

WINCHESTER

A CITY IN THE MAKING

Archaeological excavations between 2002 – 2007
on the sites of Northgate House, Staple Gardens and the former Winchester Library, Jewry St

Section 18

**Geoarchaeological field investigations at Winchester Discovery
Centre and Northgate House**

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Discovery Centre

Geoarchaeological fieldwork was carried out for Winchester City Council at the Winchester Discovery Centre site on Jewry Street (NGR: SU 479 297, site code: WINCMAY220). A total of 15 boreholes were taken through archaeological features. These comprised 6 boreholes undertaken by Oxford Archaeology and *ArchaeoScape*, and 9 hand augered boreholes. The boreholes were excavated through archaeological features interpreted as wells, while hand auger boreholes were taken through deep pits. The investigations aimed to establish the depth of the archaeological features; aid interpretation of function and identify any deposits relating to the use of the feature.

Field investigation involved

- recovering continuous borehole samples,
- recording the sedimentary sequences;
- adding to on site archaeological interpretation and
- recommendations for possible laboratory-based environmental archaeological investigation.

Geological context

The historic city of Winchester and its suburbs occupy the valley of the Itchen River on the northern flank of the Hampshire basin. As with the nearby site at Northgate House (see below), the Winchester library site lies on the western slope of the valley, approximately 500m from the river, and slopes from west to east. Ground surface

level at 48.32m OD lies 11m above the floodplain of the Itchen at c. 37m OD (Swindle *et al*, 2005).

Cretaceous Upper Chalk bedrock (BGS sheet 229) dips north to south and is overlain in the area by clay silt, alluvium and sand and gravel river terrace deposits, although none are mapped directly on site. Superficial Clay-with-flint deposits, probably formed by weathering and dissolution of chalk, cryoturbation and solifluction during the Quaternary, are observed covering the site in a non uniform manner. Archaeological deposits overlie Clay-with-flints and are significantly truncated by episodes of modern levelling.

Method

Borehole (BH1-6) and hand auger (HA1-9) locations are indicated in Figure 1. Sediments were logged on OA proformas using standard geological terminology, and bedrock was proved at each location (with the exception of one hand augered borehole). Locations were recorded in three dimensions using a Leica Total Stations (TPS).

Boreholes were recovered using an Eijkelkamp gouge set, driven by an Atlas Copco 2-stroke percussion engine (dimensions: 100 X 10/7.5/5.3 cm). The meter-long gouge bores through the sediments using the weight and action of the engine, and is removed by hand with the help of a jack. Deposits were recorded on site from the gouge window.

The sediments become compressed in the process of coring, particularly if loosely compacted, and the retrieved gouge may be partially full when recovered. Deposit thickness must therefore be extrapolated, using a simple calculation (Appendix 1). In accounting for this compression, deposit boundary depths are estimated and must be considered an approximation.

Hand auger boreholes were recovered using a stony soil auger, the wider head suitable for deposits with high gravel content. The gouge measures 0.20m in length, and boreholes were deepened in contiguous 0.20m spits. Occasionally the gouge was forced down further than 0.20m, and in this case the compression of sediments was accounted for by the principle outlined (Appendix 1).

The location of boreholes 1-5 were selected to investigate the sedimentary sequences of five wells on site. The additional boreholes were positioned in pits exceeding the limit of excavation at mitigation depth (46.90m OD). Samples were

taken from cess-rich and organic-rich deposits encountered, and from contexts lying at the base of features.

Results and interpretation

The 4 chalk-lined wells chosen for borehole excavation comprised features 1128, 2039, 3043 and 3077 (BH1, 2, 4 and 5 respectively). Each measured over 2m in diameter. BH3 was located in a flint-lined feature (context 1518) also interpreted as a well, and Borehole 6 penetrated a large pit (context 1114). All hand auger boreholes were positioned in pits of depths exceeding mitigation depth (46.90m OD).

Chalk bedrock was reached in all boreholes with two exceptions. Clay-with-flints were encountered in HA2 at approximately 3m, indicating the bottom of the feature, and the borehole considered complete. The base of HA5 was not reached, as the depth exceeded the 4m of extension rods available. Depths of all boreholes are displayed (Table 1 and Figure 2).

Boreholes

Borehole 1 (Figure 3a)

Bedrock was reached at a depth of 11.00m (34.89m OD) in the chalk-lined well feature 1128. Directly overlying chalk was a light grey clay (34.87-34.67m OD). This fine-grained deposit (sample 1) may represent the primary fill of the feature, and comprises mineral matter deposited at the base of the feature from suspension within an open water body. Overlying sediments recovered from the feature 1487, 1485 and 1310 comprised chalky backfill: moderately well compact, mid dark grey-brown silt with clay and sand component, with frequent chalk, charcoal, flint and bone. Context 1486 consisted of over 1m of well compact, clast supported chalk nodules (41.5-40.1m OD). Sherds of pottery, possibly Romano British greyware, were found at approximately 3.40m depth (context 1485) and under 8m depth (context 1487). Samples were taken from the lower fills of the feature, including the 'primary fill' (sample 2), but appear void of environmental remains.

Borehole 2 (Figure 3b)

The chalk-lined well 2039 in area 2 was found to be approximately 8.5m deep (from 47.22 to natural chalk at 38.66m OD). A void in the core gouge of approximately 0.05m was noted overlying natural chalk. It is likely that the void represents an area

where organic material has decayed away, or perhaps where poorly consolidated material has moved under gravity. It may also be possible that natural chalk and overlying chalky clay were pushed apart within the gouge as it was extracted. A further two voids were noted at 39.3 and 39.09m OD each spanning <0.01m and are considered to be the result of movement of sediments within the gouge. These small cavities are not considered significant to the interpretation. Backfill deposits overlying bedrock 2412-2402 and 2265 consisted largely of silty clay with chalk, flint and charcoal inclusions. CBM occurs in upper fills, and oyster shell and large chalk inclusions towards the bottom of the borehole (context 2411). Samples were taken from the lowest chalky clay deposit 2412.

Borehole 3 (Figure 3c)

Flint-lined pit 1518 contains a sequence of mixed backfill deposits. A high proportion of cess-rich silty clays are noted, often with significant amounts of charcoal, particularly overlying bedrock (contexts 1491 and 1492, samples 7 and 6 respectively). The overlying sequence comprises soft, green-grey cassy clay silt with grit or sand, chalk and sub-rounded to sub-angular flint inclusions (context 1490); a dark grey clay silt with sand/gravel, chalk, charcoal and sub-angular flint (context 1489); and a loose, light grey-brown silt clay with chalk and fragments of slate. At less than 2.5m, the shallow depth of this feature (bedrock was encountered at 38.66m OD) suggests it could not have functioned as a well. The interpretation of function can therefore be altered on the basis of this result.

Borehole 4 (Figure 3d)

This chalk-lined well 3043 was heavily truncated on its north side by the WWII air raid shelter. Only one edge of the original masonry remains (<0.70m across) and associated sediments (approximately 0.20m width in plan). The gouge was positioned in the available space, thus deposits retrieved relate to the edge rather than the centre of the feature as in other boreholes. The sediments overlying bedrock at the base of the feature (at 38.69m OD, a depth of approximately 7.5m) comprise mixed clay silt backfill deposits with flint and slate. The inclusion of slate suggests backfill events post date the late 12th century (S.Teague pers comm.) but are likely to be more recent, as the loose compaction of these deposits suggests rapid backfill or dumping, and the upper deposits 3306 and 3307 contain brick and appear modern.

Borehole 5 (Figure 3e)

The borehole was taken through the centre of the chalk-lined well feature (context 3077) measuring approximately 1.90m in diameter. A lack of domestic debris, for example bone and pottery is noted, although due to the narrow width of the gouge this may not be a significant observation. In general the deposits appear less mixed than in other cores, but bands of chalk are recorded. The sequence is composed of natural chalk at a depth of 47.5m OD overlain by moderately compact mid brown-grey, sandy silt with clay, small and large chalk, small charcoal, slate and small-medium flint and flecks of burnt clay (context 3305) and similar silty backfill deposits (3304 - 3299 and 3074). For a well, the feature is relatively shallow reaching 4.2m depth.

Borehole 6 (Figure 3f)

The borehole through the large, rounded pit 1114 yielded 6.10m of backfill deposits. Overlying natural chalk at 39.88m OD is a patchy, mixed deposit of stiff orange clay, chalk and sandstone in a moderately compact to firm, dark grey clay silt matrix (context 1500). Very soft, very dark grey-black clay silt with flecks of charcoal and flint, siltstone, chalk and gravel (context 1499) overlies 1500 and contexts 1498 and 1497 comprising brown and grey clays with various inclusions (chalk, sand, flint and occasional CBM). 0.30m of clast supported chalk nodules in a clay matrix follow (context 1495), overlain by further sandy silt backfill deposits 1494, 1493 and 1188.

Hand Auger boreholes

HA1 (Figure 4a)

HA1 was taken through pit 1100 and contained 2m of backfill deposits, consisting of loosely compact-soft green-black (cess-like) sandy silt with charcoal, gravel, chalk and patches of stiff, orange-brown clay (context 1501) overlying chalk bedrock. This was overlain by context 1099: a moderately compact, mid-dark brown-grey silt clay with a high chalk content, oyster, mussel shell and patches of stiff, orange-brown clay with some bone, charcoal and CBM.

HA2 (Figure 4b)

A sequence of 4 contexts reaching to a depth of approximately 3m are recorded in pit 2002. Clay-with-flints encountered at nearly 43m OD is considered to be 'natural' deposit representing the pit base. Very loose, green-brown sandy silt with clay

content and charcoal (context 2397) overlies the bottom of the feature and context 2397 a dark grey-brown silty clay with charcoal, flint and chalk nodules, burnt clay and chalk grit.

HA3 (Figure 4c)

Chalk bedrock was reached at a depth of 44.52m OD in pit 2043. The 1.20m of backfill deposits consisted of 0.30m of moderately compact or soft mid-brown silt clay with some sand content, occasional charcoal and chalk inclusions (context 2399) and 0.40m of moderately compact grey-green soft silt clay with some inclusions and sand, plus occasional CBM and some burnt clay (context 2398). The upper context 2238, is a moderate-well compact mid-dark brown very silty clay with sand, chalk and some charcoal and bone. The mixed nature of these deposits suggests formation by backfilling. The soft texture and green colour of 2398 indicates the presence of cess.

HA4 (Figure 4d)

Pit 3150 contained nearly 4m of backfilled sediments. The sequence comprised a dark grey-brown silty clay with sand (context 3298) overlying chalk bedrock at 42.32m OD. This is overlain by well compact grey-brown gritty clay silt (context 3297) with slate noted at the base of the deposit. 3189 comprises a loosely compact, light yellow-brown chalk clast-supported clay silt.

HA5 (Figure 4e)

HA5 in pit 1457 reached a depth of approximately 42m OD. The borehole depth was limited by a lack of auger extension rods and was not excavated to bedrock. The feature contained context 1502, a mixed deposit of soft-loose green-grey cess-like clay with high charcoal content, burnt clay, shell and chalk inclusions, overlying natural chalk. The upper deposit, context 1449, consisted of soft, dark brown-grey silty clay including sand, chalk nodules, occasional shell, medium-small charcoal and flecks of burnt clay. The 4m of sediments in HA5 are considered backfill deposits.

HA6 (Figure 4f)

HA6 bored through 2.74m of backfill sediments in pit 1482 to bedrock at 43.43m OD. Context 1803 overlying chalk bedrock was made up of a well compact, chalk clast-

supported deposit dark grey-brown clay silt. The overlying context 1802 (a loose brown silt with few inclusions), appears organic rich and may yield environmental remains (sample 16). Contexts 1801-1799 are considered to be mixed backfill deposits consisting of yellow to brown sandy silts with chalk inclusions and charcoal.

HA7 (Figure 4g)

HA7 in pit 1640 contained 1.70m of backfill. The sequence consists of chalk bedrock at a depth of 45m OD; a moderately well compact, dark green-brown sandy silt, some clay, flecks of charcoal and chalk inclusions (context 1790); and 1664, a loosely compact, dry, friable, dark grey sandy silt with chalk clasts, oyster shell, flint nodules and charcoal.

HA8 (Figure 4h)

Natural chalk was reached at 45.6m OD in pit 2035. The sequence is made up of 0.98m of backfill deposits. Contexts 2411, a moderately compact mid grey clay silt with a high chalk content that increases with depth, is overlain by context 2027, a loose, friable, dark brown sandy silt with chalk nodules, oyster shell, flint, bone and flint tempered pot.

HA9 (Figure 4i)

Pit 3138 contained 1.98m of backfill deposits. Natural chalk (at 44.6m OD) was overlain by a moderate-well compact clast-supported chalk with dark grey-brown silt clay matrix (context 3296). The overlying stiff, orange-brown silt clay with sand, chalk inclusions, charcoal and flecks of burnt clay (context 3295) completes the sequence.

Discussion

The fieldwork aimed to establish the depth of the archaeological features investigated. This aim was achieved in all but the case of HA5. It is of note that no inflow of water occurred in any of the boreholes, suggesting the water table was not reached. It is widely accepted that the water table stood higher during the medieval period at a time when Roman drainage systems had fallen out of use (S.Teague pers comm.) Similar observations were made at the Northgate House site (see below; Swindle *et al*, 2005). These changes in groundwater levels could also be attributed to aquifer recharge during the Medieval Warm Period.

Interpretation of the function of archaeological features have been made on structural and sedimentological grounds prior to the borehole study. For example large, circular, chalk-lined features are recognised as wells, and cess pits are identified on the basis of cess-rich deposits. In only one instance, flint-lined pit 1518, have geoarchaeological field investigations revised the interpretation of a feature. The shallow depth of the feature (2.29m) appears to disprove its initial interpretation as a well, and the sedimentology suggests its use as a cess-pit.

The majority of the sediments recorded during this investigation are classed as backfill. As these deposits are of uncertain age and provenance, any environmental information derived will be similarly ambiguous. While environmental analysis, for example macrofossil identification from cess or organic-rich deposits (Table 2), would yield results relating to the general subsistence base and dietary habits of the occupants, it is of limited use in identifying the function of pit features. Were primary fills relating to the use of the feature recovered, environmental analysis would lead to better interpretation of function and depositional events. ‘Absolute’ dates relating to feature use would be possible with AMS radiocarbon dates on macrofossils in primary fills. Primary fills, however, were only noted in one borehole (BH1) and appeared sterile and is unlikely to yield environmental remains.

Large variations in bedrock depth are observed across site, and these differences can be accounted for by local topographic deviations from mapped structural patterns. The Upper Chalk bedrock underlying superficial clay-with-flints is of hydrogeological importance, being highly porous and permeable, and forms part of the major groundwater reservoirs of the UK. The high porosity of the chalk is attributed to both primary porosity (depositional i.e. framework porosity) and also likely to be secondary (due to fractures and tectonism) (Tucker, 1991). Water

circulates in the saturated zone of the aquifer (100-200m) and fractures in the upper 50-100m can provide small amounts of water to individual wells and springs (UK Groundwater Forum, 2004). It is suggested that processes such as Jurassic and Palaeogene tectonism may explain the variability noted in the surface of the Upper chalk, and the relatively shallow depth of the majority of the wells. The broad structural pattern of the Hampshire basin dips to the south, but bedrock topography on site appears to follow a localised topographical form.

Northgate House

This report summarises the overall findings from geoarchaeological field investigations undertaken by *ArchaeoScape* in collaboration with Oxford Archaeology at Northgate House, Winchester. These investigations consisted of taking boreholes gouge samples from deep archaeological features at the sites. This permitted an examination of the local sedimentary successions and thus an opportunity to evaluate their archaeological importance. This report summarises the findings of the investigations.

Methods

A map of the site, illustrating the location of boreholes 1, 2, 3, 4 and 5 is displayed in Figure 5. The boreholes were recovered using an Eijkelkamp gouge set driven by an Atlas Copco 2-stroke percussion engine (dimensions: 100 x 10/7.5/5/3cm). Table 3 indicates the depth of the boreholes (metres Ordnance Datum and metres from the surface), the structure or cut number of the feature in which they were located and the likely age of that feature. All of the boreholes penetrated into the bedrock chalk except borehole 5. Bulk samples were retained from each unit in all five boreholes for possible laboratory-based environmental archaeological investigation.

Figure 6 shows the sequence of sediments encountered in the five boreholes. The lithostratigraphy was recorded in the field using standard procedures for the characterisation of unconsolidated sediment and peat. This involved noting the physical properties (e.g. colour), composition (gravel, sand, silt, clay, peat and organic detritus), peat humification (degree of organic matter decomposition), and the nature of changes across lithostratigraphic unit boundaries, and inclusions (e.g.

archaeological remains such as bone, pottery, burnt flint, struck flint and metalwork). The results are presented in Tables 4 to 8.

Results and interpretation of sedimentary sequences

The sedimentary sequences from boreholes 1, 2, 3 and 5 penetrated the fill of four deep shafts interpreted on the basis of archaeological evidence as medieval wells (structures NH2605, NH4028, NH3547 and NH9528). Borehole 4 penetrated a cesspit (NH4300) interpreted on the basis of archaeological evidence as Anglo-Saxon in age. All of the boreholes, except borehole 5, bottomed in undisturbed Upper Chalk, assumed in each case to be the bottom of the original well or cesspit. Borehole 5 was terminated above the level of bedrock (10.70m) due to health and safety procedures associated with taking borehole samples over 10m in depth.

Borehole 1

The sequence in borehole 1, within structure [NH2605], is composed of natural chalk overlain by approximately 8.56m of archaeological deposits (between 39.82-48.38m OD; Table 4 and Figure 6). The archaeological deposits contain a mixture of backfill in the form of flint-rich clay mixed with blocky chalk rubble and fine-grained mineral sediments. Contexts (NH2674), (NH2676), (NH2677), (NH2682) and (NH2685) contained charcoal, oyster shell, pottery (possibly Saxon and Late Roman), waterlogged seeds and waterlogged wood.

Borehole 2

The sequence in borehole 2, within structure [NH4028], is composed of natural chalk overlain by light grey clayey silt, context (NH4634), containing charcoal, burnt bone, and bone and burnt flint. This is overlain by approximately 5.00m of backfill in the form of flint-rich clay mixed with blocky chalk rubble (between 43.27-48.27m OD) containing oyster shell, bone and charcoal (Table 5 and Figure 6). The presence of fine-grained sediment may indicate deposition of mineral matter from suspension within an open water body prior to backfilling.

Borehole 3

The sequence in borehole 3, within structure [NH3547], is composed of natural chalk overlain by light orange brown silty clay, context (NH3635), containing waterlogged

fruit pips, charcoal and bone. This context may represent the 'primary' fill of the feature. This is overlain by approximately 7.56m of backfill in the form of flint-rich clay mixed with blocky chalk rubble (between 37.70-45.27m OD; Table 6 and Figure 6). Two relatively thin, fine grained mineral-rich sedimentary units, contexts (NH3631) and (NH3633), occur at 43.99-44.07 and 38.47-38.86 respectively within the backfill. These contain charcoal and pottery thought to be Late Bronze Age-Early Iron Age in date.

Pollen analysis, plant and faunal macrofossil analysis was undertaken on material from NH3635. The pollen grains and spores were extracted as follows:

1. Sampling a standard volume of sediment (1ml)
2. Deflocculation of the sample in 1% Sodium pyrophosphate
3. Sieving of the sample to remove coarse mineral and organic fractions (<5 μ and >125 μ)
4. Removal of finer mineral fraction using Sodium polytungstate (specific gravity of 2.0g/cm³)
5. Acetolysis to remove unwanted organic matter
6. Mounting of the sample in glycerol jelly

Pollen grains and spores were identified using the Royal Holloway (University of London) pollen type collection and the following sources of keys and photographs: Moore *et al* (1991), Reille (1992). Plant nomenclature follows the Flora Europaea as summarised in Stace (1997). The pollen grains and spores were examined using a high power microscope at x400 and x1000 magnifications using phase and interference contrast facilities. A maximum number of 300 pollen grains and spores were attempted for each sample (Table 9), but unfortunately, no pollen grains and spores were recovered.

The bulk samples were processed by wet sieving using 300 micron and 1mm mesh sieves. For analysis, the flots were sorted and identifications were made under a low power zoom-stereo microscope. Identifications were made with reference to the modern seed reference collection at Royal Holloway University London, and Berggren (1981) and Anderberg (1994). Plant nomenclature follows Stace (1997) (Table 4).

The archaeobotanical material recovered from context (NH3635) was preserved by mineralisation – the replacement of organic material by minerals (Table

10). Plum stones (*Prunus* sp.) were occasional along with seeds of strawberry (*Fragaria* sp.). Other seeds present were possible legumes (Fabaceae sp.), thistle (*Carduus* sp.) and dead-nettle (*Lamium* sp.). Mineralised fragments of awns were frequent. The occurrence of mineralised plant remains is indicative of either preservation in a phosphate rich environment e.g. cesspit (Green, 1979; Greig, 1981; Jones *et al.*, 1991), or the secondary deposition of mineralised material e.g. well. Since the depositional context is a well, it is possible that faecal material containing plant remains was discarded into it after abandonment. This would account for the presence of strawberry and legume seeds, indicating that these plants formed part of the diet. The presence of awns is interesting, and suggests that the by-products of cereal processing or utilisation of wild grasses (e.g. hay) were also discarded into the well. The presence of dead-nettle, e.g. white dead-nettle (*Lamium album*), is also of interest because the plant is edible (Mabey, 1992). The well was also used for the disposal of domestic rubbish, which is indicated by the presence of fruit stones (plums), bones (small mammals and fish) and fuel wood (oak). This mixed assemblage indicates an economy possibly based on mixed farming, which may have involved utilisation of cereals, exploitation of hay for animal husbandry and the use of wild resources.

Charcoal remains recovered from the processed samples (see procedure above) were examined followed standard procedures for the analysis of charcoal as described in Hather (2000). Taxa were identified with reference to descriptions in Hather (*ibid.*). Nomenclature follows Stace (1997) (Table 11). Context (NH3635) from well [NH3547] proved to contain fragments of mature oak with tyloses.

Fragments of bone recovered from the processed samples (see procedure above) were examined followed standard procedures for the analysis of bone as described in Reitz and Wing (1999) and Schmid (1972) (Table 12). The assemblage was small and many fragments could not be identified to species. The presence of frog in (NH3635) is consistent with the suggestion that [NH3547] is a well.

Borehole 5

The sequence in borehole 5, within structure [NH9528], was made up of 10.70m of archaeological deposits. At the base, 0.70m of dark brown silty clay, context (NH9742), underlies 0.10m of olive brown clayey silt, context (NH9741) and 0.10m of dark brown silty clay, context (NH9740). These contexts contain abundant pieces

of broken slate, charcoal, Mollusca and bone. Because it was not possible to investigate the full depth of this structure, it is unclear whether these contexts represent the 'primary' fill. These are overlain by 5.45m of backfill consisting of whitish grey chalk mortar, contexts (NH9739) and (NH9737) (between 38.95-44.40m OD; Table 8 and Figure 6). One relatively thin, fine-grained unit, context (NH9738) occurs at 41.95-41.85 within this backfill. The whitish grey chalk mortar backfill is overlain by 4.35m of flint-rich clay, context (NH9736), mixed with fragments of chalk (between 44.40-48.75m OD) containing slate, Mollusca, bone and charcoal.

Boreholes 1, 2, 3 and 5

Within the shafts investigated by boreholes 1, 2 and 3, interpreted as medieval wells, the Chalk was encountered at 39.82m, 42.92m and 37.70m OD, respectively 2.82m, 5.92m and 0.7m above the level of the modern floodplain (c.37m OD). Borehole 5 did not terminate in Chalk. No inflow of groundwater to any of the boreholes was encountered. For any of these shafts to have acted as wells they must originally have extended below the water-table, perhaps by at least 1.0m. Close to permanent streams in areas underlain by the Upper Chalk, modern experience indicates that good supplies of water can usually be obtained from wells sunk to about the level of the stream bed (e.g. White, 1925). In this context, all the shafts described above seem rather shallow if their object was to obtain a reliable supply of water and it is unsurprising that no inflow of water was encountered in sinking the boreholes. However, it is possible that in the medieval period, with different patterns of land-use, urban occupation and water extraction, the water table stood on average at a higher level than it now does.

Borehole 4

The sequence in borehole 4, within pit [NH4300], is composed of natural chalk at 43.49m OD, (6.49m above the modern floodplain), overlain by approximately 4.95m of archaeological deposits (between 43.49-48.44m OD; Table 7 and Figure 6). The sedimentary sequence contains units of dark olive brown silt that contain small pieces of chalk, and small fragments of shell, bone and charcoal, with intercalated units of re-deposited chalk. Due to the colour, composition and inclusions present within the dark olive brown silt, it is interpreted as 'cess', which has been purposely 'capped'

with chalk. The substantial voids recorded in borehole 4 are likely to be the result of the *in-situ* decay and/or possible shrinkage of cess.

All contexts were wet sieved using 300 micron and 1mm mesh sieves and assessed as above. Contexts NH4672 and NH4675 did not contain macroscopic archaeobotanical remains. Context NH4677 contained charcoal from indeterminate hardwoods (not *Quercus*) while context NH4679 from cesspit contained four fragments of *Quercus*, two fragments of Indeterminate charcoal (probably *Quercus*) and 1 fragment of Maloideae (Table 11).

Pollen analysis was undertaken on sub-samples extracted from contexts NH4672, NH4675 and NH4677 using the methodology given above. However, although context NH4679 did contain pollen, it was not present in sufficiently high concentrations to justify a full pollen count (Table 9). Nevertheless, the results indicate a range of taxa possibly associated with dietary practices or the general environment. The presence of cereal pollen indicates utilisation of cereals, and presumably their consumption. However, the presence of cereal pollen in a cesspit context does not necessarily imply that pollen was ingested as part of a meal; instead, the pollen may have entered the stomach, small and large intestine by breathing-in and then swallowing the pollen trapped in mucous. This is a perfectly normal action in the human body, and indicates that an individual was probably near an arable field or in an area of cereal processing when the pollen was swallowed. Therefore, the presence of cereal pollen may provide a record of the general environment, or the activities of an individual, rather than diet. The other taxa suggest the presence or utilisation of heathland (heather), possibly for flavouring a drink, meadow grassland or rough grassland (black knapweed, thistle and grass), possibly for animal fodder or bedding, which was discarded into the cesspit, and woodland (pine). Although the latter was probably some distance from the site.

The cesspit samples proved to contain a mixture of plant and animal remains derived from two sources: (1) small fish bones and pollen incorporated within faecal material and (2) large mammal remains (pig) and charcoal (oak) indicating the deposition of domestic rubbish. These classes of bioarchaeological remains indicate a diet consisting of meat, fish, marine shellfish (oysters) and possibly cereals, and the utilisation of oak for fuel. The small fish bones in NH4679 are of a size that could be eaten and safely passed through the human digestive tract. A pig molar is unlikely to

have been consumed and thus is likely to derive from general waste rather than a pure cess deposit.

These findings are consistent with those from other cesspits studied in England (e.g. Greig, 1981; Jones *et al.*, 1991), and indicate an economy based on mixed farming and the exploitation of wild resources.

Conclusions

The aim of the geoarchaeological field investigations at Northgate House was to ascertain the formation processes and events that led to the infilling of the five archaeological features. The records indicate:

1. That the sedimentary records from boreholes 1, 2, 3 and 5 and the OD heights represent former wells that were deliberately backfilled sometime after their abandonment.
2. That in the medieval period, with different patterns of land-use, urban occupation and water extraction, the water-table possibly stood on average at a higher level than it now does allowing the wells to be useful source to retain and collect water.
3. That cut [NH4300] represents a former cess pit that was progressively filled with domestic and human waste.
4. Two 80cm voids were recorded in borehole 4. These are thought to be a result of *in-situ* decay and/or possible shrinkage of cess.

Appendix 1: Dimensions of boreholes from Discovery Centre

Boreholes:

Gouge length = 1.00m

Thickness of compressed deposit = **X** (less than 1.00m)

$1.00\text{m} / \mathbf{X} = \text{Expansion measurement}$

Expansion measurement x measured depth of deposit boundary = approximated true depth of deposit boundary

Hand augered Boreholes:

Gouge length = 0.20m

Thickness of sediments forced into gouge = **Y** (more than 0.20m)

$\mathbf{Y} / 0.20 = \text{Expansion measurement}$

Expansion measurement x measured depth of deposit boundary = approximated true depth of deposit boundary

References

- Anderberg, A-L. 1994 *Atlas of Seeds: Part 4*, Swedish Museum of Natural History, Risbergs Tryckeri AB, Uddevalla: Sweden.
- Berggren, G. 1981 *Atlas of Seeds: Part 3*, Swedish Museum of Natural History, Berlings, Arlöv: Sweden.
- British Geological Survey, Sheet 299 - Winchester
- Green, F.J. 1979 Phosphatic mineralisation of seeds from archaeological sites, *Journal of Archaeological Science*, 6, 279-284.
- Greig, J. 1981 The investigation of a medieval barrel-latrine from Worcester, *Journal of Archaeological Science*, 8, 265-282.
- Jones, G., Straker, V. and Davis, A. 1991 'Aspects of Saxon and Norman London: early medieval plant use and ecology' in Vince, A. G. 1991, 347-85.
- Mabey, R. 1992 *Food for Thought*, London: Harper Collins Publishers.
- Reitz, E. and Wing, E. 1999 *Zooarchaeology*, Cambridge: Cambridge University Press.
- Schmid, E. 1972 *Atlas of Animal Bones* Amsterdam, London New York: Elsevier.
- Stace, C. 1997 *New Flora of the British Isles* (2nd ed.), Cambridge: Cambridge University Press.
- Swindle, G.E., Green, C.P. and Branch, N.P. 2005 Geoarchaeological field investigations at Northgate, 19/20 Staple Gardens, Winchester, Hampshire (AY93), *ArchaeoScape Unpublished Report*.
- Teague, S. and Ford, B., 2006. *Northgate House, Staple Gardens, Winchester, Hampshire: post-excavation assessment and updated project design*. Oxford Archaeology Unpublished Report
- Tucker, M. E., 1991. *Sedimentary Petrology*. 2nd Ed. Oxford: Blackwell Scientific Publications
- UK Groundwater Forum, 2004. *The aquifers of the UK*
http://www.groundwateruk.org/archive/the_aquifers_of_the_uk.pdf.
<http://www.groundwateruk.org/html/depth.htm> [Accessed 03/06]
- Vince, A. G. (ed.) 1991 *Aspects of Saxon and Norman London 2: Finds and Environmental Evidence*, London and Middlesex Archaeological Society Special Paper 12.
- White, H.J.O 1925 *The Geology of the Country around Marlborough*, Memoir of the Geological Survey of Great Britain, HMSO

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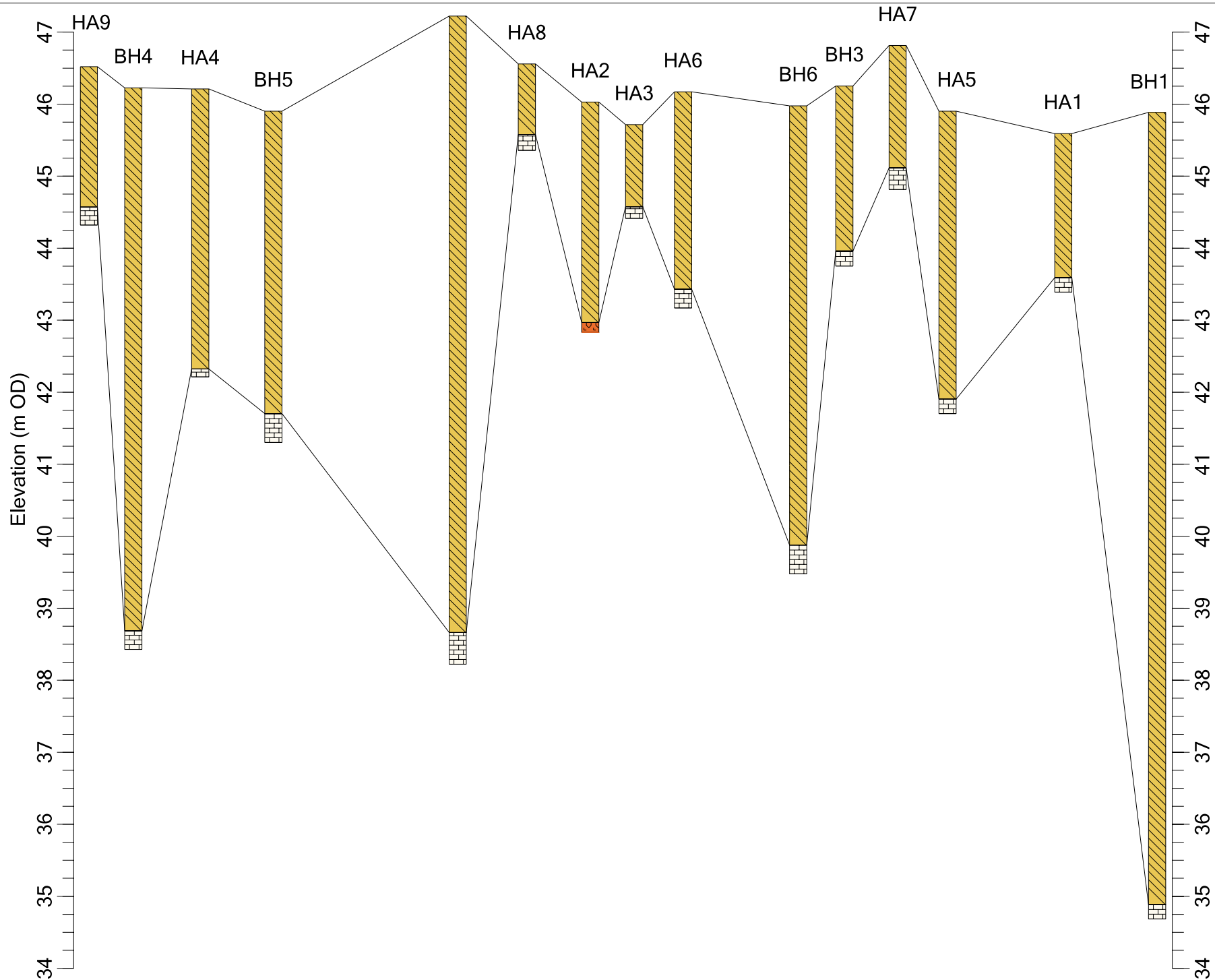
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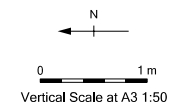
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Section 18 Figure 1: Contour map of surface of bedrock



- Archaeological deposits
- Clay-with-flints
- Chalk bedrock


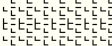
























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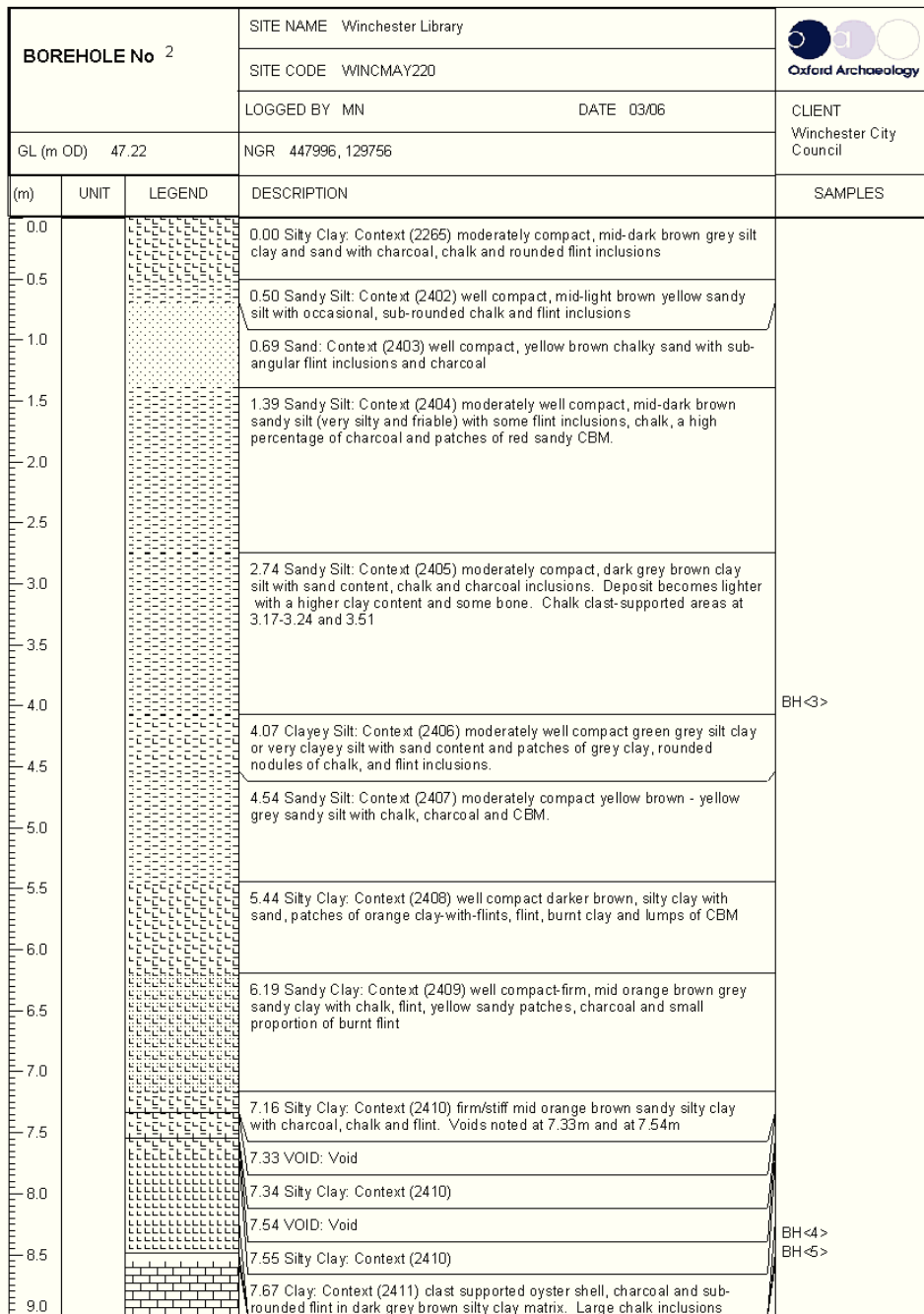
WINCMAY220
 Winchester Library

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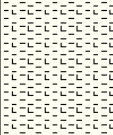
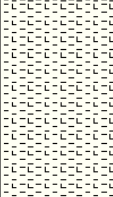
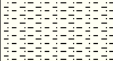

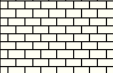
Section 18 Figure 2: Cross sections of borehole stratigraphy

BOREHOLE No BH1		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
GL (m OD) 45.886		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Silty Clay: Context (1310) loosely compact, mid-dark brown grey silt clay with chalk, charcoal and flint inclusions and some CBM	
0.5			0.25 Silty Clay: Context (1485) moderate-loosely compact, mid brown grey silt clay with charcoal (5-10%), large, sub-rounded chalk (c. 30%), bone (<5%), yellow clay and small-medium, sub-angular flint inclusions. Pot sherd at c. 3.40m depth.	
1.0				
1.5				
2.0				
2.5				
3.0				
3.5				
4.0				
4.5			4.36 Chalk: Context (1486) well compact, clast supported, white, chalk nodules	
5.0				
5.5				
6.0			5.78 Sandy Silt: Context (1487) moderately well compact, mid-dark brown sandy silt (very silty and friable) with some flint inclusions, chalk, a high percentage of charcoal and patches of red sandy CBM.	
6.5				
7.0				
7.5				
8.0				
8.5				
9.0				
9.5				
10.0				
10.5				BH<1>
11.0			10.80 clay: Context (1488) light grey clay	BH<2>


Section 18 Figure 3a: Borehole 1





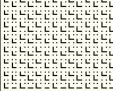
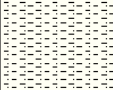
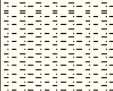
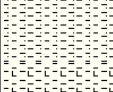
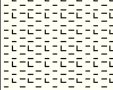
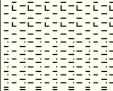
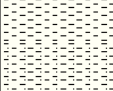
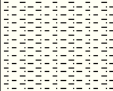
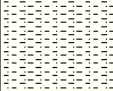
Section 18 Figure 3b: Borehole 2

BOREHOLE No BH3		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.252		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
NGR 447996, 129756				
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Silty Clay: Context (1520) loosely compact, light grey, brown silt clay with chalk inclusions (c. 30%) and rare slate	
0.5				
1.0				
1.5			1.28 Clayey Silt: Context (1489) Dark grey, clay silt with sand/gravel component, chalk, charcoal and sub-angular flint	
2.0			1.60 Clayey Silt: Context (1490) soft/loose (wet) green grey cassy clay silt with gravel/sand with chalk and sub-rounded to sub-angular flint inclusions	
2.5			2.05 Sandy Silt: Context (1491) loose/soft (wet) light grey brown, sandy/gravelly silt with clay component	BH<7>
			2.20 Clayey Silt: Context (1492) loose (wet), dark green grey, charcoal-rich cassy clay silt with sand	BH<6>
			2.29 chalk: Upper Chalk	


Section 18 Figure 3c: Borehole 3

BOREHOLE No BH4		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.228		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
NGR 447996, 129756				
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Clayey Silt: Context (3306) mixed CBM (brick), chalk, flint, charcoal rubble with loose black clay silt matrix. Well compact yellow sand with angular flint inclusions and patches of orange clay-with-flints (modern backfill)	
0.5				
1.0				
1.5			1.50 Clayey Silt: Context (3307) well compact, clast supported chalk with dark grey clay silt matrix (modern backfill)	
2.0				
2.5			2.00 Clayey Silt: Context (3308) moderately compact, light grey clay silt with clay fraction and gravel, charcoal flecks, mid-large chalk inclusions and medium sub-angular flint inclusions	
3.0				
3.5				
4.0				
4.5				BH-6>
4.62			4.62 chalk: Context (3309) clast supported sub-rounded chalk nodules	
5.0			4.80 Clayey Silt: Context (3310) moderately compact-loose dark grey, clay silt with sand and fine gravel content, flint, slate, charcoal, medium sub-rounded chalk, bone and fragments sandstone inclusions	
5.5				
6.0				
6.5			6.33 Clayey Silt: Context (3311) clast supported chalk in dark grey clay silt matrix with sand/gravel and fragments of yellow sandstone	BH-9>
7.0				
7.5			7.36 Clayey Silt: Context (3312) clast supported chalk with dark grey clay silt matrix with angular and sub-angular flint, fragments of sedimentary rock (possibly silicified sandstone)	


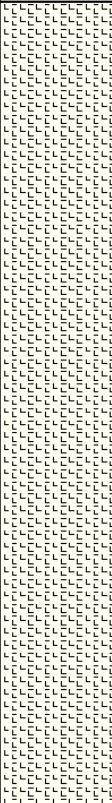
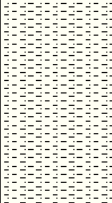
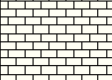


Section 18 Figure 3d: Borehole 4

BOREHOLE No BH5		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 45.904		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Sandy Clay: Context (3074) moderately compact, mid grey brown sandy clay silt with chalk, flint (c. 40%) and gravel inclusions. Patches of clast supported sub-rounded chalk and mid-orange brown sandy silt clay with frequent small flint and chalk inclusions.	BH<10>
0.5			0.78 Sandy Clay: Context (3299) soft, dark grey/black silty sandy clay with charcoal and small chalk inclusions	
1.0			1.15 Sandy Silt: Context (3300) moderately compact, light yellow brown sandy silt with small chalk inclusions. More compact than other backfill-like deposits	
1.5			1.57 Sandy Silt: Context (3301) moderately compact mid brown sandy silt with some clay fraction, flecks of charcoal, chalk, fragments of grey sandstone and small flint inclusions	
2.0			2.15 Clayey Silt: Context (3302) moderately compact /soft mid brown orange clay silt with high sand/grit content, small amount of slate and sandstone inclusions with thick bands of clast supported chalk	
2.5			2.80 Sandy Silt: Context (3303) dark grey sandy slit with clay (c. 35%), and large, sub-rounded flint inclusions	BH<11>
3.0			3.00 Silt: Context (3304) soft/loosely compact dark grey silt with some clay component and sand/grit - gravel of chalk fragments CBM/burnt clay inclusions, flint and sandstone	
3.5			3.18 Sandy Silt: Context (3305) soft-moderately compact mixed deposit of mid brown grey, sandy silt with clay (c. 35%), small and large chalk inclusions, small charcoal, slate and small-medium flint and flecks of burnt clay	
4.0			4.20 chalk: Upper Chalk	
4.5				


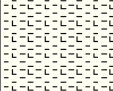
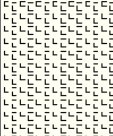

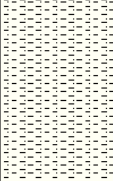
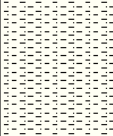
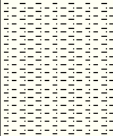
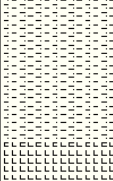
Section 18 Figure 3e: Borehole 5

BOREHOLE No BH6		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 45.977		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
NGR 447996, 129756				
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Sandy Silt: Context (1188) loosely compact dark grey black sandy silt with frequent, small chalk and occasional flint inclusions	
0.5				
1.0				
1.5			1.18 Sandy Silt: Context (1493) moderately well compact mid brown/grey black sandy silt with frequent CBM/burnt clay flecks, charcoal and small and medium chalk throughout	
2.0				
2.5			2.23 Sandy Silt: Context (1494) highly mixed deposit of clast supported large chalk inclusions with light grey sand silt with clay matrix, patches of firm red oxidised clay (clay-with-flints), charcoal and small-medium, sub-angular flint	
3.0			2.76 Clay: Context (1495) clast supported chalk nodules interspersed with firm red oxidised clay (clay-with-flints)	
3.5			3.00 Clayey Silt: Context (1497) moderately compact (wet) poorly sorted dark grey clay silt with sand, small frequent chalk inclusions and flecks of charcoal and occasional CBM	
4.0				
4.5			4.22 Clayey Silt: Context (1498) soft (wet) mid-dark brown clay silt with medium, rounded chalk inclusions and sandy patches with bands of firm, orange brown clay (clay-with-flints) with small flint inclusions; bands of chalk nodules in dark grey clay silt and bands of charcoal and grey sandy clay silts	BH<12>
5.0				
5.5			5.08 Clayey Silt: Context (1499) very soft, very dark grey black clay silt with flecks of charcoal and dark occasional medium-large flint inclusions, siltstone, chalk and gravel	BH<13>
6.0			5.74 Clay: Context (1500) patchy, mixed deposit of stiff orange clay (clay-with-flints), chalk, sandstone in moderately compact-firm, dark grey clay silt matrix	BH<14>
6.5			6.10 chalk: Upper Chalk	





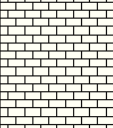
Section 18 Figure 3f: Borehole 6

BOREHOLE No HA1			SITE NAME Winchester Library		
			SITE CODE WINCMAY220		
GL (m OD) 45.59			LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
			NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES	
0.0			0.00 silty clay: Context (1099) moderately compact, mid-dark brown grey silt clay with high chalk content, oyster shell and patches of stiff, orange brown clay (c. 10%) (clay-with-flints), some bone, mussel shell, charcoal and CBM.		
0.5			1.58 sandy silt: Context (1501) loosely compact-soft green black (cess-like) sandy silt with charcoal (c. 40%), gravel component (10%), small and rounded chalk inclusions and patches of stiff, orange brown clay (clay-with-flints)	HA<1>	
1.0				HA<2>	
1.5				HA<3>	
2.0			2.00 chalk: Upper Chalk		


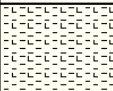
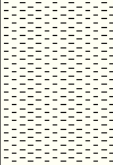


Section 18 Figure 4a: Hand augered borehole 1

BOREHOLE No HA2		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 42.534		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Clayey Silt: Context (2163) moderately compact mid grey-brown clay silt with sand content, gravel, small flint inclusions, small and medium occasional chalk; occasional small patches of orange clay and high% charcoal	
0.5			0.30 Silty Clay: Context (2395) light brown grey, very silty clay with large % small and medium chalk inclusions. Deposit becomes more mixed at the base with large charcoal inclusions and high sand content	
1.0			0.70 Silty Clay: Context (2396) darker grey brown (wet) very silty clay with charcoal, larger flint and chalk nodules, burnt clay and chalk grit	
1.5			1.26 Sandy Silt: Context (2397) very loose green brown/orange brown sandy silt with clay content, charcoal	
2.0			2.06 Silty Clay: Context (2398) light brown grey, very silty clay with large % small and medium chalk inclusions. Deposit becomes more mixed at the base with large charcoal inclusions and high sand content	HA<4>
2.5			2.76 Silty Clay: Context (2399) light brown grey, very silty clay with large % small and medium chalk inclusions. Deposit becomes more mixed at the base with large charcoal inclusions and high sand content	HA<5>
3.0			3.06 clay: firm-stiff orange sandy clay with flints	HA<6>


Section 18 Figure 4b: Hand augered borehole 2

BOREHOLE No HA3		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 45.716		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
NGR 447996, 129756				
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Silty Clay: Context (2238) moderate-well compact mid-dark brown very silty clay with sand content and c. 30% chalk inclusions and some charcoal and bone. Deposit increases in flint inclusions and large chalk inclusions at depth. Band of chalk noted at lower deposit boundary	
0.5			0.50 Silty Clay: Context (2398) moderately compact grey green soft silt clay with some inclusions and some sand content noted, plus occasional CBM and some burnt clay	
1.0			0.88 Silty Clay: Context (2399) moderately compact-soft mid brown silt clay with some sand content. Slightly orange brown in colour. Occasional charcoal inclusions and chalk	HA<7>
			1.14 chalk: Upper Chalk	


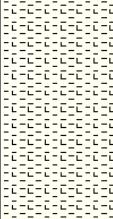
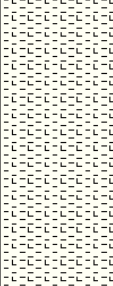
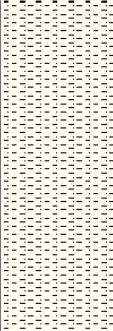

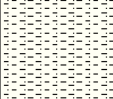
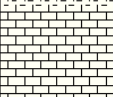
Section 18 Figure 4c: Hand augered borehole 3

BOREHOLE No HA4		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.21		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Clayey Silt: Context (3189) loosely compact, light yellow brown chalk (50%) and clay silt (50%)	
0.5			0.30 Silt: Context (3297) well compact grey brown gritty clay silt. Same as overlying deposit with higher chalk inclusions and occasional charcoal. Slate noted at base of context.	
1.0			0.90 Silty Clay: Context (3298) mid grey brown dark very silty clay with sand content. Sub angular chalk nodules, occasional small burnt clay, small-medium flint and charcoal inclusions. Patches of light chalky clay silt (similar to overlying deposit). Context becoming more silt and charcoal-rich lower down profile	
2.0				
2.5				
3.0				HA<8>
3.5				
4.0			3.89 chalk: Upper Chalk	HA<13>


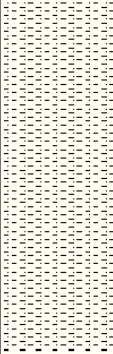
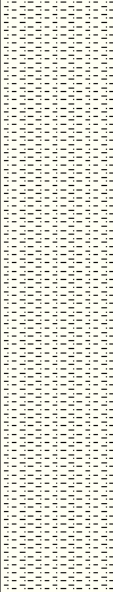
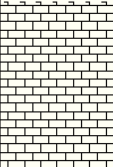
Section 18 Figure 4d: Hand augered borehole 4

BOREHOLE No HA5		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.17		LOGGED BY MN	DATE 03/06	CLIENT CLIENT
		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Silty Clay: Context (1449) soft, dark brown grey very silty clay with sand content, c. 20% chalk nodules, occasional shell, medium-small charcoal and <20% small flecks of burnt clay inclusions.	
0.5				
1.0				HA<9>
1.5				
2.0				
2.5				
3.0				HA<10>
3.5				
4.0			3.90 Clay: Context (1502) mixed deposit of soft-loose green grey clay (cess-like) with high charcoal content, red burnt clay, occasional shell and occasional-frequent medium chalk inclusions.	HA<11>
			4.00 chalk: Upper Chalk	HA<12>
4.5				


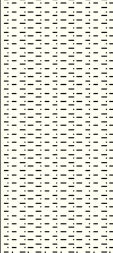
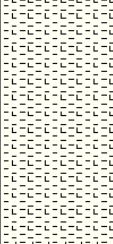
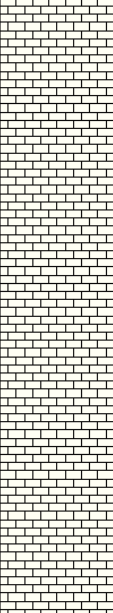
Section 18 Figure 4e: Hand augered borehole 5

BOREHOLE No HA6			SITE NAME Winchester Library	
			SITE CODE WINCMAY220	
			LOGGED BY MN	DATE 03/06
GL (m OD) 46.418			NGR 447996, 129756	
			CLIENT Winchester City Council	
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Clayey Silt: Context (1799) moderately compact, mid brown grey clay silt with sand content and high % of large sub angular-sub rounded flint inclusions, small and large chalk nodules	
0.5			0.60 Clayey Silt: Context (1800) compact, dark brown-black, slightly clayey silt with frequent small chalk inclusions and charcoal	
1.0			1.40 Sandy Silt: Context (1801) loosely compact mid light brown yellow sandy silt with some clay content, c. 40-50-% chalk inclusions and charcoal. Lower % flint inclusions than overlying deposit	
1.5			2.30 Silt: Context (1802) loosely compact, brown silt, appears organic rich with few inclusions	HA<16>
2.0			2.40 Sandy Silt: Context (1803) well compact dark grey-brown, chalk clast-supported sandy silt (>50% chalk).	
2.5			2.74 chalk: Upper Chalk	HA<17>
3.0				


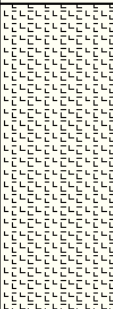



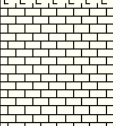
Section 18 Figure 4f: Hand augered borehole 6

BOREHOLE No HA7			SITE NAME Winchester Library		
			SITE CODE WINCMAY220		
GL (m OD) 46.815			LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
			NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES	
0.0			0.00 Sandy Silt: Context (1664) loosely compact (dry) friable, dark grey matrix-supported sandy silt with high % medium, sub rounded chalk clasts, oyster shell, flint nodules and small charcoal inclusions (c. 10%)	HA<15>	
0.5			0.63 Sandy Silt: Context (1790) moderately well compact, dark green brown sandy silt with some clay content, small occasional flecks of charcoal and small sub rounded chalk inclusions		
1.0			1.70 chalk: Upper Chalk		
1.5					
2.0					

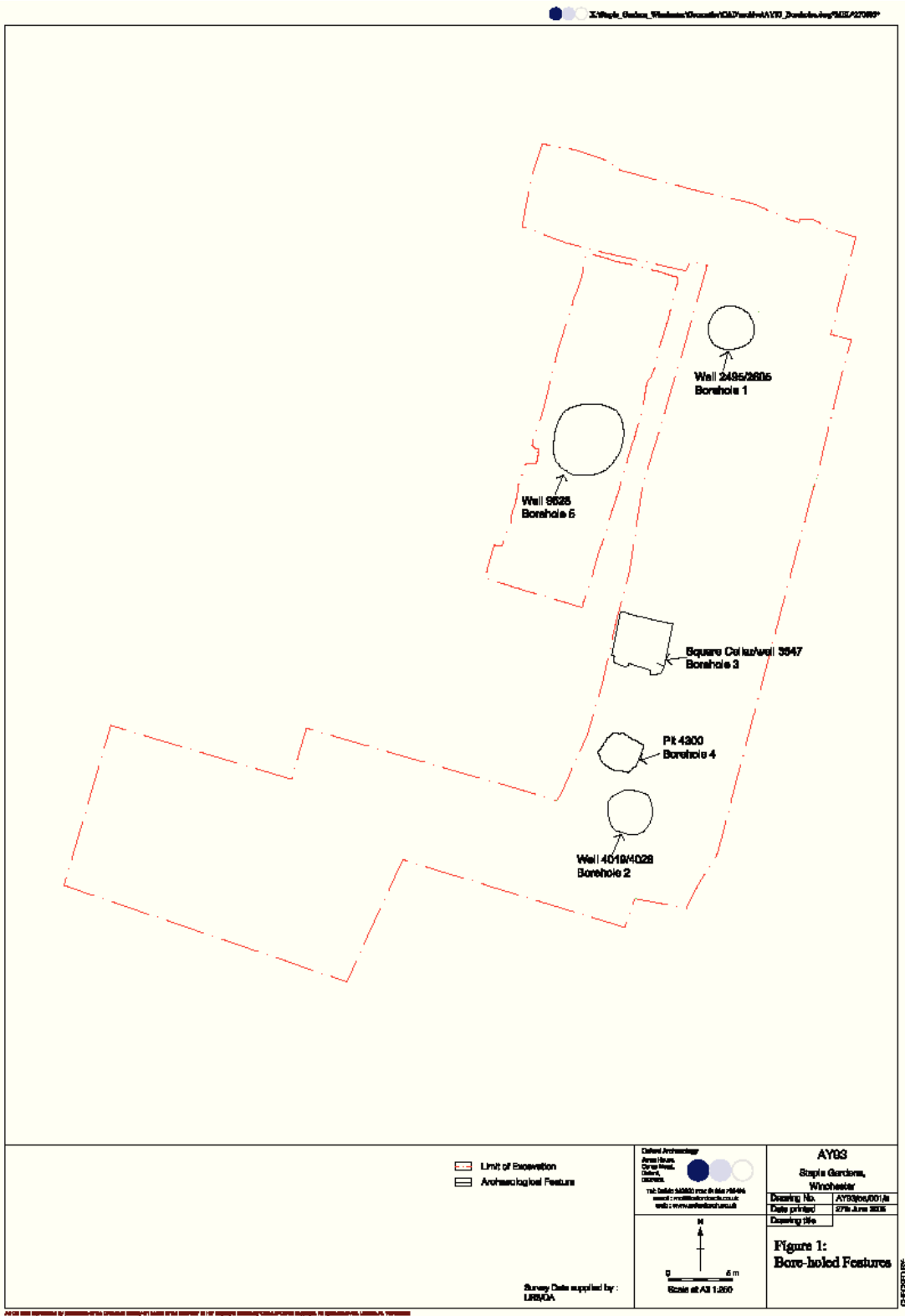
Section 18 Figure 4g: Hand augered borehole 7

BOREHOLE No HA8		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.522		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
NGR 447996, 129756				
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Sandy Silt: Context (2027) loosely compact, friable, dark brown sandy silt with medium-small sub angular - sub rounded chalk nodules. Oyster shell, flint, bone and flint tempered pot	
0.5			0.50 Clayey Silt: Context (2411) moderately compact mid grey clay silt with high chalk content (c. 30-40%). Deposit becomes abundant in chalk inclusions (c. 60%) clast supported with veins of matrix	
1.0			0.98 chalk: Upper Chalk	
1.5				
2.0				

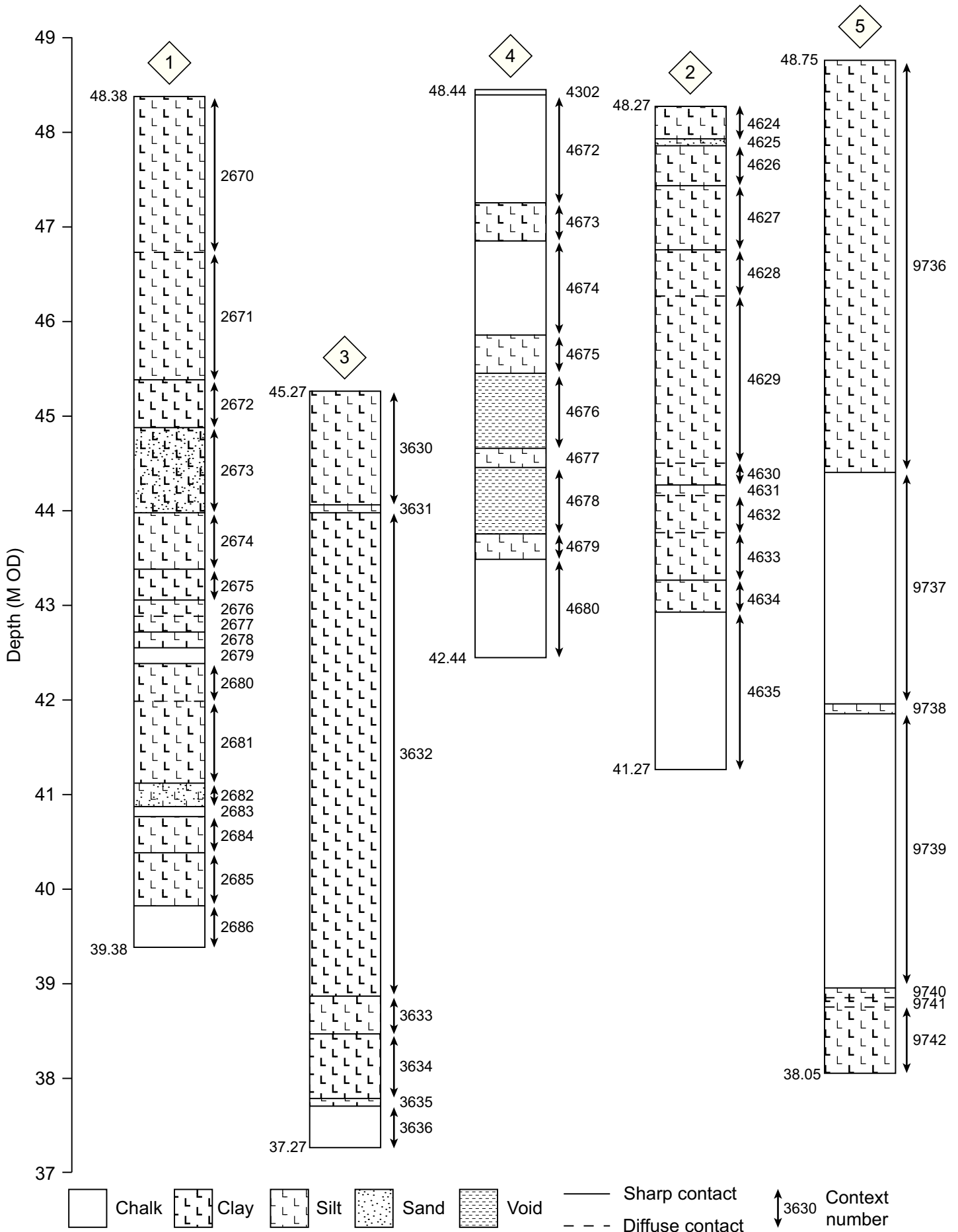
Section 18 Figure 4h: Hand augered borehole 8

BOREHOLE No HA9		SITE NAME Winchester Library		
		SITE CODE WINCMAY220		
GL (m OD) 46.522		LOGGED BY MN	DATE 03/06	CLIENT Winchester City Council
		NGR 447996, 129756		
(m)	UNIT	LEGEND	DESCRIPTION	SAMPLES
0.0			0.00 Silty Clay: Context (3127) moderately compact-well consolidated dark brown, grey and black silty clay with sand content	
0.5			0.60 Silty Clay: Context (3294) well consolidated chalk clast supported deposit with dark grey brown silty clay matrix	
1.0			1.10 Silty Clay: Context (3295) stiff, orange brown matrix supported silt clay with sand content and small, frequent chalk inclusions, small frequent charcoal and small occasional flecks of burnt clay	
1.5			1.50 Silty Clay: Context (3296) moderate-well compact very chalky (clast supported) dark grey brown silt clay	
2.0			1.95 chalk: Upper Chalk	HA<14>

Section 18 Figure 4i: Hand augered borehole 9



Section 18 Figure 5: Northgate House: site map displaying position of boreholes



Section 18 Figure 6: Lithostratigraphy of boreholes 1, 2, 3, 4 and 5 from Northgate, 19-20 Staple Gardens, Winchester (AY93) taken by ArchaeoScape February 2005

Table 1: Discovery centre: borehole Depths and heights m OD

	BH1	BH2	BH3	BH4	BH5	BH6
OD at top (m)	45.886	47.22	46.252	46.227	45.903	45.977
Depth (m)	11	8.56	2.29	7.54	4.2	6.1
OD at base (m)	34.886	38.66	43.962	38.687	41.703	39.877

	HA1	HA2	HA3	HA4	HA5	HA6
OD at top (m)	45.59	46.0291	45.716	46.212	45.903	46.17
Depth (m)	2	3.03	1.2	3.89	4	2.74
OD at base (m)	43.59	42.9991	44.516	42.322	41.903	43.43

	HA7	HA8	HA9
OD at top (m)	46.815	46.558	46.521
Depth (m)	1.7	0.98	1.95
OD at base (m)	45.115	45.578	44.571

Table 2: Discovery centre: sampled cess or organic-rich deposits

Borehole number	Feature	Context
BH3 <6>	cess pit 1518	1492
BH3 <7>	cess pit 1518	1491
HA1 <1>	pit 1100	1501
HA1 <2>	pit 1100	1501
HA1 <3>	pit 1100	1501
HA2 <4>	pit 2002	2397
HA2 <5>	pit 2002	2397
HA2 <6>	pit 2002	2397
HA5 <12>	pit 1457	1502
HA6 <16>	pit 1482	1802

Table 3: Northgate House: details of boreholes taken by ArchaeoScape

Borehole Number	Depth of borehole from surface (M)	Height at top of borehole (M OD)	Height at base of borehole (M OD)	Within Structure/Cut Number	Likely Age and function
1	9.0	48.38	39.38	2605	Medieval Well
2	7.0	48.27	41.27	4028	Medieval Well
3	8.0	45.27	37.27	3547	12 th Century Well
4	6.0	48.44	42.44	4300	Anglo-Saxon Cess Pit
5	10.7	48.75	38.05	9528	Medieval Well

Table 4: Northgate House: lithostratigraphic sequence from borehole 1

Depth (M)	Depth (M OD)	Context Number	Description
0.00-1.64	48.38-46.74	2670	Dark brown silty clay; shattered flints; re-deposited chalk blocks; diffuse contact
1.64-3.00	46.74-45.38	2671	Re-deposited chalky blocks in a dark brown silty clay matrix; sharp contact
3.00-3.50	45.38-44.88	2672	Large angular flints in a light grey clay matrix; re-deposited chalk blocks; sharp contact
3.50-4.40	44.88-43.98	2673	Re-deposited chalk in a orangey sandy clay matrix; sharp contact
4.40-5.00	43.98-43.38	2674	Dark brown silty clay; charcoal; pottery; waterlogged seeds and wood; small pieces of re-deposited chalk; sharp contact
5.00-5.34	43.38-43.04	2675	Re-deposited chalk in a light orange brown clayey matrix; sharp contact
5.34-5.50	43.04-42.88	2676	Light brown clayey silt; charcoal; bone; small pieces of re-deposited chalk; diffuse contact
5.50-5.67	42.88-42.71	2677	Dark brown clayey silt; charcoal bone; small pieces of re-deposited chalk; sharp contact
5.67-5.83	42.71-42.54	2678	Light brown silty clay; sharp contact
5.83-6.00	42.54-42.38	2679	Large angular flints and re-deposited chalk blocks; sharp contact
6.00-6.40	42.38-41.98	2680	Re-deposited chalk blocks in a light brown silty clay; charcoal; diffuse contact
6.40-7.37	41.98-41.01	2681	Orangey brown silty clay; small pieces of re-deposited chalk; sharp contact
7.37-7.56	41.01-40.87	2682	Light grey sandy silt; charcoal; bone; sharp contact
7.56-7.61	40.87-40.76	2683	Re-deposited chalk block; sharp contact
7.61-8.00	40.76-40.38	2684	Orangey brown silty clay; small pieces of re-deposited chalk; sharp contact
8.00-8.56	40.38-39.82	2685	Large re-deposited chalk blocks within a dark brown clayey silt matrix; charcoal; bone; flint;

			sharp contact
8.56-9.00	39.82-39.38	2686	Natural Chalk

Table 5: Northgate House: lithostratigraphic sequence from borehole 2

Depth (M)	Depth (M OD)	Context Number	Description
0.00-0.34	48.27-47.93	4624	Light brown silty clay; charcoal, re-deposited chalk blocks, bone; sharp contact
0.34-0.42	47.93-47.85	4625	Dark orangey brown silty sand; charcoal; flint; sharp contact
0.42-0.84	47.85-47.43	4626	Light brown silty clay; charcoal, re-deposited chalk blocks, bone; sharp contact
0.84-1.52	47.43-46.75	4627	Dark orangey brown silty clay; re-deposited chalk blocks; charcoal and flint; sharp contact
1.52-2.00	46.75-46.27	4628	Light brown silty clay; re-deposited chalk blocks; charcoal; oyster shell; diffuse contact
2.00-3.77	46.27-44.50	4629	Re-deposited chalk blocks within a light brown silty clay matrix; charcoal; oyster shell; diffuse contact
3.77-4.00	44.50-44.27	4630	Dark brown silty clay; flint; charcoal; sharp contact
4.00-4.12	44.27-44.15	4631	Light greyish brown silty clay; large flints; charcoal; chalk; diffuse contact
4.12-4.50	44.15-43.77	4632	Re-deposited chalk within Light greyish brown silty clay matrix; large flints; charcoal; chalk; diffuse contact
4.50-5.00	43.77-43.27	4633	Dark orange brown; silty clay; charcoal; very large angular flints; re-deposited chalk; sharp contact
5.00-5.35	43.27-42.92	4634	Light grey clayey silt; re-deposited chalk blocks; charcoal; burnt flint; burnt bone; bone; sharp contact
5.35-7.00	42.92-41.27	4635	Natural Chalk

Table 6: Northgate House: lithostratigraphic sequence from borehole 3

Depth (M)	Depth (M OD)	Context Number	Description
0.00-1.20	45.27-44.07	3630	Light orangey brown silty clay; large angular flints; re-deposited chalk; sharp contact
1.20-1.28	44.07-43.99	3631	Dark brown organic silty clay; charcoal; sharp contact
1.28-6.41	43.99-38.86	3632	Angular flints within a orangey brown clay with re-deposited chalk blocks; sharp contact
6.41-6.80	38.86-38.47	3633	Light orange silty clay; charcoal; pottery; sharp contact
6.80-7.48	38.47-37.79	3634	Angular flints within a orangey brown clay with re-deposited chalk blocks; sharp contact
7.48-7.56	37.79-37.70	3635	Light orangey brown silty clay; waterlogged fruit pips; charcoal; bone; sharp contact
7.56-8.00	37.70-37.27	3636	Natural Chalk

Table 7: Northgate House: lithostratigraphic sequence from borehole 4

Depth (M)	Depth (M OD)	Context Number	Description
0.00-0.05	48.44-48.39	4302	As context at base of cut; sharp contact
0.05-1.20	48.39-47.24	4672	Re-deposited chalk, iron staining, angular flint; sharp contact
1.20-1.60	47.24-46.84	4673	Orangey clay and dark brown silty clay; charcoal; small fragments of chalk; sharp contact
1.60-2.60	46.84-45.84	4674	Re-deposited chalk; iron staining, angular flint; sharp contact
2.60-3.00	45.84-45.44	4675	Dark olive brown silt; small pieces of chalk; small fragments of shell; small fragments of bone; charcoal
3.00-3.80	45.44-44.64	4676	VOID
3.80-4.00	44.64-44.44	4677	Dark olive brown silt; small pieces of chalk; small fragments of shell; small fragments of bone; charcoal
4.00-4.80	44.44-43.64	4678	VOID
4.80-4.95	43.64-43.49	4679	Dark olive brown silt; small pieces of chalk; small fragments of shell; small fragments of bone; charcoal; sharp contact
4.95-6.00	43.49-42.44	4680	Natural Chalk

Table 8: Northgate House: lithostratigraphic sequence from borehole 5

Depth (M)	Depth (M OD)	Context Number	Description
0.00-4.35	48.75-44.40	9736	Dark yellowish brown silty clay with small to medium angular flints; chalk fragments; slate; charcoal; infrequent Mollusca; sharp contact
4.35-6.80	44.40-41.95	9737	Whitish grey chalk mortar; infrequent bone; infrequent Mollusca; infrequent pieces of broken slate; sharp contact
6.80-6.90	41.95-41.85	9738	Dark brown silt; broken slate; charcoal; chalk fragments; sharp contact
6.90-9.80	41.85-38.95	9739	Whitish grey chalk mortar; infrequent bone; infrequent Mollusca; pieces of broken slate; sharp contact
9.80-9.90	38.95-38.85	9740	Dark brown silty clay; broken slate; chalk fragments; diffuse contact
9.90-10.00	38.85-38.75	9741	Olive brown clayey silt with small angular flints; charcoal; infrequent Mollusca; abundant pieces of broken slate; chalk fragments; bone; diffuse contact
10.00-10.70	38.75-38.05	9742	Dark brown silty clay; abundant pieces of broken slate; chalk fragments; bone

Table 9: Northgate House: Pollen assemblage

Borehole Number	Context Number	Structure/Cut	Provisional Date	Main Taxa	Common Name
3	3635	3547	11th-13th Century	None	NA
4	4672	4300	9th-10th Century	None	NA
4	4675	4300	9th-10th Century	None	NA
4	4677	4300	9th-10th Century	None	NA
4	4679	4300	9th-10th Century	<i>Calluna vulgaris</i> <i>Cereale</i> type Poaceae <i>Sinapis</i> type <i>Centaurea nigra</i> <i>Cirsium</i> type <i>Pinus</i>	Heather Cereal Grass family e.g. Charlock Black knapweed e.g. Thistle Pine

Table 10: Northgate House: Mineralised plant macrofossil assemblage

Taxa	Common Name	Item	Borehole Number	3	4	4	4	4
			Context Number	3635	4672	4675	4677	4679
			Cut	3547	4300	4300	4300	4300
			Provisional Date	11th-13th Century	9th-10th Century	9th-10th Century	9th-10th Century	9th-10th Century
<i>Prunus</i> sp.	Plum taxa	Stone		2	-	-	-	-
<i>Fragaria</i> sp.	Strawberry	Seed		3	-	-	-	-
Fabaceae sp.	Pea family	Legume		1	-	-	-	-
<i>Carduus</i> sp.	Thistle	Seed		1	-	-	-	-
<i>Lamium</i> sp.	Dead-nettle	Seed		2	-	-	-	-
Poaceae sp.	Grass family	Awn		F	-	-	-	-

Key:

F frequent
 - absent

Table 11: Northgate House: Charcoal assemblage

Borehole Number	Context Number	Structure/Cut	Provisional Date	Taxa	No of Elements	Comments	Suitable for 14C
3	3635	3547	11th-13th Century	Quercus	3	mature Oak (with tyloses)	No
4	4672	4300	9th-10th Century	-	-	-	No
4	4675	4300	9th-10th Century	-	-	-	No
4	4677	4300	9th-10th Century	-	3	All indeterminate	No

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						hardwoods (not Quercus)	
4	4679	4300	9th-10th Century	Quercus Indet. (probably Quercus) Maloideae.	4 2 1	-	No

Table 12: Northgate House: Animal bone assemblage

Borehole Number	Context Number	Structure/Cut	Provisional Date	Taxon	Element/Part	Comments
3	3635	3547	11th-13th Century	rabbit-sized	one lumbar vertebra, one caudal vertebra	
				frog	scapula	
				frog	clavicle	
				frog	atlas	
				frog	3 forelimb bones	
				amphibian	limb bones	
				small mammal	limb bone in 2 pieces	
				small mammal	2 vertebra	
				fish not identified to species	non-vertebral fragments	
4	4672	4300	9th-10th Century	-	-	-
4	4673	4300	9th-10th Century	mammal	1 fragment	tiny non-diagnostic fragment
4	4675	4300	9th-10th Century	-	-	-
4	4679	4300	9th-10th Century	pig	part of crown of molar tooth	
				mammal	1 fragment	non-diagnostic fragment
				fish	4 vertebra	
				small mammal	2 vertebra fragments	
				fish (eel)	vertebra	
				fish	unidentified non vertebral fragments	
				oyster	3 shell fragments	

WINCHESTER

A CITY IN THE MAKING

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