

**CLAY LAKE  
SPALDING, LINCOLNSHIRE**

**Archaeological Trial Trench Evaluation**

**Museum Project Code: SPCL11**

**Network Project Code: SCL14**

**NGR: 525680 321090**

**Museum Accession Number LCNCC: 2011.76**

**Prepared by**

**NETWORK ARCHAEOLOGY LTD**

**for**

**SAVILLS**

**on behalf of**

**ASHLEY KING DEVELOPMENTS LTD**

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## **NON-TECHNICAL SUMMARY**

An archaeological trial trench evaluation was undertaken by Network Archaeology Ltd as part of a pre-determination planning application outline for a new business park and associated infrastructure at Clay Lake, Spalding, Lincolnshire.

Locally significant archaeological features and deposits dated to the later Iron Age were revealed, along with several undated features which may be of a similar or later date. The features revealed within the trenches consisted mainly of ditches, a number of which are likely to represent water management associated with late Iron Age salt making. Several ditches are considered to be related to Iron Age settlement, possibly field systems or enclosure ditches, while the rest are believed to be drainage ditches of a later date.

Archaeological deposits were revealed directly below the topsoil at depths of as little as 0.3m below the present ground surface across the site.

# **1 INTRODUCTION**

## **1.1 Purpose of the report**

This report presents the results of an archaeological trial trench evaluation undertaken within a proposed development area (PDA) on land at Clay Lake, Spalding, Lincolnshire (Figure 1). This report assesses the potential impact of development on the buried archaeological resource within the PDA.

## **1.2 Commissioning bodies**

Ashley King Developments Ltd commissioned Savills to act as site agent. Network Archaeology Ltd was invited to tender for the works by, and submitted its tender to, Savills, and was awarded the contract by Ashley King Developments Ltd in April 2011.

## **1.3 Proposed development area**

### **Location**

The PDA lies 1.5km southeast of the modern centre of Spalding on the site of the former turkey farm and adjacent field, between Spalding Drove and the A16 (NGR 525680 321090) (Figure 2).

### **Development proposal**

The proposal is for a new business park and associated infrastructure.

The PDA currently consists of a disused turkey farm in the western half and an arable field in the eastern half.

### **Geology, topography, soils and land use**

Local soils are the deep, stoneless clayey soils of the Wallsea 2 Association developed over extensive deposits of superficial marine alluvium (SSEW 1983). These silts and clays overlie a solid geology of Oxford Clay.

The PDA is situated on roughly level ground at a height of approximately 2.5m OD.

## **1.4 Legislation, regulations and guidance**

An outline application has been made for the redevelopment of a new business park (Class B1, B2 and B8) and associated infrastructure (H16-0347-11). Evaluation of the site was requested by Lincolnshire County Council with a view to ensuring a mitigation strategy is in place. The scope for this 'pre-determination' archaeological evaluation was recommended by the Historic Environment Team (Jennings 2010).

A Written Scheme of Investigation (WSI) was produced by Network Archaeology Ltd (Wood 2011) detailing the procedures to be followed during archaeological trial trenching.

## **1.5 Archaeological and historical background**

The deep deposits of superficial marine alluvium found throughout the Fens are the result of successive marine incursions from the Neolithic through to the mid to late Iron Age, and then again in the post-Roman period. This limited the potential for settlement and land use until the later Iron Age when the sea-levels dropped to the point where limited occupation was possible (Hayes and Lane 1992). A dendritic pattern of creeks were infilled with silt, creating raised areas known as roddons that provided ideal zones for settlement, animal husbandry and craft activities, elevated above the periodically flooded Fenland.

Salt-making was the predominant industrial land-use in the area, with several Iron Age saltern sites known in the Fenland, most notably from Cowbit, 3km south of the site (Hayes

and Lane 1992). Cropmarks of numerous ring ditches have been recorded in Weston Hills, 1.5km southeast of the site, and may suggest there may have been a prehistoric settlement in the area (HER25709). Later settlement has also recorded, particularly at Wygate Park, which showed evidence for occupation from the 1st century BC through to the early-mid 4th century AD (Wood 2006). Record has also been made of burnt human remains and an urn, provisionally dated to the Roman period, found immediately to the north of the site (HER 22371).

Rising sea-levels in the later Roman period may have made further occupation in the area untenable from the 4th century AD until the Saxon period, as is seen in salt making sites and possible farms identified in nearby Gosberton and Pinchbeck (Crowson *et al* 2005).

The origin of the name 'Spalding' is believed to be derived from the *Spaldingas*, a tribe living in the area in the Saxon period. The word literally means 'members of the tribe of *Spalda*' (Ekwall 1991).

The town and surrounding area saw a growth in wealth during the medieval period. The establishment of a priory in the town and numerous other ecclesiastical buildings in the area stand testament to this.

By the 17th century, the Fenland witnessed the great period of fen drainage, with numerous dyke systems created allowing the fertile soils to be exploited more extensively.

### **Previous archaeological work**

An archaeological watching brief was conducted on the turkey farm immediately to the northwest of the PDA (Lewis 1998). Several ditches were revealed; there was very little dating evidence, and it was concluded that they probably represent Roman field systems (HER 20558).

## **1.6 Aims**

The aims and objectives of the archaeological evaluation, as set out in the scheme of archaeological works, were to:

- establish the presence or absence, quality and extent of archaeological remains and their location within the development area;
- gather sufficient information to enable an assessment of the potential significance of any archaeological remains to be made and the impact which development will have upon them;
- enable an informed decision to be made regarding the future treatment of any archaeological remains and consider any appropriate mitigatory measures either in advance of and/or during development;
- produce recommendations for future work as part of the region's ongoing research agenda;
- produce a project archive for deposition with The Collection;
- provide information for accession to the County Historic Environment Record (HER).

## **2 FIELDWORK PROCEDURES**

### **2.1 Quality standards**

All archaeological work was undertaken in accordance with the Institute for Archaeologists' standard and guidance documents (IfA 2008a, 2008b, 2008c, 2010) and those set out in the Lincolnshire Archaeology Handbook (Lincolnshire County Council 2010).

Network Archaeology is a Registered Organisation (RO) with the IfA and adhered to the standards represented by that status throughout.

### **2.2 Evaluation**

Eighteen evaluation trial trenches (each measuring 50m by 2m) were proposed in the WSI following consultation with the Historic Environment Team. This equated to a largely random distribution, sampling 3% of the overall PDA, 1800sqm in total. Six trenches were to be placed in the eastern half of site, currently arable land and where the proposed attenuation ponds and access track are intended, with the remaining twelve trenches located around the existing turkey farm area, the proposed location for the business park units.

The presence of four overhead electricity pylons and extensive areas of concrete padding over large drains hindered the placement of the trenches within the turkey farm. Following further consultation with the Historic Environment Team, it was agreed that the number of trenches in the turkey farm area could be reduced to ten; making a total of sixteen trenches.

#### **Survey**

All trenches were located and recorded, where appropriate, using a Leica GPS900, achieving accuracy levels of  $\pm 2\text{cm}$ .

#### **Mechanical-excavation**

The evaluation trenches were excavated down to the top of the first archaeological horizon by a 360° mechanical excavator fitted with a 2m wide toothless ditching bucket. A toothed bucket was used to break up the uppermost overburden of trenches located in areas of hard standing. All mechanical excavation was undertaken under the supervision and direction of the lead archaeologist.

#### **Hand excavation, recording and sampling**

A full written record was maintained on site, including standardised context descriptions on pro-forma record sheets. Scale plans of individual trenches containing archaeological features were made and sections drawn showing archaeological deposits and representative soil profiles. Both colour and monochrome photographs were taken.

### **2.3 Project codes and number allocations**

The evaluation has been given the internal Network Archaeology project code SCL14. In addition, a museum project code (SPCL11) has been issued for the deposition of the site archive. All documents relating to the site archive for this project have been referenced, where appropriate, with these codes.

Each evaluation trench was allocated a unique number along with a block of context numbers. For example, the first context number from Trench 3 was 300, and that for Trench 4 was 400, etc. Palaeoenvironmental samples were numbered in the order they were collected, irrespective of from which trench they came.

## 2.4 Assessment of archives, finds and soil samples

Following completion of the evaluation, the stratigraphic information gathered was assessed to determine its potential and significance.

The finds were quantified and sent to appropriate specialists for assessment; these specialists are listed in the table below.

**Table 2.1 Material types and specialists**

Material type	Assessment by
Flint	Hugo Anderson–Whymark
Iron Age and Roman pottery	Ian Rowlandson
Post-Roman pottery	Jane Young
Briquetage	Elaine Morris
Animal bone and shell	Jennifer Wood
Burnt stone and fuel ash slag	Mike Wood
Environmental samples	PRS

### 3 RESULTS

Sixteen evaluation trial trenches were excavated in total. Trenches 1 and 2 were not excavated because of large areas of concrete padding and overhead electricity pylons covering the site.

Trenches 3 to 12 were located in the western half of the site (with existing turkey sheds), whilst trenches 13 to 18 were located in the eastern half (arable land).

**Table 3.1 Summary of results**

Trench	Location	Feature no.	Description	Interpretation
1	-	-	-	-
2	-	-	-	-
3	West	302	NE-SW linear feature	Natural alluvial undulations
4	West	403	N-S-SE curvilinear ditch	Late Iron Age boundary/enclosure ditch
		406	N-S linear ditch	Late Iron Age boundary/enclosure ditch
		410	NNW-SSE linear ditch	Late Iron Age boundary/enclosure ditch
		412	N-S linear ditch	Undated ditch
5	West	503	NW-SE linear ditch	Late Iron Age ditch
		509	NW-SE linear ditch	-
		512	N-S linear ditch	Late Iron Age ditch
		516	N-S linear ditch	Late Iron Age ditch
		522	WNW-ESE linear ditch	Post-medieval ditch/dyke
		527	WNW-ESE linear ditch	Post-medieval ditch/dyke
6	West	-	-	-
7	West	702	NNW-SSE linear ditch	Undated ditch
8	West	803	NW-SE linear ditch	Undated ditch
9	West	-	-	-
10	West	-	-	-
11	West	-	-	-
12	West	-	-	-
13	East	1303	NE-SW linear ditch	Late Iron Age salt making feature
		1314	NW-SE linear ditch	Late Iron Age salt making feature
		1320	Posthole	Late Iron Age salt making feature
		1323	NW-SE-S curvilinear ditch	Late Iron Age salt making feature
		1336	NW-SE linear ditch	Late Iron Age salt making feature
		1338	NW-SE linear ditch	Late Iron Age salt making feature
14	East	1403	NNW-SSE linear ditch	-
15	East	1503	NNW-SSE linear ditch	Post-medieval ditch/dyke
16	East	1602	NNW-SSE linear ditch	Post-medieval ditch/dyke
17	East	1703	E-W linear ditch	-
		1707	NW-SE linear ditch	-
		1713	NW-SE linear ditch	-
		1720	NW-SE linear ditch	-
		1722	NNW-SSE linear ditch	Post-medieval ditch/dyke
18	East	1803	E-W linear ditch	-
		1809	NNW-SSE linear ditch	Post-medieval ditch/dyke

Within the ten trenches excavated in the western half of the PDA, twelve archaeological features were revealed, the majority of which were located within Trenches 4 and 5. These trenches were also responsible for almost the entirety of the finds assemblage from this side of the site, including late Iron Age pottery and small quantities of animal bone and briquetage.



Within the six trenches located in the eastern half of the PDA, a total of sixteen archaeological features were encountered. Whilst one large ditch was recorded down the eastern edge of the PDA in Trenches 15, 16, 17 and 18, the most significant remains were located within Trench 13. Here, late Iron Age pottery, briquetage and animal bone were among the finds recovered, accounting for almost the entire assemblage recovered from the eastern side of the PDA.

All archaeological features excavated were cut into the underlying alluvium.

### 3.1 Trench 3 (Figure 3)

Natural deposits in Trench 3 comprised yellowish brown sandy silt alluvium, 304 and 305, and were present at heights of 2.23m OD and 2.1m OD respectively.

A northeast-to-southwest oriented feature, **302**, was observed at the southern end of the trench. This feature measured 5.5m wide and was initially interpreted as a large ditch or watercourse; although following a controlled excavation of the feature with a mechanical excavator, it seems more likely this represents a natural undulation in the underlying alluvium rather than part of a creek.

A 0.21m thick layer of hard-standing comprising limestone and brick rubble, 300, extended across the entire length of the trench at a height of 2.43m OD, and truncated what appeared to be a remnant topsoil layer 301 of modern provenance.

### 3.2 Trench 4 (Figure 3, Plate 3)

Natural deposits in Trench 4 comprised orange-brown silt alluvium, 402, and were revealed at a height of 2.1m OD.

Trench 4 revealed four linear ditches, three of which produced a small assemblage of artefacts (Iron Age pottery, burnt stone, animal bone, briquetage, and hammerscale).

Ditch **403** was located at the western end of the trench, oriented north-to-south with its southern end appearing to curve to the southeast. This ditch measured 0.77m wide by 0.17m deep, had steep sides and a rounded base, and the majority of a late Iron Age handmade jar was retrieved from its basal fill 404. Burnt stone, animal bone and a small quantity of briquetage were also collected from the orange-brown silty clay ditch fill (Appendices C, F, G and H).

Immediately to the east, north-to-south aligned ditch, **406**, transected the trench and cut into the alluvium. This ditch measured 1.1m wide by 0.33m deep and shared a similar profile to that of its neighbour. No secure dating evidence was retrieved from its fills, but small fragments of animal bone, burnt stone and briquetage were present (Appendices F, G and H).

In the centre of the trench, another ditch, **410**, was recorded in both the north and south trench baulk sections. Its projected orientation was north-northwest-to-south-southeast and it had a shallow profile with undulating base, measuring 1.7m wide by 0.26m deep. It contained a single fill, 411, from which fragments of animal bone, briquetage, hammerscale and a late Iron Age jar were recovered (Appendices C, G, H and I).

The similarities observed between these ditches indicate that a roughly contemporary late Iron Age date is likely.

Ditch **412** at the eastern end of the trench was also aligned in a north-south direction; however this one did not share the same properties as those to the west. This feature had a steep-sided, u-shaped profile, measured 1.7m wide by 0.7m deep, and contained no finds.

A layer of 0.36m thick topsoil, 400, extended across the entire length of the trench.

### 3.3 Trench 5 (Figure 4, Plates 4 and 5)

Natural deposits in Trench 5 comprised orange brown silt alluvium, 502, and were present at a height of 2.13m OD.

Archaeology revealed in Trench 5 comprised six linear ditches and a pit or posthole. A small assemblage of artefacts was recovered (Iron Age pottery and briquetage from one feature; animal bone and briquetage from a second; and medieval pottery from a third).

Three large linear ditches were observed following the initial removal of overburden in Trench 5 and it was agreed with the Historic Environment Team that a controlled excavation of these features using a mechanical excavator was appropriate.

A large feature, **503**, was excavated at the north-eastern end of the trench. This feature measured 4m wide by 1.1m deep, was oriented northwest-to-southeast, and was truncated on its eastern edge by a number of modern services. The eastern edge had a gradual slope that appeared stepped down to a generally flat base, while on the western edge the gradient was much steeper. This feature contained five layered fills, all of which have been interpreted as separate natural silting events. The basal deposit was grey silty clay, 504, from which several fragments of animal bone and briquetage were retrieved (Appendices G and H).

A smaller ditch, **509**, measuring 1.1m wide by 0.32m deep, was cut into its upper fills. It too was oriented northwest-to-southeast, although its profile was a flat bowl-shape containing two fills, neither of which produced any finds.

To the southwest, in the centre of the trench, were two large parallel linear features oriented west-northwest-to-east-southeast. It was decided that the most meaningful approach to excavating them was to insert individual machine-dug sondages across them to enable a true profile to be recorded.

Ditch **522** was the most northerly of the two and measured 2.2m wide by 0.6m deep. It was filled by a sequence of four clay silt deposits, the first of which was greyish brown, organic-rich deposit, 523. Sherds of medieval pottery were recovered from the tertiary fill, 526, indicating the ditch may have been out of use by this period (Appendix D).

This ditch truncated an earlier linear feature, **516**, that was oriented north-to-south. Its full width was not seen in the sondage excavated within the trial trench, but measured at least 2.2m wide by 0.6m deep. The fills were all clay silts with the exception of a dark grey, organic-rich deposit, 520, located towards the top of the ditch cut. No finds were retrieved from any of these contexts.

In turn, this north-south ditch was revealed to have been a re-cut of an earlier ditch, **512**. This ditch had steep sides and a flat base, the remnants of which measured 0.9m wide by 0.7m deep. This was filled by silty clay deposits and its basal fill, 513, produced three small fragments of Iron Age pottery and a fragment of briquetage (Appendices C and H).

Ditch **527**, parallel to ditch **522**, was located 5m to the southwest of these intercutting features. This ditch had a concave profile and measured 3.2m wide by 1.25m deep. The initial deposits within this ditch were well-laminated grey silts, 528 and 529, but from then on the sequence was notably similar to that found in ditch **522**; a 0.28m thick deposit of dark brown, organic-rich fill, 530, followed by clayey silts. No finds were retrieved from any of these fills.

Based on the depositional sequences found in both of these two large parallel ditches, it seems likely that they were open at the same time. The lack of finds and silty nature of their fills suggests they served as drainage ditches.

A layer of 0.35m thick topsoil, 500, extended across the entire length of the trench.

### 3.4 Trench 6 (Figure 5)

Natural deposits in Trench 6 comprised orange-brown sandy silt alluvium, 601, and were revealed at a height of 1.93m OD. This was covered the entire length of the trench by a 0.35m thick layer of topsoil, 600.

No archaeological features were observed in Trench 6.

### **3.5 Trench 7 (Figure 5)**

Natural deposits in Trench 7 comprised orange silt alluvium, 701, and were encountered at a height of 1.9m OD.

Ditch **702** was the only feature recorded and was present through the northern half of the trench, oriented north-northwest-to-south-southeast. The basal deposit was firm grey silty clay, 703, that may represent a clay lining to the ditch. The only finds observed from this ditch were present in the tertiary fill, 706; these were identified on-site as modern sherds of pottery and were consequently discarded.

A layer of 0.4m thick topsoil, 700, extended across the entire length of the trench.

### **3.6 Trench 8 (Figure 5)**

Natural deposits in Trench 8 comprised brown sandy silt alluvium, 801 and 802, and were encountered at heights of 2.07m OD and 1.75m OD respectively.

A single ditch, **803**, was recorded in this trench, and was cut into alluvium 801 in the eastern half of the trench. This ditch measured 1.2m wide by 0.26m deep and was oriented northwest-to-southeast and contained a single fill, 804, which did not produce any finds.

A layer of 0.3m thick topsoil, 800, extended across the entire length of the trench.

### **3.7 Trench 9 (Figure 6)**

Natural deposits in Trench 9 comprised orange-brown sandy silt alluvium, 902 and 903, and were encountered at a height of 1.96m OD and 1.8m OD respectively. This was covered, along the length of the trench, by a 0.3m thick layer of hard standing limestone rubble, 900, that truncated a former layer of topsoil, 901.

No archaeological features were observed in Trench 9.

### **3.8 Trench 10 (Figure 6)**

Natural deposits in Trench 10 comprised dark greyish brown clayey silt, 1002, and silty clay, 1003; both alluvial. They were encountered at a height of 2.65m OD and 2.4m OD respectively. These layers were covered by a 0.5m thick layer of topsoil, 1000 and 1001.

No archaeological features were observed in Trench 10.

### **3.9 Trench 11 (Figure 6)**

Natural deposits in Trench 11 comprised grey clayey silt, 1101, and dark brownish grey silty clay, 1102; both alluvial. They were encountered at a height of 2.06m OD and 1.98m OD respectively.

The initial stripping of the trench revealed four definite linear features. Subsequent investigation of these features revealed them to be modern drains and services.

A layer of 0.33m thick topsoil, 1100, extended across the entire length of the trench.

### **3.10 Trench 12 (Figure 7)**

Natural deposits were not present in Trench 12. It was established that the trench had been located over the top of a large modern ditch. The trench was excavated to a height of 1.08m OD, at which depth no deposits other than the modern ditch fill, 1201, were observed. It is believed that this large ditch may be contemporary with the large bund immediately adjacent to it that encloses the turkey farm on its eastern boundary. The full 50m length of the trench was not excavated for this reason.

A layer of 0.8m thick, limestone rubble hard standing, 1200, extended across the entire length of the trench at a height of 2.30m OD.

### 3.11 Trench 13 (Figure 7, Plates 6, 7 and 8)

Natural deposits in Trench 13 comprised brownish orange sandy silt, 1301, and greyish blue silty clay, 1302, both alluvial. They were revealed at a height of 2.28m OD and 1.39m OD respectively. All excavated features were cut into alluvium 1301.

Trench 13 produced several archaeological features: five ditches, and a posthole. Together, all of the ditches yielded a reasonable quantity of artefacts (pottery, briquetage, burnt stone, fuel ash slag, and animal bone), which represent the majority of the total assemblage from the trench evaluations.

One northeast-to-southwest oriented ditch, **1303**, measuring 1.1m wide by 0.32m deep with moderately steep sides and a flat base, was seen following the initial excavation of the 50m trial trench. Some slumping, 1305, was evident in its base, while in its secondary fills several fragments of animal bone and briquetage were retrieved (Appendices G and H, Figure 10).

At the western end of the trench, an archaeological feature had been observed in the south-facing baulk section, and was producing briquetage from its fill. Upon consultation with the Historic Environment Team it was recommended that the trench be extended to establish the nature and extent of this deposit. A 20m extension was stripped to the south from the western end of Trench 13.

The feature first seen in the original trench baulk section was northwest-to-southeast aligned shallow ditch, **1338**. This feature had been heavily disturbed by animal burrowing, leaving only the base of the ditch surviving. The remaining ditch was 1m wide by 0.27m deep and was filled with mid brownish orange silty loam, 1337, which produced seventy-nine fragments of briquetage and a small quantity of burnt stone (Appendices F and H). To its south ran a parallel ditch, **1336**, that had been severely truncated through ploughing (it measured 1m wide by 0.1m deep). A similar quantity of briquetage and burnt stone was also retrieved from the greyish brown silty clay fill of **1336**, 1335, along with several fragments of animal bone (Appendices F, G and H, Figure 10).

Ditch **1314** was also oriented northwest-to-southeast and was located centrally within the southern extension to Trench 13. It measured 2.2m wide by 0.72m deep and contained a sequence of well-stratified datable fills. Basal deposit 1315 was a laminated light grey silt and clay and produced five sherds of pottery from a late Iron Age globular jar and two fragments of fuel ash slag. Late Iron Age/early first century pottery was also recovered from secondary fill 1333 and later dump deposits 1317 and 1319 (Appendix C). A total of 181 fragments of briquetage (weighing nearly 1kg) was hand collected from the ditch, the majority coming from mid brownish orange silty loam dump deposit 1318 (Appendix H, Figure 10).

At the southern end of the extension was curvilinear ditch **1323**; it was oriented northwest-to-south, measured 0.8m wide by 0.43m deep, and was visible for 7m of its length. The ditch had steep sides and a flat base and contained numerous laminations of grey silt and clay in its base. A small quantity of briquetage, animal bone (including a fragment of house mouse maxilla) and burnt stone was retrieved from fills 1330 and 1332 (Appendices F, G and H, Figure 10).

Ditch **1323** was cut on its western side by a posthole, **1320**, that was circular in plan and measured 0.7m diameter by 0.6m deep. Its fills were brown silty loam deposits 1321 and 1322, of which the basal fill 1321 produced some animal bone and briquetage (Appendices G and H, Figure 10).

A layer of 0.35m thick topsoil, 1300, extended across the entire length of the trench.

All features excavated in Trench 13 appear likely to have been roughly contemporary with each other, and to have been in use during the later Iron Age. The briquetage assemblage retrieved would indicate that there had been salt making in the immediate area and that the ditches and posthole excavated were probably directly related to such activities.

### 3.12 Trench 14 (Figure 8)

Natural deposits in Trench 14 comprised orange-grey silty clay 1401, and purple grey silty clay 1402, both alluvial. These were present at heights of 2.08m OD and 2.01m OD respectively.

One ditch, **1403**, was recorded; it was located in the middle of Trench 14, was cut into alluvium 1402, and sealed by alluvium 1401. This feature measured 0.9m wide by 0.6m deep and was oriented north-northwest-to-south-southeast. The ditch was filled by seven well-laminated clay and clayey silt deposits, none of which produced any finds.

A layer of 0.4m thick topsoil, 1400, extended across the entire length of the trench.

### 3.13 Trench 15 (Figure 8, Plate 9)

Natural deposits in Trench 15 comprised orange-grey silt 1501, and blue-grey silty clay 1502, both alluvial, and revealed at heights of 1.8m OD and 1.66m OD respectively.

One large ditch, **1503**, was recorded in this trench; it transected the eastern end of Trench 15 and was excavated using a controlled machine excavation. The ditch measured 2.28m wide by 1m deep, was oriented north-northeast-to-south-southwest, and was sealed by alluvial deposit 1501. The fills were mainly grey silty clays although a darker organic-rich deposit, 1508, was recorded overlying the basal fill, 1509. This is likely to represent a period of vegetal growth soon after its excavation.

Ditch **1503** is the same as ditch **1602** in Trench 16, **1722** in Trench 17, and **1809** in Trench 18. This is confirmed by the identification of a cropmark visible during trial trenching (Figure 03).

A layer of 0.35m thick topsoil, 1500, extended across the entire length of the trench. A single piece of flint was retrieved from the topsoil (Appendix E).

### 3.14 Trench 16 (Figure 8)

Natural deposits in Trench 16 comprised orange yellow silt 1603, orange-grey clayey silt 1604, and light blue-grey silty clay 1605, all alluvial, and revealed at heights of 1.59m OD, 1.3m OD, and 1.06m OD respectively.

A single ditch, **1602**, was observed in the centre of this trench; it was 2.5m wide, and cut through all alluvial layers.

Ditch **1602** is the same as ditch **1503** in Trench 15, **1722** in Trench 17, and **1809** in Trench 18. This is confirmed by the identification of a cropmark visible during trial trenching (Figure 03). This ditch was not excavated in Trench 16 as it had been sufficiently recorded in Trenches 15 and 18.

A layer of 0.3m thick topsoil, 1600, extended across the entire length of the trench.

### 3.15 Trench 17 (Figure 9)

Natural deposits in Trench 17 comprised yellowish brown silty sand 1701, and light brown sandy silt 1702, both alluvial, and encountered at heights of 2m OD and 1.86m OD respectively.

Trench 17 revealed five linear ditches, one of which contained a few fragments of animal bone and shell.

Three intercutting ditches were excavated at the southern end of the trench. The northernmost ditch, **1713**, measured 1.84m wide by 0.88m deep and was oriented northwest-to-southeast. It possessed a concave profile and contained a single fill of light blue-grey silty clay, 1714, which had been re-cut by ditch **1720**. The latter was filled by grey silty clays for the most part. Dark grey, organic-rich silty clay 1716 was found below the final fill of ditch **1720** and is believed to represent a period of vegetal growth.

During excavation of ditch **1720**, it became apparent that it was cut into an earlier ditch not previously seen because of the similarity between its (the earlier ditch's) fills and the underlying alluvium. Earlier ditch **1707** was also oriented northwest-to-southeast, had steep sides and a large flat base, and measured 2.8m wide by 0.4m. Small quantities of animal bone and shell were retrieved from its fill, greyish brown clayey silt 1710 (Appendix G).

Ditch **1707** was also truncated on its southern edge by east-to-west oriented ditch **1703**. This ditch had gradually sloping sides and an undulating base, measured 1.65m wide by 0.5m deep, and contained a single orange-grey clayey silt fill, 1704. A modern ceramic land drain was cut down its length, suggesting that the ditch itself could be fairly recent.

No datable finds were recovered from any of the ditches excavated in Trench 17, most likely because they primarily functioned as drains away from settlement.

Ditch **1722** was observed at the northern end of the trench, was 2.5m wide, and is the same as ditch **1503** in Trench 15, **1602** in Trench 16 and **1809** in Trench 18. This is confirmed by the identification of a cropmark visible during trial trenching (Figure 03). It remained unexcavated in Trench 17 as it had been recorded and characterised in Trenches 15 and 18.

All features excavated were cut into alluvium 1702 and sealed by alluvium 1701, with the notable exception of ditch **1722** at the northern end of the trench.

A layer of 0.35m thick topsoil, 1700, extended across the entire length of the trench.

### **3.16 Trench 18 (Figures 9)**

Natural deposits in Trench 18 comprised greyish brown clayey silt 1801, orange brown silt 1802, and dark greyish blue silty clay 1820; all alluvial, and encountered at heights of 1.51m OD, 1.19m OD and 0.57m OD respectively.

Trench 18 revealed two linear ditches; neither produced any artefacts.

Ditch **1803** was located at the south-western end of the trench, was oriented east-to-west, and measured 3m wide. The upper fills were orange-brown silty sands 1806, 1807 and 1808, and these overlaid grey silty clay deposits 1804 and 1805. A modern ceramic land drain had been cut into the upper fills and was observed to extend along the ditch's length.

The base of the ditch was not reached because the excavation was beginning to compromise the integrity of the trench walls making work unsafe. The ditch was cleaned and recorded at 0.80m deep.

In the middle of the trench another ditch, **1809**, was excavated, measuring 2.45m wide by 1m deep and oriented north-northeast-to-south-southwest. It had moderately steep sides and an uneven base. Its fills were mainly grey silty clays and appeared to be very similar to the sequence seen in ditch **1503** in Trench 15.

Ditch **1809** is the same as ditch **1503** in Trench 15, **1602** in Trench 16 and **1722** in Trench 17. This is confirmed by the identification of a cropmark visible during trial trenching (Figure 03).

Two alluvial deposits, 1818 and 1819, were recorded at the north-eastern end of the trench, and extended for 18m. They represent separate flooding events apparently confined to the north-eastern corner of the PDA.

A layer of 0.3m thick topsoil, 1800, extended across the entire length of the trench.

## 4 DISCUSSION

Natural silts were encountered in all but one of the trial evaluation trenches across the PDA. These are considered to have been deposited through successive periods of marine alluviation from the Neolithic to the middle Iron Age. They were found between heights of 2.65m OD (in Trench 10), and 1.51m OD (in Trench 18), and there was little variation in the depths at which they were encountered below the current ground level, ranging between 0.3m and 0.4m.

A total of twenty-nine archaeologically significant features was revealed within the trenches, twenty-eight of which were ditches and one was a posthole. A number of other deposits were recorded in the eastern part of the development site, although these are believed to represent later, natural flood events that are considered of lesser archaeological significance.

In terms of distribution across the PDA, the archaeology was recorded as follows:

Ten trenches were excavated in the western half (turkey sheds) of the PDA. Of these, two trenches in the north (Trenches 4 and 5) account for 77% of the archaeological features and 99% of all finds recovered. A small amount of activity, taking the form of two small ditches, is noted in trenches excavated immediately to the south of this area (Trenches 7 and 8). However, the remaining trenches show that the area is either void of archaeology or heavily truncated by modern services.

Six trenches were excavated in the eastern half (arable land) of the PDA. One large ditch was recorded in Trenches 15, 16, 17 and 18; however, the most significant of the other remains found were located within Trench 13. Of the six trenches investigated, 46% of the features identified and 99% of the finds assemblage came from this trench in the south-western quadrant of the eastern half of the PDA.

Based on the distribution of recorded archaeology, two principal zones of archaeological interest have been identified (Figure 11):

- Zone A is located in the north-central portion of the western half of the PDA, and is where significant concentrations of archaeological remains were encountered in Trenches 4 and 5.
- Zone B is located in the south-western quadrant of the eastern half of the PDA, where significant amounts of briquetage from archaeological features within Trench 13 were found.

As a result of these findings, three distinct, yet also inter-related themes, have arisen: late Iron Age settlement, late Iron Age salt making, and multi-period water management.

The archaeology found within the PDA strongly points towards this site being on the periphery of a late Iron Age settlement. This assertion is supported largely by the material evidence from Trench 4 (Zone A), which includes the majority of the Iron Age pottery assemblage from the site, as well as a small concentration of hammerstone, which is suggestive of smithing activity close by. As to where such a late Iron Age settlement might have been more precisely located is less certain, although there is some evidence relating to this question, and it is worth exploring briefly, as follows.

- The HER records limited late Iron Age activity in and around Spalding, but no evidence yet to indicate extensive settlement.
- A glance at the distribution and types of known cropmarks in the vicinity of the PDA (Figure 2) shows that almost all are recorded to the south and east of the PDA, with none adjacent to the western edge of the PDA and the archaeology from Trench 4. In addition, all of those cropmarks lying within c.500m of the PDA are thought to represent agricultural field systems and/or relate to water management (see below), and not settlement. The absence of recorded settlement-type cropmarks adjacent to

the PDA does not, however, preclude the existence of such settlement, since there are several reasons why below-ground archaeology might not show as a cropmark. Indeed, the fact that the cropmarks stop abruptly on a north-east to south-west line that passes roughly between the western and eastern halves of the PDA, reflects current land use. To the north and west the area has been built upon, and where it hasn't has been left for pasture. In contrast, land to the south and east contains an abundance of cropmarks because of the arable farming style practised there.

- The depositional sequence within the archaeological features observed in Trench 4 is different from that within the features recorded in the trenches further east. The Trench 4 features tended to contain lighter, fairly friable, dark, clay soils, whereas those in Trenches 5 (eastern half of PDA) and 13 (western half) contained a higher proportion of heavier, more compact, well-laminated alluvial deposits.

Taken together, this evidence suggests that the best drained land would have lain within the western part of the PDA. Consequently, it is this part of the site that would have been most suited to settlement. Such activity in the Fens, before their widespread drainage in the post-medieval period, was often focussed on high ground, such as roddons (elevated banks representing former tidal creeks), although the presence of such cannot be confirmed here.

Turning to the landscape of the PDA and its immediate surroundings as a whole, during this period there would have been a harsher living environment, more exposed than that to which we are used to today. That said, the presence of house mouse (recorded on Trench 13) does suggest an environment with shelter and food. Targeted sampling of archaeological features enables us to visualise the Clay Lake area in the late Iron Age as an upper salt marsh verging on freshwater marsh, excellent for grazing animals and exploiting a range of marine resources, including salt.

Briquetage was found in eleven separate archaeological features, five in the western half of the PDA (Trenches 4 and 5), and six in its eastern half (Trench 13). Four features were dated to the late Iron Age through the pottery in their fills, and all of these contained briquetage (three were from the western half of the PDA - two from Trench 4 and one from Trench 5; and one was from the eastern half - Trench 13). The concentration of larger diagnostic fragments of briquetage was in Trench 13 (Figure 10), with only small quantities recovered from the pottery-rich ditch fills of Trench 4. The alluvium filling the bases of the briquetage-rich ditches in Trench 13 was well-laminated and appears to represent successive flood episodes. The majority of the briquetage was found in dump deposits sealing the ditches, suggesting that salt making had occurred in the very near vicinity.

It would be difficult to postulate the precise function of the features containing briquetage in Trench 13, or the precise location of the salt making activity; however, these ditches are likely to represent some form of water management involved in the salt making process.

The briquetage assemblage was found in direct association with late Iron Age pottery and “has provided a missing link in the sequence of salt production in the Fens representing the period from the first century BC through to the Roman Conquest” (Appendix H). Chronologically and geologically it fits between the middle Iron Age salterns at Cowbit and the early Roman ones at Wygate Park, thus demonstrating a degree of continued salt production in the wider area throughout this period.

There was also evidence for water management that was not associated with salt making. Many of the ditches investigated in the eastern half of the PDA (Trenches 15 to 18) were cut through later alluvial deposits and appear to respect the lines of current boundaries. The single north-south ditch recorded in each of Trenches 15 to 18, as well as the ditch running east west in Trench 18, are both recorded as cropmarks (Figures 2 and 11). These ditches comfortably fit within the north-northeast-to-south-southwest and west-northwest-to-east-southeast lines of dykes and ditches east of Spalding Drove. At least one of the parallel



ditches in Trench 5 is recorded on the Ordnance Survey Map of *c.*1880, indicating a likely late post-medieval date.

Water management has always been of the utmost importance to those occupying the Fenland environment. The current landscape is dominated by fertile low-lying land, drained by dykes that serve as field boundaries. It comes as no surprise that during the trial trenching, in a landscape such as this, drainage ditches (dating from as early as the Iron Age) would be encountered.

## **5 ASSESSMENT OF IMPACT**

### **5.1 Importance**

The area in and around Spalding is known to contain reasonably extensive Iron Age and Roman remains. This activity is now known to have extended into the Clay Lake PDA. Whilst these remains are of archaeological importance, because they provide evidence for salt making and probable settlement during the late Iron Age in the Spalding area, overall they are considered to be of local significance.

### **5.2 Potential impact**

The trench evaluation has proven the existence of significant archaeological remains at this location, within the confines of most of the trenches. This archaeology was encountered at between 0.30m and 0.40m below the current ground surface, across the development area. These findings also suggest that at least some archaeology exists elsewhere within the PDA. Consequently, development at this location has the potential to have an adverse and direct impact upon these recorded/potential archaeological remains, and in particular in two areas:

- Zone A: the north-central portion of the western half of the PDA (currently turkey sheds, and the proposed site for the industrial units);
- Zone B, the south-west quadrant of the eastern half of the PDA (currently arable, and designated for access roads and ponds).

## **6 CONCLUSION**

The trial trench evaluation has identified significant archaeological remains dated to the late Iron Age. A number of undated ditches could also date to this period, though equally some could represent later activity at the site. All of the archaeology revealed is of local significance, although the late Iron Age salt making evidence does also tie into regional research themes.

The recorded late Iron Age features suggest that there was both settlement and industry in the vicinity of the site. The settlement evidence found in the western half of the PDA (Zone A) points to possible late Iron Age settlement not far from here, and it would equally seem reasonable to assume that the south-western part of the eastern half of the PDA (Zone B) lies on the periphery of a late Iron Age salt making site.

Water management is apparent at the site from the late Iron Age through to the present. Whilst much of this activity remains undated, it can be postulated that many of the features containing finds date to the late Iron Age, while many of the larger ditches (especially those on the eastern strip of the eastern half of the PDA) are probably of later medieval or post-medieval date.

## 7 ARCHIVE

The documentary archive will comprise:

- A copy of the written scheme of investigation for the evaluation
- A copy of the final evaluation trial trench report
- Finds catalogues
- Site records, as detailed in the table below:

**Table 6.1: Quantification of the site archive**

Item	Count
Trench sheets	16
Context registers	16
Context sheets	192
Drawing registers	2
Drawing sheets	12
Sample register	1
Sample sheets	8
Photographic registers	14
Black and white photographs	180
Colour slide photographs	180
Digital colour photographs	270

On completion of the reporting stages of the project, the archive will be prepared for long-term storage in a format agreed in advance with the relevant local depository. This will be in accordance with guidelines prepared by the UK Institute of Conservation (Walker 1990) and the Museums and Galleries Commission (MGC 1992). The project archive will be managed in accordance with current guidelines.

The recipient museum is The Collection, Danes Terrace, Lincoln, Lincolnshire LN2 1LP; tel: 01522 550990, who have assigned this project the accession code LCNCC: 2011.76.

The recipient museum will receive the document archive, and with the permission of the landowners, any finds generated from the archaeological works.

Prior to the deposition of the archive, the necessary arrangements will be made with the site owners regarding the transfer of ownership of any archaeological finds to the recipient museums. In the event that deposition of the archive cannot be concluded, Network Archaeology will store the archive to a suitable standard until deposition can be arranged. In this event, Network Archaeology will retain ownership of the document archive until the document archive and its ownership is passed to the recipient museums.

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## Appendix A

### Context Summary

Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
3	300	Layer		0.21m thick	Compact limestone and brick rubble	Hard standing
3	301	Layer		0.20m thick	Friable light grey fine silt	Truncated topsoil
3	302	Cut		5.50m wide, 0.20m deep min.	Gradual sloping sides, base left unexcavated, NE-SW oriented linear	Undulation in alluvium
3	303	Fill	302	0.20m thick min.	Laminated grey silt and silty clay layers	Fill
3	304	Layer		0.10m thick	Firm yellowish brown sandy silt	Hard-weathered alluvium
3	305	Layer		0.60m thick min.	Soft striated bands of yellowish brown sandy silt	Alluvium
4	400	Layer		0.36m thick	Friable dark greyish brown silty clay	Topsoil
4	401	VOID				
4	402	Layer		0.50m thick min.	Soft laminated mid orange brown silt	Alluvium
4	403	Cut		0.77m wide, 0.17m deep	Steep sides, concave sides to a flat base, N-S oriented linear (possibly S end curving SE?)	Ditch
4	404	Fill	403	0.77m wide, 0.06m thick	Firm mid orange brown silty clay with dark greyish black laminations	Basal fill
4	405	Fill	403	0.67m wide, 0.11m thick	Firm light orange brown silty sand	Upper fill
4	406	Cut		1.1m wide, 0.33m deep	Steep concave sides with undulating base, N-S oriented linear	Ditch
4	407	Fill	406	1.1m wide, 0.08m thick	Soft light grey silt	Fill
4	408	Fill	406	1.1m wide, 0.13m thick	Firm mid grey silty clay	Secondary fill
4	409	Fill	406	0.90m wide, 0.18m thick	Firm light orange silt	Fill
4	410	Cut		1.70m wide, 0.26m deep	Wide u-shape, N-S oriented linear	Ditch
4	411	Fill	410	1.70m wide, 0.26m deep	Firm dark greyish brown silty clay	Fill
4	412	Cut		1.10m wide, 0.70m deep	Steep sided, deep u-shaped, N-S oriented linear	Ditch
4	413	Fill	412	1.10m wide, 0.70m thick	Firm mid brown silty clay with orange mottling	Fill
4	414	Fill	412	1.00m wide, 0.52m thick	Firm mid grey silty clay with orange mottling	Fill
4	415	Fill	412	0.80m wide, 0.42m thick	Firm very dark grey organic-rich silty clay	Fill
5	500	Layer		0.35m thick	Friable mid brown silty loam	Topsoil
5	501	VOID				
5	502	Layer		1.40m thick min.	Soft well-laminated orange brown silt	Alluvium

Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
5	503	Cut		4.00m wide, 1.10m deep	Steep SW sloping side and shallow, somewhat stepped NE side, undulating base, NW-SE oriented linear	Ditch
5	504	Fill	503	2.60m wide, 0.24m thick	Soft light-to-mid grey clayey silt with occasional orange mottling and occasional charcoal fragments	Basal fill
5	505	Fill	503	4.00m wide, 0.20m thick	Soft light grey silt with frequent brown mottling	Fill
5	506	Fill	503	3.00m wide, 0.14m thick	Soft mid grey silty clay with occasional light grey silt banding	Fill
5	507	Fill	503	3.00m wide, 0.30m thick	Soft light greyish orange silt	Fill
5	508	Fill	503	2.60m wide, 0.22m thick	Friable orange brown clayey silt	Tertiary fill
5	509	Cut		1.10m wide, 0.32m deep	Concave, bowl-shaped, NW-SE oriented linear	Ditch
5	510	Fill	509	1.10m wide, 0.10m thick	Friable band of dark greyish black, organic-rich clayey silt with occasional flecks of fired clay	Primary fill
5	511	Fill	509	0.8m wide, 0.20m thick	Friable orange brown clayey silt with occasional flecks of fired clay	Upper fill
5	512	Cut		0.90m wide, 0.70m deep	Steep sides, flat base, N-S oriented linear	Ditch
5	513	Fill	512	0.66m wide, 0.25m thick	Friable grey silty clay with occasional flecks of charcoal	Basal fill
5	514	Fill	512	0.50m wide, 0.10m thick	Soft greyish orange sandy silt	Slumping
5	515	Fill	512	0.30m wide, 0.10m thick	Soft light grey silty loam with frequent brown laminations	Alluvial deposit
5	516	Cut		2.10m wide min., 0.70m deep	Gradual sloping sides at top of cut, 45° towards base, flat base, N-S oriented linear	Ditch
5	517	Fill	516	1.40m wide, 0.25m thick	Firm grey clay	Basal fill
5	518	Fill	516	1.00m wide, 0.50m thick	Firm blue grey clay	Fill
5	519	Fill	516	2.10m wide min., 0.30m deep	Soft light grey sandy silt	Fill
5	520	Fill	516	1.60m wide, 0.25m thick	Soft dark grey organic-rich clayey silt	Vegetal growth
5	521	Fill	516	1.40m wide, 0.20m thick	Friable orange brown clayey silt	Tertiary fill
5	522	Cut		2.20m wide, 0.60m deep	Concave, 60° steep sides at the top, 45° steep sides towards the base, flat base, WNW-ESE oriented linear	Ditch
5	523	Fill	522	2.00m wide, 0.16m thick	Soft greyish brown organic-rich clayey silt	Primary fill
5	524	Fill	522	1.78m wide, 0.15m thick	Friable brownish grey clayey silt	Fill
5	525	Fill	522	2.00m wide, 0.14m thick	Soft light greyish brown silt	Alluvial deposit
5	526	Fill	522	2.00m wide, 0.28m thick	Friable greyish orange clayey silt	Upper fill
5	527	Cut		3.20m wide, 1.25m deep	Concave, bowl-shaped, WNW-ESE oriented linear	Ditch
5	528	Fill	527	1.80m wide, 0.13m thick	Soft well-laminated light greyish brown silt	Fill
5	529	Fill	527	2.80m wide, 0.40m thick	Soft well-laminated grey silt	Fill



Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
5	530	Fill	527	2.10m wide, 0.28m thick	Soft dark brown organic-rich, clayey silt	Vegetal growth
5	531	Fill	527	1.80m wide, 0.20m thick	Friable dark grey clayey silt with light brown patches	Fill
5	532	Fill	527	2.40m wide, 0.55m thick	Friable light greyish brown clayey silt with occasional flecks of charcoal	Upper fill
6	600	Layer		0.30m thick	Friable light greyish brown silty loam	Topsoil
6	601	Layer		0.70m thick min.	Soft bands of orange brown sandy silt	Alluvium
7	700	Layer		0.40m thick	Firm mid greyish brown silty clay	Topsoil
7	701	Layer		0.70m thick min.	Firm mid orange silt with grey mottling	Alluvium
7	702	Cut		1.36m wide, 0.37m deep	Steep sides, concave sides with a rounded base, N-S oriented linear	Ditch
7	703	Fill	702	1.26m wide, 0.09m thick	Light grey firm silty clay	Basal deposit
7	704	Fill	702	1.02m wide, 0.06m thick	Firm dark greyish black silty clay	Vegetal growth
7	705	Fill	702	0.76m wide, 0.06m thick	Firm mid grey silty clay with light orange brown silt mottling	Upper fill
7	706	Fill	702	0.40m wide, 0.08m thick	Firm mid orange brown silty clay	Tertiary fill
8	800	Layer		0.30m thick	Friable light greyish brown silty loam	Topsoil
8	801	Layer		0.26m thick	Friable brown sandy silt	Hard-weathered alluvium
8	802	Layer		0.50m thick min.	Compact brownish grey sandy silt	Alluvium
8	803	Cut		1.20m wide, 0.26m deep	45° steep sides, flat base, NW-SE oriented linear	Ditch
8	804	Fill	803	1.20m wide, 0.26m thick	Firm mid brown silty clay	Fill
9	900	Layer		0.30m thick	Compact limestone rubble	Hard standing
9	901	Layer		0.22m thick	Friable brownish grey clayey silt	Truncated topsoil
9	902	Layer		0.18m thick	Compact orange brown sandy silt	Hard-weathered alluvium
9	903	Layer		0.50m thick min.	Firm orange grey sandy silt	Alluvium
10	1000	Layer		0.30m thick	Friable dark brown silty loam with occasional CBM inclusions	Topsoil
10	1001	Layer		0.20m thick	Friable light grey clayey silt	Weathered topsoil
10	1002	Layer		0.22m thick	Firm greyish brown clayey silt layer	Alluvium
10	1003	Layer		0.50m thick min.	Firm dark grey silty clay	Alluvium
11	1100	Layer		0.33m thick	Friable light greyish brown silty loam	Topsoil
11	1101	Layer		0.10m thick	Compact grey clayey silt	Hard-weathered alluvium

Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
11	1102	Layer		0.50m thick min.	Firm dark greyish brown silty clay	Alluvium
12	1200	Layer		0.80m thick	Compact limestone rubble	Hard standing
12	1201	Fill		1.00m thick min.	Friable dark brown organic-rich clayey silt	Modern ditch fill
13	1300	Layer		0.35m thick	Friable light greyish brown silty loam	Topsoil
13	1301	Layer		0.80m thick	Soft brownish orange sandy silt	Alluvium
13	1302	Layer		0.10m thick min.	Firm greyish blue silty clay	Alluvium
13	1303	Cut		1.10m wide, 0.32m deep	45° steep sides, flat base, NE-SW oriented linear	Ditch
13	1304	Fill	1303	0.70m wide, 0.13m thick	Soft brown sandy silt	Basal deposit
13	1305	Fill	1303	1.10m wide, 0.30m thick	Friable greyish brown silty clay	Slumping
13	1306	Fill	1303	0.60m wide, 0.10m thick	Soft light grey silty clay	Secondary fill
13	1307	Fill	1303	1.10m wide, 0.20m thick	Soft light brownish orange silty loam	Upper fill
13	1308	Cut		2.70m wide, 0.20m deep	Gradual sloping side, undulating base	Ditch
13	1309	Fill	1308	2.70m wide, 0.20m thick	Friable dark brown silty loam	Fill
13	1310	Cut		1.85m wide, 0.10m deep	Gradual sloping side, undulating base	Ditch
13	1311	Fill	1310	1.85m wide, 0.10m thick	Friable greyish brown silty loam	Fill
13	1312	Layer		0.12m thick	Soft very light grey sandy silt	Alluvium
13	1313	Layer		0.10m thick	Soft very light grey sandy silt	Alluvium
13	1314	Cut		2.20m wide, 0.72m deep	45° steep sides, concave base, NW-SE oriented linear	Ditch
13	1315	Fill	1314	1.27m wide, 0.17m thick	Firm laminated light grey silty clay	Basal fill
13	1316	Fill	1314	1.10m wide, 0.04m thick	Firm dark greyish black silty clay	Secondary fill
13	1317	Fill	1314	1.70m wide, 0.11m thick	Firm mid grey silty clay with occasional flecks of charcoal	Dump deposit
13	1318	Fill	1314	1.20m wide, 0.18m thick	Soft mid brownish orange silty loam	Dump deposit
13	1319	Fill	1314	0.85m wide, 0.15m thick	Firm mid greyish brown silty clay	Dump deposit
13	1320	Cut		0.70m wide, 0.60m deep	Steep sides, flat base, circular in plan	Posthole
13	1321	Fill	1320	0.70m wide, 0.40m thick	Friable dark brown silty loam	Fill
13	1322	Fill	1320	0.70m wide, 0.30m thick	Soft brown silty clay	Fill
13	1323	Cut		0.80m wide, 0.43m deep	Steep sides, flat base, NW-S curving linear	Ditch
13	1324	Fill	1323	0.80m wide, 0.01m thick	Soft dark greyish black organic-rich silty clay	Primary fill
13	1325	Fill	1323	0.80m wide, 0.05m thick	Soft light grey silt	Fill

Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
13	1326	Fill	1323	0.80m wide, 0.10m thick	Soft dark grey silty clay	Fill
13	1327	Fill	1323	0.80m wide, 0.20m thick	Soft light orange silt	Fill
13	1328	Fill	1323	0.80m wide, 0.08m thick	Friable dark grey silty clay	Fill
13	1329	Fill	1323	0.80m wide, 0.30m thick	Friable greyish brown silty clay	Fill
13	1330	Fill	1323	0.60m wide, 0.20m thick	Soft dark brown silty clay	Tertiary fill
13	1331	Layer			Soft very light grey sandy silt	Alluvium
13	1332	Fill	1323	0.60m wide, 0.04m thick	Friable greyish brown clayey silt	Tertiary fill
13	1333	Fill	1314	2.20m wide, 0.22m thick	Firm laminated light grey silty clay	Fill
13	1334	Fill	1314	1.60m wide, 0.09m thick	Firm mid greyish brown silty clay	Dump deposit
13	1335	Fill	1336	1.00m wide, 0.10m thick	Friable mid greyish brown silty clay	Fill
13	1336	Cut		1.00m wide, 0.10m thick	Gradual sloping side, rounded base, NW-SE oriented linear	Ditch
13	1337	Fill	1338	1.00m wide, 0.27m thick	Soft mid brownish orange silty loam with occasional charcoal inclusions	Fill
13	1338	Cut		1.00m wide, 0.27m thick	Gradual sloping side, rounded base, NW-SE oriented linear	Ditch
14	1400	Layer		0.40m thick	Soft mid greyish brown sandy silt	Topsoil
14	1401	Layer		0.10m thick	Soft orange grey silty clay	Alluvium
14	1402	Layer		0.50m thick min.	Firm purplish grey silty clay	Alluvium
14	1403	Cut		0.90m wide, 0.60m deep	V-shaped ditch, slightly rounded base, NNW-SSE oriented linear	Ditch
14	1404	Fill	1403	0.30m wide, 0.06m thick	Firm dark reddish purple clay	Basal fill
14	1405	Fill	1403	0.80m wide, 0.17m thick	Soft orange grey clayey silt	Secondary fill
14	1406	Fill	1403	0.48m wide, 0.10m thick	Firm light grey clay with orange mottling	Fill
14	1407	Fill	1403	0.60m wide, 0.03m thick	Firm dark grey clay	Fill
14	1408	Fill	1403	0.90m wide, 0.07m thick	Firm mid grey clay	Fill
14	1409	Fill	1403	0.65m wide, 0.02m thick	Soft dark grey organic-rich clayey silt	Fill
14	1410	Fill	1403	0.65m wide, 0.20m thick	Firm light grey clay	Fill
15	1500	Layer		0.35m thick	Friable light grey clayey silt	Topsoil
15	1501	Layer		0.30m thick	Soft orange grey silt	Alluvium
15	1502	Layer		0.60m thick min.	Firm blue grey silty clay	Alluvium
15	1503	Cut		2.28m wide, 1.00m deep	45° steep sides, concave base, NNE-SSW oriented linear	Ditch
15	1504	Fill	1503	2.28m wide, 0.08m thick	Firm mid greyish brown silty clay	Tertiary fill

Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
15	1505	Fill	1503	2.28m wide, 0.20m thick	Firm mid orange grey silty clay	Fill
15	1506	Fill	1503	2.20m wide, 0.30m thick	Friable mid grey silty clay	Fill
15	1507	Fill	1503	1.20m wide, 0.28m thick	Firm mid grey silty clay with orange mottling	Fill
15	1508	Fill	1503	1.50m wide, 0.03m thick	Soft dark greyish black organic-rich silty clay	Vegetal growth
15	1509	Fill	1503	1.50m wide, 0.24m thick	Soft light blue grey silty clay	Basal fill
16	1600	Layer		0.30m thick	Soft mid brown silty loam	Topsoil
16	1601	Fill	1602	2.5m wide	Number assigned to fills of ditch	Fills
16	1602	Cut		2.5m wide	NNE-SSW linear	Ditch
16	1603	Layer		0.20m thick	Soft orange yellow silt	Alluvium
16	1604	Layer		0.24m thick	Compact orange grey clayey silt	Alluvium
16	1605	Layer		0.15m thick min.	Firm light blue grey silty clay	Alluvium
17	1700	Layer		0.35m thick	Friable light greyish brown clayey silt	Topsoil
17	1701	Layer		0.15m thick	Soft yellowish brown silty sand	Alluvium
17	1702	Layer		0.28m thick min.	Soft light brown sandy silt	Alluvium
17	1703	Cut		1.65m wide, 0.50m deep	Gradual sloping sides, undulating base, E-W oriented linear	Ditch
17	1704	Fill	1703	1.65m wide, 0.50m thick	Friable orange grey clayey silt	Fill
17	1705	Cut		0.12m wide, 0.44m deep	Modern ceramic drain	Modern ceramic drain
17	1706	Fill	1705	0.12m wide, 0.44m thick	Modern ceramic drain	Modern ceramic drain
17	1707	Cut		2.80m wide, 0.40m deep	Steep side, flat base, NW-SE oriented linear	Ditch
17	1708	Fill	1707	1.30m wide, 0.12m thick	Firm light greyish orange silty sand	Tertiary fill
17	1709	Fill	1707	1.30m wide, 0.08m thick	Firm brown clay	Fill
17	1710	Fill	1707	2.40m wide, 0.30m thick	Friable greyish brown clayey silt	Fill
17	1711	Fill	1707	2.40m wide, 0.12m thick	Firm greyish brown silty clay	Fill
17	1712	Fill	1707	0.40m wide, 0.40m thick	Soft orange clayey silt	Slumping
17	1713	Cut		1.84m wide, 0.88m deep	Steep sided, concave, NW-SE oriented linear	Ditch
17	1714	Fill	1720	0.58m wide, 0.82m thick	Friable light blue grey silty clay	Fill
17	1715	Fill	1713	0.75m wide, 0.26m thick	Firm mid grey silty clay with occasional orange patches	Fill
17	1716	Fill	1713	1.60m wide, 0.06m thick	Firm dark greyish black organic-rich silty clay	Vegetal growth
17	1717	Fill	1713	1.68m wide, 0.18m thick	Firm mid grey silty clay with occasional orange mottling	Fill

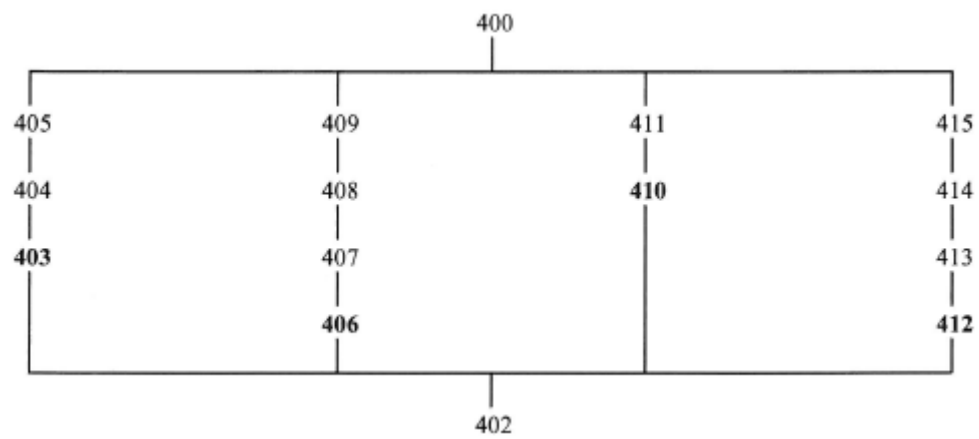
Trench	Context	Type	Fill of	Dimensions	Description	Interpretation
17	1718	Fill	1713	1.80m wide, 0.08m thick	Soft light blue grey silty clay	Fill
17	1719	Fill	1713	1.84m wide, 0.38m thick	Firm mid grey silty clay with orange mottling	Fill
17	1720	Cut		1.84m wide, 0.88m deep	Steep sides, rounded to a flat base, NW-SE oriented linear	Ditch
17	1721	Fill	1722	2.5m wide	Number assigned to fills of ditch	Fills
17	1722	Cut		2.5m wide	NNE-SSW linear	Ditch
18	1800	Layer		0.30m thick	Friable light greyish brown clayey silt	Topsoil
18	1801	Layer		0.10m thick	Friable mid greyish brown silty clay	Alluvium
18	1802	Layer		0.52m thick min.	Friable brownish grey sandy silt	Alluvium
18	1803	Cut		3.00m wide, 0.80m deep	45° steep irregular sides, E-W oriented linear	Ditch
18	1804	Fill	1804	1.90m wide, 0.26m thick min.	Firm light grey silty clay with orange mottling	Fill
18	1805	Fill	1804	1.90m wide, 0.06m thick min.	Soft dark grey silty clay	Fill
18	1806	Fill	1804	3.00m wide, 0.50m thick	Firm light greyish brown silty sand with orange mottling	Fill
18	1807	Fill	1804	2.02m wide, 0.34m thick	Firm orange brown silty sand	Fill
18	1808	Fill	1804	1.70m wide, 0.10m deep	Friable dark orange brown silty sand	Fill
18	1809	Cut		2.45m wide, 1.00m deep	Moderately steep sides, uneven base, NNE-SSW oriented linear	Ditch
18	1810	Cut		0.30m wide, 0.28m deep	Vertical sides, flat base, NNE-SSW oriented linear	Field drain
18	1811	Fill	1810	0.30m wide, 0.28m thick	Firm dark orange clayey silt	Fill
18	1812	Fill	1810	0.80m wide, 0.20m thick	Firm dark grey silty clay	Fill
18	1813	Fill	1810	0.85m wide, 0.10m thick	Friable dark grey organic rich silty clay	Fill
18	1814	Fill	1810	2.30m wide, 0.35m thick	Soft brown clayey silt	Fill
18	1815	Fill	1810	2.30m wide, 0.20m thick	Friable orange grey clayey silt	Fill
18	1816	Fill	1810	1.00m wide, 0.30m thick	Friable dark grey clayey silt	Fill
18	1817	Fill	1810	1.60m wide, 0.30m thick	Soft light grey silt	Fill
18	1818	Layer		18.00m wide, 0.16m thick	Firm light grey silt with yellow patches	Alluvium
18	1819	Layer		0.12m thick	Firm dark greyish brown silty clay	Alluvium
18	1820	Layer		0.12m thick min.	Soft dark greyish blue silty clay	Alluvium

## Appendix B Matrices

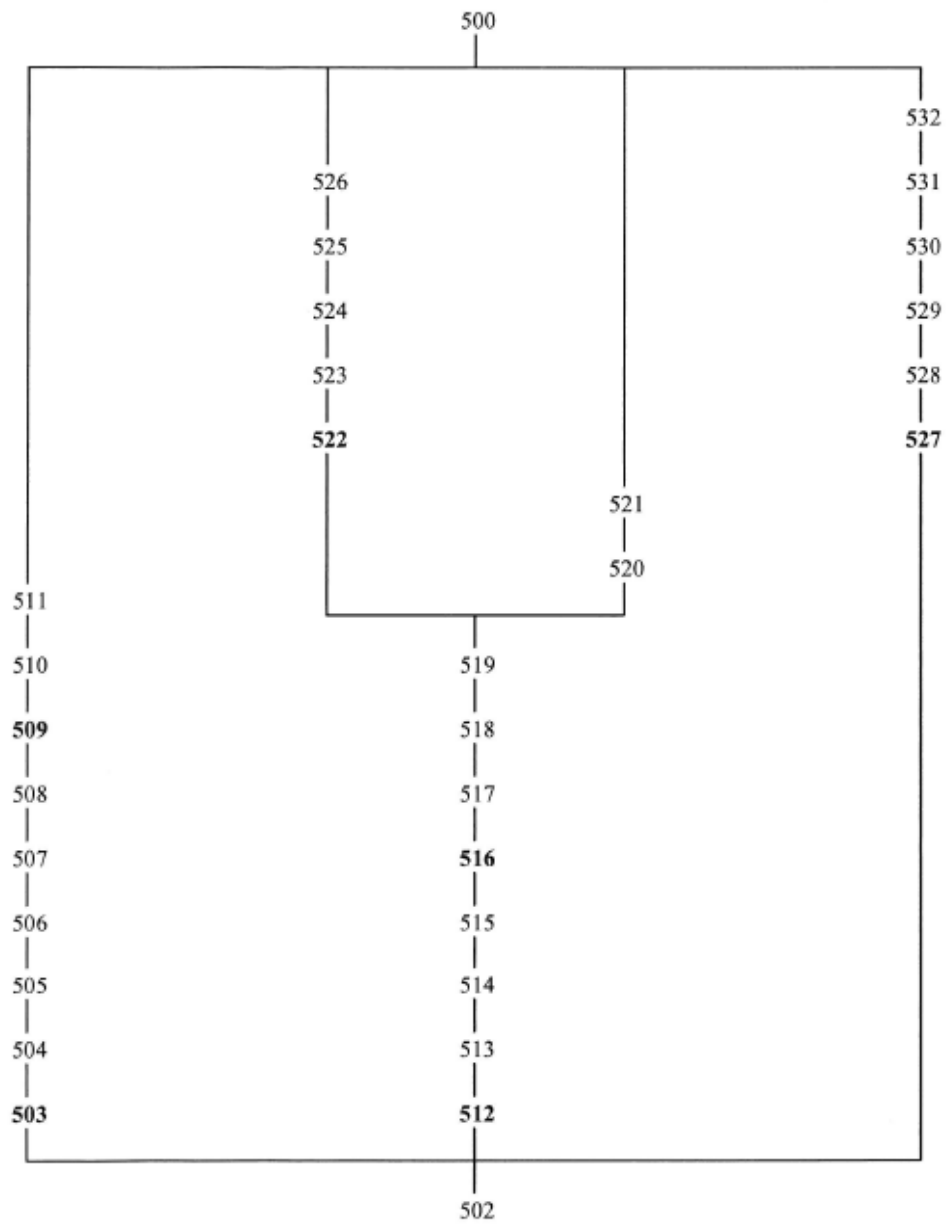
### Trench 3

300  
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301  
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304  
|  
303  
|  
**302**  
|  
305

### Trench 4



## Trench 5



### Trench 6

600  
|  
601

### Trench 8

800  
|  
801  
|  
804  
|  
803  
|  
802

### Trench 9

900  
|  
901  
|  
902  
|  
903

### Trench 11

1100  
|  
1101  
|  
1102

### Trench 7

700  
|  
706  
|  
705  
|  
704  
|  
703  
|  
702  
|  
701

### Trench 10

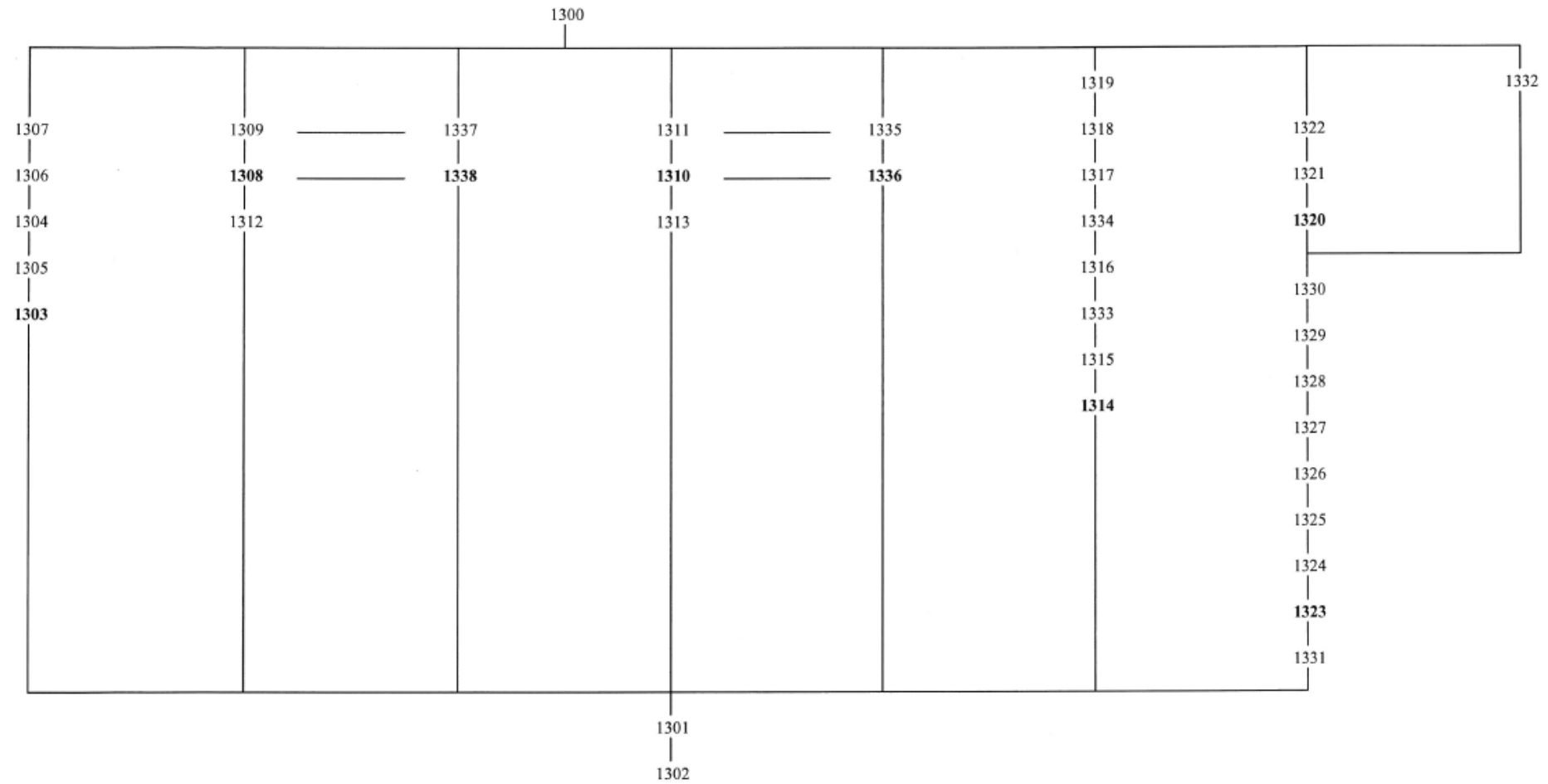
1000  
|  
1001  
|  
1002  
|  
1003

### Trench 12

1200  
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1201



Trench 13



### Trench 14

1400  
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1401  
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1410  
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1409  
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1407  
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1406  
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1405  
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1404  
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**1403**  
|  
1402

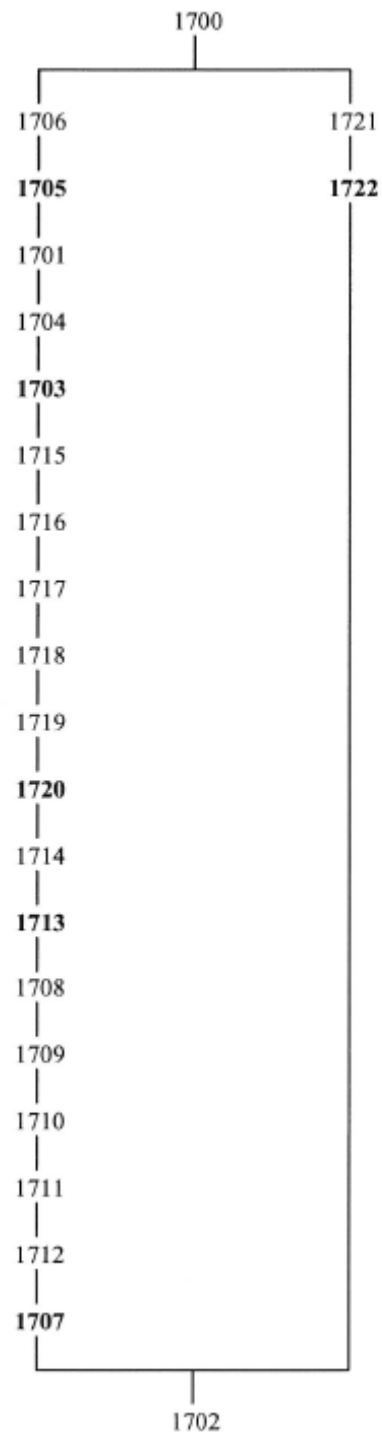
### Trench 15

1500  
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1504  
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1505  
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1506  
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1507  
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1508  
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1509  
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**1503**  
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1501  
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1502

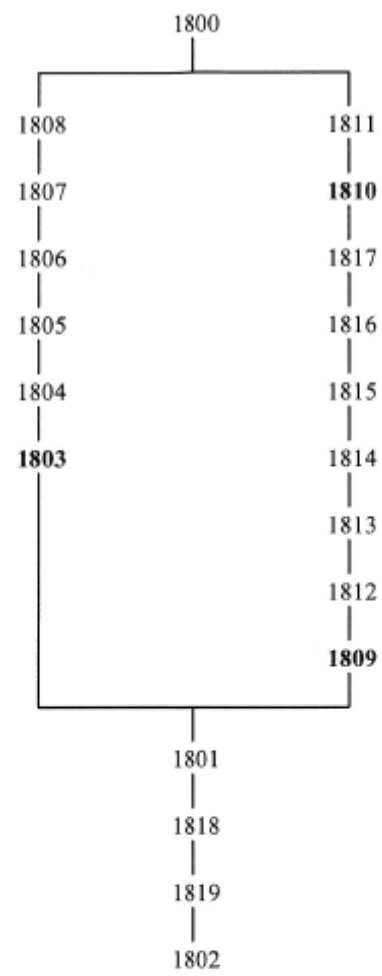
### Trench 16

1600  
|  
1601  
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**1602**  
|  
1603  
|  
1604

## Trench 17



## Trench 18



## Appendix C

### Iron Age and Roman Pottery Report

*Ian Rowlandson*

#### Introduction

The pottery has been archived using count and weight as measures according to the guidelines laid down for the minimum archive by The Study Group for Roman Pottery (Darling 2004) using the codes developed by the City of Lincoln Archaeological Unit - CLAU (see Darling and Precious forthcoming). Rim equivalents (RE) have been recorded for the stratified groups and an attempt at a 'maximum' vessel estimate has been made following Orton (1975, 31). The pottery has been bagged by fabric according to the Lincolnshire Handbook Guidelines. Vessels suitable for illustration have also been extracted and bagged separately. The report was produced on the basis of site information provided by Chris Casswell and Mike Wood of Network Archaeology. Fabrics follow standard CLAU fabric codes. The archive record (Table 4) is an integral part of this report and will be curated in an Access database, available from the author in a digital format.

#### Condition

The ceramics presented for assessment totalled 133 manually retrieved sherds probably from no more than sixteen vessels, weighing 2.009 kg, RE 1.46, from eight contexts from a scheme of archaeological trial trenching. The majority of the pottery is fresh, the average sherd weight is 15.11 g/sh. Four of the vessels have evidence of carbonised deposits and the butt beaker from context 1317 has been burnt. A large proportion of a handmade jar was retrieved from context 404. All of the sherds, with the exception of a single Roman sherd from topsoil 1100, date to the pre-Conquest late Iron Age period.

#### Dating

The stratified pottery is summarised in the dating table below. It should be noted that the majority of groups present contain a small number of vessels. The archive (Table 1, below) contains the full quantified details.

Dating summary								
F No	F Type	Context	Spot date	Comments	Sherd	Weight (g)	Total RE %	Ave sherd/g
403	Ditch	0404	LIA	A large group including a large proportion of a shell gritted jar with a slack shoulder and a flattened lip pinched out externally and an ellipsoidal jar with an internally bevelled rim	85	1685	83	19.82
410	Ditch	0411	LIA	Includes fragments from a single shell gritted jar with a rounded lip	3	84	15	28.00
0512	Ditch	0513	IA	Three tiny fragments of shell gritted pottery	3	1	0	0.33
1100	Layer	1100	M2-M3	A single sherd of Nene Valley greyware	1	12	0	12.00
1314	Ditch	1315	LIA	Sherds from a single globular jar with an externally rounded rim	5	142	10	28.40
1314	Ditch	1317	LIA/IC	A small group including fragments of a Cam. 113 type butt beaker and local shell gritted Iron Age sherds	16	59	25	3.69

Dating summary								
F No	F Type	Context	Spot date	Comments	Sherd	Weight (g)	Total RE %	Ave sherd/g
1314	Ditch	1319	LIA/1C	A small group including a basal fragment of a butt beaker and fragments of an handmade ?jar with an inturned rim	4	10	5	2.50
1314	Ditch	1333	LIA	Sherds from a fine walled jar	16	16	8	1.00

Table 1 Dating summary

## Fabrics and Trade

Fabric summary							
Fabric code	Fabric group	Fabric details	Sherd	Sherd %	Weight (g)	Weight %	Total RE %
GBWW?	Fine	Gallo-Belgic white wares	14	10.53%	47	2.34%	21
NVGW	Reduced	Nene Valley grey ware	1	0.75%	12	0.60%	0
GROGF	Reduced	Fine Grog tempered ware	1	0.75%	4	0.20%	0
GROG	Reduced	Grog-tempered wares	2	1.50%	4	0.20%	5
SHMM	Calcareous	Shell- moderate medium shell	5	3.76%	13	0.65%	0
SHCM	Calcareous	Shell- common medium	18	13.53%	23	1.14%	12
SHCC	Calcareous	Shell- common coarse	92	69.17%	1906	94.87%	108

Table 2 Fabric summary

Form summary							
Form	Form Type	Form Description	Sherd	Sherd %	Weight (g)	Weight %	Total RE %
BKBB	Beaker	Butt beaker	15	11.28%	51	2.54%	21
CLSD	Closed	Form	2	1.50%	12	0.60%	0
J	Jar	Unclassified form	102	76.69%	1525	75.91%	86
JEV	Jar	Everted rim	1	0.75%	6	0.30%	4
JGLOB	Jar	Globular	5	3.76%	142	7.07%	10
JIR	Jar	Inturned rim	3	2.26%	259	12.89%	25
-	Unknown	Form uncertain	5	3.76%	14	0.70%	0

Table 3 Form summary

The main vessels of note are fragments of a Cam 113 butt beaker (Hawkes and Hull 1947), probably imported from Northern Gaul and another small sherd from a 'native' butt beaker copy in an oxidised fine grog and sand gritted fabric from context 1317. A number of typical later Iron Age jar types are present mostly with slack or globular body shapes including a large proportion of a single vessel from context 404 (see D1-4 comperanda are listed in Table 4). This group containing fragments of sand tempered drinking vessels and fragments from a single shell gritted vessel in the fine burnished 'Dragonby/Sleaford' Late Iron Age style (context 1317) suggests that the occupants of the site had access to a range of table ware and utilitarian cooking and storage vessels.

The shell gritted pottery that makes up the majority of the assemblage is probably from a relatively local source and is similar to examples seen by this author from the Woolram Wygate site. A number of the sherds have the distinctive Punctate Brachiopod shell evident under x20 magnification typical of local products. Soil conditions have resulted in the leaching out the fossil shell from some sherds which has prevented the identification of these diagnostic fossils in the other vessels.

A single sherd of Nene Valley greyware, from topsoil context 1100, is the only Roman sherd present.

## **Discussion**

There have been small quantities of late Iron Age pottery from Spalding found during previous excavations (see Malone 2010 and Darling in Trimble and Wood in prep., M. Wood pers. com.) but thus far the main focus of Iron Age activity has not yet been located. This group, containing fragments of butt beakers and Iron Age cooking pots, suggests that there is a focus of Iron Age activity in the immediate vicinity.

The Roman pottery present is limited to a single sherd although it is possible that more substantial groups may be found by further investigation of the site.

## **Conclusions**

On the evidence of this group it is possible that larger, more important, groups of Iron Age pottery may be encountered during further ground works. This group adds to the growing evidence for Iron Age occupation in the Spalding area.

## **Recommendations**

The pottery should be retained and deposited in the relevant museum to enable future scrutiny. This assemblage should be integrated into any discussion of further work on the site. The vessels noted as suitable for illustration (highlighted in the archive with a 'D' number) should be considered for illustration as part of an overall report following any further work.

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Trimble, D. and Wood, M., in prep, *Excavations at Wygate Park, Spalding, Lincs.*

SPCL11 IRON AGE & ROMAN POTTERY ARCHIVE											
Context	Fabric	Form	Decoration	Vessels	Alt	Drawing	Comments	Sherd	Weight	Rim diam	Rim eve
0404	SHCC	JIR		1	SOOT EXT	D3	RIM; IRF; PUNCTATE B SHELL; KNIFE TRIMMED INTERNAL BEVELED RIM ON A 'BARREL SHAPED' ELLIPSOIDAL JAR SEE BROADLY SIMILAR FORMS FROM LATE IA SITES IN EAST MIDLANDS ELSDON 1996A D17.1	1	255	18	20
0404	SHCC	J		1	SOOT INT		BASE- PLAIN; IRF; LIGHT/PALE OXID SURFACES; PUNCTATE B SHELL; SIMILAR TO D2 BUT NO GROG	3	209	0	0
0404	SHCC	J		1		D2	RIM BS BASE- PLAIN; IRF; PALE OXID SURFACES; RARE GROG SF NO.1; LARGE JAR FLATTENED LIP PINCHED OUT EXTERNALY SLACK SHOULDER; SEE BROADLY SIMILAR FORMS FROM CAMBRIDGESHIRE MONUMENT 97 FIG32.6; FIG 33.19 & 20	81	1221	22	63
0411	SHCC	J		1	SOOT EXT	D4	RIM; IRF; PUNCTATE B SHELL; ROUNDED 'BEAD' TYPE LIP; SLIGHT INTERNAL CHANNEL PROB. DUE TO MANUFACTURE METHOD; NB- FABRIC BROADLY SIMILAR TO SOUTHERN MAXEY	2	79	15	15
0411	SHMM	CLSD	HM	1	VAB		BS	1	5	0	0
0513	SHMM	-		1			BS	3	1	0	0
1100	NVGW	-		1			BS	1	12	0	0
1315	SHCC	JGLOB	HM	1	SOOT INT	D1	RIM BASE FRAGMENTS; IRF; PUNCTATE B SHELL; GLOBULAR JAR EXTERNALLY ROUNDED RIM	5	142	18	10
1317	GBWW?	BKBB		1	BURNT		RIM BS SOME BURNT OXID OR GREY- FABRIC AS TOMBER AND DORE NOG WH3 WITH ADITION OF MODERATE FINE SILVER MICA; LOWER BODY HAS GROVES NOT TYPICAL OF CAM. 113 BUT RIM TYPE IS A GOOD MATCH	13	45	14	21
1317	SHCM	JEV	HM?	1	SALT? STAINED		RIM;OXID/?LIGHT FIRING? EVERTED	1	6	18	4



SPCL11 IRON AGE & ROMAN POTTERY ARCHIVE											
Context	Fabric	Form	Decoration	Vessels	Alt	Drawing	Comments	Sherd	Weight	Rim diam	Rim eve
							EXTERNAL BEVEL				
1317	SHCM	-	HM	1			BS; THIN SHERD; R	1	1	0	0
1317	SHMM	CLSD	HM	1			BS; ?SHOULDER;THIN SHERD; R; PUNCTATE B SHELL	1	7	0	0
1319	GBWW?	BKBB		1	ABR		BASE; ?SAME VESSEL AS 1317	1	2	0	0
1319	GROG	JIR	HM	1			RIM POORLY MIXED FABRIC	2	4	16	5
1319	GROGF	BKBB	CORD	1			BS; OX/R/OX; CORDON- FRAGMENT OF 'NATIVE' COPY OF IMPORTED BEAKER- SMALL FRAGMENT; FINE GROG AND SAND FABRIC	1	4	0	0
1333	SHCM	J	WF?	1			RIM BS; R; FINE VESSEL MOSTLY TINY FRAGMENTS	16	16	15	8

Table 4 Iron Age and Roman pottery archive

## Appendix D

### Post-Roman Pottery Report

Jane Young

The pottery has been fully archived to the standards for acceptance to the Collection in Lincoln in accordance with Lincolnshire County Council's Archaeological Handbook (sections 13.4 and 13.5) and with the guidelines laid out in Slowikowski *et al.* (2001). Visual fabric identification of the sherds was checked by a x20 binocular microscope. The assemblage was quantified by three measures: number of sherds, weight and vessel count within each context. The resulting pottery data was entered on an Access database using fabric codenames (Table 1) developed for the Lincoln Ceramic Type Series (Young, Vince and Nailor 2005).

#### Assemblage

In total, two post-Roman sherds, representing a single vessel were recovered from the site (Table 1). The sherds are both in a slightly abraded condition and could represent primary deposition.

Context	Codename	Full name	Sherds	Vessels	Weight (g)
526	BOUA	Bourne-type Fabrics A, B and C	2	1	7

Table 1 Post-roman pottery archive

Two medieval sherds were recovered from context 526. The two sherds are from a single Medieval Bourne ware jar of 13th to 14th century date. The vessel is in the finer Fabric A and has an internal glaze.

#### Statement of Potential

The pottery recovered from this site is unremarkable but should be included in any survey of ware types in the county.

#### Storage and Curation

The sherds are in a stable condition.

#### References

Lincolnshire County Council, 2010, *Archaeology Handbook*. Lincolnshire County Council.

Slowikowski, A., Nenck, B. and Pearce, J., 2001, *Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics*. Medieval Pottery Research Group, Occasional Paper 2.

Young, J., Vince A. G. and Nailor V., 2005, *A Corpus of Anglo-Saxon and Medieval Pottery from Lincoln*. Lincoln Archaeology Studies 7. Oxbow, Oxford.

## **Appendix E**

### **Flint Report**

*Dr Hugo Anderson-Whymark*

A single flint flake weighing 10g was recovered from the topsoil in Trench 15 (1500). The flake is of broad proportions and exhibits a prominent bulb and a hinged distal end; the edges exhibits post-depositional damage. The flake is a primary cortical removal and as such it cannot be attributed to any period with confidence.

## Appendix F

### Stone and Production Residue Report

*Mike Wood BA (hons) MLitt MIfA*

#### Introduction

A small collection of stone and fuel ash slag was recovered from evaluation trenches on land off Clay Lake, Spalding, Lincolnshire. Thirteen fragments of stone, weighing a total of 680 grams, as well as two fragments of fuel ash slag weighing 12g and were recovered. The material was all derived from ditch fills.

#### Methodology

The material was counted and weighed in grams, then examined visually to identify any diagnostic pieces and the overall condition of the assemblage. A summary of the material is recorded in Tables 1 to 2.

#### Assemblage

Trench	Context	Deposit	Date	Count	Weight (g)	Comments
4	404	Ditch fill of <b>403</b>	LIA	1	248	Fractured and burnt sandstone
4	408	Ditch fill of <b>406</b>	Und	1	235	Fractured and burnt sandstone
13	1326	Ditch fill of <b>1323</b>	Und	3	3	Natural ironstone
13	1330	Ditch fill of <b>1323</b>	Und	1	33	Fractured and burnt sandstone
13	1332	Ditch fill of <b>1323</b>	Und	2	12	Burnt sandstone fragments
13	1335	Ditch fill of <b>1336</b>	Und	1	27	Natural sandstone
13	1337	Ditch fill of <b>1338</b>	Und	2	68	Burnt sandstone
17	1721	Ditch fill of <b>1720</b>	Und	2	54	Fractured and burnt sandstone

Table 1 Stone

Trench	Context	Deposit	Date	Count	Weight (g)	Comments
13	1315	Ditch fill of <b>1314</b>	LIA	2	12	Fuel ash slag

Table 2 Production residue

#### Discussion

A small group of stone, burnt stone and fuel ash slag was recovered during trial trenching on land at Clay Lake, Spalding. Material was derived from ditch fills, including late Iron Age ditches **1314** and **403**. The remaining deposits are undated. Much of the material comes from features also containing briquetage (in Trench 13), which may imply the heated stone was related to a nearby salt-making process. However, this may simply represent casual disposal of unwanted material in convenient open ditches and the burnt stone and briquetage are unrelated.

The presence of burnt stone often suggests a practical use such as in domestic cooking as either pot boilers or for slow-roasting meat in pits. Some pieces of unworked or unburnt stone have been recovered and were likely naturally deposited.

Fuel ash slag is a light weight and usually light coloured vesicular slag-like material formed from the reaction between wood ash and minerals such as sand or silt. This material is not necessarily formed during industrial processes and has been noted from domestic hearth residues and the possible remains of burnt wooden structures such as round houses (Biek and Bayley 1979). The presence of fuel ash slag in the same contexts as dumped briquetage may however imply this is related to the waste product from firing a salt-making hearth.

### **Recommendations for further work**

All the artefacts are in a stable condition and require no further conservation. The burnt stone and unworked and unburnt stone are of little intrinsic value and could be discarded. While the fuel ash slag is a very small assemblage, it should be retained as part of the archive and included in a fuller report by an archaeometalurgist in any future, larger assemblages derived from this area.

### **Reference**

Biek, L. and Bayley, J., 1979, Glass and other vitreous materials. *World Archaeology* xi, 1-25.

# **Appendix G**

## **Animal Bone Report**

*Jennifer Wood*

### **Introduction**

A total of 104 (1456g) refitted fragments of animal bone were recovered during a scheme of archaeological trial trenches undertaken by Network Archaeology at Clay Lake, Spalding, Lincolnshire.

Trenches 4, 5, 13 and 17, produced animal bone, with the main concentration of bone being recovered from Trenches 4, 5 and 13. The majority of the remains were recovered from ditches, with a small assemblage from a post-hole. All of the remains were recovered from undated and late Iron Age-1st Century contexts.

### **Methodology**

The entire assemblage has been fully recorded into a database archive. Identification of the bone was undertaken with access to a reference collection and published guides. All animal remains were counted and weighed, and where possible identified to species, element, side and zone (Serjeantson 1996). Ribs and vertebrae were only recorded to species when they were substantially complete and could accurately be identified. Undiagnostic bones were recorded as micro (rodent size), small (rabbit size), medium (sheep size) or large (cattle size). The separation of sheep and goat bones was done using the criteria of Boessneck (1969) and Prummel and Frisch (1986) in addition to the use of the reference material. Where distinctions could not be made the bone was recorded as sheep/goat (S/G).

The quantification of species was carried out using the total fragment count, in which the total number of fragments of bone and teeth was calculated for each taxon. Where fresh breaks were noted, fragments were refitted and counted as one. The data produced the basic NISP (Number of Identified Specimen).

The condition of the bone was graded using the criteria stipulated by Lyman (1996). Grade 0 being the best preserved bone and grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable. Also fusion data, butchery marks (Binford 1981), gnawing, burning and pathological changes were noted when present.

Tooth eruption and wear stages were measured using a combination of Halstead (1985), Grant (1982), Levine (1982) and Payne (1973), and fusion data was analysed according to Silver (1969). Measurements of adult, that is, fully fused bones were taken according to the methods of von den Driesch (1976), with asterisked (\*) measurements indicating bones that were reconstructed or had slight abrasion of the surface.

### **Results**

#### **Condition**

The condition of the bone is moderate, averaging at grade 3 of the Lyman criteria (1996), allowing for measurements and the scoring of butchery, pathology and gnawing where applicable.

#### **Pathology**

No evidence of pathological conditions was noted within the assemblage.

### ***Gnawing***

A total of 7 fragments of bone displayed evidence of gnawing. Animal remains recovered from ditches **403, 503, 1314, 1336** and posthole **1320** all displayed evidence of carnivore gnawing. Gnawing on the remains suggests that some refuse was left open to scavengers after or as part of the disposal process. Although as only a small number of fragments of the assemblage were gnawed it would suggest that most of the remains were rapidly buried after disposal.

### ***Burning***

A total of 13 fragments of bone recovered from ditches **403, 406, 512, 1314** and **1336** displayed evidence of burning, probably representing hearth sweepings and incidental burning events.

### **Species Representation**

Cattle were the most predominant species identified within the assemblage, closely followed by sheep/goat. Pig was the next abundant species, with as single cockle (*Cerastoderma edule*) shell also represented within the assemblage.

	Trench No												
	4			5		13						17	Total
	Late Iron Age		Unphased	Iron Age	Unphased	Late Iron Age/ 1 <sup>st</sup> Century	Unphased					U	
Taxon	Ditch 403	Ditch 410	Ditch 406	Ditch 512	Ditch 503	Ditch 1314	Ditch 1303	Ditch 1308	Posthole 1320	Ditch 1323	Ditch 1336	Ditch 1707	
Cattle	6		1	1	2	3		3		1	2	1	20
Sheep/Goat	2		6	2		2			1				13
Pig					4								4
Cockle ( <i>Cerastoderma edule</i> )												1	1
Large Mammal	1		3		8	5	1	4	1		1		24
Medium Mammal	4	1	2		7	6					3		23
Unidentified			2	1	10	2			2		2		19
N=	13	1	14	4	31	18	1	7	4	1	8	2	104

Table 1 Hand Collected Assemblage Identified to Taxa, by Trench



## Discussion

The animal bone assemblage is small but moderately preserved, allowing for the identification of taphonomic changes such as butchery, gnawing etc. Three trenches (4, 5 and 13) produced the majority of the animal bone assemblages, which possibly indicates a focus of activities. The taxa and skeletal element representation appears to be relatively typical of domestic waste of the period, mostly food waste with some butchery waste included. Young animals were noted as present within the assemblage, which may suggest that animals were being bred and utilised on site.

Due to the small size of the assemblage, little information on the underlying animal husbandry and utilisation practices can be gained. However, due to the good preservation of the remains any further work would be liable to produce more bone of a similar nature with a good potential for providing further information on the underlying animal husbandry practices and diet economy of the site.

## References

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Cxt No	Taxon	Element	Side	Z1	Z2	Z3	Z4	Z5	Z6	Z7	Z8	Prox	Dist	Path	Butch	Worked	Burnt	Gnaw	Fresh Break	Assoc'd	Measured	Tooth Wear	Surface	Condition	No	(g)	Notes
404	Large Mammal	Lumbar	R	N	N	N	N	N	N	N	N	U	U	N	N	N	N	N	N	N	N	N	X	3	1	11	
404	Cattle	Metatarsal	R	Y	Y	Y	Y	Y	Y	Y	Y	F	F	N	N	N	N	N	N	N	Y	N	X	3	1	140	
404	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	2	3	
404	Cattle	Tooth	R	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	1	Lower Dpm3 Burnt black
404	Cattle	Tooth	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	2	Broken lower dpm4 Burnt black
404	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	1	Burnt black
404	Cattle	Phalanx (I)	R	N	N	Y	Y	Y	Y	Y	Y	U	F	N	N	N	N	N	N	N	N	N	X	3	1	2	Juv
404	Cattle	Innominate	L	N	N	N	N	N	N	Y	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	4	Juv
404	Medium Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	1	
404	Sheep/Goat	Femur	L	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	1	
404	Cattle	Femur	R	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	Y	N	N	N	N	X	3	1	150	Carnivore gnawing on the proximal end
405	Sheep/Goat	Tibia	L	N	N	N	N	Y	Y	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	8	Juv
408	Large Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	3	1	6	
408	Sheep/Goat	Metacarpal	L	Y	Y	Y	Y	N	N	N	N	F	X	N	N	N	N	N	N	N	Y	N	X	3	1	4	
408	Large Mammal	Lumbar	B	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	3	1	23	
408	Cattle	Metacarpal	R	N	N	N	N	N	Y	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	3	Burnt grey/white
408	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	2	1	

408	Sheep/Goat	Tibia	R	N	N	Y	Y	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	1	3	
408	Sheep/Goat	Tibia	R	N	N	N	N	Y	Y	N	N	X	U	N	N	N	N	N	N	N	N	N	X	4	1	2	
408	Sheep/Goat	Humerus	R	N	N	N	N	Y	Y	Y	Y	X	F	N	N	N	N	N	Y	N	N	N	A	4	1	5	
408	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	2	5	
408	Sheep/Goat	Nav-Cuboid	R	Y	Y	Y	Y	Y	Y	Y	Y	X	X	N	N	N	N	N	N	N	N	N	A	4	1	1	
408	Sheep/Goat	Tibia	L	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	4	1	6	
408	Large Mammal	Femur	L	N	N	Y	Y	N	N	N	N	U	X	N	N	N	N	N	N	N	N	N	X	3	1	18	
411	Medium Mammal	Atlas	L	N	N	N	Y	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	1	5	
504	Cattle	Metatarsal	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	33	Shaft fragment
504	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	3	
504	Cattle	Mandible	L	N	N	N	N	N	N	Y	Y	X	X	N	N	N	N	N	Y	N	N	N	X	3	1	46	
504	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	3	75	
504	Pig	Mandible	R	Y	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	12	
504	Large Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	2	5	26	
504	Medium Mammal	Skull	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	6	19	
504	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	10	2	
504	Pig	Mandible	R	N	N	N	N	N	N	N	N	X	X	N	N	N	N	Y	N	N	N	Y	X	3	3	76	
513	Sheep/Goat	Scapula	R	N	N	N	N	Y	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	2	
513	Sheep/Goat	Radius	L	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	8	
513	Cattle	Metatarsal	R	N	Y	N	N	N	N	N	N	F	X	N	N	N	N	N	N	N	N	N	X	2	1	12	
513	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	1	Burnt grey/white
1304	Large Mammal	Rib	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	3	1	2	
1309	Cattle	Tibia	L	N	N	N	N	Y	Y	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	33	
1309	Cattle	Ulna	L	N	N	Y	Y	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	4	1	33	
1309	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	4	18	
1309	Cattle	Radius	L	N	Y	Y	Y	N	N	N	N	F	X	N	N	N	N	N	N	N	N	N	X	4	1	95	

1315	Cattle	Mandible	R	N	N	Y	Y	N	Y	N	N	X	X	N	N	N	N	N	Y	N	N	Y	X	3	1	203	
1315	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	2	Burnt grey/white
1315	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	Y	N	N	N	N	X	3	1	3	Possible carnivore gnawing on one end of the shaft
1317	Medium Mammal	Tibia	R	N	N	N	Y	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	2	Burnt grey/black
1317	Cattle	Phalanx (II)	L	N	N	N	N	N	N	Y	Y	X	F	N	N	N	Y	N	N	N	N	N	X	3	1	4	Burnt grey
1317	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	4	1	2	Burnt black
1317	Cattle	Skull-zygomatic	L	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	15	
1317	Sheep/Goat	Humerus	L	N	N	Y	Y	Y	Y	Y	Y	X	F	N	N	N	N	N	N	N	Y	N	X	3	1	15	
1317	Large Mammal	Skull	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	2	7	
1317	Medium Mammal	Cervical	B	N	N	N	N	N	N	N	N	U	X	N	N	N	N	N	N	N	N	N	X	3	1	2	
1317	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	2	3	
1317	Large Mammal	Cervical	R	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	A	4	1	10	
1317	Medium Mammal	Ulna	L	N	N	N	N	Y	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	1	5	
1317	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	10	
1319	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	1	7	
1319	Sheep/Goat	Mandible	R	N	N	N	N	Y	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	1	5	
1321	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	2	
1321	Sheep/Goat	Humerus	L	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	Y	N	N	N	N	X	3	1	5	Possible carnivore gnawing on the distal end
1321	Large Mammal	Thoracic	B	N	N	N	N	N	N	N	N	U	U	N	N	N	N	N	N	N	N	N	X	2	1	27	

1321	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	2	1	8	
1326	Cattle	Humerus	L	N	N	Y	Y	Y	Y	N	N	X	X	N	N	N	N	N	N	N	N	N	X	3	1	17	
1335	Cattle	Mandible	R	N	N	Y	Y	N	N	N	N	X	X	N	N	N	N	N	N	N	N	Y	X	4	1	51	
1335	Cattle	Humerus	R	N	N	N	N	Y	Y	N	N	X	X	N	N	N	N	Y	Y	N	N	N	X	3	1	68	Possible carnivore gnawing on the distal end
1335	Large Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	7	Burnt black
1335	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	2	2	Burnt white
1335	Unidentified	Unidentified	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	N	N	N	N	X	4	2	6	
1335	Medium Mammal	Long Bone	X	N	N	N	N	N	N	N	N	X	X	N	N	N	Y	N	N	N	N	N	X	3	1	2	Burnt black
1710	Cockle	Shell	X	N	N	N	N	N	N	N	N	X	X	N	N	N	N	N	Y	N	N	N	X	3	1	3	
1710	Cattle	Mandible	L	N	N	N	N	N	N	N	Y	Y	X	X	N	N	N	N	N	N	N	Y	N	N	N	61	

## **Appendix H**

### **Briquetage Report**

*Elaine L Morris*

A small assemblage of 540 pieces (2,916g) of briquetage, ceramic material associated with salt production, was recovered. The assemblage consists of fragments from containers, supports, structures and undiagnostic miscellaneous material (Table 1), the four principal classes of Fenland briquetage (Lane and Morris 2001). The condition of the assemblage is highly fragmented with an overall mean piece weight of only 5.4g. Despite this, it is possible to assign 70% of the assemblage to a specific briquetage class other than that of general undiagnostic material.

#### **Method of Analysis**

The analysis and recording of this assemblage followed the scheme established for prehistoric and Roman period briquetage recovered from excavations conducted as part of the Fenland Management Project (Morris 2001a). This includes assigning fabric types using standard codes with site specific descriptions, form types using Fenland-wide standard codes and descriptions, standard wall thickness codes for container sherds (2, <7mm; 3, 7-9.9mm; 4, 10-12.9mm; 5, 13-15.9mm; X, only one container wall surface present), measuring the diameter, thickness and height for supports where appropriate, and indicating the presence and positions of evidence of use in salt production on any pieces. In addition, the minimum depth/height for any featured container sherds (ie. rims and bases respectively) was recorded. The spreadsheet of this recorded data is available in the archive, along with 1:1 sketches of each container rim, the majority of container bases and many of the support fragments onto Featured Briquetage Record forms. An additional field of information about the intensity of the evidence of use visible for each piece of briquetage, a method first developed during analysis of Roman briquetage from the Longhill Road saltern in March (Cambs.) (Morris, in prep), has also been applied to the analysis and recording of the Clay Lake assemblage for comparative purposes and is discussed further below.

#### **Fabrics**

Analysis revealed the presence of five definably different fabrics (Table 2). One is made from naturally-occurring micaceous, silty clay with frequent iron oxide pellets that is consistently untempered (Q1). Three appear to have been made from the same clay as fabric Q1 with the addition of various amounts of chopped organic temper added to them (V2, V3, V4). The fifth fabric (V1), which is organic-tempered, was made from clay that is silty in texture but in complete contrast to fabric Q1 it also has a modest amount of sand-sized grains and some larger fragments of naturally-occurring detritus in the clay rather than any iron oxide pellets. Each piece of briquetage in this assemblage was examined using a binocular microscope at x10 power microscopy to determine the presence or absence of sand-sized grains and iron oxide pellets as well as the density of organic temper – the key variables in differentiating the fabrics.

The very fine inclusions of silt-grade quartz and mica and the iron oxide pellets found in fabric Q1 indicate that this clay derives from the silty clays of the Fenland which are found all around Spalding, including the Clay Lake landscape. The similarity of the clay matrices observed in fabrics V2, V3 and V4 to that of fabric Q1 indicates that these fabrics are also most likely to derive from similar Fenland silty clays from the local area, if not the actual same deposit of clay. However, fabric V1 with its slightly sandier texture (which can often be felt by touching the surfaces of the briquetage pieces), occasional rounded pieces of detritus such as flint or chalk/limestone, and the absence of significant iron oxide pellets and glittering

mica originated from a different Fenland clay source to that, or those, used to make fabric Q1 and fabrics V2-V4. This range of briquetage fabrics is typical of early Roman assemblages from elsewhere in the Fenland as at Spalding-Wygate Park (Morris 2007a). It is similar to the range of fabric recipes found amongst the briquetage recovered from the early Roman saltern complex at March-Cedar Close but the basic clay matrix for those fabrics derived from local March Island, boulder clay rather than a silty Fen clay source (Morris 2008, 94-5). Both of these examples indicate that untempered local clay and tempered versions of local clays are the norm for the manufacture of briquetage at this time. However, what is most distinctive about the Clay Lake assemblage is the correlation of fabrics to forms and this is discussed below after presenting descriptions of the fabrics and further below the range of forms identified.

### **Silty Fabric**

**Q1 micaceous, silty fabric:** very common to abundant (30-40%), angular to sub-rounded quartz grains and glittering shreds of mica, measuring <0.1mm across with very rare quartz grains up to 0.2mm, in a clay matrix which always contains sparse (2-7%), rounded, iron oxide pellets measuring <1mm with the majority <0.3mm

### **Organic-tempered, Sandy Fabric**

**V1 organic-tempered, slightly sandy fabric:** common to very common (20-30%), poorly-sorted, linear and irregularly-shaped vesicles, <8mm long with the majority <4mm, which formerly contained organic temper in a silty and slightly sandy clay matrix with rare to sparse (1-7%), well-sorted, sub-rounded, medium to coarse-grade quartz grains measuring between 0.3-0.8mm and common to very common (20-30%), well-sorted, angular to sub-rounded, fine and silty-grade quartz; rare, round pieces of flint and/or chalk detritus may also occur in this fabric; one container sherd displayed a single piece of iron oxide, a rounded fragment of detritus measuring 3mm across, otherwise this fabric, and more specifically its' clay matrix, is characteristically free of any naturally-occurring iron oxide pellets

### **Organic-tempered, Silty Fabrics**

**V2 organic-tempered, silty fabric:** moderate to common (10-20%), poorly-sorted, linear and irregularly-shaped vesicles, <8mm long with the majority <4mm, which formerly contained organic temper in a clay matrix very similar (if not identical) to fabric Q1

**V3 sparsely organic-tempered, silty fabric:** sparse (3-7%), poorly-sorted, linear and irregularly-shaped vesicles, <8mm long with the majority <4mm, which formerly contained organic temper in a clay matrix very similar (if not identical) to fabric Q1

**V4 richly organic-tempered, silty fabric:** very common to abundant (30-50%), poorly-sorted, linear and irregularly-shaped vesicles, <8mm long with the majority <4mm, which formerly contained organic temper in a clay matrix very similar (if not identical) to fabric Q1

## **Classes and Form Types**

Quantifications of the Clay Lake assemblage by class and by form type are presented in Tables1 and2.

<b>Class</b>	<b>Count</b>	<b>Percentage by count</b>	<b>Weight (g)</b>	<b>Percentage by weight</b>
Containers	335	62%	1399	48%
Supports	34	6%	639	22%
Structural	8	1%	63	2%
Miscellaneous	163	30%	815	28%
<b>Total</b>	<b>540</b>	<b>100%</b>	<b>2916</b>	<b>100%</b>

Table 1 Briquetage assemblage by class type.

Class	Form type	Fabric type										Total count	Total weight (g)
		Q1		V1		V2		V3		V4			
		CT	WT	CT	WT	CT	WT	CT	WT	CT	WT		
<b>Containers</b>													
Bases	B1	-	-	2	39	-	-	-	-	-	-	2	39
	B99	-	-	1	38	2	20	-	-	2	50	5	108
Rims	R3	1	14	-	-	2	11	-	-	-	-	3	25
	R5	-	-	2	19	-	-	-	-	-	-	2	19
Body sherds	BS1/2	-	-	137	629	141	459	25	53	20	67	323	1208
<b>Class sub-total</b>		<b>1</b>	<b>14</b>	<b>142</b>	<b>725</b>	<b>145</b>	<b>490</b>	<b>25</b>	<b>53</b>	<b>22</b>	<b>117</b>	<b>335</b>	<b>1399</b>
<b>Supports</b>													
Stabilisers	CL1	1	51	-	-	1	25	-	-	-	-	2	76
	CL9	-	-	-	-	1	23	-	-	-	-	1	23
	CL13.1	-	-	-	-	2	13	-	-	-	-	2	13
Bars	BR1	-	-	-	-	1	24	-	-	-	-	1	24
	BR99	-	-	-	-	-	-	-	-	4	13	4	13
Brick	BK1	-	-	-	-	3	222	-	-	-	-	3	222
Pedestals	PD3	-	-	-	-	-	-	1	44	-	-	1	44
	PD98	-	-	-	-	2	28	-	-	-	-	2	28
Platforms	PL1	1	16	1	4	3	16	-	-	7	18	12	54
	PL7	-	-	-	-	1	55	-	-	-	-	1	55
	PL12	-	-	-	-	4	80	-	-	-	-	4	80
	PL13	-	-	-	-	1	7	-	-	-	-	1	7
<b>Class sub-total</b>		<b>2</b>	<b>67</b>	<b>1</b>	<b>4</b>	<b>19</b>	<b>493</b>	<b>1</b>	<b>44</b>	<b>11</b>	<b>31</b>	<b>34</b>	<b>639</b>
<b>Structural</b>													
Wall/Flooring	WFL1	8	63	-	-	-	-	-	-	-	-	8	63
<b>Miscellaneous</b>													
Fired clay	FC	64	397	4	15	43	175	21	132	31	96	163	815
<b>Grand total</b>		<b>75</b>	<b>541</b>	<b>147</b>	<b>744</b>	<b>207</b>	<b>1158</b>	<b>47</b>	<b>229</b>	<b>64</b>	<b>244</b>	<b>540</b>	<b>2916</b>

Table 2 Briquetage assemble by class, form and fabric type.



## Containers

The largest amount of fragments in the assemblage, by number of pieces or by weight, derives from containers used to evaporate the water from brine. Shallow, sub-rectangular pans were the most likely shapes of these vessels solely by comparison to other assemblages with better preservation of sherds in the region. Up until sometime in the second century BC, evaporation took place in narrow, cut rim troughs (Morris 2001a, fig. 17, 1 & 7; 2001b, fig. 88, 1-2 & 5-6; 2001c, fig. 93, 1-3 & 6-10) with their distinctive, sliced cylinder shapes displaying added end plaques to create a pair of troughs (cf. Morris 2001c, fig. 92). During the second century BC, this form began to be replaced with simpler, flatter evaporation pans with their obvious corner sherds and variously shaped rims made from organic-tempered fabrics as seen amongst some of the assemblage from Cowbit located 1.5km to the south (Morris 2001a, fig. 17, 2-3) and from Helpringham Fen located 18km to the northwest of Spalding (Healey 1999, fig. 8, 29A-31). Some of the best examples of transitional containers between the cut-rim troughs and the truly flat-base pans were found eroding from the shoreline at Ingoldmells Beach (Crosby 2001b, figs. 126-130). Sherds from a number of flat evaporation pans with distinctive sub-rectangular corners were recovered at the early Roman saltern at Morton Fen (Crosby 2001a, figs. 32-33, 1-14) where a distinction between truly cut rim troughs and rims which were deliberately bevelled can be seen. This change in container form and manufacture signalled a major change in briquetage production which coincided with the development of indirect heating systems at salterns (see below). These new style pans were designed to hold more brine and also present a much larger surface area for easier, and possibly more efficient, evaporation of the considerable amount of water contained in sea brine (97%) during the crystallisation process.

***R3 rounded rim*** (Figure 11, 1-3)

***R5 pointed/rounded rim*** (Figure 11, 4-5)

***B1 simple, flat base straight in plan*** (Figure 11, 6)

***B99 flat area of a base plate without base angle present*** (not illustrated)

***BS1/2 body sherds with no curvature in plan*** (ie. not a corner body sherd) (Plate 10)

## Supports

There is a range of support types present including bars, brick, clips, pedestals and platform fragments. The bars are flat types (BR1), the single brick is a classic example of the well-smoothed tapered type (BK1), and the clips include substantial examples of the cylindrical type (CL1) as found at Morton Fen (Crosby 2001a, fig. 33, 17-18) rather than the slight ones from Cowbit (Morris, 2001a, fig. 20, 31-35) but also highly individual, irregularly wedge-shaped ones (CL9; CL13) as found at Spalding-Wygate Park (Morris 2007a). Tapered bricks were found at Helpringham Fen (Healey 1999, fig.8, 11-19), and Morton Fen (Crosby 2001a, figs 34, 37 & 35, 38-39). There is one hand-squeezed pedestal type (PD3) which is similar to examples from Morton Fen (Crosby 2001a, figs. 33, 28 & 34, 29). The platforms include numerous fragments with a single surface remaining (PL1), but also examples with rounded edges (PL7) or squared-off edge sides (PL12). They are often curiously quite rustic in manufacture, ie. handmade by pressing layers of clay together resulting in irregular upper surfaces which were not smoothed over, but there is no doubt that they are platforms, better made than the 'slabs' found at Cowbit (Morris 2001a, figs. 18, 23-25 and 19, 26-30A-D), and more similar to the early Roman examples from Morton Fen (Crosby 2001a, fig. 35, 41-42 & 44).

## Bars

***BR1 rectangular cross-section bar*** (Figure 11, no. 7)

***BR99 indeterminate type of bar fragment*** (not illustrated)

## Brick

***BK1 tapered, upright brick*** (Figure 11, 8)

### **Stabilising Spacer-Clips**

***CL1 cylindrical spacer-clip:*** hourglass-shaped, horizontal cylinder with roughly triangular to oval cross-section and one flat end face with overhang from container rim impression and one flat end face without overhang from oven wall impression (Figure 11, 9-10)

***CL9 wedge-like stabiliser, similar to a truncated door wedge*** (Figure 11, 11)

***CL13.1 triangular bar or triangular wedging clip with at least one pre-firing perforation*** (Figure 11, 12)

### **Pedestals**

***PD3 angle-topped, hand-squeezed pedestal*** (Figure 11, 13)

***PD98 hand-squeezed pedestal stem fragment*** (not illustrated)

### **Platforms**

***PL1 platform fragment: fractured piece from a platform with only one smoothed flat surface remaining*** (not illustrated)

***PL7 softly rounded-edge platform fragment*** (Figure 11, 14)

***PL12 sharply square-edged platform fragment*** (Figure 11, 15)

***PL13 platform corner:*** fragment of platform with four surfaces comprising two flat, parallel, smoothed surfaces and two sharp, straight sides creating a right-angle corner (not illustrated)

### **Structural Material**

At salterns, briquetage containers and supports are assembled either on open hearths or as part of enclosed oven structures which have flues and stokeholes. Therefore, either hearth fragments or fragments from more elaborate oven structures may be recovered along with container sherds and broken supports resulting from the abandonment of a prehistoric or Roman salt production complex and its subsequent ploughing. The identification of hearths versus ovens as the method of heating and evaporating water from brine can now be recognised more confidently due to the study of Roman period saltern structural material from several sites. The two first kiln-like oven complexes excavated in the Fens were at the extreme ends of the oven spectrum; these were a later Iron Age example at Cowbit (Lane 2001) and two late Roman examples from the Middleton saltern (Crowson 2001). Cowbit revealed that a major technological change in production had occurred in the later Iron Age period (around the second century BC) with the introduction of indirect heating of containers within an oven-type structure where the containers were removed from the heating source by the presence of gradually more elaborate supports in the form of platforms, slabs and spacer-clips with the heating source controlled by the use of flues (Morris 2001d).

While the direct hearth type of structure had been used from the later Bronze Age to the middle Iron Age, the indirect oven and flue type of structure became the norm from the later Iron Age onwards. The earliest example of the flue-type, indirect method of oven structure was found at Cowbit (Lane 2001, plate 2, fig. 12) which was dated by association with two similar radiocarbon results for charcoal from in the structure to 185-95 cal BC (95% confidence) (Bayliss and McCormac 2001), i.e., the second century BC, which is in-keeping with the range of later Iron Age pottery recovered from the site (Knight 2001). The massive Middleton ovens with double, opposing flues revealed that this method could develop into a significant industrial-scale, heating complex by the late Roman period in the Fenland region. The original terminology used to classify the ceramic material from these oven structures varied from an error (by this author) in understanding the role played by 'slabs' at Cowbit (Morris 2001a, 45, figs. 19 & 22), which should have been classified as support platforms rather than structural material particularly as platforms were identified in that assemblage, to oven lining at late Roman Middleton (Percival 2001). Subsequently early Roman below ground oven structures were excavated at Spalding-Wygate Park and at March-Cedar Close (Lane, Morris and Peachey 2008). Analysis of the structural material recovered from these sites and the features themselves suggested that the use of the term wall/flooring material was not inappropriate for these very distinctive fragments due to the process of construction of the

ovens. Elongated pits were dug into the natural followed by layers of fine clay infill which were then carved to create the oven space of continuous walls and floors, and then fired in situ. The layered texture of the oven fabric is extremely distinctive, and very different from that found in association with open, direct hearths. For the time being, it is more than acceptable for the oven lining codes (LN) and the oven wall/flooring codes (W/FL) to be relatively interchangeable.

### **Wall/Flooring**

***WFL1 wall/flooring fragment with one smoothed face*** (not illustrated)

### **Miscellaneous**

Numerous pieces in the assemblage had clearly been associated in some way with salt production or had at least been affected by direct association with brine at some time. These undiagnostic fragments of fired clay material have no indication of their original form type and therefore must be assigned to the miscellaneous class. Because of the high fragmentation of this assemblage resulting in such a low mean piece weight for briquetage of 5.4g, the miscellaneous class represents a significant 30% of the collection.

### **Briquetage Fired Clay**

***FC undiagnostic fired clay fragments affected by saltwater*** (not illustrated)

## **Manufacturing - Correlation of Forms and Fabrics**

Close examination of the fabrics used to make the different classes of briquetage in this assemblage revealed that all but one sherd had been made from organic-tempered fabrics and that nearly equal numbers of sherds had been made from the silty variant (V2) as had been made from the sandier clay matrix variant (V1). Similarly, nearly equal numbers of sherds derived from containers made from the fabric with a low amount of added organic temper (V3) as had been made from the fabric with a much greater amount of temper (V4), however, overall these two fabrics had been utilised much less often. On the other hand, fabric V2 was the principal fabric used to make supports; 77% of supports by weight (493g) were made from fabric V2 (56% by number of pieces). Only one small piece (4g) from a platform was identified as fabric V1, 11 (31g) from the very porous fabric V4, and one (44g) from the much denser variant V3. Overall, the moderately-tempered, silty fabric V2 appears to have been a multi-purpose fabric used to make the majority of both containers and supports in the Clay Lake assemblage and are most likely to represent the selection of clay resources immediately nearby or at this location. Making briquetage needs to be cost-effective for the saltmakers because it is the salt itself that has the real value for these craftsmen and women. Therefore, being able to use clays requiring little if any transportation is a top priority. However, the presence of a total of five fabrics to make these same classes and types of briquetage indicates that other clay resources and tempering recipes are part of the story behind this 'assemblage'. It may be that the collection is representative of more than one group or family of saltmakers who worked in the general area and chose or preferred to use sandier clay for making containers, for example. The variation in rim shapes for the containers also suggests that this is a likely interpretation as R3 rims are made from fabric V2 or the untempered fabric Q1, while the R5 shape was made from fabric V1. Although there are very few rimsherds in the assemblage, this is an intriguing correlation nevertheless. The variation in fabric types may also be indicating that this assemblage should not be interpreted as representative of a single saltern location nearby but rather representative of an accumulation of more than one saltern activity zone in the landscape. The high fragmentation of all the pieces and the extremely poor representation of structural material strongly suggest that the actual location of the closest saltern 'site' may be quite some metres to the east.

## Evidence of Use and the Intensification of Salt Production

One demonstration of the special nature of briquetage is the evidence that it was used in association with saltwater and heat. The simplest way of seeing this evidence is the bleaching caused by the chlorine in brine when activated by heat. It is the iron oxides in the orange-red firing clay which changes colour from pale orange to pink, lavender and finally white depending upon the intensification of contact, either over a single, continuous length of time or repeatedly over shorter periods of time (Morris 2007b). Not all briquetage shows this bleaching effect, or 'salt scale' as it has been referred to previously (Morris 2001a, 41). Bronze Age and earlier Iron Age briquetage is distinctive due to the rarity or complete absence of bleaching, while later Iron Age briquetage such as that from Cowbit showed slight and variable amounts of bleaching (Morris 2001a, plate 4). Bleaching was particularly pronounced in the Spalding-Wygate Park (Morris 2007a) and March-Cedar Close (Morris 2008) assemblages, and a method for measuring this variation in intensity of bleaching was developed for the March-Longhill Road assemblage (Morris, in prep.) in order to be able to classify, quantify and compare the nature and intensity of salt production in the region. Intensity level 1 ranges from slight or patchy evidence resulting in no more than 19% of the visible areas showing some degree of bleaching whether a 'salt skin' or a range of the pink/lavender/icy grey or white colours. Intensity 2 measures from 20-39% of the area, intensity 3, 40-59%; intensity 4, 60-89%; and intensity 5, 90-100% [no evidence of bleaching is represented by a hyphen in the database cell].

The Clay Lake assemblage is more bleached than the third-to-second century BC Cowbit Wash assemblage but is far less bleached than that recovered from the Roman saltern at March-Longhill Road. A detailed understanding of the variation amongst briquetage assemblages must wait until the analysis and reporting of the Longhill Road assemblage is complete. However, 61.6% of the Clay Lake assemblage was slightly bleached to intensity levels 1 (52%) and 2 (9.6%), while significant bleaching was observed on 3.7% of the pieces (level 3), intensive bleaching on 8.9% (level 4) and complete bleaching of pieces is shown on 4.8% of the assemblage. No bleaching effect was observed on 20.9% of the material. Therefore, it is apparent that the production of salt in the Clay Lake area represented by the highly fragmented assemblage of redeposited material was significantly less intensive than that excavated at Longhill Road and consequently produced less salt. However, the salt making activity represented by the briquetage recovered at Clay Lake but was more productive than that at Cowbit Wash.

## Dating Evidence

The presence of numerous sherds of late Iron Age pottery from several different vessels in well-stratified contextual association with a significant amount of this briquetage assemblage is a most welcome discovery. The co-occurrence of distinctive pre-Conquest late Iron Age pottery, including sherds from an imported Cam 113 butt beaker dated to the first century BC/AD (see Pottery), with 181 (974g) of these relatively small fragments of briquetage in ditch 1314 in trench 13 has confirmed our understanding of the dating of technological changes in the manufacture of briquetage and the process of salt making which took place during the late Iron Age, a period of considerable transformation in the southern Fenland of eastern England. Previously, this wide range of briquetage forms and fabrics was known to occur with early Roman, late first-to-second century AD, pottery as at the early Roman saltern located in Morton Fen (Trimble 2001; Crosby 2001a, figs. 32-35; Precious 2001).

The excavation at Clay Lake has revealed that some of these changes may have occurred up to a century earlier. Sherds from this distinctive whiteware butt beaker, as well as a locally made grog-tempered butt beaker and sherds from more than one late Iron Age Dragonby/Sleaford-style jar, were recovered from several contexts in ditch **1314**. The

particular types of briquetage supports found in this feature include a diagnostic bar (Figure 11, 7), two pieces from a stabiliser-clip (Figure 11, 12) and a second bar (not illustrated) as well as small pieces of oven wall/flooring from an oven structure (Table 3). Several additional support types were recovered from other ditches in Trench 13 but none were found in association with pottery, while one platform fragment and six container sherds were found in ditch **403** along with a large group of late Iron Age Dragonby/Sleaford-style pottery comprising sherds from three different jars. Therefore, this direct association of distinctive pre-conquest late Iron Age period pottery and particular types and classes of briquetage, as well as the absence of any Roman pottery in the features, represent a phase of salt production technology dating from the first century BC to first century AD, prior to the late first century AD. The Clay Lake excavation has provided a missing link in the sequence of salt production in the Fens representing the period from the first century BC through to the Roman Conquest.

There is no doubt that the briquetage from Clay Lake post-dates that found at the middle-to-late Iron Age saltern at Cowbit Wash based on the absence of any shell-gritted container sherds or cut rim trough-shaped containers and the presence well-made platforms with squared edges rather than only rustic slabs, a well-smoothed and tapered-profile brick and flat bars rather than the one rod-like bar found at Cowbit (Morris 2001a, fig. 19, 28) and during fieldwalking in the southwestern Fens at Morton 69 and Billingborough 21 (Lane 1992, fig. 129, 1-3). Variation in vessel wall thickness between the organic-tempered container sherds from Cowbit compared to those from Clay Lake adds some weight to this conclusion. If the number of sherds by thickness code are quantified and converted into percentages, it is possible to appreciate an additional difference between these two assemblages (Table 4). The walls of the specifically organic-tempered vessels from Cowbit are significantly thinner than those from Clay Lake and much more like middle Iron Age shell-gritted briquetage container sherds from Cowbit. This difference is clearly indicated by the resulting cumulative percentage frequencies for each assemblage (Table 4). The 50th and 75th percentiles in the Cowbit assemblage both occur within thickness codes 2 and 3 with half of that assemblage having walls measuring less than 7mm and three-quarters measuring less than 10mm thick. In contrast, the 50th does not occur until sherds with thickness code 3 are fully calculated in the Clay Lake assemblage and the 75th within thickness code 4. Therefore only half of this collection has walls measuring less than 10mm but another 41% measures 10mm or more. Assuming that this is not simply a factor of different saltmakers and their personal manufacturing techniques, this may be a subtle indication of chronological change in production methods. The final firing of the saltern oven at Cowbit took place between 185-95 cal BC (Bayliss and McCormac 2001). Therefore, the activity represented by the briquetage assemblage, or at least the briquetage from ditch **1314**, post-dates salt production at Cowbit Wash and is most likely to predate production at Morton Fen. The range of briquetage form types represented by the small Clay Lake assemblage is similar to the fragmented but vastly larger assemblage from Morton (16,274 pieces; 36kg). Because of this difference in number of pieces recovered between the two sites, it is unwise to present a detailed comparison of the presence and absence of specific form types.

Salt production at Clay Lake may have been contemporary with some of that revealed at Helpringham Fen. At this multi-hearths complex, a variety of middle Iron Age pottery and several specifically late Iron Age wheel-made vessels of Dragonby/Sleaford-style were recovered (Healey 1999, fig. 7), but it is uncertain from the reporting of this fieldwork, which took place between 1972-7 by the Car Dyke Research Group, exactly which illustrated briquetage form types were found in association with which pottery types. In addition, unstratified Roman period pottery was recovered from the surface of the site. A sample of wood from the site was radiocarbon dated to 379-116 cal BC (HAR-2280) (Healey 1999, 12), a date which fits comfortably within the middle Iron Age period of direct heating structures, but the absence of any contemporary cut rim, shell-gritted or organic-tempered, briquetage container rims remains a mystery. The Helpringham collection includes many illustrated examples of platforms and tapered bricks (Healey 1999, fig. 8, 1-9 & 10-18) which would be

expected from a late Iron Age saltern in the Fens but it also has two examples of pyramidal pedestals (Healey 1999, fig. 8, 10 & 21) commonly found in middle Iron Age briquetage assemblages as at Langtoft (Morris 2001b, figs. 89-90) and Market Deeping (Morris 2001c, figs. 94, 17-20 and 95, 21-22). The presence of several direct heating method hearths at Helpringham suggests that salt production activity at this saltern was strongly traditional in some aspects but eventually was participating in some of the changes to this industry during the later Iron Age, but not all of them.

Trench	Feature	Context	Containers				Supports						Structural	Misc.	Total count	Total weight (g)
			R	B	BS	sub-total	CL	BR	BK	PD	PL	sub-total				
4	DITCH 403	404	-	-	1	1	-	-	-	-	1	1	-	4	6	53
4	DITCH 406	408	-	-	1	1	-	-	-	-	-	-	-	5	6	15
4	DITCH 410	411	-	-	-	-	-	-	-	-	-	-	-	1	1	3
5	DITCH 503	504	-	-	-	-	-	-	-	-	-	-	-	10	10	75
5	DITCH 512	513	-	-	-	-	-	-	-	-	-	-	-	1	1	1
13	DITCH 1303	1306	-	-	11	11	-	-	-	-	3	3	-	14	28	68
13	DITCH 1308	1309	-	1	23	24	-	-	3	-	-	3	-	6	33	375
13	DITCH 1310	1311	-	-	-	-	-	-	-	-	-	-	3	19	22	139
13	DITCH 1314	1315	-	-	4	4	-	-	-	-	-	-	-	11	15	49
		1317	-	-	6	6	-	3	-	-	-	3	3	2	14	69
		1318	2	4	93	99	2	1	-	-	-	3	2	6	110	642
		1319	-	-	27	27	-	-	-	-	-	-	-	15	42	214
13	POSTHOLE 1320	1321	-	-	8	8	-	-	-	-	6	6	-	10	24	65
13	DITCH 1323	1326	-	-	1	1	-	-	-	-	-	-	-	1	2	16
		1330	1	-	3	4	-	-	-	-	-	-	-	4	8	30
		1332	-	-	49	49	1	-	-	-	1	2	-	7	58	165
13	DITCH 1336	1335	-	2	49	51	1	1	-	3	-	5	-	23	79	458
13	DITCH 1338	1337	2	-	47	49	1	-	-	-	7	8	-	24	81	479
		<b>Total</b>	<b>5</b>	<b>7</b>	<b>323</b>	<b>335</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>18</b>	<b>34</b>	<b>8</b>	<b>163</b>	<b>540</b>	<b>2916</b>

Table 3 Location of the briquetage assemblage.

Briquetage thickness code	Cowbit			Clay Lake		
	Number of pieces	Percentage of pieces	Cumulative percentage	Number of pieces	Percentage of pieces	Cumulative percentage
2 (<7mm)	228	33.2	33.2	12	4.6	4.6
3 (7-9.9mm)	306	44.7	77.9	141	54.2	58.8
4 (10-12.9mm)	151	22.0	99.9	95	36.5	95.3
5 (13-15.9mm)	1	0.1	100.0	12	4.6	99.9
<b>Total</b>	<b>686</b>	<b>100%</b>	<b>-</b>	<b>260</b>	<b>99.9%</b>	<b>-</b>

Table 4 Briquetage thickness code

## Spatial Distribution and Salt Production Activity

Briquetage fragments were most commonly recovered from the ditches in Trench 13, with only 24 fragments from Trenches 4 and 5 (Table 3). Fortunately, the largest number of pieces was found in ditch **1314** (181; 974g), with the majority from dump deposit 1318, and therefore dated by association with latest pre-Roman Iron Age pottery to the first century BC/first century AD. Those features found on the same alignment as ditch **1314**, which ran northeast-to-southwest, include ditches **1336** and **1338**. The briquetage from all three ditches is very similar in range of fabrics as well as types of forms present and relative frequency of those types. Ditch **1323**, a curvilinear ditch, also had a similar collection despite having only a third as many pieces recovered from it (68; 211g) compared to ditch **1314**. Therefore, based on the range of briquetage alone, there is every reason to suspect that these four ditches were open at the same time or at least infilled with briquetage debris from the same period of salt production activity. The nature of this salt production activity includes the recognition of indirect heating ovens based on the small number of fragments recovered from two ditches, **1310** and **1314**. Although the alignment of ditch **1303** is 90° different from that of ditches **1314**, **1336** and **1338**, the platform fragments and container sherds recovered from it give no indication that this material was not derived from contemporary activity.

## Recommendation

Because all the evidence points to this as a very fragmented and redeposited collection of briquetage, it is recommended that only the well-stratified material from ditch fills should be retained in the archive. All other pieces recovered from the surface or from topsoil and subsoil contexts should be placed in suitable teaching collections for public and professional training and reference.

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## List of Illustrated Briquetage

(Figure 11, briquetage record number)

1. R3; fabric V2; slightly bleached exterior and interior surfaces, intensity 1; BRN 1017, context 1337, ditch **1338**.
2. R3; V2; no evidence of bleaching; BRN 1125, 1318, ditch **1314**.
3. R3; Q1; pink bleached interior, intensity 1; BRN 1168, 1330, ditch **1323**.
4. R5; V1; partially bleached exterior, intensity 1; BRN 1001, 1337, ditch **1338**.
5. R5; V1; well-bleached throughout, intensity 4; BRN 1126, 1318, ditch **1314**.
6. B1; V1; slightly bleached core and interior, intensity 1; BRN 1109, 1318, ditch **1314**.
7. BR1; V2; moderately bleached exterior and core, intensity 3; BRN 1128, 1318, ditch **1314**.
8. BK1; V2; bleached exterior, intensity 1; BRN 1046, 1309, ditch **1308**.
9. CL1; Q1; bleached exterior, intensity 1; BRN 1079, 1335, ditch **1336**.
10. CL1; V2; moderately bleached exterior and core, intensity 3; BRN 1162, 1332, ditch **1323**.
11. CL9; V2; bleached exterior, intensity 1; BRN 1027, 1337, ditch **1338**.
12. CL13.1; V2; bleached exterior and core, intensity 2; BRN 1129, 1318, ditch **1314**.
13. PD3; V3; slightly bleached exterior, intensity 1; BRN 1078, 1335, ditch **1336**.
14. PL7; V2; moderately bleached throughout, intensity 3; BRN 1023, 1337, ditch **1338**.
15. PL12; V2; bleached exterior and core, intensity 2; BRN 1024, 1337, ditch **1338**.

# Appendix I

## Environmental Report

*Palaeoecology Research Services, PRS*

*Alison Foster, Gemma Martin, John Carrott and James Poland*

### Introduction

Eight bulk sediment samples ('GBA'/'BS' *sensu* Dobney *et al.* 1992) were collected, from which four were selected and submitted to Palaeoecology Research Services Limited, Kingston upon Hull, for an assessment of their bioarchaeological potential.

### Methods

The lithologies of the samples were recorded using a standard *pro forma*. Subsamples were taken and processed for the recovery of plant, invertebrate and vertebrate remains (macrofossils), broadly following the techniques of Kenward *et al.* (1980), producing a mineral residue and a washover from each subsample.

The washovers were initially examined wet as they contained uncharred plant remains. This material proved to be from modern rootlet, with the ancient plant remains present preserved by charring, and consequently the washovers were dried prior to recording. The washovers were examined for macrofossil remains using a low-power binocular microscope (x7 to x45); the material was sieved into fractions (using 2 mm and 4 mm sieves) to facilitate assessment where necessary. All of the components were recorded using a five-point semi-quantitative scale. The abundance scale employed was: 1 – few/rare, up to 3 individuals/items or a trace level component of the whole; 2 – some/present, 4 to 20 items or a minor component; 3 – many/common, 21 to 50 or a significant component; 4 – very many/abundant, 51 to 200 or a major component; and 5 – super-abundant, over 200 items/individuals or a dominant component of the whole. Processed sample fractions were scanned until no new remains were observed and a sense of the abundance of each taxon or component (relative to the processed fraction as a whole) was achieved. The abundance of recovered organic and other remains within the sediment as a whole may be judged by comparing the washover volumes and the quantities of remains recovered from the residues with the size of the processed sediment subsamples.

Plant macrofossil remains were identified to the lowest taxon necessary to achieve the aims of the project by comparison with modern reference material (where possible) and the use of published works (e.g. Cappers *et al.* 2006). Nomenclature for plant taxa follows Stace (1997).

Land snail remains were examined and individuals identified with reference to published works (chief sources: Cameron 2003; Cameron and Redfern 1976; Kerney and Cameron 1979). Nomenclature follows Kerney (1999). Numbers of the burrowing snail *Ceciloides acicula* (Müller) were recorded semi-quantitatively as outlined above but these records are not included in any interpretation because of the likelihood of its being intrusive to the deposits (this species may burrow to depths of 2m – Kerney 1999, 168). Minimum numbers of individuals present were determined by numbers of shell apices.

The residues were dried prior to the sorting and recording of their components and those from samples 7 and 8 were then rewashed to maximise recovery of charred material. The first and second washovers from these samples were combined prior to recording. The weights and descriptions of the dry residues were recorded after sorting. Weights and descriptions of inorganic and environmental material refer to the larger pieces which have been extracted and reserved; smaller fragments remain in the residues and are not included. Artefacts, charcoal

and large mammal bone were all sorted to 4mm; small vertebrate bone (including fish bone) molluscs and charred plant remains other than charcoal were sorted to 2mm. Residue less than 1mm was retained unsorted. The residue fractions less than 2mm (including the less than 1mm fraction) were scanned for magnetic material.

Where present, bone and artefactual material was noted and recorded or removed to be returned to the excavator and forwarded to appropriate specialists. Where possible, vertebrate remains were identified to species or species group using the PRS modern comparative reference collection and by consultation of published works (e.g. Schmid 1972; Lawrence and Brown 1973). Remains that could not be identified to species were described as the 'unidentified' fraction. Within this fraction, fragments were grouped into a number of categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid) and completely unidentifiable. Nomenclature for mammal species follows Corbet and Southern (1977).

During recording, consideration was given to the suitability of the macrofossil remains for submission for radiocarbon dating by standard radiometric technique or accelerator mass spectrometry (AMS).

## Results

Details of the results of the assessment are presented in Tables 1 to 4 and summarised in the following text.

The four samples selected for assessment (Samples 2, 6, 7 and 8) were taken from the fills of four ditches; features **1314**, **1323**, **403** and **410** respectively. All have been dated to the late Iron Age (Table 1). The four samples were sub-sampled, with 5kg being processed (equating to between 4 and 4.5l of sediment) and the sediment descriptions of the samples taken prior to processing are detailed in Table 1.

The samples produced small washovers, ranging between 5 and 20ml, that contained small charred plant assemblages primarily consisting of comminuted indeterminate charcoal that was mostly less than 4mm (Table 2). Occasional charred herbaceous root and stem fragments were noted, including 'grass-sized' culm nodes but, overall, there was extremely limited scope for identification and further analysis. Charred cereal residues were confined to a single barley (*Hordeum distichon* L./*H. vulgare* L.) grain, a wheat glume base and a tiny fragment of twisted awn from fill 411 of ditch **410**. Charred 'seeds' of wild species were present in each of the samples, with preliminary identifications including plantain (*Plantago*) seeds and fruits, rush (*Juncus*), possible sea club-rush (cf. *Bolboschoenus maritimus* L.), sea club-rush/club-rush (*B. maritimus*/*Schoenoplectus*), branched bur-reed (*Sparganium erectum* L.), heath-grass (*Danthonia decumbens* (L.) DC.) and grasses (small indeterminate *Poaceae* <2mm). Mineralised fragments of spike-rush (*Eleocharis*) were also identified. In addition, often fine, fragile (?siliceous) concretions that appeared to be 'ash-like' residues were abundant in the washover from basal fill 404 of ditch **403**.

Uncharred botanical remains were present in each of the samples in the form of varying quantities of root material and wild/weed seeds, including common fumitory (*Fumaria officinalis* L.), goosefoot/orache (*Chenopodiaceae*), small leguminous seeds (indeterminate *Fabaceae* <2mm) and rush (Table 2). Small numbers of earthworm egg capsules were also noted in three of the samples, indicating that the deposits experienced a degree of bioturbation. Whilst the uncharred root material and the majority of the weed seeds were most likely intrusive, an abundance of uncharred rush seeds were noted in the basal fill of ditch **1314**, which also contained some fish bone, foraminifera and ostracods (see below), and it may be that here the remains of rush were contemporary with deposit formation.

Terrestrial molluscs were present in moderate numbers in two samples; from basal fill 404 of ditch **403** and fill 411 of ditch **410**. The records were exclusively of the burrowing snail *Cecilioides acicula* (Müller) and almost certainly recent intrusions. Other invertebrates recovered from the samples included the small numbers of foraminifera and ostracods from basal deposit 1315 of ditch **1314**, as noted above, and a few foraminifera were also present in upper fill 1330 of curvilinear ditch **1323**.

The bone from the sample residues was limited; the remains mostly consisted of small, undiagnostic fragments, with the only identified domestic mammal remains being two cattle teeth from context 411. Of particular note was a fragment of house mouse (*Mus musculus* L.) maxilla recovered from fill 1330 of curvilinear ditch **1323**. In addition, basal fill 1315 of ditch **1314** produced a small assemblage of fish bone, which was recovered from both the washover and the residue; a dorsal spine, probably of three-spined stickleback (*Gasterosteus aculeatus* L.) was identified within this assemblage.

Aside from 'briquetage-like' material (see below), other traces of evidence for industrial/craft activities were present in the form of a small concentration of hammer scale from fill 411 of ditch **410**. Three pottery sherds were also recovered from the fills of ditches **403**, **410** and **1323**, as well as a small fragment of glass from ditch **403**.

The mineral residues were notable for a lack of stone, being mainly composed of sediment concretions with pieces of poorly fired earth (sorted to 4mm), which appears to be briquetage, being prevalent in upper fill 1330 of curvilinear ditch **1323**.

## Discussion and Statement of Potential

The biological evidence recovered from the four samples certainly indicated a brackish environment; the presence of plant species such as sea club-rush and also foraminifera, which are usually indicative of brackish or saline conditions attest to this. The stickleback remains that were noted in ditch **1314** also suggest a degree of salinity as this species can exploit both freshwater and brackish habitats. Marshy habitats, that may have been freshwater, were also indicated by the presence of spike-rush, rushes and branched bur-reed. The site may therefore have been active when the area formed part of the upper salt marsh verging on the freshwater marsh areas. The charred botanical assemblages contained species that were also recorded from nearby excavations at Spalding Wygate Park where evidence of Iron Age salt-making and Iron Age and Romano-British settlement activity was encountered (Allinson *et al.* 2007); notably the plantain seeds and capsules, and here the samples from deposits associated with salt-making similarly yielded little in the way of domestic (food) remains or significant charcoal assemblages, which raises questions regarding the permanence of the inferred industrial activity and the selection of fuel for use in the salt-making process.

The house mouse maxilla recovered from ditch **1323**, dating to the late Iron Age period, adds to the accumulating body of evidence for an introduction of this commensal species to Britain during the Iron Age; other early occurrences have been recorded from Gussage All Saints, Dorset (Harcourt 1997), Danebury (Browne 1995) and Maiden Castle (Armour-Chelu 1991). At a site level, the presence of house mouse was of some interest as it suggests an environment with shelter and food (especially during the winter); despite the lack of evidence for domestic debris and food residues and the apparent primarily industrial nature of the site.

A small concentration of hammer scale from context 411 suggested smithing activity nearby, but as hammer scale is produced in large quantities during smithing this does not necessarily indicate intensive production and may relate to a single event.

The four environmental sediment samples assessed produced moderate assemblages of ancient biological remains (principally plant remains) the character of which was akin to

others of similar date and function in the vicinity of Spalding which suggests a degree of uniformity in the approach to salt-making within the area during the late Iron Age/early Roman periods.

Although remains which could be submitted for radiocarbon dating (via AMS) were recovered from each of the assessment subsamples this is not recommended. The aquatic/marsh plant taxa could be subject to reservoir effect errors and the extension of any dates returned from small quantities of charred remains to the deposits as a whole would be suspect, given the depositional environment and evidence for modern intrusive material (e.g. rootlet) and likely consequent bioturbation.

## Recommendations

Given that the ditch fills included in this assessment have yielded plant assemblages of some interest and interpretative value, any further work on the site should include a targeted sampling strategy to maximise our understanding of the late Iron Age environment.

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Context	Sample	Context description	Provisional date	Sediment description	Wt/V (kg/l)	Sediment remaining (l)
404	7/T	Basal fill of ditch 403	late Iron Age	Just moist, mid to dark grey-brown to dark grey, slightly brittle, crumbly (working soft), silt, with some clasts of clay to 15 mm. Abundant charcoal/black ash and some modern rootlets were noted prior to processing.	5/4	~4 (+ 2 tubs)
411	8/T	Single fill of ditch 410	late Iron Age	Just moist, mid grey (mottled with mid grey-brown), crumbly but brittle and indurated (working somewhat plastic when wetted), clay. A little charcoal and a large mammal tooth were present, together with some modern rootlet.	5/4	~4 (+ 1 tub)
1315	2/T	Basal deposit of ditch 1314	late Iron Age/early Roman	Just moist, light to mid grey (with some patches of light grey, light to mid grey and light to mid brown), crumbly, somewhat stiff (but working soft and plastic), clay silt, with areas of silty clay. Occasional charcoal/black ash was present, together with a little modern rootlet.	5/4.25	~4 (+ 1 tub)
1330	6/T	Upper fill of curvilinear ditch 1323	late Iron Age/early Roman	Dry, light to mid brown to light to mid grey-brown, brittle and indurated to crumbly (working somewhat soft and slightly sticky), slightly clay silt, with occasional small stones (2 to 20 mm) and a little ?charcoal. Modern roots were abundant.	5/4.5	~4 (+ 1 tub)

Table 1 Context information, sediment descriptions and sample sizes. Key: 'Wt/V (kg/l)' = weight/volume of processed sediment sample in kilograms/litres.



CN	S	Wt/V (kg/l)	W/o vol (ml)	C'coal (>4 mm)	C'coal (2-4 mm)	C'coal (<2 mm)	Charred cereal grain	Charred cereal chaff	Charred seeds	Moll	Notes
404	7/T	5/4	20	2	4	5	-	-	4	2	Charred Cyperaceae (cf. <i>Bolboschoenus maritimus</i> (L.) Palla) x17 and <i>Bolboschoenus/Schoenoplectus</i> x28), indeterminate seeds x3. Mineralised <i>Eleocharis</i> (fragments) estimated x3. Uncharred roots score 2. Uncharred seed score 2; Chenopodiaceae, small leguminous seeds. Snails; all <i>Cecilioides acicula</i> (Müller). Bone score 2; indeterminate calcined fragments and calcined bird phalanx (claw) x1. Earthworm egg capsules score 1. Coal (<4 mm) score 1. Abundant ?siliceous concretions (<4 mm), some fuel ash slag and some plant derived?
411	8/T	5/4	15	1	2	5	1	1	2	3	Charred <i>Hordeum distichon</i> L./ <i>H. vulgare</i> L. x1, <i>Triticum</i> glume base x1, twisted awn fragment x1, <i>Sparganium erectum</i> L. (fragments) estimated x1, Cyperaceae x3, indeterminate seed x5. Uncharred roots score 3. Uncharred seed score 1; Chenopodiaceae. Washover mostly sediment 'crumb' and fine rootlets. Earthworm egg capsules score 1. Snails; all <i>Cecilioides acicula</i> . Coal (<2 mm) score 2.
1315	2/T	5/4.25	5	1	2	5	-	-	2	-	Charred <i>Plantago</i> x5 seeds and 1x capsule, ?charred <i>Juncus</i> x4, <i>Danthonia decumbens</i> (L.) DC. x1, small indeterminate Poaceae x4, indeterminate seed x6. Uncharred roots score 1. Uncharred seed score 5; <i>Juncus</i> (dominant), <i>Fumaria officinalis</i> L. <i>Cenococcum sclerotia</i> score 1. ?Recent insect remains score 1; beetle sclerites/fragments. Indeterminate fish bone score 2. Ostracods score 1. Foraminifera score 2. Sediment 'crumb' (<2 mm) score 5.
1330	6/T	5/4.5	11	1	2	5	-	-	3	-	Charred <i>Plantago</i> capsules x5 and seeds x17, small indeterminate Poaceae x1, <i>Juncus</i> x1, indeterminate seed x2. Uncharred roots score 5. Uncharred seed score 3; Chenopodiaceae. Earthworm egg capsules score 1. Recent insect score 1; centipede. Foraminifera score 1. Fired earth (<2 mm) score 5. Fuel ash slag score 1.

Table 2 Charred botanical remains and other biological material recovered from the washovers. Key: 'CN' = context number; 'S' = sample; 'Wt/V (kg/l)' = weight/volume of processed sediment sample in kilograms/litres; 'W/o vol (ml)' = volume of washover in millilitres; 'C'coal' = charcoal; 'Moll' = molluscs. Abundance scale: 1 – few/rare, up to 3 individuals/items or a trace level component of the whole; 2 – some/present, 4 to 20 items or a minor component; 3 – many/common, 21 to 50 or a significant component; 4 – very many/abundant, 51 to 200 or a major component; and 5 – super-abundant, over 200 items/individuals or a dominant component of the whole.

Context	Sample	Wt/V (kg/l)	Residue weight (g)	Pottery #/mm/g	Fired earth #/mm/g	Cinder #/mm/g	Glass #/mm/g	Magnetic h'scale/g	Mineral residue fraction after sorting
404	7/T	5/4	208	1/34/5.5	3/30/11	-	1/5/<0.1	5/<0.1	Mineralised, concreted sediment with occasional tiny pieces of burnt and unburnt bone. A few stones (to 44 mm) also present with very occasional fired earth 'crumb', fuel ash slag and coal.
411	8/T	5/4	307	1/10/0.5	2/26/9	-	-	20/0.2	Hard, dark brown, 'spiky' mineralised sediment concretions, the larger pieces (to 20 mm) being somewhat flat. Several root pseudomorphs (to 25 mm) also present. Occasional tiny burnt and unburnt bone fragments, some charcoal, a little fired earth 'crumb' and very occasional tiny pieces of coal.
1315	2/T	5/4.25	19	-	-	1/18/0.7	-	1/<0.1	Sediment concretions, with frequent small, worn, pieces of fired earth (to 10 mm) and occasional indeterminate bone fragments.
1330	6/T	5/4.5	270	1/9/0.1	200/48/174	-	-	7/0.2	A mixture of fired earth and concreted sediment, with occasional undiagnostic burnt and unburnt bone and charcoal fragments.

Table 3 Non-biological remains recovered from sample residues, with additional notes on the mineral fractions of the residues and material remaining after sorting. Key: 'Wt/V (kg/l)' = weight/volume of processed sediment sample in kilograms/litres; '#' = number of fragments/items; 'mm' = maximum linear dimension in mm; 'g' = weight in grammes; 'h'scale' = number of flakes and/or spheroids of hammerscale.

Context	Sample	Wt/V (kg/l)	Charcoal sq/mm/g	Bone sq/mm/g	Notes and identifications
404	7/T	5/4	+++/18/3.7	+++/47/12	<i>Medium-sized mammal</i> : Rib and long bone fragments <i>Undiagnostic</i> : Small fragments, some calcined
411	8/T	5/4	+++/18/5	++/56/41	<i>Cattle</i> : Teeth (lower molar; upper premolar) <i>Medium-sized mammal</i> : Phalanx (complete but heavily coated with concreted sediment) <i>Undiagnostic</i> : Few fragments, some calcined
1315	2/T	5/4.25	-	+/14/0.2	<i>Fish</i> : Three-spined stickleback ( <i>Gasterosteus aculeatus</i> L.) spine; small fish mandible, also possibly stickleback <i>Undiagnostic</i> : Few fragments
1330	6/T	5/4.5	-	++/12/0.3	<i>Small mammal</i> : House mouse ( <i>Mus musculus</i> L.) maxilla fragment <i>Undiagnostic</i> : Two small fragments

Table 4 Biological remains recovered from sample residues, with additional notes and identifications. Key: 'Wt/V (kg/l)' = weight/volume of processed sediment sample in kilograms/litres; 'sq' = semi-quantitative abundance score; '+' = present (1-3); '++' = occasional (4-20); '+++ = common (21-50); 'mm' = maximum linear dimension in mm; 'g' = weight in grammes.

## Appendix J

### Photographic Register

Film	Shot	Description	Trench
1-2	1	General shot of trench.	17
1-2	2	Rep-sec of trench 18 looking NW.	18
1-2	3	Rep-sec of trench 18 looking NW.	18
1-2	4	Post-Ex shot of trench 18 looking NE.	18
1-2	5	Post-Ex shot of trench 18 looking NE.	18
1-2	6	Post-Ex shot of trench 18 looking SE.	18
1-2	7	Post-Ex shot of trench 18 looking SE.	18
1-2	8	Oblique shot of features 1308 + 1310.	13
1-2	9	Oblique shot of features 1308 + 1310.	13
1-2	10	N facing sec of 1310.	13
1-2	11	N facing sec of 1310.	13
1-2	12	N facing sec of 1308.	13
1-2	13	N facing sec of 1308.	13
1-2	14	Post-Ex shot of trench13 looking West.	13
1-2	15	Post-Ex shot of trench13 looking West.	13
1-2	16	Rep sec 14.3	14
1-2	17	Rep sec 14.3	14
1-2	18	Rep sec 14.2	14
1-2	19	Rep sec 14.2	14
1-2	20	Rep sec 14.1	14
1-2	21	Rep sec 14.1	14
1-2	22	Post-Ex shot of trench14 looking East.	14
1-2	23	Post-Ex shot of trench14 looking East.	14
1-2	24	NE facing sec of ditch1303.	13
1-2	25	NE facing sec of ditch1303.	13
1-2	26	NW facing sec of ditch 1403.	14
1-2	27	NW facing sec of ditch 1403.	14
1-2	28	SE facing sec of ditch 1403.	14
1-2	29	SE facing sec of ditch 1403.	14
1-2	30	ESE Facing sec of ditch 1803.	18
1-2	31	ESE Facing sec of ditch 1803.	18
1-2	32	SE Facing sec of dyke 1809.	18
1-2	33	SE Facing sec of dyke 1809.	18
1-2	34	ESE Facing sec of ditch 1803.	18
1-2	35	ESE Facing sec of ditch 1803.	18
1-2	36	ID shot.	
3-4	1	Working shot.	
3-4	2	Post -Ex shot of ditches 1336 + 1338 looking SE.	13
3-4	3	Post -Ex shot of ditches 1336 + 1338 looking SE.	13
3-4	4	Post -Ex shot of ditches 1336 + 1338 looking south.	13
3-4	5	Post -Ex shot of ditches 1336 + 1338 looking south.	13
3-4	6	W facing sec of ditch 1314.	13
3-4	7	W facing sec of ditch 1314.	13
3-4	8	SE facing sec of ditch 1314.	13
3-4	9	SE facing sec of ditch 1314.	13
3-4	10	Pre-Ex shot of Southern Ext of trench 13 looking south.	13
3-4	11	Pre-Ex shot of Southern Ext of trench 13 looking	13

Film	Shot	Description	Trench
		south.	
3-4	12	Pre-Ex shot of Southern Ext of trench 13 looking north.	13
3-4	13	Pre-Ex shot of Southern Ext of trench 13 looking north.	13
3-4	14	Rep-sec of trench 15.	15
3-4	15	Rep-sec of trench 15.	15
3-4	16	Oblique shot of ditch 1503.	15
3-4	17	Oblique shot of ditch 1503.	15
3-4	18	Post-Ex shot of trench 15 looking east.	15
3-4	19	Post-Ex shot of trench 15 looking east.	15
3-4	20	Oblique shot of ditch 1602.	16
3-4	21	Oblique shot of ditch 1602.	16
3-4	22	NE facing rep-sec of trench 16.	16
3-4	23	NE facing rep-sec of trench 16.	16
3-4	24	Post-Ex shot of trench 16 looking SE.	16
3-4	25	Post-Ex shot of trench 16 looking SE.	16
3-4	26	NW facing sec of ditch 1713 looking SE.	17
3-4	27	NW facing sec of ditch 1713 looking SE.	17
3-4	28	Trench 17Post-Ex shot looking north.	17
3-4	29	Trench 17Post-Ex shot looking north.	17
3-4	30	Trench 17Post-Ex shot looking south.	17
3-4	31	Trench 17Post-Ex shot looking south.	17
3-4	32	SE facing sec of ditch cut 1707.	17
3-4	33	SE facing sec of ditch cut 1707.	17
3-4	34	E facing sec of ditch cut 1703.	17
3-4	35	E facing sec of ditch cut 1703.	17
3-4	36	ID shot.	
5-6	1	Trench 4 rep-sec looking south.	4
5-6	2	Trench 4 rep-sec looking south.	4
5-6	3	Trench 4 rep-sec looking south.	4
5-6	4	Post-Ex shot of trench 4 looking east.	4
5-6	5	Post-Ex shot of trench 4 looking east.	4
5-6	6	Post-Ex shot of trench 4 looking west.	4
5-6	7	Post-Ex shot of trench 4 looking west.	4
5-6	8	North facing sec of ditch 412.	4
5-6	9	North facing sec of ditch 412.	4
5-6	10	North facing sec of ditch 410 looking south.	4
5-6	11	North facing sec of ditch 410 looking south.	4
5-6	12	Post-Ex shot of trench 12 looking north.	12
5-6	13	Post-Ex shot of trench 12 looking north.	12
5-6	14	Post-Ex shot of trench 12 looking south.	12
5-6	15	Post-Ex shot of trench 12 looking south.	12
5-6	16	North facing sec of linear 406 looking south.	4
5-6	17	North facing sec of linear 406 looking south.	4
5-6	18	NW facing sec of linear 403 looking SE.	4
5-6	19	NW facing sec of linear 403 looking SE.	4
5-6	20	North facing rep-sec of trench11.	11
5-6	21	North facing rep-sec of trench11.	11
5-6	22	Post-Ex shot of trench 11 looking west.	11
5-6	23	Post-Ex shot of trench 11 looking west.	11
5-6	24	Post-Ex shot of trench 11 looking east.	11

Film	Shot	Description	Trench
5-6	25	Post-Ex shot of trench 11 looking east.	11
5-6	26	Post-Ex shot of trench 13 southern Ext looking south.	13
5-6	27	Post-Ex shot of trench 13 southern Ext looking south.	13
5-6	28	Post-Ex shot of trench 13 southern Ext looking north.	13
5-6	29	Post-Ex shot of trench 13 southern Ext looking north.	13
5-6	30	SSE facing sec of ditch 1323.	13
5-6	31	SSE facing sec of ditch 1323.	13
5-6	32	N facing ditch + pit sec 1323 + 1320.	13
5-6	33	N facing ditch + pit sec 1323 + 1320.	13
5-6	34	NW facing sec of ditches 1316 + 1338.	13
5-6	35	NW facing sec of ditches 1316 + 1338.	13
5-6	36	ID shot.	
7-8	1	Working shot.	
7-8	2	Working shot.	
7-8	3	West facing rep-sec of trench 3.	3
7-8	4	West facing rep-sec of trench 3.	3
7-8	5	North facing sec of 512 + 516.	5
7-8	6	North facing sec of 512 + 516.	5
7-8	7	East facing sec of 522.	5
7-8	8	East facing sec of 522.	5
7-8	9	Trench 5 ditch 522 intersection looking SW.	5
7-8	10	Trench 5 ditch 522 intersection looking SW.	5
7-8	11	Post-Ex shot of trench 5 looking NE.	5
7-8	12	Post-Ex shot of trench 5 looking NE.	5
7-8	13	Post-Ex shot of trench 5 looking SW.	5
7-8	14	Post-Ex shot of trench 5 looking SW.	5
7-8	15	Post-Ex shot of trench 3 looking north.	3
7-8	16	Post-Ex shot of trench 3 looking north.	3
7-8	17	NW facing sec of linears 503 + 509.	5
7-8	18	NW facing sec of linears 503 + 509.	5
7-8	19	West facing rep-sec of trench 9	9
7-8	20	West facing rep-sec of trench 9	9
7-8	21	Post-Ex shot of trench 9 looking north.	9
7-8	22	Post-Ex shot of trench 9 looking north.	9
7-8	23	Post-Ex shot of trench 9 looking south.	9
7-8	24	Post-Ex shot of trench 9 looking south.	9
7-8	25	North facing rep-sec of trench 8.	8
7-8	26	North facing rep-sec of trench 8.	8
7-8	27	NW facing sec of cut 803.	8
7-8	28	NW facing sec of cut 803.	8
7-8	29	Post-Ex shot of trench 8 looking east.	8
7-8	30	Post-Ex shot of trench 8 looking east.	8
7-8	31	Post-Ex shot of trench 8 looking west.	8
7-8	32	Post-Ex shot of trench 8 looking west.	8
7-8	33	SSE facing sec of ditch 1503.	15
7-8	34	SSE facing sec of ditch 1503.	15
7-8	35	SSE facing sec of ditch 1503.	15
7-8	36	ID shot.	
9-10	1	Working shot backfill etc....	
9-10	2	Working shot backfill etc....	

Film	Shot	Description	Trench
9-10	3	Working shot backfill etc....	
9-10	4	Working shot backfill etc....	
9-10	5	Working shot backfill etc....	
9-10	6	Working shot backfill etc....	
9-10	7	Working shot backfill etc....	
9-10	8	Working shot backfill etc....	
9-10	9	Working shot backfill etc....	
9-10	10	Working shot backfill etc....	
9-10	11	Working shot backfill etc....	
9-10	12	Working shot backfill etc....	
9-10	13	Working shot backfill etc....	
9-10	14	Small find #1 pottery vessel fragments 403.	4
9-10	15	Small find #1 pottery vessel fragments 403.	4
9-10	16	Post Ex shot of trench 6 looking SW.	6
9-10	17	Post Ex shot of trench 6 looking SW.	6
9-10	18	NW facing rep-sec of trench 6.	6
9-10	19	NW facing rep-sec of trench 6.	6
9-10	20	Post Ex shot of trench 6 looking NE.	6
9-10	21	Post Ex shot of trench 6 looking NE.	6
9-10	22	Post Ex shot of trench 6 looking SW.	6
9-10	23	Post Ex shot of trench 6 looking SW.	6
9-10	24	East facing rep-sec of trench 7 looking west.	7
9-10	25	East facing rep-sec of trench 7 looking west.	7
9-10	26	NNW facing sec of 702 looking SSE.	7
9-10	27	NNW facing sec of 702 looking SSE.	7
9-10	28	Post-Ex shot of trench 7 looking north.	7
9-10	29	Post-Ex shot of trench 7 looking north.	7
9-10	30	Post-Ex shot of trench 7 looking south.	7
9-10	31	Post-Ex shot of trench 7 looking south.	7
9-10	32	Post-Ex shot of trench 10 looking south.	10
9-10	33	Post-Ex shot of trench 10 looking south.	10
9-10	34	Trench 10 west facing rep-sec.	10
9-10	35	Trench 10 west facing rep-sec.	10
9-10	36	ID shot.	

## Appendix K OASIS Form

# OASIS DATA COLLECTION FORM: England

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**OASIS ID: networka2-102073**

### Project details

Project name	Spalding, Clay Lake
Short description of the project	An archaeological trial trench evaluation was undertaken by Network Archaeology Ltd as part of a pre-determination planning application outline for a new business park and associated infrastructure at Clay Lake, Spalding, Lincolnshire. Archaeologically significant features and deposits dated to the later Iron Age were revealed along with several undated features which may be of a similar or later date to this period. The features revealed within the trenches consist mainly of ditches, a number of which are likely to represent water management associated with late Iron Age salt making. Several ditches are considered to be related to Iron Age settlement, possibly field systems or enclosure ditches, while the rest are believed to be drainage ditches of a later date.
Project dates	Start: 03-05-2011 End: 20-05-2011
Previous/future work	Not known / Not known
Any associated project reference codes	H16-0347-11 - Planning Application No.
Any associated project reference codes	LCNCC: 2011.76 - Museum accession ID
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 3 - Operations to a depth more than 0.25m
Current Land use	Vacant Land 3 - Despoiled land (contaminated derelict and ?brownfield? sites)
Monument type	OCCUPATION SITE Late Iron Age
Monument type	SALT PRODUCTION SITE Late Iron Age
Significant Finds	BRIQUETTES Late Iron Age
Significant Finds	POTTERY Late Iron Age
Methods & techniques	'Sample Trenches'
Development type	Extensive green field commercial development (e.g. shopping centre, business park, science park, etc.)
Prompt	Direction from Local Planning Authority - PPS
Position in the planning process	Pre-application

### Project location

Country	England
Site location	LINCOLNSHIRE SOUTH HOLLAND SPALDING Clay Lake, Spalding
Postcode	PE112FN
Study area	1800.00 Square metres
Site coordinates	TF 25680 21090 52.7724051109 -0.136777481371 52 46 20 N 000 08 12 W Point
Height OD / Depth	Min: 1.00m Max: 2.80m

#### Project creators

Name of Organisation	Network Archaeology Ltd
Project brief originator	Local Planning Authority (with/without advice from County/District Archaeologist)
Project design originator	Network Archaeology Ltd
Project director/manager	Michael Wood
Project supervisor	Christopher Casswell
Type of sponsor/funding body	Landowner
Name of sponsor/funding body	Ashley King developments ltd.

#### Project archives

Physical Archive recipient	The Collection Lincoln
Physical Contents	'Animal Bones','Ceramics','Environmental','other'
Digital Archive recipient	The Collection Lincoln
Digital Contents	'Animal Bones','Ceramics','Environmental','other'
Digital Media available	'GIS','Spreadsheets','Survey','Text'
Paper Archive recipient	The Collection Lincoln
Paper Contents	'Animal Bones','Ceramics','Environmental','other'
Paper Media available	'Context sheet','Drawing','Matrices','Photograph','Plan','Report','Section','Survey'

#### Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Clay Lake Spalding, Lincolnshire Archaeological Trial Trench Evaluation
Author(s)/Editor(s)	Casswell,C
Other bibliographic details	578
Date	2011



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Entered on 31 May 2011

## **Plates**

- Plate 1 General site shot within the turkey farm.
- Plate 2 General site shot of eastern half of site.
- Plate 3 Broken late Iron Age handmade jar in the base of ditch 403 in Trench 4.
- Plate 4 Re-cut of late Iron Age ditch 512 in Trench 5.
- Plate 5 Post-excavation shot of Trench 5, looking southwest.
- Plate 6 Post-excavation shot of southern extension to Trench 13, looking north.
- Plate 7 Southeast facing section of ditch 1314 in Trench 13.
- Plate 8 North facing section of posthole 1320 cutting ditch 1323 in Trench 13.
- Plate 9 South facing section of ditch 1503 in Trench 15.
- Plate 10 Briquetage with bleached white interior, repaired with unbleached red clay.



**Plate 1** General site shot within the turkey farm.



**Plate 2** General site shot of eastern half of site.





**Plate 3** Broken late Iron Age handmade jar in the base of ditch **403** in Trench 4.



**Plate 4** Re-cut of late Iron Age ditch **512** in Trench 5.





**Plate 5** Post-excavation shot of Trench 5, looking southwest.



**Plate 6** Post-excavation shot of southern extension to Trench 13, looking north.





**Plate 7** Southeast facing section of ditch **1314** in Trench 13.



**Plate 8** North facing section of posthole **1320** cutting ditch **1323** in Trench 13.





**Plate 9** South facing section of ditch **1503** in Trench 15.



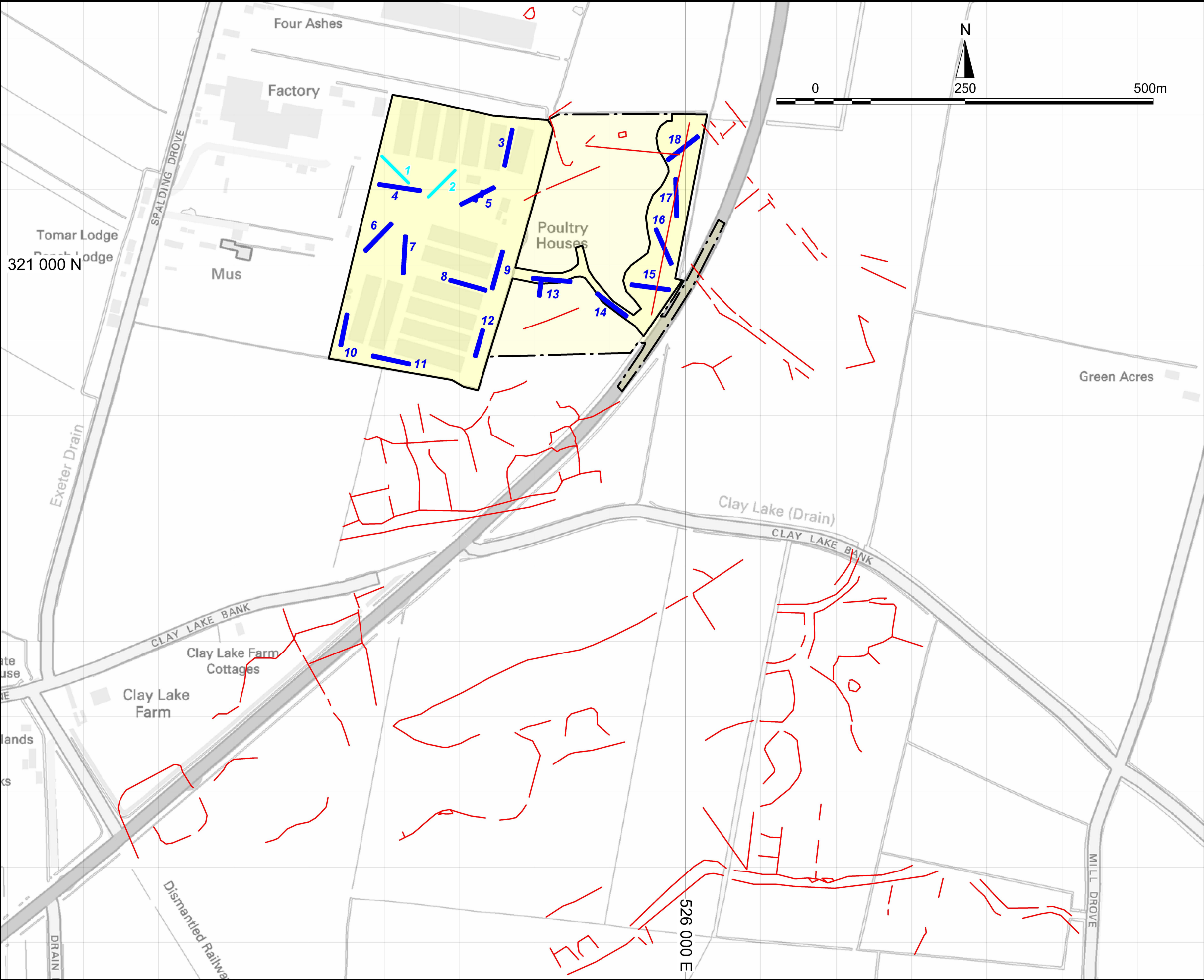
**Plate 10** Briquetage with bleached white interior, repaired with unbleached red clay.

# Figures

- Figure 01 Location of development area
- Figure 02 Location of proposed development area in relation to cropmark data
- Figure 03 Location of evaluation trenches in relation to cropmark data
- Figure 04 Plans and sections of Trenches 3 and 4
- Figure 05 Plans and sections of Trench 5
- Figure 06 Plans and sections of Trenches 6, 7 and 8
- Figure 07 Plans and sections of Trenches 9, 10 and 11
- Figure 08 Plans and sections of Trenches 12 and 13
- Figure 09 Plans and sections of Trenches 14, 15 and 16
- Figure 10 Plans and sections of Trenches 17 and 18
- Figure 11 Briquetage, number 1-15







- Proposed development area
- Evaluation area
- Evaluation trench
- Unexcavated evaluation trench
- Cropmarks

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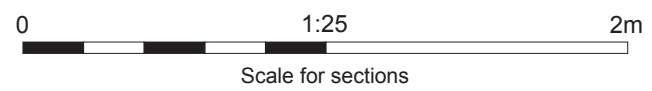
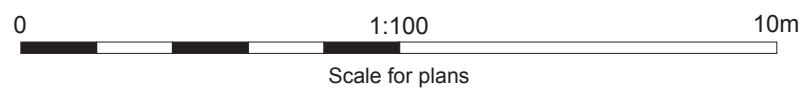
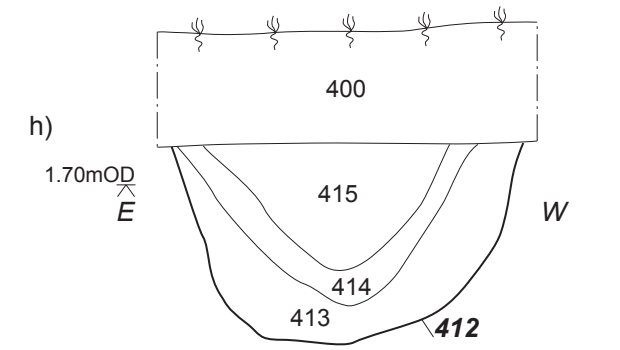
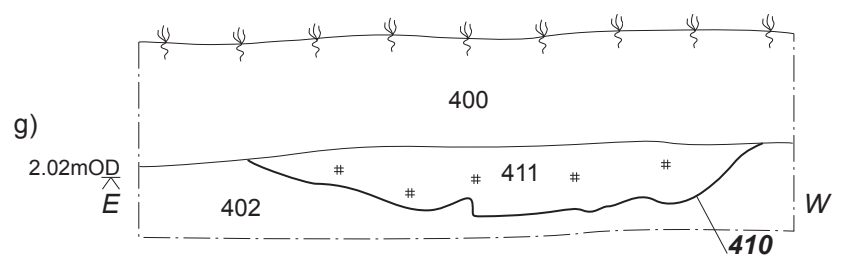
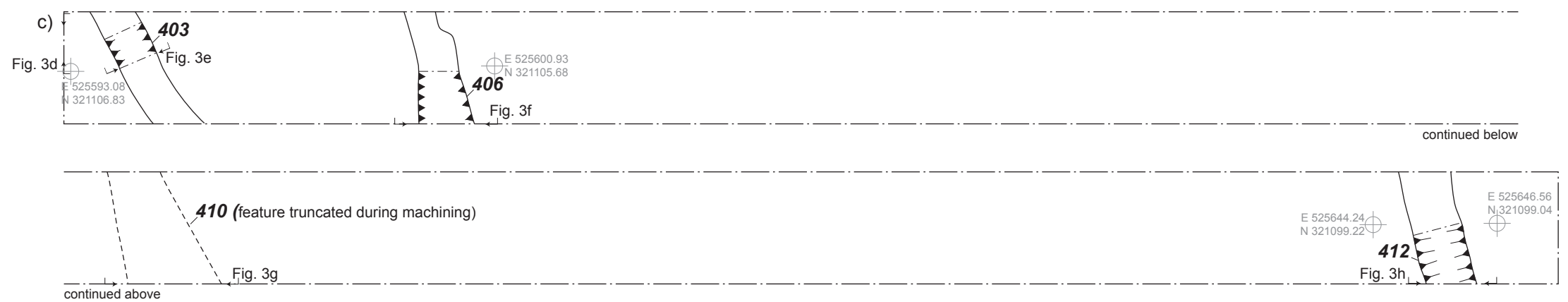
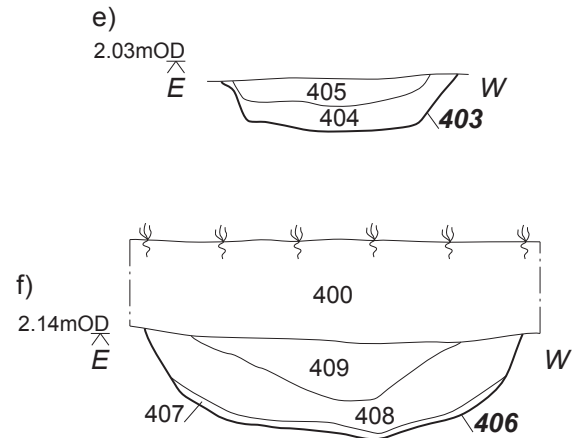
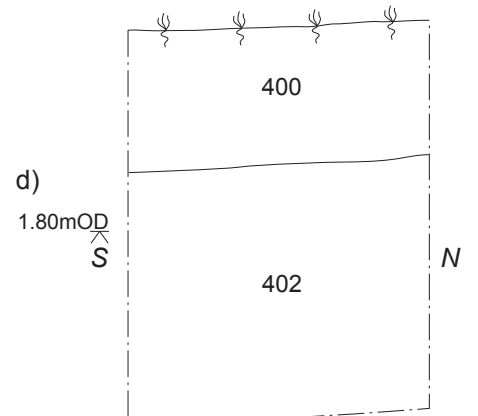
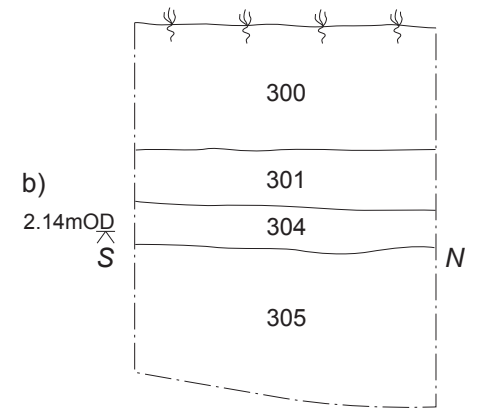
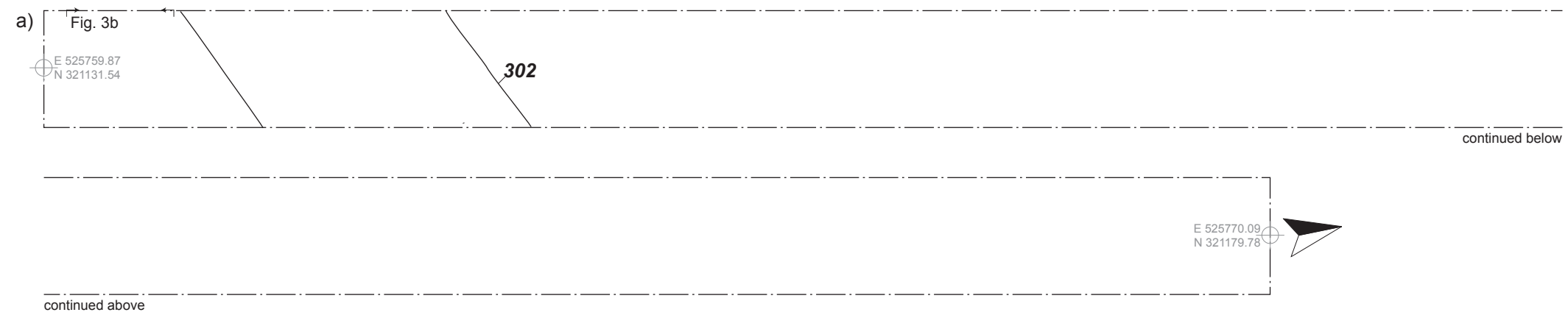
Ver	Date	Description	Drn	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	30/09/11	Scale change	AH	CC	CT
1.00	31/05/11	First issue	SAF	CC	CT



Clay Lake, Spalding

Figure 2  
Evaluation trenches and  
cropmarks

Scale: 1:5000



- Limit of excavation
- Cut line
- Layer line
- Projected cut line
- Field drain
- 1234 Cut number
- 1233 Layer/fill number
- Charcoal

Ver	Date	Description	Drn	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.01	23/5/11	Trenches 3 & 4	JLC	CC	MW



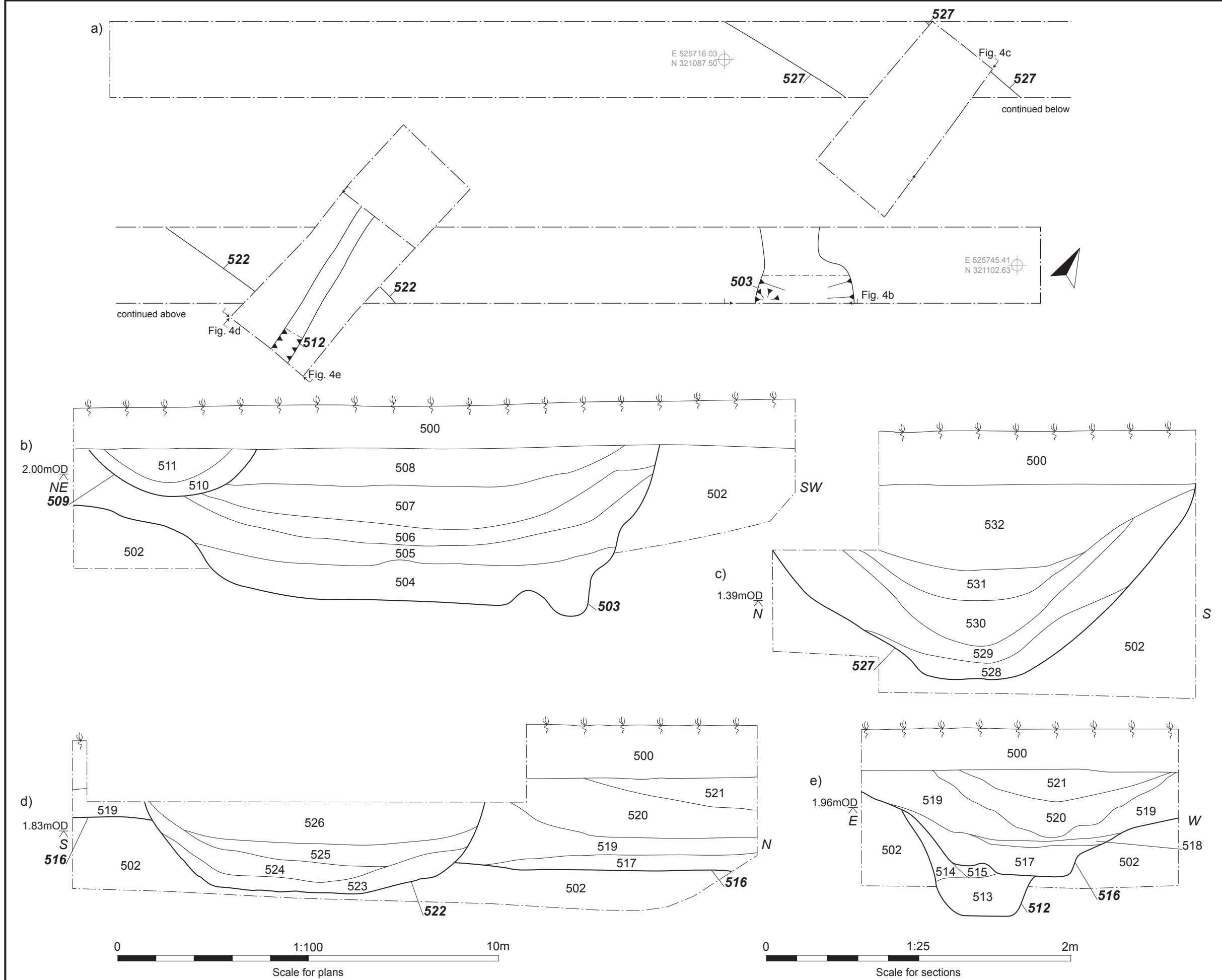
**Clay Lakes, Spalding**

Figure 3: Plans and sections of Trenches 3 and 4

a) Plan of Trench 3  
b) Representative section, Trench 3  
c) Plan of Trench 4  
d) Representative section, Trench 4  
e) Section of ditch 403, Trench 4  
f) Section of ditch 406, Trench 4  
g) Section of ditch 410, Trench 4  
h) Section of ditch 412, Trench 4

Scales 1:100 and 1:20





- Limit of excavation
- Cut line
- Layer line
- Field drain
- 1234** Cut number
- 1233 Layer/fill number

Ver	Date	Description	DM	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.01	23/5/11	Trench 5	JLC	CC	MW



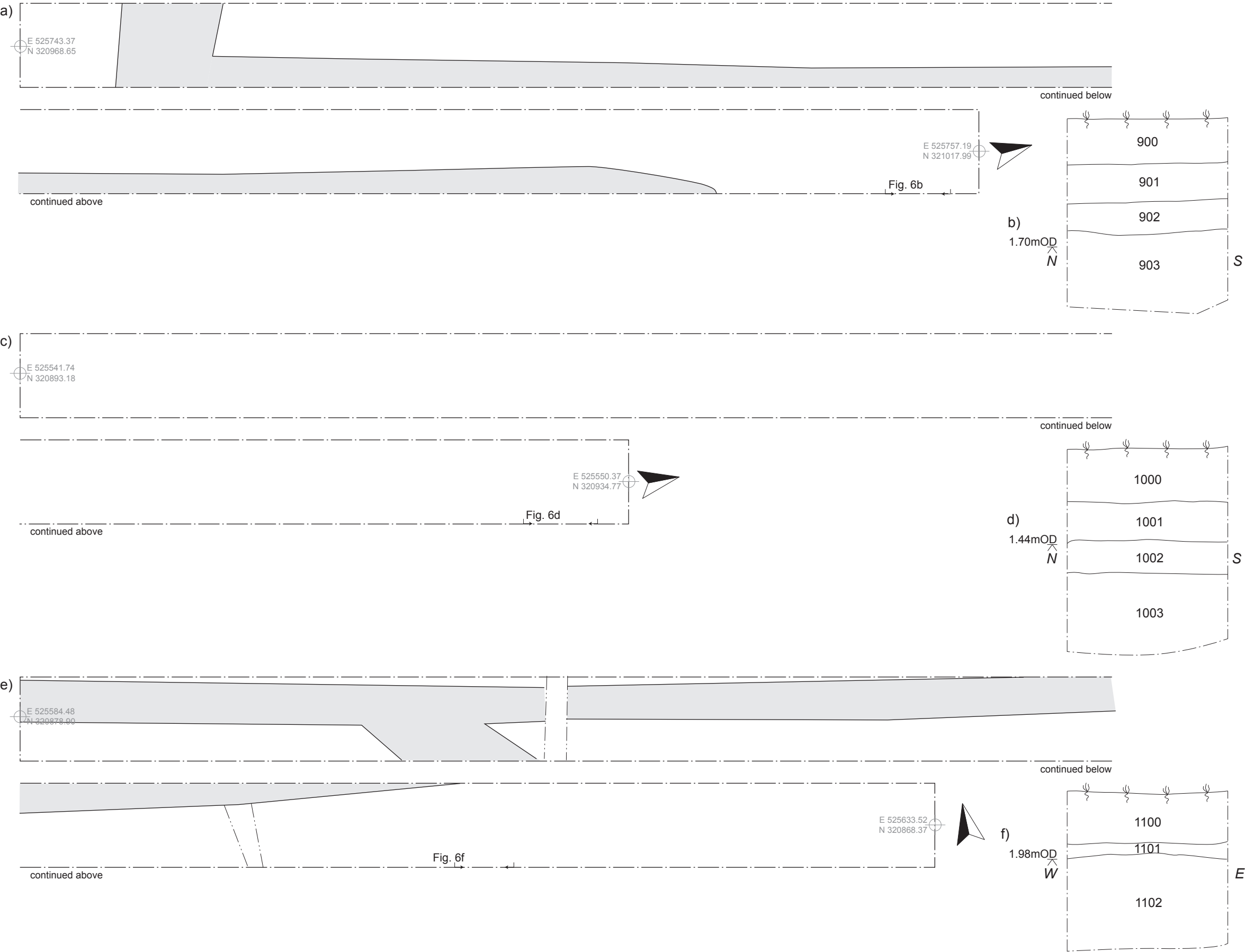
**Clay Lakes, Spalding**

Figure 4: Plans and sections of Trench 5

a) Plan of Trench 5  
b) Section of ditch 503, Trench 5  
c) Section of ditch 527, Trench 5  
d) Section of ditches 522 and 516, Trench 5  
e) Section of ditches 512 and 516, Trench 5

Scales 1:100 and 1:25





- Limit of excavation
- Cut line
- Layer line
- Field drain
- Modern feature
- 1234** Cut number
- 1233 Layer/fill number

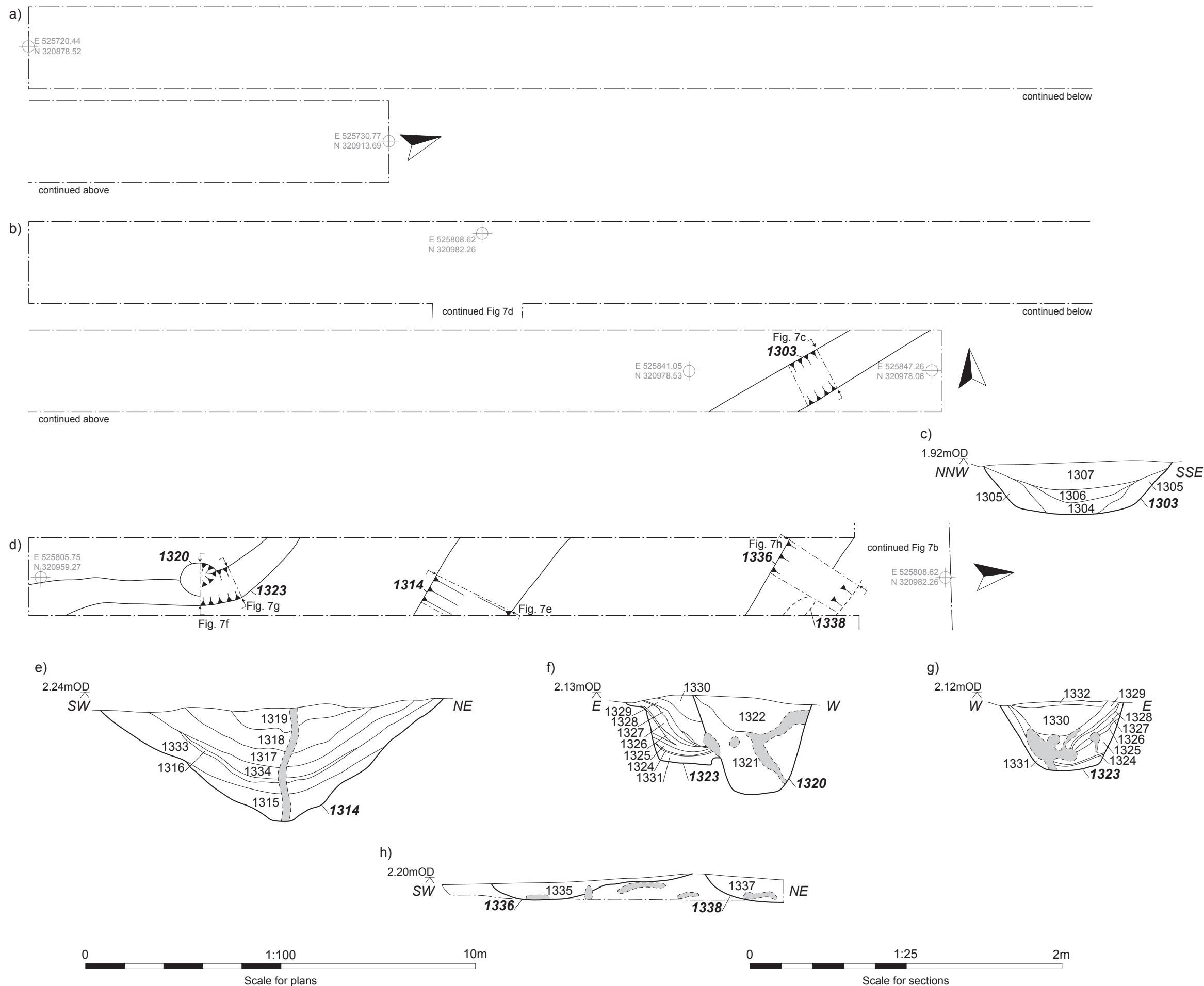
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2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.1	24/5/11	Trenches 9-11	JLC	CC	MW
Ver	Date	Description	DM	Chk	App

**Clay Lakes, Spalding**

Figure 6: Plans and sections of Trenches 9, 10 and 11

a) Plan of Trench 9  
b) Representative section, Trench 9  
c) Plan of Trench 10  
d) Representative section, Trench 10  
e) Plan of Trench 11  
f) Representative section, Trench 11

Scales 1:100 and 1:25



Ver	Date	Description	DM	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.1	24/5/11	Trenches 12 & 13	JLC	CC	MW

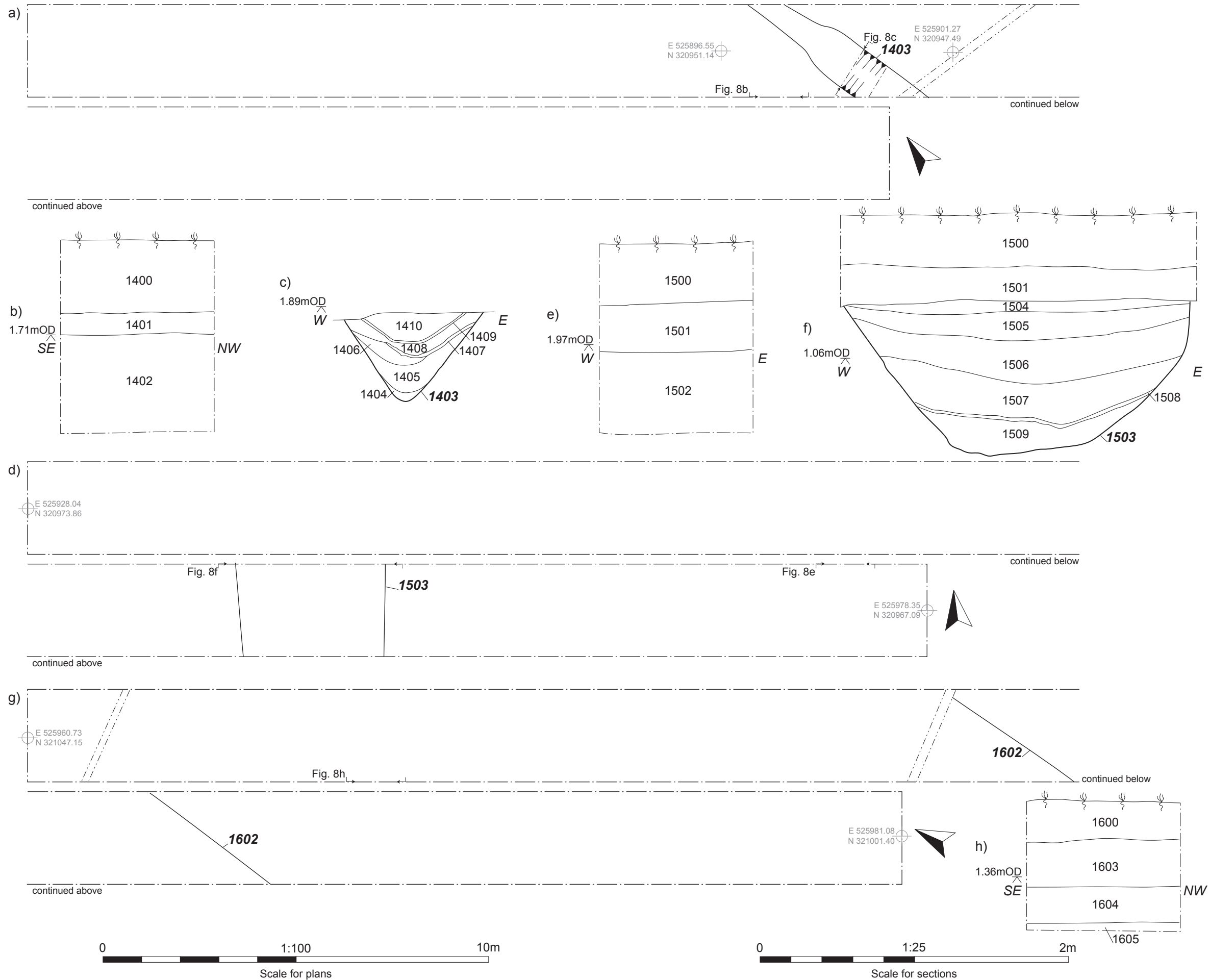
**network archaeology**

**Clay Lakes, Spalding**

**Figure 7: Plans and sections of Trenches 12 and 13**

a) Plan of Trench 12  
b) Plan of Trench 13  
c) Section of ditch 1303, Trench 13  
d) Plan of Trench 13 southern extension  
e) Section of ditch 1314, Trench 13  
f) Section of ditches 1320 and 1323, Trench 13  
g) Section of ditch 1323, Trench 13  
h) Section of ditches 1336 and 1338, Trench 13

Scales 1:100 and 1:25



--- --	Limit of excavation
—	Cut line
—	Layer line
---	Field drain
<b>1234</b>	Cut number
1233	Layer/fill number

Ver	Date	Description	DM	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.1	24/5/11	Trenches 14-16	JLC	CC	MW



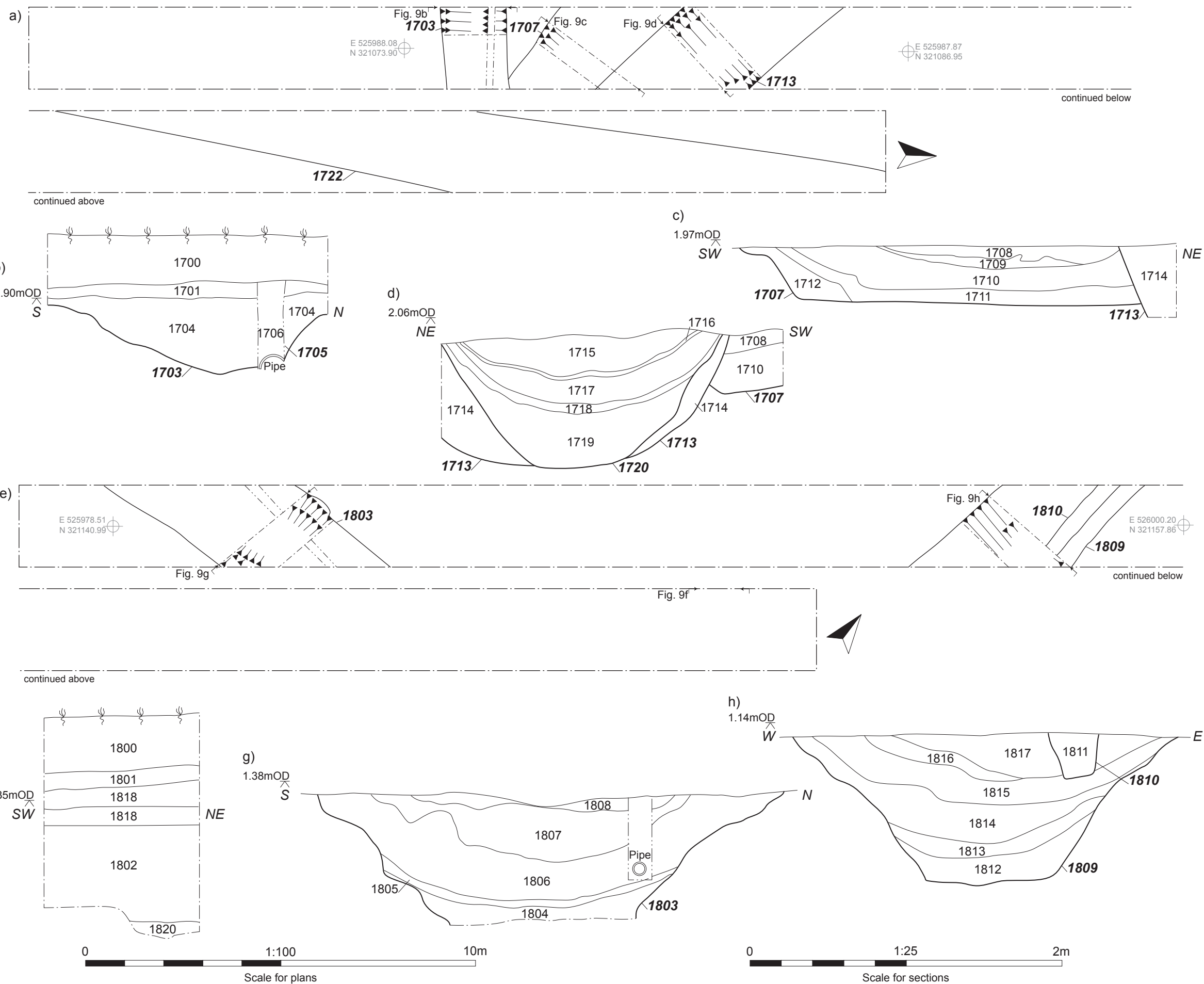
**Clay Lakes, Spalding**

Figure 8: Plans and sections of Trenches 14, 15 and 16

a) Plan of Trench 14  
b) Representative section, Trench 14  
c) Section of ditch 1403, Trench 14  
d) Plan of Trench 15  
e) Representative section, Trench 15  
f) Section of ditch 1503, Trench 15  
g) Plan of Trench 16  
h) Representative section, Trench 16

Scales 1:100 and 1:25





- Limit of excavation
- Cut line
- Layer line
- Field drain
- 1234** Cut number
- 1233 Layer/fill number

Ver	Date	Description	DM	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	4/10/11	Second issue	JLC	CC	CT
1.00	28/9/11	First issue	JLC	CC	MW
0.1	25/5/11	Trenches 17 & 18	JLC	CC	MW

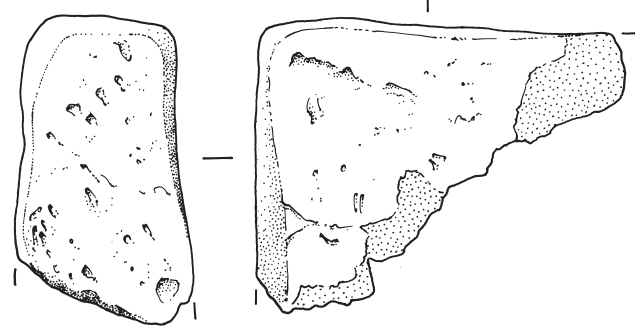
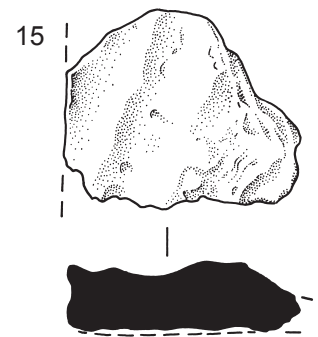
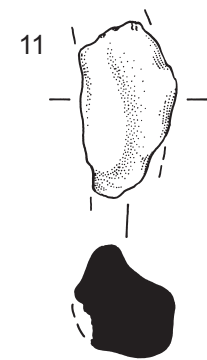
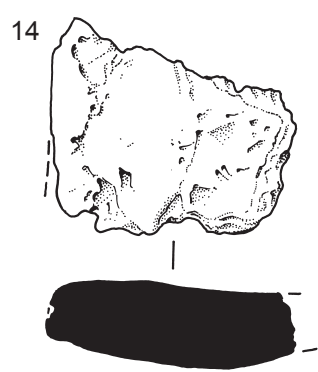
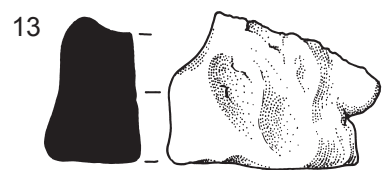
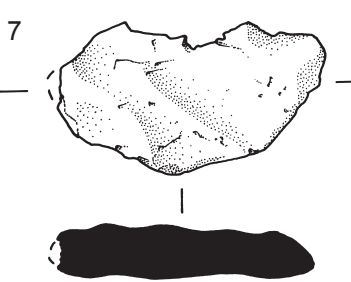
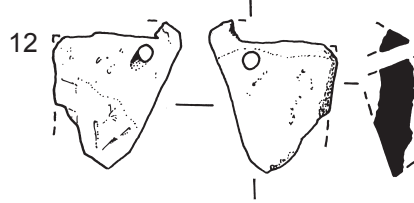
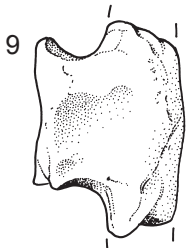


Clay Lakes, Spalding

Figure 9: Plans and sections of Trenches 17 and 18

- a) Plan of Trench 17
- b) Section of ditch 1703, Trench 17
- c) Section of ditches 1707 and 1713, Trench 17
- d) Section of ditches 1707, 1713 and 1720, Trench 17
- e) Plan of Trench 18
- f) Representative section, Trench 18
- g) Section of ditch 1803, Trench 18
- h) Section of ditch 1809 and 1810, Trench 18

Scales 1:100 and 1:25



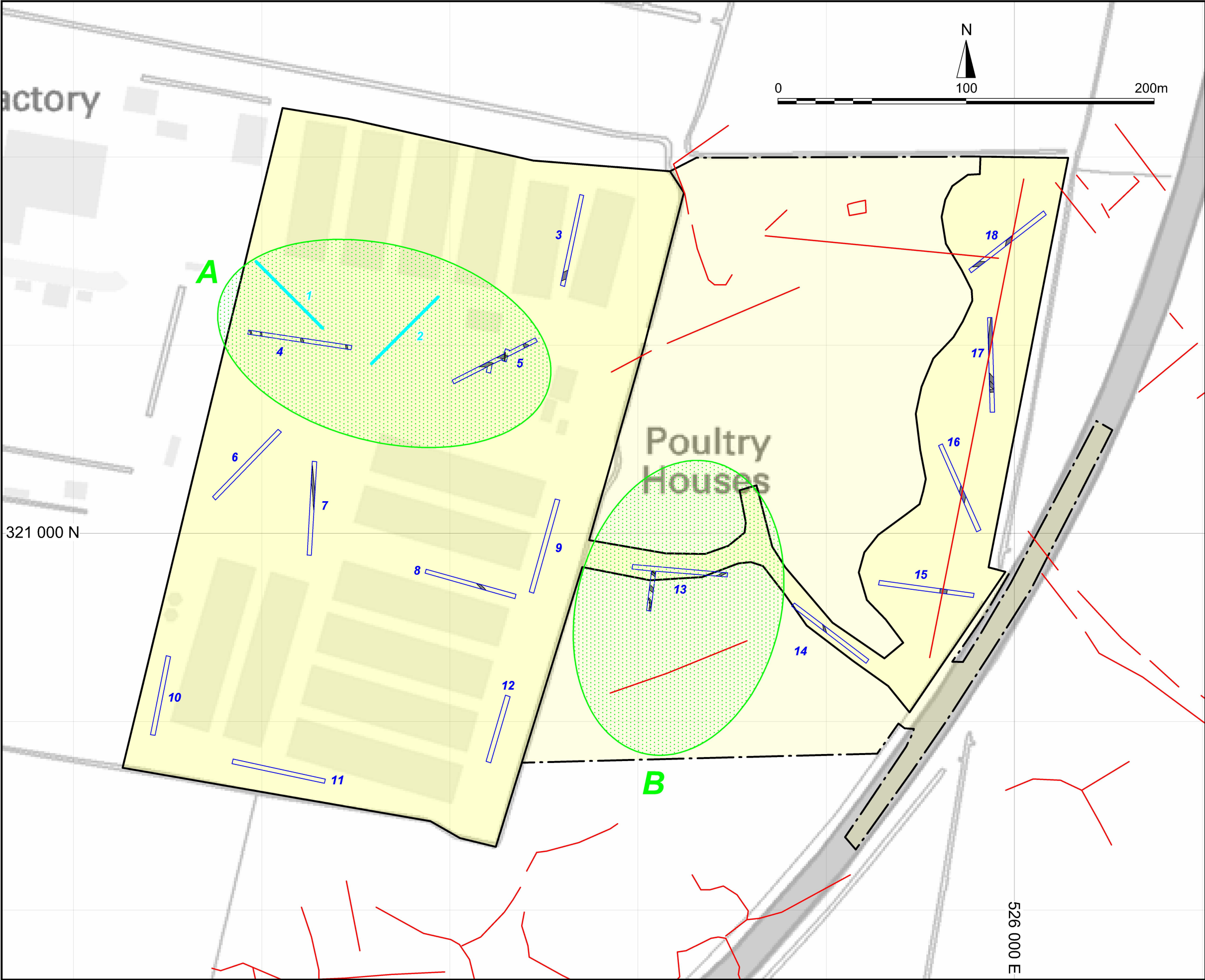
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2.00	4/10/11	Second issue	JLC	CC	CT
0.1	21/9/11	Briquetage	DW	CC	MW
Ver	Date	Description	DM	Chk	App



Clay Lakes, Spalding

Figure 10: Briquetage

Scale 1:2



- Proposed development area
- Evaluation area
- Zone of archaeological interest
- Archaeological features
- Evaluation trench
- Unexcavated evaluation trench
- Cropmarks

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Ver	Date	Description	Drn	Chk	App
3.00	23/11/11	Third issue	JLC	CC	CT
2.00	03/10/11	Second issue	JLC	CC	CT
1.00	31/05/11	First issue	SAF	CC	CT



Clay Lake, Spalding

Figure 11  
Proposed development area  
and zones of archaeological  
interest

Scale: 1:5000