



EXCAVATIONS AT WATERDALE, DONCASTER

EXCAVATION REPORT

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NON-TECHNICAL SUMMARY

ArcHeritage undertook a programme of archaeological fieldwork at the site of the Civic Square and New Performance Venue development at Waterdale, Doncaster, South Yorkshire (NGR 457667 402944) in 2011. The fieldwork followed two earlier archaeological evaluations which had established the presence of archaeologically significant features on the site.

The mitigation fieldwork identified late prehistoric, Roman and post-medieval deposits and features. A single dated pit was probably late prehistoric but in the absence of further evidence its context is uncertain.

Most significant was a Romano-British cemetery consisting of a series of cremation burials dating from the 1st and 2nd centuries AD. The cremation burials dated to the construction of the first Roman fort at *Danum*. The cemetery included between 20 and 30 individual cremation burials and cenotaph deposits. Possible subdivisions within the cemetery and an area of burning, possibly a pyre location, were identified. Evidence relating to the funerary practices associated with the cremations was recovered, the material culture incorporated in the burials, included complete cremation urns, pottery including amphorae and mortaria, oil lamps, glass vessels and nails. Some of the material culture showed evidence of heating and burning indicating its incorporation in the pyre. Also recovered were the remains of votive offerings and ritual feasting, including exotic imports, evidence for which came from material recovered from bulk samples taken during excavation.

A small number of inhumation burials with associated material indicated continued use of the area in the later Roman period, 3rd to 4th centuries AD, associated with the later fort and *vicus*.

Post-medieval activity comprised small scale gravel extraction, the pits for which were identified, and trenches, constructed to British Army specifications, that related to military training undertaken on the site during the First World War.

The site and the material culture provide evidence of cremation and burial rituals in the Roman period when the fort of *Danum* was first established, the adherence to Roman funerary practices from the first cremation burials and the importation of exotic goods and food for use in the funerary rites.

KEY PROJECT INFORMATION

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1 INTRODUCTION

Doncaster's new Cultural and Civic Quarter (**Figure 1**) was subject to a programme of archaeological investigation, including desk-based assessment, evaluation trial trenching by Northamptonshire Archaeology (2008) with further trial trenching, excavation and watching briefs undertaken by ArcHeritage in 2010 and 2011 (Bell 2011). The work was commissioned by Muse Developments and carried out to designs produced by URS in consultation with the South Yorkshire Archaeology Service who monitored the work.

The archaeological works uncovered a sequence of Roman to early twentieth-century archaeology on the site. The most significant archaeological remains related to a Roman cremation and inhumation cemetery, which was the focus of the excavations analysis and reporting.

1.1 Archaeological Background

Doncaster was an important Roman centre from the first through to the late third century AD and was first identified as the Roman *Danum* by William Camden in 1586. Initial Roman activity involved the construction of a fort around AD 70-71 to control a crossing point of the River Don. A *vicus* developed next to the fort and this continued when the fort was abandoned in the late 120s AD.

A second, slightly smaller, fort was built some 30 years later. The exact date of the rebuilding of the fort is uncertain but, as with forts at Brough-on-Noe in the Peak District, Burgwallis and rebuilding at Templeborough, this phase of activity may have been related to unrest amongst the Brigantes in the late 150s (Buckland 1986).

Roman Doncaster appears to have declined gradually and it seems likely that the civilian settlement continued in use after the departure of the military. Evidence for continuing occupation in the form of coins and pottery demonstrates activity through the late fourth and into the early fifth century (Buckland 1986).

The site on Waterdale is located to the south-east of Doncaster town centre outside the known extent of the Roman town; the nearest Roman finds that may provide evidence of settlement are from excavations on Wood Street and Hall Gate (Atkinson and Cumberpatch 1995), approximately 200m north-west of the site. The site also lies some 300m from the Roman road that ran along Hallgate and approached the fort from the south-east. The nearest identified Roman activity was a cremation burial recovered during the construction of Doncaster Magistrates Court during the 1960s (Buckland and Magilton 1986, 60); and a 2nd- to 3rd-century Roman cemetery discovered during the excavations to the rear of Hall Gate (Atkinson and Cumberpatch 1995).

Following the end of the Roman period, Doncaster declined and by the 7th century the town was controlled by the Northumbrian kings. Grants of Town and Market Charters in 1194, 1199, 1248, 1468 and 1505 demonstrate Doncaster's development and growth as a market centre over the medieval period (Buckland et al 1989a). Throughout this period, the site probably lay in fields outside the town.

Post-medieval maps show that during the 17th century the site was open agricultural land. In 1812, Beechfield House and its gardens were constructed on the north-east edge of the site and by the late 19th century the majority of the site lay within Glasgow Paddocks, an area used for horse training and trading with stabling and show rings. During the 20th century, the site was occupied by a bus station and, subsequently, a car park.

2 METHODOLOGY

2.1 Project Strategy and Scope of Works

The project was undertaken to a *Written Scheme of Investigation for Archaeological Works – Waterdale Doncaster* (WSI) that was produced by URS Scott Wilson (2010 Revision 4) and agreed with the South Yorkshire Archaeology Service. The WSI described the stages, aims and methodology for both the evaluation and excavation. Following initial discoveries, a *Further Archaeological Design - New Performance Venue* (FAD) was produced for part of the site by URS Scott Wilson (2011 Revision 2).

The WSI and FAD took account of the Standard and Guidance for Archaeological Field Evaluation (IfA 2008); the IfA Code of Conduct (IfA 2010) and other current and relevant best practice and standards guidance.

2.1.1 Phase 1: Evaluation

The evaluation involved the excavation of four trial trenches. Trenches 1 to 3 were located in the Waterdale car park and Trench 4 in the car park to the south. The trenches varied in size, Trenches 1 and 3 were 5m x 5m, Trench 2 was 2m x 10m and Trench 4 was 5m x 2m.

2.1.2 Phase 2: Mitigation

There were three elements to the mitigation works identified in the WSI:

Phase 2a: Strip and Map - The area identified for strip and map covered the area of proposed pavement construction where limited levels of disturbance to ground levels were expected.

Phase 2b: Strip, Map, and Sample - The area identified for strip, map and sample included areas where deeper construction groundworks were undertaken and included excavations for proposed tree pits, an attenuation tank, a water feature and a plant room.

Phase 2c: Watching Brief - The areas identified for archaeological watching brief included the route of a sewer diversion within the Waterdale car park and an attenuation tank and tree pits in the Horse Fair car park.

Additional elements of archaeological fieldwork identified in the FAD covered:

Phase 2d: Watching Brief - A targeted watching brief was undertaken on the removal of a redundant sewer pipe. The aim was to minimise disturbance to the surrounding area.

Phase 2e: Strip, Map and Sample - Strip, Map, and Sample was undertaken within the footprint area of the New Performance Venue (NPV) and its access roads, in areas which has not suffered previous ground truncation.

All areas subject to archaeological works were identified on plans included in the WSI and FAD (**Figures 12 and 13**).

2.2 Project Aims and objectives

The WSI identified the following archaeological aims for the project:

2.2.1 Phase 1: Evaluation

Evaluation was to be undertaken in those areas where no previous fieldwork had taken place. The objectives of the archaeological evaluation were:

- to identify the presence/absence of buried archaeological remains;
- to determine (where possible) the nature, depth, extent, character and date of any archaeological deposits or features encountered (as far as circumstances permitted);
- to determine the condition or state of preservation of any archaeological deposits or features encountered;

- to determine the likely range, quality and quantity of artefactual and environmental evidence present;
- to determine the significance of any archaeological remains present;
- to aid in the design of a suitable mitigation strategy as necessary.

2.2.2 Mitigation

Phase 2a: Strip and Map objectives were:

- to identify the presence/absence of buried archaeological remains within the identified area;
- to preserve by record the extent of any archaeological deposits or features encountered by mapping the identified archaeological remains;
- to preserve *in situ* any mapped archaeological remains beneath the pavement for the new Civic Square.

Phase 2b: Strip, Map, and Sample objectives were:

- to preserve by record archaeological remains (where these survived) that would be impacted by the proposed construction works in the specified areas of deeper excavation;
- to confirm and enhance the results of the previous archaeological evaluation;
- to determine whether there was any evidence for prehistoric settlement within the landscape, or if activity was limited to a residual presence in later features;
- to determine the extent and significance of Roman activity within the development area;
- to determine the impact of 'Romanisation' on the landscape, where evidence survived;
- to attempt a reconstruction of the history and use of the site, functions and activities.

Phase 2c: Watching Brief objectives were:

- to identify and record the presence/absence, nature, extent, and date of any archaeological remains during construction activities in those areas subject to the watching brief.

Additional project aims identified in the FAD related to the Watching Brief and additional Strip, Map and Sample.

Phase 2d: Targeted watching brief objectives were:

- to mitigate any impacts on archaeological remains that were disturbed during the controlled removal of the sewer pipe. The aim of the Targeted Watching Brief was to preserve by record any archaeological remains that were uncovered during the course of the works, or were visible within the existing sewer trench section.

Phase 2e: Strip, Map and Sample objectives were:

- to understand the extent and distribution of cremation burials and, where possible, to define the extent and boundaries of any associated cemetery;
- to elucidate the nature, character and function of the ditches identified within the evaluation trenches and any associated field systems or trackways;
- to capture evidence to contribute to our knowledge and understanding of the past.

2.3 Recording Methodology

The archaeological fieldwork was undertaken by ArcHeritage and monitored by URS Scott Wilson, who undertook regular site visits during the duration of the works. On-site progress meetings were

held between ArchHeritage and URS Scott Wilson during the course of the investigations and written progress reports were provided on request.

2.3.1 *Trial Trenching*

The trial trenches were located using a total station to an accuracy of $\pm 500\text{mm}$ and fixed in relation to nearby permanent structures and roads. The trenches were opened using a mechanical excavator fitted with a toothless ditching blade.

Machine excavation was undertaken under direct archaeological supervision, in level spits, until either the top of the first archaeological horizon or undisturbed natural deposits were encountered. The surface achieved through machine excavation was inspected for archaeological remains. The machined surface was cleaned by hand, where required, to enable the definition of archaeological remains. Following cleaning, all archaeological deposits and remains were planned to enable the selection of features and deposits for sample excavation.

Excavation by hand was undertaken to sample the full range of archaeological features identified according to the following sampling strategy. All features were investigated – discrete features were half-sectioned in the first instance; linear features were sampled for a minimum of 25% of their length (each sample section being not less than 1m). Deposits at junctions or interruptions in linear features were to be sufficiently excavated for the relationship between components to be established. Structures were sampled sufficiently to define the form, extent, character, date, stratigraphic complexity and depth of the feature and its associated deposits.

The complete stratigraphic sequence, down to naturally occurring deposits, was investigated and areas without archaeological features were recorded as sterile. The stratigraphy of all trenches was recorded, even where no archaeological deposits were identified.

2.3.2 *Strip and Map*

The area subject to strip and map was stripped using an appropriate mechanical excavator fitted with a toothless ditching bucket under direct archaeological supervision. This was undertaken in level spits, until either the top of the first archaeological horizon or the required construction level was reached. The surface achieved through machine excavation was inspected for archaeological remains. The machined surface was cleaned by hand, where required, to enable the definition of archaeological remains. Following cleaning, all archaeological deposits and remains were mapped, photographed, and described. All archaeological features were mapped using a total station to an accuracy of $\pm 50\text{mm}$.

2.3.3 *Strip Map Sample*

Following the strip and map stage, the strip, map and sample was undertaken in the areas previously defined in the WSI and in the area defined by the FAD. If no archaeological remains were identified within the areas identified from strip, map and sample, then archaeological works ceased in sterile areas. The areas for excavation were positioned using a total station to an accuracy of $\pm 100\text{mm}$.

In areas containing archaeological remains, features and deposits were hand excavated in an archaeologically controlled and stratigraphic manner in order to meet the aims and objectives of the investigation.

All archaeological features and deposits were investigated and recorded. Hand excavation was initially targeted to provide information on the form, function and date of the feature. Stratigraphic relationships between features were investigated and recorded.

Sampling strategies for specific feature types were as follows:

Linear features: A minimum sample of 25% along the length of ditches was excavated. Hand excavated segments were not less than 1m long and regularly spaced along the length of the

feature. The linear segments were located away from intersections with other features to recover unmixed assemblages of artefacts. In addition, intersections were investigated to identify relationships between linear features.

All pits were half-sectioned. Where good quality artefact/ecofact assemblages were recovered, or where understanding of the form and function of the pit was enhanced, additional excavation was undertaken in agreement with URS Scott Wilson and SYAS.

All post holes were half-sectioned. Additional excavation was undertaken where post holes were part of a clearly defined structure or where they contained post-packing or evidence of *in situ* burning.

2.3.4 *Watching Brief*

An archaeologist was present on site to monitor all excavation and/or soil disturbance during groundworks in areas subject to the watching brief. The archaeologist monitored the areas, where possible and practicable, and examined any available trench sections after excavation was completed. Where archaeological remains were identified, construction works ceased and the archaeologists were given sufficient time to excavate and record the remains as appropriate. Sterile areas were noted as such and their stratigraphic sequence recorded.

2.3.5 *Recording*

A full written, drawn and photographic record was made of all archaeological deposits and of archaeologically sterile areas. Hand-drawn plans and sections of features were produced at an appropriate scale (normally 1:20 for plans and 1:10 for sections). All plans and sections included spot heights relative to Ordnance Datum in metres, correct to two decimal places.

Colour transparency and monochrome negative photographs were taken at a minimum format of 35mm. Digital photography was used to supplement the archive. In addition to records of archaeological features, a number of general site photographs were taken prior to, during and after excavation.

Spoil heaps were searched for ferrous and non-ferrous metal artefacts using a metal detector capable of making this discrimination, operated by an experienced metal detector user.

2.3.5 *Artefact Recovery*

All artefacts were collected, stored and processed in accordance with standard methodologies and national guidelines. All non-modern artefacts were collected and retained. All 'significant' finds and artefact scatters were recorded three-dimensionally. Bulk finds were collected and recorded by context.

All artefacts were cleaned, labelled, stabilised, conserved and stored in accordance with the guidelines of the United Kingdom Institution of Conservators (UKIC). Artefacts were stored in appropriate materials and conditions, and monitored to minimise further deterioration.

2.3.6 *Environmental Sampling*

An environmental sampling programme was undertaken to strategy agreed with the project palaeo-environmentalist and the English Heritage Regional Science Advisor. A minimum sample size of 40 litres of deposit was collected from each individual context that was chosen for sampling, where the context allowed. All samples were taken from appropriately cleaned surfaces and placed in clean containers. Cremation and burial deposits were 100% sampled and fully processed.

2.3.7 *Human remains*

Human remains were discovered during the course of the excavations. The remains were initially covered, protected and left *in situ*. The removal of human remains complied with all current legislation, Environmental Health regulations and the Burial Act 1857.

3 ARCHAEOLOGICAL SEQUENCE

The site at Waterdale is located on fluviually reworked glacial sands and gravels, reworking was probably by glacial melt waters and by the River Don, although no specific palaeochannels were identified on site. These deposits varied considerably in the proportions of sand and gravel (**Plate 1**) and the original site topography appears to have been uneven and undulating. The excavations identified a depression in the east corner of the site that, over time, filled with an orange-brown silty sand hill wash or colluvium. Although apparently homogeneous, this deposit showed some variation. Archaeological features on the site, notably the Roman features, were located throughout the colluvial sequence demonstrating that formation processes leading to the deposition of the colluvium were active during the Roman period. The colluvial deposits and earlier sands and gravels were truncated by later post-medieval activity, including gravel pits and the construction of the bus station and car park.



Plate 1: View of sondage showing sands at the base of the sequence with mixed deposits above

The Roman archaeological deposits were predominantly located within, or close to, the area of hillwash. It is possible that the Roman cremation cemetery was originally larger and that the post-medieval truncation of the higher sands and gravels to the west and north removed further Roman deposits.

Eight main phases of activity were identified on the site (**Figure 2**). These ranged from later prehistory through to the twentieth century. The divisions between the phases being based on changes in function or identified dates. Roman remains have been divided into three phases. A number of Roman features that could not be dated to a specific phase have been assigned to the Roman period in general. Further features were undated and these will be discussed where evidence suggests that they may relate to a specific phase. Specialist reports on the human remains and artefacts recovered from the excavations are provided in Appendices 3 to 18. Specific plans and features are provided to illustrate the description and discussion in **Figures 2 - 9**. A plan showing the

location of all the sections on site, **Figure 14**, and sections of all the prehistoric, Roman and medieval features and examples of undated and post-medieval features are provided in **Figures 15 -18**.

3.1 Phase 1 - Prehistoric

There was little evidence for prehistoric activity on the site, but one possible prehistoric pit 6281 was identified (**Figure 2**). This contained a broken, probably Neolithic, flint bladelet and a single sherd of slightly abraded Iron Age pottery. These finds could be residual, and two further residual flints were recovered from Roman pit fills, but the absence of any Roman material in pit 6281 and its stratigraphic relationship to Roman pit 6279, which cut it, suggests 6281 was probably Iron Age in date. The nature of any prehistoric activity associated with this single dated pit is unknown.

3.2 Phase 2 – Early Roman (1st to mid-2nd century AD)

The earliest and most substantial phase of Roman activity was a cremation burial cemetery which contained the interred remains of a number of cremations (Caffell and Holst, Appendix 3). This covered an area of approximately 25m by 15m and comprised three groups of cremation burials, single cremation burials, a probable funeral pyre and possible sub-divisions within the cemetery (**Figure 3**). Finds recovered indicate a date in the late first and early second century AD, possibly extending into the mid-second century AD.

Two of the groups of cremation burials, A and B, were of similar size, each containing eight cremation deposits, while the third, cremation Group C, consisted of only two burials. All three groups were located towards the east side of the cemetery, Group A at the north and Groups B and C at the south. The groups consisted of several intercutting pits containing cremated bone, pyre debris and offerings. In both cremation Group A, 6246, and Group B, 6331, late first to early second century AD rusticated greyware jars (Leary, Appendix 4) had been used as funerary urns (**Figures 4 and 5**). In both cases, the urns were unburnt and occurred late within each group's sequence.



Plate 2: Cremation Group A burnt wood and oil lamps in section

Cremation Group A was surrounded by numerous other Roman features and contained both exotic and expensive burnt food offerings, pine nut, walnut, fig, grapes, lentils, a possible date fragment and cereals (Miller et al., Appendix 18), and artefacts including five ceramic oil lamps of a late 1st- or 2nd-century date (**Plate 2**) (Griffiths, Appendix 7). Potentially enclosing and south of Group A was a gully (6352 and 6216), this comprised two sides of a potentially square or rectangular feature. The south eastern side was 5m in length and this joined to the truncated south-west side, which survived for a length of approximately 1.7m. The truncation of the south-west side related to a later inhumation burial that had cut through this area (**Figure 6 and 7**). The south-eastern side of the feature, V-shaped in section and 0.25m deep, had been cut through by several later pits. The fill of the gully contained pottery of early to mid-second century date, which was broadly contemporary with that recovered from the cremation deposits (Leary, Appendix 4). As only two sections of gully were identified it is uncertain if it formed a continuous boundary around cremation Group A, however, the dating evidence does show the gully appears to be contemporary with the cremations and was probably related to them in some way.

Cremation Group B was located to the south of Group A and away from the main concentration of Roman features, although it was near to the possible pyre site and cremation Group C. The date for the rusticated greyware urn recovered from Group B (**Plate 3**) indicates that this is contemporary with cremation Group A (Leary, Appendix 4). The fill in Group B contained a more limited range of artefacts and burnt food offerings, rare cereals and occasional seeds of lentils and/or vetch, compared to Group A (Miller et al., Appendix 18).



Plate 3: Cremation Group B pre-excavation with the top of the geryware jar urn exposed

All of the intercutting cremation deposits within Groups A and B dated to the late first to early second century AD, suggesting that the focused use of these two locations was deliberate. Material recovered from the excavation of Groups A and B provides no evidence to indicate why the cremations were buried in groups. It is possible that the groups were related, perhaps through familial or other associations, such as by military unit. DNA that could potentially be used to investigate potential familial relationships has been recovered from cremated archaeological bone (Brown *et al* 2005), but DNA does not survive high temperatures, cut-off temperatures between 300

°C to 800 °C are reported for its survival (Uberlaker and Rife 2007). Melted glass from cremation deposits at Waterdale suggests that temperatures exceeded 1000 to 1100 °C (Cool, Appendix 8), suggesting DNA extraction is not possible. The intercutting nature of the deposits in Groups A and B suggest the probability of contamination between deposits further limiting the potential for analysis of the cremated remains. Offerings of food and objects included within the fills suggest that there were differences in access to costly and imported goods, and presumably the wealth and status, of individuals in Groups A and B.

In contrast to cremation Groups A and B, Group C contained only two intercutting pits containing limited burnt bone but numerous large fragments of partially burnt and broken amphorae that may have been used to cover the burials (**Plate 4**). The amphorae thus appear to have been used differently than the cremation urns in groups A and B. The amphorae, predominately Dressel 20, provide a date range of mid-first to third century AD for Group C (Leary, Appendix 4), but the remains of melted glass unguentaria from the fills, suggest a first- to second-century AD date (Cool, Appendix 8). The fills of Group C also contained 'exotic' foodstuffs hazelnuts, possible pine nuts, figs, dates, grapes, apple and lentils (Miller et al., Appendix 18). Artefacts included large numbers of iron nails in these two burials, totalling 42% of all the nails from the cremations; these possibly originated from biers, coffins or objects placed on the funeral pyre swept up with the pyre debris (Rogers, Appendix 9). Group C therefore appears to have similar access to costly and imported goods to Group A while the evidence of the nails and amphorae may demonstrate different funerary practices were performed at Group C compared to Groups A and B; this will be discussed further below.



Plate 4: Deposit of amphorae sherds in Burial Group C

In addition to the three cremation groups, ten single cremation burials (**Figure 3**) were also identified. These were primarily located to the north-west of the grouped cremations and were varied both in the material culture and in the carbonised botanical remains that were recovered from them.

Cremation burial 6056 (**Figure 6**) produced a complete urn (**Plate 5**), again dating to the late first to mid-second century AD, but no offerings. A second, almost complete, heavily fractured whiteware flagon was excavated standing upright in a shallow pit 6358. The vessel, probably mid-second century in date, did not contain cremated material and may be a cenotaph deposit (Leary, Appendix

4). Cenotaphs could be used where the individual was buried elsewhere, to enable funerary rituals to be undertaken by friends or family at home (McKinley 2000b).



Plate 5: Cremation urn 6057 from grave 6056

A number of unurned cremations were also recovered. Cremation 6126 contained significant plant macro-fossils, including the remains of grapes, walnuts and figs. Pit 6139, which contained substantial quantities of white ware/Gallic amphora that exhibited signs of burning, cut through cremation pit 6126. Pit 6139 contained no human remains, with only burnt pottery, probably used during a funerary ritual and subsequently interred or disposed of ritually, being present.

Other un-urned cremations included 6293, which contained a substantial amount of cremated bone together with charred plant remains, including oak and alder, and scraps of grey ware pottery. Cremation burial 6130 produced cremated bone accompanied by remnant pyre fuel probably oak. Cremation burial 6393 contained both cremated and un-cremated bone (Caffell and Holst, Appendix 3), with the latter probably being intrusive from 6337, an inhumation burial that cut 6393; the boundary between these features being very difficult to define.

In addition to pottery and carbonised plant macrofossils, nails and hob nails were recovered from cremations and burials across the site. In total, 141 nails, 755 nail fragments and 172 hob nails were recovered (Rodgers, Appendix 9). Fragments of melted glass, probably the remains of unguentaria placed on the pyre, were recovered from a number of cremation burials and pyre debris deposits (Cool, Appendix 8).

One pit 6392, at the south-west edge of the site, contained sherds of Dressel 20 oil amphora, Gallic amphora, white ware and black burnished ware; burning on some of the sherds suggests this material related to cremation activity. The material, probably of mid-second century date, is late in the cremation cemetery phase (Leary, Appendix 4).

The final feature dated to the early Roman cremation phase was the potential funeral pyre 6432. This consisted of a rough oval measuring 4m by 2.5m, where the natural sands and gravels had been strongly heat affected. A number of sherds of grey ware and grog-tempered pottery recovered from this area date to the late first to early second century AD (Leary, Appendix 4). The pyre location appears to have been situated in an open space and the nearest Roman feature was cremation Group B, which was approximately 1.75m south-east of the edge of burning. An arc of undated probable post holes (6424, 6159, 6207, 6210, 6149, 6214, 6184, 6212, 6243 and 6241) located to the west of the pyre may relate to it. These formed a potential division between the pyre area and the majority of the cemetery, with the exception of cremations in Groups B and C located east and south of the pyre (**Figure 3**). The arc, centred on the pyre at a diameter of 7.4m, may originally have been part of a circle although, if so, it would cut across cremation Group C. The post holes were irregularly spaced and in one case intercut suggesting that if these post holes formed an alignment, it was subject to repair over time. Although undated it is possible these posts holes define a former internal subdivision, or screen, within the cemetery that separated off the area around the pyre.

3.3 Phase 3 – Mid-Roman (2nd to 3rd century AD)

The mid Roman Period phase 3 saw the sites continued use as a cemetery, with a change to inhumation rather than cremation burial (**Figure 6**). Two inhumation burials were identified on the site, both at the northern edge of the cemetery, together with a pit from this phase. Both burials were poorly preserved, with the skeletons being less than 15% complete (Caffell and Holst, Appendix 3).



Plate 6: General view looking east of inhumation (6400)

Grave cut (6400) (**Plate 6**) contained very fragmentary human remains 6401 (**Plate 7**) (Caffell and Holst, Appendix 3) and may have been disturbed during antiquity. This grave, aligned north-west to south-east was sub-rectangular in plan approximately 2m long and 0.8m wide. Fragmentary pottery recovered from the fill, included grey ware, mortaria, Nene Valley colour coated ware, and amphora

dating from the late first through to the third century AD (Leary, Appendix 4). A coin recovered from the fill of this grave dates to AD 268-269 (Barclay, Appendix 10), placing the grave at the end of the date range indicated by the pottery.



Plate 7: Detail of inhumation 6400 showing remains of human skull.

A second grave 6379, containing skeleton 6339, was located just south of 6400. The bones from this burial, which were disturbed and fragmentary, came from an older adolescent (Caffell and Holst, Appendix 3). This grave was also aligned north-west to south-east and poorly defined due to intercutting with other features. Grave 6379 cut through the phase 2 cremation (6393) and was itself cut by the phase 4 gully 6337. The grave was also approximately on the extrapolated line of the truncated phase 2 gully 6216, associated with cremation Group A.

A third feature 6422 close to the two inhumation burials may have been from phase 3. This feature produced grey ware and black burnished ware pottery indicating a mid-second century date (Leary, Appendix 4). While feature 6422 could therefore belong to phase 2 or phase 3, its sub-rectangular form is more like the grave cuts of phase 3, if somewhat smaller at 1.1m long and 0.6m wide. No human remains were recovered from 6422 and its function must therefore remain speculative.

3.4 Phase 4 – Late Roman

A single Roman feature, gully 6337, post-dates the inhumation burials in phase 3 (**Figure 7**). The finds from this feature are somewhat mixed including human bone and cremated bone, this is due to the gully cutting through phase 3 burial 6379, and phase 2 cremation burial 6393 and potentially gully 6216. As gully 6337 cuts the inhumation burial it is probably not related to the inhumation burials in phase 3. The limited extent of the phase 4 remains makes it impossible to determine the function of this gully or if it was related to continuing funerary activities on the site.

3.5 Phase 5 – Medieval

There was limited evidence for medieval activity on the site, a number of sherds of medieval pottery were recovered but these were primarily residual pieces in later deposits. Only two post holes, 6264 and 6270, (**Figure 8**) could be dated to the medieval period based on the finds within them, although only three sherds, one 12th century and two 15th century, were recovered between these two post holes (K. Weston, Appendix 13). These post holes were at either end of an L-shaped arrangement of seven post holes. Of the other five post holes four were undated (6262, 6285, 6291 and 6283) and

one produced a small sherd of Roman pottery. This arrangement of postholes therefore appears most likely to be late Medieval in date. The location of the site outside the medieval town and the absence of any other medieval features or surfaces suggests it is likely that this arrangement of posts was probably from features in the fields that surrounded the medieval town, possibly a fence line.

3.6 Phase 6 – Post-medieval gravel pits

In the early post-medieval period a number of small sand and gravel pits were excavated on the site. These were primarily on the northern and western sides of the site with the most extensive working on the Waterdale frontage. Some of the pits appear to have been used over a period of time as there were several cuts and fills associated with them. There were three main pits 6081, 6102 and 6106. The fills from these pits included finds, primarily ceramics, with the most interest relating to gravel pit 6081 as the fills from this pit contained significant quantities of Roman pottery in addition to that of medieval and post-medieval date. This pit was located near the centre of the site just north west of the main complex of cemetery features and the Roman pottery recovered from this pit suggests that the cemetery may once have extended further into this area.

3.7 Phase 7 – The 19th and early 20th centuries

Phase 7 covers the 19th and early twentieth centuries a period when the site was still largely open, and when the first known structures were being built upon it. From the early 19th century the site, then known as Glasgow Paddocks, was used for horse training and trading, documentary evidence shows that stable blocks were located on the site. No deposits or structures related to this activity were identified but a number of finds, such as horse shoes, which may have dated to this period, were recovered as residual material on the site.

During the First World War the area was used by the military on several occasions and series of interconnecting linear features were identified as practice trenches (**Figure 8**). Sections excavated through these trenches confirmed their date and investigated their construction (**Figure 9**). The trenches originally had vertical sides supported by timber revetting; with time, this had decayed and collapsed, particularly the upper parts, and had left ditches with vertical lower sides and sloping upper sides (**Plate 8, Figure 9**).

The practice trenches were laid out in parallel lines to form two connected rectangles. The form and function of these trenches was interpreted in light of the available documentary evidence (General Staff War Office, 1914). The profile of the north-west/south-east aligned trenches was found to bear a form very similar to that of ‘communication trenches’, with a trench aligned north-east/south-west likely to have been a ‘front line firing trench’. A section excavated through the potential ‘front line’ trench identified a modern service had removed any trace of a potential ‘firing step’. The backfills of the trenches contained residual fragments of eighteenth- and nineteenth-century pottery and clay pipe stems. Research in the archives of the Glasgow Paddocks Sub-Committee of the Race Committee of Doncaster Town Council identified that the Paddocks were used by a number of military units during the war, including the Territorial Army, the 2/1st West Riding Division, the 3/5th King’s Own Yorkshire Light Infantry and the 62nd West Riding Division. A number of other units trained in Doncaster at times during the war but it is not known if any of these used Glasgow Paddocks. The archives contain a reference to a request in July 1915 from the Officer Commanding the King’s Own Yorkshire Light Infantry for permission to dig practice trenches in the Paddocks but this was not granted. There are no other references in the Committee minutes to trenches at Glasgow Paddocks, although there are records of practice trenches being excavated on other sites in Doncaster. It is therefore not possible to determine exactly when the trenches were dug or by which unit.



Plate 8: East-facing section of early 20th-century military training trench 6004

One other feature that probably dates from this phase was a large linear feature 6119, orientated approximately east-west, the west end of which terminated with a large sub-pentagonal pit 6120, approximately 3.2m across. This feature located close to the northeast edge of the site was in the area formerly occupied by the rear garden of Beechfield House. The fill of the linear and pit was rubble debris of early to mid-20th-century date and this feature was probably a former garden feature that had been filled in during phase 8.

3.8 Phase 8 – Modern (post 1918)

Post the 1st World War a bus station and car park occupied the site through most of the twentieth century. The construction of the bus station and car park appear to have been associated with ground works including stripping of topsoil, and levelling of the site with the higher ground to the north and west having been truncated, with the ground works cutting down into the sands and gravels. There were also a number of service trenches and other features, such as bollard foundation holes and manholes identified relating to this phase.

4 DISCUSSION

Davies, Caffell, Holst, Leary, Cool, Griffiths, Rogers and Miller

Roman cemeteries were located outside urban areas and were frequently situated adjacent to roads leading into towns. The location of the Waterdale Roman cremation, and later inhumation, cemetery outside the Roman town at Doncaster is therefore typical of this period. Based on the artefacts - pottery, ceramic oil lamps and glass - recovered from the cremation burials, the cremation cemetery dates to the late first and early second century AD, contemporary with the first Roman fort at Doncaster, which dated to approximately AD 70 to 120. The later inhumation burials are less securely dated but are probably from the late third century; this fits with the shift in Roman funeral practices from cremation to inhumation burial which took place during the second century AD (Hope 1999).

Although relatively small, the cremation cemetery has produced a number of features, including a pyre, groups of burials, internal subdivisions and finds that enable an interpretation to be made of the funerary practices at Waterdale. The groups of burials include two large intercutting complexes of cremation burials, Groups A and B, a small group of two cremation burials, group C, and several single cremation burials. A pyre location is suggested by an area of burning identified through the effect of heating on the underlying deposits. The presence of only one identifiable pyre location in the cremation cemetery suggests that this pyre was probably used more than once. This interpretation is supported by the absence of burials in its immediate vicinity, which suggests that the area around the pyre was kept clear. The possible, although unfortunately undated, fence line that curved around the pyre to the west also suggests this may have been a permanent or long term feature within the cemetery. It is uncertain if the fence was originally continuous, circling the pyre location, but as this would have overlapped with cremation burials to the south-west it appears unlikely. The fence could have delineated an area within the cemetery for the pyre or, more prosaically, it could have formed a wind break.

Remains of pyre debris were recovered from a number of cremation deposits that have permitted aspects of the cremation process to be identified. The analysis of wood charcoal identified that oak (*Quercus*), an expensive wood was the preferred fuel for the pyre. Oak's properties, burning at a high temperature for a long period (Tylecote 1962), made it a desired fuel for cremations throughout antiquity (Dickson & Dickson 2000; Deforce and Haneca 2012). The remains of carbonised bark recovered from cremation fills, demonstrates that the oak was undressed and presumably cut as pyre fuel, rather than being reused timbers. One cremation deposit in Cremation Group B was dominated by alder (*Alnus*) charcoal. Alder is an alternative fuel for cremations and industrial processes with similar properties to oak (Tylecote 1962; Dickson & Dickson 2000; Edlin 1973; Deforce and Haneca 2012) and it has been associated with pyres in later prehistory as oak became scarce (McGregor & Lelong 2008). In this case the use of alder is possibly related to the status of the burial, which also lacks the abundant food remains seen in Group A. The pollen record for the area shows that both oak and alder declined over the Roman period (Nelson 1976) as they were extensively used.

The cremation burials produced a range of artefacts including some that appeared to have been placed on the funeral pyre before being swept up with the debris. Iron nails, often fragmented through the effect of heat, are likely to have been incorporated through funerary practices (Alfayé 2009). These could have been incorporated with funerary furniture, coffins, funeral biers and wooden boxes, or from old timbers used as pyre fuel (McWhirr *et al* 1982), although as noted bark in the pyre debris suggests that the pyre fuel comprised new rather than reused timbers at Waterdale. Hobnails were recovered from cremation deposits. These were found in small numbers suggesting they did not represent complete shoes, added post cremation (Barber and Bowsher 2000), but shoes that burned on the pyre with the hobnails only partially recovered for internment. Shoes could have been either worn by the body or placed on the pyre as an offering.

The presence of glass unguentaria and oil and wine amphorae suggests the use and importance of oils and perfumes to the funeral ritual. The unguentaria were common but almost all had been melted, with the temperatures required to achieve this demonstrating that they were probably placed on the pyres as part of the funeral practice (Cool, 2004). Amphorae are not usually associated with cemeteries in northern Britain (Evans 2004), but were common at Waterdale and a number of them are burnt suggesting use in the funerary ritual. The oil in the amphorae could have been used for anointing the body or as an accelerant (Cool 2004). The wine amphorae, such as those found in Cremation Groups B and C, could have been associated with burial meals and libations poured out on the pyre. In the case of the Amphorae in Burial Group C they may have been used to protect burials as was suggested for some amphorae at the Eastern Cemetery in London (Barber and Bowsher 2000). The ceramic oil lamps recovered from cremation Group A were probably also related to funerary rituals. Such lamps are not particularly common in Britain, compared to the continent, and where found they have previously been associated with temples, sanctuaries and burials (Eckardt 2002; Bird 2011). Burning and scorching on some of the flagon sherds suggests these too may have been involved in the funerary ritual, possibly as pyre goods. The variations in the character of the deposits and finds between Groups A, B and C suggest variations in funerary practices.

Remnants of carbonised food were found within many of the cremation burials. These are undoubtedly the residue of votive food offerings for the dead. The preservation of many of these relatively fragile remains indicates that they were burnt separately, possibly on an altar, and then added to the cremation during burial (Miller *et al.* 2012). The food offerings included a wide range of exotic imported foods from the Mediterranean including olive (*Olea europaea*), fig (*Ficus carica*), grape (*Vitis vinifera*), pine nut (*Pinus pinea*), lentil (*Lens culinaris*) and dates (*Phoenix dactylifera*). These foods demonstrate the status and wealth of at least some of the individuals buried at Waterdale as the import of such foods would have made them expensive commodities. These imported foods remain primarily associated with major towns and military sites such as Lincoln, York, Leicester and London during the Roman period (eg Davis & de Moulins 2000; Hall & Kenward 1990; Schultze-Motel 1994; Kroll 1995; 1998; Reynolds 1996; van der Veen *et al.* 2008; Wilcox 1977) and in some cases, such as the dates, are extremely rare, with only two other Roman period records within Britain (Murphy 1984; Giorgi 2000). These foods also demonstrate that the individuals in the cemetery were identifying with a Roman style of death and therefore probably life. Similar offerings of food are found across the continent (Priess *et al.* 2005; Cooremans 2008; Matterné & Derreumaux 2008) and the similarities between the samples from Waterdale and the continent emphasises the identification with the empire and its rituals. The variation identified in the type and number of grave goods and food offerings associated with the cremation burials site suggests variation in the socioeconomic status of different individual and between cremation groups, Cremation Groups A and C contained more prestigious and costly offerings compared to Cremation Group B which appeared somewhat less affluent. The early, rich burials at Doncaster and the close adherence to Roman ritual practices suggest that these burials related to the incoming Roman community in Doncaster, possibly elements of the military.

The interned cremations show a range of practices with some contained in urns, and one possibly protected by amphorae. Others are likely to have been buried in wooden or cloth containers that have now decayed. The presence of groups of cremation burials suggests some allegiance to a group within society, but the condition and disturbed nature of the bone remains makes further analysis of the individuals within these groups unviable. The limited time frame for the burial of these groups and the intercutting nature of the burials indicate that this is likely to have been a deliberate act of association for these burials. These could be family groups or if the burials are of military personnel could relate to units or associations within the garrison. There are some differences between the groups that suggest variations in status. Group A was separated off from the rest of the cemetery by a gully and included a rich range of votive food offerings and the ceramic oil lamps. Group B lacked the enclosing gully and was more limited in the range and quality of exotic food offerings; they also

included a cheaper pyre fuel in Alder, suggesting these cremations may be of lower status. Group C is smaller in number, with only two deposits, but includes large quantities of lentils and appears to have been protected by amphorae sherds deposited over the feature.

The funerary practices and rituals associated with the later inhumation burials are less easily understood. This is primarily due to the limited number of burials, poor preservation of bone and the disturbed nature of one of the burials. The shapes of the grave cuts, which were both on the same alignment, suggest that the bodies were laid out, but little more can be identified. Even the limited material culture associated with the burials is problematic as at least one inhumation includes earlier material from a cremation burial that had been cut through by the grave.

Although the cremation practices identified at Waterdale follow many of the features seen across the Roman Empire there are differences with practices seen at other sites in the local region such as Derby and Wall (Birss 1985 and Leary 2008). These differences are seen primarily as aspects of the material culture. Amphorae were common at Waterdale but were not at either Derby or Wall. Both Derby and Wall included flagons and small jars among the burial goods, and there were also significant quantities of samian and colour coated wares at Derby that were burnt, suggesting their use as pyre goods. At Waterdale such imported fine ware were unburnt and very limited in number and form. Drinking was an important part of the funerary ritual as evidenced by the wine amphorae, but the absence of small jars, used as drinking vessels, from the Waterdale assemblage suggests that other materials were used to consume wine or alternatively drinking jars were removed from site following the funeral.

The location of the cemetery at Waterdale appears to have been outside the town, as is typical in Roman towns and it was in fact against the law to bury within towns (Henig 1984). Waterdale follows the pattern seen across Roman Britain with cremation burials in the early Romano-British period and inhumation burials later. Inhumation burials became common from late second or third centuries AD. It has been suggested (Macdonald 1977) that this may relate to the growth in mystery cults such as Mithraism or Christianity but there is no evidence at Waterdale for either of these religions.

The only recent excavations in Doncaster that have produced comparable material are the excavations at Hallgate and Wood Street (Atkinson and Cumberpatch 1995). On Hallgate, these recovered the remains of a cemetery with both cremation burials and inhumations and a possible pyre location. The excavations at Wood Street identified two Roman ditches but the excavators were not able to determine whether these related to settlement, agriculture or were part of the cemetery. They could have been part of a boundary around the cemetery which is common for Roman cemeteries (Cleary 2000). No boundary was identified for the cemetery at Waterdale, although the evidence of a cremation found under the law court in 1967 suggests that the Waterdale cemetery may have extended beyond the site, to the south. The potential square gully around cremation Group A is similar to enclosures that were found at King Harry Lane cemetery in London (Niblett 2000).

The deposits related to cremations can be compared to the study by Weeks (2008) of Romano-British cremation funerals. This is informative, as several of the stages and types of deposits he identified were present at Waterdale. The possible pyre location would appear to be *ustrina*, built on the ground, rather than *bustr*, which had a pit below and was usually associated with a single act of cremation. The pyre location at Waterdale could therefore have been used for a number of different cremations. Waterdale also contained urned and unurned cremation burials, pyre debris and possibly a cenotaph deposit. There was, however, no evidence of the pyre spread deposits that were identified by McKinley (2000b). Due to the truncated nature of the features at Waterdale, it is difficult to be sure how representative the quantities of cremated material recovered are to what was originally buried, but the small quantities of bone recovered from many of the cremation burials may suggest that some were token deposits, such as those that Weeks and McKinley have discussed.

A number of the grave goods recovered from the excavations provide evidence for elements of the funerary ritual. For example, the unguentaria and oil amphorae would have contained perfumes and oil that could have been used to anoint the bodies. The wine from wine amphorae could have been drunk and used for libations made at the time of burial (Hennig 1984).

The range of grave goods and votive food offerings found within the burials suggest that the status of the individuals buried at Waterdale varied. Pearce's (2000) criticism of the problems with identifying the social status of individuals and ethnicity of burials is well founded but the presence of a range of evidence, including the evidence of Roman rituals, exotic imported foodstuffs, Roman grave goods and potential subdivisions in the cemetery, all suggest that there was variation in the cremation burials at Waterdale and that there was a conscious attempt to follow Roman practices.

5 CONCLUSIONS

The archaeological investigations undertaken at Waterdale, Doncaster, enabled the successful identification, characterisation, excavation, recording and analysis of the archaeological remains on the site, in line with the project aims.

The archaeological remains consisted of negative features dating from the prehistoric to the post-medieval period with the most extensive and significant remains relating to a multi-phase Roman cemetery and the construction of First World War practice trenches. Eight phases of activity were identified.

Prehistoric activity was limited to a single probable late prehistoric pit that could not be related to any specific function or activity.

Three phases of Roman activity were identified. The first two related to a Roman cemetery, initially for cremations and later for inhumations. The cremation cemetery included group and individual cremation burials, a probable pyre location and possible sub-divisions within the cemetery. The artefactual and environmental remains from the cremation burials identified that the cemetery was early (late 1st to early 2nd century AD). Analysis of the material recovered identified that the funerary practices were typically Roman, incorporating food offerings and grave goods imported from as far afield as the Mediterranean. Variations in the quality and quantity of offerings indicated that the burials included persons of varying social status or with varying access to exotic imported grave goods and offerings. The grouping of some cremation burials appeared deliberate but it was not possible to identify why these were grouped or what relationships there may have been between the individuals involved. The relatively high status and early date of these cremations suggests that they related to the first Roman fort at Doncaster and may have included military personnel. The two later (late 2nd or 3rd century AD) inhumation burials were less well-preserved and detailed analysis was not possible as to the funerary practices or the status of the individuals interned. The final Roman phase consisted of a linear feature that cut through features from the earlier phases but its purpose and whether it was related to the cemetery could not be determined.

Medieval remains were very limited, although the site would have stood outside the medieval town as it did the Roman town. An L-shaped arrangement of post holes, probably from a fence, was possibly medieval in date.

Three post-medieval phases were identified. The first post-medieval phase related to gravel extraction, with several small gravel pits identified. The second phase related to the excavation of practice trenches during the First World War. These features were constructed as per the *General Staff War Office Manual of Field Engineering* (1914). As several units used the area for training during the First World War, it was not possible to determine who had dug the practice trenches. The final phase of post-medieval features related to the bus station and car park that occupied the site throughout the majority of the 20th century.

The archaeological fieldwork at Waterdale has also demonstrated that despite extensive modern development during the 20th century. There remains the potential for archaeological deposits to survive within Doncaster's core, of varying degrees of preservation, that can significantly contribute to our understanding of earlier periods of occupation.

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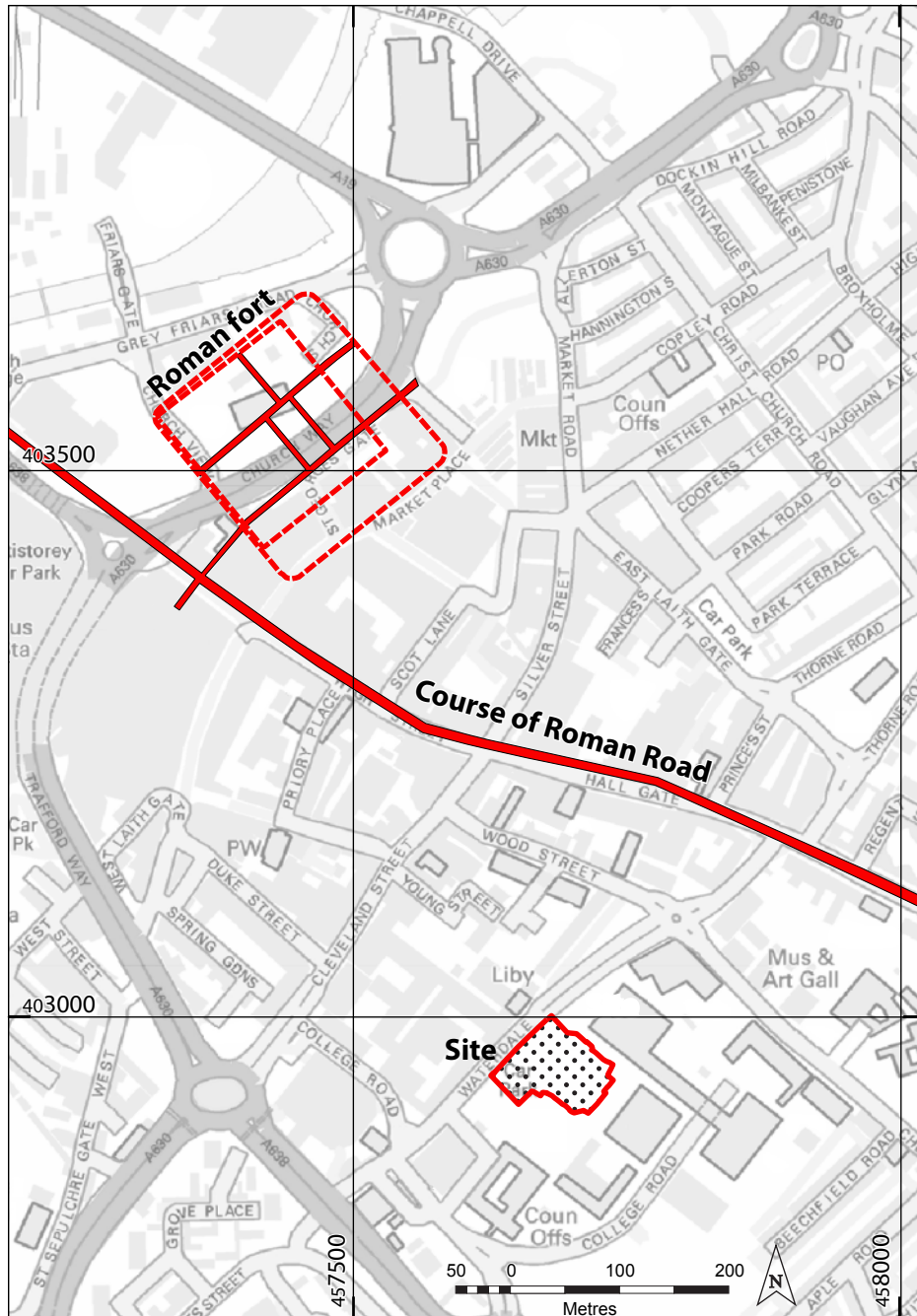
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7 ACKNOWLEDGEMENTS

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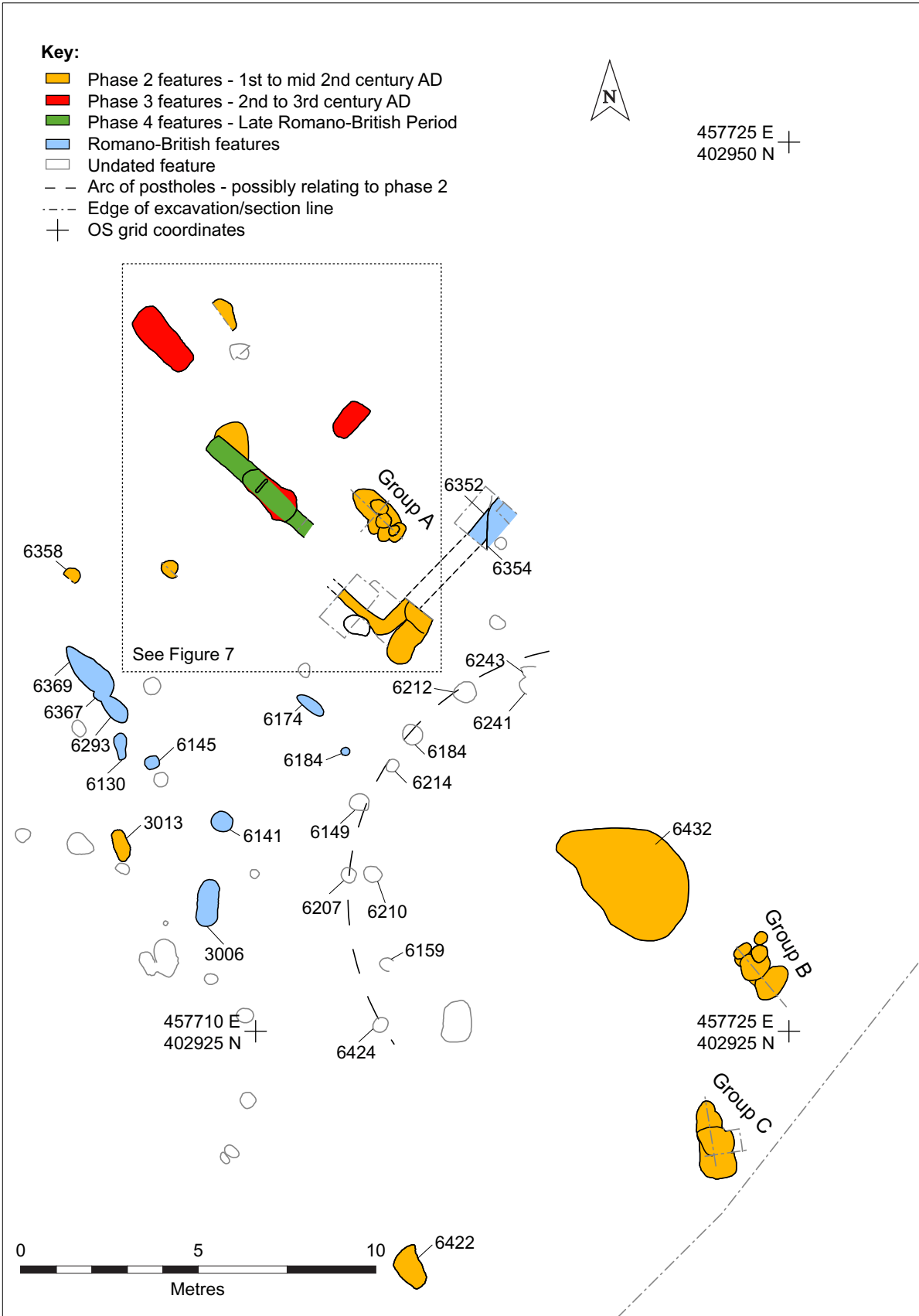
8 FIGURES

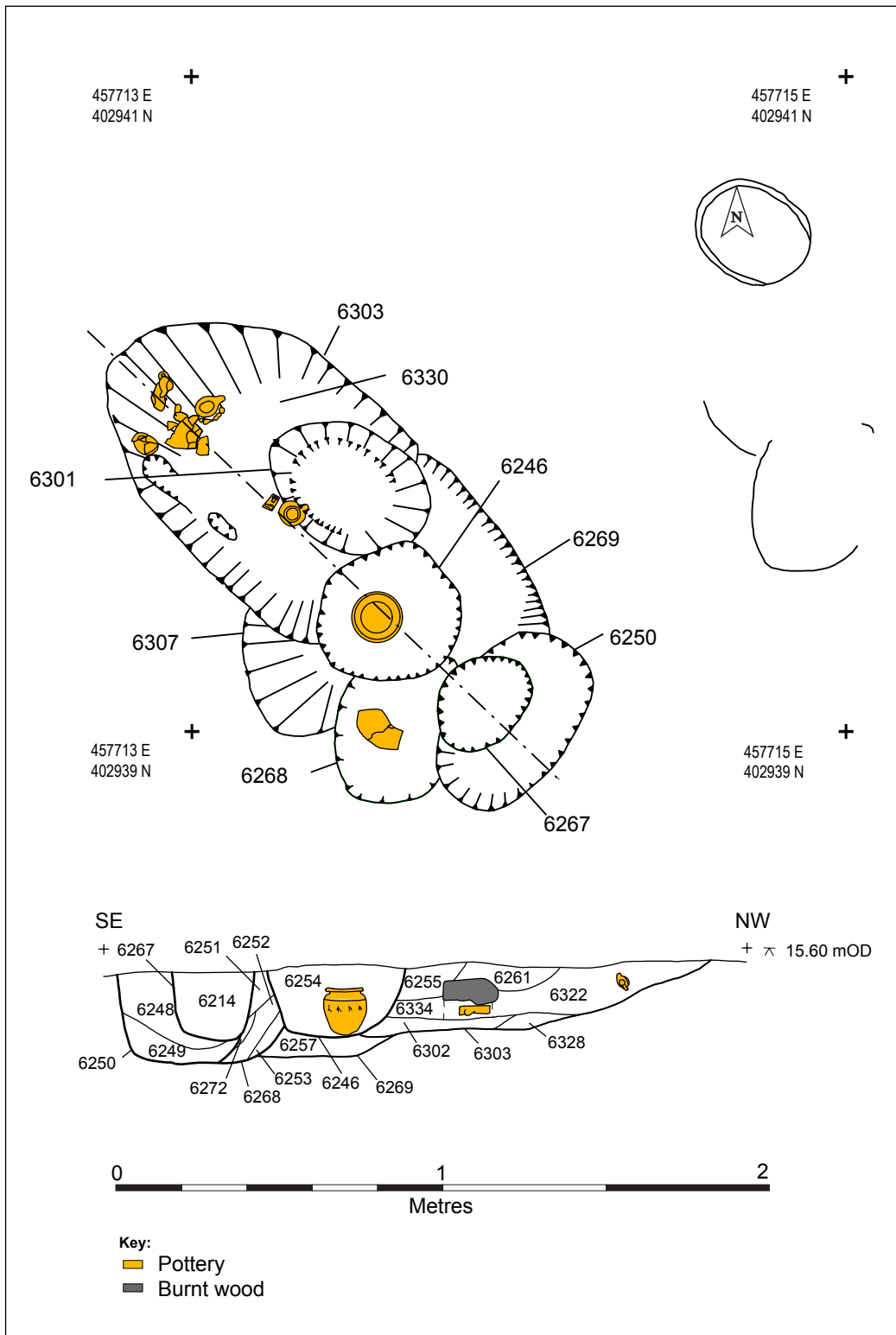


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Figure 2: General site layout showing phasing





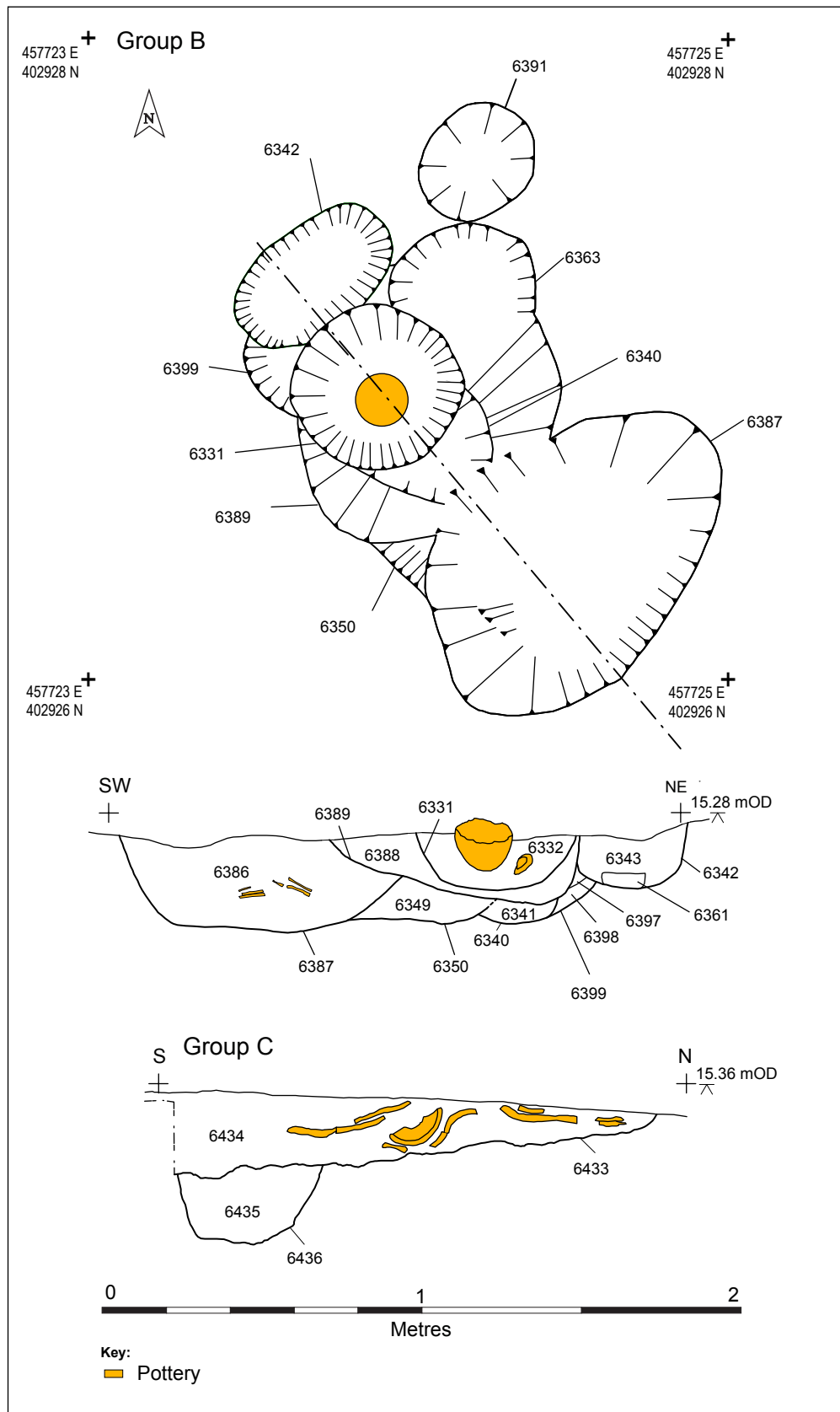


Figure 5: Groups B and C plan and sections

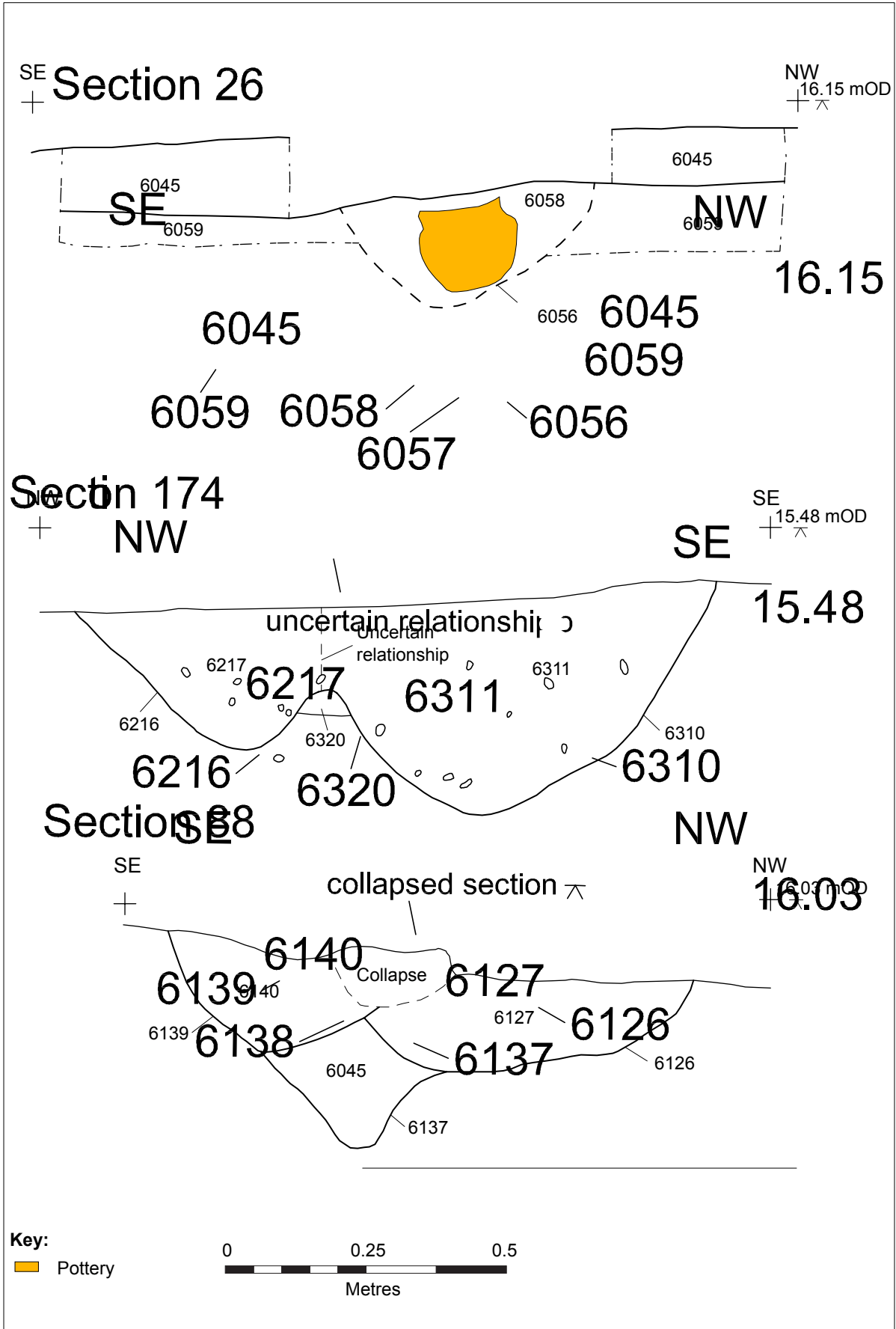
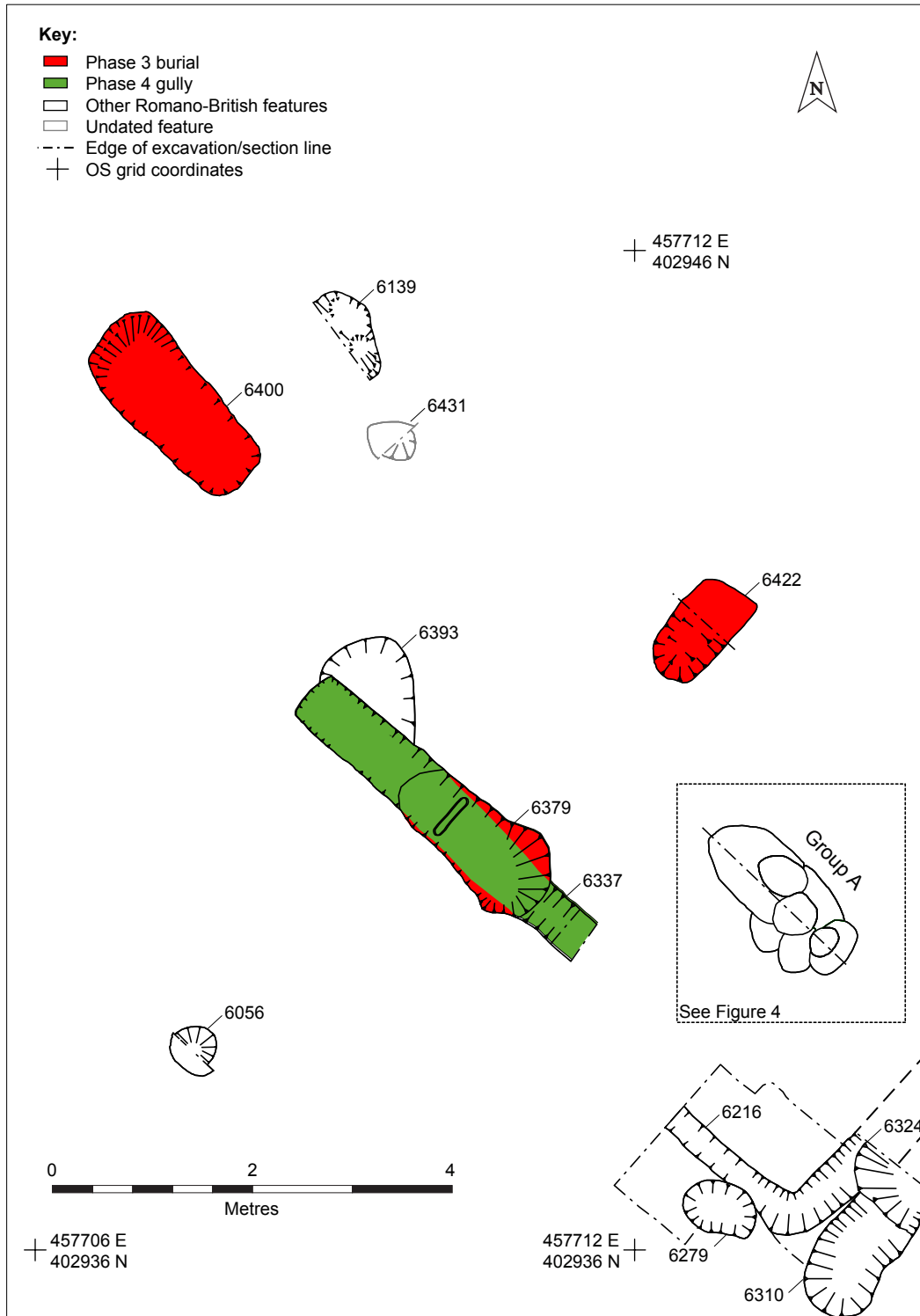
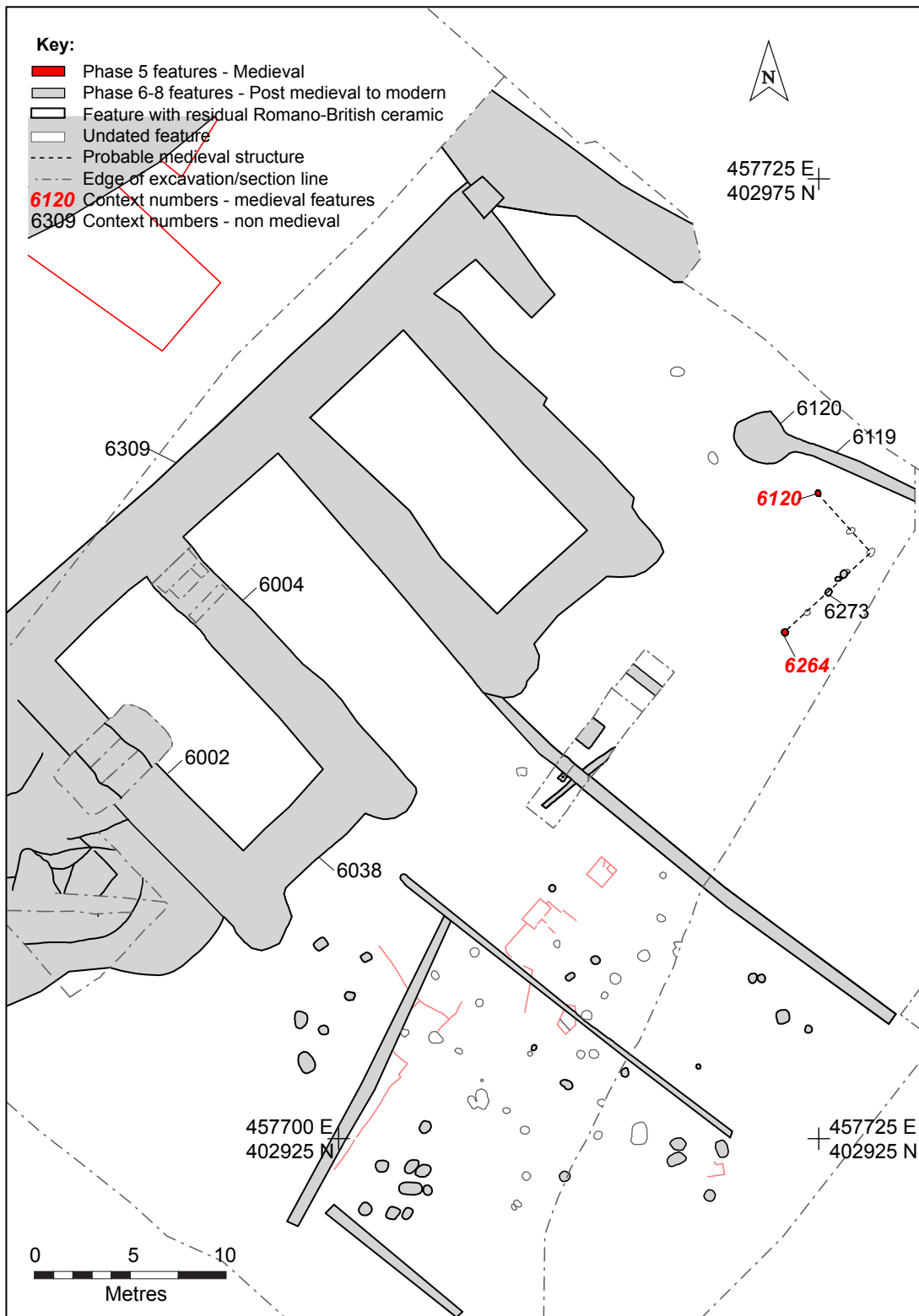


Figure 6: Sections of features





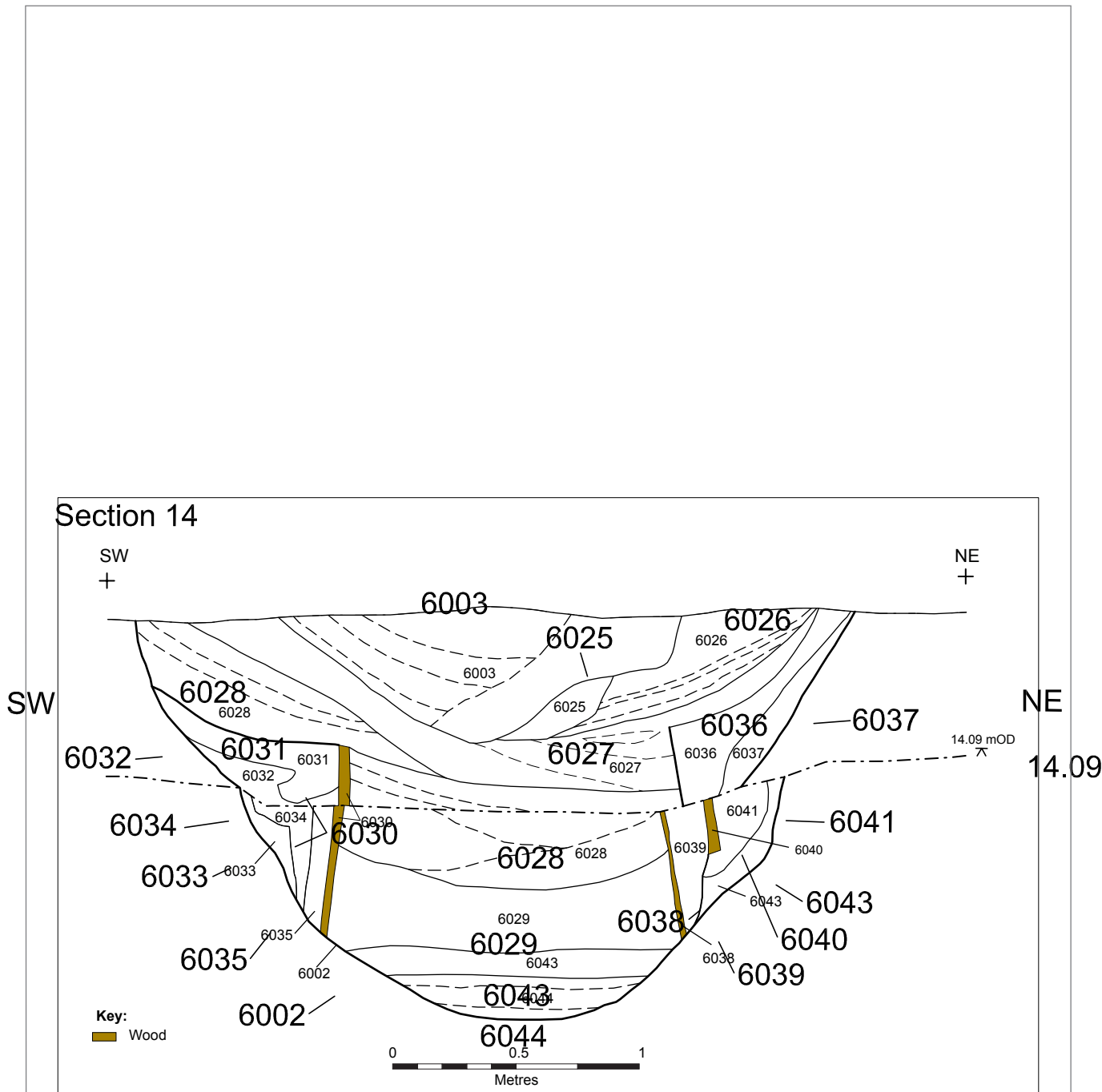
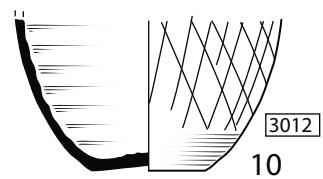
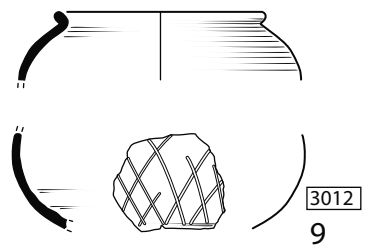
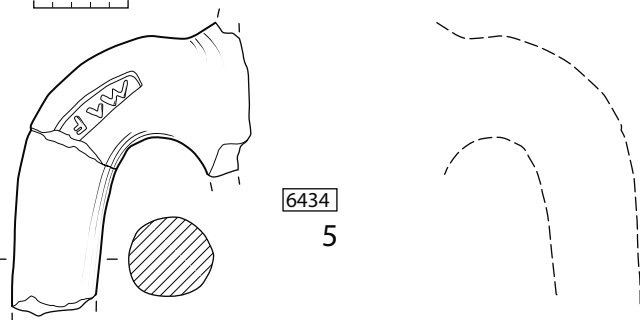
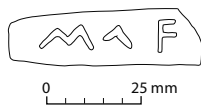
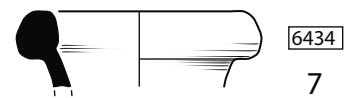
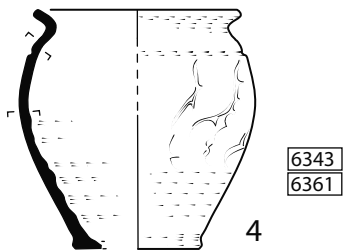
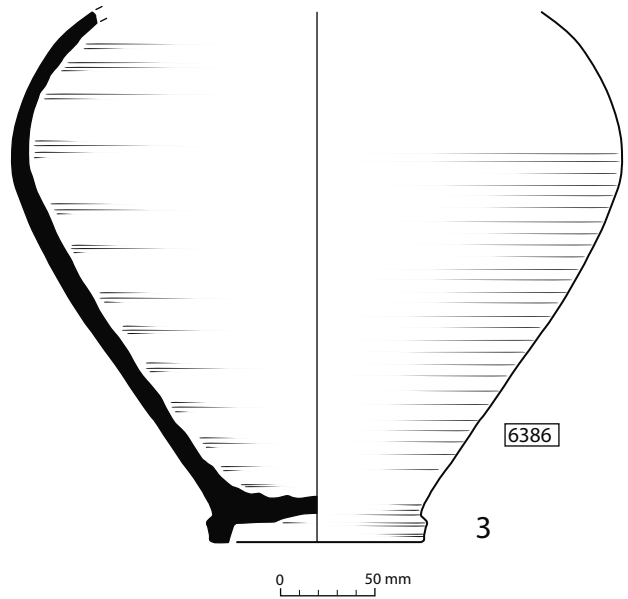
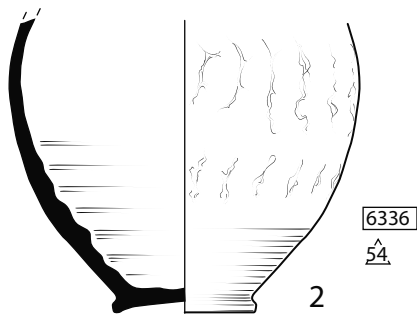
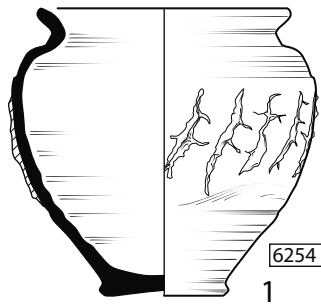


Figure 9: Section through First World War practice trench



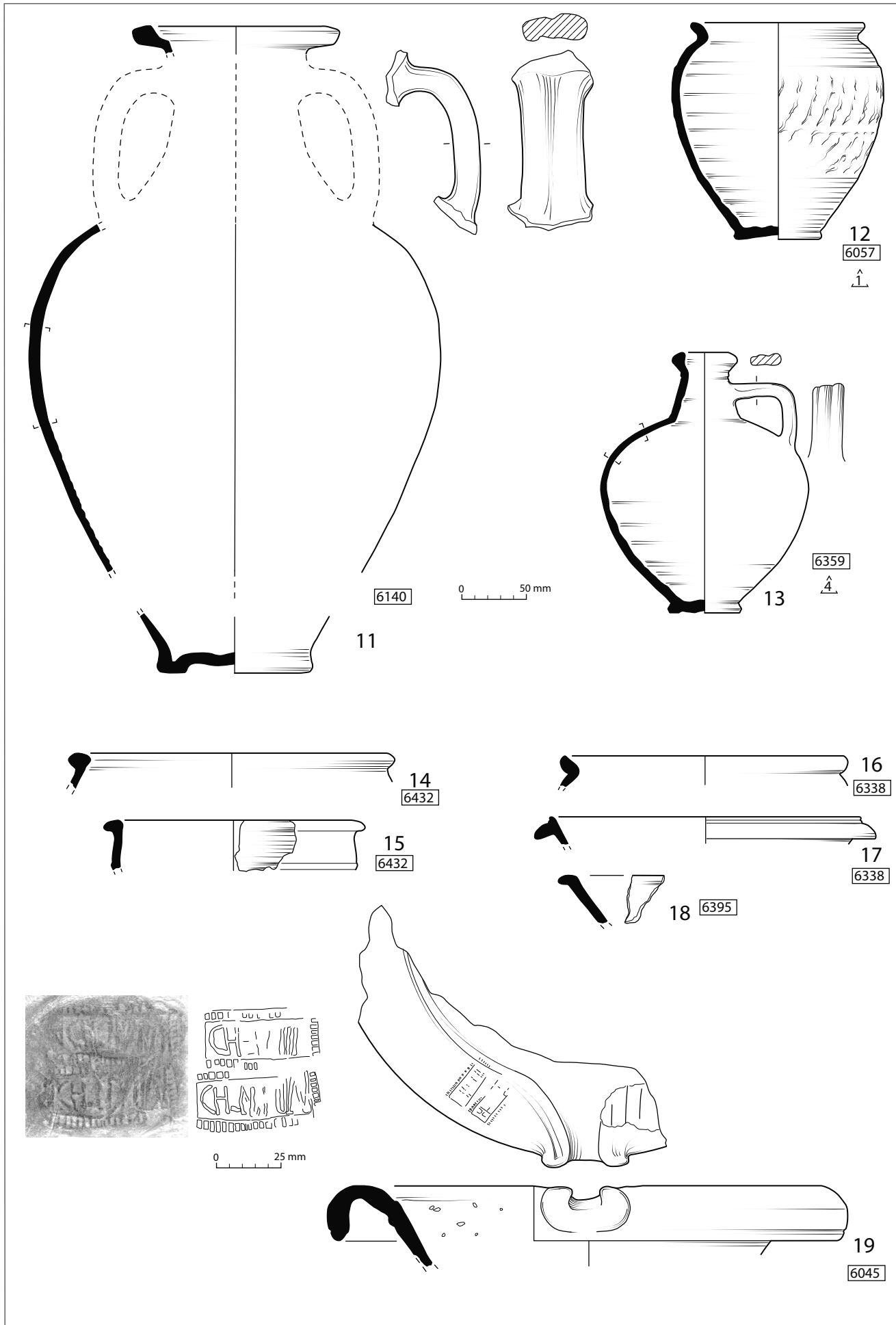


Figure 11: Ceramics



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Key	
	Boundary - Phase 1 Public Realm
	Trial trench location
	Strip, Map & Sample area
	Strip & Map area
	Watching Brief / Sewer diversion
	NA archaeological trenches (5x5m)
	Watching Brief / Attenuation tank / Tree pits


Revision Details	By	Date	Suffix
	Check		

Job Title
DONCASTER WATERDALE

Drawing Title
**FIGURE 2
LOCATION OF ARCHAEOLOGICAL WORKS**

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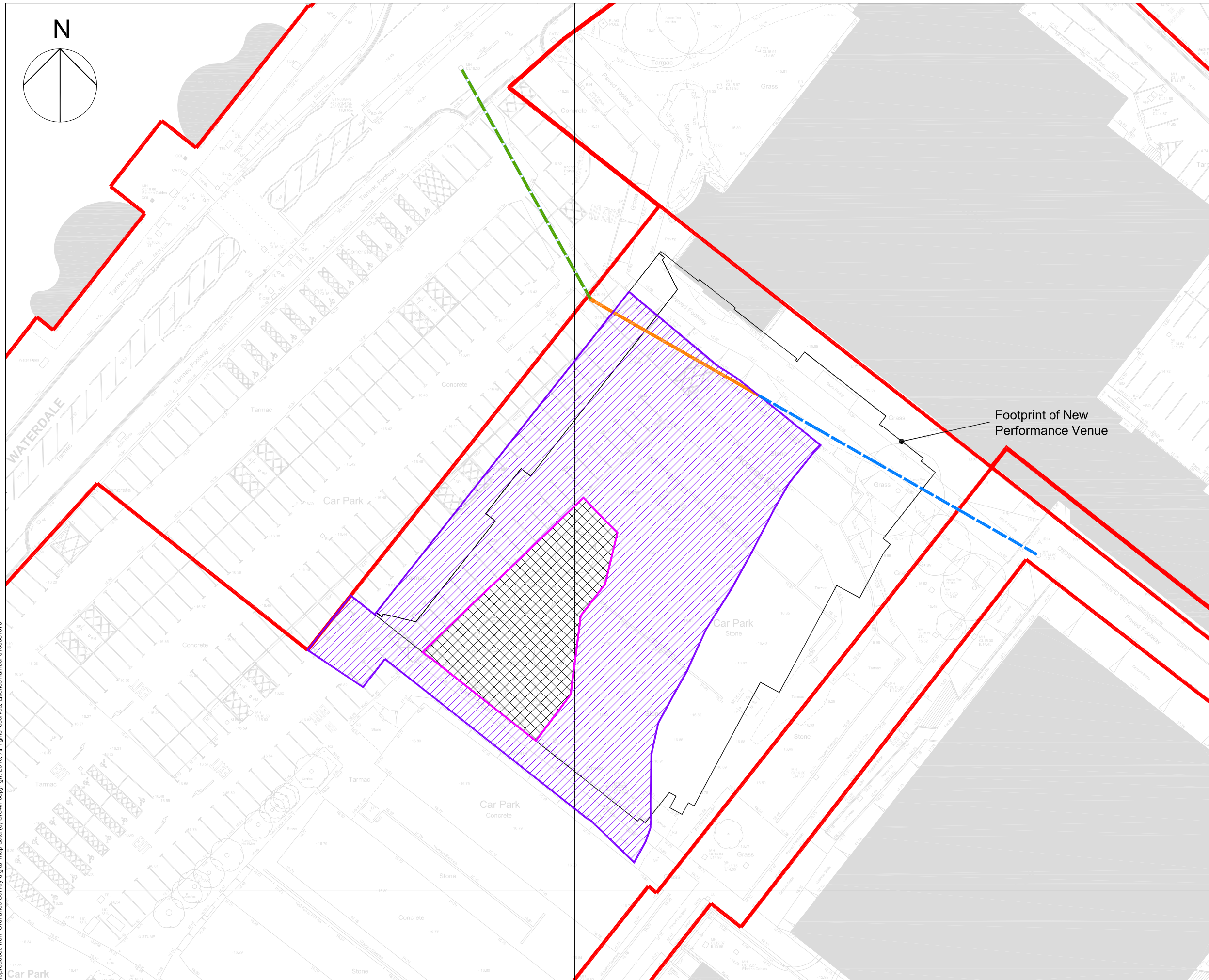
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




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Figure 12: WSI Archaeological Works Plan




This drawing may be used for the purpose intended and only written dimensions shall be used.

- Key**
-  Boundary of Public Realm and Infrastructure Contract
 -  Strip Map & Sample area (SMS)
 -  Area of trees excluded from SMS until fully stripped and review undertaken
 -  Former sewer to be removed archaeological watching brief required
 -  Pipe to stay insitu following grouting - no archaeological watching brief required
 -  Former sewer to be removed no archaeological watching brief required

Footprint of New Performance Venue

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Revision Details		By	Date	Suffix
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DONCASTER WATERDALE				
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FIGURE 2 LOCATION OF ARCHAEOLOGICAL WORKS				
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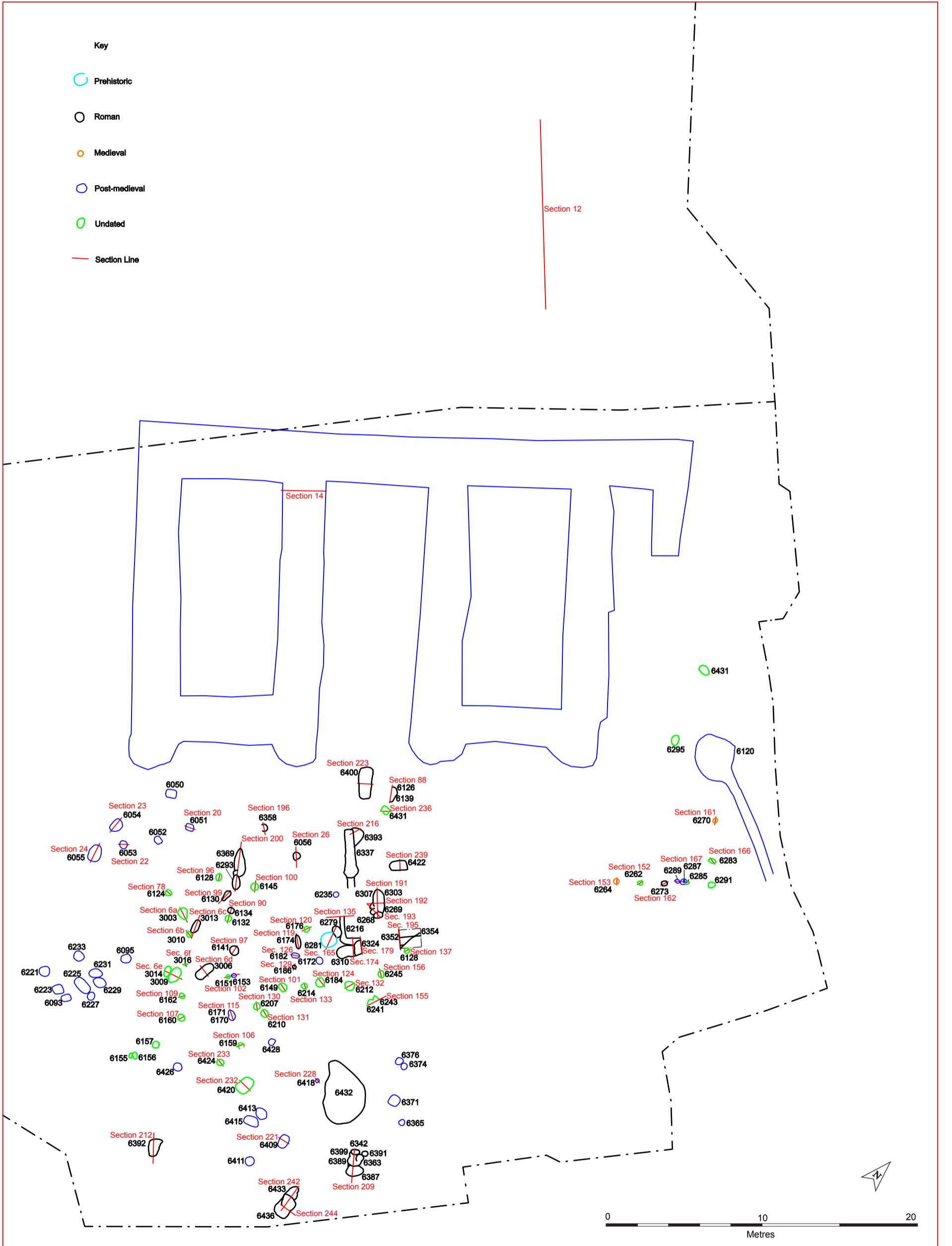
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Figure 13: FAD Archaeological Works Plan

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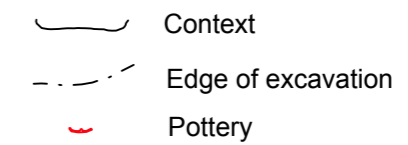
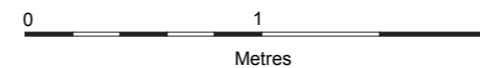
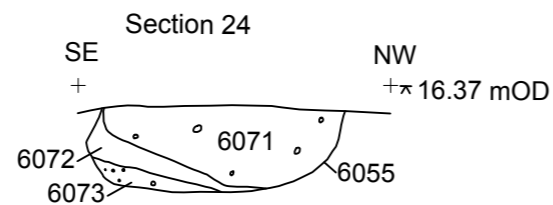
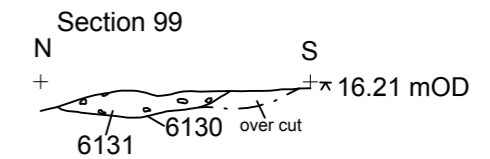
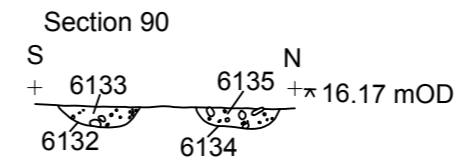
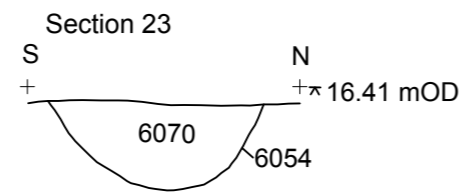
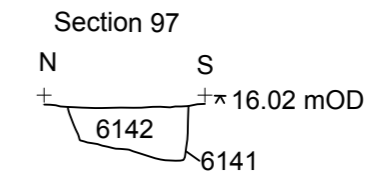
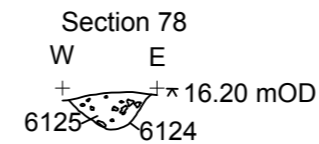
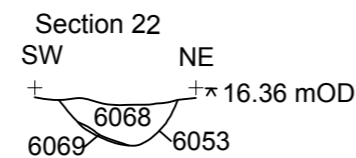
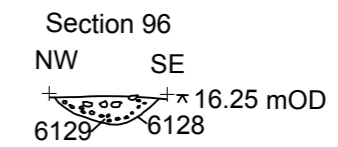
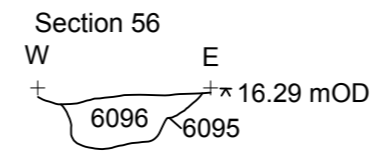
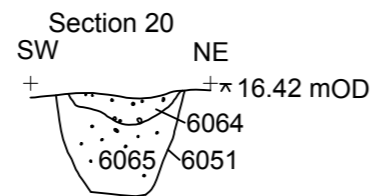
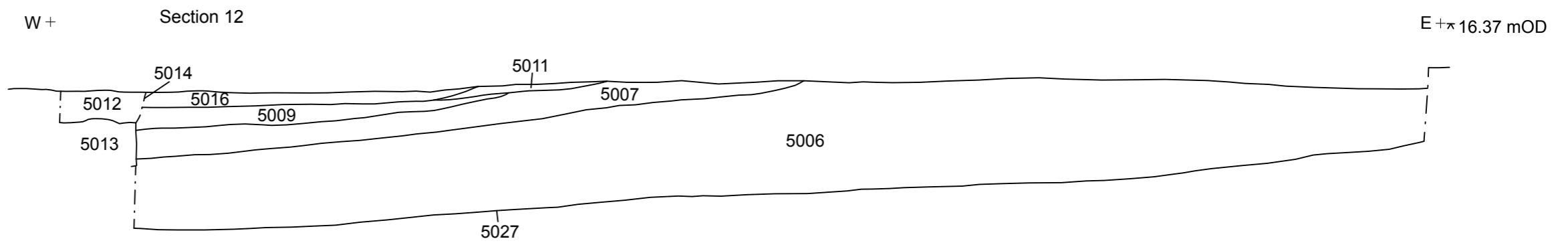
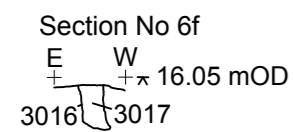
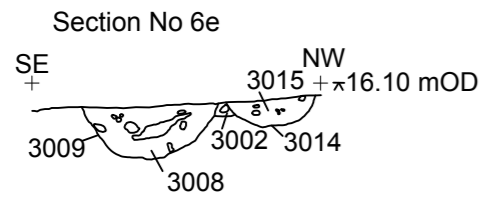
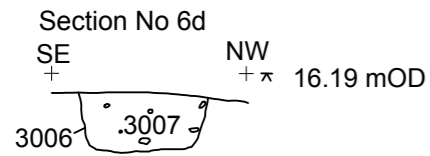
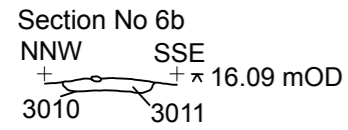
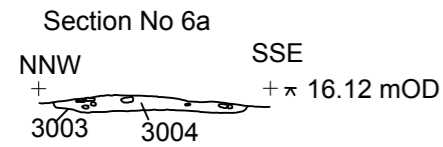
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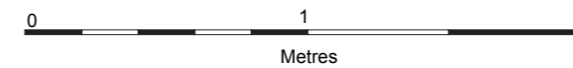
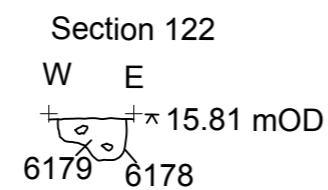
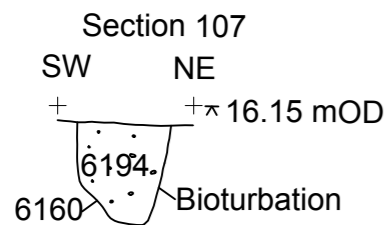
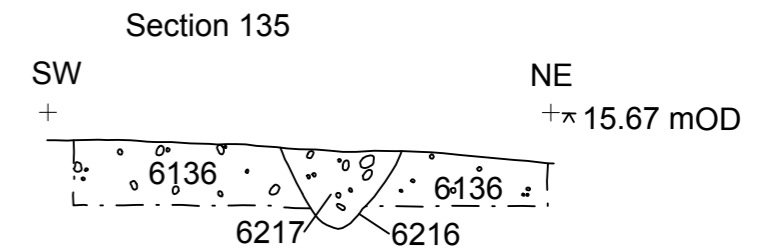
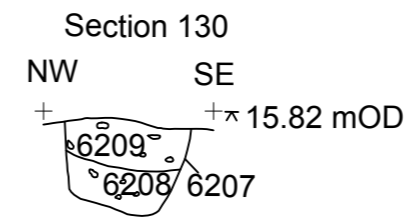
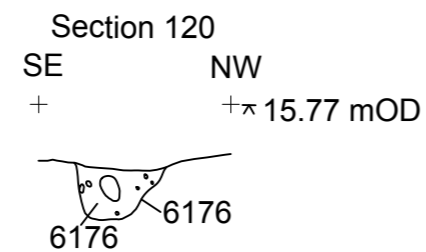
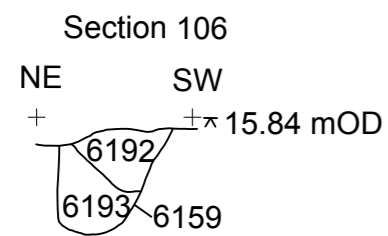
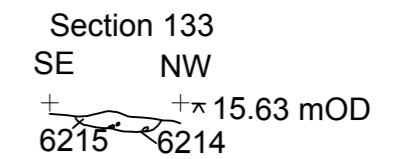
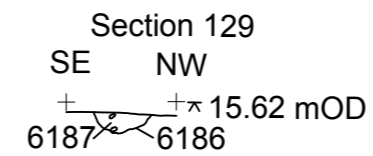
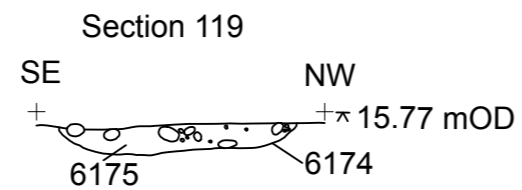
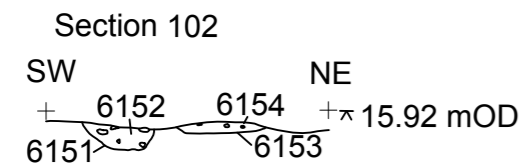
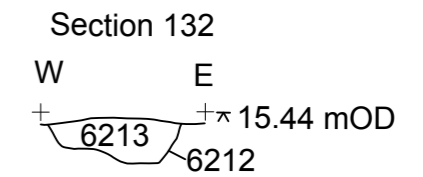
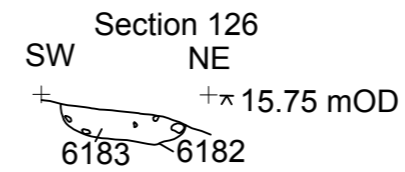
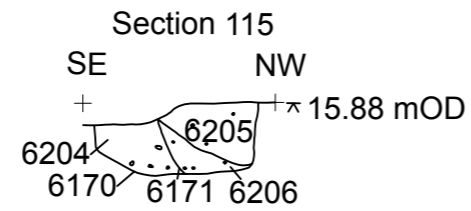
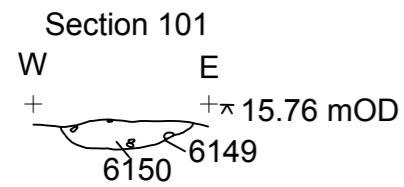
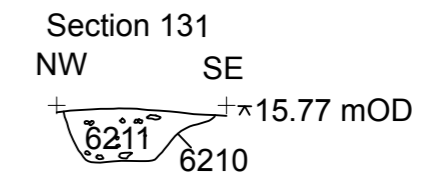
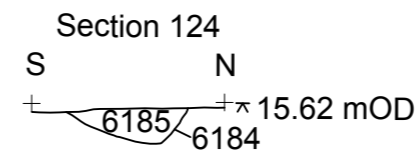
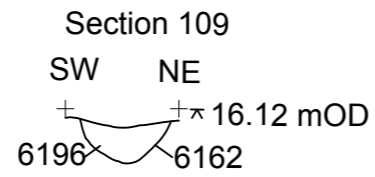
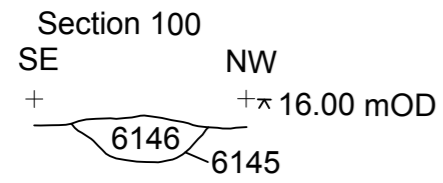





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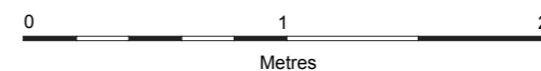
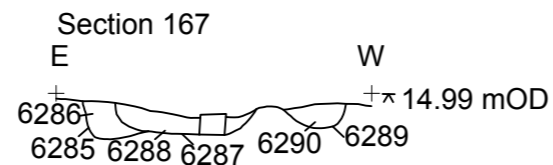
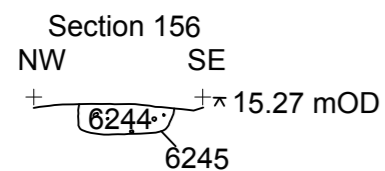
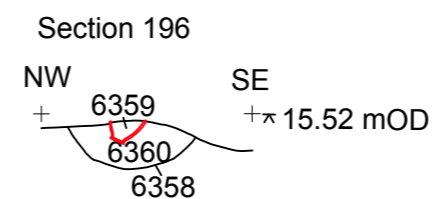
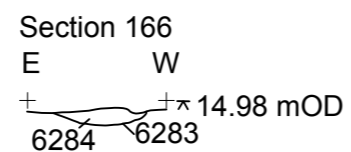
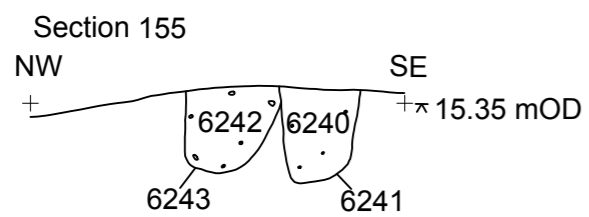
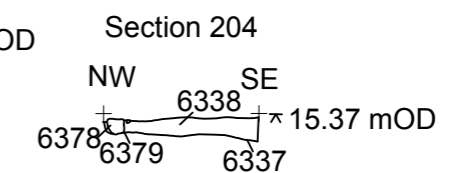
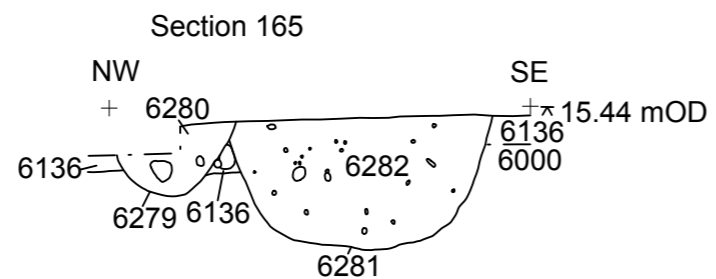
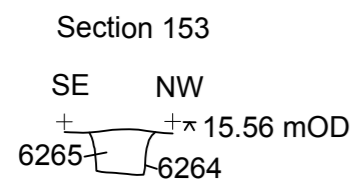
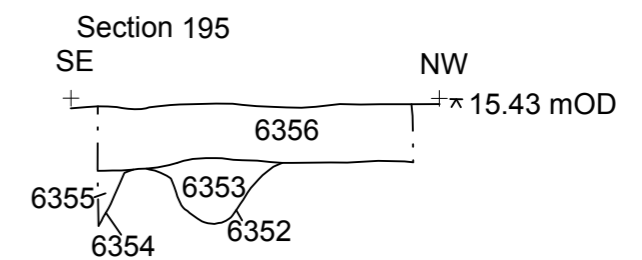
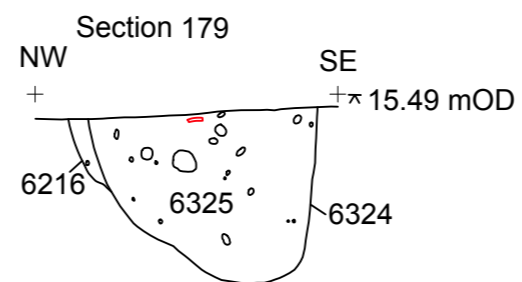
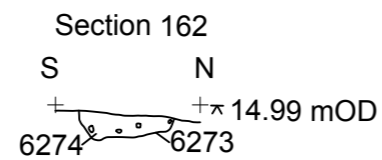
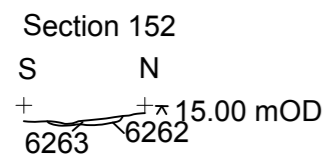
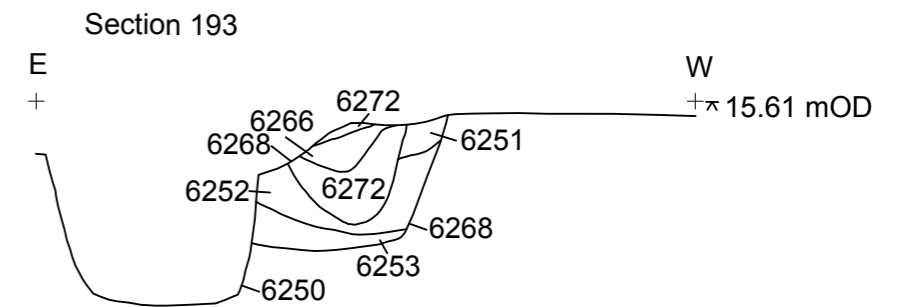
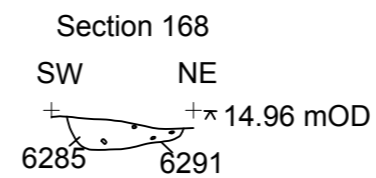
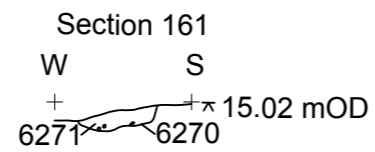
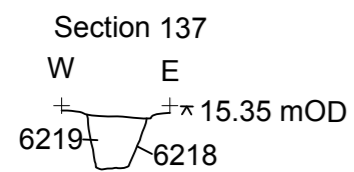
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Figure 14: Site Plan showing Location of Sections



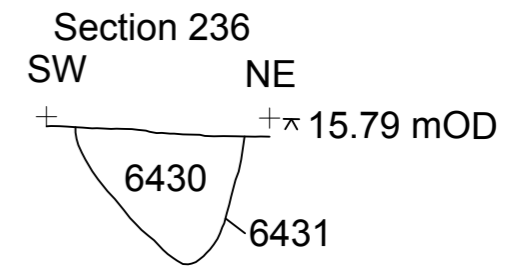
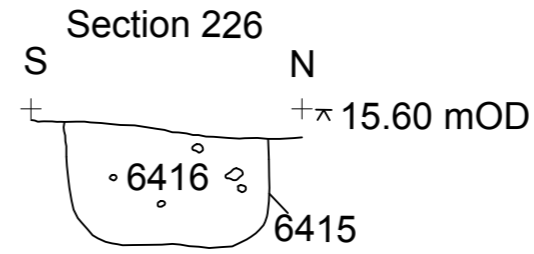
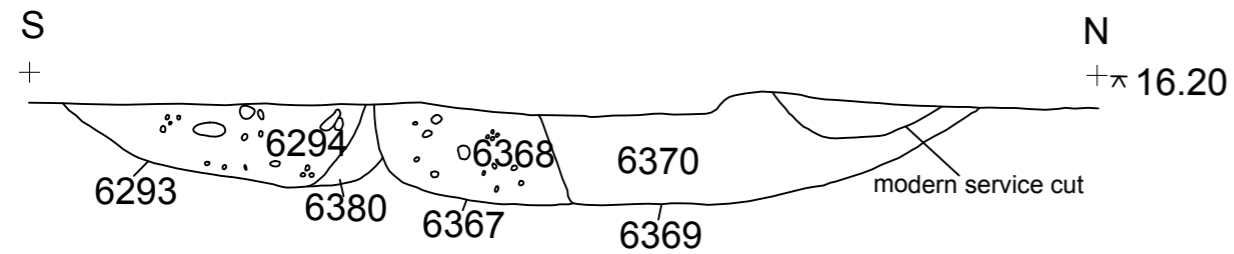


-  Context
-  Edge of excavation
-  Pottery

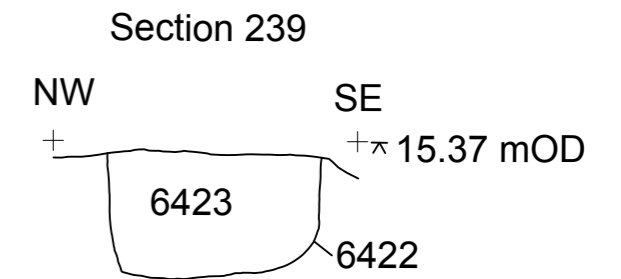
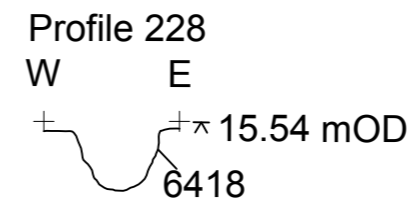
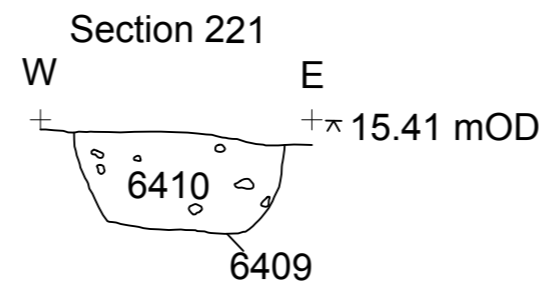
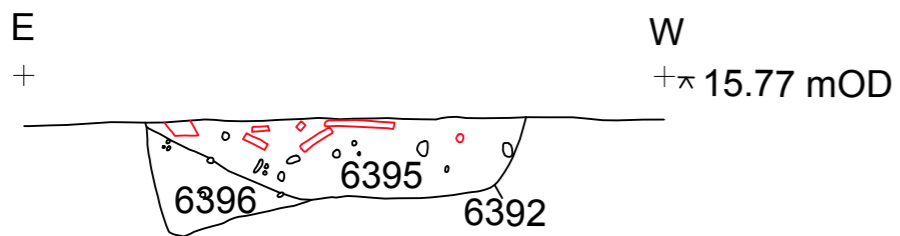


- Context
- Edge of excavation
- Pottery

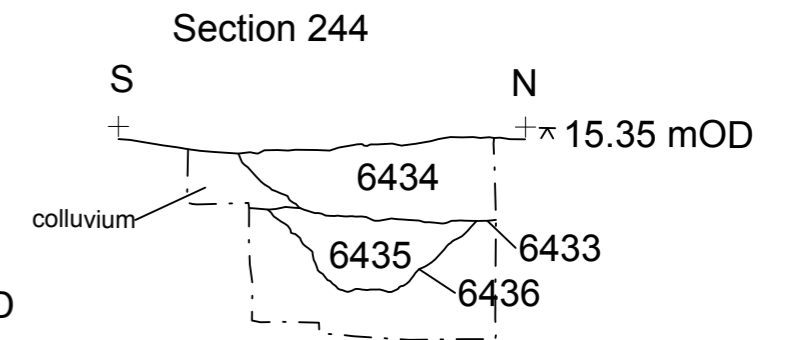
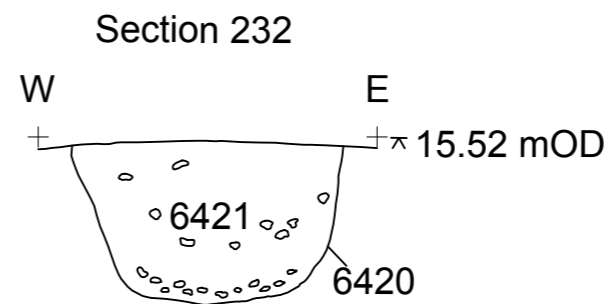
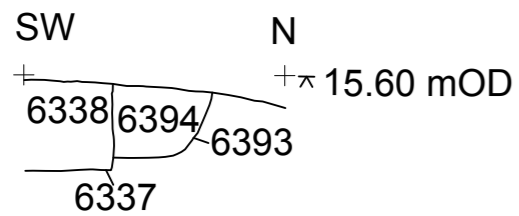
Section 200



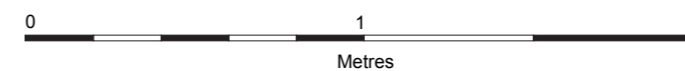
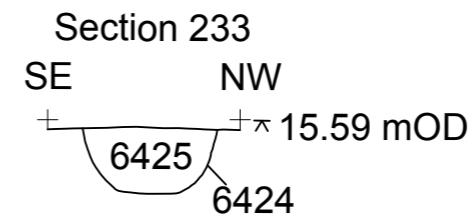
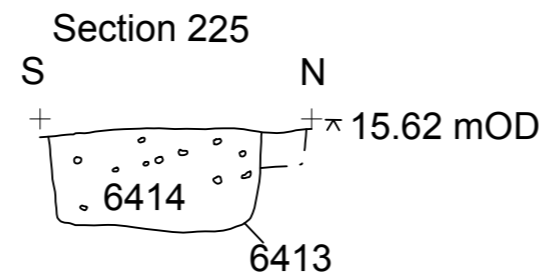
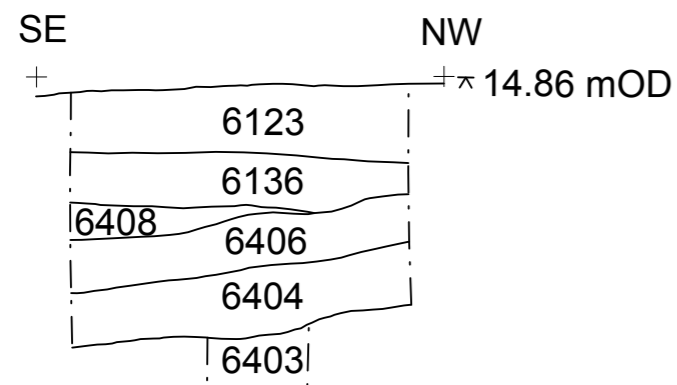
Section 212



Section 216



Section 219



- Context
- Edge of excavation
- Pottery

9 APPENDICES

APPENDIX 1 – INDEX TO ARCHIVE

Table 1 Archive

Item	Number of items
Context register	19
Context sheets	470
Levels register	40
Drawing register	9
Photographic register	24
Original drawings	246
B/W photographs (films/contact sheets)	358 (11)
Colour slides (films)	355 (11)
Digital photographs	480
Sample register	2
Bulk finds register	11
Small finds register	2
Written Scheme of Investigation	2
Report	1

APPENDIX 2 - CONTEXT LIST

Table 2 Context List

Context	Type	Keywords	Trench / Area	Figure No.	Figs 13-16 Section Numbers for cuts
5000	Deposit	Natural	5		
5001	Structural	Yard Surface	5		
5002	Deposit	Service Trench Fill	5/B		
5003	Cut	Service Trench	5/B		
5004	Deposit	Service Trench Fill	5/C		
5005	Cut	Service Trench	5/C		
5006	Deposit	Gravel Pit Fill	5/C		
5007	Deposit	Gravel Pit Fill	5/C		
5008	Deposit	Gravel Pit Fill	5/B		
5009	Deposit	Gravel Pit Fill	5/C		
5010	Deposit	Redeposited Natural	5/C		
5011	Deposit	Layer	5/C		
5012	Deposit	Service Trench Fill	5/C		
5013	Structural	Concrete Drain	5/C		
5014	Cut	Service Trench	5C		
5015	Cut	Modern Excavation	5/D,E,F,G		
5016	Deposit	Tip Layers	5/D,E,F		
5018	Deposit	Disturbed Ground	5		
5019	Deposit	Redeposited Natural	5		
5020	Deposit	Redeposited Natural	5		
5021	Structural	Post	5/E		
5023	Structural	Post Pad	5/D		
5025	Cut	Modern Intrusion	5/A		
5026	Deposit	Fill	5/A		
5027	Cut	Gravel Pit	5/C		
5028	Cut	Post-hole	5/E		
5029	Cut	Gravel Pit	5/B		
5031	Deposit	Subsoil (Paddock?)	5/G		
6000	Deposit	Natural	6		
6001	Deposit	Modern Overburden	6		
6002	Cut	Ditch Cut	6	9	
6003	Deposit	Ditch Fill	6		
6004	Cut	Ditch Cut	6		
6005	Deposit	Gravel Pit Fill	6		
6006	Deposit	Gravel Pit Fill	6		
6007	Deposit	Trench Backfill	6		
6008	Deposit	Victorian Overburden	6		

6009	Deposit	Modern Backfill	6		
6010	Deposit	Redeposited Natural	6		
6011	Deposit	Secondary Fill	6		
6012	Structural	Revetment	6		
6013	Structural	Revetment	6		
6014	Deposit	Redeposited Natural	6		
6015	Deposit	Redeposited Natural	6		
6016	Deposit	Backfill	6		
6017	Deposit	Backfill	6		
6018	Deposit	Silting	6		
6019	Deposit	Silting	6		
6020	Deposit	Silting	6		
6021	Deposit	Silting	6		
6022	Deposit	Silting	6		
6023	Deposit	Silting	6		
6024	Deposit	Silting	6		
6025	Deposit	Ditch Fill	6		
6026	Deposit	Ditch Fill	6		
6027	Deposit	Ditch Fill	6		
6028	Deposit	Ditch Fill	6		
6029	Deposit	Ditch Fill	6		
6030	Deposit	Revetment	6		
6031	Deposit	Backfill	6		
6032	Deposit	Colluvium	6		
6033	Deposit	Slump	6		
6034	Deposit	Backfill	6		
6035	Deposit	Backfill	6		
6036	Deposit	Backfill	6		
6037	Deposit	Backfill	6		
6038	Structural	Revetment	6		
6039	Deposit	Backfill	6		
6040	Structural	Revetment	6		
6041	Deposit	Backfill	6		
6042	Deposit	Ditch Fill	6		
6043	Deposit	Ditch Fill	6		
6044	Deposit	Ditch Fill	6		
6045	Deposit	Undefined Fill	6		
6046	Deposit	Victorian Overburden	6		
6047	Deposit	Secondary Fill	6		
6048	Deposit	Secondary Fill	6		
6049	Cut	Post-hole	6		
6050	Cut	Post-hole	6		
6051	Cut	Post-hole	6		20

6052	Cut	Rooting	6		
6053	Cut	Post-hole / Small Pit	6		22
6054	Cut	Small Pit	6		23
6055	Cut	Pit	6		24
6056	Cut	Cremation	6	6	
6057	Deposit	Cremation Urn (Small Find 1)	6		
6058	Deposit	Backfill	6		
6059	Deposit	Silting	6		
6060	Deposit	Post-hole Fill	6		
6061	Deposit	Post-hole Fill	6		
6062	Deposit	Post-hole Fill	6		
6063	Deposit	Concrete Backfill	6		
6064	Deposit	Post-hole Fill	6		
6065	Deposit	Post-hole Fill	6		
6066	Deposit	Silting	6		
6067	Deposit	Silting	6		
6068	Deposit	Silting	6		
6069	Deposit	Slump	6		
6070	Deposit	Silting	6		
6071	Deposit	Silting	6		
6072	Deposit	Pit Fill	6		
6073	Deposit	Pit Fill	6		
6074	Deposit	Secondary Fill	6		
6075	Deposit	Primary Fill	6		
6076	Deposit	Backfill	6		
6077	Deposit	Backfill	6		
6078	Deposit	Backfill	6		
6079	Deposit	Backfill	6		
6080	Deposit	Revetment Packing	6		
6081	Cut	Gravel Pit (?)	6		
6082	Cut	Ditch Cut (WWI)	6		
6083	Cut	Ditch Cut (WWI)	6		
6084	Deposit	Backfill	6		
6085	Cut	Pit	6		
6086	Deposit	Construction Deposit	6		
6087	Deposit	Silting	6		
6088	Deposit	Silting	6		
6089	Deposit	Silting	6		
6090	Deposit	Backfill	6		
6091	Deposit	Silting	6		
6092	Deposit	Overburden	6		
6093	Cut	Pit	6		
6094	Deposit	Silting	6		

6095	Cut	Pit	6		56
6096	Deposit	Silting	6		
6097	Deposit	Post-hole	6		
6098	Deposit	Backfill	6		
6099	Deposit	Buried Soil	6		
6100	Deposit	Backfill	6		
6101	Deposit	Overburden	6		
6102	Cut	Pit	6		
6103	Deposit	Silting	6		
6104	Deposit	Backfill	6		
6105	Deposit	Backfill	6		
6106	Cut	Pit	6		
6107	Deposit	Silting	6		
6108	Deposit	Silting	6		
6109	Deposit	Silting	6		
6110	Deposit	Slump	6		
6111	Deposit	Silting	6		
6112	Deposit	Topsoil Remnant	6		
6113	Deposit	Backfill	6		
6114	Deposit	Silting	6		
6115	Deposit	Silting	6		
6116	Deposit	Backfill	6		
6117	Deposit	Backfill	6		
6118	Deposit	Backfill	6		
6119	Cut	Service Trench	6		
6120	Cut	Pit / Shaft	6		
6121	Deposit	Backfill	6		
6122	Deposit	Backfill	6		
6123	Deposit	Colluvium	6		
6124	Cut	Pit	6		78
6125	Deposit	Backfill	6		
6126	Cut	Pit	6		
6127	Deposit	Backfill	6		
6128	Cut	Pit	6		96
6129	Deposit	Backfill	6		
6130	Cut	Cremation Cut	6		99
6131	Deposit	Cremation Fill	6		
6132	Cut	Pit / Post-hole	6		90
6133	Deposit	Silting	6		
6134	Cut	Post-hole	6		90
6135	Deposit	Silting	6		
6136	Deposit	Colluvium	6		
6137	Cut	Pit	6	6	

6138	Deposit	Backfill	6		
6139	Cut	Pit	6		
6140	Deposit	Backfill	6		
6141	Cut	Pit	6		97
6142	Deposit	Silting	6		
6143	Cut	Tree Rooting	6		
6144	Deposit	Silting	6		
6145	Cut	Pit	6		100
6146	Deposit	Silting	6		
6147	Deposit	Circular Cut (animal?)	6		
6148	Deposit	Silting	6		
6149	Cut	Pit	6		101
6150	Deposit	Backfill	6		
6151	Cut	Cremation Cut	6		102
6152	Deposit	Cremation Fill	6		
6153	Cut	Modern Cut	6		102
6154	Deposit	Backfill	6		
6155	Cut	Tree Rooting	6		
6156	Cut	Tree Rooting	6		
6157	Cut	Post-hole	6		
6158	Cut	Depression in Natural	6		
6159	Cut	Post-hole	6		106
6160	Cut	Post-hole	6		107
6161	Cut	Animal Burrow	6		
6162	Cut	Post-hole	6		109
6163	Cut	Tree Rooting	6		
6164	Cut	Tree Rooting	6		
6165	Cut	Natural Depression	6		
6166	Cut	Natural Depression	6		
6167	Cut	Tree Rooting	6		
6168	Cut	Tree Rooting	6		
6169	Cut	Tree Rooting	6		
6170	Cut	Post-hole	6		115
6171	Cut	Post-hole	6		115
6172	Cut	Small Pit	6		
6173	Deposit	Silting	6		
6174	Cut	Pit	6		119
6175	Deposit	Silting	6		
6176	Cut	Pit / Post-hole	6		120
6177	Deposit	Silting	6		
6178	Cut	Post-hole	6		122
6179	Deposit	Silting	6		
6180	Cut	Natural Depression	6		

6181	Deposit	Undefined Fill	6		
6182	Cut	Small Pit	6		126
6183	Deposit	Pit Fill	6		
6184	Cut	Pit Cut	6		124
6185	Deposit	Pit Fill	6		
6186	Cut	Pit	6		129
6187	Deposit	Backfill	6		
6188	Deposit	Fill of Rooting	6		
6189	Deposit	Fill of Rooting	6		
6190	Deposit	Backfill	6		
6191	Deposit	Silting	6		
6192	Deposit	Post-hole Fill	6		
6193	Deposit	Backfill	6		
6194	Deposit	Silting	6		
6195	Deposit	Fill of Animal Burrow	6		
6196	Deposit	Silting	6		
6197	Deposit	Silting	6		
6198	Deposit	Silting	6		
6199	Deposit	Fill of Depression	6		
6200	Deposit	Silting	6		
6201	Deposit	Fill of Rooting	6		
6202	Deposit	Silting	6		
6203	Deposit	Silting	6		
6204	Deposit	Backfill	6		
6205	Deposit	Silting	6		
6206	Deposit	Silting	6		
6207	Cut	Post-hole	6		130
6208	Deposit	Silting	6		
6209	Deposit	Silting	6		
6210	Cut	Small Pit	6		131
6211	Deposit	Silting	6		
6212	Cut	Pit	6		132
6213	Deposit	Silting	6		
6214	Cut	Pit	6		133
6215	Deposit	Silting	6		
6216	Cut	Gully	6	6	135
6217	Deposit	Gully Fill	6		
6218	Deposit	Silting	6		137
6219	Cut	Animal Burrow	6		
6220	Deposit	Burnt Stone	6		
6221	Cut	Pit	6		
6222	Deposit	Backfill	6		
6223	Cut	Pit	6		

6224	Deposit	Backfill	6		
6225	Cut	Pit	6		
6226	Deposit	Backfill	6		
6227	Deposit	Pit	6		
6228	Deposit	Backfill	6		
6229	Cut	Pit	6		
6230	Deposit	Backfill	6		
6231	Cut	Pit	6		
6232	Deposit	Backfill	6		
6233	Cut	Pit	6		
6234	Deposit	Backfill	6		
6235	Cut	Pit	6		
6236	Deposit	Silting	6		
6237	Cut	Tree Rooting	6		
6238	Deposit	Fill of Rooting	6		
6239	Cut	Tree Rooting	6		
6240	Deposit	Silting	6		
6241	Cut	Post-Hole	6		155
6242	Deposit	Silting	6		
6243	Cut	Post-hole	6		155
6244	Deposit	Silting	6		
6245	Cut	Post-hole	6		156
6246	Cut	Cremation	6	4	
6247	Deposit	Cremated Material	6		
6248	Deposit	Cremated Material	6		
6249	Deposit	Mixed Slump	6		
6250	Cut	Cremation	6	4	193
6251	Deposit	Cremation Material	6		
6252	Deposit	Redeposited Natural	6		
6253	Deposit	Cremated Material	6		
6254	Deposit	Cremated Material	6		
6255	Deposit	Cremation Material	6		
6256	Deposit	Cremation Material	6		
6257	Deposit	Redeposited Natural	6		
6258	Deposit	Cremated Material	6		
6259	Cut	Pit	6		
6260	Deposit	Backfill	6		
6261	Deposit	Cremated Material	6		
6262	Cut	Post-hole	6		152
6263	Deposit	Fill	6		
6264	Cut	Post-hole	6		153
6265	Deposit	Post-hole Fill	6		
6266	Deposit	Cremation Material	6		

6267	Cut	Cremation	6	4	
6268	Cut	Cremation	6	4	193
6269	Cut	Cremation	6	4	192
6270	Cut	Post-hole	6		161
6271	Deposit	Silting	6		
6272	Deposit	Cremated Material	6	4	
6273	Cut	Post-hole	6		162
6274	Deposit	Fill	6		
6275	Cut	Linear	6		
6276	Deposit	Backfill	6		
6277	Cut	Pit	6		
6278	Deposit	Fill	6		
6279	Cut	Pit	6		165
6280	Deposit	Silting	6		
6281	Cut	Pit	6		165
6282	Deposit	Fill	6		
6283	Cut	Post-hole	6		166
6284	Deposit	Silting	6		
6285	Cut	Post-hole	6		167
6286	Deposit	Silting	6		
6287	Cut	Modern Cut	6		167
6288	Deposit	Backfill	6		
6289	Cut	Borehole	6		167
6290	Deposit	Backfill	6		
6291	Deposit	Post-hole	6		168
6292	Deposit	Silting	6		
6293	Cut	Cremation	6		200
6294	Deposit	Cremation Material	6		
6295	Cut	Pit	6		
6296	Deposit	Backfill	6		
6299	Cut	Depression	6		
6300	Deposit	Silting	6		
6301	Cut	Cremation	6	4	192
6302	Deposit	Cremated Material	6		
6303	Cut	Cremation	6	4	192
6304	Deposit	Cremation Material	6		
6305	Deposit	Cremated Material	6		
6306	Deposit	Redeposited Natural	6		
6307	Cut	Cremation Pit	6	4	192
6308	Cut	Firing Trench	6		
6309	Cut	Pipe Trench	6		
6310	Cut	Pit	6	6	
6311	Deposit	Silting	6		

6312	Deposit	Backfill	6		
6313	Deposit	Silting	6		
6314	Deposit	Silting	6		
6315	Deposit	Silting	6		
6316	Structural	Ceramic Pipe	6		
6317	Deposit	Concrete	6		
6318	Deposit	Backfill	6		
6319	Deposit	Slump	6		
6320	Deposit	Backfill	6		
6321	Deposit	Silting	6		
6322	Deposit	Cremation Material	6		
6324	Cut	Pit	6		179
6325	Deposit	Silting	6		
6328	Cut	Cremation	6		
6329	Deposit	Undefined Fill	6		
6330	Cut	Depression from Organic Object	6		
6331	Cut	Cremation	6	5	
6332	Deposit	Cremation Material	6		
6333	Deposit	Fill of Urn	6		
6334	Deposit	Cremation Material	6		
6335	Deposit	Cremation Material	6		
6336	Deposit	Cremation Urn	6		
6337	Cut	Grave / Pit	6		204, 216
6338	Deposit	Grave / Pit Fill	6		
6339	Deposit	Human Remains	6		
6340	Cut	Cremation	6	5	
6341	Deposit	Cremation Material	6		
6342	Cut	Cremation	6	5	
6343	Deposit	Cremation Material	6		
6344	Deposit	Material from below Oil Lamp	6		
6345	Deposit	Material from below Oil Lamp	6		
6346	Deposit	Material from below Oil Lamp	6		
6348	Deposit	material from above lamp	6		
6349	Deposit	Cremation Material	6		
6350	Cut	Cremation	6	5	
6352	Deposit	Gully	6		195
6353	Deposit	Gully Fill	6		
6354	Cut	Pit	6		195
6355	Deposit	Pit Fill	6		
6356	Deposit	Layer	6		
6357	Deposit	Modern Overburden	6		
6358	Cut	Pit	6		196
6359	Deposit	Vessel	6		

6360	Deposit	Pit Fill	6		
6361	Deposit	Cremation Material	6		
6364	Feature	Cremation Complex	6		
6365	Cut	Pit	6		
6366	Deposit	Pit Fill	6		
6367	Cut	Pit	6		200
6368	Deposit	Backfill	6		
6369	Cut	Pit	6		200
6370	Deposit	Silting	6		
6371	Cut	Pit	6		
6372	Deposit	Pit Fill	6		
6374	Cut	Pit	6		
6375	Deposit	Pit Fill	6		
6376	Cut	Pit	6		
6377	Deposit	Pit Fill	6		
6378	Deposit	Backfill (grave)	6		
6379	Cut	Grave Cut	6		204
6380	Deposit	Backfill	6		
6382	Deposit	Fill of Tree Rooting	6		
6383	Cut	Tree Rooting	6		
6384	Deposit	Fill of Tree Rooting	6		
6385	Cut	Tree Rooting	6		
6386	Deposit	Cremation Material	6		
6387	Cut	Cremation	6	5	
6388	Deposit	Cremation Material	6		
6389	Cut	Cremation	6	5	
6390	Deposit	Fill in Depression	6		
6391	Cut	Depression in Natural	6	5	
6392	Cut	Pit	6		212
6393	Cut	Pit	6		216
6394	Deposit	Pit Fill	6		
6395	Deposit	Dump	6		
6396	Deposit	Slump / Trample	6		
6397	Deposit	Cremation Material	6		
6398	Deposit	Cremation Material	6		
6399	Cut	Cremation	6	5	
6400	Cut	Rectilinear	6		223
6401	Cut	Grave Fill	6		
6402	Deposit	River Deposit	6		
6403	Deposit	River Deposit	6		
6404	Deposit	River Deposit	6		
6405	Deposit	River Deposit	6		
6406	Deposit	River Deposit	6		

6407	Deposit	River Deposits	6		
6408	Deposit	Colluvium	6		
6409	Cut	Pit	6		221
6410	Deposit	Pit Fill	6		
6411	Cut	Pit	6		
6412	Deposit	Pit Fill	6		
6413	Cut	Pit	6		225
6414	Deposit	Pit Fill	6		
6415	Cut	Pit	6		226
6416	Deposit	Pit Fill	6		
6417	Deposit	Human Remains	6		
6418	Cut	Pit	6		228
6419	Deposit	Pit Fill	6		
6420	Cut	Pit	6		232
6421	Deposit	Pit Fill	6		
6422	Cut	Pit	6		239
6423	Deposit	Backfill	6		
6424	Cut	Pit	6		233
6425	Deposit	Fill	6		
6426	Cut	Pit	6		
6427	Deposit	Pit Fill	6		
6428	Cut	Pit	6		
6429	Deposit	Fill	6		
6430	Deposit	Pit Fill	6		
6431	Cut	Pit	6		236
6432	Cut	Interface, Burnt Area	6		
6433	Cut	Pit	6	5	244
6434	Deposit	Pit Fill	6		
6435	Deposit	Pit Fill	6		
6436	Cut	Cremation	6	5	244
6437	Feature	Cremation Group	6		

APPENDIX 3 - HUMAN BONES

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1 INTRODUCTION

Osteological analysis was undertaken on 49 cremation-related deposits and two inhumations from the excavations at Waterdale. Three of the cremation-related deposits were excavated during the evaluation trial trenching, and the remaining 46 cremation-related deposits and the inhumation burials were excavated during the following excavation of the site.

The cremation-related deposits dated to the early Roman period, between the late first to the mid second century AD, based on pottery and artefactual evidence (Bell 2011, 8). The 49 cremation-related deposits derived from 32 features. Twenty-four of these features contained a single deposit, and eight features contained between two and six deposits. The latter are listed in Table 3. The majority of these features were believed to be cremation burials. Other features containing cremated remains included a posthole (6134, fill 6135), a stake-hole (6186, fill 6187), an oval pit of unknown use (6214), buried soil (6099), and tree rooting (6156).

Table 3: Features containing multiple cremation-related deposits

Feature	Cremation-Related Deposits Within Feature	Burial Grouping
6250	6248, 6249	Group A
6258	6251, 6252, 6253, 6266, 6272	Group A
6269	6256, 6257	Group A
6303	6261, 6302, 6322, 6328, 6334, 6335	Group A
6307	6304, 6305, 6306	Group A
6331	6332, 6333, 6336	Group B
6337	6338, 6339	Individual burial disturbed by grave for Skeleton 6339
6342	6343, 6361	Group B

Three clusters of burials were identified by the archaeologists, referred to as cremation Group A, Group B and Group C. The remaining burials were considered to be individual burials (Table 4). Group A contained eight features and 21 deposits, and was surrounded by a gully; Group B contained seven features and ten deposits; and Group C contained two features and two deposits. There were ten individual cremation burials containing eleven deposits. The majority of the burials had been truncated, and one burial had possibly been robbed.

The inhumation burials dated to the late Roman period, between the late third to early fourth century AD (Bell 2011, 10). The grave for Skeleton 6339 had cut through an earlier cremation burial (6393) and a gully (6216) associated with cremation Group A. Unburnt bone found in contexts 6394 (from cut 6393) and 6338 was assumed to be part of Skeleton 6339.

Table 4: Burial grouping

Burial Grouping	Features
Group A	6246, 6250, 6267, 6268, 6269, 6301, 6303, 6307
Group B	6331, 6342, 6350, 6387, 6389, 6399, (6363)
Group C	6433, 6436
Individual Burial	3010, 3013, 3020, 6057, 6126, 6130, 6139, 6293, 6340, 6337
Non-burial	6099, 6134, 6156, 6186, 6214

1.1 Aims and Objectives

The aim of the skeletal analysis was to determine the age, sex and stature of the skeletons, as well as to record and diagnose any skeletal manifestations of disease and trauma.

1.2 Methodology

The skeletons were analysed in detail, assessing the preservation and completeness, calculating the minimum number of individuals present as well as determining the age, sex and stature of the individuals. All pathological lesions were recorded and described.

The cremated bone was analysed according to the guidelines specified by McKinley (2004a). The bone was passed through a nest of sieves with mesh sizes of 10mm, 5mm and 2mm. The maximum fragment size was measured, bone colour was noted, and any identifiable fragments were recorded. An attempt was made to determine age and sex, and any pathological lesions present were described.

2 OSTEOLOGICAL ANALYSIS

Osteological analysis is concerned with the determination of the identity of a skeleton, by estimating its age, sex and stature. Robusticity and non-metric traits can provide further information on the appearance and familial affinities of the individual studied. This information is essential in order to determine the prevalence of disease types and age-related changes. It is crucial for identifying sex dimorphism in occupation, lifestyle and diet, as well as the role of different age groups in society. Summaries of the osteological and palaeopathological data are given in Table 5 (for the inhumation burials) with detailed catalogues provided in Appendix A. A summary of the cremated bone is provided in Table 6.

Table 5: Summary of osteological and palaeopathological data of the inhumed skeletons

Sk No	C (%)	SP	F	Age	Age Group	Sex	Stature (cm)	Dental Pathology	Pathology
6339	<10	4	ext	16-18?	ad?	-	-	Calculus; rotation RP ₂	-
6401	<15	4	ext	35+	oma/ma	-	-	AMTL	-

Key: SP = Surface preservation: grades 0 (excellent), 1 (very good), 2 (good), 3 (moderate), 4 (poor), 5 (very poor), 5+ (extremely poor) after McKinley (2004b); C = Completeness; F = Fragmentation: min (minimal), sli (slight), mod (moderate), sev (severe), ext (extreme)

Non-adult age categories: f (foetus, <38weeks *in utero*), p (perinate, c. birth), n (neonate, 0-1m), i (infant, 1-12m), j (juvenile, 1-12y), ad (adolescent 13-17y)

Adult age categories: ya (young adult, 18-25y), yma (young middle adult, 26-35y), oma (old middle adult, 36-45y), ma (mature adult, 46+y), a (adult, 18+y)

Table 6: Summary of cremated assemblages

Burial	Feature	Group	Description	Urn	Bone Colour	Preservation	ID	MNI	Age Group	Age	Sex	Weight >2mm (g)	Weight as % of modern *	Max Frag. Size (mm)
3011	3010		Cremation burial	N	Buff/ white	Good	H?	1	?	?	?	9.0	0.6%	31.7
3012	3013		Cremation burial	N?	Buff/ white	Good	H	1	na?	<18?	-	41.6	2.6%	28.0
3019	3020		Cremation burial	N	White	Moderate	H?	1	?	?	?	0.7	<0.1%	11.0
6099	-		Buried soil	N	White	Good	H?	1	ad/a?	12/18+?	?	1.6	0.1%	18.4
6057	6056		Cremation burial	Y	Buff/ white	Good	H	1	na?	<18?	-	151.6	9.3%	34.0
6127	6126	-	Cremation burial	N	White, some pale grey	Good	H	1	na?	<18?	?	28.4	1.7%	42.8
6131	6130	-	Cremation burial	N	Buff/ white	Good	H	1	a?	18+?	?	46.5	2.9%	31.8
6135	6134	-	Fill of a posthole	N	White	Moderate	?	1	?	?	?	0.2	<0.1%	15.8
6140	6139		Cremation burial?	N?	Buff/ white	Good	H	1	?	?	?	2.5	0.2%	28.0
6156	6156		Tree rooting	N	White	Poor	?	1	?	?	?	0.1	<0.1%	7.3
6187	6186	-	Fill of a stake-hole?	N	White	Poor	?	1	?	?	?	0.1	<0.1%	8.4
6214	6214		Oval pit, unknown use	N	White	Poor	?	1	?	?	?	0.1	<0.1%	5.8
6247	6267	A	Cremation burial	N	White, some pale to mid grey	Good	H	1	ad/a?	12/18+?	?	27.9	1.7%	29.2
6248	6250	A	Cremation burial	N	White, pale grey	Good	H	1	?	?	?	22.7	1.4%	30.8
6249	6250	A	Part of 6248	N	White	Good	H	1	ad/a?	12/18+?	?	11.6	0.7%	35.5
6251	6268	A	Redeposited pyre debris, associated with Burial 6272	N	White, some pale to dark grey	Good	H	1	?	?	?	14.1	0.9%	19.1
6252	6268	A	Redeposited natural used as packing around Urn 15 (Burial 6272)	N	White, pale grey	Good	H?	1	?	?	?	1.9	0.1%	21.9
6253	6268	A	Dump of pyre debris in cut for Burial 6272	N	White, some mid to dark grey, black	Good	H	1	ad/a	12/18+	?	4.1	0.3%	24.4
6254	6246	A	Cremated remains packed around urn 13 (Burial)	N	Buff/ white, some pale grey	Good	H	1	a	18+	?	250.4	15.4%	53.0
6256	6269	A	Pyre debris used to backfill grave	N	White	Good	H	1	ad/a?	12/18+?	?	8.8	0.5%	34.5
6257	6269	A	Redeposited natural	N	Buff/ white, some pale grey	Good	H	1	?	?	?	6.0	0.4%	25.7
6258	6301	A	Cremation burial	N	White, pale grey	Moderate	? +	1	?	?	?	1.1	0.1%	14.8

							A							
6261	6303	A	Backfill of cremation grave for Burial 6302	N	White	Moderate	?	1	?	?	?	0.2	<0.1%	7.1
6266	6268	A	Redeposited natural in cut for Burial 6272	N	White, pale grey	Moderate	H	1	?	?	?	4.0	0.2%	18.0
6272	6268	A	Cremation burial	Y	White, pale grey	Moderate	H	1	?	?	?	23.2	1.4%	26.7
6294	6293	-	Cremation burial	N	White, pale grey, some mid to dark grey	Good	H	1	ad/a	12/18+	?	194.7	12.0%	38.4
6302	6303	A	Cremation burial	N	White, pale grey	Good	H?	1	?	?	?	8.8	0.5%	25.2
6304	6307	A	Redeposited pyre debris used to backfill grave for Burial 6305	N	White, pale grey	Good	H	1	?	?	?	6.6	0.4%	24.0
6305	6307	A	Cremation burial	N	White, pale grey	Moderate	?	1	?	?	?	0.4	<0.1%	7.0
6306	6307	A	Redeposited natural in base of cut for Burial 6305	N	White, pale grey	Moderate	H?	1	?	?	?	1.5	0.1%	21.2
6322	6303	A	Backfill of gawe for Burial 6302	N	White, pale to mid grey; 1 fragment green	Moderate	H	1	ad/a?	12/18+?	?	2.4	0.1%	13.6
6328	6303	A	Heat-affected sand at base of grave for Burial 6302	N	Buff/ white	Moderate	H?	1	?	?	?	0.8	<0.1%	13.9
6332	6331	B	Fill of grave (6331) containing urn (6336)	N	White	Good	H?	1	?	?	?	3.2	0.2%	17.7
6333	6331	B	Fill of urn 6336	Y	Buff/ white, pale grey	Moderate	?	1	?	?	?	0.2	<0.1%	12.7
6334	6303	A	Pyre debris used to backfill cremation grave for Burial 6302	N	White	Good	H?	1	ad/a?	12/18+?	?	3.5	0.2%	17.3
6335	6303	A	Pyre debris used to backfill cremation grave for Burial 6302	N	White	Good	H?	1	?	?	?	0.5	<0.1%	15.5
6336	6331	B	Urn	Y	White	Moderate	?	1	?	?	?	0.1	<0.1%	13.7
6338	6337		Fill of grave for Skeleton 6339, cremated bone from Burial 6393	N	Buff/ white, some pale grey	Good	H + A	1	ad/a	12/18+	?	105.3	6.5%	36.4
6339	6337		Cremated bone found with Skeleton 6339	N	Buff/ white, some pale grey	Moderate	? + A	1	?	?	?	2.3	0.1%	11.7
6341	6340		Cremation burial?	N	White	Good	H?	1	ad/a?	12/18+?	?	13.5	0.8%	28.0
6343	6342	B	Fill in base of grave to	N	White	Moderate	?	1	?	?	?	0.6	<0.1%	12.3

			cushion Burial 6361											
6349	6350	B	Cremation burial?	N	White, some pale grey	Good	H?	1	?	?	?	17.1	1.1%	33.0
6361	6342	B	Cremation burial	N	Pale to mid grey	Good	H? ?	1	?	?	?	8.6	0.5%	17.6
6362	?	B?	?	?	White	Good	H?	1	?	?	?	1.0	0.1%	17.6
6386	6387	B	Robbed cremation burial?	N?	White, some pale to mid grey	Good	H	1	a	18+	?	49.0	3.0%	32.4
6388	6389	B	Cremation burial?	N	White	Good	H?	1	?	?	?	18.9	1.2%	34.6
6398	6399	B	Dump of redeposited pyre debris?	N	White, some pale grey	Good	H?	1	?	?	?	4.3	0.3%	25.6
6434	6433	C	Fill of pit for ritual deposition of surplus cremation urns?	Y?	White, pale-mid-dark grey	Good	H? + A?	1	?	?	?	14.1	0.9%	29.6
6435	6436	C	Cremation burial?	N	White, some pale to mid grey	Good	H	1	ad/a?	12/18+?	?	239.2	14.7%	69.7

Key: ID: H – human, A – animal, ? – unknown; Age: f – foetus, n – neonate, i – infant, j – juvenile ad – adolescent, na – non-adult, ya – young adult, yma – young middle adult, oma – old middle adult, ma – mature adult, a – adult, ? – unknown; Sex: M – male, F – female, ? – unknown

* Weight of bone >2mm expressed as a percentage of average weight of bone >2mm recovered from modern cremation burials (1625.9g, McKinley 1993)

2.1 Preservation

Skeletal preservation depends upon a number of factors, including the age and sex of the individual as well as the size, shape and robusticity of the bone. Burial environment, post-depositional disturbance and treatment following excavation can also have a considerable impact on bone condition (Henderson 1987, Garland and Janaway 1989, Janaway 1996, Spriggs 1989). Preservation of human skeletal remains is assessed subjectively, depending upon the severity of bone surface erosion and post-mortem breaks, but disregarding completeness. Preservation is important, as it can have a large impact on the quantity and quality of information that it is possible to obtain from the skeletal remains.

2.1.1 Inhumation Preservation

Surface preservation, concerning the condition of the bone cortex, was assessed using the seven-category grading system defined by McKinley (2004a), ranging from 0 (excellent) to 5+ (extremely poor). Excellent preservation implied no bone surface erosion and a clear surface morphology, whereas extremely poor preservation indicated heavy and penetrating erosion of the bone surface resulting in complete loss of surface morphology and modification of the bone profile. Surface preservation could be variable throughout an individual skeleton, so the condition of the majority of bones in the skeleton was taken as the preservation grade for the whole skeleton. The degree of fragmentation was recorded, using categories ranging from 'minimal' (little or no fragmentation of bones) to 'extreme' (extensive fragmentation with bones in multiple small fragments). Finally, the completeness of the skeletons was assessed and expressed as a percentage: the higher the percentage, the more complete the skeleton.

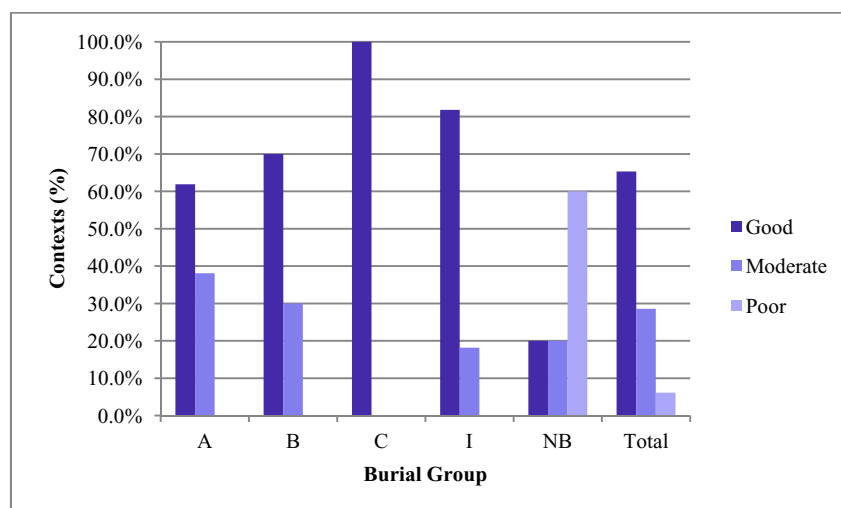
Both inhumation burials were less than 15% complete. Skeleton 6339 comprised of a few skull fragments (left temporal, part of the right mandible) a right femur shaft, a femur head and several unidentifiable small long bone fragments. Skeleton 6401 was represented by a partial cranium and mandible, several neck vertebrae, a femur midshaft and long bone fragments. Both skeletons were extremely fragmented, and preservation was poor (Grade 4), with erosion of the bone surfaces resulting in loss of surface detail. The lack of completeness, degree of surface erosion and amount of fragmentation all hindered the amount of information it was possible to gain from analysis of the skeletons.

2.1.2 Cremated Bone Preservation and Pyre Technology

Bone from the majority of the contexts was well preserved, and most of the remainder were moderately well preserved. Only a small percentage of deposits were poorly preserved (Table 7 and Graph 1). With the exception of Group C, bone from individual burials tended to be better preserved. The slightly poorer preservation of bone from Group A and Group B may be related to the greater degree of intercutting and disturbance of these contexts. Cremated bone from the non-burial contexts was the worst preserved (Table 7 and Graph 1). Those contexts associated with urns were either in a good or moderately good condition.

Table 7: Preservation of cremation deposits

Preservation	Group A		Group B		Group C		Individual		Non-Burial		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Good	13	61.9%	7	70.0%	2	100.0%	9	81.8%	1	20.0%	32	65.3%
Moderate	8	38.1%	3	30.0%	0	0.0%	2	18.2%	1	20.0%	14	28.6%
Poor	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	60.0%	3	6.1%
Total	21		10		2		11		5		49	

Graph 1: Preservation of cremation deposits

The weight of bone recovered from each individual context ranged from 0.1g (four contexts) to 250.4g (from Context 6254, from Urn 13). The mean weight of bone per context was 27.7g. When bone from multiple contexts within a feature was combined, assuming these contexts all derived from the same burial, the weight of bone per feature ranged from 0.1g (three features) to 250.4g (feature 6246), and the mean weight of bone per feature was 42.3g.

Only five features (15.6% of 32) contained an amount of bone weighing over 100g. Even these fell well short of the amount of bone produced during a modern adult cremation (1001.5-2422.5g; McKinley 1993), being the equivalent of between 6.6% and 15.4% of the expected weight. Over half the features (53.1%, 17/32) contained less than 1.0% of the expected weight of bone recovered from a modern adult cremation, weighing less than 17g. It seems that many burials had been truncated, and this has likely resulted in the loss of an unknown quantity of bone from each grave.

The maximum bone fragment size ranged from 5.8mm (Context 6214) to 69.7mm (Context 6435). The average maximum bone fragment size was 27.7mm per feature (or 23.9mm per context). The majority of the bone was in the middle sieved fraction on average, with the remainder distributed fairly evenly between the larger and smallest sieved fractions (Table 8).

Three features contained urned burials: 6057, 6268 and 6331. None contained a particularly large quantity of bone, although Burial 6057 was one of the four contexts at Waterdale to contain over 100g of bone: Burial 6057 contained 151.6g of bone in total, Burial 6268 contained 47.3g of bone in total, and Burial 6331 contained 3.5g of bone in total. The average amount of bone per urned burial (67.5g) was higher than the average amount from the remaining features (39.7g). All three urned burials had a high proportion of the bone in the middle and smallest sieved fractions: only 17.2% of the bone from burial 6057, 12.0% of the bone from burial 6268 and none of the bone from burial 6331 was in the 10mm sieved fraction. The maximum fragment sizes were also small, at 34.0mm for Burial 6057, 26.7mm for Burial 6268 and 17.7mm for Burial 6331.

When the features are considered divided into their burial groups, it is apparent that the largest mean weight of bone derived from the two burials in Group C (Table 8). The mean weights of bone from the individual burials and the burials from Group A were similar, but the burials from Group B contained a much lower mean weight. The lowest mean weight occurred in the non-burial features.

Table 8: Mean weight of cremated bone per burial group (features)

Burial Group	Sieve Fractions (mean weights)						Mean Total >2mm	Mean Total as % of modern*	Mean Max frag. mm
	10mm		5mm		2mm				
	g	%	g	%	g	%	g		
Group A	17.2	34.3	19.9	39.8	12.9	25.8	50.1	3.1	30.4
Group B	3.4	23.2	7.3	49.3	4.0	27.5	14.7	0.9	25.5
Group C	43.7	34.5	57.4	45.3	25.6	20.2	126.7	7.8	49.7
Individual Burials	13.0	21.8	30.3	50.8	16.3	27.4	59.6	3.7	31.0
Non Burial	0.3	76.2	<0.1	4.8	0.1	19.0	0.4	<0.1	11.1
Total	11.9	28.1	19.6	46.4	10.8	25.6	42.3	2.6	27.7

* Weight of bone >2mm expressed as a percentage of average weight of bone >2mm recovered from modern cremation burials (1,625.9g, McKinley 1993)

It is interesting to examine mean weights per context in each of the burial groups (Table 9). Group C retains its position, containing the greatest mean weight of bone per context. However, the contexts associated with the individual burials contained a much higher mean weight per context (54.2g) than did the contexts associated with Group A (19.1g). This contrasts with the greater degree of similarity of mean weight observed per feature between these two burial groups (see Table 8). The mean weight of bone per context in Group B was much more similar to that seen in Group A. This could relate to greater disturbance of the contexts within the burials of Group A and Group B compared to the individual burials.

Table 9: Mean weight of cremated bone per burial group (contexts)

Burial Group	Sieve Fractions (mean weights)						Mean Total >2mm	Mean Total as % of modern*	Mean Max frag. mm
	10mm		5mm		2mm				
	g	%	g	%	g	%	g		
Group A	6.5	34.3	7.6	39.8	4.9	25.8	19.1	1.2	22.8
Group B	2.4	23.2	5.1	49.3	2.8	27.5	10.3	0.6	21.7
Group C	43.7	34.5	57.4	45.3	25.6	20.2	126.7	7.8	49.7
Individual Burials	11.8	21.8	27.5	50.8	14.9	27.4	54.2	3.3	29.3
Non Burial	0.3	76.2	<0.1	4.8	0.1	19.0	0.4	<0.1	11.1
Total	7.8	28.1	12.8	46.4	7.1	25.6	27.7	1.7	23.9

* Weight of bone >2mm expressed as a percentage of average weight of bone >2mm recovered from modern cremation burials (1,625.9g, McKinley 1993)

Group A and Group C showed similar patterns of fragmentation on average (c. 34-35% in the largest sieved fraction, and 20-26% in the smallest sieved fraction), and Group B and the individual burials had similar patterns of fragmentation (22-23% in the largest fraction, and around 27.5% in the smallest fraction). The non-burials differed in that on average three-quarters of the bone was in the largest sieved fraction, and most of the remainder was in the smallest fraction (see Table 8 and Table 9). However, the mean maximum fragment size of the non-burials was small, at 11.1mm, indicating that although most of the bone was in the 10mm sieved fraction the fragments were not particularly large. The fragmentation data for each context and feature is given in Table 10.

Table 10: Cremated bone fragmentation per context and per feature

Cut	Context	Sieve Fractions						Total >2mm	Total as % of modern*	<2mm	Total	Max frag.
		10mm		5mm		2mm						
		g	%	g	%	g	%	g		g	mm	
Group A												
6250	6248	3.5	15.4	9.0	39.6	10.2	44.9	22.7	1.4	0.6	23.3	30.84
	6249	6.0	51.7	3.9	33.6	1.7	14.7	11.6	0.7	0.1	11.7	35.49
	Total	9.5	27.7	12.9	37.6	11.9	34.7	34.3	2.1	0.7	35.0	35.49
6268	6251	0.7	5.0	7.1	50.4	6.3	44.7	14.1	0.9	0.2	14.3	19.11
	6252	0.0	0.0	1.1	57.9	0.8	42.1	1.9	0.1	0.0	1.9	21.93
	6253	0.5	12.2	2.3	56.1	1.3	31.7	4.1	0.3	0.0	4.1	24.43
	6266	0.0	0.0	1.5	37.5	2.5	62.5	4.0	0.2	0.0	4.0	17.99
	6272	4.8	20.7	9.5	40.9	8.9	38.4	23.2	1.4	0.2	23.4	26.68
	Total	6.0	12.7	21.5	45.5	19.8	41.9	47.3	2.9	0.4	47.7	26.68
6269	6256	3.0	34.1	4.3	48.9	1.5	17.0	8.8	0.5	0.0	8.8	34.52
	6257	1.2	20.0	3.3	55.0	1.5	25.0	6.0	0.4	0.0	6.0	25.68
	Total	4.2	28.4	7.6	51.4	3.0	20.3	14.8	0.9	0.0	14.8	34.52
6303	6261	0.0	0.0	0.0	0.0	0.2	100.0	0.2	0.0	0.0	0.2	7.14
	6302	0.6	6.8	5.5	62.5	2.7	30.7	8.8	0.5	0.0	8.8	25.20
	6322	0.0	0.0	1.7	70.8	0.7	29.2	2.4	0.1	0.0	2.4	13.55
	6328	0.0	0.0	0.3	37.5	0.5	62.5	0.8	0.0	0.0	0.8	13.86
	6334	0.0	0.0	1.3	37.1	2.2	62.9	3.5	0.2	0.3	3.8	17.33
	6335	0.0	0.0	0.4	80.0	0.1	20.0	0.5	0.0	0.0	0.5	15.50
	Total	0.6	3.7	9.2	56.8	6.4	39.5	16.2	1.0	0.3	16.5	25.20
6307	6304	1.0	15.2	2.6	39.4	3.0	45.5	6.6	0.4	0.1	6.7	23.99
	6305	0.0	0.0	0.0	0.0	0.4	100.0	0.4	0.0	0.0	0.4	7.03
	6306	0.0	0.0	1.0	66.7	0.5	33.3	1.5	0.1	0.0	1.5	21.21
	Total	1.0	11.8	3.6	42.4	3.9	45.9	8.5	0.5	0.1	8.6	23.99
6267	6247	2.8	10.0	15.4	55.2	9.7	34.8	27.9	1.7	0.4	28.3	29.16
6246	6254	113.4	45.3	88.6	35.4	48.4	19.3	250.4	15.4	11.2	261.6	53.03
6301	6258	0.0	0.0	0.7	63.6	0.4	36.4	1.1	0.1	0.0	1.1	14.75
Group B												
6331	6332	0.0	0.0	2.3	71.9	0.9	28.1	3.2	0.2	0.0	3.2	17.68
	6333	0.0	0.0	0.1	50.0	0.1	50.0	0.2	0.0	0.0	0.2	12.65
	6336	0.0	0.0	0.0	0.0	0.1	100.0	0.1	0.0	0.0	0.1	13.70
	Total	0.0	0.0	2.4	68.6	1.1	31.4	3.5	0.2	0.0	3.5	17.68
6342	6343	0.0	0.0	0.0	0.0	0.6	100.0	0.6	0.0	0.0	0.6	12.29
	6361	0.0	0.0	3.6	41.9	5.0	58.1	8.6	0.5	0.1	8.7	17.64
	Total	0.0	0.0	3.6	39.1	5.6	60.9	9.2	0.6	0.1	9.3	17.64

6350	6349	3.7	21.6	8.9	52.0	4.5	26.3	17.1	1.1	0.0	17.1	33.03
?	6362	0.0	0.0	0.6	60.0	0.4	40.0	1.0	0.1	0.0	1.0	17.64
6387	6386	13.9	28.4	23.1	47.1	12.0	24.5	49.0	3.0	0.9	49.9	32.39
6389	6388	6.3	33.3	9.7	51.3	2.9	15.3	18.9	1.2	0.1	19.0	34.58
6399	6398	0.0	0.0	2.5	58.1	1.8	41.9	4.3	0.3	0.0	4.3	25.61
Group C												
6433	6434	2.7	19.1	8.5	60.3	2.9	20.6	14.1	0.9	0.0	14.1	29.62
6436	6435	84.7	35.4	106.3	44.4	48.2	20.2	239.2	14.7	5.9	245.1	69.70
Individual Burials												
6337	6338	49.9	47.4	51.8	49.2	3.6	3.4	105.3	6.5	1.7	107.0	36.44
	6339	0.0	0.0	1.0	43.5	1.3	56.5	2.3	0.1	0.0	2.3	11.66
	Total	49.9	46.4	52.8	49.1	4.9	4.6	107.6	6.6	1.7	109.3	36.44
3010	3011	0.0	0.0	7.5	83.3	1.5	16.7	9.0	0.6	0.0	9.0	31.65
3013	3012	5.6	13.5	24.4	58.7	11.6	27.9	41.6	2.6	0.6	42.2	28.03
3020	3019	0.0	0.0	0.6	85.7	0.1	14.3	0.7	0.0	0.0	0.7	11.04
6056	6057	26.1	17.2	78.1	51.5	47.4	31.3	151.6	9.3	6.8	158.4	33.99
6126	6127	12.3	43.3	12.9	45.4	3.2	11.3	28.4	1.7	0.6	29.0	42.76
6130	6131	7.8	16.8	24.7	53.1	14.0	30.1	46.5	2.9	0.4	46.9	31.75
6139	6140	1.0	40.0	1.4	56.0	0.1	4.0	2.5	0.2	0.0	2.5	28.04
6293	6294	18.2	9.3	98.1	50.4	78.4	40.3	194.7	12.0	2.1	196.8	38.39
6340	6341	8.8	65.2	2.5	18.5	2.2	16.3	13.5	0.8	0.0	13.5	28.00
Non Burials												
-	6099	1.6	100.0	0.0	0.0	0.0	0.0	1.6	0.1	0.0	1.6	18.44
6134	6135	0.0	0.0	0.1	50.0	0.1	50.0	0.2	0.0	0.0	0.2	15.83
6156	6156	0.0	0.0	0.0	0.0	0.1	100.0	0.1	0.0	0.0	0.1	7.26
6186	6187	0.0	0.0	0.0	0.0	0.1	100.0	0.1	0.0	0.0	0.1	8.37
6214	6214	0.0	0.0	0.0	0.0	0.1	100.0	0.1	0.0	0.0	0.1	5.78

* Weight of bone >2mm expressed as a percentage of average weight of bone >2mm recovered from modern cremation burials (1,625.9g, McKinley 1993)

The colour of cremated bone is connected to the temperature of the pyre, amount of oxygen available during burning, and the duration of the cremation. High temperatures (c. 600°C and over) and plentiful oxygen will result in fully oxidised white bone given adequate time, whereas temperatures between c.300-600°C and/or lack of oxygen will result in partially oxidised bone ranging in colour from dark to pale grey (McKinley 2004a). Temperatures below c. 300°C and absence of oxygen will lead to charring of the bone, expressed as brown and black colours (*ibid*).

All contexts contained bone that was predominantly buff/white (see Table 6), possibly with some pale grey colouration, indicating the bone tended to be well burnt (i.e. had experienced high temperatures, plentiful oxygen supplies and burnt for a sufficient length of time to achieve full oxidation). Nine contexts (18.4% of 49) had some fragments that displayed darker shades of grey, and one had a couple of black fragments. The latter contexts may have been slightly less well burnt,

perhaps through slightly lower temperatures, a shorter burning duration, or inadequate oxygen supply, although pyre conditions were still sufficiently hot and oxygenated enough to allow most of the bone to achieve full oxidation. Most of the slightly less-well burnt contexts derived from the grouped cremation burials: four contexts from Group A (three burials); two from Group B; and both contexts from Group C. Only one context from the individual burials had slightly less well-oxidised bone present (Context 6294 from Feature 9293). Interestingly, it was found that alder had been used as pyre fuel in this case instead of oak, which was the favoured fuel in the other cremations (Miller 2012).

Twenty-one contexts contained definite fragments of human bone and seventeen contained possible human bone. One of the former contexts (6338) and one of the latter contexts (6434) also contained possible fragments of animal bone. Two further contexts also contained animal or possible animal bone, but the rest of the bone from these contexts was unidentifiable as to species (6258 and 6339). Bone from the remaining nine contexts could not be identified to species. This does not mean that human bone was not present, just that none could be identified during analysis. These burials all contained small quantities of bone (less than 1g each), and generally small fragment sizes. These factors make it more difficult to find identifiable bone fragments. Unsurprisingly, all the heavier contexts (all those over 20g in weight) which tended to have larger fragment sizes contained identifiable fragments of human bone.

Seven of the eight burials in Group A contained definite human bone, and one contained unidentified bone with some animal bone present (Context 6285 from Burial 6301). Of the 21 contexts from the Group A burials, all but three contained either definite or possible human bone. In comparison, one of the seven burials in Group B contained definite human bone and the remaining six contained possible human bone. Three of the ten contexts associated with Group B contained unidentified bone and only one context contained definite human bone. This probably reflects the smaller bone weights and greater fragmentation of the Group B contexts. The larger of the two Group C burials (Context 6435 from Burial 6436) contained definite human bone, but the smaller burial contained possible human and possible animal bone. Seven of the ten individual burials contained definite human bone, two of which also contained animal bone (Contexts 6338 and 6339 from Burial 6337). Three of the ten individual burials contained possible human bone. The five features identified as non-burials all contained small quantities of highly fragmented bone, and it is not surprising that bone from four of these contexts could not be identified to species. The fifth context contained possible human bone.

The proportion of identified bone within each context ranged from 0.8% to 68.0% (Table 11). However, the proportion of identified bone was generally small, reflecting the small fragment sizes: eleven of 24 contexts contained less than 5.0% identified bone, and the average proportion of bone identified per context was 24.0% (Table 13).

Table 11: Proportions of identified fragments per context and per feature

Cut	Burial	Identified Bone								Total ID	
		Skull		Axial		Upper Limb		Lower Limb			
		g	%	g	%	g	%	g	%	g	%
Group A											
6250	6248	0.1	16.7	0.0	0.0	0.5	83.3	0.0	0.0	0.6	2.6
	6249	0.0	0.0	0.3	100.0	0.0	0.0	0.0	0.0	0.3	2.6
	Total	0.1	11.1	0.3	33.3	0.5	55.6	0.0	0.0	0.9	2.6
6268	6251	2.4	100.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	17.0

	6253	1.2	100.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	29.3
	6266	0.1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.5
	6272	5.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	21.6
	Total	8.7	100.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	18.4
6269	6256	0.2	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.3
	6257	0.0	0.0	0.1	8.3	1.1	91.7	0.0	0.0	1.2	20.0
	Total	0.2	14.3	0.1	7.1	1.1	78.6	0.0	0.0	1.4	9.5
6303	6322	0.3	60.0	0.2	40.0	0.0	0.0	0.0	0.0	0.5	20.8
	6334	0.0	0.0	0.0	0.0	0.0	0.0	0.6	100.0	0.6	17.1
	Total	0.3	27.3	0.2	18.2	0.0	0.0	0.6	54.5	1.1	6.8
6307	6304	0.0	0.0	0.1	100.0	0.0	0.0	0.0	0.0	0.1	1.5
	Total	0.0	0.0	0.1	100.0	0.0	0.0	0.0	0.0	0.1	1.2
6267	6247	0.9	90.0	0.1	10.0	0.0	0.0	0.0	0.0	1.0	3.6
6246	6254	69.9	77.2	9.0	9.9	7.6	8.4	4.1	4.5	90.6	36.2
Group B											
6342	6361	0.3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.5
	Total	0.3	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	3.3
6387	6386	0.0	0.0	0.4	30.8	0.9	69.2	0.0	0.0	1.3	2.7
Group C											
6433	6434	0.9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	6.4
6436	6435	1.1	55.0	0.9	45.0	0.0	0.0	0.0	0.0	2.0	0.8
Individual Burials											
6337	6338	6.9	46.3	0.8	5.4	7.2	48.3	0.0	0.0	14.9	14.2
	Total	6.9	46.3	0.8	5.4	7.2	48.3	0.0	0.0	14.9	13.8
3013	3012	3.1	58.5	1.3	24.5	0.9	17.0	0.0	0.0	5.3	12.7
6056	6057	17.0	90.4	0.4	2.1	0.0	0.0	1.4	7.4	18.8	12.4
6126	6127	0.5	45.5	0.0	0.0	0.6	54.5	0.0	0.0	1.1	3.9
6130	6131	3.9	100.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	8.4
6139	6140	0.0	0.0	0.4	23.5	1.3	76.5	0.0	0.0	1.7	68.0
6293	6294	3.2	62.7	0.2	3.9	1.7	33.3	0.0	0.0	5.1	2.6

Skull fragments made up 73.5% of the identified bone on average, followed by the upper limb (13.7%), axial skeleton (8.9%) and lower limb (3.8%; Table 12). The high proportion of skull fragments can be explained by the fact that they are easy to identify even when highly fragmented (McKinley 2004c, 298-299). Identified bone from the skull included the frontal bone (forehead), parietal bones (sides of the vault), temporal bone (at the sides of the cranium supporting the ears), zygomatic bone (cheekbones), mandible (lower jaw), and generic vault fragments. Tooth fragments, predominantly roots, were frequently observed. The upper limb was represented by a few fragments of scapula (shoulder blade), radius and ulna (forearm bones), lunate bones (from the wrist) and phalanges (finger bones). The lower limb was only represented by a couple of os coxa (pelvis) fragments and a possible metatarsal fragment (from the arch of the foot). The axial skeleton

was mainly represented by vertebra fragments, usually thoracic vertebrae (which bear the ribs), although some rib fragments were observed. The presence some small bones from the wrist and fingers, as well as tooth fragments, suggests that either care was taken to recover them, or that the remains were scooped up in some way. Long bone fragments were present in many burials, but could not be identified to specific bone elements.

Table 12: Mean proportions of identified fragments per burial group (contexts)

Burial Group	Number of Contexts	Identified Bone (mean weights)								Total ID (mean weights)	
		Skull		Axial		Upper Limb		Lower Limb			
		g	%	g	%	g	%	g	%	g	%
Group A	13	6.2	77.2	0.8	9.4	0.7	8.9	0.4	4.5	8.0	41.9
Group B	2	0.2	18.8	0.2	25.0	0.5	56.3	0.0	0.0	0.8	7.8
Group C	2	1.0	69.0	0.5	31.0	0.0	0.0	0.0	0.0	1.5	1.1
Individual Burials	7	4.9	68.1	0.4	6.1	1.7	23.0	0.2	2.8	7.3	13.4
Total	24	4.9	73.5	0.6	8.9	0.9	13.7	0.3	3.8	6.6	24.0

Contexts from Group A contained the highest proportion of identified fragments on average (41.9%), followed by the individual burials (13.4%, see Table 12). The contexts from Group C contained the lowest proportion of identified fragments (1.1%). This is due to the fact that only 2.0g of bone could be identified from Context 6435, despite the fact that this contained a relatively large amount of bone (239.2g). Most of the identified bone from most of the burial groups comprised of skull fragments, with the exception of the contexts from Group B, where upper limb fragments predominated (see Table 12). Upper limb fragments were also relatively common among the individual burials.

Four contexts contained animal or possible animal bone in addition to human or unidentified bone. These were Context 6258 (Burial 6301 from Group A), Context 6434 (Burial 6433 from Group C), and Contexts 6338 and 6339 from Burial 6337. They all contained small quantities of animal bone, making up between 0.7% and 27.3% of the weight of bone from each context (Table 13).

Table 13: Animal bone

Context	Feature	Weight of animal bone (g)	Proportion of total context weight (%)
6258	6301	0.3	27.3
6338	6337	2.8	2.7
6339	6337	0.2	8.7
6434	6433	0.1	0.7

2.2 Minimum Number of Individuals

A count of the 'minimum number of individuals' (MNI) recovered from a cemetery is carried out as standard procedure in osteological reports on inhumations in order to establish how many individuals are represented by the articulated and disarticulated human bones (without taking the archaeologically defined graves into account). The MNI is calculated by counting all long bone ends, as well as other larger skeletal elements recovered. The largest number of these is then taken as the MNI. The MNI is likely to be lower than the actual number of skeletons which would have been interred on the site, but represents the minimum number of individuals which can be scientifically proven to be present.

The inhumation burials represented the remains of a minimum of two individuals, as there were two left temporal bones (petrous portions) present.

The cremation burials represented an overall minimum of three individuals, based on three frontal bones (internal frontal crest present). The fact that the MNI is so much lower than the number of archaeologically identified features reflects the small amount of bone recovered from most of the features, and the degree of fragmentation. The MNI within each context was also determined, and all contexts contained a minimum of one individual.

2.3 Assessment of Age

Age was determined using standard ageing techniques, as specified in Scheuer and Black (2000a; 2000b) and Cox (2000). For non-adults age is usually estimated using the stage of dental development (Moorrees *et al.* 1963a; 1963b), dental eruption (Ubelaker 1989), measurements of long bones and other appropriate elements, and the development and fusion of bones (Scheuer and Black 2000b). In adults, the most reliable methods for estimating age are based on stages of bone development and degeneration in the pelvis (Brooks and Suchey 1990, Lovejoy *et al.* 1985) and ribs (modified version of methods developed by İşcan *et al.* 1984; 1985 and İşcan and Loth 1986 provided in Ubelaker 1989). These methods are usually supplemented through examination of patterns of dental wear (Brothwell 1981, Miles 1962).

The individuals were divided into a number of age categories. Non-adults were subdivided into 'foetus' (f: where the age estimate clearly fell below 38-40 *weeks in utero*), 'perinate' (p: where the age estimates converged around birth), 'neonate' (n: where the age estimate suggested 0-1 month), 'infant' (i; 1-12 months), juvenile (j; 1-12 years), and adolescent (ad; 13-17 years). Adults were divided into 'young adult' (ya; 18-25 years), young middle adult (yma; 26-35 years), old middle adult (oma; 36-45 years), and mature adult (46+ years). A category of 'adult' (a) was used to designate those individuals whose age could not be determined beyond the fact that they were eighteen or older. However, it is important to note that several studies (for example Molleson and Cox 1993, Molleson 1995, Miles *et al.* 2008) have highlighted the difficulty of accurately determining the age-at-death of adults from their skeletal remains, with age-at-death frequently being underestimated for older individuals. The categories defined here should be taken as a general guide to the relative physiological age of the adult, rather than being an accurate portrayal of the real chronological age.

2.3.1 Inhumation Age-at-Death

The poor preservation of the Waterdale skeletons meant that the only methods available to estimate age were development (both dental and skeletal), and dental wear, as the relevant parts of the pelvis and ribs were not preserved in any of the burials. The problem with dental wear is that it is influenced by diet. Individuals consuming a coarse, gritty diet will experience greater degrees of dental wear (and so appear older) than individuals consuming a fine, soft diet (who will appear younger). Since the Waterdale population was Roman, it is likely that the degree of wear experienced was reasonably comparable with the populations on which the age estimation methods were developed.

Skeleton 6339 was probably an older adolescent, but could have been a young adult. The upper third molar roots were still in the process of formation, suggesting an age of around sixteen to eighteen years (Hillson 1996, 123, 133). The severity of dental wear was relatively slight, consistent with this individual being an adolescent or young adult.

Skeleton 6401 was probably over 35 years of age, based on the severity of dental wear seen on their lower second molar, and the fusion of the jugular growth plate (a small suture in the base of the skull which fuses between the ages of 22-34 years, Scheuer and Black 2000b, 59).

2.3.2 *Age Distribution of the Cremation Burials*

Age estimation was more challenging for the cremated remains due to the small quantities of bone recovered and the amount of fragmentation, which meant that the necessary parts for age estimation were not present.

Three contexts (3012, 6057 and 6127) possibly contained the remains of non-adults (3/49, 6.1%), all of which were individual cremation burials, and one of which was urned. The proportion of features containing non-adults was 9.4% (3/32). Unfortunately, it was not possible to provide a narrower age estimate, other than that the individuals were possibly under the age of eighteen.

Two contexts definitely contained the remains of adults (6254 and 6386), and a third probably contained the remains of an adult (6131). One was from Group A, one from Group B, and the third was an individual burial. The proportion of contexts containing adults was 6.1%, (3/49) and the proportion of features was 9.4% (3/32). Again, it was not possible to provide a more precise age estimate for these individuals.

Three contexts contained the remains of an adolescent or adult individual (i.e. over twelve years of age), and eight probably contained an adolescent or adult individual. Overall, 22.4% of the contexts contained adolescents/adults (11/49). Six of these contexts came from Group A, one came from Group C, three from individual burials, and one from a non-burial context (buried soil, 6099). Two of the contexts from Group A (6322 and 6334) came from the same feature (6303), so the number of features containing adolescents/adults was ten (31.3% of 32).

It was not possible to determine the age of the individuals from the remaining contexts.

2.4 **Sex Determination**

Sex determination was carried out using standard osteological techniques, such as those described by Mays and Cox (2000). Assessment of sex involves examination of the shape of the skull and the pelvis and can only be carried out once sexual characteristics have developed, during late puberty and early adulthood. Evidence from the pelvis was favoured as its shape is directly linked to biological sex (the requirements of childbirth in females) whereas the shape of the skull can be influenced by factors such as age (Walker 1995). Measurements of certain bones were used to supplement the morphological assessment (Bass 1987).

2.4.1 *Sex of the Inhumations*

Unfortunately, it was not possible to determine the sex of either individual. Although the cranium of Skeleton 6401 had two possibly male traits visible, the severity of erosion and damage made most traits difficult or impossible to assess. On balance it was felt there was insufficient evidence to support a sex estimate for this skeleton. Skeleton 6339 was probably an adolescent, and so sex estimation would not normally be attempted. Again poor preservation meant that only one or two of the relevant parts of the cranium had survived anyway.

2.4.2 *Sex Distribution of the Cremated Bone Assemblages*

Unfortunately, it was not possible to determine the sex of any of the individuals from the cremated contexts.

2.5 Metric Analysis

Unfortunately, the amount and severity of fragmentation of the inhumation burials meant that very few measurements could be taken. It was not possible to calculate stature for either individual, nor was it possible to calculate indices to describe skull shape (cranial indices) or leg bone shape (*platymeric* and *platycnemic* indices).

Bone from the cremation burials was not measured, partly due to the amount of fragmentation present, but also due to the fact that cremated bone suffers a variable amount of shrinkage during the cremation process (anywhere from 0-25%; McKinley 2000, 406).

2.6 Non-Metric Traits

Non-metric traits are additional sutures, facets, bony processes, canals and foramina, which occur in a minority of skeletons and are believed to suggest hereditary affiliation between skeletons (Saunders 1989). The origins of non-metric traits have been extensively discussed in the osteological literature and it is now thought that while most non-metric traits have genetic origins, some can be produced by factors such as mechanical stress (Kennedy 1989) or environment (Trinkhaus 1978). A total of thirty cranial (skull) and thirty post-cranial (bones of the body and limbs) non-metric traits were selected from the osteological literature (Buikstra and Ubelaker 1994; Finnegan 1978; Berry and Berry 1967) and recorded.

2.6.1 Inhumation Burials

It was only possible to record the presence or absence of some cranial non-metric traits in one individual, Skeleton 6401 (old middle/ mature adult). This skeleton had an *extrasutural mastoid foramen* on the left side, where a small hole behind the ear was located outside of a suture rather than inside it. It was not possible to record post-cranial non-metric traits in any individuals.

2.6.2 Cremated Bone Assemblages

Only one non-metric trait was observed among the cremated remains. The adult individual from Context 6254 (Burial 6246) had a left *accessory supraorbital foramen*, a small additional hole above the left orbit.

2.7 Conclusion

The poor preservation of the inhumation burials (which were both incomplete, extremely fragmented and with loss of surface detail from the bones) had a detrimental impact on the data it was possible to obtain through osteological analysis. Nevertheless, it was possible to determine that one of the inhumation burials was probably that of an older adolescent aged sixteen to eighteen years, and the other was an adult probably aged over 35 years at the time of death. It was not possible to determine the sex of the individuals, nor undertake metric analysis.

None of the features containing cremated remains yielded anywhere near the amount of bone that might be expected for an adult cremation burial. The largest burial weighed 250.4g, and the average weight of bone per feature was 42.3g. It is likely that much of the bone had been lost through truncation or disturbance of the graves. Bone from the cremation deposits tended to be fairly fragmented. All contexts contained fully oxidised bone, but 18% also contained some less well burnt fragments, where some bone was only partially oxidised. A high percentage of the identified bones were skull fragments (a typical finding for cremated bone), but bones from the upper limb (shoulder, forearm, wrist and hand), torso (spine and ribs), and lower limb (pelvis and foot) were also present. Four contexts (three features) also contained a small quantity of animal bone. Bone from nine contexts could not be identified to species.

The small quantities of bone present in most contexts and the amount of fragmentation hindered analysis of the demography of the cremated population. Three features contained adults, and three

possibly contained non-adults. A third of the features contained individuals who were either adolescents or adults. The age of the remaining individuals could not be determined, and it was not possible to determine the sex of any of the individuals.

One of the eight burials in Group A contained the remains of an adult, and five contained the remains of an adolescent or adult. One of the seven burials in Group B contained an adult, and one of the two burials from Group C contained an adolescent/adult. The nine individual burials included one adult, three adolescent/adults and three possible non-adults. The remains of an adolescent/adult were also present in a buried soil.

3 Pathological analysis

Pathological conditions (disease) can manifest themselves on the skeleton, especially when these are chronic conditions or the result of trauma to the bone. The bone elements to which muscles attach can also provide information on muscle trauma and excessive use of muscles. All bones were examined macroscopically for evidence of pathological changes. Fuller descriptions of the pathological lesions observed can be found in Appendix A.

No pathological conditions were observed in any of the inhumation or cremation burials.

4 Dental health

Analysis of the teeth from archaeological populations provides vital clues about health, diet and oral hygiene, as well as information about environmental and congenital conditions (Roberts and Manchester 2005). All teeth and jaws were examined macroscopically for evidence of pathological changes.

4.0.1 Inhumation Burials

Skeleton 6339 (16-18 year old adolescent) and Skeleton 6401 (old middle/ mature adult) had partial dentitions. Between them they had 25 identifiable teeth (not counting those where only the roots survived) and ten tooth positions (Table 14). No teeth had been lost post-mortem.

Table 14: Dental disease summary

Sk No	Teeth	Sockets	Lost PM		Lost AM		Calculus		Caries		Abscess		DEH	
			n	%	n	%	n	%	n	%	n	%	n	%
6339	23	8	0	0.0%	0	0.0%	3	13.0%	0	0.0%	0	0.0%	0	0.0%
6401	2	2	0	0.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	25	10	0	0.0%	1	10.0%	3	12.0%	0	0.0%	0	0.0%	0	0.0%

* possible developmental absence rather than AMTL

4.0.2 Cremation Burials

Although many cremation burials contained fragments of teeth, these mostly comprised tooth roots. No dental pathology was observed.

4.1 Calculus

If plaque is not removed from the teeth effectively (or on a regular basis) then it can mineralise and form concretions of calculus on the tooth crowns or roots (if these are exposed), along the line of the gums (Hillson 1996, 255-257). Mineralisation of plaque can also be common when the diet is high in protein (Roberts and Manchester 2005, 71). Calculus is commonly observed in archaeological

populations of all periods, although poor preservation or damage caused during cleaning can result in the loss of these deposits from the teeth (Roberts and Manchester 2005, 64).

Flecks of calculus were seen on three teeth from the adolescent individual (Skeleton 6339). Overall, the proportion of teeth with calculus was 12.0% (see Table 14), which was low in comparison with the average of 43.4% observed in the Roman period (Roberts and Cox 2003, 132). It is highly likely that traces of calculus had been lost from the teeth at Waterdale through post-mortem damage and erosion.

4.2 Ante-mortem tooth loss

Ante-mortem tooth loss (AMTL), or the loss of teeth during life, can occur as a result of a variety of factors, including dental caries (tooth decay), pulp-exposure from heavy tooth wear, or periodontal disease (occurring when inflammation of the gums, gingivitis, spreads to the underlying bone). Gingivitis can result when deposits of calculus on the teeth aggravate the gums. Once the tooth has been lost, the empty socket is filled in with bone (Hillson 1996, Roberts and Manchester 2005).

Skeleton 6401 (old middle/ mature adult) had lost their lower left first molar during life. AMTL tends to increase with age, so this is consistent with the likely older age of this individual. Overall, the frequency of AMTL was 10.0% (see Table 14), which was slight lower than the average frequency reported for the Roman period (14.0%, Roberts and Cox 2003, 136).

4.3 Dental anomalies

The lower right second premolar of Skeleton 6339 (16-18 year old adolescent) was rotated slightly.

4.4 Dental Conclusions

The evidence for dental health in this population was limited. The adolescent had flecks of calculus on three of their teeth possibly as a result of poor dental hygiene, and a rotated second premolar. The older adult had experienced the loss of a tooth during life, something which tends to occur with increasing age following other dental diseases.

It was not possible to observed dental disease in the cremated remains.

5 FUNERARY ARCHEOLOGY

The skeletal remains excavated at Waterdale all dated to the Roman period. Cremation burials took place in the early Roman period, in the late first to mid second century AD, corresponding with the period of use of the nearby Roman fort (Bell 2011, 15). Two individuals had been interred in the late Roman period, in the late third to early fourth century AD. This corresponds with the general shift from cremation to inhumation during the second century AD seen across many areas of Britain (Hope 1999, 55), although some sites in northern England have produced cremation burials dating to the late second, third or fourth centuries AD. The latter include Brougham, Cumbria (Cool 2004), Petty Knowes, Northumberland (Charlton and Mitcheson 1984), and Lanchester, County Durham (Turner 1990), all of which were also in the vicinity of Roman forts.

5.1 Early Roman cremation burials

There were 49 contexts from 32 features containing cremated material. Twenty-seven of these features were thought to be cremation burials, and five were probably non-burial related features. It is possible that the bone within the latter came from disturbed cremation burials. There was evidence that many graves had been severely truncated, and one had possibly been robbed, and this has no doubt resulted in the loss of bone from these burials. This level of disturbance hinders understanding of the nature of the deposits and interpretation of the features.

Roman cremation cemeteries are relatively rare and it is more common for a small number of cremation burials to be found in larger inhumation cemeteries, such as at Driffeld Terrace (Caffell and Holst 2012). One Roman cremation cemetery has been excavated at Brougham, Cumbria (Cool 2004). The cemetery was in use during the third to early fourth century AD, and cremated bone was recovered from 322 contexts and 241 features (McKinley 2004c, 283), so this cemetery was much larger and of a later date than the cemetery at Waterdale. A range of cremation related deposits were identified at Brougham, including urned and unurned burials (some with redeposited pyre debris in the fill), accessory burials, formal deposits of pyre debris, deliberately emptied graves, and cenotaphs (i.e. undisturbed groups of pots with little or no human bone present, Cool 2004, 18; McKinley 2004c, 284). Four undisturbed deposits at Brougham were interpreted as cenotaphs (McKinley 2004b, 307). At Waterdale one fairly complete pottery vessel (Vessel 6359 in Cut 6358) had apparently been deposited deliberately but it did not contain cremated bone, and this could be interpreted as a cenotaph. The deposit 6434, which contained large quantities of pottery fragments but relatively little in the way of cremated bone (14.1g), may also be of a similar nature. McKinley (2000b, 42-43; 2004c, 306-607) has discussed the possible meaning and significance of such deposits, which occur in several Roman period cemeteries. She suggests that memorial deposits may have been made when the cremated remains of the individual were buried elsewhere, and that this may have occurred in particular with soldiers or military leaders who died away from home. In these instances, the individual may have been cremated, their remains transported back to their home, and a memorial created for them where they died. Given the possible association of the cemetery with the Roman fort at Danum, the possible cenotaph deposits at Waterdale may represent such memorials to soldiers whose remains were transported elsewhere for burial. However, Cool (2004, 457-460) has suggested 'empty' vessels may have contained other substances and been deposited for magical or ritual reasons, perhaps as an offering to the dead in the years after their funeral.

It is possible that some of the contexts or features interpreted as cremation burials at Waterdale actually contain redeposited pyre debris, particularly since it was reported that fragments of melted glass vessels were frequently present (Bell 2011, 10). At Brougham, it was noted that redeposited pyre debris was more likely to contain evidence for pyre goods (in the form of melted glass vessels, burnt bone veneers and copper alloy fragments) than were the urned cremation burials, although pyre goods were also present in smaller frequencies among the cremation burials (Cool 2004, 16-18). McKinley (2000b, 41) observed that pyre debris tends to contain a mix of fuel ash, burnt flint or stone, burnt clay, fuel ash slag, fragments of cremated bone and pyre goods, whereas the bone collected for burial tends not to be mixed with the other debris. However, pyre debris may be deposited with the burial, i.e. the bone collected for burial is placed in an urn or other container and pyre debris may be placed beneath, around on or top of the burial (*ibid.*).

One of the features in Group B at Waterdale had possibly been robbed. Four graves from Brougham were also interpreted as having been robbed or emptied deliberately of their contents (Cool 2004, 16).

Three features at Waterdale contained urned burials (6056, 6268 and 6331), and it is possible that at least some of the remaining burials were contained within organic receptacles. The proportion of urned burials at Waterdale was therefore 9.4% (3/32). At Brougham, the number of urned burials was 123, with nine unurned burials and 65 deposits of pyre debris (Cool 2004, 444-455). The proportion of urned burials at Brougham was 62.4% (of all cremation-related features), or 93.2% of contexts identified as cremation burials. One of the three urned burials at Waterdale contained an adolescent or adult individual (Feature 6268), another possibly contained a non-adult (Feature 6056), and the remaining burial contained an individual of unknown age.

The cremation-related deposits at Waterdale were associated with a central feature (6432), described as a 'slightly amorphous sub-circular area' 2.5-4.0m in diameter, and comprising heavily heat-affected sand and gravel (Bell 2011, 10). This feature was interpreted as the location of a funeral pyre. No cremation burials were found within c. 20m of the central feature, although there

was a single posthole (6418) immediately adjacent to it. The majority of the cremation-related deposits were located to the north-west and west of the central feature, although two clusters of burials occurred to the east and south-east. A number of other features formed an arc around the west, south and east of the central feature. Since the central feature was located near the north-eastern corner of the trench, it is not clear whether any burials were located to the north and east.

There was no evidence for a permanent pyre location at Brougham, although it is possible that any evidence for a pyre site (which would have been subtle) may have been lost during excavation, which took place as a rescue excavation during the mid 1960s (Cool 2004, 440). At Petty Knowes, Northumberland, the funerary rite involved cremation *in situ*. The bone was then either collected and placed in a container in a pit beneath the pyre, or scraped with the pyre debris into the pit. A ditch was dug around the grave, and a mound was erected above it (Charlton and Mitcheson 1984). At Trentholme Drive in York, which was in use from 140 AD to 400 AD, 40 cremation burials were excavated and an *ustrina*, or cremation pyre site, was found with a spread of debris around it up to a 10m radius (Wenham 1968, 21). The layer contained burnt wood, coal, ash, burnt human and animal remains, nails and other artefacts. The *ustrina* at Trentholme Drive is thought to have been in use from the 2nd to the 3rd century AD (*ibid*, 26).

Ten of the cremation burials at Waterdale were interred as individual graves, including the remains of one adult, three adolescents/adults and three possible non-adults. Three clusters of intercutting burials were also identified. Group A, surrounded by a gully, was located c. 100m to the north-west of the possible pyre site and contained eight features and 21 deposits of cremated bone. One of these eight burials contained the remains of an adult, and five contained the remains of an adolescent or adult. One of the latter had been placed within an urn.

Group B was located c. 20m to the east of the possible pyre site, and included seven features and ten deposits. One of these seven burials contained the remains of an adult, and another contained an urned burial of unknown age. Group C was located c. 50m to the south-east of the possible pyre site and c. 40m to the south of Group B. This group comprised two burials, one of which was an adolescent/adult. The burials within these clusters all appeared to be placed deliberately in the same location as the previous burials, which suggests the burial locations were marked or known. The gully surrounding Group A may have helped to mark the grave location. It is interesting that none of the large number of cremation burials at Brougham were enclosed within a gully, either individually or in groups (Cool 2004, 26). However, the majority of the burials at Brougham were placed within deep stone-lined cists and there was relatively little intercutting of burials (Cool 2004, 18; McKinley 2004c, 285).

In terms of plant remains, oak charcoal dominated the assessed samples from the cremation burials, and it was suggested that oak was the preferred fuel for cremation (Miller 2011, 60). In Burial 6294 in Group A, alder was used as a pyre fuel, probably because it is almost as efficient as fuel as oak. In contrast, at Brougham birch and alder appeared to be the main fuel choice for the cremations, although poplar or willow and hazel may also have been used as fuel (Campbell 2004, 269-271). While oak was present at Brougham, it appeared to have been used for artefact construction (e.g. boxes or coffins). It was suggested that this may have reflected locally available supplies of wood.

Four contexts (three features) from Waterdale contained animal bone. The proportion of contexts containing animal bone was 8.2%, and the proportion of features was 9.4%. This was much lower than the proportion of deposits containing animal bone at Brougham, which was 23%, although a smaller proportion of burials from some other sites cited contained animal bone (McKinley 2004d, 331). McKinley (2006, 84) observed that between 10-50% of Roman period burials contain a few grams of animal bone, typically pig or sheep and bird. At Brougham, animal bone was found predominantly with urned burials (*ibid.*). Most of the animal bone from Brougham was interpreted as food offerings burnt on the pyre, although some may have been possessions or companion animals (Bond and Worley 2004, 331).

Other than the animal remains, votive food offerings are also suggested by the presence of lentils, dates, figs, grapes and pine nuts in some of the burials. According to Miller (2012, 3), *'...the confirmed occurrence of date fruits in one cremation fill (6294) and two probable others (6248, 6251) suggests strongly that those cremation fills related to funerary rites for highly esteemed individuals with military connections.'* Dates are rare in Roman cremation burials in England and are associated with individuals of high status and military garrisons (*ibid*). *'The close similarities between the cremation deposits at Doncaster and those at Roman cemeteries in continental Europe are strongly suggestive of the Waterdale cemetery being associated with the garrison, where the beliefs, customs and rituals of the population remained strongly tied to Rome.'* (*ibid*).

Evidence for pyre goods was present in many of the deposits, including melted glass vessels and nails. The former was present in seventeen contexts (fourteen features) and may have held perfumes and perfumed oils burnt on the pyre with the deceased (Weston 2011, 44-47). A similar interpretation was made for melted vessel fragments found at Brougham (Cool 2004, 441). The nails may have derived from artefacts placed on the pyre. If the nails were hobnails, they could indicate the presence of shoes, whether worn by the deceased or placed on the pyre with the body (Cool 2004, 438-439). At Brougham, hobnails were associated with a fifth of the deposits (Mould 2004, 391-392). Five ceramic oil lamps were also found with Group A.

5.2 Late Roman inhumations

The two inhumation burials were located to the north-west of the possible pyre site, in an area where cremation burials had occurred in the first and second centuries AD. The grave for one of the burials (Skeleton 6339) had cut through an earlier cremation burial (6393); although no cremated bone was present from Feature 6393, cremated bone found in the fill of the grave for Skeleton 6339 was thought to derive from this feature. The grave for Skeleton 6339 had also cut through the gully that surrounded the complex of intercutting cremation burials (Group A). Although cremation burials predominated at Brougham, there were seven long cists that were thought to contain inhumation burials (only one contained any trace of human bone). These probably post-dated the cremation burials, although the author notes they could have been contemporary with the cremation cemetery (Cool 2004, 18-19).

Both inhumation graves at Waterdale were in a north-west to south-east orientation, although since the preservation was so poor it was impossible to be certain at which end the head was positioned. The skull of Skeleton 6401 was located in the east corner of the grave, which could suggest the head was towards the south-east. However, this grave may have been disturbed, and if so the bones may have been moved from their original position. A range of burial orientations has been observed in Roman period cemeteries in Britain. O'Brien (1999, 5) observed that in smaller cemeteries a north-south (or inverted) alignment was favoured, whereas burials in larger organised cemeteries, near urban or military centres, were more likely to be on a west-east alignment. At Waterdale, the grave for Skeleton 6339 was on the same alignment as the gully that surrounded Group A, and it is possible that the gully influenced the orientation of the grave.

It was not possible to observe any details of the position of the skeletons due to the poor state of preservation. Fragmentary pottery remains were found in the grave of Skeleton 6401, including greyware, mortaria, Nene Valley colour coated ware and amphorae.

5.3 Conclusion

The earliest burials at Waterdale comprised 27 possible cremation burials dating to the first to second century AD, although some features may have contained redeposited pyre debris. Urns were only present in three burials. An empty urn and deposits of pottery vessels could be cenotaphs, or relate to ritual activity associated with ongoing interactions with the dead. The cremation burials were mostly located to the north-west and west of a possible pyre site, although burials were also

located to the east. Three concentrations of intercutting burials were identified, where the burials may have been deliberately placed in the same location as earlier burials, but individual burials also occurred. One of these concentrations of burials was surrounded by a gully. Unfortunately, the data on age and sex were so limited (or non-existent) that it was not possible to evaluate whether there was any pattern to the distribution of burials.

Two inhumation burials occurred in the late third or early fourth century AD. They were located among the cremation burials, and one of the inhumation burials had cut a cremation burial and the gully surrounding a concentration of cremation burials. Both graves were oriented north-west to south-east, but the location of the head and position of the body was unknown.

6 DISCUSSION AND SUMMARY

The excavation of the cemetery at Waterdale provided an opportunity to examine burial practices in the Roman period in the north of England. As is typical of the period, funerary activity in the first and early second century AD took the form of cremation burials, with inhumation superseding cremation in the late third to early fourth century.

Forty-nine contexts from 32 features yielded cremated bone. Twenty-seven of these features were possibly cremation burials, although some may have contained redeposited pyre debris. Five non-burial features probably contained small quantities of residual cremated bone. Three clusters of intercutting cremation burials were identified, along with individual burials. A possible pyre site was identified, which had been respected by the cremation burials.

Unfortunately, most features had been heavily truncated with loss of unknown quantities of bone. This truncation probably explains the relatively low quantities of bone recovered, which was well below that expected from modern adult cremations in all features (McKinley 1993). However, it is important to remember that the amount of bone recovered from archaeological cremation burials varies considerably, and that relatively small weights are not uncommon even in undisturbed burials (McKinley 2006, 85-86; 2000b, 42-43). Most archaeological cremation burials therefore represent token burials. McKinley (2006, 85) has explored possible factors that may influence the length of time invested in collecting bone from the pyre, including the status of the deceased, and their popularity with relatives and friends. The presence of small bones among the Waterdale cremated remains could indicate remains were scooped up from the pyre in some way, or were collected carefully. All parts of the skeleton were represented, as is typical for most cremation burials from all time periods (McKinley 2006). The high frequency of cranial fragments identified relates more to the ease with which these are recognised when fragmented than to deliberate selection (McKinley 2000).

Given the amount of truncation at Waterdale and the impossibility of knowing what the original bone weights were, it is not possible to compare the existing bone weights with other cemeteries in any meaningful way. The three urned burials at Waterdale each contained 151.6g, 47.3g and 3.5g of bone. In comparison, undisturbed urn burials at Brougham contained between 14.1g and 1,324.6g of bone, and disturbed urned burials contained between 1.0g and 460.3g of bone (McKinley 2004c, 296). It is clear that the undisturbed urned burials were more likely to contain a greater weight of bone, but even compared to the disturbed urned burials from Brougham the urned burials from Waterdale tended to contain small amounts of bone. However, the mean weight of bone from the urned burials (67.5g) was greater than that from the unurned burials (39.7g) at Waterdale, consistent with the fact that greater weights of bone are usually recovered from urned burials probably due to the additional protection provided by the urn for its contents (McKinley 1993). The unurned Waterdale burials contained between 0.7g to 250.4g of bone. This is reasonably low compared to the undisturbed unurned burials at Brougham, which contained between 6.3g to 484.9g of bone, and the undisturbed redeposited pyre debris, which contained 2.2g to 1,643.1g of bone (*ibid.*). However, the quantities of bone at Waterdale are more comparable with the disturbed

redeposited pyre debris from Brougham (0.4g to 60.9g of bone) and disturbed deposits of unknown type (0.4g to 202.1g of bone; *ibid.*). The quantity of bone from the non-burial contexts at Waterdale was very low, at between 0.1g and 1.6g.

The bone from all the burials tended to be well burnt, most of it having achieved full oxidation. This suggests the pyre reached reasonably high temperatures, which were sustained for a sufficient length of time with adequate supplies of oxygen for the bone to be fully calcined (McKinley 2000a, 406-407). This is consistent with the fact that the fuel of choice appeared to be oak, and oak is known to burn at high temperatures for extended periods (Miller 2011, 60). A few contexts contained a small amount of bone that was not fully oxidised, which could suggest the bone was exposed to slightly cooler temperatures, or was not burnt for a sufficient length of time or with enough available oxygen. McKinley (2000a; 2006) has commented on factors that can affect the efficiency of burning within a pyre, including the way in which bone is protected by soft tissues, the fact that bone towards the periphery of the fire may not burn as well as that in the centre, the presence of clothing or wrappings which might hinder oxygen circulation, the impact of the weather (wind strength and rain), and the availability of wood supplies.

Fourteen features contained fragments of melted glass indicating that bottles of perfume or oil had been burnt on the pyre with the deceased. Nails were also a frequent finding, and could represent artefacts or possibly shoes placed on the pyre. Three features contained small quantities of animal bone, and it is possible these animal remains formed part of food offerings or represented possessions (Bond and Worley 2004, 331). Identification of the species of animal is needed before an interpretation can be made. Equally, date and other exotic foods were found in the environmental samples suggesting food offerings for individuals of high status and with military connections.

Limited data was available on the demography of the cremated population, due to the low bone weights and amount of fragmentation observed. It was only possible to determine that three burials contained the remains of adults, eleven probably contained the remains of adolescents or adults, and three possibly contained the remains of non-adults. It was not possible to determine the sex of any of the individuals. The three possible non-adults were among the individual burials, and the adults and adults/adolescents were distributed between the three clusters of cremation burials and the individual burials. In comparison, at Brougham individuals of all ages (except for infants under the age of six months) and both sexes were present among the cremated remains (McKinley 2004c, 287-291): 60% were adults and 29% were non-adults; 32% of the adults were female and 19% of the adults were male.

In the late third or early fourth century AD an adolescent aged between sixteen to eighteen years and an adult probably aged over 35 years were inhumed in the same area as the cremation burials. The adolescent's grave cut an earlier cremation burial and a gully surrounding one of the clusters of cremation burials. Both graves were in a north-west to south-east orientation, but the position and orientation of the bodies could not be determined. The only pathological conditions that could be observed related to dental health. The adolescent had flecks of calculus on three of their teeth possibly as a result of poor dental hygiene, and a rotated second premolar. The older adult had experienced the loss of a tooth during life, something which tends to occur with increasing age following other dental diseases.

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Appendix A: Osteological and Palaeopathological Catalogue

Full descriptions of pathological lesions can be found in the skeletal recording forms.

Skeleton Number	6339 (including bone from contexts 6338 and 6394)															
Phase	Roman															
Preservation	Poor (Grade 4), extreme fragmentation															
Completeness	<10% Left temporal (petrous), incus, mandible (part R side); femur midshaft (possibly R); unidentifiable long bone fragments															
Age	16-18 years (probably adolescent or could be young adult)															
Sex	Unknown															
Stature	-															
Non-Metric Traits	-															
Pathology	-															
Dental Health	8 tooth positions, 23 teeth present (15 of which loose). Tooth roots tend to have broken off, either at apices or near crown, 5 fragments of broken tooth root present probably from identified teeth. Calculus (flecks) RP ₂ rotated slightly, buccal to distal. Plenty of space in alveolar bone.															
	Right Dentition								Left Dentition							
Present	P(I)	P(I)	P	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	P(I)	-	-
Calculus	-	-	F m	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	1	2	3	2	2	2	2	3	3	2	2	2	2	3	-	-
Maxilla	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Mandible	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Present	-	P	P	P	P	P	P	P	P(I)	-	-	-	-	P?(I)	-	-
Calculus	-	F l	-	-	-	-	-	F md	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	1	2	2	2	2	2	3	3	-	-	-	-	3	-	-

Skeleton Number	6401															
Phase	Roman															
Preservation	Poor (Grade 4), extreme fragmentation															
Completeness	<15% Partial cranium (L parietal, part R parietal, occipital, part R frontal, temporals), mandible (internal surface corpus); atlas & axis fragments, cervical vertebrae (6 fragments, minimum 3 vertebrae); femur midshaft (unside)															
Age	35+ years (probably old middle or mature adult)															
Sex	Unknown															

Stature	-															
Non-Metric Traits	Extrasutural mastoid foramen (L)															
Pathology	-															
Dental Health	2 tooth positions, 4 teeth (most incomplete, 3 loose): 1 lower molar, probably LM ₂ ; 1 lower? premolar, crown incomplete (possibly LP ₂ ?); 1 single-rooted tooth, inferior root half (also possibly LP ₂ ?); 1 single-rooted tooth, possibly canine, apex and crown lost pm.															
	Right Dentition								Left Dentition							
Present	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maxilla	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Mandible	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Present	-	-	-	-	-	-	-	-	-	-	-	-	P?	AM	P(I)	-
Calculus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caries	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wear	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-

KEY:

Present - Tooth presence; am - ante-mortem tooth loss; pm - post-mortem tooth loss; p - tooth present; p(l) – tooth present but socket absent; p (u) – tooth present but unerupted; e – erupting; s – sampled; - - jaw not present

Caries - Calculus; F - flecks of calculus; S - slight calculus; M - moderate calculus; H - heavy calculus; a - all surfaces; b - buccal surface; d - distal surface; m - mesial surface; l - lingual surface; o - occlusal surface

DEH - dental enamel *hypoplasia*; l - lines; g - grooves; p - pits

Caries - caries; s - small lesions; m - moderate lesions; l - large lesions

Wear - dental wear; numbers from 1-8 - slight to severe wear

APPENDIX 4 - ROMANO-BRITISH POTTERY

R.S. Leary

1 METHODS

An archive catalogue was compiled for all the pottery according to the standard laid down by the Study Group for Romano-British Pottery (Darling 2004). Pottery was recorded detailing specific fabrics and forms, decorative treatment, condition, cross-joins/same vessel and was quantified by sherd count, weight and rim percentage values, giving estimated vessel equivalents (EVES). All the pottery from the site was catalogued in the archive and the stratified pottery was examined in order to date the features. Key groups are illustrated (**Figures 10 and 11**) and catalogued below and unillustrated material is summarised. National fabric collection codes (Tomber and Dore 1998) are included where possible.

2 SUMMARY

Pottery sherds were recovered from 58 contexts and of these secure groups were associated with three cremation groups, four individual cremation burials, two inhumation burials, two possible cenotaphs, a possible pyre area, dumped pyre deposits and a further 13 pits and hollows. The remaining sherds came from the later post-Roman features and layers. The pottery dated the cremation cemetery features to the late first to early or mid-second century. Two cremation urns were recovered and two possible cenotaphs pots. Pottery vessels associated with the cremations were limited to jars, wine and oil amphorae and flagons. Ceramic pyre goods were common and included grey ware and grog-tempered jars and flagons. Unusually high numbers of amphora sherds were identified and these included wine and oil amphorae. Many of the oil amphora sherds were burnt and a small number of the wine amphorae were slightly scorched perhaps as a result of being placed near the pyre. The quantities of amphorae contrasted markedly with contemporary deposits from the vicus at Doncaster and other wares such as samian and fine wares were much lower.

Pottery from non-burial deposits had a different profile. Although it include a little redeposited material, the group mostly comprised samian, particularly decoration samian bowls and beakers, fine ware beakers, mortaria and coarse ware dishes and bowls- types not found in the graves. These may derive from burial and memorial rites contemporary with the cremation cemetery. This material was largely unburnt.

The late first to mid-second century assemblage provided evidence for ritual activity such as anointing the body with oil, libations of wine, placement of flagons, and possibly some wine amphorae, on the pyre, the use of jars as urns and possibly used oil amphora to protect the human remains in the grave and the use of samian, beakers and mortaria during burial feasts or memorial meals. Oil may also have been used as an accelerant on the pyres. The cemetery rituals compared well with those found at contemporary cremation cemeteries at Derby and Wall but differed both in the specific details as to which vessel types were used and not used and also when and how vessels were used.

The Flavian-Trajanic (AD69-117) assemblage has a marked Lincolnshire component.

The inhumation graves contained only redeposited scraps dating to the third and late third to fourth century.

3 THE WARES AND TYPES

3.1 Amphora

Dressel 20 oil amphorae from Baetica, southern Spain were present in significant quantity and the rims were of Trajanic-Hadrianic type (dated AD110-150) although one had a stamp dated somewhat earlier, to cAD 50-110. A number of Gauloise 4 amphorae were identified and these were in Gallic amphora wares and also Verulamium white ware. Those from Verulamium are likely to date to the late first and

early second century when mortaria from this region were being traded north. Gallic Gauloise 4 amphorae were mostly made in Narbonnensis and in Britain dates from the second half of the first century AD to the end of the third century AD.

3.2 White and white-slipped ware

A fragmented but near complete flagon with everted rim is the most diagnostic of this group and compares with a form from Castleford (see below) dated to the mid-second century. One other rim was present from a narrow-mouthed vessel with a flat rim which compares best with narrow-necked jars of the late first to early second century (Gillam 1970 no. 27), sometimes with handles. The source of this group is unknown but the links with Lincolnshire make that region a likely origin.

3.3 Black burnished ware

A flat-rim bowl or dish of mid- to late second century form and jar sherds with acute lattice burnish were identified in this fabric which compared with Rossington Bridge products.

3.4 Grey ware

The grey ware divided into three main wares- GRB1 the common South Yorkshire grey wares characterised by abundant, well-sorted subrounded quartz, GRB2, a finer medium, quartz tempered grey ware with more angular quartz and GRA, a grey ware with abundant fine quartz tempering. The GRB1 included rusticated jars in form perhaps dating earlier than the known kilns, in the early second century. In addition, this ware group included BB1 type flat-, grooved-, bead- and grooved flat-rim bowl/dishes and jar forms with everted and bead rims and acute lattice burnish, jar with zones of wavy line burnish, indented jars and a bifid-rim narrow-necked jar. GRB2 was used to make rusticated jar forms only and the fabric suggested it may have been obtained outside the immediate locality. The fabric is not sufficiently diagnostic to source without petrological and chemical analysis. GRA was used only for a late developed flanged bowl and is not dissimilar to fabrics from East Yorkshire although again further analysis would be required to determine this.

3.5 Oxidised ware

This group comprised abraded bodysherds with few diagnostic pieces. One sherd did have roughcast decoration. The fabric could fit into the range made at the South Yorkshire kilns which did include oxidised roughcast wares (Buckland et al 2001 fig. 47 no. 163). Part of what appeared to be a reeded-rim bowl of the late first to early second century was identified but other everted rims were difficult to identify or date closely.

3.6 Colour-coated ware

All the sherds in colour-coated ware were Nene Valley products except a small roughcast scrap with back colour coat outside and orange internally and white, very fine fabric from the late gravel pit fill 6048 which compared well with examples from the Central Gaulish imports of the Flavian-Trajanic period. The Nene Valley ware group comprised bodysherds from a late second to third century scale indented beaker (Perrin 1999, 94), an indeterminate vessel and a rim sherd from a long necked beaker, probably a late third to fourth century long necked globular beaker (Perrin 1999, 96).

3.7 Grog-tempered ware

The grog-tempered wares were all jars with rims formed by folding over the body to form everted or somewhat triangular rims. These are typical of assemblages in the Trent Valley and north Lincolnshire in the late first to early second century and either came from there or were made by potters who came from there. Although termed grog-tempered ware these may in fact have clay pellets in the fabric rather than grog.

Table 15: Ware and fabrics

Ware	Fabric type	Sherd count	Weight	EVES
AMP	DR20 oil	614	27673.6	0.41
AMP	FLA2 amp wine	60	2925.7	
AMP	GAL AM wine	43	1934.7	0.83
AMP	AMP VER wine?	10	479.9	
Amphora Total		727	33013.87	1.24
Central Gaulish CC	CNG CC	1	1.7	
CT	CT	3	2.7	
CT	CTA2	2	14.1	0.11
Shell-tempered wares Total		5	16.8	0.11
FLA1		125	1171.4	1.08
VER WH		28	1198.4	0.25
White ware		1	3.34	
GR	GRA	4	22.2	0.05
GR	GRB1	292	3057.5	2.98
GR	GRB1B	71	772.6	
GR	GRB2	23	133.1	0.12
Grey ware Total		390	3985.4	3.15
GTA		130	1592.8	1.15
Mortarium		45	1445.3	0.6
Nene Valley CC		4	5.1	0.5
Oxidised		30	111	0.18
Rossington BB1		9	41	0.04
Samian		11	38	0.02
Indet erminate		2	35.2	
Total		1508	42659.31	7.87

3.8 Shell-tempered ware

There may be three fabrics represented here. Two very small scraps from 6248 were too small and undiagnostic to be certain of type but the context suggested an early context. Shell-tempered wares were not common at Doncaster but where found were thought to be of Lincolnshire type as the GTA group (Leary 2004), a source also suggested by Evans for shell-tempered jars in West Yorkshire (Evans 2005, 135).

The two CTA2 sherds are shell-tempered wares of later date. Two rim sherds were present – one a lid-seated Dales type form and the other an everted rim jar. Both may be of Lincolnshire origin, the first from north Lincolnshire or the Trent Valley and the second from south Lincolnshire perhaps from kilns at Bourne or Greetham. Dales ware jars appear in the late second century but are not common until the third century (Darling 1977, 29). Evidence from Empingham, Rutland and Morton, Lincolnshire

demonstrates that the Greetham and Bourne type jars were present in the mid- to late second century (Cooper 2000, 75-6 and Precious 2001) while Clarke record third century examples at Leicester (1999, 127-8 in phase 3 fig. 69 no 151 and phase 4 fig. fig. 69 no. 163, phase 5c fig. 71 no. 193)., Cooper 2000, 76 and 80 and Precious 2001, 138-9).

3.9 Mortarium

See separate report for detail. Significantly a stamped mortarium was identified as a Lincoln product of the late first to early second century confirming the strong ceramic links with Lincolnshire

3.10 Samian

See separate report. The samian confirmed the late first to early second century date range of the cremation cemetery.

4 THE ASSEMBLAGE

4.1 Group A

24 sherds (0.99kg) of Romano British pottery were recovered from this group.

6248 3 burnt FLA1 scraps (10g) and 2 indeterminate CT scraps (1g)

6251 2 burnt FLA scrap (3g)

6254 GRB1 rusticated jar, complete (SF13, **Figure 10.1**). Although Buckland found rusticated jars continuing to be made at Doncaster as late as the mid-second century, he distinguishes the later vessels on the grounds of recurved rim, pyriform body and pedestal base form and burnished surface treatment (Buckland *et al.* 2001, 65-6). Burnishing was not apparent on this jar although the grooves delimiting the rusticated zone were present as is found at Rossington Bridge (Buckland *et al.* 2001, 65-6). This vessel had the short, straight everted jar so characteristic of Flavian-Trajanic jars contrasting with the later recurved rim form. The fabric was of South Yorkshire grey ware type.

6266 One FLA1 scrap (1g)

6272 11 FLA1 bodysherds (232g), partially scorched

6302 2 FLA1 bodysherds (6g)

6304 2 FLA1 bodysherds (1g)

The FLA1 sherds and scraps could all be derived from the same vessel or from different vessels. The small shell-tempered scraps also from 6248 may belong to the early shell-tempered wares on the first and early second century although such small scraps could, in theory, belong to a Dales ware jar of the third century. Shell-tempered wares were present at Doncaster in the Flavian-Trajanic groups in small quantities at the High St excavations (Leary unpublished), and Parrots Corner (Leary unpublished), These vessels compare well with types found in Lincolnshire and the Trent Valley in the late Iron Age to the mid-second century and probably came from there. Given the associated material an early date is much more likely. Nothing from this group has to date later than the Flavian-Trajanic period. White ware flagons of this type date generally to the late first to second century but without diagnostic sherds, precise dating cannot be given.

4.2 Gully 6216

110 sherds from fill 6217 comprised 100 oxidised GTA sherds (291g.), four FLA1 sherds (13g.), four RBB1 jar sherds (5g.) and a GRB1 sherd (2g.) and one Dressel 20 oil amphora sherd (54g.). The GTA sherds are undiagnostic and could be burnt. The GRB1 and RBB1 both come from BB1 type sherds of Hadrianic-Antonine type (AD117-192) with acute lattice burnish. The RBB1 and GRB1 sherds give a date in the Hadrianic or Antonine period, cAD120-200. If this gully is associated with Group A then it would suggest

continued activity in the cemetery at least as late as the Hadrianic period (AD117-138). Scraps of grey rusticated ware were present in fill 6325 of pit 6324 which cut gully 6216.

4.3 Group B

139 sherds (3.7kg.) came from the features in Group B

6332 4 Gauloise wine amphora FLA2 sherds (46g.) and 1 GRB2 scrap with traces of rustication.

6336 59 base and lower GRB1B bodysherds from a rusticated urn (719g., **Figure 10.2**). The GRB1B cremation pot compares well with products of the South Yorkshire kilns in fabric and since it lacks the rim must be given a wide date range from the late first to mid-second century.

6343 3 Gauloise wine amphora FLA2 sherds (200g) from same vessel as 6332 and 12 GRB1 sherds (70g) from a rusticated jar. The fabric of this vessel is somewhat finer than the normal South Yorkshire kiln fabrics and it may be a non-local item. It is of Flavian-Trajanic form.

6349 1 rusticated GRB2 scrap with multiple grooves.

6361 3 sherds (16g) from the base, body and rim of a rusticated jar (**Figure 10.4**) and one small scrap (1g)

6386 52 sherds (2641g, **Figure 10.3**) from the base and lower body of a Gauloise wine amphora FLA2, reddening on the lower body suggesting slight scorching, and 4 GRB2 rusticated sherds

A sherd from a GRB2 rusticated was present in 6390, the fill of a hollow near Group B

4.4 Group C

490 sherds (21.4kg) of pottery were recovered from this group.

6434 341 Dressel 20 amphora sherds (16625g, **Figure 10.5**) were present and probably came from at least two vessels. The amphorae were identified by Dr David Williams and on typological grounds the rim sherds looks to be Trajanic-Hadrianic in date [cf. Martin Kilcher, 1987, Beilage, nos. 76-80, dated AD 110-150]. One of the four handle fragments had a complete stamp. The impressed stamp, *in ansa*, is enclosed in a cartouche and reads **M A F**. This stamp is associated with the Dressel 20 production site at Malpica Sur, situated close to the River Genil [Roman *Singilis*], the main tributary of the River Guadalquivir, with the site lying just south of the modern town of Palma del Rio [Berni Millet, 2008, 516]. The only dating evidence for this *figlina* is a Dressel 20 handle with a similar named stamp found at Augst, though in this case with an emblematic sketch of an olive branch at the beginning and end of the cartouche [Martin-Kilcher, 1987, Abb. 52, ST 2a]. This find has an “expandible” date of c. AD 50-110 attached to the context [*ibid.*, 94]. The stamped handle is probably part of the same vessel as the rim from this context, though they don’t actually fit together. The suggested dates of the rim type and stamp do slightly overlap; moreover it is possible that the Augst date may be found to expand more into the second century AD.

36 sherds (1859g) from Gallic wine amphorae were also identified. These included two rims sherds, one incomplete rim sherd, a basal fragment and a handle. The rims were of Gauloise 4 type (**Figure 10.6-7**) and other sherds were probably also of this type.

6 GTA everted rim jar sherds (132g, **Figure 10.8**). This jar is a “native” type jar with everted rim, formed by folding in the rim, and double shoulder groove. The fabric is oxidised with quartz temper and possibly some grog or argillaceous inclusions. Similar vessels were in use from the mid-1st century until the mid-2nd century at Lincoln (Darling 1984, nos 21 and 26) and are present in a Trajanic pit and a ditch dating to pre-130AD at Doncaster (Buckland and Magilton 1986, nos 17 and 149-152) suggesting a pre-Hadrianic date range. This form compares well with types made in Lincolnshire and the Trent Valley in the mid-first to early second century. Similar

vessels were found in excavation at Doncaster High St and were associated with late first to early second century pottery (Leary 2004).

1 neck sherd (28g) was identified as white ware flagon or storage vessel by Dr Williams.

The Dressel 20 amphorae and the coarse ware jar both showed evidence of scorching and burning in the form of blackening in the case of the amphora and reddening in the case of the jar. The vessels identified from 6434 give a date range in the Trajanic period at the earliest.

6435 96 sherds of Dressel 20 amphora (1841g) and 10 further sherds (953g) from the jar present in 6434.

Only Dressel 20 bodysherds and scraps were present in context 6435 so chronological precision is not possible but the blackened sherds could well come from the same vessel(s) as that in 6434 in which case a terminus post quem in the Trajanic period is indicated and the GTA jar is of late first to early second century date.

4.5 Other cremations

6293 Two tiny scraps of GRB1ware came from a sample from cremation deposit 6293 but are not closely datable.

3012 40 sherds from the cremation related deposit 3012 came from three different vessels distinguished microscopically on fabric ground and based on differences in decorative technique.

Three scorched sherds came from a fine vessel, originally white ware but now partially reduced. Traces of a darker slip remained in places on the exterior. White wares were most common in the first and second century.

Fourteen rim and bodysherds were in a grey fabric with darker surface similar to the wheel-thrown BB1 copies made at Rossington Bridge but perhaps dating to the early to mid- second century (**Figure 10.9**). The rim sherds seem to have all come from the same vessel and the bodysherds with acute lattice burnishing were in a similar, possibly identical fabric when viewed at x30. The rim sherd was beaded and there was a slight groove on the outer face. The form compared with the neckless jars made in BB1 during the second century (Gillam 1976 nos 30-34).

A further 22 sherds in a similar but not identical fabric came from the base and body of a jar with acute lattice burnish executed by a tool with a narrower tip (**Figure 10.10**) than the previous vessel resulting in a groove rather than a flat burnish line. This vessel was medium grey throughout and was of South Yorkshire grey ware type. It also belonged to the mid- to late second century. Neither of the jars appeared to have been scorched. If this feature was a cremation, this vessel may have been a cremation pot since most sherds are adjoining and the base is complete. The white ware sherds are likely to derive from the pyre, being pyre goods thrown on to the pyre during the cremation as gifts to the deceased or to the gods as part of a libation. The smaller bead rim jar may also belong to this phase of the burial rites but this vessel has escaped scorching.

6127 Seven sherds (365g) from the burnt base of a large flagon or more probably amphora on VER WH was present in this fill. All the sherds were burnt.

6140 25 rim, base, body and two-ribbed handle sherds (1173g.) of VER WH flagon, a similar vessel (**Figure 11.11**) to that in 6127. The fabric was coarse and compared well with examples of Verulamium mortaria (St Albans) but was a brownish buff colour with cream margins and pinkish core. David Williams did not consider this was a Gauloise amphora form and it is likely to belong to the class of "lagena" or large flagon paralleled at Colchester (Symonds and Wade 1999 fig. 6.31 no. 94-5). The trade from Verulamium region kilns to the North in mortaria took place

predominantly in the Flavian-Trajanic period and it might be expected that the flagons and amphorae also belong to this period.

4.6 Possible cenotaphs

6056 a GRB1 short everted rim rusticated jar with subdued linear rustication, shoulder groove and burnishing inside the rim (751g, **Figure 11.12**). At Lincoln a Hadrianic start date was suggested for Lincoln burnishing inside the rim (Darling 1984, 87) and this may be possible here. The vessel lacks the taller recurved rim typical of the early Antonine jars (AD138-61) at Rossington Bridge however and but does not have a slim, sharp, short everted rim like those identified as the early form (Buckland and Magilton fig. 41 nos 310 and 314, comment on p.166 no. 102). A Hadrianic date (AD117-138) would suit this rather transitional rim form

6359 38 sherds (652g) from a broken but complete single handled white ware FLA1 flagon with plain everted rim slightly rebated internally (**Figure 11.13**). The form compared to flagons from Castleford in a mid-second century phase, (Rush et al 2000 nos 252-3). This is not a ring-necked flagon although it has a groove at the base of the rim. It is difficult to parallel precisely but the splay of the mouth and the rim form compares with ring-necked types of early to mid-second century date. The rim, body and base are all partially scorched to a greyish colour in patches.

Burnt area 6432 Seven sherds (155g) from different GTA jars with rather triangular rims (**Figure 11.14-15**) belong to the same native jar series as the vessel from 6435 (**Figure 10.8**)

4.7 Inhumations

Pit 6422 was considered a possible grave cut and contained GRB1 sherds from an everted rim jar and jars with zones of wavy line burnish all of at least mid- to late second century date or later. A RBB1 jar neck sherd from here is of Antonine date. Similarly in grave fill 6401 sherds included body and neck sherds from a VER WH flagon/amphora (also present in 6140), sherds from a FLA1 flagon, GRB1 jars including an everted rim and BB1 bowl/dish and some sherd from an everted-rim GTA jar. These date to the late first to mid-second century but two colour-coated sherds from the Nene Valley industry included a folded scale beaker of the late second to early third century at the earliest. In possible grave 6337 (fill 6338) a group of residual sherds included late first to early second century material such as a rim from a GTA everted –rim jar (**Figure 11.16**), GRB1 rusticated sherds and also a developed flanged bowl rim of the late third to fourth century (**Figure 11.17**).

4.8 Other features

6390 1 GRB1 rusticated jar sherd (8.5g)

6394 2 GTA sherds (28g) from a GTA neckless jar with stubby everted rim,

2 GRB1 bodysherds (8g) with a dimple and oval indentation and a

1 GRB1 bodysherd (6g) with acute lattice burnish.

The group dates to the mid-second century at the earliest but the GTA jar could be as early as the late first century. Indented grey ware jars were present at Rossington Bridge (Buckland et al 2001 no. 205).

6395 122 Dressel 20 oil amphora sherds (7512g).

6 body and handle sherds (64g) from a Gallic amphora

25 indeterminate white ware sherds (153g)

1 RBB1sherd (11g) from a flat-rim bowl or dish of mid-second century type (**Figure 11.18**).

The Dressel 20 oil amphora sherds, the RBB1 vessel and the white ware scraps were burnt.

- 6325 Three GRB sherds (7g), probably burnt. The surfaces were almost white and the core grey. There was a tiny indication of rustication. The fabric was finer than the GRB wares. A late first to mid-second century date range would be given but the fabric favours any early date in the late first to early second century before South Yorkshire grey wares dominated. However as this pit cut the mid-second century gully, 6217, these sherds should be residual.
- 6422 five GRB1 jar sherds (30g), two with wavy line decoration
RBB1 jar sherd (5g). These were all of the type made at Rossington Bridge kilns and dated to the mid-second century at the earliest.
- 6045 2 GRB1 sherds (79g) from a turned base and lower body of a jar
36 sherds from a white ware stamped mortarium (1170g)
1 scrap of samian from a closed vessel (2g,) dated AD70-110.
This feature is described as from a deposit overlying cremation 6056 and may relate to burial or memorial meals.

Undiagnostic GRB1 sherds were found in the fills of pits 6142, 6279, 6254, 6354, 6368, 6369 and 6409. None of these are closely datable but the fabric tends to favour a period when the South Yorkshire kilns were in operation in the second century or later. A Nene Valley beaker rim from 5006 is one of the latest vessels and belongs to a long-necked globular beaker type of the later third or fourth century. Similarly from a shell-tempered everted rim from 6074 is probably from a jar from Lincolnshire or the south Midlands and dates to the third century. Additional types from later features included roughcast beaker sherds in both local oxidised ware and traded colour-coated ware probably from Central Gaul from pit 6081

5 CHRONOLOGY

The assemblage dates from the late first-early second century to the third century. There are no ceramic types that have to be fourth century. The GTA ware group is of early date and at Doncaster Buckland and Magilton give this type of jar, in a group which includes shelly ware and coarse gritty wares, a date in the late first to early second century (1986, 155 no.17 and 192 nos 149-52). Verulamium region mortaria date principally to the late first to early second century in the North and the amphora and flagons are likely to belong to the same period. The rusticated jars include early forms of the Flavian-Trajanic period as well as examples with burnishing which may be more likely to be of Hadrianic date. Cremation 2015 was accompanied by BB1 type jars in grey ware with acute lattice burnishing dating to the early to mid-second century and RBB1 sherds were present in gully 6216, dump 6395, grave 6401 and fill 6423 suggesting cremation activity continued as late as the mid-second century. Eight out of eleven of the samian sherds, mostly in redeposited contexts, were of Flavian-Trajanic date and the samian as a group included no material later than the Hadrianic period. The Dressel 20 amphora rims were given a date of cAD110-150 although as the stamp from the associated handle was dated AD50-110, a point early in this date range is preferred.

Abraded sherds from the graves and later features indicate sporadic activity in the later second and third century and these included indented scale beaker sherds and a rim sherd from a long necked globular beaker, both in Nene Valley colour-coated ware, grooved, flat rim bowls, developed flanged bowls, recurved, everted rims jars, jars with zones of wavy line burnish and two shell-tempered jars, one with an everted rim, perhaps from south Lincolnshire, and one with a Dales type rim, from north Lincolnshire or the Trent Valley. This scatter of later sherds, all of which are small and abraded, indicate some sort of continued activity. The sherds could derive from activity linked to the commemoration of the dead or be derived from sporadic dumping after the cremation cemetery went out of use and before inhumation began. Sherds from the graves suggest these probably belong to the third century at the earliest and 6338 included late third or fourth century sherds. The graves could, of course, be

considerably later than this but there is no certain evidence for ceramic deposition after the third century.

6 DISCUSSION

The assemblage is dominated by rusticated jars, Dressel 20 oil amphorae, Gauloise 4 wine amphorae, including imported vessels from France and traded vessels from the Verulamium region (St Albans), and also a Verulamium/Brockley Hill region flagon and unsourced white ware flagons. The jars were primarily used as cremations urns and the rusticated fragments were probably from disturbed urns and from pyre goods. The urns, from cremations 6254 and 6336 and pit/cenotaph 6056, were unburnt. The two vessels from cremation 3012 excavated in the evaluation were also unburnt. Sherds from rusticated jars in gully 6216 were scorched and a jar from 6434 and 6435 in Group B was burnt. A GTA jar from burnt area 6432 was also scorched. These vessels were pyre goods.

The oil amphorae included burnt sherds suggesting they were being used during the cremation ritual. Cool has suggested the use of olive oil both in perfumes and as an accelerant (2004, 439) and the quantity of melted glass fragments interpreted as ungentaria would add weight to the former use accounting for at least some of the amphora contents. It is notable that there was a marked concentration of Dressel 20 sherds in Group B where Gauloise 4 wine amphorae were also present. The wine amphorae may be associated with burial meals and libations poured out on the pyre. The vessels from contexts 6434 and 6435 were largely complete but no Dressel 20 bases were found and some of the Gauloise parts appeared to be missing. Many of the Dressel 20 sherds from here were scorched and another concentration of Dressel 20 sherds, in context 3695, also included many blackened sherds. Apart from these groups a burnt VER WH Gauloise 4 base was found in cremation pit 6126. An unburnt abraded DR20 sherd was found in gully 6126 and Gallic wine amphora bodysherds were present in 6362 and dump 6395 with a possible VER WH amphora sherd in grave fill 6401. These latter sherds are likely to be disturbed and redeposited material from the cremation or cremation rites but the burnt base in cremation 6126 may come from the pyre. The evidence suggests that the cremation ritual involved the use of olive oil on a lavish scale. The wine amphorae indicate prodigal use of wine with amphorae standing near or on the pyre. The severe scorching of the base from 6127 suggests it stood on burning material while that from 6386 was unburnt on the base but slightly reddened on the lower body suggesting it had been placed near the pyre.

Flagon sherds from several contexts – Group A 6248, 6251 and 6272, pit 6360 vessel 6359, Group B 6386, and dump 6395- were also burnt through or scorched and these included partial scorching of a near complete but fragmented flagon in pit 6360 and the base of the large Verulamium flagon or amphora in pit 6127. Most of these vessels are likely to be pyre goods gathered up with the cremated remains although the near complete vessel from pit 6360 may have merely stood near enough the pyre or fire to be scorched. Study of the charcoal remains from Group C suggested some of the larger pieces of charcoal indicate an additional ritual which involved foodstuff, particularly lentils, being burnt in a separate ritual before being added to the cremation deposit. The jar sherds in Group C were only very slightly burnt although the Dressel 20 oil amphora sherds were markedly burnt.

Differences between the ceramics from the complexes were principally that in Group A ceramics were restricted to a rusticated cremation urn and sherds of flagon pyre goods. In Group B again a rusticated urn was present with sherds from another unburnt rusticated jar and the base and lower body of a Gauloise 4 wine amphora, scorched on the body but not the base. In Group C there were fragments of a slightly scorched GTA jar, a great deal of scorched Dressel 20 amphorae and unburnt Gauloise 4 amphorae sherds. All these suggest wine played a key part in the cremation rites and the oil amphora indicate that in Group C oil was unusually important or that the vessels were being re-used as burial urns or protectors (see below).

Amphorae are not common finds on northern cemeteries (Evans 2004, 337). However at Derby Racecourse cemetery, although amphorae were not used as cremation urns, there were relatively

common in the fills of cremation and inhumation graves. Unlike at Waterdale the Derby amphora sherds were not burnt, although burnt flagon sherds were common (Birss 1985, Table 20). At the Eastern cemetery in London amphorae were used as cremation urns and also were present amongst the pyre debris (Barber and Bowsher 2000, 107-8, 121 and table 104). At the Eastern cemetery, London, Barber and Bowsher suggest the amphorae were used to protect burials, as “burial chambers” from later grave digging activities. The amphorae from Group C may have functioned in this way and the good condition of the cremated bone from this complex adds weight to this suggestion.

Flagon 6359 appears to have been deposited as an offering and was slightly scorched in places. The rusticated jar from 6056 lacked any associated cremated bone and may also have been an offering or cenotaph. The burnt area 6432 contained very little pottery but slightly scorched GTA jar sherds were identified and may be residual pyre goods. Similarly in dump 6395 a concentration of scorched Dressel 20 amphora and flagon scraps with unburnt Gauloise 4 sherds indicate again the tendency for the oil amphorae to get more burnt than the wine amphora.

The sherds from non-burial groups included a wider range of types such as sherds from decorated samian bowls and two beakers, RBB1 and GRB1 bowls, jars, fine colour-coated ware beakers, mortaria, flagons and amphorae. These are likely to come from burial and commemorative rites and typically include a wider range of vessel types. Of these unburnt vessels, most of the samian, flagons, GTA and GRB1 rusticated jars, a CNG roughcast beaker, the mortaria and two possible bowls in oxidised wares are contemporary with the cremation phase. The predominance of decorated bowls in the small samian collection is noticeable and unusual since decorated samian is generally uncommon in cemeteries (Cool and Leary 2012, 313). It has however been noted that there is a small amount of evidence that bowls are more common in contexts associated with post-burial rituals (Cool and Leary 2012, 316). For example in London at West Tenter street cemetery Pierpont associated samian bowls, amphorae, flagon and beakers with post burial rituals and contrasted them with the jars and small jars/beakers from the cremations themselves (Whytehead 1968, 81). Similarly at Wall decorated samian came from two of the features identified as funerary gardens (Leary 2008, 163 and McKinley 2008, 189). The evidence for this is limited based on a small number of sites and often unburnt sherds from cemeteries are dismissed as residual and unrelated to the cemetery rites.

Compared with pottery groups from the vicus at Doncaster High St (Table 16), the Waterdale group has a larger assemblage of oil amphora, particularly by sherd count, and the lower numbers of grey wares and samian sherds. The larger amount of GTA ware is a result of the early date of the Waterdale group as is the low BB1 numbers at Waterdale. Wine amphorae have been identified at other sites in Doncaster but they appear to be uncommon with only one neck fragments from the Church Way site, Leary unpublished). At the High St no wine amphorae were identified and, some of the bodysherds may have been grouped with other white ware sherds, nonetheless the numbers were very small. By contrast the presence of several wine amphorae at Waterdale emphasise the generous and “exotic” nature of the offerings despite the relatively low number of ceramic grave and pyre goods.

With respect to the vessel types, this difference can be seen in the higher number of amphorae at Waterdale and the rather lower numbers of bowls, dishes and beakers (Table 17). This demonstrates the careful selection of suitable types of vessels for the burial rites and highlights again the unusually low numbers of small drinking vessels such as cups and beakers.

Table 16: Comparison of wares at Waterdale and Doncaster High St vicus (Leary 2004)

Wares	Waterdale % of nos	Waterdale % of weight	Doncaster High St all phases % of nos	Doncaster High St all phases % of weight
Dressel 20 oil amphora	40.7	64.9	17	60
Gauloise 4 wine amphora	7.5	12.5	0	0
White ware	10.2	5.6	8	4
Colour-coated ware	0.3	0	1	0
Shell-tempered	0.3	0	0	0
Grey wares	25.9	9.3	53	23
Grog-tempered	8.6	3.7	3	1
Mortarium	3	3.4	2	4
Oxidised	2	0.3	5	2
Rossington BB1	0.6	0.1	6	3
Samian	0.7	0.1	4	2
INDET	0.1	0.1	1	1

Table 17: Comparison of vessels at Waterdale with those at Doncaster High St (Leary 2004)

Vessels	Waterdale	Doncaster High St
amphora	16	2
beaker/cup	1	13
bowl	3	11
bowl/dish	3	2
dish	0	4
flagon	17	13
jar	52	43
mortarium	8	2
narrow-n jar	1	7
other		3
Total EVES	8	49.4

The rituals suggested can be compared with evidence from the contemporary cremation cemeteries at Wall and Derby. At both sites pyre goods from the burials included flagons and small jars as here. However at Derby most of the burnt pyre good sherds were found redeposited in the later inhumations and comprised sherds from flagons and non-local fine wares, namely samian and colour-coated wares, and at Waterdale the non-local fine wares were all unburnt, suggesting these were not used as pyre

goods. At Wall small jars were commonly found as pyre goods whereas these are rare at Waterdale (Birss 1985 and Leary 2008, 161). The absence of small jars at Waterdale, which functioned as beakers, is significant, and given the evidence for wine consumption suggests either an organic drinking vessel was being used or that any beakers and cups used were not being deposited in the grave or on the pyre but were retained by the living. Their absence at Waterdale is made all the more conspicuous by their relative abundance in the vicus at Doncaster High St where cups and beakers very common in the Flavian-Trajanic levels and were still more common in the Hadrianic-Antonine period than at Waterdale (31% of the assemblage by EVES and 9% in the Hadrianic-Antonine period).

Amphorae were common at neither Wall nor Derby. At Wall remains of melted unguent bottles were found in two graves and in a pyre deposit and at Derby melted glass was noted redeposited in a later inhumation and these demonstrate the use of oil during preparation of the body preparation as is suggested here.

At Wall the same pattern of samian and coarse ware bowls being associated with burial and/or memorial feasts was noted and at Derby a high proportion of unburnt fine ware from the cemetery was interpreted as indicative of burial or memorial rituals.

The comparison of the evidence from Waterdale with that from Derby and Wall reveal some shared traditions as well as some distinct differences in what vessels were used at what stage in the procedures and ritual associated with burial and memorial activity. These reflect the common rituals used by Romans across the Empire as well as the distinct differences in rites adopted by different ethnic groups or even families.

7 FABRIC DESCRIPTIONS

Colour: narrative description only

Hardness: after Peacock 1977
 soft - can be scratched by finger nail
 hard - can be scratched with penknife blade
 very hard - cannot be scratched

Feel: tactile qualities
 smooth - no irregularities
 rough - irregularities can be felt
 sandy - grains can be felt across the surface
 leathery - smoothed surface like polished leather
 soapy - smooth feel like soap

Fracture: visual texture of fresh break, after Orton 1980.
 smooth - flat or slightly curved with no visible irregularities
 irregular - medium, fairly widely spaced irregularities
 finely irregular - small, fairly closely spaced irregularities
 laminar - stepped effect
 hackly - large and generally angular irregularities

Inclusions:

Type: after Peacock 1977

Frequency: indicated on a 4-point scale - abundant, moderate, sparse and rare where abundant is a break packed with an inclusion and rare is a break with only one or two of an inclusion.

Sorting: after Orton 1980

Shape: angular - convex shape, sharp corners
 subangular - convex shape, rounded corners
 rounded - convex shape no corners
 platey - flat

Size: subvisible - only just visible at x30 and too small to measure
 fine - 0.1-0.25mm
 medium - 0.25-0.5
 coarse - 0.5-1mm
 very coarse - over 1mm

7.1 The Fabrics

Amphora

DR20 Baetican olive-oil amphora Dressel 20 (Peacock and Williams, 1986, Class 25).
 AMP VER WH Verulamium region Gauloise 4 type amphora. Tomber and Dore 1998 fabric VER WH.
 GAL AM Gallic wine amphora, Gauloise 4 type where identifiable. Tomber and Dore 1997 fabric GAL AM.
 FLA2 amp white. Hard and smooth with moderate medium subangular quartz, sparse medium red/brown inclusions and rare medium, subangular dark inclusion, perhaps igneous. Micaceous

Fine ware

CNG CC Central Gaulish colour-coated roughcast ware Tomber and Dore 1998 CNG CC1
 NV1 and 2 Nene Valley colour-coated ware Tomber and Dore 1998 NV CC. NV1 has white paste and NV2 has pink or orange paste.

Shell-tempered ware

CT brown with moderate, ill-sorted platey vesicles. Only scraps represented.
 CTA2 Dales ware. Tomber and Dore 1998 DAL SH

White ware

FLA1 white or cream. Hard and smooth with moderate, fairly fine quartz and sparse, fine rounded red/brown inclusions (clay pellets?)
 VER WH Verulamium region white ware. Tomber and Dore 1998 fabric VER WH
 FLB white-slipped oxidised ware. Moderate, medium subangular quartz and sparse, medium, rounded red/brown inclusions

Grey ware

GRA medium grey, smooth and hard. Abundant, fine subangular quartz. Unlike usual South Yorkshire product
 GRB1 South Yorkshire grey ware. Moderate to abundant, medium, subrounded quartz. Typical of South Yorkshire industries.
 GRB1B As GRB1 but with brown core.
 GRB2 medium grey. Fairly smooth and hard with moderate, medium, angular and subangular quartz, sparse medium white inclusions and black/brown inclusions. Probably not a South Yorkshire product although variations in the grey wares do occur.

Grog-tempered ware

GTA grey with hard rather bumpy feel. Moderate, medium, subangular quartz and sparse subangular/ rounded, grey argillaceous inclusions. Possibly grog tempered or with naturally occurring clay cognates. The burnt examples are orange with orange argillaceous inclusions.

Mortarium

MH2 Mancetter-Hartshill white ware Tomber and Dore 1998 MAH WH

Oxidised ware

OAB1 oxidised ware. Fairly soft and powdery with moderate, medium, subrounded quartz and sparse iron oxide inclusions

Black burnished ware

RBB1 Rossington Bridge BB1 ware. Tomber and Dore 1998 RBB1

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APPENDIX 5 – SAMIAN WARE

G. Monteil

1 INTRODUCTION

A total of 11 sherds of samian ware were recovered from excavations at Waterdale. An additional fragment comes from the evaluation. The fabric of each sherd was examined, after taking a small fresh break, under a x 20 binocular microscope and was catalogued by context number. Each archive entry consists of a context number, fabric, form and decoration identification, condition, sherd count, rim EVEs (Estimated Vessel Equivalents), rim diameter, weight, notes and a date range. Rubbings of the decorated fragments were undertaken during analysis. They were mounted, scanned and submitted as illustrations.

Table 18: Samian fabrics and forms present

	La Graufesenque		pre-import Lezoux?		Lezoux			Total		
	sh	wght	sh	wght	sh	wght	EVE	sh	wght	EVE
beaker	3	3						3	3	
bowl	1	10			1	2	0.02	2	12	0.02
closed form	1	2						1	2	
dec bowl	1	4						1	4	
dish	1	8						1	8	
DR37	1	5	1	4	1	7		3	16	
unid	1	1						1	1	
Total	9	33	1	4	2	9	0.02	12	46	0.02

2 CONDITION

The assemblage is very small with 12 sherds representing 11 vessels for a total weight of 46g and a total rim EVES figure of 0.02 (Table 18). With the exception of a fragment found in a late Roman grave (6401), the samian material was found residual in post-Medieval deposits (5006, 6045, 6047 6048 and 6074). All of the fragments are small with an average weight of 4.6g and therefore typical of residual material. No evidence of burning, wear or graffiti was recorded on any of the fragments.

3 FABRICS REPRESENTED AND CHRONOLOGY

All but three of the samian vessels recovered from the site come from the site of La Graufesenque in South Gaul and form a homogeneous albeit small group (Table 18). The range of forms is poor and with the exception of a Dr.37 recovered from deposit 6048 dating to the late Flavian-early Trajanic period (D1 below), little can be dated precisely. The plain ware includes fragments from three beakers (one in 6045 and two in grave 6401) and an extremely abraded dish recovered from the evaluation trench.

The other three fragments of samian ware are from Lezoux in Central Gaul (Table 18) and include three bowls fragments two of which are decorated. A much abraded sherd from gravel pit 5006 is perhaps a Trajanic import from Lezoux (D3), one from 6074 can be dated more precisely to the Hadrianic period (D4 below). There is no material later than this Hadrianic piece and no evidence of mid-late 2nd century and early 3rd century occupation in the samian assemblage.

4 CONCLUDING REMARKS

Although residual this small samian assemblage dating to the Flavian period and the first half of the 2nd c. AD seems contemporary to the cremation cemetery but played an apparently small role in the cemetery rites. As is perhaps expected from a military site (Cool and Leary 2012), samian vessels were not selected to use as grave goods in this cremation cemetery and the absence of any trace of burning also precludes its association with pyre rituals. The range of forms present in this small group, beakers and decorated bowls and the lack of cups and dishes would confirm this, samian dishes and cups are the favoured forms when used as grave goods (Willis 2005, appendix 9.1), pyre goods and pre-burial rites of the period (Cool and Leary 2012, table 29.3 and p. 306-11). The samian vessels recovered here were perhaps used in post-burial ritual (*ibid*, 315-6).

5 CATALOGUE OF DECORATED SAMIAN WARE

The following catalogue lists and identifies the decorated pieces recovered from the site. The Inventory Numbers (Inv No) quoted for the decorated South Gaulish vessels are taken from *European intake of Roman Samian ceramics*. <http://www2.rgzm.de/samian/home/frames.htm>

The letter and number codes used for the non-figured types on the Central Gaulish material –such as B226, C190, etc are the ones created by Rogers (Rogers 1974).

The figured-types referred to as Os *** are the ones illustrated by Felix Oswald in his *Index of figure-types on terra sigillata* (1936).

5.1 South Gaulish, La Graufesenque

***D1-**(6048), Dr.37. Little of the decoration remains, part of the ovolo is visible, a wavy line, a rosette and a trifid motif. The ovolo with a very long tongue is possibly the one found on Dr.37s stamped by Sabinus iv (0005420). The trifid motif with serrated edge on outer leaf is not on any of the stamped or signed ones, the rosette at junction fits. Late Flavian-Trajanic.

D2-(6074), decorated bowl, probably a Dr.37. A little decoration remains, possibly the tail of a dolphin though the published examples do not match the details seen here. Flavian.

5.2 Central Gaulish, Lezoux

D3-(5006), Dr.37. The external surface has almost completely worn away and the details of the decoration remain unidentifiable. The fabric is powdery, light orange with mica, sand and the slip thin and brownish characteristics consistent with origin in pre import Lezoux. The fabric and finish suggest a Trajanic-early Hadrianic date.

***D4-**(6074) Dr.37. From lower part of the decoration, two small double festoons each with the same bird (Os.2298 like but with more details on feathers) and linked by an astragalus, beneath are several examples of bifid motif/small dolphins Os.2407A (Stanfield and Simpson 1990, fig. 15, no. 4) and a wavy line. All of these details suggest the style of Geminus iv, AD 120-140.

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APPENDIX 6 - MORTARIA

Kay Hartley

1 STAMPED MORTARIUM

Context 6045 1270gms. Diam 370mms 24% (eight joining sherds, with stamps) and 30% (twenty joining sherds) (**Figure 11.19**). There are 8 small sherds which are likely to be from the base. In addition, there are 33 other small sherds and upto 70 minute sherds. All 69 plus the c70 sherds are from the same mortarium. 54% of the rim survives, but more survives below the rim than this figure suggests and some fresh breaks show that not all the fragments have been recovered. The mortarium was heavily worn throughout with the trituration grit worn completely away below c3cms below the bead.

The cuts on the surface of the right-facing side of the spout are part of the deliberate slashing of the surface to provide keying for the extra clay which was added to form the spout; the added clay has broken away at this point exposing the cuts. There is deep, jagged cracking underneath the flange which may have occurred during the initial firing of the vessel.

The fabric is a rather discoloured, slightly micaceous and fine-textured cream with pink and black in the core. There are traces of a matt, pinkish-brown slip especially in and near the spout. There are moderate, ill-sorted and random red-brown, rare black inclusions and tiny flecks of mica. The trituration grit consists mostly of orange-brown sandstone with some quartz and rare, angular black rock, perhaps with some quartz sandstone.

The vessel was shattered and is still fragmenting, often in layers, i.e. laminating. This condition plus the discolouration might fit best with it having been in a severe fire, perhaps also having water thrown onto it. It is not possible to be certain that this mortarium was complete at the time when it shattered, but there is certainly a possibility. Mortaria are very rarely found in association with any type of burial, but the condition of the sherds could fit with it being used during a cremation ceremony.

There are two left-facing stamps, impressed close together. Parts of the stamps are eroded and the die was not completely impressed. However, the end-borders of the stamps nearest to the inside of the vessel are complete; the 'outside' borders and part of the first letter were never impressed. The damage makes the stamps appear difficult to read, but a complete stamp from the same die, found near Pontefract, together with this one, provide a complete reading for this potter, IICITHDA, with D reversed and ligated with the H. 'IICIT' represents '*fecit*' for 'made it' (II are sometimes used to represent E) and HDA the name of the potter. H in mortarium stamps always represents E; EDA could perhaps be an abbreviation, but no obvious expansion is known and there are other possible interpretations. Despite the difficulties, the stamp is an easy one to recognize. Normally the name precedes *fecit* in a stamp, this is a rare example of the reverse occurring.

Other certain examples of mortaria with this stamp are recorded from: Castleford (Rush, Dickinson et al 2000, fig. 97, no.24, drawn upside down and lacking fragments of letters D and A; attributed to this potter); Dragonby; Dringhouses, York; Lincoln; Malton; a site near Pontefract; Slack; Ferriby Brickyard (parish of South Ferriby), and another mortarium from a site nearby, also in the parish of South Ferriby, north Lincs (report in prep.). (Another stamp which may be his is from Carlisle (CAR 81 CAL A 66)) The fabric, the distribution and the rim-profiles used by this potter point clearly to production in Lincoln. The Waterdale mortarium has a quite unusual profile which can be matched exactly in a mortarium of Vitalis 1 (found at Healam, Yorks), whose mortaria were fired in the Technical College kiln at Lincoln (Baker 1936). There is no reasonable doubt that these potters were active there within the period AD90-120 and the potter 'HDA' can be confidently attributed to the group working there though no stamps of his were found at the kiln. Traces of a matt, red slip have also been recorded on mortaria stamped by these potters. The use of such a slip could be some indication of supplying the military, but more evidence is needed to make this certain.

2 OTHER SHERDS

Context 6047 3 joining sherds from the base of a mortarium. The fabric fits with production at Lincoln (Tomber and Dore 1998, 160 (LTC WH)). The base is heavily worn, but not as heavily as one would expect the base of the FECITHDA mortarium to be. There is no indication of burning and the fabric is not splintering in the same way. It seems unlikely to be from the same vessel. As a Lincoln product in this fabric it can reasonably be dated second-century.

P5436 u/s Fragment with incomplete section of the rim; probably from a mortarium though there is no trituration grit present. Red-brown fabric with frequent quartz inclusions. Attributable to a South Yorkshire source such as Cantley. Probably third- or fourth-century rather than earlier. Burnt.

Context 6432 Body sherd not a mortarium

Context 6045 i. body sherd; not a mortarium.

ii. 2 joining sherds from a footring. Not a mortarium

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APPENDIX 7 - ROMAN CERAMIC OIL LAMPS

David Griffiths

1 INTRODUCTION

Lighting equipment and artificial light played an important role in Roman ritual activities throughout the empire (Zaitsev 2002, 44), but was not particularly common in Britain (Bird 2011, 282-5). Lighting equipment have been recovered from a number of temples and sanctuaries (e.g. Carrawburgh, London and Verulamium), mainly dedicated to deities such as Mithras and Cybele (Eckardt 2002, 96-8; 2011, 190-1). Burials have also contained lighting equipment alongside objects of personal adornments; metal, glass, and ceramic vessels for eating and drinking, and occasionally ceramic tazzas (incense burners), suggesting that light and purifying smells were important components in some Romano-British funeral rituals (Eckardt 2002, 98-115; Bird 2011, 282-5).

2 RESULTS

The assemblage of Roman ceramic oil lamps found in Cremation Group A at Waterdale, consists of four complete Firmalampen, or Factory lamps (Small Finds no's **37** (Loeschcke Type IXb), **41** (Loeschcke Type IXc), **42** (Loeschcke Type X k) and **46** (Loeschcke Type IXb)), and six fragments from one Picture lamp (Small Finds no's **53** and **69** (Loeschcke Type IV) are most likely from the same vessel). All the lamp remains were recovered from a single context (6322). These types (Loeschcke Type IV, IX and X, 1919, pl.1) are the most commonly found on Romano-British sites (Eckardt 2011, 185-186). The use of oil lamps in Roman Britain was relatively short-lived, with the majority of lighting equipment dating to the late first to early second centuries AD, with fewer examples found in mid- to late second century AD contexts. There is resurgence in the use of Roman-style lighting equipment in the later Roman period, but with candles and candlesticks, rather than oil lamps (Eckardt 2011, 191). Lighting equipment use in Roman Britain was very restricted, with oil lamps predominantly found on large urban and military sites (Eckardt 2011, 192). The relatively small amounts of lighting equipment recovered from Romano-British deposits (approximately 2000+) further highlights their restricted consumption in Britain. In comparison, recent excavations of pre- 79 AD deposits at seven properties at Insula VI. 1, Pompeii, have recovered over 550 ceramic oil lamps and lamp fragments (Griffiths 2012).

3 FIRMALAMPEN

Most Loeschcke Type IX b lamps (**37** and **46**) found in Britain originated from East Gaul and Köln, and this type of Firmalampen are the most commonly copied lamp throughout the Roman provinces (Harris 1980; Eckardt 2002, 190). Two examples from Verulamium (**1830** and **1831**, Eckardt 2002, 190) were found alongside two Type IX c lamps (see No. **41** below) in a rich burial dating to c. 80-90 AD. Bailey (1988, 165-168) cites a number of examples from London (e.g. **Q1585**, **Q1590**, **Q1597**) and Colchester (e.g. **Q1588**, **Q1598**, **Q1613**), dating from the late first to early second centuries AD. The discuses of Firmalampen are generally undecorated, but when they are, the theatrical mask (as on no. **37** here) is a popular design. An almost identical example to no. **37** comes from Colchester (**560**, Eckardt 2002, fig. 87, 202).

The Loeschcke Type IX c lamp (**41**) also dates to the late first and early second centuries AD. Their distribution is focussed on large urban sites, such as Verulamium, Caerleon, and London (Eckardt 2002, 190). Bailey (1988, 168) cites examples from London, Old Jewry (**Q1614**) and Clements Lane (**Q1615**), and Colchester (**Q1616** and **Q1617**). Two examples were recovered from a burial at Verulamium (**1828** and **1829**), in association with two Loeschcke Type IX b lamps, and dating to the late first century AD (Eckardt 2002, 190). An additional example from Verulamium comes from a burial associated with a coin of Titus or Vespasian, dating to the late first century AD. A further example was found in a rich cist burial in Caerleon, dating to the early second century AD (Eckardt 2002, 190).

Loeschcke Type X lamps (**42**) do not appear until the beginning of the second century AD, and continues to be produced throughout this century, and possibly into the very early third, but in very debased forms (Eckardt 2002, 189). Examples from Colchester (**Q1622**, Bailey 1988, 169), London (**1051**, **1057**, **2049**, Eckardt 2002, 193) and Castleford (**1** and **3**, Bailey 1998, 224-225).

4 PICTURE LAMP

The single (fragmentary) Picture lamp (**53** and **69**) likely dates to a slightly earlier period than the Firmalampen, possibly around the third quarter of the first century AD, and was probably manufactured in Italy. Other examples come from pre-Flavian (before 69AD) contexts at Colchester (**459**, **478**, **521**), the latter found in a burial associated with six small Firmalampen stamped by SIRONI and four tazze, and two examples from London (**1746**, **1749** - associated with four Firmalampen and eight tazze) (Eckardt 2002, 182-185).

5 MAKER'S STAMPS

The four Firmalampen from Waterdale (**37**, **41**, **46**, **42**) all have maker's stamps. Two are stamped STROBILI (**37** and **46**) and one FORTIS (**42**). The fourth, no. **41**, is probably a local copy, with a debased and illegible maker's mark. Fortis and Strobili were two dominant lamp 'Factories' who stamped their products (Bailey 1988, 97 & 100; Eckardt 2002, 204). Both workshops originated in northern Italy, with regional branches throughout the northern provinces, including Britain (Bailey 1988, 97). Possible Romano-British production sites of Fortis lamps include Colchester, Caerleon and Holt (Eckardt 2002, 204). It is difficult to identify for certain the place of manufacture for the Firmalampen from Waterdale based on fabric type, as the four lamps are unbroken, leaving no visible breaks for fabric analysis. It may be tentatively suggested, based on surface clay type/colour and their robust manufacture, that they were all produced in the northern provinces, rather than Italy. Small Finds no. **37** compares with lamps produced in the Colchester region, based in clay colour and form (e.g. **560**, Eckardt 2002, fig. 87, 202).

6 CONCLUSION

Given that a relatively small number of lamps have been recovered from Romano-British contexts, the group of oil lamps from Waterdale provides an interesting addition to the *corpus*. Oil lamps in funerary contexts are particularly rare, and this assemblage has the potential to enhance our understanding of the ritual and religious uses of artificial light, for both the living and the dead, as part of complex and socio-culturally important burial rites. The use of oil lamps during this period suggests a conscious adoption of a Roman, and specifically Mediterranean, lifestyle.

7 CATALOGUE

37

Complete *Firmalampe* of Loeschcke Type IX b (Loeschcke 1919, pl. 1). Raised rim around discus with closed nozzle channel with air-hole; flat nozzle. Three unpierced shoulder-lugs. Discus with theatrical (slave?) mask flanked by two fuel-holes. Multiple base-rings with makers mark STROBILI in relief. Sooting stains to discus and lamp body. Iron staining to shoulder. No slip. Late first to early second century AD. Possibly manufactured in the Colchester region. **Fabric** pale cream-white. **Dimensions:** L. 99.5mm, W. 68mm, H. 31.6mm. **Rim diam.** 51mm; **Rim** 100%; **Body diam.** 68mm; **Base diam.** 44.5mm; **Base** 100%; **Wt.** 72g; **Count** 1. **Context** 6322; **P:** 5436. **DONMG 2011.4.**

41

Complete *Firmalampe* of Loeschcke Type IX c (Loeschcke 1919, pl.1). Raised rim around discus (with central fuel-hole) which extends to form narrow V-shape channel across part of the nozzle. Channel does not extend towards the flat wick hole area (as in Loeschcke Type X). Ring-handle and two shoulder-lugs (unpierced). Multiple base-rings; debased makers mark (illegible) on base. Grey, slightly metallic, slip. Uncertain origin, possibly British? **Fabric** buff. **Dimensions:** L. 100.5mm (inc. handle), W. 56mm, H.

26mm (not inc. handle). **Rim diam.** 41mm; **Rim** 100%; **Body diam.** 56mm; **Base diam.** 35mm; **Base** 100%; **Wt.** 70g; **Count** 1. **Context** 6322; **P:** 5436. **DONMG 2011.4.**

42

Complete *Firmalampe* of Loeschcke Type X k (Loeschcke 1919, pl.1; Eckardt 2002, 190-193). Raised rim surrounding discus and wick hole area. Two unpierced lugs. Open channel with air-hole from discus to nozzle. Short nozzle protruding from circular body. Undecorated discus with central fuel-hole. Multiple base-rings with maker's mark FORTIS in relief. Light, grey slip or pain on surface. c. 100 – 150 AD. **Fabric** grey-buff. **Dimensions:** L. 102mm, W. 85.3mm, H. 29.1mm. **Rim diam.** 58mm; **Rim** 100%; **Body diam.** 85.3mm; **Base diam.** 50.6mm; **Base** 100%; **Wt.** 109g; **Count** 1. **Context** 6322; **P:** 5436. **DONMG 2011.4.**

46

Complete *Firmalampe* of Loeschcke Type IX b (Loeschcke 1919, pl. 1). Raised rim around discus with closed nozzle channel with air-hole; flat nozzle. Two unpierced shoulder-lugs. Undecorated discus with central fuel-hole and air-hole next to rim towards nozzle. Multiple base-rings with makers mark STROBILI in relief. No slip. Very smooth finish. Slight damage on rim but otherwise looks unused. Late first to early second century AD. **Fabric** grey-buff. **Dimensions:** L. 110.5mm, W. 75.8mm, H. 33.2mm. **Rim diam.** 55.8mm; **Rim** 100%; **Body diam.** 75.8mm; **Base diam.** 48.3mm; **Base** 100%; **Wt.** 95g; **Count** 1. **Context** 6322; **P:** 5436. **DONMG 2011.4.**

53

Loeschcke Type IV Picture lamp (Loeschcke 1919, pl. 1). Four fragments which include rim, discus, shoulder, body and base: Loeschcke Shoulder-form VI; decorated discus with a dog (with collar) crouched to the right, with raised haunches and lowered tail, fuel-hole below. Voluted nozzle (missing) and small fragment of base-ring. Heavily eroded mid-brown slip. Second-half of the first to early second century AD. Possibly Italian origin. **Fabric** pale cream-grey (Munsell 2.5Y 7/1 light grey). **Rim diam.** 52.5mm; **Rim** c. 30%; **Body diam.** 62.5mm (broken); **Base diam.** c. 50mm; **Base** c. 25%; **Wt.** 21g; **Count** 4. **Context** 6322; **P:** 5436. **DONMG 2011.4.**

69

Two lamp body and base fragments. Probably the same vessel as No. 53. **Fabric** pale cream-grey (Munsell 2.5Y 7/1 light grey); **Wt.** 3g; **Count** 2. **Context** 6322; **P:** 5436. **DONMG 2011.4.**



Plate 9: Ceramic oil lamps



Plate 10: Makers stamps on the base of oil lamps

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APPENDIX 8 - METALWORK AND GLASS

H.E.M. Cool

1 INTRODUCTION

The catalogue is presented according to the context groups identified on site and through post excavation analysis. The material has been grouped according to grave, pit or features and not and not by individual context for the analysis. The nails and hobnails recovered during excavation are reported in Appendix 9 and have not been included here.

2 PYRE GOODS

Most of the material recovered appears to have been derived from pyre goods. The remains of glass vessels which had been placed on the pyres were found in the urned cremation burials 6303, 6268, 6245, 6332 (nos. 7, 16, 21, 17) and the burials contained within a probable organic containers (6267 - no. 14, 6243 - no. 25). It was also found in deposits that may be redeposited pyre debris rather than formal burials pit (6260 - no. 29, 6350 - no. 28, 6399 - no. 31). Nos. 35-7 and nos. 30 and 24 probably also originated in this way.

All of this glass is blue/green and probably originated from glass containers that had held perfumes which were used to anoint the body and scent the pyre, and other liquids used for libations during the funeral. The colour indicates a use within the first to third centuries. The glass was completely melted and had generally formed rounded lumps with a few drips and trails. Some contained tiny fragments of bone, and the vesicular surfaces of others retained white staining that was probably derived from the ash from bones and other pyre material. To melt glass completely like this would require temperatures in excess of 1000-1100°C suggesting very effective management of the pyres (Cool 2004, 366). The complete melting of most of the glass means that it is difficult to suggest the precise types of vessels used. One fragment (no. 21) retained a shape that was very reminiscent of the pinched attachment trails seen on jugs such as no. 40 discussed below. If it indeed came from a jug and is not just a fortuitous effect of the melting this would date the vessel to the later first to mid second century period.

Normally in other cemeteries where the burning has not always been so intense and the vessels, though deformed, retain some information about the form, it can be seen that what was being put on the pyre were unguent bottles. In this cemetery there are two rim fragments from blue/green unguent bottles. One is no. 13 from the organic container cremation burial 6267, and the other is no 20 from the urned cremation burial 6254. Both have rims where the edge has been rolled in. This would suggest a date of the end of the first century at the earliest as before that unguent bottles had sheared rims. Unguent bottles with outbent rims with the edges rolled in can be expected from the last decade of the first century until the mid to later second century. After that the preferred rim form tended to be one that was folded out and then in. So these two burials are most likely to belong to the first half of the second century. No. 13 has a dulled surface as if it has been in the vicinity of the pyre. No. 20 shows no evidence of burning, but clearly given their contexts both had been involved in the funeral ritual.

A chip from an apparently unburnt colourless rim came from the pit 6340 (no. 23). The fragment is too small for the form to be identified but the colour and the rim formation would suggest a later second or third century date. A second to third century date would also be appropriate for the colourless body fragment no. 32 from a post hole. It is heat-affected but does not show the level of melting seen on the blue/green fragments and it need not have been a pyre good. The status of the colourless chips from 6269 (no. 11) and context 6436 is equivocal. With such small pieces it is impossible to be sure whether they were burnt or not or, indeed, whether they were truly colourless.

That glass vessels were regularly being placed on the pyres indicates that the cemetery is following a military or large urban centre pattern. The study of pyre goods from cemeteries in Roman Britain is still in its infancy, but there are now an increasing number of cemeteries which have had the benefit of

detailed sampling regimes. From those it is possible to see that the placing of glass vessels on pyres associated with rural and small urban settlements occurs only very rarely and frequently not at all (Cool and Leary 2012, Table 29.2). The use of glass vessels in the funeral ritual at Waterdale probably indicates that the community burying its dead there is military in origin.

Amongst the metal pyre goods considered here the commonest artefact is a small copper alloy hooked fitting. These have a transverse cross-bar and an angular C-shaped hook with groove across the outer end. Amongst the urned cremation burials, two came from 6303 (nos. 1-2), one from 6268 (no. 15), and two certain and one fragmentary came from 6245 (no. 24-26). One certain and one probable fragment (nos. 26-27) also came from the redeposited pyre debris in pit 6350. These are a most welcome addition to the *corpus* of Roman finds as hitherto they have been very rare.

The only sites where they have been found in comparable quantities are Caerleon and in the Walbrook stream deposits in London. At Caerleon three were found in drain deposits of the fortress baths which date between AD 160 and 230, and one was found in a fourth century context (Brewer 1986, 181 no. 109-10, 186 no. 170). In publishing those Brewer noted a further three from the Caerleon Basilica excavations in 1964. An additional example was noted from a fourth century context at the Roman Gates site in Caerleon (Webster 1992, 156 no. 360). In publishing that one Webster noted an example from Winchester which was, and still is, unpublished. Both authors drew attention to three examples from the Walbrook. Wilmott's publication of the finds from there suggests there were 14 in total from Bucklersbury House (Wilmott 1991, 132 nos. 494-5). The Walbrook finds can be dated in general to the mid first to mid second century and three (Wilmott 1991, 119 nos. 340-2) come from a deposit which is most likely to belong to the mid second century. On balance, therefore, a second century date seems most likely for them. Broken examples would be hard to identify, but that they are rare rather than just overlooked seems very likely. I have never encountered them before in over 35 years of working with Roman copper alloy finds, and a survey of reports on my shelves has not located any examples other than the ones cited.

They are normally described as dress hooks with the idea that they functioned as part of a hook and eye type fastening. Here the less functionally specific name T-bar hook has been preferred for the simple reason it is difficult to see what part of Roman dress they would have fastened. Clothing was rarely tailored and relatively little sewing was needed. The angular C-shaped hook would be appropriate to fit over something about 5 or 6mm thick with a bevelled edge, so leather would be appropriate. The Waterdale finds are important because it shows that they were used in multiples. Given the presence of hobnails amongst the pyre goods, it is tempting to suggest that they were some form of shoe fitting. Against that, it can be pointed out that Roman shoes are relatively well understood and examples are relatively common. To my knowledge no fittings like these have ever been found on Roman shoes, but further research might be appropriate.

The urned cremation burial 6303 and the heavily truncated pit 6269 both contained fragments that could well come from the same pyre. These contexts both come from the bottom of the sequence of cremation burial group A with 6303 cutting 6269. The uniting finds for these two deposits are fragments from a distinctive iron chain. This is formed by taking an oval ring and bending it over in two to form a U-shape. The next link is then threaded through the loops at the end of the arms of the U, and bent in turn. This is single loop-in-loop chain. It was most frequently used in non-ferrous metal for jewellery and, on a larger scale, display items such as the chains for hanging lamps.

In iron it was not used for utilitarian chains. Instead it was again used for objects where display was important. It was used, for example, on the cauldron hangers which are a *tour-de-force* of the smith's craft (Manning 1983). The chain links from the two deposits (nos. 4 and 9) are very similar, and it seems extremely likely they came from the same object. In pit 6369 part of the chain still articulates with a ring and split pin (no. 9a). The pin has a decorated enlarged loop, again suggesting that the chain came from an object where display was important. The same pit produced two other split pins of similar dimensions (9b and 9c) and a third was found in 6303. Where preserved the length of the legs suggests

these pins were driven into a board of c. 10mm thickness. Split pins such as these were used on wooden caskets both as parts of iron strap hinges and to attach other decorative fittings as can be seen on those from cremation burials at Skeleton Green (Partridge 1981, 318-9 fig 121). The clear association of at least one of the pins with a length of chain though, suggests that here they were not functioning in that way. A distinct possibility is that the chains were for suspension and the pins united it with what was being suspended.

The two deposits also contain a quantity of heat distorted copper alloy sheet fragments (nos. 3 and 8). One (no. 3a) was bent through 90° and associated with a similarly bent narrow iron strap. A second (no. 3b) also had an iron strap bent at the end. Again the obvious identification to suggest is that these came from some form of casket placed on the pyre. In 6269 there is also a copper alloy split pin with an expanded head of the same dimensions as the iron split pins. This might suggest that the copper alloy sheet fragments came instead from the artefact associated with the chains. What that might be is currently a matter of speculation. It can be noted that a nail head (no. 6) of the sort used on upholstery (Manning 1986, 165 Type 7) came from Group A. It would probably be appropriate to review all of the nails from these two deposits to see if they show any unusual features that could be associated with this complex of finds. The charcoal recovered should also be inspected to see if it includes woods of the type used for joinery rather than fuel. Given the items were found in the grave that also contained the lamps, it may be appropriate to note that other forms lamps were frequently suspended, and one possibility might be that these remains were from a piece of furniture or a fitting associated with lighting.

3 OTHER FINDS

The iron finger ring no. 33 does not come from an obvious burial-related context. The good preservation of this delicate piece means though that it would not be surprising if it had been on the pyre, as the heat often leads to this effect. Unsurprisingly it cannot be easily paralleled amongst the known iron finger-rings. Iron was used to make jewellery in the Roman period more frequently than is generally appreciated, but the more delicate pieces only tend to survive in special circumstances. No. 33 has concavities on each shoulder backed by grooves with a plain block bezel. This constricted shoulder form is common in copper alloy (Cool 1983, 349 Group XIII A) in use during the second century and into the third.

The complete body of a conical blue/green jug (no. 40) is an intriguing find (**Plate 11**). This was recovered during construction machining south of the main excavation area and details of its archaeological context are limited but it must be assumed that this was from a special deposit of some form as otherwise it is highly unlikely to have survived in the state it is in. Such jugs are a common find generally from the later first century to the mid second century (Price and Cottam 1998, 155-7) and are not uncommon as grave goods during that period. The intriguing element about this piece is the neat break at the same level at the base of the neck and across the handle. Both of these breaks are located across the thickest part of the jug. The probability that this could have happened by chance, without damaging any part of the much thinner body and base, seems very low. How these jugs normally break can be seen from another example from Frenchgate in Doncaster (Allen 1986, 103 no. 1, fig. 24). This was found in a Flavian pit with other broken, but substantially complete, glass vessels. The handle of the Frenchgate jug broke at approximately the same place as the handle of the Waterdale jug, but the neck and body did not break until much higher up below the rim. It was also broken lower down at the edge of the base ring. The breaking patterns of two other similar substantially complete, but broken, jugs found in an Antonine pit at Park Street, Towcester can also be considered (Price 1980, 66 nos. 7 and 9 fig. 15), where there were numerous breaks on the body. Breakages are much more likely there than across the neck/body junction where the glass is very thick. The deliberate modification of the piece before deposition thus seems very likely. One might posit that the jug originally became damaged in the upper part of the neck, and the neck was then removed in its entirety to make it suitable for deposition.



Plate 11: 1st to 2nd century AD glass vessel, catalogue no. 40, recovered during machine excavation along the line of the new access road to the rear of the NPV

4 CATALOGUE

4.1 Cremation Group A

Cremation pit 6303

- 1 T-bar hook. Copper alloy. Circular-sectioned shank becoming slightly rectangular bent to form a slightly angular C-shape; rectangular end has narrow square-sectioned crossbar. Shank terminal has groove across outer face. Ends of crossbar chipped. Width crossbar 10mm, length 7mm, central void 4mm. SF262 [6255] Sample 28.
- 2 T-bar hook. Copper alloy. Lower part of circular-sectioned shank in angular C-shape, terminal has groove across outer face. Also one melted fragment that might be another part of this fitting Extant depth 5mm. SF231 [6302] Sample 35
- 3 Box fittings(?). Copper alloy sheet buckled and folded from heat, several associated with iron strap fragments rectangular section.

- a Copper alloy sheet fragment bent through 90° with similarly bent iron strap passing through sheet at angle. Iron strap section 4 x 3mm., sheet dimensions 21 x 9mm. SF40 [6322].
 - b Crumpled copper alloy sheet in several layers. Iron strap bending through 90° at edge of sheet, bent end forked. Iron strap length 34mm, section 5 x 3mm, dimensions copper alloy 35 x 27mm. SF47 [6322].
 - c Folded and crumpled copper alloy sheet with iron shank fragment, tapering and most probably a nail shank and not a strap like the other pieces. Dimensions of sheet 24 x 17mm. SF47 [6322].
 - d Copper alloy sheet fragment, folded and possible with a perforation at the fold . Dimensions 18 x 14mm. SF43 [6322].
 - e Copper ally sheet fragment. Dimensions 6 x 3mm. SF231 [6302]. Sample 35.
 - f Copper alloy sheet fragments (2). Dimensions 11 x 5mm. SF237 [6261]. Sample 34.
 - g Tiny melted droplet of copper alloy. Diameter 3.5mm. SF263 [6335].
- 4 Chain fragments. Iron. Link-in-link chain with individual links formed of narrow rectangular-sectioned tapering strap.
- a Largest fragment consisting of three complete links with remains of link in each end. Total length 48mm, individual link – length 20mm, width 11mm. SF 62 [6302].
 - b One side of a link retaining fragment of a second link. Length link 17mm, width link 11mm. SF 261 [6302]. SA36.
 - c Junction of two links, also two fragments of side of links. SF225 [6322]. SA27.
 - d Fragment from side of link. SF238 [6302]. SA36.
- 5 Split pin (not conserved). Iron. Strap expanded centrally bent in two with loop at end formed from expanded part and legs parallel, probably outbent end to one. Length 32mm, width loop c. 12mm. SF49 [6322]
- 6 Upholstery nail; head fragment. Iron. Head diameter 11mm. SF225 [6322]. Sample 27.
- 7 Melted blue/green glass. Elongated rounded lump with vesicular surface; one end broken. Length 18mm. Weight 1.75g. SF168 [6334].

Cremation pit 6269

- 8 Box fittings (?). (Not conserved) Copper alloy sheet bucked and distorted from heat.
- a 14 copper alloy sheet fragments, two with edges bent over as if originally from an edge binding. Largest fragment 24 x 24mm. SF21 [6256].
 - b One copper alloy sheet fragment curved as if from edge binding; also c. 20 very small flakes of sheet and melted fragments. Dimensions of (?) binding 19 x 6mm. SF229 [6256]. Sample 29.
 - c Four copper alloy sheet fragments, one with small square perforation. Largest fragment 19 x 14mm. Perforation width 1.5mm. SF137 [6256].
 - d Split pin. Copper alloy. Strap expanded centrally bent in two with loop at end formed from expanded part and legs parallel, one leg bent sideways, other broken. Area around loop shows iron corrosion products. Length 21.5mm, width of loop c. 11mm, distance between loop and legs c. 7mm. SF229 [6256]. Sample 29.

- e Three fragments of copper alloy bar, one bent through 90°; possibly parts of split pi legs like no. 8d. Largest – length 8mm. SF229 [6256]. Sample 29.
- 9 Chain fragments. Iron. Link-in-link chain with individual links formed of narrow rectangular-sectioned tapering strap.
- a Terminal fragment (conserved). Split pin of strap expanded centrally bent in two with loop at end formed from expanded part and legs parallel, extant tip of one leg bent sideways through 90°; centre of loop forged to have rib on either side. Loop articulates with bar of rounded section bent into ring, one complete and one fragmentary link of chain attached to ring. Split pin – length 28mm, width loop 8.5mm, distance between loop and out-turned legs c. 12mm; ring – diameter 22.5mm, section c. 5mm; chain link – length 22mm, width 12mm. SF22, [6256].
- b Split pin (not conserved). Strap expanded centrally bent in two with loop at end formed from expanded part and legs parallel. Centre of loop may have edge ribs. Length 28mm, width of loop 11mm, SF227 [6256]. Sample 29.
- c Split pin and fragments of links of chain (not conserved). Split pin – strap expanded centrally, bent in two with loop at end formed from expanded part, broken legs; traces of plate on back. One complete link with fragments of two other links attached. Six fragments from links. Split pin - current length 21mm, width of loop 9mm; Complete link – length 20mm, width 11mm. SF228 [6256]. Sample 29.
- d Fragments of chain links. (not conserved). Three parts of broken links retaining junction with second in each case, and one small additional fragment. Width links 12mm SF 242 [6258]. Sample 43.
- 10 Melted blue/green glass. Rounded lump with vesicular surfaces retaining minute traces of bone. Length 17mm. Weight 1.35g. SF270 [6256]. Sample 29.
- 11 Four chips of colourless glass. Weight 0.21g. SF270 [6256]

Cremation pit 6301

- 12 Melted copper alloy fragment. Largest – 7 x 4mm. SF243 [6258]. Sample 43.

Cremation pit 6267

- 13 Unguent bottle, rim fragment. Blue/green glass, dulled surface. Out-turned rim, edge rolled-in, cylindrical neck. Rim diameter 25mm, wall thickness 2mm, present height 11mm. Weight 1.66g. SF 165 [6247]
- 14 Melted blue/green glass. Rounded lump. Length 19mm Weight 1.62g. SF264 [6247]. Sample 7.

Cremation pit 6268

- 15 T-bar hook. Copper alloy. Angular shank with groove over outer face. Present length c. 8mm. SF216 [6272]. Sample 13.
- 16 Melted blue/green glass fragments (total weight 24.93g).
- a Three fragments broken across vesicular surfaces, rounded surface on larger. Maximum length 9mm. Weight 1.37g. SF267 [6272]. Sample 13.
- b Rounded and vesicular. Possible traces of bone. Fresh breaks. Maximum length 48mm. Weight 18.39g. SF9 [6251].
- c Rounded lump. Maximum length 29mm Weight 4.89g. SF8 [6251].
- d One rounded lump sheared down centre, vesicular. Length 9mm. Weight 0.29g. SF268 [6252]. Sample 14.

- e Small strain cracked blue/green glass chip. Length 4mm. Weight 0.05g. SF269 [6266].

Cremation pit 6254

- 17 T-bar hook. Copper alloy. Circular-sectioned broken shank becoming slightly rectangular bent to form a slightly angular C-shape; rectangular end has narrow square-sectioned crossbar, one arm broken. Width crossbar originally c.12mm, length 7mm, central void 4mm. SF10 [6254].
- 18 T-bar hook. Copper alloy. Circular-sectioned shank becoming slightly rectangular bent to form a slightly angular C-shape; rectangular end has narrow square-sectioned crossbar, one arm broken. Shank terminal has groove across outer face. Ends of crossbar chipped. Present width crossbar 8.5mm, length 7mm, central void 3.5mm. SF203 [6254].
- 19 T-bar hook? Angular shank fragment, both ends broken. Length 7mm. SF221 [6254]. Sample 18.
- 20 Unguent bottle; rim fragment. Blue/green glass. Cylindrical neck, outbent rim edge rolled in. Rim diameter 25mm, present height 8mm, wall thickness 2mm. Weight 0.79. SF266, [6254]
- 21 Melted handle fragment? Possible pinched extension from handle trail, edges and back melted and vesicular, also five melted and very vesicular fragments. Width trail 10.5mm. Weight 3.25g. SF266 [6254].

4.2 Cremation Group B

Cremation pit 6332

- 22 Melted blue/green glass. Elongated rounded lump broken into three pieces; vesicular internally. Length 54mm. Weight 9.9g. SF64 [6332]

Cremation pit (?) 6340.

- 23 Chip possibly from edge of folded rim. Colourless. Dimensions 14 x 6mm. Weight 0.48g. SF275 [6341]. Sample 53.
- 24 Melted blue/green glass. Rounded lump, broken in three joining pieces. Strain cracked internally. Length 30mm. Weight 4.58g. SF272 [6347]. Sample 47.

Cremation pit 6343

- 25 Melted blue/green glass fragments (total weight 8.57g).
- a Rounded lump with vesicular surfaces and one recent break. Length 17mm. Weight 2.14g. SF78 [6361].
- b Rounded lump with vesicular surface and embedded patch of iron corrosion. Length 32mm. Weight 4.8g. SF273 [6361]. Sample 48.
- c Two rounded broken lumps and one chip. Vesicular internally. Maximum length 11mm. Weight 1.45g. SF273.[6361]. Sample 48.
- d Two joined trails, one curved to spiral. Length 10mm. Weight 0.18g. SF 273 [6361]. Sample 48.

Cremation / redeposited pyre debris pit 6350

- 26 T-bar hook. Copper alloy. Circular-sectioned shank becoming slightly rectangular bent to form a slightly angular C-shape; shank terminal has groove across outer face. Crossbar missing. Present length 6.5mm, central void 5mm. SF253 [6349]. Sample 55.
- 27 T bar hook? Copper alloy. Outer part of angular C-shape. Present length c. 7mm. SF253 [6349] Sample 55.

- 28 Melted blue/green glass (total weight 9.55g)
- a Rounded lump, bubbles internally. Length 33mm. Weight 6.17g. SF276 [6349]. Sample 55.
 - b Three rounded lumps with heavily vesicular surfaces. Weight 3.38g. SF 276 [6349]. Sample 55.

4.3 Other burial contexts

Redeposited pyre debris pit (?) 6250

- 29 Melted blue/green glass fragments (total weight 10.14g)
- a Rounded and spread with minute fragments of bone incorporated. Fresh breaks. Maximum length 36mm. Weight 2.25g. SF6 [6248]
 - b lump with irregular surfaces. Length 25mm. Weight 3.45g. SF265 [6248]. Sample 8.
 - c Three rounded lumps with vesicular surfaces. Length 20, 19 and 13mm. Weight 3.55g. SF 265 [6245]. Sample 8.
 - d Trail with vesicular surface. Length 17mm. Weight 0.97g. SF169 [6248].

Possible Cremation pit 6363

- 30 Melted blue/green glass. Two rounded drops. Maximum length 14mm. Weight 1.27g. SF274 [6362]. Sample 52.

Cremation / redeposited pyre debris pit 6399

- 31 Melted blue/green glass (total weight 2.72g).
- a Rounded lump in two joining pieces; vesicular surfaces. Length 17mm. Weight 2.28g. SF277. Context 6398. Sample 56.
 - b Rounded drop. Length 8mm. Weight 0.44g. SF278 [6398]. Sample 57

4.4 Other contexts

Posthole 6204

- 32 Body fragment. Colourless glass. Heat affected surfaces. Dimensions 8 x 5mm. SF279 [6170]. Sample 71.

Pit 6393

- 33 Finger ring, in three joining pieces. Iron. Square-sectioned hoop becoming rectangular-sectioned over the shoulders and expanding to oval block bezel; concavity either side of bezel, with traces groove(s) behind, possibly with additional edge nicks at base of shoulder. Diameter c. 21mm, hoop section c. 2mm, width bezel 6mm. SF 106 [6394].
- 34 Upholstery nail. Iron. Large flat head. Diameter 11mm, length shank 12mm. SF 129 [6394].

Pit 6435 / 6

- 35 Melted blue green glass. 52 strain-cracked and vesicular chips and fragments from a rounded lump retaining fragment of burnt bone. Maximum length 14mm. Weight 7.7g. SF281 [6435]. Sample 74.
- 36 Melted blue/green glass. Flatted rounded lump. Length 11mm. Weight 0.62g. SF280 [6436]. Sample 73.
- 37 Melted blue/green glass. Rounded drop. Length 6mm. Weight 0.18g. SF 281 [6435].

- 38 Two small chips. Blue/green (?) glass. Maximum length 4.5mm. Weight 0.12g. SF280 [6436]. Sample 73.
- 39 Two colourless (?) glass chips Weight 0.17g. SF 280 [6436]. Sample 73.

4.5 Material recovered from construction machining

- 40 Conical Jug; complete body and base. Blue/green glass. Tooled neck junction; conical body with rounded carination to wide lower body; open pushed-in base ring.; Lower part of ribbon handle with central trail and long pinched attachment trail. Rim, neck and upper part of handle missing; breaks smooth and at same level for both neck and handle, possible slight traces of grozing on neck edge. From the internal iridescence pattern the vessel probably lay on its side in the ground. Present height 149mm, base diameter 72mm, weight 218g. SF204 [unstratified].

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APPENDIX 9 – THE NAILS

Nicky Rogers

1 QUANTIFICATION

A total of 141 nails were recovered during the excavations; of these, 100 derived from cremation related deposits, and 13 from inhumation deposits. Fragments of nails numbered approximately 755, of which approximately 735 were found in cremation related deposits, and five in inhumation deposits.

2 NAILS FROM CREMATIONS

Excavation demonstrated that the cremation burials occurred both in isolation and in tightly packed groups of multiple deposits. Three groups were labelled as Groups A, B and C: the nails and nail fragments from these complexes have been tabulated below in Tables 19 - 21. Nails and nail fragments from the individual cremation features are tabulated in Table 22.

Table 19: Group A nails and nail fragments by context

Context	Context type	Nails	Nail Fragments
6247	Cremated Material	1	9
6248	Cremated Material	-	9
6251	Cremation Material	-	7
6252	?Redeposited Cremation Material	1	2
6253	Cremated Material	-	2
6254	Cremated Material URN SF13	3	11
6255	Cremation Material	-	1
6256	Cremation Material	4	29
6257	?Redeposited Cremation Material	-	12
6258	Cremated Material	-	4
6261	Cremated Material	4	5
6272	Cremated Material	2	11
6302	Cremated Material	2	14
6306	?Redeposited Cremation Material	-	22
6322	Cremation Material	6	51
6328	Cremation	1	5
6334	Cremation Material	1	3
Total		26	197
%age of all cremations		26	26.8

Table 20: Group B nails and nail fragments by context

Context	Context type	Nails	Nail Fragments
6332	Cremation Material	2	
6333	Fill of Urn SF54	-	3
6341	Cremation Material	-	12
6343	Cremation Material	-	8
6349	Cremation Material	1	13
6361	Cremation Material	4	21
6386	Cremation Material	2	5
6388	Cremation Material	-	17
Total		9	79
%age of all cremations		9	10.7

Table 21: Group C nails and nail fragments by context.

Context	Context type	Nails	Nail Fragments
6434	?Redeposited Cremation Material	5	118
6435	Cremation Material	37	205
Total		42	323
%age of all cremations		42	44

Table 22: Individual cremation features: nails and nail fragments by context

Context	Context type	Nails	Nail Fragments
3011	?Cremation Pit Fill	2	-
3012	?Cremation Pit Fill	1	18
6045	Fill Urn frags SF3	2	-
6057	Cremation Urn SF1	1	-
6127	Backfill of possible cremation pit	4	22
6131	Cremation Fill	-	12
6140	?Redeposited Cremation Material	2	3
6294	Cremation Material	11	81
Total		23	136
%age of all cremations		23	18.5

2.1 Urned Cremations

Of all the nails found in the cremation related deposits, only six nails and fourteen nail fragments were found in association with surviving urns or urn fragments (Table 23); none was recorded as being inside an urn. Unless particularly large in size, at perhaps 100+ mm in length, nails and nail fragments found in association with urns are generally thought to derive from funerary practice (Alfayé 2009, p.429), either being from coffins, funeral biers, or other nailed wooden objects – such as boxes - burned on the pyres, and collected unintentionally with the ashes of the deceased. It is also possible that old timbers with nails attached were used as fuel for the pyre (McWhirr et al 1982, 100). The nails found with urns at Waterdale ranged in length from 32mm (SF210) to 64.5mm (SF152), and thus are most likely to be part of the pyre material; some of the nail fragments exhibited signs of burning e.g. SF55, Context 6333

Table 23: Nails from urned cremations

Area/Individual	Context	Urn	Nails	Nail Fragments
Group A	6254	SF13	3	11
Group B	6333	SF54	-	3
Individual	6045	SF3	2	-
Individual	6057	SF1	1	-

2.2 Unurned Cremations

Within the unurned cremations, nails and nail fragments were usually found in considerably larger amounts than in the urned cremations. It is possible that some may derive from wooden containers or caskets in which cremations were sometimes buried (Philpott 1991) but no patterns of distribution of the nails within the burials were recorded, so this cannot be proven.

Within both the groups, and the individual cremation burials, nails were recovered from some deposits with signs of burning on them; these evidently must derive from material burnt on the pyres. Other nails and nail fragments lacking visible signs of burning also occur in the same deposits that have produced nails with indications of burning, and these may also been present on the pyres but have not been affected by the heat in the same ways.

2.3 Distribution of the nails

It has been noted elsewhere that Cremation Group C contained two cremations, the fill (C.6435) of one of which 'contained the most abundant and varied carbonised votive assemblage of any of the cremation deposits analysed', containing 'a range of exotic, 'modern' imported foods', suggesting that the individual had been 'of an extremely high status' (Miller et al. Appendix 18). This cremation was cut by a second with fill C.6434 containing remains of less exotic food stuffs (Miller et al. Appendix 18). It must be of some significance that despite comprising only these two cremations, Group C contained 42% of all the complete nails and 44% of all the nail fragments recovered from cremation related deposits; C.6435 alone produced 37% of all the complete nails and 27.9% of all the nail fragments. This compares to eight features in Group A producing approximately 26% of all the nails, and 26% of the nail fragments, and eight features in Group B producing 9% of all the nails and 10.7% of all the nail fragments. The implications of this distribution are uncertain: it cannot be ascertained how the nails came to be in the cremation fills with certainty, but it must be assumed that they derive from the containers on which the bodies were placed on top of the pyre, and/or the fuel used on the pyre. The very high number of small nail fragments certainly suggests they have been in the presence of high temperature activity; 48 fragments of melted glass (SF281) also from Context 6435, provide evidence of temperatures above 1000°C. Perhaps the large number of fragments of artefacts associated with these cremations points to a more careful collection of the residue of the cremation prior to burial of the

ashes; with regard to this argument, it is worth noting that the highest weight of cremated bone from all the cremations came from Context 6435 (Holst p.?).

3 NAILS FROM INHUMATIONS

Thirteen nails, and five nail fragments were recovered from the fill (Context 6338) of a grave cut (Context 6337); unfortunately this grave cut through two earlier features, a probable cremation (Context 6393), from which it had disturbed cremated bone, and (Context 6216) the gully associated with cremation Group A. This means it is impossible to be certain which – if any – of the nails relate to the inhumation or to disturbed cremation remains. None of the nails shows signs of burning, but as noted above, this does not necessarily mean that these have not been present on a pyre. Apart from one particularly large nail with a length of 123mm (SF118), the lengths of all the complete nails fell into a range of 49 – 68mm; it was noted in London, that most coffins in the Eastern Cemetery were assembled using nails 41 – 100mm long (Barber and Bowsher 2000, 94), so it is possible all of these nails could have been coffin nails. Similar sized nails were, however, also found amongst those recovered from the cremations at Waterdale.

4 HOB NAILS

4.1 Hob Nails from cremations

Table 24 below shows the locations and numbers of hob nails recovered from cremations. It has been suggested that where hob nails occur in cremation deposits, this may have been because they were collected with the ashes from the pyre, indicating that the body had been wearing shoes, or that shoes were placed separately on the pyre (Barber and Bowsher 2000, 69). Where large numbers of hob nails, perhaps 50 or more are recovered, this may suggest either the careful collection of all nails, or that unburnt shoes may have been interred with the ashes (x ref with Chichester Excav 1); none of the Watergate cremation deposits has produced more than 30 hob nails, pointing to the shoes being burned on the pyre, and some of the nails collected.

4.2 Hob Nails from inhumations

The largest collection of hob nails (77) came from the inhumation fill and skeleton (Contexts 6338/6339). These may have come from shoes worn on the body or placed within the grave, but as noted above, this grave cut through an earlier cremation (Context 6393), and gully (Context 6216); consequently, it is uncertain how many – if any – of the hob nails derive from the inhumation.

Table 24: Hob Nails from cremations and inhumation

Set	Context	Context Description	Hob Nails
Group A	6254	Cremated Material	13
Group A	6256	Cremation Material	1
Group A	6261	Cremated Material	2
Group A	6302	Cremated Material	3
Group A	6322	Cremation Material	21
Group A	6328	Cremation	5
Group B	6332	Cremation Material	1
Group C	6435	Pit Fill	30
Cremation	6294	Cremation Material	18
Cremation	6127	Cremation Material?	1
Burial	6338	Grave / Pit Fill	69
Burial	6339	Skeleton	8
Total			172

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APPENDIX 10 - ROMAN COIN

Craig Barclay

A single coin (SF 122) was recovered from the excavations. This was found in context 6401 the fill of grave 6400. This coin, which dates from AD 268-269, fits in with the 1st to 3rd century date for pottery from this grave.

AE Radiate; Claudius II

Rome, AD 268-269

Obv.) Radiate bust right: [IMP C C]LAVDIUVS AVG

Rev.) - Libertas standing facing, head left, holding a pileum in her right hand and a tall sceptre in her left:

[LIB]ERT [AVG]

cf *RIC* VI, 62

Light wear; contemporary loss

APPENDIX 11 - THE CERAMIC BUILDING MATERIAL

J. M. McComish

A total of 948g of Ceramic Building Material (CBM) was examined which ranged in date from probably Roman to modern (Table 25). The material was recorded to a standard YAT methodology, with only a sample of each of the fabrics recorded being retained (i.e. eight sherds). The overwhelming bulk of the material comprised highly abraded fragments each weighing less than 10g; the size and fragmentary nature of the sherds made any identification of the date of the material in question tentative.

The bulk of the sherds present comprised small abraded fragments which were interpreted as being probably Roman in date; these were in two differing fabrics (Fabrics 2 and 3). The sherds were too abraded to determine the original forms and they were therefore classified as being probably Roman Brick. Due to the fragmentary nature of the material few features relating to manufacture were present, though a couple of the sherds had reduced cores. In addition to the sherds interpreted as probably Roman brick there was one fragment of possible *opus signinum* which was retained.

Medieval material comprised five sherds of plain tile of 13-16th century date in Fabric F4 and two fragments in Fabric 1 that may represent medieval brick. The possible medieval bricks were far less abraded than the sherds interpreted as probably Roman and were in a differing fabric perhaps suggesting that they were of later date, however, it should be stressed that both these sherds were small and their identification is tentative.

Post-medieval and modern material comprised nine brick fragments. The post-medieval brick of 16-18th century date was in Fabric F5 and included one sherd with grass marks and a turning mark on the base. There were eight modern brick fragments, one sherd in context 6074 was wire cut and in Fabric F6, while the remaining seven fragments were of modern machine made brick in Fabric F7 which were recovered from context 6188. A single fragment of machine made brown glazed sewer pipe dating to 1850 or later was present in Context 6024.

The fragmentary nature of the CBM examined limits its potential for further research, with the bulk of the sherds being too small to accurately determine the date or form. No further research is warranted.

Table 25 CBM Catalogue

Context	Dating	Keywords
0	14-16th?	Medieval brick?
5006	13-16th	Plain, Roman brick?
5008	1-4th?	Roman brick?
5009	1-4th?	Roman brick?
6024	1850+	Sewer
6046	13-16th	Plain, Roman brick
6047	1-4th?	Roman brick?
6048	16-18th?	Post-medieval brick?
6070	14-16th?	Medieval brick?
6074	1850+	Brick
6075	1-4th?	Roman brick?
6118	1850+	Roman brick, Brick
6144	1-4th?	Roman brick?
6175	1-4th	Roman brick?
6198	1-4th	Opus signinum?
6271	1-4th?	Roman brick?

APPENDIX 12 – SLAG AND INDUSTRIAL RESIDUE

R. S. Cubitt

A small quantity of debris derived from possible metalworking or other heating processes was encountered in the excavations at Waterdale. This material was subject to visual assessment. The balance used was accurate to 1g. Very small and light items were given a nominal weight of 1g. The assemblage is summarised in Table 26 below.

Table 26: Debris from Waterdale, Doncaster.

Type of debris	Weight (g)	No. of items
Fired clay	58	2
Over fired clay	4	1
Fuel ash slag	5	2
Cinder	8	1
Slagged shale	20	1
Iron fragment	58	2

Both items of fired clay come from cremation deposits (contexts 6247 and 6248). This is mostly material that has been accidentally heated as part of the cremation process. The over-fired clay has been heated to a higher temperature. It was found in the secondary fill of a pit (context 6047) but may be material related to the cremation process which has been subsequently disturbed. Roman sherds found amongst the 18th century pottery in this context suggests disturbance.

A tiny quantity of fuel ash slag was recovered from sieving. This residue is produced in any high temperature fire where alkalis are able to react with silicates (Bayley et al 2001,21). This material probably derives from the cremations. Pottery in the same context (6362) dates to the Roman period.

Fragment of cinder are formed in the same way as fuel ash slag but their darker colour is indicative of ironworking (Bayley et al 2001,21). The cinder fragment is from context 6009 containing both 19th century and Roman pottery. Due to this disturbance it is not possible to make any comment about how this fragment arrived on the site. The piece of slagged shale, pointing to a coal fuelled process of some sort, is also from a backfill deposit (6007) which is dated to the 19th century.

Two items from context 5006 have been termed iron fragments. They are magnetic, containing a high proportion of metal, but with a concreted exterior with stones and charcoal adhering. However, they are not objects as such, they have no recognisable form on the x-ray. Pottery from this context included Roman and 16th century sherds suggestions disturbance.

No further work is recommended on this assemblage

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APPENDIX 13 – THE NON ROMAN POTTERY

K. Weston

In addition to the Roman pottery, over 500 sherds of pottery dating to other periods were recovered from the excavations (Table 27).

1 PREHISTORIC POTTERY

One small, abraded sherd from 6282 is of particular note as it appears to be Iron Age in date. It is hand-made and probably fired in a bonfire kiln, with a coarse fabric, sparse rounded burnt organic inclusions <4mm across and chaff shaped voids amongst other crushed rocks within its fabric. It has a reduced dark grey brown internal surface, oxidised external surface and a laminar lightly reduced core.

2 POST ROMAN POTTERY

The rest of the pottery was post-Roman. The material primarily dates to the seventeenth to nineteenth centuries but also contains a number of medieval pieces.

The total assemblage may be interpreted as being a fairly typical domestic assemblage from the area, with no obviously industrial material present. The medieval pottery appears in the main to have emanated from the local Hallgate kilns (Buckley et al 1979; Buckland et al 1989; Cumberpatch et al 1998-1999); the coarse white wares being mainly of Hallgate B type, while the red wares probably belong to the Hallgate A group of wares. Hallgate A wares can be mistaken for Humber wares which are also known to occur in this area during the medieval period. However, as their name suggests, kilns producing these wares have been found and excavated in East Yorkshire and Humberside. One medieval sherd may be of a London type ware jug (see context 6009). It has a brick red brown fabric decorated with a white slipped vertical line on. These jugs were often found on excavations in London where they are thought to be 13th to 14th century in date (see Pearce et al 1985, McCarthy and Brooks 1988, 308).

The late medieval and early post-medieval period, late 15th and 16th centuries, is represented by small amounts of purple glazed and Cistercian wares. The pottery from the modern period, seventeenth to nineteenth centuries, mainly comprises English stone wares, black and brown glazed wares, with smaller quantities of transfer printed, tin glazed, cream and white earthen wares. Some of these fine wares may have been made locally in the Don Pottery (Griffin 2000). One sherd of slip ware with a chestnut glaze is decorated with a series of wavy lines and may have emanated from the London/Essex area, though slip wares with buff fabrics were being made much more locally at sites like Midhope, near Sheffield for example.

Table 27: Non Roman Pottery

Context	Find	Quantity	Dating	Details
0	BF183	2	19th Century	Demolition layer - 1 English stoneware bottle, 1 transfer printed 1 English brown stoneware Nottingham type jar or bottle base 311g All large sherds
		3	19th Century	Surface finds Grid SQ 720E/950N - 13th century 2 Hallgate A type 1 Hallgate B type. All small sherds
		25	19th Century	Cleaning layer Tr5 Area C - 1 transfer printed blue white small, 1 pearl fluted small, 1 cream collander small, 1 white earthenware bowl base with series of pairs of blue vertical 3mm dashes medium, 1 slipware moulded bowl buff fabric small, 1 Hallgate A type with splashed spot of glaze small, 2 lightly reduced fine green glazed, 1 brownish purple glazed coarse buff cistern large sherd, 4 Hallgate B type with light

				greenish yellow glaze small, 1 brown glazed fine oxidised earthenware jar with small horizontal lug handle with hole through small, 210g, 1 Brandsby type jug rim small, 2 oxidised gritty small abraded, 5 ?Scarborough I type jug and jar small and medium, 4 Humber small abraded, 92g
5002	BF110	2	Late 12 th Century	2 oxidised gritty ware 4g, small sherds abraded
5006	BF111	137	16 th Century With residual Roman	1 Cistercian 1 coarsely gritted lightly oxidised purple glazed Firsby or Rawmarsh 2 purple glazed oxidised moderately gritted earthenware 23 Hallgate B jug and jar 3 fine white ware with lustrous apple green glaze urinal 7 Hallgate C small abraded 1 slipware with fine oxidised fabric 1 moderately gritted oxidised fabric with green brown glaze 39 Hallgate A type jug 560g 1 Hallgate A jug rim small 10 Humber small 4 Hallgate B small abraded 7 Coal measure white moderately coarsely gritted small 1 ?Iron Age small abraded 4 grey ware small 14 oxidised ?Hallgate A small abraded 30 very small oxidised ?Hallgate A All abraded and small 414g 1 fine sandy oxidised small 5g All small to medium sized sherds Also contained residual Roman ceramics.
5007	BF112	7	18th/19th Century With residual Roman	2 coarse lightly reduced coal measure fabric Firsby or Rawmarsh 2 white earthenware 3 Hallgate C abraded 1 Hallgate B type splash glazed 2 Hallgate B type 53g All small sherds. Also contained residual Roman ceramics.
5008	BF113	31	Late 14th Century With residual Roman	8 Hallgate A 11 Hallgate B 81g 1 white gritty ware jar rim small 4 ?Hallgate B type scraps 2 oxidised gritty small 4 fine sandy oxidised ?Hallgate A small 46g All small sherds. Also contained residual Roman ceramics.
5009	BF114	2	18th Century	1 banded slip blue brown white 1 black glazed finely gritted oxidised earthenware 10g Small sherds 1 fine oxidised small abraded 1 fine white small abraded
6003	BF115	2	18th/19th Century	1 white earthenware 1 purple glazed coarse lightly oxidised coal measure Firsby or Rawmarsh 19g All small sherds
6006	BF117	1	18th Century With residual Roman	1 brown glazed fine red earthenware mug Wrenthorpe 9g small/medium sherd. Also contained residual Roman ceramics.
6007	BF118	2	19th Century	1 scrap transfer printed 1 scrap pearl 1g 1 coarsely gritted oxidised scrap 1g
6009	BF119	6	19th Century With residual Roman	1 pearl 1 transfer printed 1 white earthenware with fine gold line decoration 1 purple glazed moderately oxidised 1 Hallgate A abraded 1 London type ware jug 17g All small sherds. Also contained residual Roman ceramics.
6016	BF121	1	18th Century	1 banded slip plain small 4g
6018	BF122	1	19th Century	1 transfer printed open form blue and white small 4g
6020	BF123	1	15th Century	1 coarsely gritted S Yorkshire type Firsby or Rawmarsh small 16g
6021	BF124	3	18th Century	1 black glazed fine oxidised ware 1 Hallgate A 13g 1 coarsely gritted oxidised jar base small 8g Small sherds
6024	BF125	6	18th Century	3 white earthenware small 1 black glazed fine oxidised earthenware small to medium 1 Nottingham type stoneware 1 lightly reduced moderately gritted coal measure with purplish spots glaze 41g
6046	BF127	10	18th Century	3 white earthenware cup handle 3 fine oxidised black glazed jar 1 moderately gritted buff ware with brown glaze bowl 1 gritty jar with small rolled rim 1 coarsely gritted oxidised earthenware with brown

				glaze 1 coal measure type coarse buff fabric 96g All small sherds
6047	BF128	21	18th Century With residual Roman	1 Cistercian 2 Nottingham type stoneware 3 Hallgate A 2 Hallgate B 1 purple glazed fine oxidised thick strap handle medium sized sherd 2 coarse reduced purple glazed coal measure 2 brown glazed fine oxidised see BRNGLOX3 100g Mostly small sherds 3 Hallgate B small 1 fine grey ware with brown surfaces small 1 very fine white ?Roman jar small 1 fine oxidise scrap 1 gritty ware with grey core and oxidised surfaces small 1 Humber small Also contained residual Roman ceramics.
6048	BF129	42	Late 17th Century With residual Roman	1 slipware jug medium sized sherd chestnut glaze (see Metropolitan slipware) 2 lightly reduced hard moderately gritted jug with splash glaze 1 brown glazed moderately gritted oxidised ware with green brown glaze spots under base 1 moderately gritted lightly oxidised ware with chestnut glaze scrap 3 Hallgate B abraded 1 fine oxidised fabric with brown glaze see BRNGLOX6) 2 coarsely grittedlightly oxidised splashed ware 1 fine oxidised ?Hallgate C ware 110g Mostly small sherds 7 fine oxidised Hallgate A type small 1 Firsby/Rawmarsh type small 2 grey gritty scraps 3 oxidised gritty small 82g. Also contained residual Roman ceramics.
6062	BF131	1	18th/19th Century	1 English brown stoneware blacking bottle
6074	BF132	18	17th Century? With residual Roman	4 brown glazed moderately oxidised bowl see BRNGLOX6 small to medium sized sherds 1 brown glazed moderately gritted oxidised with chestnut glaze on one surface small sherd 2 fine lightly reduced green glazed medium and small sized sherds 1 purple glazed moderately oxidised scrap 88g Small and medium sized sherds 1 fine oxidised ?Romano-British small 1 oxidised coarse sandy base medium/large 1 reduced ware with grey core and light brown margins small abraded 2 moderately coarse grey ware brittle feel small and medium 1 oxidised sandy ware with reduced core and oxidised surfaces small 2 fine sandy grey ware with brownish surfaces small 1 coarsely gritted oxidised ware with sandy brownish surfaces small 3 scraps 167g. Also contained residual Roman ceramics.
6076	BF133	1	19th Century	1 English stoneware with light greenish buff tiger skin salt glaze small sherd 8g
6077	BF134	7	18th/19th Century	1 transfer printed 1 ?sponged ware 3 English brown stoneware ?Nottingham type 1 black glazed moderately gritted oxidised earthenware 1 brown glazed moderately gritted oxidised earthenware 22g All small sherds
6078	BF135	8	Late 18th / early 19th Century	2 ?banded slipware blue and white ?scrap 2 white earthenware plate with scalloped rim and blue moulded feathered edge small sherd 1 white salt glazed with moulded raised rosettes scraps 1 manganese dusted buff earthenware with streaky brown glaze small sherd 1 black glazed finely gritted earthenware 1 transfer printed with ?mocha tree design small sherd 24g All small sherds
6087	BF136	1	18th Century	1 brown glazed moderately gritted oxidised see BRNGLOX7 small sherd 8g
6090	BF137	4	18th Century	1 moderately oxidised earthenware with shiny brown glaze inside and dark self slipped external surface small sherd 8g 3 ?Roman small 19g
6091	BF138	2	18th Century	1 coarsely gritted oxidised earthenware bung hole cistern with purple glaze medium sherd 1 fine oxidised earthenware with shiny brown glaze small sherd 74g

6099	BF139	1	19th Century	1 transfer printed ware scrap with green design 1g
6110	BF140	2	18th Century	1 shiny dark brown black glazed fine oxidised ware small sherd 1 brown glazed fine oxidised jar base with glaze over break second medium sherd 56g
6122	BF184	1	18th Century With residual Roman	1 black glazed speck. Also contained one residual Roman ceramic.
6136	BF143	1	Late 12th Century With residual Roman	1 splash glazed gritty ware with oxidised margins and surfaces and lightly oxidised core small sherd 11g. Also contained residual Roman ceramics.
6170	BF185	5	18th Century	1 white gritty Hallgate B type with splashed glaze 2 scraps brown glazed fine oxidised earthenware with ?slip decoration 1 very fine white ware scrap 1 speck white glazed earthenware 4g All small
6183	BF186	1	18th Century	1 ?manganese dusted brown glazed oxidised earthenware scrap 0.5g
6206	BF147	1	18th Century	1 black glazed fine oxidised earthenware small sherd 9g
6265	BF152	1	Lat 12th Century	1 Hallgate B type fabric with splash glaze small 8g
6271	BF153	2	14th/15th Century	1 Humber scrap 1 fine oxidised with grey surfaces scrap 1g
6282	BF158	1	Iron Age	1 coarsely gritted hand-made ware with chaff shaped voids slightly abraded small 16g
6372	BF171	1	13th Century With residual Roman	1 ?Hallgate A small sherd 5g. Also contained residual Roman ceramics.
6386	BF173	1	14th/15th Century With Roman	1 Humber small 5g. Also contained large quantities of Roman ceramics, medieval may be intrusive..
6410	BF178	3	18th/19th Century With residual Roman	1 banded slip blue white scrap 1 yellow glazed buff earthenware scrap 1 coarsely gritted ?Hallgate C small 3g. Also contained residual Roman ceramics.

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APPENDIX 14- CLAY TOBACCO PIPES

K. M. Weston

A small group of 36 clay tobacco pipes, comprising 34 plain stems and 2 stems with partial bowls, were recovered from the excavations (Table 28).

Table 28: Clay Tobacco Pipes

Context	Find Number	Description	Date	Context Description
0	BF208	Qty: 6; 3 stems dating to late 18th/19th Century; 3 stems dating to 17th/early 18th Century - one with yellow/brown glaze	1600-1900	Unstratified
2005	BF14	Qty 1; plain stem	1600-1750	Silting deposit
5006	BF198	Qty 1; plain stem	1600-1750	Gravel pit fill
5007	BF200	Qty 2; plain stems	1600-1750	Gravel pit fill
5009	BF202	Qty 1; plain stem	1600-1750	Gravel pit fill
6007	BF211	Qty 1; plain stem	1800-1900	Deliberate backfill of WW1 trench
6009	BF201	Qty 3; 1 plain stem; 2 plain stem fragments	1800-1900	Deliberate backfill of WW1 trench
6011	BF197	Qty 1; plain stem	1800-1900	Secondary fill
6024	BF213	Qty 2; plain stems	1800-1900	Silting deposit
6028	BF210	Qty 1; plain stem	1800-1900	Natural backfill of ditch
6036	BF206	Qty 1; plain stem	1800-1900	Backfill behind shoring
6046	BF209	Qty 3; plain stems	1800-1900	Victorian overburden - sandy silt cut by WW1 trench
6047	BF204	Qty 2; plain stems	1650-1800	Secondary pit - silting
6048	BF203	Qty 3; 2 plain stems dating to late 17th/18th Century. 1 stem with part of bowl - shape suggests a date of 1670-1700.	1650-1800	Secondary pit fill
6068	BF212	Qty 1; plain stem fragment	1800-1900	Silting deposit
6077	BF199	Qty 4; 3 stem fragments, 1 stem and partial bowl - shape suggests date of 1690-1740	1600-1750	Backfill
6078	BF207	Qty 1; plain stem	1800-1900	Backfill
6173	BF196	Qty 1; plain stem with yellow/brown glaze	1600-1750	Silting deposit
6197	BF205	Qty 1; plain stem	1800-1900	Silting deposit

Plain pipe stems are difficult to date accurately and should be used with caution. The size of the stem bore and the appearance of the stem fragment can give an indication of the century in which it was produced but a general lack of bowls or any makers marks in this assemblage makes dating less reliable.

Half of the plain stems seem to date to the 17th/early 18th Century and the other half to the 19th Century. There are two stems which have enough of the bowl present to be able to date them more accurately based on their shape. These date to 1670-1700 (Context 6048) and 1690-1740 (Context 6077). The stems are all in either deliberate pit backfills, or in natural backfilling/silting of pits and WW1 trenches.

No further work is recommended for this assemblage.

APPENDIX 15 - OTHER FINDS

K. M. Weston

A number of other finds were recovered from the excavations at Waterdale (Table 29). In total there was 679g of charcoal recovered, 625g of which is cremation material, and 54g from pit fills and silting. A total of 5 oyster shells were recovered and also 5 burnt stone fragments.

Table 29: Other finds list

Context	Context Description	Material	Find	Find Description
5006	Gravel Pit Fill	Charcoal	BF104	11g
6048	Secondary Fill	Charcoal	BF105	7g
6255	Cremation Material	Charcoal	BF106	625g
6271	Silting	Charcoal	BF107	9g
6274	Fill	Charcoal	BF108	2g
6367	Pit	Charcoal	BF109	25g
0	Unstratified	Shell	BF38	oyster shell fragment
6047	Secondary Fill	Shell	BF36	3 oyster shell fragments
6078	Backfill	Shell	BF37	oyster shell fragment
6432	Interface, Burnt Area	Stone	BF57	5 burnt stone fragments

No further work is recommended for this material.

APPENDIX 16 - THE FAUNAL REMAINS

Clare Rainsford

1 QUANTIFICATION

126 bones were recovered from 29 contexts, of which 51 (40%) were identified to species level. A further 26 bones were present in the assemblage as unstratified material, including 1 semi-complete horse skeleton. These have been excluded from the majority of the following analysis, which will deal separately with stratified and unstratified material.

2 STRATIFIED MATERIAL

Very little bone was recovered from most contexts, with 22 out of the 29 contexts containing 5 fragments or less of bone. In general, the bone was highly fragmentary, and frequently variable within the context in terms of taphonomic (degree of sub-aerial weathering) or diagenetic condition (staining / deterioration). Approximately 56% of identified material was considered to be 50% or more complete, with 37% falling into the “75% or more complete” category. However, this figure is likely to have been skewed by the high proportion of loose teeth, which make up almost half of the identified assemblage. The majority of fragments showed some evidence of sub-aerial weathering, in terms of flaking and abrasion of surfaces; or root etching. In addition, the preservation condition of bone from some contexts due to diagenetic factors appears poor: contexts [6338] and [6136], representing a mixed grave/gully fill and a spread of colluvium respectively, both comprised almost exclusively of fragmentary cattle molars with deteriorated dentine, although [6136] also contained a few small fragments of burnt bone.

The assemblage is comprised almost exclusively of sheep and cattle elements, with cattle accounting for 48% of identified assemblage, and sheep accounting for almost 46% (Table 30, see also Table 32). Other than this, pig represents 4% of assemblage, with only two fragments identified, and 1 fragment of red deer antler was also noted, from context [5006]. No bird, fish, or smaller mammal bones were recorded in the assemblage, although this is unsurprising due to the poor condition of the bones, noted above.

The assemblage from context [6074] has two distinctive features worth noting. Firstly, the condition of the bones is substantially better than in the majority of contexts, with little evidence of weathering noted and also the survival of 1 large cattle horncore. Secondly, the only two elements of pig identified in the assemblage as a whole derive from this context. This could indicate that the assemblage in this context derived from a slightly different source and was buried more rapidly than the rest of the site assemblage.

Table 30: Species representation (stratified and unstratified bone)

	Stratified	Unstratified	TOTAL
Sheep	21		21
Cow	27	2	29
Pig	2		2
Horse		22	22
Red deer	1		1
Total ID	51	24	75
Unid	75	2	77
TOTAL	126	26	152

3 UNSTRATIFIED

26 fragments of unstratified bone were present in the assemblage, of which 24 were identified to species level. Of these, 22 represent a single, semi-complete horse skeleton, and the remainder are fragments of cattle elements. The horse is represented by the right forequarter and cranium, although the right front leg below the humerus is absent (Table 31). All teeth present are fully in wear, and the presence of lipping on articular surfaces, and excess bone growth in other areas (particularly noticeable on the vertebrae present), suggests that the horse was a mature if not old individual at the time of death. No butchery was noted on the bones, nor any evidence of carnivore gnawing, and only minimal evidence of sub-aerial exposure on some surfaces. The bones were largely complete, and any breakage appeared recent. It would appear that the horse represents a deliberate burial, although it may have been partially decomposed after a period of exposure when finally interred. The relatively fresh condition of the bone, particularly in comparison to the other bone recovered from the site, suggests that it is likely to have been a more recent burial, rather than one of particular antiquity.

Table 31: Horse elements present from unstratified contexts.

Element	Quantity
Maxilla (right)	1
Mandible (right)	1
Mandible (left)	1
Scapula (right)	1
Humerus (right)	1
Ribs	3
Vertebrae (cervical)	6
Vertebrae (thoracic)	4
Axis	1
TOTAL	19

Table 32: Species representation (NISP) by context

Context	Cattle	Sheep	Pig	Horse	Red deer	UNID	TOTAL
5006	8	6			1	14	29
5007		1					1
5008	5	3				3	11
5009						1	1
6007						1	1
6036						1	1
6046		1				2	3
6047	1	1				10	12
6048	1	3				4	8
6070						1	1
6074	2	2	2			6	12
6075		2				3	5
6076						1	1
6077						1	1
6078		1				1	2
6090	1	1				2	4
6118	1					1	2
6135						6	6
6136						1	1
6142						1	1
6217						2	2
6271						2	2
6274						3	3
6338	2						2
6339	5						5
6372	1						1
6381						2	2
6382						1	1
6394						4	4
8384						1	1
Unstrat	2			22		2	26
TOTAL	29	21	2	22	1	77	152

APPENDIX 17 - WOOD

S J Allen

Seven pieces of wood from two contexts were received for assessment. The wood was all recovered from the shoring of the first World War trenches.

Five pieces of *Taxus baccata L.* roundwood came from context 6016. Though some clearly had cut ends the abrasion and drying suffered by these pieces had removed any evidence for tool identification. The wood appeared to be slow grown, typical of branch wood from a Yew, with no evidence for management.

Two fragments of *Pinus sylvestris L.* came from context 6078. Though described as radially faced, there is no evidence to show that these two pieces were deliberately shaped and no indication that they necessarily derive from worked wood.

Both species (Yew and Scots Pine respectively) are native to the British Isles and to North-West Europe in general. Both species could have grown locally and there is no need to suppose that any of this wood has been imported over any significant distance between their source and their findspot.

None of the pieces provide any intrinsic dating evidence, although their context, the shoring of the First World War Training trenches, suggests an early 20th century date. ¹⁴C dating would be possible on the pieces from 6016 but in light of their context this is not recommended.

Unless required for ¹⁴C dating, the wood can be discarded as no further useful information can be gathered.

APPENDIX 18 - BOTANICAL ANALYSIS OF CREMATION DEPOSITS

Jennifer Miller with Clark Innes and Alan Wood (Northlight Heritage)

1.0 SUMMARY

The carbonised botanical assemblage from Waterdale was particularly significant in some samples and included charcoal undoubtedly relating to pyre fuel but also a variety of votive food offerings to the dead. Expensive and in some circumstances extremely rare (within the Roman UK record) food plants are well represented, with fragments or entire fruits of fig, grape and date found. Other imported and valuable foods included walnut, stone pine and lentils, whilst hazelnut and cereals were also recorded. The number and variety of exotic food types of Mediterranean and Eastern provenance present are strongly indicative of a sophisticated consumer community with strong affiliation to Rome and the military garrison. Some individuals especially are considered to have had significant wealth and status. This assemblage is of particular note as it bears strong resemblance to Roman cremation cemeteries in France, Belgium and Italy, emphasising the maintenance and expression of Roman cultural identity by the military community based in Britain

2.0 METHOD

Of the original 74 samples processed, a total of 44 had retained carbonised botanical material. Preliminary assessment indicated the potential of the botanical assemblages to add significant information pertaining to the cremation practices so full botanical analysis of those samples was undertaken. This included identification and interpretations of a representative percentage of charcoal fragments and all plant macrofossils. Sorting and identification of carbonised materials was undertaken using a Zeiss binocular microscope with independent cold light source at magnifications of X4-X45 and a Zenith Metam-P metallurgical reflecting microscope at magnifications of X10-X50. Charcoal weights were recorded and a single identified fragment isolated for AMS dating potential. Nutshell was weighed but seeds were recorded numerically.

3.0 RESULTS

Results of the botanical analysis of materials recovered by flotation are given in Table 33. The results are ordered within the table by groupings identified during excavation, denoted Cremation Groups A, B or C respectively and presented in sample order. Isolated features, one inhumation and a few individual cremations were also analysed and are grouped together in sample order.

3.1 Early Roman (1st-2nd Century) Deposits

Excavation revealed that the Romano-British cremation burials occurred both in isolation and in multiple complexes. Dating of the cemetery comes from material culture associated with the cremations including pottery and ceramic oil lamps. Pottery from a gully around Cremation Group A is broadly contemporary with the use of the cemetery and may have defined it.

3.2 Cremation group A

Fills 6213, 6247, 6248, 6252, 6251, 6249, 6272, 6252, 6253, 6266, 6302, 6334, 6258, 6294, 6257, 6304, 6322, 6255, 6256, 6329, 6328, 6322, 6335, 6261

The Cremation Group A fills examined were interpreted during excavation as either cremation deposits or associated redeposited natural. With rare exceptions, there was little difference between the provenance suggested by the fills examined, although specific plant taxa and numbers of each varied somewhat, at least in part from preservation and differing subsequent disturbance. Together, the assemblages confirm the functionality of this area as a cremation cemetery. Oak (*Quercus*) charcoal was recurrent and dominant throughout, confirming it as the pyre fuel of choice. Oak was present in 22 of

the 24 fills examined that contained charcoal and was dominant in 21 of those samples. Contexts (6253, 6328 and 6322) contained no oak but were otherwise unremarkable anyway, so the one exception to this was context (6294) which contained predominantly alder (*Alnus*) charcoal. However, there was little else within the sample examined (other than bone) to infer functionality, so it may have been different to the others in some way anyway, whether due to status of the individual or immediate availability of pyre fuels at the time required.

The properties of alder have made it acknowledged as a good substitute alternative to oak as pyre fuel in prehistory (Dickson & Dickson 2000). Oak gives the most heat for a sustained period (Tylecote 1962), but the slow growing wood also has significant structural value, making it a desirable, hence expensive, commodity. By contrast, alder grows rapidly in wet scrub woodland and has less commercial value so would be cheaper and relatively accessible on local marginal land. The lack of associated votive offerings other than a chip of possible walnut (*Juglans regia*) shell and one grain of rye (*Secale cereale*) would support the propositions that this person was either of different status or had no immediate access to high value foods and fuels at time of death. Cereals were recorded infrequently anyway within Complex A, but rye was only identified from one other context (6252), which was interpreted as redeposited. Rye did not become a common crop in its own right in Britain until the Saxon times (van der Veen 1992) and wheat (*Triticum* spp) was always favoured whenever possible. This suggests that the single grain recorded here could have come from an imported minor crop that had particular significance to the cremated individual or from processing waste from a more 'mainstream' wheat crop. The differences between this and the other cremations are considered real and of note, suggesting that this was either of an individual of low rank or that they died when resources were limited or when transport links and supplies were severely compromised, such as in a bad winter.

Fragments of bark within several samples examined reveal that pyre wood was from felled trees rather than dressed, perhaps reused demolition timbers. Although practically every fill that contained charcoal had oak as the predominant fuel wood, occasional other woods had also been burned. Ash (*Fraxinus*) and beech (*Fagus*) were recorded as rare fragments in one or two contexts and may have been supplementary pyre fuel. Alder was also recorded as a single fragment in redeposited cremation fill (6257) although again oak was predominant and in that situation alder may have been from additional fuel or evidence of intrusive materials. Hazel (*Corylus*) and either willow or poplar (*Salix/Populus*) were also identified as single fragments from two separate contexts each where they are likely to be residual kindling materials, whether to start the pyre or for votive offerings.

Within the Cremation Group A samples there was strong evidence of votive offerings to the dead. High value, high status imported foodstuffs were recorded frequently and in many cases were almost entire, suggesting that, in some cases at least, the foods may have been burned separately on a shrine before being deposited subsequently with the cremation, rather than being placed fresh within the pyre itself or eaten as part of a ritual last feast. Nutshell of pine nut (*Pinus pinea*) and walnut were noted, with fragments of the pine nut kernel still present within some of the shell fragments. Partial figs (*Ficus carica*), fragments of possible date (*Phoenix dactylifera*) and practically entire grapes (*Vitis vinifera*) were also recovered. Single lentils (*Lens culinaris*) were recovered occasionally (6256, 6328, 6261, 6302) and occasional cereals including bread wheat (*Triticum aestivum*), rye and a single 6-row barley (*Hordeum vulgare* s1) were recorded. This is in stark contrast to the hundreds of lentils identified within Complex C fills, whether suggesting residuality in Complex A, more complete burning, fewer expressions of wealth or differing trends in ritual practices for individual cases.

Other plant remains recovered are suggestive of turf or grass. Whether the pyre was constructed over turf or the votive offerings were burned on a bed of grass is not possible to determine, although perhaps turf under the pyre is more likely. Rhizomes of onion couch (*Arrhenatherium elatius*) may have been deposited intentionally as a food item but could equally have come from the turf on which the pyre was laid. Nevertheless, onion couch rhizomes within cremation fills at Roman cemeteries have been interpreted previously as intentional offerings (Priess *et al* 2005) so this must be at least a consideration.

3.3 Cremation Group B

Fills 6343, 6388, 6362, 6349

Pottery typology suggests the cremation deposits that comprised Cremation Group B were broadly contemporary with those of Cremation Group A, or extending slightly later. However, the botanical assemblage suggests some notable differences, primarily related to the numbers and types of associated food remains recorded. Although oak charcoal remained predominant, no nutshell or fruit remains of any kind were identified and the rare cereals found were indeterminate. Apple/rowan/hawthorn type (Maloideae) charcoal in two fills may be from kindling or a burnt fruitwood votive artefact.

Further differences relate to the presence of occasional seeds of lentils and lentil/ vetch (*Lens/Vicia*). Compared to the assemblage from Cremation Group A this is a meagre votive assemblage. The scant finds may be in part an artefact of residuality, since carbonised remains were of small volume throughout. However, very few Cremation Group A samples contained even scant evidence of lentil, so there is at least some real difference. Lentils are frequent components of the Mediterranean Roman diet and like grapes and figs, at this period in history are most prevalent in military and large urban sites within the UK (van der Veen *et al* 2008); increasing from occasional early Roman records to more regular occurrences by the middle Roman period. Although modern imported foods suggest a desire to maintain a cultural identity aligned with Rome or perceived status of the individuals concerned, the absence of both figs and grapes in Cremation Group B could imply cremations of one or more lower classed individuals than some of those from Cremation Group A.

The close proximity of the cremations means that a certain degree of admixing is highly probable. Closely associated cremation fills (6388, 6349) of cuts (6389, 6350) are practically identical in terms of botanical material which suggests that finds from these deposits at least may relate to the same cremation.

3.4 Cremation Group C

Fills 6434, 6435

Initial cremation (6436) was dated by pottery association to the mid 1st-3rd Century. Overlying this, fill (6435) contained the most abundant and varied carbonised votive assemblage of any of the cremation deposits analysed. As with almost every cremation examined, charcoal of oak predominated, but several large fragments of willow/poplar were also recorded, alongside smaller quantities of beech, hazel and alder. However, the large fragment size of the willow/poplar and hazel charcoal especially is more in keeping with a small domestic fire than the intense heat of a cremation pyre. Together with the great abundance of carbonised small seeds, primarily lentils or lentil/vetch within this fill, this suggests strongly that some of the food plants associated with this cremation were probably burned as a separate funerary ritual before being added to the cremation deposit rather than deposited on the pyre to be cremated with the body.

Other food plants associated with this cremation deposit included hazel and possible pine nuts, plus a good selection of fruits including figs, dates, grapes and the only incidence of probable apple (*Malus* sp) recovered from any of the cremations examined. Lentils were also recovered, in some abundance. Such a lavish offering of such a range of exotic, 'modern' imported foods implies strongly that this cremation was of an extremely high status individual and a high ranking Roman military officer is quite possible. Dates especially remained rare and expensive in Roman Britain (van der Veen *et al* 2008) with only two prior records of this period known, so a strong affiliation to Rome and a sophisticated palate is implied. The predominance of lentils suggest this cremation may have been slightly later than many of the Cremation Group A deposits as lentil consumption increased most significantly into the 2nd century AD (van der Veen *et al* 2008).

Cremation deposit (6436/6435) was cut by shallower but broadly contemporary pit [6433]/(6434). From a stratigraphic point of view, fill (6434) is quite likely to contain a certain amount of redeposited materials from fill (6435) immediately below it, but the taxon assemblage of (6434) would suggest that any admixing has not been significant. Although upper cremation pit fill (6434) contained abundant lentils like (6435), the prolific variety of fruits and nuts present in the lower pit was present only as occasional grape seeds and a single piece of probable pine nut shell in the upper pit. However, pit fill (6434) also contained various types of wheat that were not recorded in the lower cremation and so there are at least some discrete differences to the stratigraphically earlier pit. Those differences may reflect the fact that (6434) was of slightly different period or more likely that it related to cremation of a lower ranking individual.

3.5 Single Features

Fills 6135, 6127, 6131, 6152, 6187, 6190, 6210, 6170, 6122

Of the single cremations and pit features examined, only fill (6127) of cremation [6126] contained an assemblage worthy of further discussion. Predating and cut by a mid 1st to 3rd century AD pit, the botanical assemblage was entirely in keeping with others within the cremation complexes and included possible walnut with fig, grapes and probable lentil/vetch seeds. However, charcoal in this fill was predominantly alder, whilst rare Maloideae may be from pyre kindling or fuel for the votive offering. Other single cremation related pit fills were largely barren, although (6131) and (6187) retained some evidence of the oak pyre fuel, the latter also with bark indicating trunks rather than timbers.

3.6 Late Roman (3rd-4th Century)

Poorly preserved inhumations relating to later Roman activity had cut through earlier cremations. Fill (6339) of inhumation 6337 was interpreted as including probable redeposited cremation material but no environmental evidence to support this was recovered other than quantities of cinder that may be pyre fuel residue.

4.0 DISCUSSION

The charcoal assemblages in the majority of samples examined were dominated by oak (*Quercus*) suggesting that this was the pyre fuel of choice. Coal and cinder were also notable in some samples, which would suggest that additional pyre fuel was sometimes required. The association of oak with cremation practice since antiquity is well documented (eg Dickson & Dickson 2000), due to specific properties that make oak wood burn at temperatures in excess of 1600°C for extended periods (Tylecote 1962). Pollen analysis of sites within the Doncaster area show a marked decline in oak pollen during the Roman period (Nelson 1976) which would concur with widespread depletion of mature oaks within the surrounding landscape, undoubtedly harvested both for construction and funerary pyres. The recurrence of bark within cremation fills suggests the use of trunks rather than dressed timbers for fuel. Hazel (*Corylus*) and willow (*Salix*) pollen also reduced somewhat over this period, highlighting the value of these taxa for domestic hearth fuel, small item turnery and wattle panelling to the increased population during the occupation period.

Beech (*Fagus*) and alder (*Alnus*) charcoal were not recorded frequently within the cremation deposits, although alder was the dominant fuel in one of the Cremation Group A cremation deposits (6294). The pollen record for this period shows that beech may not have had a significant local presence within the area of the site (Nelson 1976) anyway. Alder was present though, but declined slightly over the period of Roman occupation, implying that resources were being utilised by the occupying forces. Although often a component of domestic hearth fuel, alder burns almost as well as oak and has a similarly long association with smelting, funerary and industrial practices (eg Tylecote 1962; Dickson & Dickson 2000; Edlin 1973). Indeed in many circumstances alder replaced oak as the ritual pyre fuel of choice in later prehistory as oak reserves became depleted (eg McGregor & Lelong 2008), a fact that is often used arbitrarily to imply a later provenance ahead of dating confirmation. However, in this particular situation

the stratigraphy would suggest that this cremation is not of a later period but is otherwise different to the others within both this complex and elsewhere. The rarity of associated food remains may also be of relevance here, suggesting that this individual was different to others within this assemblage, reflecting individual circumstance such as lower status, lack of affiliation to Rome or environmental issues.

Within the Roman occupation period of c. AD 43-410, a wide variety of new and exotic food plants were introduced to Britain, including a large number of Mediterranean imports such as olive (*Olea europaea*), fig (*Ficus carica*), grape (*Vitis vinifera*), pine nut (*Pinus pinea*) and lentil (*Lens culinaris*). Following the Roman occupation, new consumer groups not directly related to agriculture emerged, including the military personnel, but also townspeople and craftsmen. As a result opportunities for trade and differentiation of social classes began to emerge. Imported items would have been expensive, but provided new and differing sources of vitamins, minerals, protein, essential oils and sugars to the 15-20% of the population of Britain encompassed by the military personnel and emergent townsfolk (van der Veen *et al* 2008). Within those groups, consumption of familiar Mediterranean import foods would have helped maintain some semblance of cultural identity to the Roman military personnel that could afford it, whilst novelty value would have instilled a sense of status and sophistication amongst wealthy Romano-British townspeople.

Mediterranean fruits have been recovered from Late Iron Age sites across Central Europe (eg Kreuz 2004; Schultze-Motel 1994) and studies of Roman latrines in the Netherlands have indicated that legionaries on campaign maintained at least some semblance of normality through consumption of a familiar diet (Kuijper & Turner 1992). However, before the advent of Romans to Britain the only record of Mediterranean fruits was of a single fig from Hengistbury Head, discovered as part of the Danebury Environs Project (Cunliffe 2000 pp 191-2). Seeds of opium poppy (*Papaver somniferum*) found within Early Iron Age sediments at Oakbank Crannog (Miller *et al* 1998) shows that the introduction of some exotic food plants had begun prior to the Roman occupation. Nevertheless, the available range of new foods, especially exotic luxury items such as fruits, accelerated dramatically as travel and trade improved and demand increased within the modern, sophisticated population.

Mediterranean imports in the Romano-British period remained primarily associated with major towns and military sites such as Lincoln, York, Leicester and London (eg Davis & de Moulins 2000; Hall & Kenward 1990; Schultze-Motel 1994; Kroll 1995; 1998; Reynolds 1996; van der Veen *et al* 2008; Wilcox 1977). The same is also true of exotics commonly associated with Roman civilisation, such as date (*Phoenix dactylifera*), which at this time was very rare and hence undoubtedly extremely expensive. Dates came originally from the North Africa but became a highly prized source of sugar in Mediterranean Europe in later prehistory, partly as a result of the Roman expansion. Date only has two previous Roman period records within the UK (Murphy 1984; Giorgi 2000) although only the latter is from a cemetery context. Consequently, the confirmed occurrence of date fruits in one cremation fill (6294) and two probable others (6248, 6251) suggests strongly that those cremation fills related to funerary rites for highly esteemed individuals with military connections.

The association of burnt remains of Mediterranean imported foods with the cremation deposits indicates votive offerings as part of the funerary rituals. It is feasible that food remains became incorporated by various means, all inextricably but separately linked to the funerary ritual. The state of preservation of almost entire grapes, fig fragments, date and pine nuts as well as many lentils suggests at least some of the votive food offerings had been burned on an altar with the remains added subsequently to cremation deposits. A probable grape pedestal (stalk) suggests a bunch of actual grapes rather than raisins in at least one circumstance must be considered possible. In other circumstances, nutshell fragments and single grape pips may be residual from ritual feasts whilst some food items may have been burned on the outer parts of the actual pyres.

Similar such votive depositions involving fruit, nuts, pulses and cereals have been recorded from Roman cemeteries in France, Belgium and Italy (Priess *et al* 2005; Cooremans 2008; Matteredne & Derreumaux 2008), where lentils and grapes were most commonly encountered and entire fruits of fig and grape

interpreted as being burned separately for the dead. The offering through burning of foods and other items to the dead in Roman contexts is well known, with good examples remaining especially for stone pine (Blackburn 1951; Kislev 1988; Robinson 2002; Zach 2002). Dates were received only by the wealthiest individuals at Faulquemont in northern France (Priess *et al* 2005), were similarly rare in the Porta Nocera necropolis in Pompeii (Matterne & Derreumaux 2008) but were not present at all within either Tienen or Tongeren (Cooremans 2008). The close similarities between the cremation deposits at Doncaster and those at Roman cemeteries in continental Europe are strongly suggestive of the Waterdale cemetery being associated with the garrison, where the beliefs, customs and rituals of the population remained strongly tied to Rome. The presence of almost entire date fruit remains within at least one but potentially three cremations in the early Roman cemetery at Waterdale indicates that some extremely high ranking individuals are represented amongst the populace. Furthermore, the association of fig, grape, lentil, date and pine nut together within a cremation context is the first such assemblage to be recovered out with London (van der Veen *et al* 2008) and is only the second in Britain to include date.

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Table 33 Waterdale Botanical Results

Table 33 Waterdale botanical results

Waterdale 5436	Context	6135	6127	6131	6152	6187	6390	6210	6170	6122	6213	6247	6248
Table 1	Sample	1	2	3	4	5	54	70	71	72	6	7	8
Botanical Results	Complex	no	no	no	no	no	no	no	no	no	A	A	A
	Feature	P/H silting	deposit	crem fill	crem fill	backfill	crem fill	pit	P/Hole	backfill	pit fill	crem fill	crem fill
	Flot / Retent	F	F	F	F	F	F	F	F+R	F	F+R	F+R	F+R
Total CV/coal/cinder		45ml	15ml	<20ml	20ml	70ml	<<5ml	20ml	120ml	30ml	80ml	25ml	15ml
CV> 4mm		-	5ml	5ml	-	50ml	-	-	-	-	<<5ml	<10ml	<5ml
%CV>4mm ID		-	50%	50%	-	20%	-	-	-	-	100%	100%	100%
CV<4mm >500µm		-	10ml	5ml	-	20ml	-	<<5ml	-	-	<10ml	15ml	15ml
AMS option Y / N		N	Maloideae 0.14g	N	N	N	N	N	N	N	N	Macros	Macros
Charcoal	Common Name												
Alnus	alder	-	11 (0.76g)	-	-	-	-	-	-	-	-	-	-
Corylus	hazel	-	-	-	-	-	-	-	-	-	-	-	-
Fagus	beech	-	-	-	-	-	-	-	-	-	-	-	-
Fraxinus	ash	-	-	-	-	-	-	-	-	-	-	-	-
Maloideae	apple type	-	2 (.24g)	-	-	-	-	-	-	-	-	-	-
Prunoideae	plum/cherry type	-	-	-	-	-	-	-	-	-	-	-	-
Quercus	oak	-	1 (0.02g)	20 (1.54g)	-	7 (0.71g)	-	-	-	-	1 (0.49g)	8 (0.73g)	12 (0.26g)
Salix/Populus	willow/poplar	-	-	-	-	-	-	-	-	-	-	-	-
indet cv	-	-	-	-	-	-	-	-	-	-	-	-	-
indet bark	-	-	-	-	-	8 (4.25g)	-	-	-	-	-	-	-
Ericales stem	Heather family	-	-	-	-	-	-	-	-	-	-	-	-
Plant macrofossils													
Nuts													
Corylus nutshell	hazel	-	-	-	-	-	-	-	-	-	-	-	-
cf Juglans regia nutshell	cf walnut	-	1 (0.02g)	-	-	-	-	-	-	-	-	-	-
Pinus pinea nutshell	spine nut	-	-	-	-	-	-	-	-	-	10 (0.14g)	14 (0.18g)	-
cf Pinus pinea nutshell	cf pine nut	-	-	-	-	-	-	-	-	-	-	-	-
Corylus/Pinus pinea nutshell	hazel/pine nut	-	-	-	-	-	-	-	-	-	-	-	17 (0.21g)
indet nutshell	-	-	1 (0.01g)	-	-	-	-	-	-	-	-	9 (0.13g)	-
Fruits & Gathered Foods													
Arrhenatherium elatius	onion couch	-	-	-	-	-	1	-	-	-	-	-	-
Ficus carica fruit + seed	fig	-	17	-	-	-	-	-	-	-	-	12 (1.15g)	-
cf Malus sp seed vpc	apple sp	-	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera fruit	date	-	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera seed	date	-	-	-	-	-	-	-	-	-	-	-	-
cf Phoenix dactylifera fruit	cf date	-	-	-	-	-	-	-	-	-	-	-	1
Vitis vinifera fruit + seed	grape	-	-	-	-	-	-	-	-	-	-	-	-
Vitis vinifera seed	grape	-	14	-	-	-	-	-	-	-	-	1	2
cf Vitis vinifera fruit	cf grape	-	1	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera seed	cf grape	-	-	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera stalk	-	-	-	-	-	-	-	-	-	-	-	-	-
fruit fgmt NFI	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulses													
Lens/Vicia	lentil/vetch	-	-	-	-	-	-	1	-	-	-	-	-
cf Faba/ Vicia	cf bean/vetch	-	-	-	-	-	-	-	-	-	-	-	-
Lens culinaris	lentil	-	-	-	-	-	-	-	-	-	-	-	-
cf Lens culinaris	cf lentil	-	-	-	-	-	-	-	-	-	-	-	-
Fabaceae NFI	bean family	-	4	-	-	-	-	-	-	-	-	-	-
cf Brassica nigra	cf black mustard	-	-	-	-	-	-	-	-	-	-	-	-
Cereals													
Hordeum vulgare sl	barley	-	-	-	-	-	-	-	-	-	-	-	-
Secale cereale	rye	-	-	-	-	-	-	-	-	-	-	-	-
Triticum aestivum	bread wheat	-	-	-	-	-	-	-	-	-	-	-	-
Triticum cf spelta	cf spelt wheat	-	-	-	-	-	-	-	-	-	-	-	-
Triticum cf spelta/dicocum	cf spelt/emmer	-	-	-	-	-	-	-	-	-	-	-	-
Triticum sp	wheat	-	-	-	-	-	-	-	-	-	-	-	-
cf Triticum sp	cf wheat	-	-	-	-	-	-	-	-	-	-	-	-
indet cereal	-	-	-	-	-	-	-	-	-	-	-	2	-
Other Botanicals													
Plantago lanceolata	ribwort plantain	-	-	-	-	-	-	1	-	-	-	-	-
Poaceae stem	grass stem	-	-	-	-	-	-	-	-	-	-	4	-
Rhizome fragment	storage root	-	-	-	-	-	-	-	-	-	-	-	-
Bud NFI	bud	-	-	-	-	-	-	-	-	-	-	-	-
Other Non-Botanical													
Bone (small mammal)		-	-	-	-	-	-	-	-	-	-	-	-
bone NFI		-	-	-	-	-	-	-	-	-	-	2 (0.02g)	2 (0.12g)
Cramp?		-	-	-	-	-	-	-	-	-	-	-	-
Metal (incl spherules)		-	-	-	-	-	-	1 (3.19g)	-	-	-	5 (1.16g)	4 (0.28g)
Decayed pot?		-	-	-	-	-	-	-	-	-	-	-	4 (0.28g)
Cinder /coal cinder		+++++	-	+++	+++++	++	++	-	+++++	+++++	+++++	-	-
Non Carb (?Modern?)													
Veronica hederifolia		-	-	2	-	-	-	-	-	-	-	-	-
Earthworm egg capsule		-	-	1	-	-	-	-	-	-	-	-	-
Calluna vulgaris leafy shoot	heather shoot	-	-	-	-	-	-	-	-	-	-	-	-
Calluna vulgaris flower	heather flower	-	-	-	-	-	-	-	-	-	-	-	-
Stellaria media	chickweed	-	-	-	-	-	-	-	-	-	-	-	-

* subsample only taken

** various nutshell fragments stored together and total weight obtained

Table 33 Waterdale botanical results

Waterdale 5436	Context	62524	6251	6249	6272	6252	6253	6266	6257	6304	6322	6255
Table 1	Sample	9	10	11	13	14	15	16	18	25	27	28
Botanical Results	Complex	A	A	A	A	A	A	A	A	A	A	A
	Feature	redep nat	crem /nat	mxm slump	crem fill	redep nat	crem fill	crem fill	redep nat	crem fill	crem fill	crem fill
	Flot / Retent	F + R	F	F	F+R	F	F	F	F	R	F	F
Total CV/coal/cinder		65ml	15ml	10ml	20ml	<<5ml	<<5ml	<<5ml	12.5ml	<<5ml	70ml	50ml
CV> 4mm		45ml	5ml	<5ml	5ml	<2.5ml	<2.5ml	<2.5ml	<5ml	<<5ml	50ml	40ml
%CV>4mm ID		20%	100%	100%	100%	100%	100%	100%	100%	100%	20%	20%
CV<4mm >500µm		20ml	10ml	<5ml	15ml	<2.5ml	<2.5ml	<2.5ml	>5ml	<<5ml	20ml	10ml
AMS option Y / N		Macros	Macros	?Macros	N	N	N	N	Alnus 0.05g	N	N	N
Charcoal	Common Name											
Alnus	alder	-	-	-	-	-	-	-	1 (0.05g)	-	-	-
Corylus	hazel	-	-	-	-	-	-	-	1 (0.01g)	-	-	-
Fagus	beech	-	1 (0.02g)	-	-	-	-	-	-	-	-	-
Fraxinus	ash	-	-	2 (0.05g)	-	1 (0.02g)	2 (0.07g)	-	-	-	-	-
Maloideae	apple type	-	-	-	-	-	-	-	-	-	-	-
Prunoideae	plum/cherry type	-	-	-	-	-	-	-	-	-	-	-
Quercus	oak	10 (5.72g)	14 (0.73g)	5 (0.24g)	10 (0.45g)	6 (0.17g)	-	2 (0.06g)	17 (1.39g)	10 (0.70g)	30 (5.30g)	20 (3.21g)
Salix/Populus	willow/poplar	-	-	-	-	-	-	-	1 (0.02g)	-	-	-
indet cv	-	-	-	-	-	-	-	-	-	-	-	-
indet bark	-	1(0.32g)	1 (0.11g)	3 (0.94g)	9 (0.96g)	-	-	-	-	-	-	-
Ericales stem	Heather family	-	-	-	-	-	-	-	-	-	-	-
Plant macrofossils												
Nuts												
Corylus nutshell	hazel	-	-	-	-	-	-	2 (0.01g)	-	-	-	-
cf Juglans regia nutshell	cf walnut	-	-	-	-	-	-	-	-	-	1 (<0.01g)	-
Pinus pinea nutshell	spine nut	10 (0.24g)	7 (0.21g)	-	-	-	-	-	2 (0.04g)	-	10 (0.22g)	-
cf Pinus pinea nutshell	cf pine nut	1 (0.02g)	-	-	-	-	-	-	-	-	5 (0.04g)	-
Corylus/Pinus pinea nutshell	hazel/pine nut	-	-	-	-	-	-	-	-	-	-	-
indet nutshell	-	-	-	-	-	-	-	-	-	-	2(<0.05g)	-
Fruits & Gathered Foods												
Arrhenatherum elatius	onion couch	-	-	-	-	-	-	-	-	-	-	-
Ficus carica fruit + seed	fig	-	1 (0.01g)	-	1 (0.01g)	2	-	-	1	-	5 (0.29g)	-
cf Malus sp seed vpc	apple sp	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera fruit	date	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera seed	date	-	-	-	-	-	-	-	-	-	-	-
cf Phoenix dactylifera fruit	cf date	-	4 (0.18g)	-	-	-	-	-	-	-	-	-
Vitis vinifera fruit + seed	grape	-	-	1	-	-	-	1	1	-	-	-
Vitis vinifera seed	grape	1	1	2	-	-	1	-	-	-	-	-
cf Vitis vinifera fruit	cf grape	-	1	-	-	-	-	-	-	-	-	-
cf Vitis vinifera seed	cf grape	-	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera stalk	-	-	1	-	-	-	1	-	-	-	-	-
fruit fgmt NFI	-	-	-	2 (0.01g)	-	-	2 (0.01g)	-	-	-	-	-
Pulses												
Lens/Vicia	lentil/vetch	-	-	-	-	-	-	-	-	-	-	-
cf Faba/ Vicia	cf bean/vetch	-	-	-	-	-	-	-	-	-	-	-
Lens culinaris	lentil	-	-	-	-	-	-	-	-	-	-	-
cf Lens culinaris	cf lentil	-	-	-	-	-	-	-	-	-	-	-
Fabaceae NFI	bean family	-	-	-	-	-	-	-	-	-	-	-
cf Brassica nigra	cf black mustard	-	-	-	-	-	-	-	-	-	-	-
Cereals												
Hordeum vulgare sl	barley	-	-	-	-	-	-	-	-	-	-	-
Secale cereale	rye	-	-	-	-	1	-	-	-	-	-	-
Triticum aestivum	bread wheat	-	-	1	-	1	-	-	-	-	-	-
Triticum cf spelta	cf spelt wheat	-	-	-	-	-	-	-	-	-	-	1
Triticum cf spelta/dicocum	cf spelt/emmer	-	-	-	-	-	-	-	-	-	-	-
Triticum sp	wheat	-	-	-	-	-	-	-	-	-	-	-
cf Triticum sp	cf wheat	-	-	-	-	-	-	-	-	-	-	-
indet cereal	-	-	-	4	-	-	1	-	-	-	2	-
Other Botanicals												
Plantago lanceolata	ribwort plantain	-	-	-	-	-	-	-	-	-	-	-
Poaceae stem	grass stem	-	1	-	-	-	-	-	1	-	2	-
Rhizome fragment	storage root	-	-	-	-	-	-	-	4	-	1	-
Bud NFI	bud	-	-	-	-	-	1	-	-	-	-	-
Other Non-Botanical												
Bone (small mammal)		-	-	-	-	-	-	-	-	-	-	-
bone NFI		-	2 (<0.01g)	-	1 (<0.01g)	-	-	-	-	-	-	-
Cramp?		-	-	8 (0.13g)	-	-	5 (0.07g)	-	5 (0.07g)	-	-	-
Metal (incl spherules)		-	1 (<0.01g)	-	-	-	-	-	-	-	-	-
Decayed pot?		-	-	-	3 (0.23g)	-	-	-	-	-	-	-
Cinder /coal cinder		+	-	-	-	-	-	-	-	-	+++	-
Non Carb (?Modern?)												
Veronica hederifolia		-	-	-	-	-	-	-	-	-	-	-
Earthworm egg capsule		-	-	-	-	-	-	-	-	-	-	-
Calluna vulgaris leafy shoot	heather shoot	-	-	-	-	-	-	-	1	-	-	-
Calluna vulgaris flower	heather flower	-	-	-	-	-	-	-	1	-	-	-
Stellaria media	chickweed	-	-	-	-	-	-	-	-	-	-	-

* subsample only taken

** various nutshell fragments stored together and total weight obtained

Table 33 Waterdale botanical results

Waterdale 5436	Context	6256	6329	6328	6322	6335	6261	6302	6302	6334	6258	6294	6339
Table 1	Sample	29	30	31	32	33	34	35	36	37	43	44	24
Botanical Results	Complex	A	A	A	A	A	A	A	A	A	A	A	B
	Feature	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	crem fill	Inhumatn
	Flot / Retent	F + R	F	F	R	F	F+R	F	F	F+R	F	F	F
Total CV/coal/cinder		70ml	<<5ml	<<5ml	<5ml	<5ml	30ml	20ml	30ml	30ml	<10ml	135ml	<<5ml
CV> 4mm		50ml	<<5ml	-	<<5ml	<5ml	20ml	10ml	20ml	20ml	5ml	75ml	-
%CV>4mm ID		20%	100%	-	100%	100%	20%	20%	25%	20%	50%	20%	-
CV<4mm >500µm		20ml	<<5ml	<<5ml	<<5ml	<<5ml	10ml	10ml	10ml	10ml	5ml	60ml	<<5ml
AMS option Y / N		Macros	N	N	N	N	Macros	N	N	N	Bark 0.12g	Alnus 0.31g	N
Charcoal	Common Name												
Alnus	alder	-	-	-	-	-	-	-	-	-	-	19 (3.02g)	-
Corylus	hazel	-	-	-	-	-	-	-	-	1 (0.02g)	-	-	-
Fagus	beech	-	-	-	2 (0.25g)	-	-	-	-	-	-	-	-
Fraxinus	ash	-	-	-	-	-	-	-	-	-	-	-	-
Maloideae	apple type	-	-	-	-	-	-	-	-	-	-	-	-
Prunoideae	plum/cherry type	-	-	-	-	-	-	-	-	-	-	-	-
Quercus	oak	20 (6.00g)	4 (0.45g)	-	-	10 (0.23g)	11 (3.07g)	10 (0.85g)	20 (9.90g)	14 (1.87g)	14 (0.82g)	1 (0.20g)	-
Salix/Populus	willow/poplar	-	-	-	-	-	-	-	-	-	1 (0.02g)	-	-
indet cv	-	-	-	-	-	-	-	-	-	-	-	-	-
indet bark	-	-	-	-	-	-	-	-	-	-	1 (0.12g)	-	-
Ericales stem	Heather family	-	-	-	-	-	-	-	-	-	-	-	-
Plant macrofossils													
Nuts													
Corylus nutshell	hazel	4 (0.16g)	-	-	-	-	-	-	-	-	-	-	-
cf Juglans regia nutshell	cf walnut	-	-	-	-	-	-	-	-	-	-	1(0.01g)	-
Pinus pinea nutshell	spine nut	5 (0.07g)	-	-	-	-	2 (0.07g)	-	-	-	-	-	-
cf Pinus pinea nutshell	cf pine nut	-	-	-	-	-	-	-	-	-	-	-	-
Corylus/Pinus pinea nutshell	hazel/pine nut	-	-	-	-	-	-	-	-	-	-	-	-
indet nutshell	-	-	1 (0.04g)	-	2 (0.03g)	-	-	1 (0.01g)	-	-	-	-	-
Fruits & Gathered Foods													
Arrhenatherium elatius	onion couch	1	-	-	-	-	1	-	1	-	-	-	-
Ficus carica fruit + seed	fig	-	-	-	-	-	-	-	-	-	-	-	-
cf Malus sp seed vpc	apple sp	-	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera fruit	date	-	-	-	-	-	-	-	-	-	-	-	-
Phoenix dactylifera seed	date	-	-	-	-	-	-	-	-	-	-	-	-
cf Phoenix dactylifera fruit	cf date	-	-	-	-	-	-	-	-	-	-	-	-
Vitis vinifera fruit + seed	grape	-	-	-	-	-	-	-	-	-	-	-	-
Vitis vinifera seed	grape	1	-	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera fruit	cf grape	-	-	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera seed	cf grape	-	-	-	-	-	-	-	-	-	-	-	-
cf Vitis vinifera stalk	-	-	-	-	-	-	-	-	-	-	-	-	-
fruit fgmt NFI	-	-	-	-	-	-	-	-	-	-	1 (0.02g)	-	-
Pulses													
Lens/Vicia	lentil/vetch	-	-	-	-	-	-	-	-	-	-	-	-
cf Faba/ Vicia	cf bean/vetch	-	-	-	-	-	-	-	-	-	-	-	-
Lens culinaris	lentil	1	-	1	-	-	2	-	-	-	-	-	-
cf Lens culinaris	cf lentil	-	-	-	-	-	-	1	-	-	-	-	-
Fabaceae NFI	bean family	-	-	-	-	-	-	-	-	-	-	-	-
cf Brassica nigra	cf black mustard	-	-	-	-	-	-	-	-	-	-	-	-
Cereals													
Hordeum vulgare sl	barley	1	-	-	-	-	-	-	-	-	-	-	-
Secale cereale	rye	-	-	-	-	-	-	-	-	-	-	1	-
Triticum aestivum	bread wheat	-	-	-	-	-	-	-	-	-	1	-	-
Triticum cf spelta	cf spelt wheat	-	-	-	-	-	-	-	-	-	-	-	-
Triticum cf spelta/dicocum	cf spelt/emmer	-	-	-	-	-	-	-	-	-	-	-	-
Triticum sp	wheat	-	-	-	-	-	-	-	-	-	-	-	-
cf Triticum sp	cf wheat	1	-	-	-	-	-	-	-	-	-	-	-
indet cereal	-	-	-	-	-	-	-	1	-	-	-	4	4
Other Botanicals													
Plantago lanceolata	ribwort plantain	-	-	-	-	-	-	-	-	-	-	-	-
Poaceae stem	grass stem	1	-	1	-	-	-	-	-	-	-	-	-
Rhizome fragment	storage root	-	-	-	-	-	1	1	-	-	-	-	1
Bud NFI	bud	-	-	-	-	-	-	-	-	-	-	-	-
Other Non-Botanical													
Bone (small mammal)		-	-	-	-	-	-	-	-	-	-	1	-
bone NFI		-	3 (0.05g)	-	-	-	-	-	-	-	-	-	-
Cramp?		-	-	-	-	-	-	-	-	-	-	-	-
Metal (incl spherules)		1 (0.12g)	-	-	-	-	-	1 (0.18g)	-	-	-	2 (<0.01g)	-
Decayed pot?		-	-	-	-	-	-	-	-	-	-	-	-
Cinder /coal cinder		-	-	-	-	-	-	-	-	-	-	-	-
Non Carb (?Modern?)													
Veronica hederifolia		-	-	-	-	-	-	-	-	-	-	-	-
Earthworm egg capsule		-	-	-	-	-	-	-	-	-	-	-	-
Calluna vulgaris leafy shoot	heather shoot	-	-	-	-	-	-	1	-	-	-	-	-
Calluna vulgaris flower	heather flower	-	-	-	-	-	-	-	-	-	-	-	-
Stellaria media	chickweed	-	-	-	-	-	-	-	-	-	-	-	-

* subsample only taken

** various nutshell fragments stored together and total weight obtained