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YORK ARCHAEOLOGICAL TRUST

THE FORMER FOSS ISLANDS
FILLING STATION
FOSS ISLANDS ROAD
YORK

A Report on an
Archaeological
Watching Brief

by Gareth Dean
and
David Evans

**THE FORMER FOSS ISLANDS FILLING
STATION**

FOSS ISLANDS ROAD, YORK

**REPORT ON AN
ARCHAEOLOGICAL WATCHING BRIEF**

by

Gareth Dean and

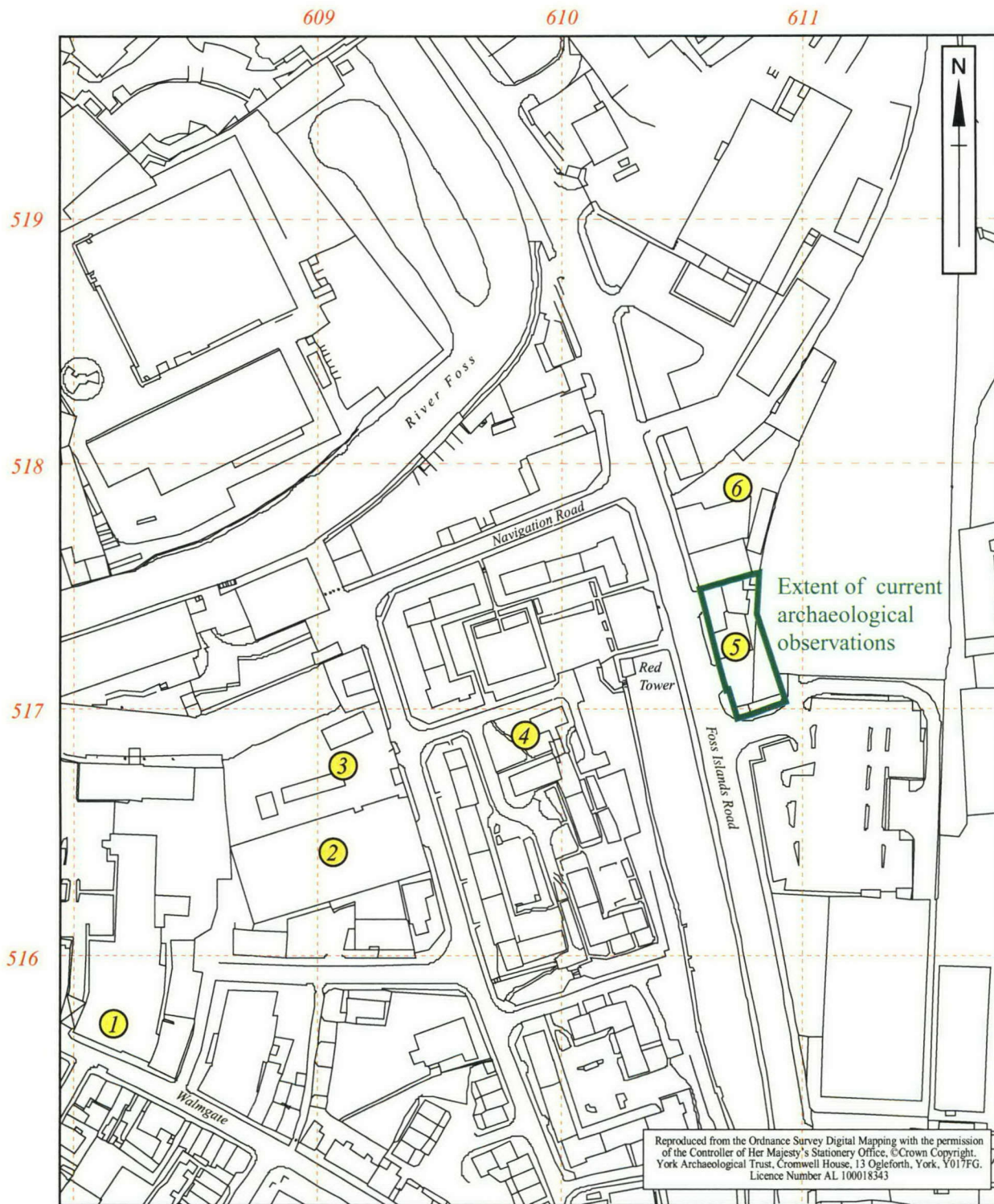
David Evans

February 2005

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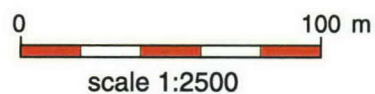


KEY:

Previous archaeological sites mentioned in text

- ① 76-82 Walmgate ② Former Bus Depot ③ Land off Navigation Road
- ④ Rosemary Place ⑤ Former Foss Islands Road Filling Station ⑥ Council depot

Figure 1 Location of current site and other sites mentioned in the text



SUMMARY

In October 2004, and on January 26th 2005, York Archaeological Trust carried out an archaeological watching brief at the former Foss Islands Filling Station, Foss Islands Road, York, during the excavation of a combined total 17 test pits and 5 boreholes. Previous archaeological work on the site had already identified modern dumping deposits sealing highly organic deposits associated with the Kings Fish Pool. The test pits and the boreholes during this programme of work confirmed these findings suggesting that this area was on the edge of the King's Fish Pool as the natural subsoil was located close to the surface at the southern end of the site and dropped sharply to the north. An environmental sample was taken from the pond deposits within Borehole 5 that showed there was very good organic preservation. Most of the plant remains identified were from aquatic or waterside habitats, the only exceptions being daisy, which grows in short grassland, and black-bind weed that occurs as a weed in waste places and arable ground. The identified invertebrate remains were also of aquatic forms. The watching brief in January 2005 yielded further evidence for the presence of the King's Fish Pool with organic sediments and at least one wooden structure together with a number of other wooden posts being observed.

1. INTRODUCTION

In October 2004 and January 2005 York Archaeological Trust carried out an archaeological watching brief on land at the former Foss Islands Filling Station, Foss Islands Road, York (NGR: SE 6108 5173; Fig. 1). The mechanical excavation of 17 test pits and 5 boreholes was observed.

The works in October 2004 were carried out by HB Boring and Co Limited as requested by ARCADIS, Geraghty & Miller International Inc, of Cambridge who commissioned the archaeological watching brief. The work in January 2005, also requested by ARCADIS, was carried out by J.R. Masterson and Son Ltd.

All site records are currently stored by York Archaeological Trust under the Yorkshire Museum accession code YORYM: 2002.450.

2 METHOD STATEMENT

The October 2004 test pits were located across the site with a concentration at the northern end of the site. The boreholes, forming part of the October 2004 work, were located predominantly along the boundaries of the former garage. The test pits measured on average 3m x 1m, were excavated to an average depth of 3.50m Below Ground Level (BGL) and were excavated by a wheeled mechanical excavator. Test Pit 10 was not recorded. The water table was approximately 1.5m BGL within the test pits. Boreholes were excavated using a percussion rig with cores collected within plastic tubes. Boreholes were excavated to an average depth of 6m BGL. Borehole 7 was located within Test Pit 5 and only the data from 3.6m-5.7m BGL were recorded. Borehole 8 was relocated as in its original position the quantity of brick rubble and mortar prevented the casing for the bore hole to be driven in to maximum depth. Within Borehole 8 there was no recovery of material between 2.4m-3.6m BGL and in Borehole 9 between 1.2-2.4m BGL.

In January 2005 six further test pits were excavated by a 360° tracked mechanical excavator. The first of these, Test Pit 12, was located just south of the current perimeter fencing at the southern end of the site. Test Pits 13 and 14 were excavated a short distance to the north-east of Test Pit 12. Test Pit 15 was located c.6m to the north of Test Pit 14 just to the east of the current boundary wall of the former filling station. Demolition work on site includes the removal of this wall and the immature trees to its east. The final two test pits, 16 and 17, were excavated close to Test Pits 7 and 5 respectively and were dug to a depth of no more than c.2m purely to check on hydrocarbon contamination of the soil.

Due to the unstable nature of the sides of all the test pits all depths are approximate as it was not possible to get close enough to take accurate measurements. Records for all test pits and boreholes were made in a watching brief note book.

In the archaeological and historical background, sites in York are normally referred to in the form YAT 1997, site 1990.111. Further details of these sites are available from the YAT online archive gazetteer. The web address of this resource is given in Section 11, Bibliography.

3. LOCATION, TOPOGRAPHY AND GEOLOGY

The drift geology of the area is of Boulder Clay above Warp and Lacustrine Clay with sand and gravel that overlies a solid geology of Bunter and Keuper Sandstone, (Geological Survey 1967). The site lies c.40m east of the Red Tower, part of the city walls in this area. The site was roughly trapezoid, measuring a maximum of c.45m north-south by c.25m east-west and was roughly level lying at a height of approximately 9.2m OD (Ordnance Datum).

4. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The watching brief was carried out because it is located close to the City walls on the south-east side of the city. Previous work on the site (Evans 2002) had shown that it appeared to be on the edge of the King's Fish Pool in the medieval period and the current programme of work had the potential to add further information.

There is very little evidence for prehistoric activity and the earliest archaeological activity is from the Roman period. A Roman road from Brough approaches York from the east (RCHMY 1, 2; Road 2) approximately 0.5km to the south-east of the site. This road has been identified in Lawrence Street and in front of Walmgate Bar and may turn to follow the line of Walmgate (Brinklow et al., 87). At 17-23 Lawrence Street (1989.8) at the junction of Foss Islands Road, Roman activity was identified possibly associated with pottery manufacture.

Evidence for the Anglian and the Anglo-Scandinavian period in the area is limited. Outside the walls archaeological excavations on the defences close to Walmgate Bar (1986.20) produced an Anglian pit and surface. The excavation at 17-23 Lawrence Street (1989.8) identified a palisade thought to belong to the Anglo-Scandinavian period. There is evidence for there being some exploitation of the river Foss and adjacent land because in the late 11th century the river Foss was dammed to create a moat around the new castle and had the effect of creating a large pool on the east side of the city, often referred to as the King's Pool or Fish Pool. The impact of this, recorded in the Domesday Book, was the loss of arable land and two new mills

(RCHMY 2, 137-8).

The pool used the natural topography and artificial banks with a programme of water management to prevent it becoming stagnant and had three landing places at Layerthorpe Bridge, the Carmelite Friary and St Margaret's Landing (Griffiths 2002). St Margaret's Landing was close to the Red Tower 50m to the west of the present site. Boreholes at a site in Rosemary Place (MAP 1994), c.100m to the north-west of the present site, located the presumed edge of the King's Fish Pool. This is a pattern consistent with excavation and borehole data from sites in the surrounding area from Foss Islands to Hungate (YAT 1999.253). For example, at Carmelite Street (YAT 1991.9) there was over 1m of 19th and 20th century material overlying earlier deposits between 2.3m and 3.5m thick. The natural was located between 3.6m and 5m AOD. In Navigation Road, at the former Bus Depot no deposits associated with the Fish Pool were exposed, but on the land immediately to the east of bore holes and an evaluation trench in Navigation Road identified deposits associated with the Fish Pool and perhaps suggest the limits of the Fish Pool in this area (Dean 2004; Evans and Dean 2004). The possible northern limits of the King's Pool were defined in a borehole survey at the council depot, Foss Islands Road approximately 0.5km to the north of the present site (Johnson 1999). Further work in this area (Smith and Johnson 2005) has added further evidence to show the continuation of Fish Pool, and perhaps deposits associated with the Tang Hall Beck, within this area.

The site is located immediately to the east of the Walmgate suburb of the city that was defended by a rampart from the 12th century and rebuilt in stone in the mid- 14th century although the Red Tower is a later addition of c.1490 and there is a reference, of 1501/2, to the construction of a new piece of wall connecting the Red Tower with the existing wall. A medieval building, pit, and hearth were examined at Foss Islands Road/Lawrence Street, medieval pottery was recovered from a site at Lawrence Street/James Street (1979.1021), and possible medieval build-ups were seen at a site off James Street (1995.0285).

The late medieval period also saw a steady reclamation of land from the King's Fish Pool and this is reflected in the archaeological evidence. This reclamation was either through natural silting or deliberate dumping of material. Excavations at 76-82 Walmgate (1987.33) uncovered medieval infilling of the King's Fish Pool and the boreholes in Rosemary Place (MAP 1994) identified King's Fish Pool overlain by successive phases of levelling, up to 3m thick. This sequence of dumping is reflected on the opposite side of the Kings Fish Pool in the Hungate area. Boreholes and excavation here have shown extensive dumping of material with the area becoming the official dump for the city in the 16th century (Griffith 2002). By 1736 a map by Francis Drake shows that Foss Island had formed and was surrounded by the waters of the Foss and the Tang Hall Beck. Although the actual King's Fish Pool had gone by the late 18th century the area remained very wet and marshy until it was purchased by York Corporation in 1853 and subsequently drained, the resulting land being used for gas, railway, and later, electricity works. Both the electricity station and the extensive railway sidings along Foss Islands Road have now gone having been replaced since the 1970s by various retail developments which continue to dominate the area.

Early maps of York that show the area, from John Speed's map of 1610 to those of the mid-19th century, show the gradual reclamation of land from the Fish Pool. They all indicate that the present site lay close to the edge of the Fish Pool outside the Walmgate suburb. Although

the first Ordnance Survey map, of 1853, shows the area apparently drained with a towpath beside the River Foss, the area is still marked as open, undeveloped land. By the early 20th century much of the area had been developed and the O.S. map of 1909 shows possible buildings of uncertain function on the site together with many railway sidings to the east and north. Also to the north is shown the electricity station and closer to the site the Corporation Depot, still present today. To the south-east were the Foss Islands Tannery and some 200 yards to the east is St Lawrence's Brick and Tile Works. All these, with the exception of some railway sidings to the east, had gone by on the 1979 O.S. map of the area which shows the Foss Islands Filling Station. The most modern maps show the retail developments that cover much of the immediate area.

5. THE WATCHING BRIEF

5.1 Boreholes

5.1.1 Borehole 6

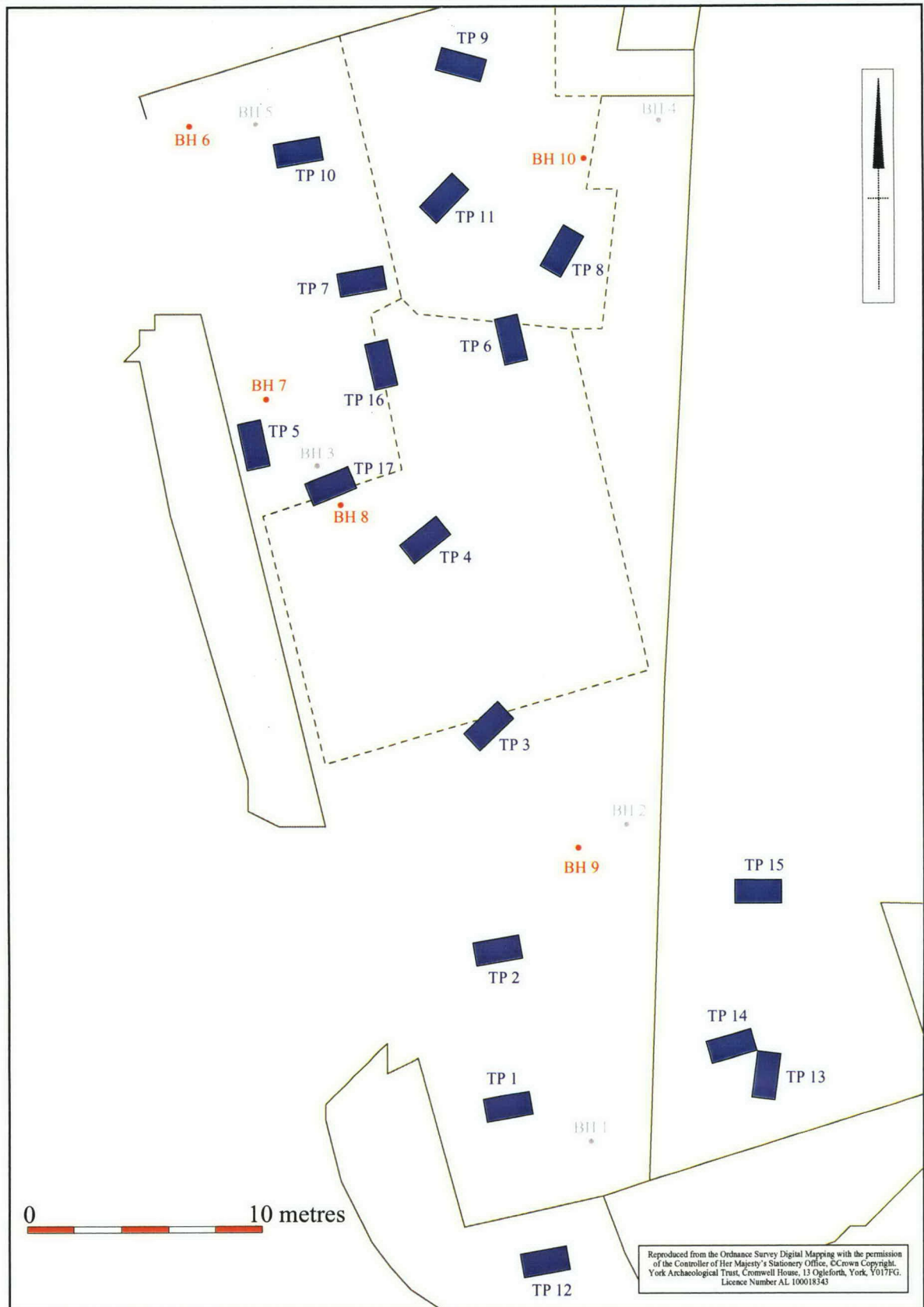
The earliest deposits within the borehole were probably associated with silting within the King's Fish Pool. The first of these was a firm dark grey brown clay with a high organic content and fresh water mussel shells (1007) between 4.7m-6m BGL. This was overlain by a band, c. 0.56m thick, of soft brown silt (1006) which was sealed by 0.94m of firm mid-grey clay (1005). Directly above this was a 0.1m thick band of dark grey clay (1004). This was overlain by 0.7m of mid brown sandy silt (1003). Sealing these deposits was a sequence of dump deposits associated with the reclamation of land from the Fish Pool. Between 2m-2.4m BGL this consisted of a moist grey clay with inclusions of brick rubble (1002). This was sealed by 1.9m of loose sand and gravel and clay and brown silt sand bands with frequent inclusions of brick rubble (1001). This was directly below the 0.1m of tarmac of the present ground surface (1000).

5.1.2 Borehole 7

At the base of the borehole between 5.5m-5.7m BGL the earliest deposit exposed was a firm brown clay (2003) that is thought to be the natural subsoil. This was overlain by a deposit of dark grey-black clay silt (2002) 0.7m thick. This deposit is probably associated with material within the Fish Pool. Directly above this was a 0.8m thick deposit of dark grey silt sand with occasional brick fragments (2001) overlain by 3.6m of dark grey gravelly sandy clay (2000) that formed the backfill of Test Pit 5.

5.1.3 Borehole 8

Between 4.8m and 6m BGL was a firm brown clay (3002) that was thought to be the natural subsoil. Overlying this was a dark grey silt with occasional inclusions of brick rubble and angular limestone fragments (3001) between 3.6m-4.8m BGL. Between 2.4m and 3.6m BGL there was no recovery of material. The uppermost deposit recovered from the borehole consisted of loose brick rubble and mortar with inclusions of gravel and sand (3000) that continued to a depth of 2.4m BGL.



KEY

BH1 Earlier borehole survey locations BH Current borehole survey locations TP Test pit locations

Figure 2 Borehole and test pit locations

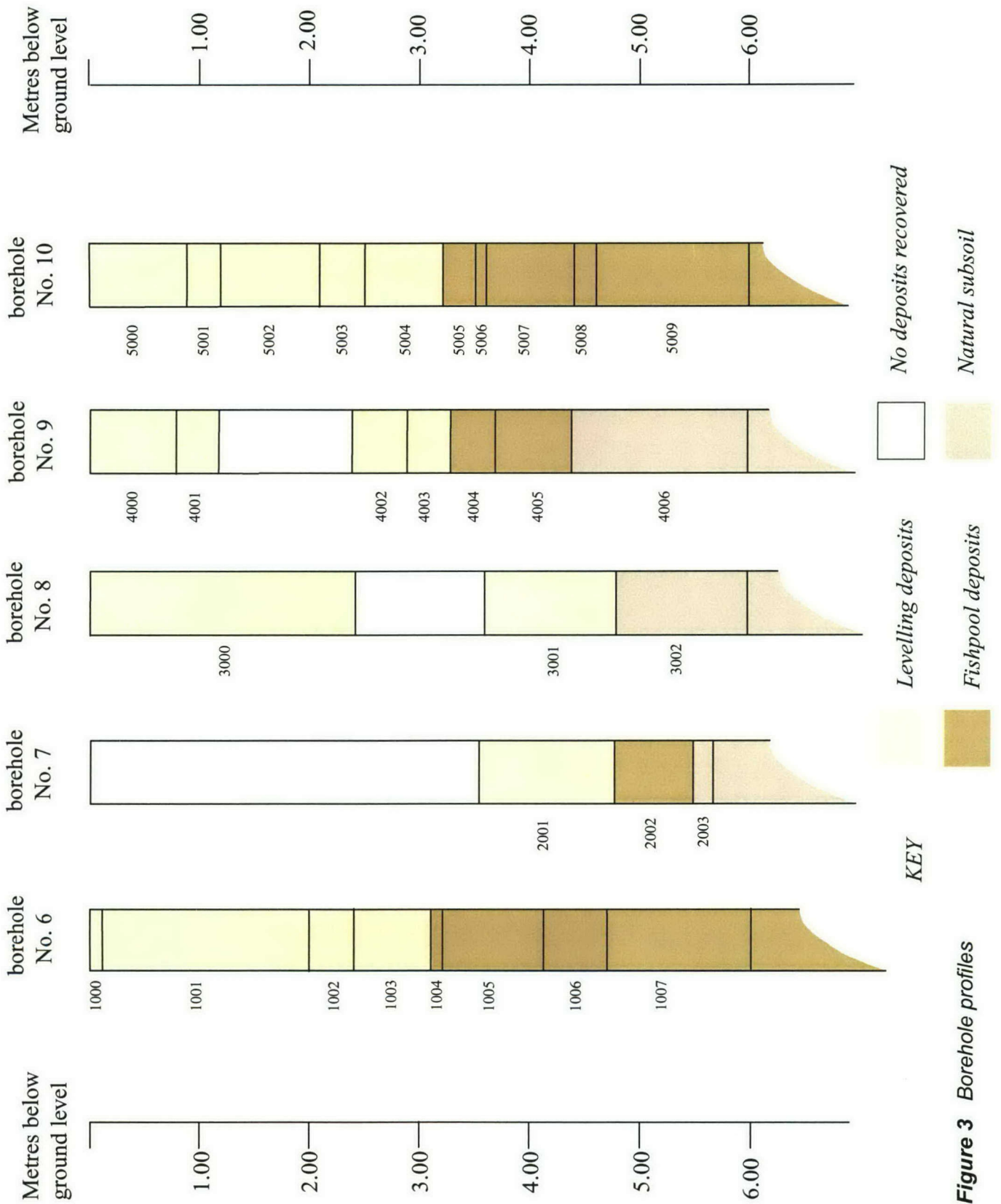


Figure 3 Borehole profiles

5.1.4 Borehole 9

Deposits thought to be the natural subsoils were exposed between 4.4m-6m BGL. This consisted of a firm brown clay that changed gradually to a sand laminated clay (4006). Directly above this were 1.1m of deposits associated with the Fish Pool. The earliest of these was a 0.7m thick dark grey-black silty deposit with a high organic content with fresh water mussel shells and fragments of plant remains (4005). Overlying this was a 0.3m thick deposit of dark grey clay silt with occasional organic inclusions (4004). Directly above this was material associated with land reclamation. Overlying 4004 was a 0.4m thick deposit of grey silt clay sand (4003) which was directly below 0.5m of grey brown clay with inclusions of mortar fragments (4002). There was no recovery between 1.2-2.4m BGL. Between 1.2m-0.8m BGL was a brown sandy clay (4001) directly below 0.8m of brick rubble that formed the present ground surface.

5.1.5 Borehole 10

The earliest deposit exposed between 4.6m-6m BGL was a dark grey clay (5009). This was overlain by a 0.2m thick dark brown clay with some organic inclusions (5008). Directly above this was a 0.8m thick dark grey clay with inclusions of fresh water mussel shell (5007). A bulk environmental sample was taken from this deposit (see Section 6 below).

This was sealed by two thin deposits. The first of these consisted of a brown sandy clay (5006) 0.1m thick. The second consisted of 0.3m thick deposit of grey, slightly sandy clay (5005). Sealing these deposits was a very dark grey silty sand (5004) 0.7m thick directly below a 0.4m thick deposit of brown sandy clay (5003). Overlying these deposits was 0.9m of brick rubble and grey brown gravelly sand (5002). Above this was a 0.3m thick deposit of dark grey clay and gravel with inclusions of brick rubble and sandstone (5001) overlain by a mixed deposit of concrete fragments, clinker and brick rubble (5000) of the modern ground surface.

5.2 TEST PITS

5.2.1 Test Pit 1

The earliest deposit within the test pit was a moist, friable reddish brown gravelly clay (6004) between 3-3.5m BGL. This was overlain 1.5-2m of firm, dark-grey sandy-clay with a high quantity of visible plant fibres and mussel shell (6003) that may form part of the silts on the edge of the King's Fish Pool. This was sealed by 1m of loose, dark grey-brown sandy gravel, brick and shell fragments (6002) that are probably a dump of material into the edges of the Fish Pool. Directly above this was 0.4m of firm, mid-brown sandy gravel (6001) below 0.1m of tarmac of the present ground surface (6000).

5.2.2 Test Pit 2

The main deposit (7002) within this test pit was a firm, dark-grey clay silt encountered at 1m BGL. Towards the base of the test pit between 3-3.5m there was a large quantity of fresh water mussel shell and the deposit appeared to be changing to a soft grey silt (7001). These deposits are associated with the King's Fish Pool and were sealed by 0.9m of loose dark grey silt sand with a high quantity of brick rubble and concrete (7000).

5.2.3 Test Pit 3

Between c.1.7-3m BGL a deposit associated with the King's Fish Pool was exposed. This consisted of a dark grey clay silt (8003) which was overlain by a sequence of dump deposits. The earliest was c.0.2m of brick rubble (8002) over which was a 1m thick deposit of loose, dark grey brown silty sand (8001). This was sealed by c.0.5m of loose sand and gravel with frequent inclusions of brick rubble and concrete (8000).

5.2.4 Test Pit 4

The earliest deposit exposed was a firm brown silt sand (9003) between 0.6 - 1.5m BGL. This was overlain by the concrete foundation slab (9002) for the demolished petrol station buildings. Also cut through Deposit 9003 was a modern pit (9001) associated with the demolition of the petrol station that contained a quantity of large fragments of concrete and brick rubble (9000).

5.2.5 Test Pit 5

Between 0.8m to the base of the Test Pit at 3.5m BGL was a deposit of dark, greyish brown slightly sandy clay silt (10001). This deposit was quite mixed and close to the modern ground level was contaminated with petrol. Towards the base of the test pit, the deposit had a more organic content. Through out this deposit were inclusions of brick and tile fragments. Context 10001 is probably associated with silting, probably within the King's Fish Pool. Overlying this deposit was a demolition deposit c.0.8m thick of sandy gravel, brick rubble and concrete (10000) that formed the present ground surface.

5.2.6 Test Pit 6

A sandy gravelly clay that was waterlogged was exposed between 0.5-3.5m BGL that contained fragments brick (11002). Directly above this was a 0.3m of demolition material (11001) associated with the former petrol station that was overlain by 0.2m of topsoil (11000).

5.2.7 Test Pit 7

The only deposit within the test pit was a soft greyish brown slightly gravelly clay containing fragments of brick, tile and slate (12002) exposed between 0.5-3.5m BGL. The upper part of this deposit was disturbed by a modern service pipe (12001) and smelt of petrol. Sealing this deposit was 0.5m thick layer of tarmac (12000) that formed the present ground surface.

5.2.8 Test Pit 8

A dark grey brown clay silt with a high organic content (13003) was exposed between 3-3.5m BGL. This deposit is probably associated with sediments forming at the base of the King's Fish Pool. Sealing this deposit was a soft sandy clay with some inclusions of organic material (13002) located between 2-3m BGL. Directly above this deposit was a 1.6m thick deposit of brown sandy clay with frequent inclusions of brick rubble and tile (13001). Overlying this was a 0.4m thick layer of concrete (13000) associated with the former petrol station.

5.2.9 Test Pit 9

The test pit flooded at 0.6m BGL and recording stopped at this depth. The only deposit observed was a loose sand and gravel with frequent inclusions of brick rubble (14001). This deposit was sealed by 0.2m of concrete (14000) that formed part of the floor of the former petrol station.

5.2.10 Test Pit 11

The earliest deposit within this pit, between 1.5-3.5m BGL was a deposit of soft dark grey slightly sandy clay with lenses of organic material (15002) and is probably material associated with the King's Fish Pool or one of the becks. This was overlain by 1.2m of mid greyish brown gravely sand with frequent inclusions of brick rubble and concrete (15001). This was overlain by 0.3m of concrete (15000).

5.2.11 Test Pit 12

In this test pit the earliest deposit recorded was seen between c.1.9m and 3.1m BGL and consisted of a clean mid greyish-brown silty clay (16003), believed to be natural. Cut into this was a modern foul water drain (16004). It was not possible to ascertain any details of the cut proper but the ceramic pipe had a diameter of c.0.3m and was aligned north-south. It was sealed by a probable levelling deposit, c.1.2m deep, which was a mixture of mid-greyish-brown silt and black clinker (16002). Over this was another probable levelling deposit of brick rubble and moderately coarse crushed limestone (16001) up to 0.6m thick. This was capped by the existing modern ground surface of tarmac (16000).

5.2.12 Test Pit 13

The lowest deposit in this test pit was a light brown, soft, sandy clay possibly containing patches of dark brown peat (17004). This deposit, which probably formed naturally, was seen between c.2.8 and 3.3m BGL but may have been much deeper. Above this, between c. 1.2 and 2.8m BGL, was a mid-orange-brown clay (17003) turning to mid-grey in colour towards its base. It was sealed by a probable levelling deposit composed of mainly mid- greyish-brown silt with moderate amounts of grey ash and occasional brick, slag and clinker (17002). Overlying this was a levelling deposit of mid-greyish-brown silt containing moderate lenses of light grey ash (17001). The uppermost deposit was rough grass and weeds in a dark brown silt (17000) forming the modern ground surface.

5.2.13 Test Pit 14

In this test pit the lowest observed deposit, at c.4m BGL and lower, was laminated mid-brown and grey clays (18006). This was probably natural and it was overlain by a mid-grey, slightly peaty silt with moderate quantities of small, c.50mm long, well-preserved wood fragments (18005). At least one circular wooden stake, with a diameter of 70mm, was seen driven through 18005 and to an unknown depth into 18006. Sealing 18005 was a possible levelling deposit of mid orange-grey-brown sticky clay (18004). Above this was a mid orange-brown sandy clay (18003) which was below a sticky mid-brown clay (18002). Despite their composition 18002-4

were very probably all levelling deposits. Sealing 18002 was a mixture of mid greyish-brown silt and clinker (18001), another probable levelling deposit. The highest deposit in this test pit, forming the current ground surface, was a dark brown silt capped with rough grass and weeds (18000).

5.2.14 Test Pit 15

The lowest deposit noted in this test pit, seen from c.3.7m to at least c.4.5m BGL, was a firm, sticky, pale brown clay (19005), probably natural. This was overlain by a dark greyish-brown, very slightly clayey, slightly peaty silt which contained moderate amounts of mussel shell and wood fragments and occasional tile fragments (19004). Driven through 19004, towards the east end of the test pit, was a row of wooden stakes (19006). These were well preserved, aligned north-south, c.60mm in diameter and spaced at intervals of c.0.3m. Overlying 19004 was a deposit of mid orange-brown slightly silty clay (19003) and above this a dark greyish-brown silt with occasional orange ash (19002). This had been sealed by a mixture of mid-brown and mid grey ashy silt containing occasional brick fragments (19001). Contexts 19001-3 were all probably levelling deposits. The topmost deposit was rough grass and weeds in dark brown silt (19000) forming the existing ground surface.

5.2.15 Test Pit 16

In this test pit the earliest deposit, visible between c.0.6 and at least 1.4m BGL, was a dark grey slightly clayey silt (20002) with a very strong hydrocarbon smell. Over this was a probable levelling deposit of crushed limestone and brick rubble (20001). The uppermost deposit in this test pit was the modern tarmac ground surface (20000).

5.2.16 Test Pit 17

The earliest deposit seen in this test pit, from c.1.9m downward, was a very dark grey clayey silt with a very strong hydrocarbon smell (21001). This was sealed by crushed limestone mixed with a little light grey silt (21000). This also formed the modern ground surface and was very probably a modern backfill after the removal of equipment associated with the former garage.

6. ENVIRONMENTAL SAMPLE

by Örne Akeret, John Carrott and Stewart Gardner

6.1 Summary

A single bulk sediment sample was submitted for evaluation of its bioarchaeological potential. The sample was from a borehole and no direct dating evidence was available for the deposit.

Assemblages of well-preserved plant and rather variably preserved invertebrate macrofossils were recovered from the sample. The remains reflected essentially 'natural' aquatic and waterside environments, with only hints of human activity nearby.

It is not recommended to pursue this material in isolation—given that the sample was recovered

from a borehole, and hence lacks an archaeological context, may represent more than one sediment layer and has no direct dating evidence. Any further work on the current material would be of use as part of a wider study of the past landscape of the area, but not inherently valuable in the interpretation of this particular site.

6.2 Introduction

A single bulk sediment sample ('GBA'/'BS' sensu Dobney et al. 1992), from the base of a borehole, was submitted to Palaeoecology Research Services Limited (PRS), County Durham, for an evaluation of its bioarchaeological potential.

6.3 Methods

The sediment sample was inspected and its lithology recorded, using a standard pro forma. A 3 kg subsample was disaggregated in water, the volume being recorded after a minimum of 24 hours of soaking and with the subsample in a waterlogged state. The subsample was then sieved to 300 microns for the recovery of plant and invertebrate macrofossils broadly following the techniques of Kenward et al. (1980; 1986).

Plant and invertebrate remains and the general nature of the fractions (300 μ m -2mm and greater than 2mm) were recorded briefly by "scanning" identifiable taxa and other components being listed paper. Nomenclature for plant taxa follows Stace (1997).

6.4 Results

Archaeological information provided by the excavator is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample number.

6.4.1 Context 5007 [borehole sample]

Sample 1/T (3 kg/5.2 litres sieved to 300 microns; approximately 3 litres of unprocessed sediment remain)

Moist, mid brown to mid to dark grey-brown (to black internally – sulphide staining), brittle (working soft), slightly humic silt, with fine and coarse herbaceous detritus and crushed freshwater mussel shell present.

There was a rather small residue (~400 ml) mostly of plant remains, with a little sand. The plant macrofossils were mostly of aquatic and waterside taxa and in an excellent state of preservation (by anoxic waterlogging). The following plant taxa were identified: water-plantain (*Alisma*), daisy (*Bellis perennis* L.), sedge (*Carex*), black-bindweed (*Fallopia convolvulus* (L.) Á. Löve), reed sweet-grass (*Glyceria maxima* (Hartm.) Holmb.), water-milfoil (*Myriophyllum*), yellow water-lily (*Nuphar lutea* (L.) Sm.), dock (*Rumex*), common club-rush (*Schoenoplectus lacustris* (L.) Palla).

There were also numerous invertebrate remains, again primarily of aquatic taxa (where

identified). Insect remains were abundant and although showing little chemical erosion were very heavily fragmented (perhaps through compression from the borehole, though some snail shells, see below, were very well preserved). There were also some remains of freshwater snails and bivalves. Most of the remains were of small fragments of freshwater mussel shell but there were also a few planorbids, *Lymnaea truncatula* (Müller) and *Valvata piscinalis* (Müller). No remains of terrestrial molluscs were seen.

6.5 Discussion and statement of potential

Most of the plant taxa recorded were of aquatic or waterside habitats, the only exceptions being daisy (*Bellis perennis* L.), which grows in short grassland, and black-bindweed (*Fallopia convolvulus* (L.) Á. Löve), that occurs as a weed in waste places and arable ground. Water-milfoil (*Myriophyllum*) is a subaquatic herb, and yellow water-lily (*Nuphar lutea* (L.) Sm.) has floating leaves, both occur in lakes, ponds and slow rivers. Water-plantain (*Alisma*), reed sweet-grass (*Glyceria maxima* (Hartm.) Holmb.) and common club-rush (*Schoenoplectus lacustris* (L.) Palla) are emergent species of the littoral zone. The identified invertebrate remains were also of aquatic forms.

The plant and invertebrate remains essentially reflect a 'natural' low-energy aquatic environment. There were only hints (from a few of the plant remains) of human activity nearby.

6.5.1 Recommendations

Further plant and invertebrate species would be identified if the material were fully analysed, and consequently a more precise environmental reconstruction would be possible. However, given that the sample was recovered from a borehole—and hence lacks an archaeological context, may represent more than one sediment layer and has no direct dating evidence (though radiocarbon dating, at least via AMS, would be possible)—it is not recommended to pursue this material in isolation.

Any further work on the current material would be of use as part of a wider study of the past landscape of the area, but not inherently valuable in the interpretation of this particular site.

6.5.2 Retention and disposal

All of the remaining sediment, together with the remains extracted from the processed subsample, should be retained for the present.

6.6 Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

7. DISCUSSION AND CONCLUSIONS

The information from boreholes and the test pits is broadly comparable and gives a good indication of the deposits across the site. Natural geological deposits within the boreholes and test pits consisted of a firm brown clay or a laminated clay sand that give an indication of the former topography of the site. There appears to have been an area of high ground on the southern and eastern edges of the site with natural clays in Borehole 7 at 5.5m BGL rising to the south of this with natural clay at an average of between 3-4m BGL, reaching its shallowest depth within Test Pit 12 at only c. 2m BGL. The predominate trend though is for the natural deposits to slope down sharply to the northern and eastern sides of the site. Within the Boreholes 6 and 10 and Test Pits 7 and 10 no natural clay deposits were exposed up to 6m BGL. This information may indicate the position of the edge of the Fish Pool in this area outside the city wall close to the Red Tower.

The earliest deposits exposed within the boreholes and the test pits were associated with waterlain environments and were deeper on the eastern and northern sides of the site, and were thought to be most likely associated with the medieval King's Fish Pool. Within Test Pits 1, 12, 13 and 14 there is good evidence to suggest that these are on the edge of the Fish Pool as they contained a higher concentration of plant fibres, timber fragments and mussel shells suggestive of a bank.

There was also evidence for timber structures on the edge of the King's Fish Pool. In Test Pit 14 there was also at least one well-preserved timber stake, but in Test Pit 15 there were three, evenly spaced stakes that may have formed part of a jetty or structure. An environmental sample from Borehole 10, that had extensive organic deposits, confirms the indication that the site is located close to the edge of the King's Fish Pool. The pollen and insect remains were in a very good state of preservation and the plant remains living in the water and the surrounding dry land. The water plant species were predominantly those associated with still or slow moving water and those from the wider area indicate either grass land or arable use.

Sealing the King's Fish Pool deposits were extensive levelling deposits probably associated with levelling and reclamation during the 18th and 19th century. There were also extensive deposits associated with the construction and demolition of the former petrol station. Within these later deposits, especially in the area of the forecourt of the petrol station, there was contamination from hydrocarbons.

The watching brief has therefore shown that there are significant archaeological deposits associated with the edge of the King's Fish Pool surviving below the 18th-20th century levelling and disturbance. These waterlain deposits also have a high potential for environmental analysis to add to our understanding of the ecology in the area from the medieval period to the 18th century. At the southern end of the site there is, importantly, the potential for further timber structures associated with the edge of the Fish Pool to survive.

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