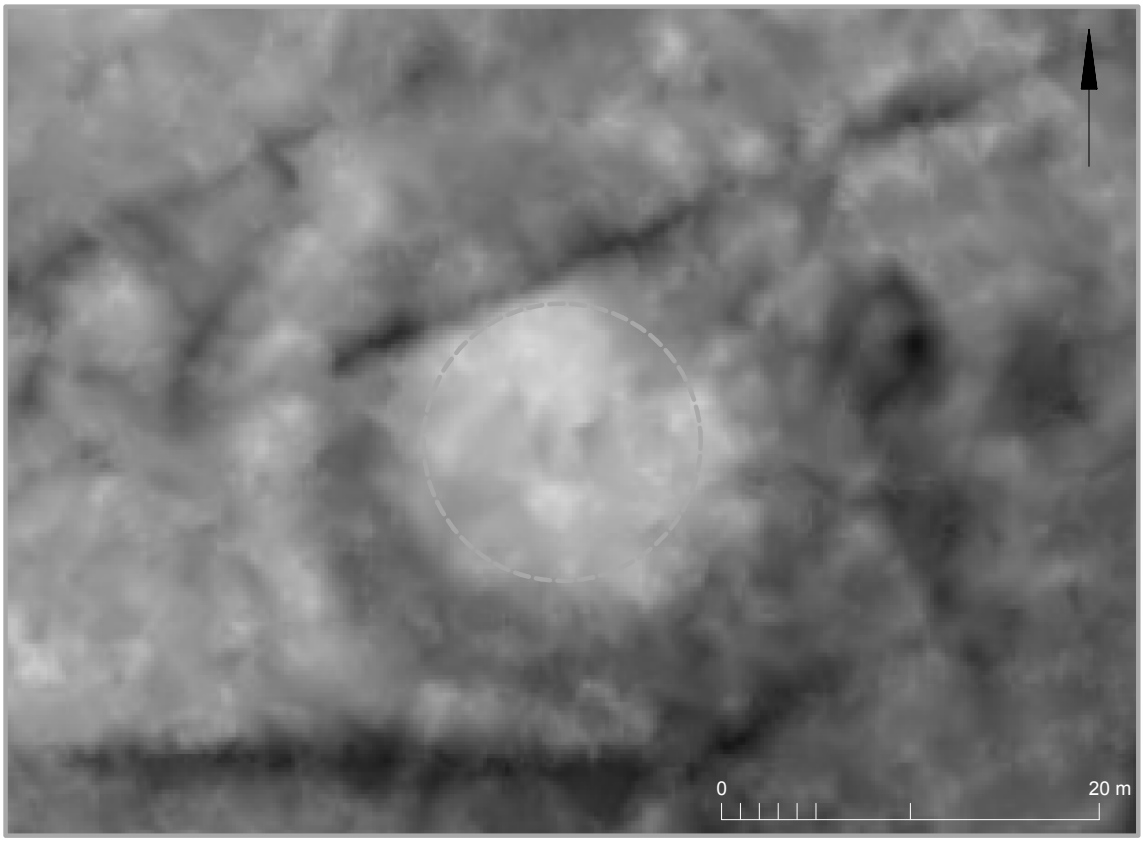


Fig 6 Idealised sections showing the construction of Barrow A based on different strands of evidence.



Barrow A magnetometer



Barrow A LiDAR

Fig 7 The results of the magnetometer survey compared to the LiDAR image. The dashed circle shows the position of the mound exposed during the 2010-11 watching brief.

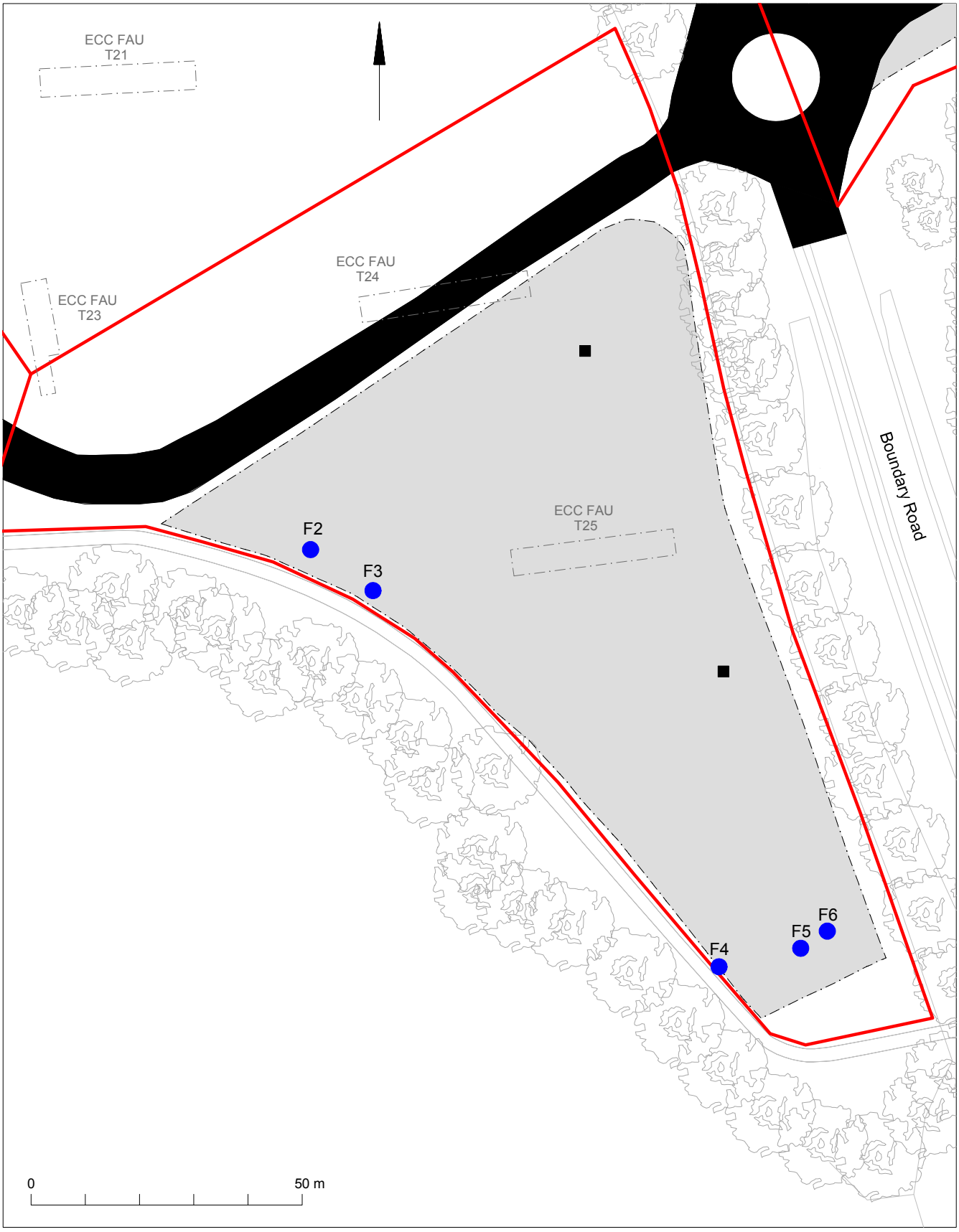


Fig 8 Area B: the area shaded grey is the extent of Borrow Pit 3. ECC FAU evaluation trenches which contained LIA-Roman and prehistoric archaeological features and finds are outlined in dark grey.

key: ● archaeological feature ■ geological trial-hole

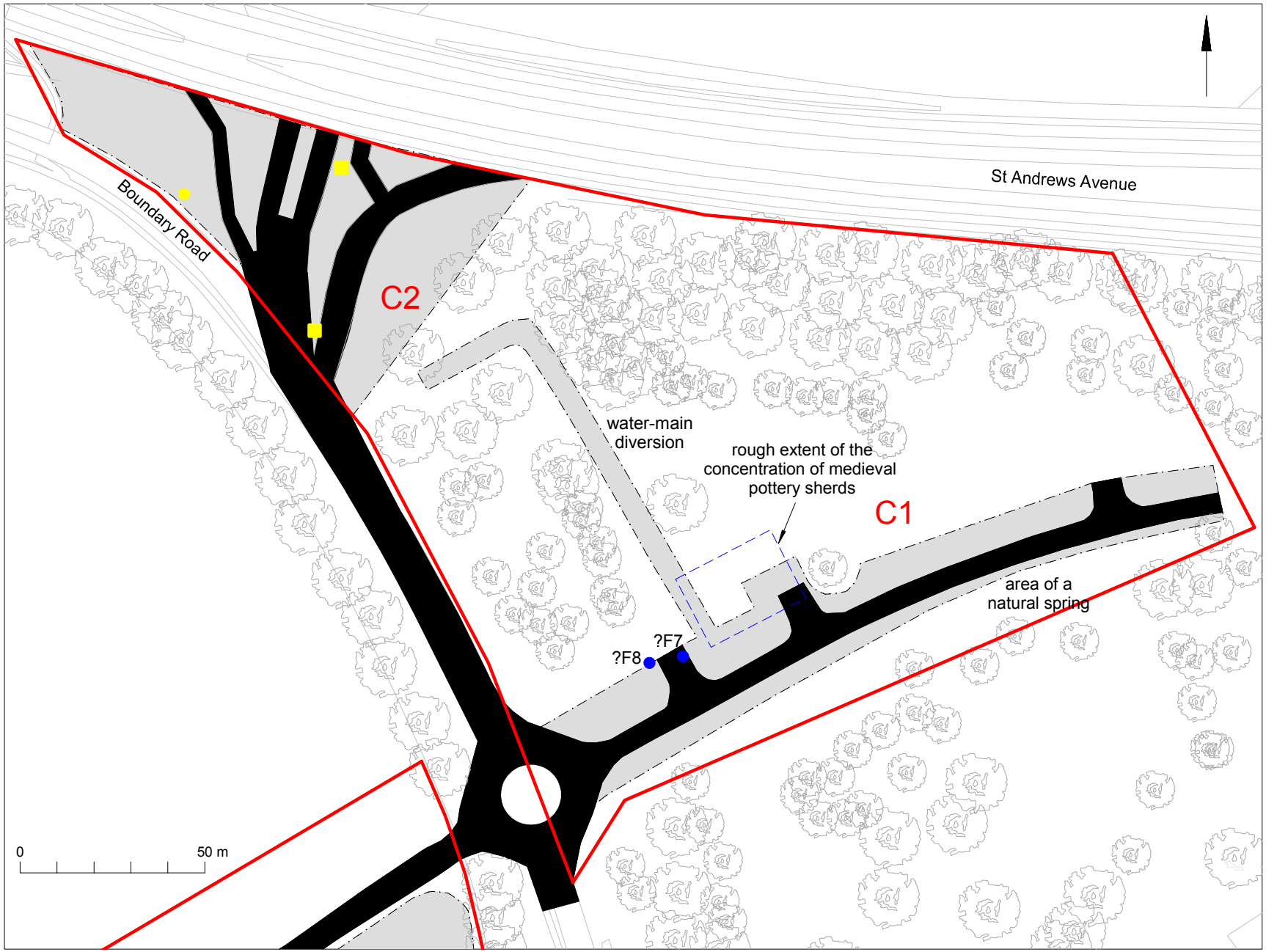


Fig 9 Area C: the areas shaded grey are where the topsoil stripping was observed.

key: archaeological feature modern ditch modern pit

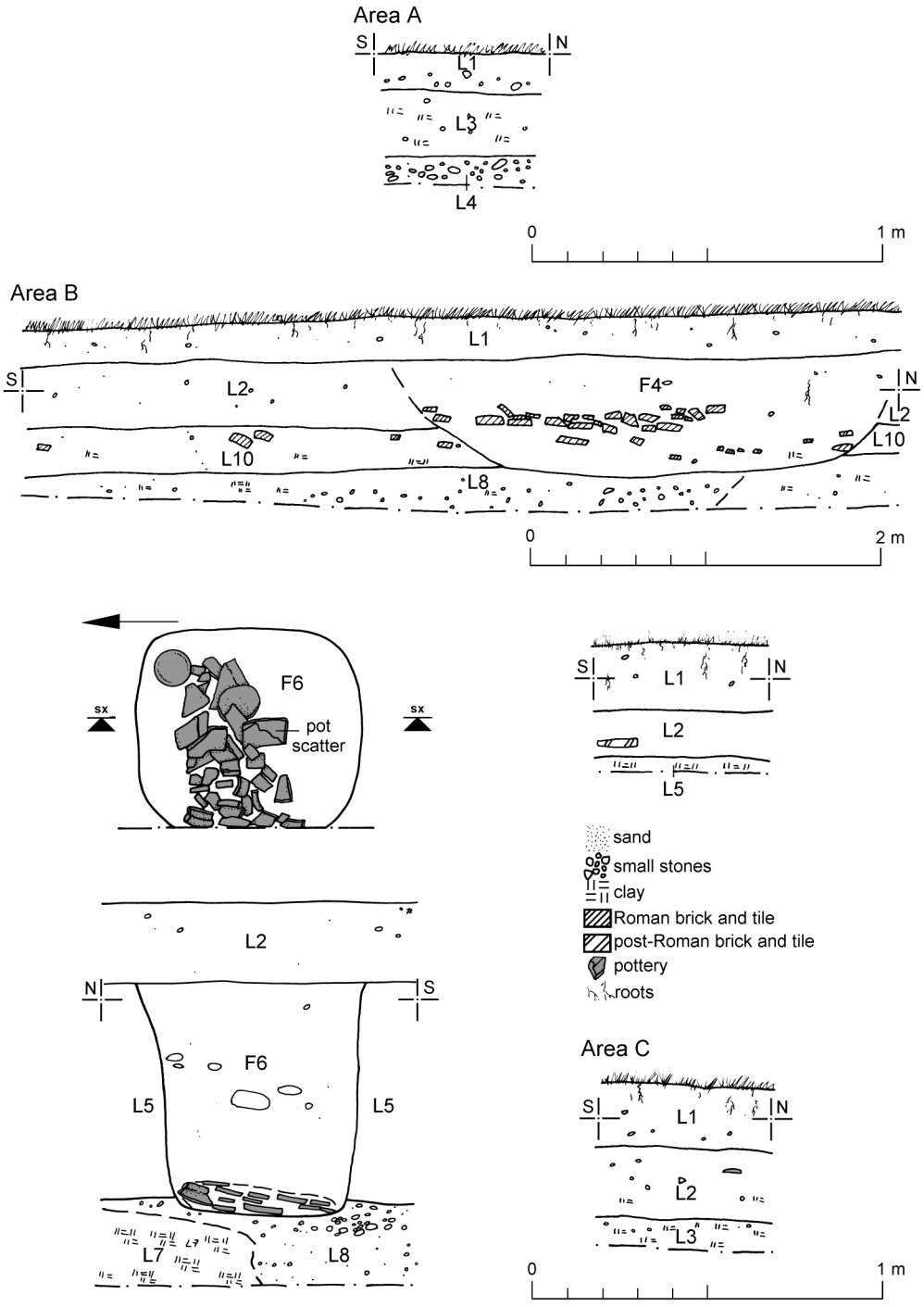


Fig 10 Area B F4: section. F6: plan and section. Areas A-C: representative sections.

Essex Historic Environment Record/
Essex Archaeology and History

Summary sheet

Site address: The Knowledge Gateway, University of Essex, Colchester, Essex.	
Parish: Wivenhoe	***District:*** Colchester
NGR: TM 0242 2424	***Site codes:*** CAT project - 10/3b Museum accession - COLEM 2010.64
Type of work: Watching brief	***Site director/group:*** Colchester Archaeological Trust
Date of work: September 2010-August 2011	***Size of area investigated:*** c 6.05ha
Location of finds/curating museum: Colchester and Ipswich Museums	***Funding source:*** The University of Essex
Further seasons anticipated? Yes	***Related EHER and UAD nos:*** 2413, 2534, 16186, 2419
Final report: CAT Report 638	
Periods represented: Bronze Age, Roman, medieval, post-medieval	

Summary of fieldwork results:

The Colchester Archaeological Trust undertook a watching brief during infrastructure works for the University of Essex's new research park which is to be known as the 'Knowledge Gateway'.

The remains of a Bronze Age barrow cemetery are located at the western edge of the development site on the flood plain of the River Colne. The removal of topsoil from one of the barrows provided the opportunity to record the extant mound and undertake a magnetometer survey. Examination of the LiDAR image of the flood plain also revealed details of the layout of the barrow cemetery. A discrepancy between the size of the ring-ditch identified in the magnetometer survey and the mound and outer bank in the LiDAR image suggests that the barrow has been altered significantly since its initial construction.

A trial-trenching evaluation undertaken by the Essex County Council Field Archaeology Unit in 2004 identified evidence for agricultural activity on the lower valley slope of the River Colne during the Late Iron Age-early Roman period. Further evidence for activity during this period was encountered during the watching brief and included a pit containing frequent Roman CBM fragments that probably derive from a nearby farm building. Burial activity in the middle Roman period was also uncovered on the lower valley slope, and further up the slope the recovery of late Roman pottery sherds suggests that this area was utilised throughout the Roman period.

Near the top of the valley, a dense concentration of medieval pottery has been attributed to domestic occupation in the area in the 13th-14th centuries, probably associated with a previously unknown medieval farmstead.

Previous summaries/reports: ECC FAU Reports 1214 & 1328	
Keywords: Bronze Age barrow cemetery, Roman, burial, medieval pottery	***Significance:*** **
Author of summary: Adam Wightman	***Date of summary:*** May 2012
CBC monitor: Martin Winter	