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The Results of an Archaeological Field Evaluation by Trial Trenching and Archaeological Excavation at Humbie Farm, Kirkliston (Land Parcel 15)

Archaeological Consultant: Jacobs Arup
Report Authors: Elizabeth Jones
Report Status: Approved



Executive Summary

Headland Archaeology conducted an archaeological evaluation by trial trenching at Humble Farm, Kirkliston (Land Parcel 15), NGR: NT 1134 7476 (centred), to assess the presence/absence of archaeological remains or deposits in an area identified as having good archaeological potential in the Forth Replacement Crossing Environmental Statement (Jacobs Arup, 2009a). The work was commissioned by Transport Scotland, managed and monitored by Jacobs Arup and undertaken in advance of the proposed commencement of construction works.

A total of 25 trenches with an overall area of 4300 m² were excavated comprising a 5% sample of Land Parcel 15. The trial trenching revealed a series of north to south orientated furrows relating to post medieval agricultural activity on site. At the north-east end of the site modern made ground deposits were encountered, these were presumed to relate to the construction of the motorway bridge.

The trial trenching also identified a kiln in the far south-western corner of the site. This comprised a large pit filled with burnt stones, charcoal and limestone, with finds dating to the 18th – 19th century. The trench was extended in order to reveal the extent of the kiln and revealed further deposits running downhill of the kiln to the east. This area was subject to further excavation and an area measuring 20 m by 20 m was excavated centred on the kiln. The remains of the kiln comprised a semi-circular stone structure set into a large pit, which had been truncated on its eastern side. At least two phases of use were evident within the pit, which contained a hard burnt clay floor with a small drain cut into it. The presence of a large lump of lime within the pit suggests it was used for making agricultural lime. The large cut truncating the pit probably represents an infilled quarry, which is depicted on the first edition Ordnance Survey map of 1856.

ARCHAEOLOGICAL EVALUATION

Forth Replacement Crossing: Land Parcel 15, Humble Farm, Kirkliston

PROJECT SUMMARY SHEET (FRCE10)

<i>Client</i>	Transport Scotland
<i>Consultant</i>	Jacobs Arup
<i>National Grid Reference</i>	NT 1134 7476 – site centre evaluation NT 1115 7469 – site centre excavation
<i>Project Manager</i>	Edward Bailey/Russel Coleman
<i>Text</i>	Elizabeth Jones
<i>Illustrations</i>	Julia Bastek
<i>Evaluation Team</i>	Samira Ben Mohammed Ian Hill Elizabeth Jones Jurgen van Wessel
<i>Excavation Team</i>	Elizabeth Jones Richard Tuffin
<i>Schedule</i>	
Evaluation	31 st March – 5 th April 2011
Excavation	26 th – 29 th April
Report	May 2011

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1 Introduction

1.1 General

- 1.1.1 This Data Structure Report is submitted as a report on a programme of archaeological trial trenching to Jacobs Arup and Transport Scotland in respect of the proposed Forth Replacement Crossing (hereinafter 'FRC'), and in accordance with the mitigation measures recommended in the FRC Environmental Statement Chapter 14 (Cultural Heritage) wherein the requirement for a programme of trial trenching was identified (Jacobs Arup 2009a).
- 1.1.2 Between the 31st March and 5th April 2011, Headland Archaeology (UK) Ltd. undertook a programme of archaeological evaluation by trial trenching on Land Parcel 15 on the southern side of the landfall for the FRC (Illus 1). The project was managed by Edward Bailey (Project Manager), the fieldwork and reporting was overseen by Elizabeth Jones (Senior Archaeologist). Four additional staff members were involved throughout the evaluation.
- 1.1.3 Between the 26th – 29th April Headland Archaeology (UK) Ltd. undertook a targeted excavation based on the results of the evaluation. This comprised excavation of an area 20 m by 20 m in the south-western corner of Land Parcel 15. The project was managed by Russel Coleman (Project Manager) and the fieldwork and reporting was undertaken by Elizabeth Jones (Senior Archaeologist) and one other archaeologist.

1.2 Project Background

- 1.2.1 In December 2007, following the completion of the FRC Study as part of the Strategic Transport Project Review (hereinafter 'STPR'), the Scottish Government confirmed the intention to provide a new cable-stayed bridge to the west of the existing Forth Road Bridge. Jacobs Arup (as a joint venture) was commissioned in January 2008 to assist Transport Scotland to develop the FRC proposals, to undertake an Environmental Impact Assessment (hereinafter 'EIA') and to prepare an Environmental Statement (hereinafter 'ES') (Jacobs Arup 2009a).
- 1.2.2 The purpose of the cultural heritage component of the EIA was to identify the cultural heritage baseline, evaluate the likely significant impacts that the proposed development would have on this resource, and provide mitigation measures to ameliorate any impacts.
- 1.2.3 The cultural heritage baseline data for the EIA was obtained via a desk-based assessment and walkover survey undertaken in 2008-2009 in accordance with the principles set out in DMRB Volume 11, Section 3 Part 2 'Cultural Heritage' (HA 208/07; Highways Agency 2007). Further information was also gathered during archaeological watching briefs on Ground Investigations for the proposed scheme carried out during 2008 and 2009 by variously Jacobs Arup, Glasgow University Archaeology Research Division and Headland Archaeology Ltd in accordance with the requirements of Historic Scotland to whom the results were reported (Transport Scotland 2010, 30).

- 1.2.3 Based on the results of the EIA the ES recommended that a programme of invasive and non-invasive archaeological works be undertaken to include resistivity survey and trial trenching (Jacobs Arup 2009a).

1.3 *Aims and Objectives of the Archaeological Works*

- 1.3.1 The general objectives of the programme of archaeological works (Transport Scotland 2010) were to:

- ensure that significant archaeological or palaeoenvironmental remains shall be neither needlessly destroyed, nor destroyed without record;
- identify any unknown archaeological remains that may be affected by the scheme;
- enable a more confident assessment of the impact of construction of the proposed scheme on archaeological remains;
- enable the identification and design of any measures that may be necessary to mitigate the impact of the proposed scheme on newly identified archaeological remains;
- enhance available information about known archaeological remains, where existing information is insufficient to enable a full assessment of impact or the design of mitigation measures.

- 1.3.2 Following the results of the evaluation the objectives of the excavations were to:

- Clarify the nature, character and extent of the features identified during the evaluation and obtain a plan of any additional features identified during the excavation.
- Identify any structures or activity areas and the date and duration of any settlement remains
- Obtain artefactual and environmental evidence for the purposes of dating and interpretation of the site

2 **Site Background**

2.1 *Archaeological and Historical Background*

- 2.1.1 Within a study area ranging in extent from 500m from the proposed route to 6km from the proposed main crossing a total of 356 cultural heritage sites were identified by the ES, whilst a desk-based assessment of a wider study area undertaken at route selection stage, identified a total of 1200 cultural heritage sites (Transport Scotland 2010, 30). The results from these studies show that the scheme is located in a landscape containing archaeological evidence dating from the Mesolithic period, through the prehistoric and medieval periods, up to post-medieval and modern times.

- 2.1.2 Within the vicinity of the of the M9 Junction 1a improvements (Illus 1) prehistoric activity has been recorded in the form of a Late Bronze Age socketed axe found near Kirkliston. Latterly there are written records from 1513 that refer to a Kirkliston House acquired by the Commandery of Torphichen although the exact location of the house is not recorded. Based on the coordinates provided by the Royal Commission

on the Ancient and Historic Monuments of Scotland both these sites are located within 1 km of Land Parcel 16 and indicate the potential for prehistoric and medieval settlement in the area.

2.2 *Site Topography and Land Use*

- 2.2.1 The site is located to the west of the village of Kirkliston and is bounded by the B9080 to the north, by woodland to the south and east and by the M9 slip road to the east. The ground is generally flat, but slopes downhill towards the south-west, where the ground is more undulating. At the time of the evaluation the field was under young crop. The site is under the ownership of J G Dudgeon and sons.

2.3 *Site Geology*

- 2.3.1 The results of geotechnical investigations (Jacobs Arup 2009b) carried out demonstrate that the subsurface stratigraphy generally constitutes glacial till deposits of varying thickness; these are predominantly comprised firm to very stiff boulder clay deposits with occasional granular till deposits. The trial trenching (below) has identified small patches of free-draining sands and larger bands of bedrock.
- 2.3.1 The solid geology of the site is typified by igneous alkali dolerite (British Geological Survey 2008). The alkaline nature of the bedrock geology has the effect of breaking up the structure of clays within the soil matrix which negatively affects its water holding capacity, similar to the effect agricultural lime has on arable soils.

3 **Methodology**

3.1 *Evaluation*

- 3.1.1 All works were undertaken in accordance with the specification in the contract documents (Transport Scotland 2010), which had been agreed with Historic Scotland and Transport Scotland. The total area of the Land Parcel measured 84,686 m², of which a 5% sample (or 4300 m²) was investigated by trial trenching. An indicative trench plan was agreed with the consultant archaeologists, Jacobs Arup.
- 3.1.2 All trenches were individually numbered and a pole-mounted Trimble G6 differential GPS programmed with the relevant coordinates was utilised to identify and mark out the locations of trenches. The trenches were excavated using one 13 ton 360° tracked mechanical excavator, fitted with a 2 m wide flat-bladed ditching bucket. The machine operated under continuous archaeological supervision and turf, topsoil and subsoil were removed down to the first archaeological horizon or clean geological deposits, whichever was met first. Topsoil and subsoil were stored separately. Any potential features identified were hand cleaned and investigated appropriately. Archaeological features and deposits were hand excavated and recorded using standard archaeological methods and pro-forma record sheets. The excavated trenches and any archaeological contexts were recorded using a Trimble G6 differential GPS, as well as hand drawing where appropriate. Photographs were taken using colour slide film, black and white film, and digital.

- 3.1.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Institute for Archaeologists 2008).

3.2 *Excavation*

- 3.2.1 All works were undertaken in accordance with the specification in the contract documents (Transport Scotland 2010), which had been agreed with Historic Scotland and Transport Scotland. The total area excavated was 400 m², comprising a trench measuring 20m by 20m centred on the kiln.

- 3.2.2 The area was excavated using a 13 ton 360° tracked mechanical excavator, fitted with a 2m wide flat-bladed ditching bucket. The machine operated under continuous archaeological supervision and turf, topsoil and subsoil were removed down to the first archaeological horizon or clean geological deposits, whichever was met first. All potential features identified were hand cleaned and investigated appropriately. Archaeological features and deposits were hand excavated and recorded using standard archaeological methods and pro-forma record sheets. The excavation area and archaeological contexts were recorded using a Total Station EDM linked to a field computer running *TheoLT* software. Photographs were taken using colour slide film, black and white film and digital.

- 3.2.3 Bulk soil samples were collected from secure archaeological contexts for processing and assessment. Where possible a minimum 30-litre sample was collected from each archaeological deposit and given a unique number (Transport Scotland 2010, 59). Samples were processed in laboratory conditions using a standard floatation method (cf Kenward *et al* 1980). All plant macrofossil samples were analysed using a stereo-microscope at magnifications of x10 and up to x100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al* (2006).

- 3.2.4 All finds were recorded by individual context and their cleaning, storage and conservation undertaken in accordance with the Institute for Archaeologists Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Institute for Archaeologists 2008).

4 **Results of Fieldwork (Illus 2)**

4.1 *Trial Trenching*

- 4.1.1 Twenty-five trenches were excavated across Land Parcel 15 (Illus 2) with a combined total area of 4300 m². Full detailed descriptions of each trench and individual contexts can be found in Appendix 1 and Appendix 2. Results are summarised below.

- 4.1.2 The natural geology seen in the trenches was largely orange and grey clays [011], with occasional shattered bedrock fragments or outcrops. This was generally overlain by 0.30 m of mid brown clayey silt topsoil [026], although this was deeper in the undulating trenches in the south-west of the site. The topsoil contained little recent ceramic material.
- 4.1.3 Colluvial deposits were identified in Trench 4, which ran across a sharp north to south dip in the field. These were up to 0.3m in depth and comprised greyish brown clayey silt [027].
- 4.1.4 Trench 1 contained a large pit [006], which appeared to be the remains of a kiln (Illus 3 & 4). The south-east quadrant of the kiln was excavated during the evaluation. The base of the kiln comprised bright red burnt clay natural [005], which had become baked through repeated firings and contained occasional coal flecks. Above this, the basal fill [004] comprised firm mid brown to black clay, coal and charcoal, containing vitrified material as well as fragments of bone and iron. A large lump of limestone [007] was found above this deposit. The pit had been backfilled with a deposit of clay and rubble [003], also containing coal and charcoal. The southern edge of the kiln was not clearly defined but the kiln measured approximately 2.90 m by 2.70 m in plan and was 0.40 m in depth.
- 4.1.5 Trench 1 was extended on three sides in order to fully expose the feature. The southern edge of the kiln appeared to have been truncated. To the south of the kiln further deposits were revealed (Illus 2), comprising dark grey clayey silts and containing coal and charcoal [010]. These were not investigated during the evaluation and it was unclear whether they related to the kiln.
- 4.1.6 Furrows were found in Trenches 4, 6, 7, 19, 20, 21, 22, 23, 24 and 25 (Illus 2). These ran in a north to south direction and were on average 2m wide and 5 – 8 m apart. The interface between the furrows and the natural subsoil was very unclear. Excavation of a furrow [001] in Trench 4 showed it to be 1.64 m in width and 0.18 m in depth, with shallow sloping sides and a concave base. It was filled with firm grey silt [002]. The remaining furrows were not subjected to excavation and were recorded in plan only.
- 4.1.7 Rubble drains were also found in a number of the trenches. These generally ran east to west across the field, with some drains running north-west to south-east.
- 4.1.8 At the eastern end of Trench 25 was a mixed spread of pinkish stone and grey clay; plastic bags were found within the deposit. The deposit was not excavated and is thought to represent made ground associated with the construction of the motorway bridge immediately to the east of the site.

4.2 *Excavation*

- 4.2.1 The kiln identified during the evaluation was fully excavated during the excavation. The excavation also revealed the extent of the deposits found in the eastern end of Trench 1 and the nature of the truncation of the kiln. A full description of the deposits and the kiln matrix are given in Appendices 2 and 3.

- 4.2.2 The Phase 1 kiln [006] was cut into natural clay [011], which sloped gently to the east. The bowl was roughly oval in plan and measured 2.10 m north to south and 2 m east to west. The kiln had been truncated on its eastern edge and so the full form and extent is unknown. The sides sloped fairly steeply to a flat base, 1.40 m wide (north to south) and it was 0.60 m in depth. At the base of the kiln was a layer of compact burnt red clay [005] 0.05 m thick (Illus 5, 6, 7 & 8).
- 4.2.3 There was a hiatus in the use of the kiln and some modifications were made. An L-shaped drain [023] was cut along the north and west sides of the kiln through the burnt clay base [005]. This was 0.30 m wide and 0.25 m deep and was filled with medium-sized angular stones within a damp greyish-brown silt matrix [021]. Overlying this and the burnt base was a thin layer of greyish brown clay [018] containing burnt clay fragments, clay and small stones.
- 4.2.4 The stone footings [019] forming the structure of the Phase 2 kiln were laid on top of [018]. These were large angular stones, up to 0.40 m wide, with occasional rounded stones and formed two rough courses inside the bowl. Once laid they formed a sub-square structure inside the cut. They were packed with mid brown silty clay [020] containing large lumps of coal and clean clay; bottle glass and iron objects were also found within this material. At the west end there was a small gap between the stones, which had been capped with slate (Illus 7). Behind this slate two small subsurface voids were found cut into the natural [025]. The clay around the entrance to these voids was baked red (Illus 8). The northern void was 0.20 m in diameter and extended for 0.30 m; the southern one was 0.10 m in diameter and was 0.20 m in length.
- 4.2.5 A second layer of burnt clay [017] represented the use of the Phase 2 kiln. This was 0.03 m in depth and was overlain by a layer of mixed coal, clay and charcoal [004] 0.05 m in depth (Illus 5 & 7).
- 4.2.6 The abandonment phase of the kiln comprised a series of backfill deposits (Illus 5). A layer of yellowish brown silty clay [016] with charcoal, burnt clay and stones overlay [004] and was in turn sealed by dark grey silty clay [003/022] with lenses of charcoal and patches of burnt clay (Illus 5 & 7). This material was also filling the gap between the stones capped by the slate. Above this slate and extending into the two voids at the west end was a localised deposit of dark grey silty clay [013/024] with frequent charcoal, ash, burnt clay and angular limestone fragments.
- 4.2.7 The kiln had been directly truncated on its eastern side by a large cut [012], which extended across the eastern and southern sides of the site (Illus 2). This had caused disturbance to the fill deposits at the eastern end as seen in section (Illus 5 & 7). Some disturbed structural stones [015] (Illus 4) and a large fragment of limestone [007] were overlain by a layer of yellowish brown silty clay [014] containing occasional stones and charcoal. This deposit was similar to the colluvium [009] described below.
- 4.2.8 Cut [012] was subsequently filled with a mixture of mixed clay, shale and sandstone deposits [010]. This was overlain by a colluvial deposit of yellowish brown sandy clay loam [009]. Overlying this were deposits of burnt shale and coal [008]. These were sealed by topsoil [026].

5 Palaeoenvironmental Assessment

David Masson & Sarah-Jane Haston

5.1 Plant Remains

5.1.1 Four samples were taken from the kiln. The results of the sample processing are provided in Table 1 (Retent finds, Appendix 7) and Table 2 (Floatation finds, Appendix 8). Suitable material for AMS dating is also identified within each table. All plant remains were preserved through charring.

5.1.2 Charred cereal grain is present in only one sample (03), context [014], with a single grain of bread wheat (*Triticum aestivum*). Bread wheat is known to have been cultivated along with oat and hulled barley on the eastern coast of Scotland in the medieval period (Boyd 1988). Wild taxa were generally sparse throughout the samples (see Table 2). The only weed seeds recovered were goosefoots (*Chenopodium* sp.) present in two samples: sample (03) from context [014] and sample (05) from context [003]. Goosefoots are common elements of agricultural fields and waste places and it would seem likely that they originally became charred along with the cereal remains. The low concentration however, makes any detailed discussion of field ecology impossible.

5.1.3 Wood charcoal fragments were found in varying amounts from rare to abundant in all four samples. The large quantities of wood charcoal fragments present in a range of sizes up to 20 mm are suggestive of *in-situ* primary refuse from the kiln or deliberately dumped fire debris. The smaller sized fragments (less than 10 mm) may have been transported across the site by mechanisms such as windblow and surface run-off. Charcoal fragments of a size and condition suitable for identification and/or Accelerated Mass Spectrometry (AMS) dating were recovered in all four samples (see Tables 1 and 2).

5.2 Other finds

5.2.1 Together with the charred plant remains a small number of finds were recovered from the samples. These include two sherds of modern pottery found in sample (04), context [017] and a sherd of modern glass in sample (02), context [013]. Metallic objects were found in two samples (02), context [013] and (05), context [003] and included an iron nail in sample (05). Metallic waste, in the form of magnetic residue was found in abundance in sample (02) and could indicate metal-working activity in the vicinity of the site. A very small amount of unburnt mammal bone was recovered in sample (05). Coal and cinders were recovered in roughly equal abundant quantities from all of the samples processed.

5.3 Discussion

5.3.1 The small number of finds and few palaeoenvironmental remains recovered from the processed samples do not provide conclusive evidence to suggest the function of this feature. The low level domestic and industrial debris recovered from the deposits are unlikely to relate to the original function of the kiln. The samples did not contain burnt limestone to suggest the production of lime, abundant magnetic waste to suggest metalworking nor was any abundance of carbonised grain found to indicate

that the kiln was used for corn drying. The absence and relative absence of any of these materials could suggest that the kiln was cleaned out regularly with any rake-out material having been lost through the passage of time.

- 5.3.2 All samples did, however, contain high concentrations of coal and cinders. The quantity of coal recovered compared to the relatively high amount of large sized wood charcoal suggests that it was the predominant fuel used in the kiln feature. The use of coal for fuel, within the Forth area, did not commence until the medieval period and the presence of coal and cinders within the kiln features suggest that it is likely to be of medieval or post-medieval date.

5.4 *Recommendations*

- 5.4.1 Further detailed analysis of the finds or palaeoenvironmental remains would add little to that gained above. Therefore no further work is recommended.

6 **Conclusions**

- 6.1 The general picture of the site from the Trial Trenching and Excavation is one of medieval/post-medieval to 19th century agricultural use, with no evidence for activity on the site from earlier periods.
- 6.2 The spacing of the furrows found during the trial trenching suggests they conform to the category of 'Broad Rig', which originated in the high medieval period (Parry 1976), however no finds were recovered from any of the furrows to date them. The absence of furrows in the other trenches is probably due to the shallow topsoil, which has resulted in them being ploughed out. The alignment of the furrows respected the existing eastern and western field boundaries, as shown on 19th-century maps (Thomson 1832, Ordnance Survey 1856). The rubble drains generally respected the northern and southern field boundaries, with a number of drains running counter to this pattern probably feeding into the main drainage system.
- 6.3 The kiln excavated on the southern part of the site is interpreted as a Lime Kiln, due to the presence of a large lump of limestone within the fill, its date and a similarity to other early lime kilns. There were no environmental remains to suggest that it was used for drying grain or industrial use. The kiln may relate to the Improvement period, manufacturing lime for the fields in order to improve the drainage of the clay-rich agricultural soils; until the middle of the 18th-century most lime kilns were set up to burn lime on site (Smith 2011, 4). Lime kilns were usually sited close to outcropping limestone and geological maps of the area show there is an exposed crop of Burdiehouse limestone in the immediate vicinity of the kiln (British Geological Survey 2008). Limestone was quarried on an industrial scale in the area by the 18th century (Transport Scotland 2010, 33). The environmental remains, however did not reveal any conclusive evidence as to the function of the kiln and no lime fragments were found (see Section 5, above). The kiln may have been regularly cleaned out, leaving little in the way of debris, with the exception of the coal required to fire the kiln.

- 6.4 The very early types of lime kilns were clamp kilns and consisted of alternating layers of limestone and fuel covered in horseshoe shaped mounds of stone or turf, which were broken open in order to extract the lime (Brown 1996, 17). Later pre-industrial kilns were larger stone built structures with a hearth at the base, commonly dug into banks and designed for more than one use. These more permanent structures are known as 'flare kilns' or 'draw' kilns; the former would need to cool for the lime to be drawn off, while the latter could keep burning continuously (Williams 2004). The earliest phase of the excavated kiln comprised an unlined pit dug into a shallow slope, followed by the addition of a stone structure. The height of the original structure is unknown, however other excavated examples have survived up to 3m high, with the walls rising up from the sides of the hearth area (Williams 2004).. The roughly square shape is also similar to other flare kilns, which have a draw hole on one side to introduce air (Feachem 1957, 50; Smith 2011, 3). The gap in the stones at the west end of the kiln may have acted as a draw hole; this would have been towards the base of the kiln when the superstructure was still intact, with the limestone stacked above this (Smith 2011, 3). Poke holes were often located in the sides of the kilns to loosen the limestone material (Brown 1996, 17) and this may have been the function of the two voids located at the west end. The burnt lime was probably removed from the top, while the east side may have been the location of the stoke hole for introducing fuel and raking out the ash.
- 6.5 The function of the L-shaped drain in the base of the kiln is unclear as it was confined to the internal space of the kiln, rather than running off down slope as would be expected. This may have been enough to drain water from the base of the kiln, which may have collected due to the clayey nature of the subsoil. Alternatively it may have been designed to retain moisture to produce steam for some purpose associated with the function of the kiln. The burnt lime is known as quick lime when it is removed and has to be made safe for use by the addition of water (Brown 1996, 17), a process known as slaking. The drain may have acted as a small sump following this process.
- 6.6 The finds from the kiln included bottle glass, a cow/horse shoe and iron work and suggest a date of 18th to 19th century. The kiln was disturbed after it had gone out of use by a large cut across the eastern and southern sides of the site. Geological maps show that the limestone outcrop is overlain by the Hopetoun series of mudstone, siltstone, sandstone and shale measures and this mixture of deposits is the source of the backfill of the cut (British Geological Survey 2008). It is presumed to be an infilled quarry, possibly also for limestone, as depicted on the first edition Ordnance Survey map of the area (1856), but not later maps, suggesting the quarry went out of use by the late 19th century. The field presumably reverted to exclusive agricultural use, which continues to the present day.
- 6.7 Based on the results of the archaeological trial trenching and excavation and subsequent post-excavation assessment the archaeological archive is assessed as having no further potential and therefore no additional works are recommended.

7 References

7.1 Bibliographic References

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7.2 Cartographic References

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8 Appendices

Appendix 1: Trench Register

Trench No	Length (m)	Maximum Depth (m)	Description
1	50	0.4	NW-SE. Contains pit/kiln [006].
2	50	0.5	N-S.
3	100	0.35	NE-SW. Rubble drains E-W, ceramic drains NW-SE.
4	100	0.6	NW-SE. Colluvium [027] 0.3m. Furrows NE-SW.
5	50	0.3	NW-SE. Rubble drains E-W, ceramic drains NW-SE.
6	100	0.35	NW-SE. Furrows N-S, rubble drains E-W and N-S.
7	100	0.3	NW-SE. Furrows N-S, rubble drains E-W.
8	50	0.3	N-S. Ceramic drain N-S.
9	100	0.4	NE-SW. Rubble drains.
10	100	0.35	N-S. Rubble drains.
11	100	0.3	NW-SE. Rubble drains E-W.
12	100	0.3	NW-SE. Rubble drain NE-SW.
13	50	0.3	NE-SW. Rubble drains E-W.
14	100	0.3	E-W. Rubble drains E-W and NW-SE.
15	100	0.3	E-W. Field drains N-S.
16	100	0.3	NW-SE.
17	50	0.3	NW-SE. Rubble drains N-S and E-W.
18	100	0.3	N-S. Rubble drains E-W.
19	100	0.3	NE-SW. Furrows N-S, rubble drains E-W and N-S.
20	100	0.3	NW-SE. Furrows N-S, rubble drains E-W, ceramic drains N-S.
21	100	0.3	NE-SW. Furrows N-S, rubble drains.
22	50	0.3	N-S. Furrows N-S, rubble drains E-W.
23	100	0.3	N-S. Furrows N-S, rubble drains E-W.

24	100	0.3	N-S. Furrows N-S, drains E-W.
25	100	0.3	Furrows N-S, rubble drains N-S. 20 m (wide) of made ground at E end of trench.

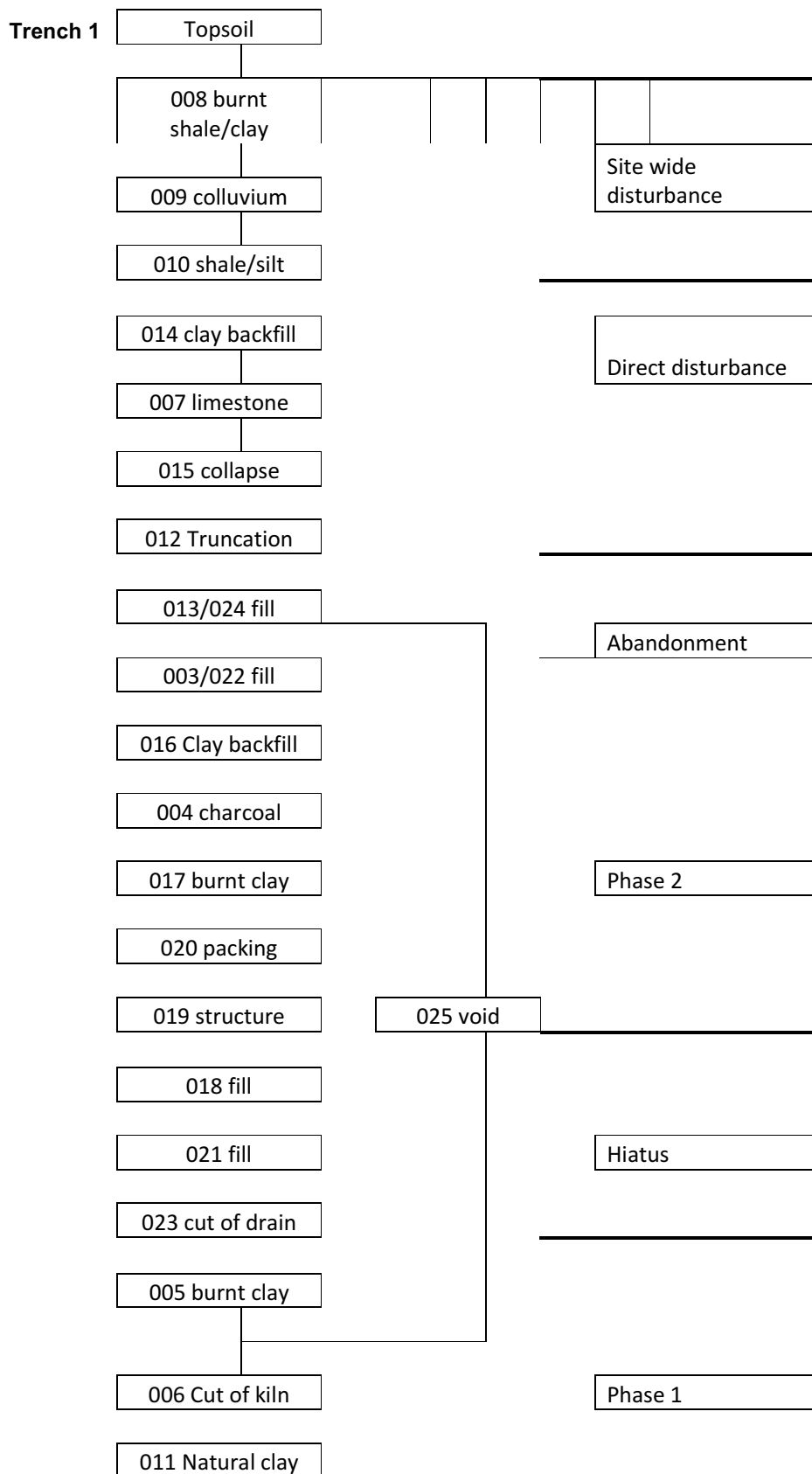
Appendix 2: Context Register

Context No.	Trench	Description
001	4	Cut of furrow, runs N-S, with shallow sloping sides and concave base. W: 1.64 m, D: 0.18 m.
002	4	Fill of [001], grey silt with diffuse interface.
003	1	Dark grey silty clay deposit with a frequent amount of charcoal and burnt clay inclusions, the former forming lenses in section. L: 1.3 m, W: 0.9 m, D: 0.1 m. Fill of [006]. The deposit relates to the abandonment phase.
004	1	Dark brown-to-black deposit formed from coal, clay and charcoal. W: 1.3 m, D: 0.01-0.08 m. Fill of [006], relates to the feature's second phase of use.
005	1	Bright orange/red compact clay with coal flecks located at the base of the kiln [006]. W: 1.2 - 1.6 m (N-S) and 1.4 - 1.6 m (E-W), thickness: 0.05m. Deposit has been created by the application of heat to a layer of clay (either imported or natural), which has resulted in it becoming baked hard.
006	1	Cut of kiln made into the natural clays (011). Roughly oval in plan with steep-sloping sides and a flat base. W: 2.1m (N-S) and 2m (E-W), though the eastern edge has been truncated by the later cut [012], D: 0.6 m (maximum width 1.4m [N-S] at base).
007	1	Large, friable piece of lime located at base of kiln, directly on (005) deposit.
008	1	Dark brownish red sandy clay loam containing a high level of bright orange/red clay. Inclusions of rounded stones and angular pieces of coal throughout, with larger lenses of coal and coal dust being located beneath the red deposit. Deposit is located in the south west quadrant of the 20 x 20 m excavation area and is related to the later use of the area which resulted in the truncation of the kiln feature. L: 3.8 m, W: 1.9m, D: 0.2 m+. Burnt shale/clay deposit within [012].
009	1	Yellowish brown sandy clay deposit with coal fragments scattered throughout. Also inclusions of stone and pure orange clay lenses. D: 0.6 m max. Appears to be colluvium deposited after infilling of [012], above [009].
010	1	Dark grey clayey silt deposit with a high level of shale throughout. Inclusions of red burnt clay lenses, crushed sandstone and yellow/grey clay lenses. Located in eastern extent of the 20 x 20 m excavation area and has a maximum depth of at least 1 m. Infill of cut [012].
011	1	Natural orange and grey clays.
012	1	Cut running north west - south east through the eastern extent of the 20 x 20 m excavation area, as well as south west through the site's south eastern corner. The cut truncates the kiln feature and is filled with (008)-(010) deposits, with a depth of at least 1m.
013	1	Dark grey silty clay, fill of [006]. Contains a very high level of charcoal fragments, lenses of fine light grey silt (ash), fragments of burnt orange clay and angular pieces of limestone. Measures 0.6m (N-S) x 0.4m, D: 0.06-0.18 m. It has been deposited over the in situ footings of (019).

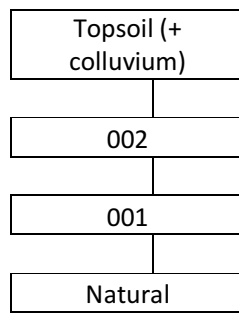
014	1	Yellowish brown silty clay containing fragments of angular limestone, charcoal, orange burnt clay, rounded and angular stones. Upper fill of kiln [006]. It extends at least 2.3m (E-W) and is 0.2-0.3m thick. The deposit overlies both the in situ footings (019) and the kiln deposits and is thought to relate to the disturbance caused by the later cut [012].
015	1	Large angular stones (max 0.4 m x 0.2 m x 0.1 m), not worked, no bonding. Overlies (003) and sealed by (014). L: 0.85 m, W: 0.45 m, D: 0.25 m. Collapsed structure of kiln [006].
016	1	Yellowish brown silty clay deposit with lenses of orange/red burnt clay and inclusions of charcoal and medium-sized stones. Fill of kiln [006]. Abuts the base of the in situ footings (019), extending 1.1m to the east, with a maximum width of 1.3m. Varies in thickness from 0.05-0.15m. Deposit most likely accrued after the abandonment of the kiln.
017	1	Deposit of bright orange/red compact clay, with inclusions of small fragments of charcoal and occasional small stones. Fill of kiln [006], below the charcoal-rich (004). Deposit abuts the base of the in situ footing (019) and extends 1m to the east, with a maximum width of 1.3m. The deposit's thickness varies from 0.02-0.04m. It is likely to be baked clay relating to the kilns' second phase of use.
018	1	Mid greyish brown silty clay with frequent fragments of burnt clay and occasional fragments of coal/charcoal and small stones. Fill of kiln [006]. The in situ footings (019) have been laid on top of the deposit. Extends for at least 1.8m from below (019) toward the later cut [012], with a thickness of 0.02-0.05m. Deposit most likely deposited between the two phases of use, possibly as preparation for the construction of the (019) footings.
019	1	Dolerite stones forming the in situ footings of kiln [006]. Stones are unworked and unmortared, having been packed with clay (020). They form a rectilinear structure at least 1.94m (external) 1.3m (internal) wide (N-S). The eastern extent of the structure has been truncated (by [012]), though at least 1.6m of the northern footing is present. There is a 0.4m gap in the western footing, over which has been placed a thin slate/shale capstone. The gap is filled with (022). The footings are at least 0.5m high and are formed from at least two randomly-laid courses. These in situ footings are thought to relate to the second phase of use.
020	1	Mid brown silty clay with inclusions of coal/charcoal, stones, fragments of orange/red burnt clay and artefacts (ferrous and glass). Deposit has been packed between the kiln cut [006] and the in situ footings (019). Inclusion of materials related to first phase of use (burnt clay and coal/charcoal) suggests that the clay packing used around the stones was sourced from the kiln itself, or a spot nearby.
021	1	Medium sized angular stones tightly packed within a greyish brown silt matrix. Fill of cut [023].
022	1	Dark grey silty clay with a very high level of charcoal fragments and fragments of burnt orange clay. Located below the slate/shale 'capstone' located centrally in the western footings of kiln [006]. Deposit measures 0.25m (N-S) x 0.3m and is 0.25m thick. It is identical to (003), suggesting that it is an extension of this deposit and

		is therefore likely to have been deposited after the kilns final abandonment
023	1	L'-shaped cut made into the natural clays (011) and the basal layer of burnt clay (005). Filled with (021), the cut is steep-sided with a concave base. It has a depth of 0.2-0.25m and a maximum width of 0.26m. The total linear length is 2.3m. The truncation of the burnt clay and the location of the cut below layers relating to the kilns' second phase of use, suggests that this cut and its associated deposit relates to an event or modification carried out between the two phases of use
024	1	Dark grey silty clay containing charcoal, fragments of burnt clay and limestone and artefacts (dark olive green bottle glass). Located within the two voids/burrows [025] excavated into the natural clays (011). Similar to [013]. Likely to have been deposited after the abandonment of the structure.
025	1	Two voids/burrows excavated into the natural clays (011). The voids are located on the western side of the kiln cut, adjacent to the location of the slate/shale 'capstone'. The southernmost void is 0.2m in length, with a diameter of 0.1m, the northern being 0.3m x 0.2m. The clay around the entrance to these voids has been baked, turning it a bright orange/red. These voids were potentially related to the kilns' use, though their phasing or purpose is unclear.
026		Topsoil. Mid brown clayey silt, 0.3 – 0.5 m.
027	4	Colluvium. Greyish brown clayey silt, 0 – 0.3 m.

Appendix 3: Trench Matrices



Trench 4



Appendix 4: Photographic Register

Photo No.	Direction	Description
29	SE	LP15 General shot of Trench 1
30	S	LP15 General shot of Trench 2
31	S	LP15 General shot of Trench 3
32	W	LP15 General shot of Trench 4
38	ESE	LP15 General shot of Trench 5
39	NW	LP15 General shot of Trench 6
40	NW	LP15 General shot of Trench 7
41	S	LP15 General shot of Trench 8
42	N	LP15 General shot of Trench 9
43	N	LP15 General shot of Trench 10
44	NE	LP15 General shot of Trench 11
45	SE	LP15 General shot of Trench 12
46	NE	LP15 General shot of Trench 13
47	E	LP15 General shot of Trench 14
48	E	LP15 General shot of Trench 15
49	SE	LP15 General shot of Trench 16
50	SW	LP15 Trench 1 working shot of feature [006]
51	SE	LP15 General shot of Trench 17
52	SW	LP15 General shot of Trench 18
53	NE	LP15 General shot of Trench 19
54	E	LP15 General shot of Trench 20
55	N	LP15 Trench 1 general shot of pit/kiln [006]
56	NW	LP15 Trench 1 SE facing section through [006]
57	NE	LP15 Trench 1 SW facing section through [006]
58	NE	LP15 Trench 4 S facing section through furrow [001]
59	S	LP15 General shot of Trench 24
60	NE	LP15 General shot of Trench 21
61	SE	LP15 General shot of Trench 22
62	S	LP15 General shot of Trench 23
63	E	LP15 General shot of Trench 25
64	N	LP15 Trench 1 extension showing [006] and deposits to south-east
65	W	LP15 Trench 1 extension showing [006] and deposits to south-east
		Photos of kiln excavation
687		ID shot
688	N	South facing section of circular cut [013]
689	S	General shot of T.21
690	N	General shot of T.20
691	N	General shot of T.19

692	W	East facing section of pit (017)
693	W	General shot of (019)
694	W	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
695	SW	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
696	E	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
697	N	Shot of red baked clay and coal (008) and brown clay (009), west extent of trench
698	N	Shale, coal fragments and clay (010), east extent of trench
699	S	Shale, coal fragments and clay (010), east extent of trench
700	S	Intermediate shot. Kiln (003-007) and surrounds
701	N	Shot looking north along line of disturbance, north east trench quadrant
702	N	South facing section slot through modern cut [012]
703	N	South facing section slot through modern cut [012] West to east
704	N	South facing section slot through modern cut [012] West to east
705	S	Sondage, south west quadrant of kiln. (003-007), (013)
706	N	Working shot kiln (006)
707	N	Kiln (006) mid-excavation showing stones (015) and (014)
708	E	Kiln (006) mid-excavation showing stones (015) and (014)
709	W	Kiln. Photo of (003) after removal of (015)
710	N	Kiln. Photo of (003) after removal of (016)
711	E	Kiln. Basal fill of pit (004)
712	W	Burnt clay (017) below (004) in kiln (006)
713	N	North section of kiln
714	N	North section of kiln
715	E	Burnt clay at kiln base (005)
716	E	Kiln excavated showing structure (019) and floor (005)
717	S	Kiln excavated showing structure (019) and floor (005)
718	N	Kiln excavated showing structure (019) and floor (005)
719	W	Close up rear wall (019) of kiln (006)
720	N	Close up of north wall (019) of kiln (006)
721	E	Plan view of stone (021) at base of kiln
722	N	Drain (023) section at base of kiln

723	W	Kiln after removal of stones (019) on south side
724	N	Extent of [023]
725	N	Extent of [023]

Appendix 5: Drawing Register

Drawing No.	Plan	Section	Description
1		1:20	LP 15 Trench 1 SW facing section through pit/kiln [006]
2		1:20	LP 15 Trench 1 SE facing section through pit/kiln [006]
3	1:20		LP 15 Trench 1 Plan of evaluation slot through [006]
004		01:20	South facing, sondage through modern cut [012] and fill (010)
005	1:20		Pre-excavation of south west quadrant of kiln, showing cut [006] and stones (015)
006		01:10	South facing section of kiln [006]
007	1:20		Plan of kiln showing cut [006], structure (019) and truncation [012]
008		01:10	Section through centre of kiln showing cut [006], structure (019), linear pit (021), [023] and burnt clay layer (005)
009	1:20		Post-excavation plan of kiln

Appendix 6: Sample Register

Sample No.	Context No.	Description
001	004	Primary fill of pit/kiln [006]
002	13	Charcoal deposit at west end of kiln (006)
003	14	Upper fill of kiln (006)
004	17	Burnt clay base below (004) in kiln (006)
005	3	Fill of kiln (006)

Appendix 7 Retent sample results

Table 1: FRCE10 LP15 Retent Sample Results

Context Number	Sample Number	Feature	Sample Vol (l)	Ceramic	Glass	Metal	MWD	Unburnt bone	Charcoal		Material available for AMS Dating	Cinders	Coal	Comments
				Pottery					Quantity	Max Size (cm)				
				Modern	Glass	Fe object	Mag res	Mammal						
13	2	Deposit at the West end of the Kiln [006]	20		+	+	++++		+	1.5	Charcoal +	++++	++++	Cinders and Coal not retained.
14	3	Upper fill of kiln [006]	30									++	++	Cinders and Coal not retained.
17	4	Clay Base below (004) in Kiln [006]	30	+								++++	++++	Cinders and Coal not retained.
3	5	Fill of Kiln [006]	30			+		++	+	2	Charcoal +, Unburnt bone ++	++	++++	Cinders and Coal not retained.

Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant

NB charcoal over 1cm is suitable for identification and AMS dating

Appendix 8: Flotation sample results

Table 2:FRCE10 LP15 : Flotation Sample Results

Context Number	Sample Number	Feature	Total flot Vol (ml)	Cereal grain:	<i>Triticum aestivum</i>	Other charred plant	Charcoal Quantity	Charcoal Max size (cm)	Material available for AMS	Cinders	Comments
13	2	Deposit at the West end of the Kiln [006]	4000							++++	All of the sample is cinders
14	3	Upper fill of kiln [006]	50		+	<i>Chenopodium</i> sp.+	++++	1	Charcoal+++		
17	4	Clay Base below (004) in Kiln [006]	150				++++	1.5	Charcoal++	+++	
3	5	Fill of Kiln [006]	1000			<i>Chenopodium</i> sp.+	++++	1	Charcoal++	++++	
Key: + = rare, ++ = occasional, +++ = common and ++++ = abundant NB charcoal over 1 cm is suitable for identification and AMS dating											