



**Archaeological trial trench evaluation  
and monitoring of site investigation  
at land off Butt Lane, Blackfordby  
Leicestershire  
December 2017- May 2018**

Report No: 18/10

Author: Kamil Orzechowski, Rachel Clare and Claire Finn

Illustrator: Olly Dindol



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Accession number: X.A.150.2017

Report No.: 18/10

Quality control and sign off:

<b>Issue No.</b>	<b>Date approved:</b>	<b>Checked by:</b>	<b>Verified by:</b>	<b>Approved by:</b>	<b>Reason for Issue:</b>
1	26/01/2018	Liz Muldowney	Claire Finn	Adam Yates	Client issue
2	13/02/2018	Ian Fisher	Claire Finn	Adam Yates	Consultant comments included
3	08/03/2018	Liz Muldowney	Claire Finn	Adam Yates	Client comments included
4	06/07/2018	Claire Finn	Liz Muldowney	Adam Yates	Inclusion of Phase2 Watching Brief (Appendix 3)

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Illustrator: Olly Dindol

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Fieldwork: Kamil Orzechowski

Pottery: Paul Blinkhorn

Environmental analysis: Sander Aerts BA MSc

**OASIS REPORT FORM**

<b>PROJECT DETAILS</b>		<b>OASIS: molanort1-307313</b>	
Project title	Archaeological trial trench evaluation and monitoring of site investigation at land off Butt Lane, Blackfordby, Leicestershire, December 2017- May 2018		
In December 2017 MOLA was commissioned by CgMs Heritage to carry out an archaeological trial trench evaluation on land off Butt Lane, Blackfordby, Leicestershire in advance of residential development. Twenty-eight trenches were excavated, twelve of which contained archaeological features. These features were mainly post-medieval boundary ditches identified within the geophysical survey report. A fragment of late medieval pottery, probably residual, was recovered from one ditch. Other ditches contained late post-medieval to early modern pottery, glass and CBM. A few fragments of probable kiln furniture were identified in two post-medieval contexts indicating possible post-medieval pottery production in the vicinity. The evaluation also identified a series of post-medieval to early modern extraction pits (bell pits) and other features related to mining activity within the area. These interventions were identified during the geophysical survey.			
Project type	Evaluation		
Previous work	Archaeological and Heritage Assessment (EDP 2015); Geophysical Surveys (TerraDAT 2017; Magnitude Surveys 2017)		
Future work	Unknown		
Monument type and period	Post-medieval boundary ditches; extensive post-medieval mining/extraction pits		
Significant finds	Post-medieval pottery, CBM, glass		
<b>PROJECT LOCATION</b>			
County	Leicestershire		
Site address	Land off Butt Lane, Blackfordby, Leicestershire		
Easting and northing	SK 32566 18251		
Area	7.4ha		
Height OD	133m – 145m AOD		
<b>PROJECT CREATORS</b>			
Organisation	MOLA Northampton		
Project brief originator	Leicestershire Planning Authority		
Project Design originator	CgMs Heritage (part of RPS Group PLC)		
Project Supervisor	Kamil Orzechowski (MOLA)		
Director/ manager	Liz Muldowney (MOLA); Simon Mortimer (CgMs)		
Sponsor or funding body	CgMs Heritage		
<b>PROJECT DATE</b>			
Start date	11 December 2017		
End date	22 December 2017		
<b>ARCHIVES</b>	Location	Content	
Physical	Leicestershire CC Museums XA.150.2017	Post-medieval pottery, CBM, glass	
Paper		<i>Pro-forma</i> sheets, plans, sections, black and white contact sheets, colour slides and digital photograph contact sheets	
Digital		Report, map and site data, digital images	
<b>BIBLIOGRAPHY</b>	Journal/monograph, published or forthcoming, or unpublished client report		
Title	Archaeological trial trench evaluation and monitoring of site investigation at land off Butt Lane, Blackfordby, Leicestershire, December 2017- May 2018		
Report no.	MOLA Northampton18/10		
Author(s)	Kamil Orzechowski, Rachel Clare and Claire Finn		
Page numbers	66		
Date	January 2018, revised July 2018		



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**Archaeological trial trench evaluation  
and monitoring of engineering works  
at land off Butt Lane, Blackfordby  
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December 2017- January 2018**

*Abstract*

*In December 2017 MOLA was commissioned by CgMs Heritage to carry out an archaeological trial trench evaluation on land off Butt Lane, Blackfordby, Leicestershire in advance of residential development. Twenty-eight trenches were excavated, twelve of which contained archaeological features. These features were mainly post-medieval boundary ditches identified by the geophysical survey report. A fragment of late medieval pottery, probably residual, was recovered from one ditch. Other ditches contained late post-medieval to early modern pottery, glass and CBM. Also a few fragments of probable kiln stilts were identified in two post-medieval contexts indicating possible post-medieval pottery production in the vicinity. The evaluation also identified a series of post-medieval to early modern extraction pits (bell pits) and other features related to mining activity within the area. These interventions were identified during the geophysical survey.*

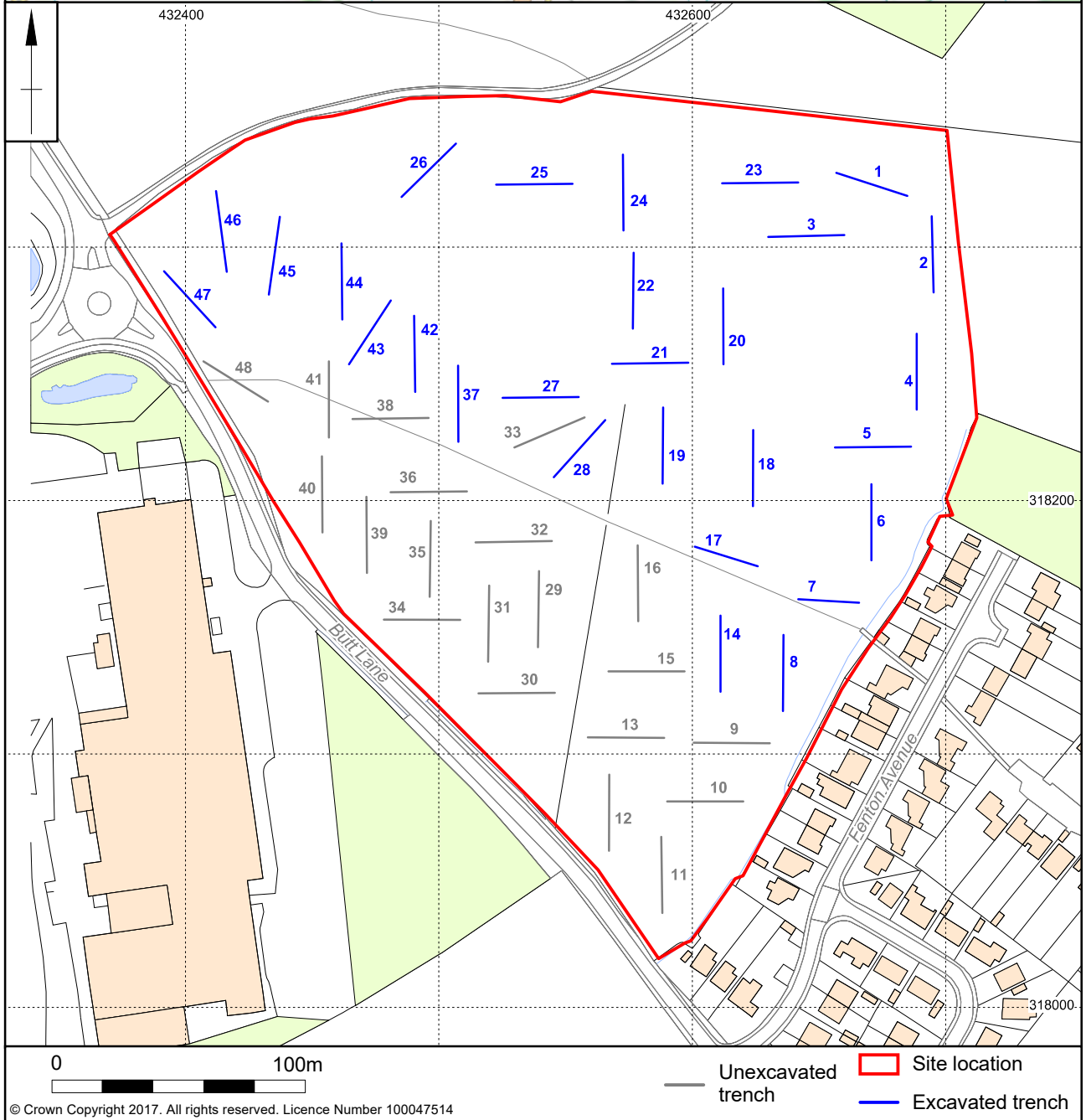
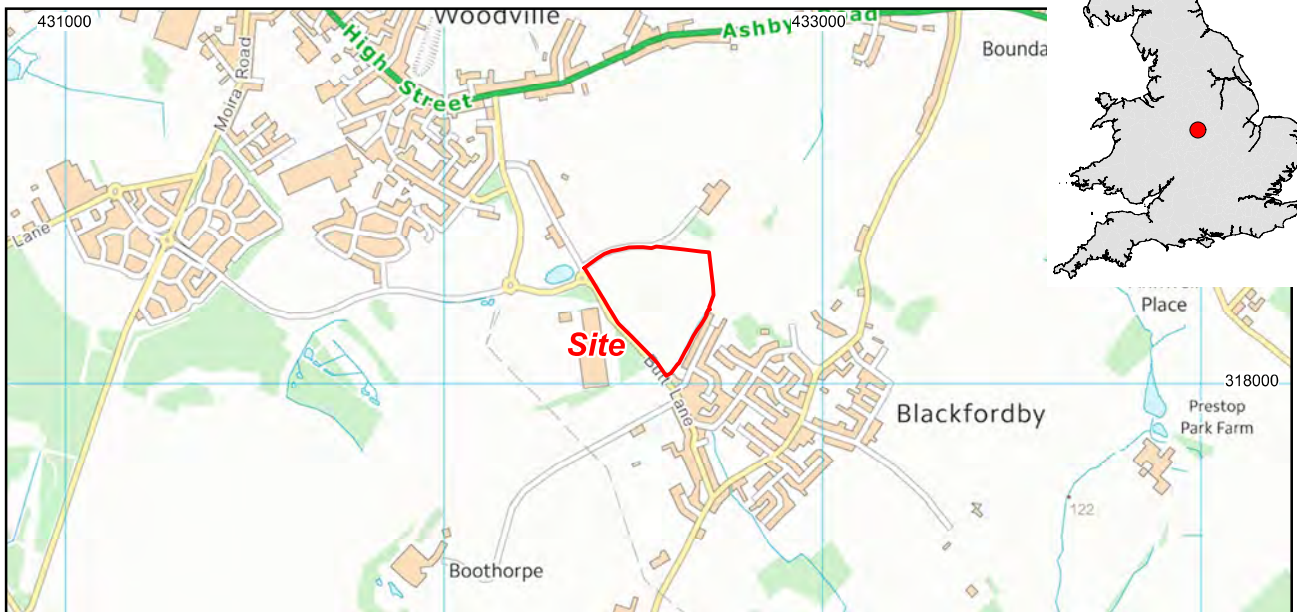
**1 INTRODUCTION**

In December 2017 MOLA was commissioned by CgMs Heritage to carry out an archaeological evaluation on land off Butt Lane, Blackfordby, Leicestershire, prior to residential development (Fig 1, NGR SK 32566 18251). This was in response to a condition attached to planning. The planning permission was subsequently granted at Appeal (Appeal Ref: App/G2435/W/15/3137258). Following the trial trench evaluation, geotechnical trenching was also subject to archaeological monitoring in January 2018. A second phase of monitoring works was undertaken in April-May 2018. The results of this work has been added as an addendum in Appendix 3 at the end of this document.

Prior to the evaluation the archaeological potential of the development site had been considered through an Archaeological and Heritage Assessment (EDP 2015) and two geophysical surveys (TerraDAT 2017; Magnitude Surveys 2017).

A Written Scheme of Investigation (WSI) was prepared by CgMs Heritage and submitted to and approved by North West Leicestershire District Council (CgMs Heritage 2017). During the course of the archaeological evaluation the approved number of the trial trenches was revised from 48 to 28 trenches following discussion with the Planning Archaeologist and CgMs Heritage representative owing to extreme adverse weather, including snow and the trenches filling with rising groundwater.

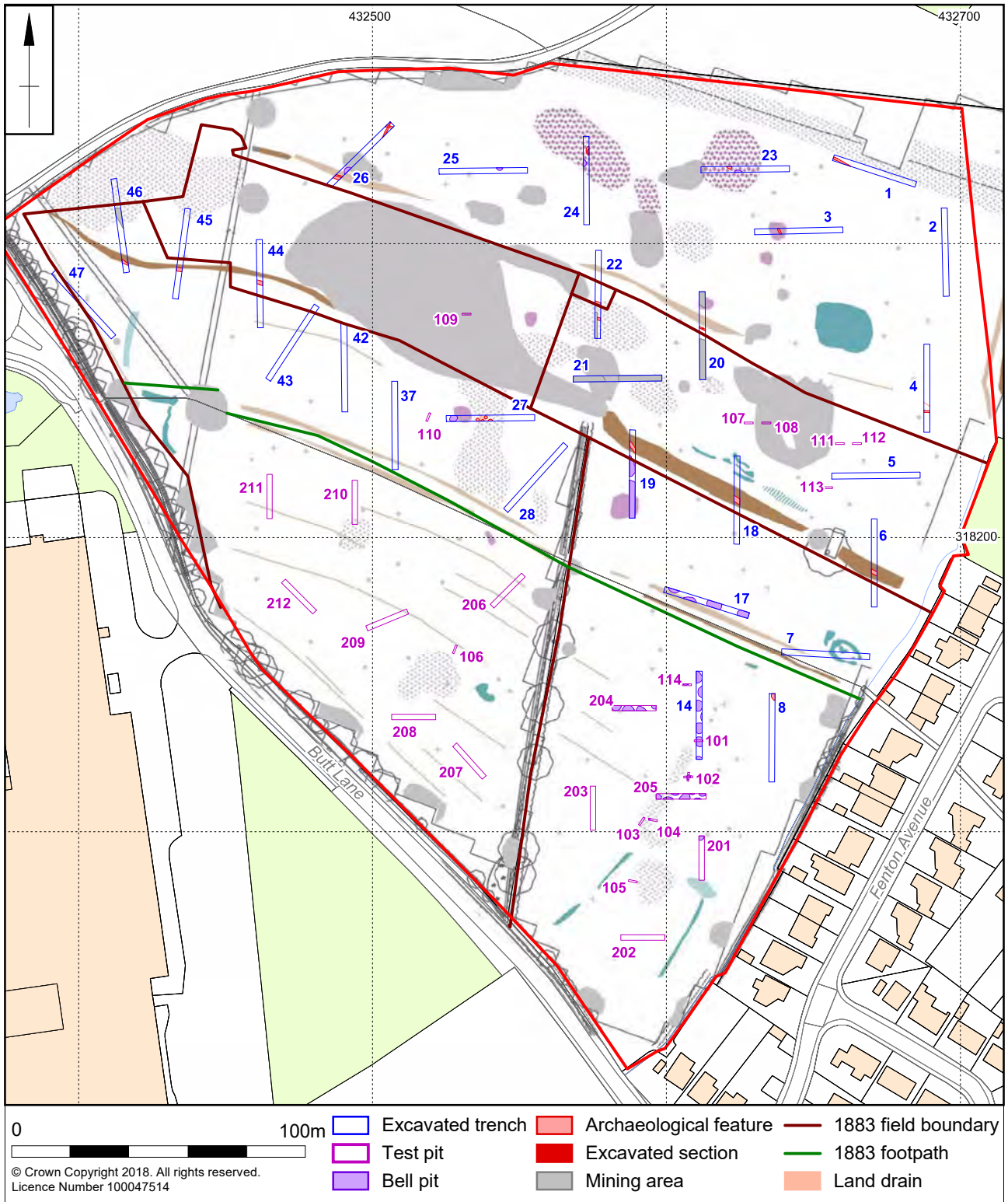
All works were carried out in accordance with the Chartered Institute for Archaeologists' *Code of Conduct* (CIfA 2014a) and *Standard and Guidance for Archaeological Field Evaluation* (CIfA 2014b). All works conformed to Historic England's *Management of Research Projects in the Historic Environment* (HE 2015).



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Scale 1:2500

Site location and excavated/unexcavated trenches Fig 1



Scale 1: 2000 (A4)

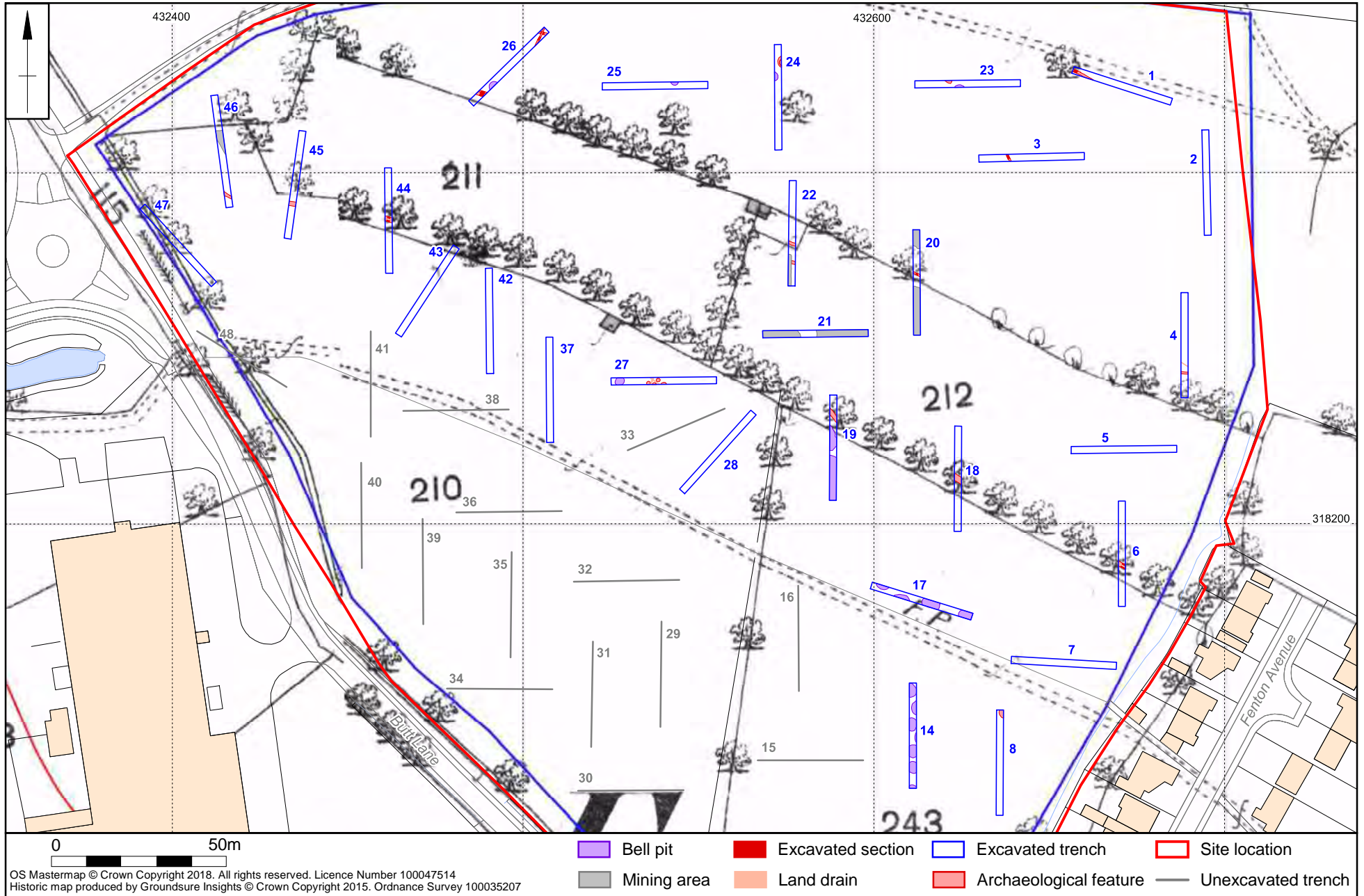
Trial trench, geological test-pit and test trench results plotted against geophysical survey results Fig 2



Scale 1:1500

Trenches and features plotted against the 1883 Ordnance Survey map

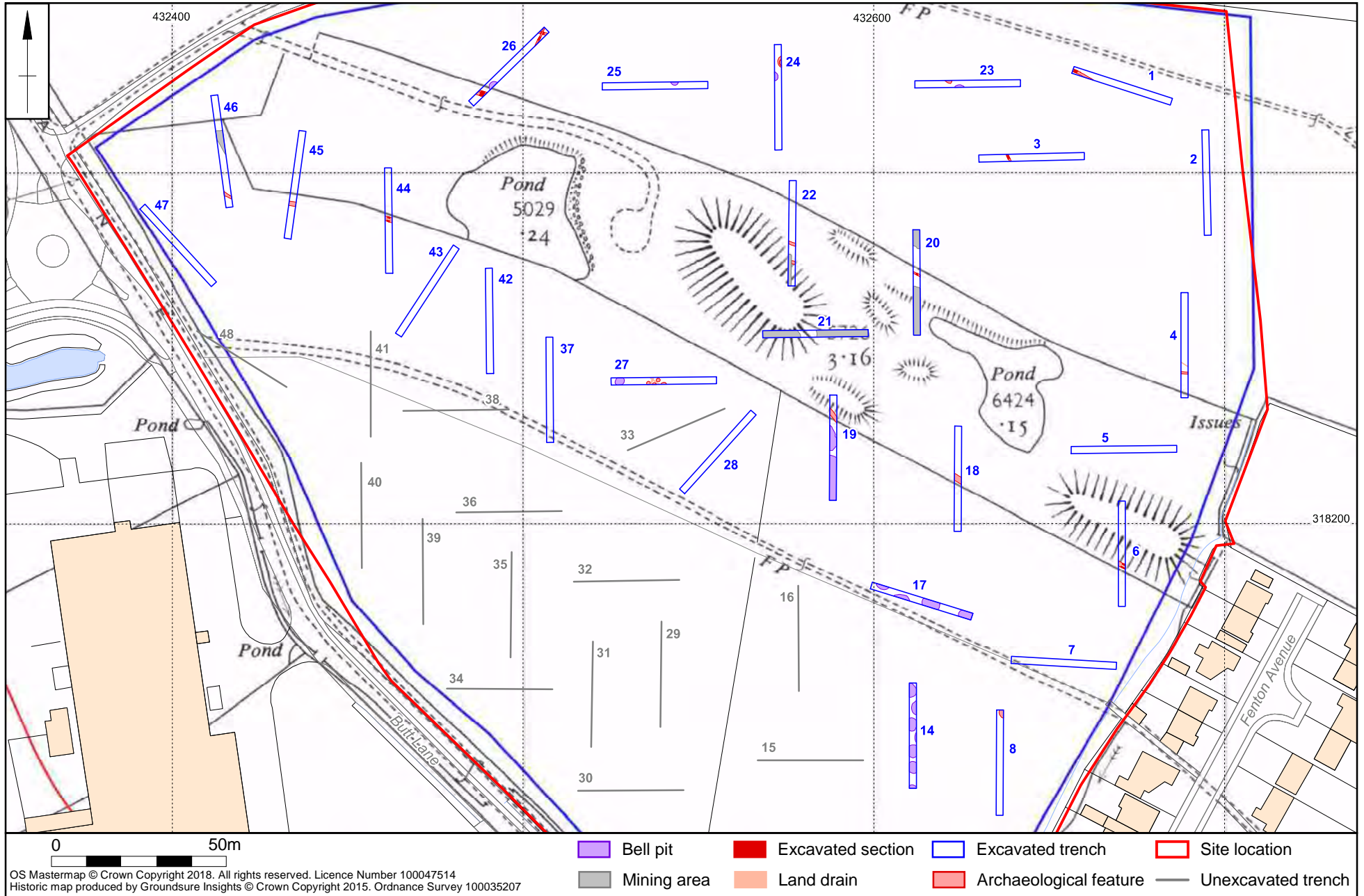
Fig 3



Scale 1:1500

Trenches and features plotted against the 1959 Ordnance Survey map

Fig 4





## **2 BACKGROUND**

### **2.1 Site location, topography and geology**

The following text is a summary of the site background, as described in the WSI (CgMs Heritage 2017).

The site is located on the north-western edge of the village of Blackfordby and consists of a single field covering an area of c7.4ha (Fig 1). It is roughly triangular and is bounded by the rear of properties on Butt Lane to the west and by a hedge and agricultural land to the east. The north is partly bounded by a single-track road and by further agricultural land.

The site contains a ridge of high ground at c145m above Ordnance Datum (aOD), aligned roughly east-west across the centre. From there, the ground slopes downward to the north and south to roughly 133m aOD at its lowest point.

The solid geology of the site is split between two different formations extending along the north-west and south-east axis. To the north is mapped as Moira Formation – Breccia sedimentary bedrock and to the south of the site it is Pennine Lower Coal Measures mudstone, siltstone and sandstone. No superficial deposits were recorded on the site (BGS 2018).

### **2.2 Historical and archaeological background**

The survey area is located on agricultural land to the west of Blackfordby. The village was first recorded in 1125. Prior to the 19th century, the inhabitants were largely engaged in agricultural work. After the mid-19th century, the local population were employed by nearby collieries and potteries (MLE15756). Several traces of this agricultural and mining have been found close to the site.

Approximately 140m east of the site, medieval village earthworks are recorded (MLE4318); while 320m to the west, ridge and furrow ploughing has been identified. Earthwork field boundaries of post-medieval date have been found approximately 150m north of the site.

The Ordnance Survey map of 1960/1961 records pits and ponds in a large band crossing the site from its northwest corner to the middle of its eastern boundary. Coal mines and/or clay pits, all now disused, are found 50m north of the site. Other clay pits and coal mines or shafts are denoted in the surrounding landscape, mainly to the west.

The geophysical survey by TerraDAT (TerraDAT 2017) identified a number of magnetic anomalies, potentially indicative of material associated with former mine working, as well as several increased responses that possibly correlate with former pits, ponds, and field boundaries. The subsequent excavation of geotechnical test pits identified two bell pits in the south-eastern corner of the site.

Several trenches were excavated 200m northwest of the site following a geophysical survey and assessment (Event 1371589) but no archaeological activity was identified. However, 1km north-east of the site, trial trenching revealed prehistoric features and Roman settlements.

### 3 AIMS AND OBJECTIVES

The specific objectives of the archaeological trial trench evaluation were to:

- determine the location, extent, date, character, condition, significance and quality of any archaeological remains within the development site;
- determine the presence/absence of any bell pits on the site (no excavation of these features was to be undertaken due to health and safety constraints);
- assess the artefactual and environmental potential of the archaeological deposits encountered;
- assess the impact of previous land use on the site;
- inform formulation of a further measures to mitigate impacts of the proposed development on surviving archaeological remains, and to;
- produce a site archive for deposition with an appropriate museum and to provide information for accession to the Leicestershire HER.

The principal objectives of the fieldwork follow the guidance of national and regional research frameworks (Knight *et al* 2012, updating Cooper 2006).

### 4 EVALUATION METHODOLOGY

#### 4.1 Trial trench evaluation

The proposed development area was subject to archaeological evaluation through trial trench excavation. The WSI had specified the excavation of 48 trenches each 30m in length and 1.8m in width (Fig 1). During the course of the archaeological evaluation the number of trenches was revised from 48 to 28 trenches following discussion with the Planning Archaeologist and representatives from CgMs Heritage owing to extreme adverse weather, including snow and the trenches filling with rising groundwater. Trench 1, 17, 28 and 37 were re-positioned to avoid the existing fencing or a footpath leading from the east perimeter to the west across the centre of the site.

The trenches were positioned to allow examination across the areas which will be predominantly affected by the permitted development. The trench locations take into account the quarries and ferrous deposits identified on the geophysical survey.

All trench locations were recorded using either Leica Viva Global Positioning System (GPS) survey equipment using SMARTNET real-time corrections, operating to a 3D tolerance of  $\pm 0.05\text{m}$  and were scanned with a Cable Avoidance Tool (CAT) prior to excavation.

Machine excavation was undertaken under the direction of an experienced archaeologist. Trenches were excavated by machine using a toothless bucket to reveal archaeological remains or, where these were absent, undisturbed natural horizons. The spoil generated during the trial trenching was mounded away from the edges of each trench and scanned by eye and by metal detector.

Each trench was cleaned sufficiently to enhance the definition of features, unless it was certain that there are no archaeological remains present. All archaeological features were investigated. Slots excavated through linear features were a minimum of 1m wide. No complex features were encountered during the investigation.

All archaeological deposits encountered during the course of evaluation were fully recorded. Recording followed standard fieldwork procedures (MOLA 2014). All

archaeological deposits were given a separate context number. Deposits were described on MOLA standard Trial Trench Logs to include details of the context, its relationships and interpretation. The MOLA site code used the LHER event number which was L'5 '0) '\$'8\$%+

Archaeological features were plotted on trench plans at a scale of 1:50. Sections or profiles through features were drawn at a scale of 1:10 or 1:20 as appropriate. All levels were related to Ordnance Datum.

The photographic archive comprised high resolution (12 megapixels or greater) digital photography. Overall shots of the site were taken after backfilling. Overall shots of each trench were taken together with detailed shots of individual features. All photographs, where appropriate, included a suitable photographic scale.

It was agreed that the mining 'bell pits' identified during the evaluation and monitoring were not excavated before initial identification due to health and safety concerns.

## **4.2 Archaeological monitoring of geotechnical test pits**

Following the trial trenching, the archaeological monitoring of 14 geotechnical test pits and 12 linear test trenches was undertaken during three days in January 2018. The positions of the pits were mapped using handheld GPS equipment. Any features within the test pit or test trench locations were recorded on a plan at a scale 1:100. The excavated spoil was scanned for artefacts and a photographic record was maintained following the evaluation methodology described above. The purpose of this monitoring was to make a record of the deposits encountered and the extent of mining activity.

Stripping of the southern half of the site was undertaken between April and May 2018 and was monitored by archaeological watching brief according to the requirements of the Written Scheme of Investigation (WSI) prepared by CgMs Heritage (CgMs Heritage 2018) and in line with the methodologies outlined in MOLA's standard fieldwork procedures (MOLA 2014). The results of this latter work are discussed in Appendix 3.

## **5 THE EXCAVATED EVIDENCE**

### **5.1 The general stratigraphy**

#### *Trial trenching*

The stratigraphy varied across the site as a result of the different geologies and the degree of previous disturbance.

The geological horizon was encountered between 0.30m and 0.60m below current ground level, in most of the trenches. In some areas, where a substantial layer of made ground was recorded (Trenches 5 and 6), the natural was found to be much deeper, up to 1.05m below ground level. Similarly, where mining activity was noted in the centre of the site (Trenches 21 to 26), the geological substrate was also deep, in some places up to 1.45m (Trench 23).

To the north in Trench 1, the west, in Trenches 20 – 22, 24 – 26, 45 – 47, and in the south-east corner in Trenches 7, 8, 14, 17, the natural comprised light yellow-grey firm silt/silty sand (Figs 5 and 6). To the east, north-east and along the footpath, in Trenches 2-6, 18, 19, 23, 27, 28, 37, 42 – 44, the natural was mainly light orange-grey compact clay with moderate to frequent manganese streaks and occasional green-grey mud/sandstone in the south-east.

Alluvium was encountered below the subsoil in four trenches (Trenches 8, 22, 23, 26) and comprised light yellow-grey sandy silt becoming darker in hue to the north.

Subsoil was present in nine trenches (Trenches 5, 18, 19, 21, 23, 24, 26, 27, and 44). It was on average between 0.10m and 0.45m deep and mainly comprised mid grey-brown friable silty sand.



Trench 46, Boundary ditch BD1 and an area of mining in the background, looking north Fig 5



Trench 20, showing the mining features at the north end, looking south Fig 6

The topsoil was between 0.20m and 0.57m deep and was present in all of the trenches. It was light grey-brown silty sand with occasional sub-angular flint.

Detailed context descriptions for all deposits and features are presented at the end of this report (Appendix 1).

#### *Geotechnical test-pit and test-trench monitoring*

In the previously unexcavated area comprising the southern field of the proposed development site, the excavation of 14 test pits was monitored (TP101 – TP114). The test-pits were approximately 3m long and were cut with a 0.6m toothless bucket. Twelve linear test trenches were also cut along the entire southern part of the field (TP 201 – 212) (Fig 2). These trenches were 15m long by 1.8m wide and cut using a standard toothless ditching bucket to reveal the natural horizon under the topsoil. This geotechnical work was undertaken to assess the potential extent and density of the bell pits in this area. The trenches were positioned randomly to provide an equal distribution and surveyed-in with GPS. The depth of the trenches did not exceed 0.65m.

The natural geology in general was consistent throughout the test trenches and comprised light yellow- firm sandy silt with orange silt and occasional grey hard clay patches (Fig 18, 19). A small quantity of gravel within the silt especially to the southern boundary of the field was also noted (TP 207, 208, 212). Topsoil, which was dark grey friable silt, was recorded directly above the natural horizon and its depth was not greater than 0.40m.

## **5.2 The archaeological features**

The majority of features on the site related to post-medieval field boundaries, mining 'bell pits', and other mining or extraction activity. Archaeological features were encountered in 12 trenches (Trenches 1, 3, 4, 6, 18 – 20, 22, 26, 44 – 46). Eight trenches contained only the remains of extraction or mining pits (Trenches 8, 14, 17, 21, 23 – 25, 27). Eight trenches contained no archaeological remains (Trenches 2, 5, 7, 28, 37, 42, 43 and 47).

In Trenches 5, 6 and 46 a layer of buried soil was identified. It comprised dark brown friable silty sand and on average was between 0.11m and 0.28m deep (Fig 7). A substantial layer of made ground was present in five trenches (5, 6, 20, 22, and 46). This could generally be described as grey compact clay and modern rubble matrix between 0.10m and 0.56m deep. It is probable that these comprised soil mounds accumulated during the open-pit mining, marked on the 1959 Ordnance Survey map (Fig 4).



Trench 6, made ground (601) and buried soil (602) below, looking west Fig 7

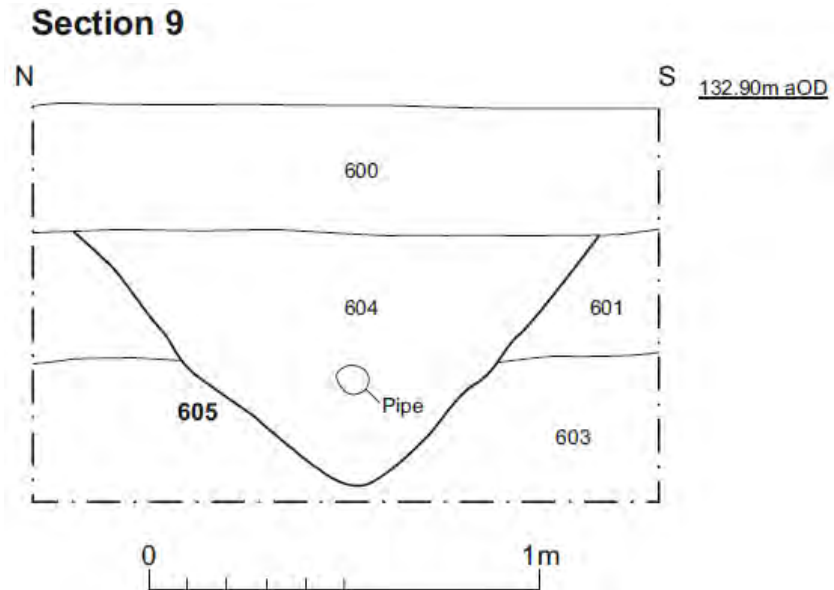
### Post-medieval boundaries

A number of post-medieval field boundaries were identified during the excavation. These features correlated with boundaries depicted on the 1883 Ordnance Survey map and also identified during geophysical survey (Figs 2 and 3). The two main boundary ditches running across the site (BD1 and BD2) were parallel on a north-west by south-east alignment, spaced some 50m apart. A smaller enclosed area depicted on the historic mapping in the northern corner of the eastern field was also identified by its ditched boundary.

### Boundary Ditch BD1

The ditch BD1 was encountered in Trenches 6, 18, 19, 44 and 45. The 1st edition Ordnance Survey map depicts a boundary this location which terminated short of Trench 46 (Fig 2, 3). The ditch was between 1.20m and 1.35m wide and on average 0.65m deep with a steep-sided, U-shaped profile (Fig 8). The fills were consistent along its length and comprised mid red-brown friable sandy silt. In Trench 44, the fill contained clay tobacco pipe fragments and a piece of early 20th-century glass. A few pieces of possible post-medieval kiln furniture were recovered from Trench 45 (Fig 9).





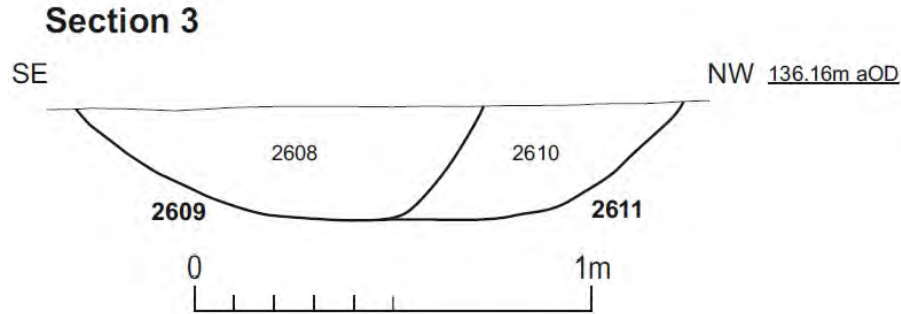
Trench 6, West facing section of BD1, cut [605] Fig 8



Trench 44, Ditch BD1, cut [4404], looking west Fig 9

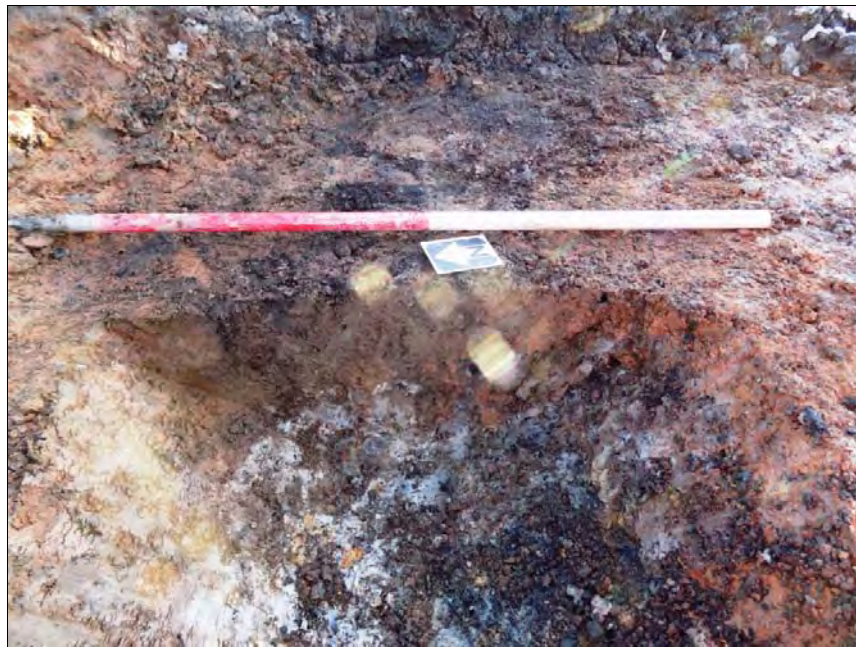
### Boundary Ditch BD2

The ditch BD2 was encountered in Trench 20, 22 and 26 (Fig 3). This was approximately 0.70m wide and between 0.20m and 0.30m deep, with moderately steep sides and a concave base. It was filled with black friable sandy silt which produced post-medieval pottery and brick fragments (Fig 10).



Trench 26, Section through BD2, cut [2611] and re-cut [2609], looking north-west Fig 10

The 1883 Ordnance Survey map depicts a small area within northern corner of the eastern field which contained a possible small building and was sub-divided from the main field by a small ditch. This smaller enclosing ditch was identified in Trench 22, lying to the south of BD2 (Fig 3). The ditch was c0.92m wide and filled with red-brown friable silty clay with occasional rubble fragments (Fig 11).



Trench 22, Small field ditch with rubble fill, looking east Fig 11

### Bell pits and open-pit mining

The evaluation and monitoring works identified a series of post-medieval extraction pits ('bell pits') and other, probably later, features related to mining and extraction activity (open-pit mining) within the area. The location of these mining pits was recorded on the 1959 Ordnance Survey map as ponds (Fig 4). The position of the bell pits was recorded but no excavation took place due to health and safety concerns.



The bell pits were present in nine excavated trial trenches (Trenches 8, 14, 17, 19, 23 – 27) and 16 bell pits were identified in four geotechnical test pits (TP 101, 102, 104, 114) during the Watching Brief phase of works (Fig 2). Features probably relating to open-pit mining were also recorded in four trial trenches (Trenches 20, 21, 22 and 23). In Trench 46, a small area of disturbance was recorded, however this may be related instead to the post-medieval boundary seen on the 1883 Ordnance Survey map (Fig 3).

### **Bell pits**

#### *Trench 8*

Within Trench 8 one bell pit lay partially within the excavated area. Pit [804] was circular in plan and measured c2.30m across. It contained sterile dark grey compact clay (803).

#### *Trench 14*

In Trench 14, a series of seven distinctive bell pits was noted in plan across the trench (Fig 12). Each bell pit was approximately 3.60m to 4.00m in diameter and was filled with similar clay material to that found in Trench 8 (803).



Trench 14, Series of distinctive bell pits across the trench, looking north-west Fig 12

#### *Trench 17*

In this trench four large bell pits were recorded in plan, measuring up to 4.00m in diameter, filled with dark grey clay.

*Trench 19*

Features of a similar type were recorded in Trench 19. Three large semi-circular bell pits were present in the southern part of the trench, containing similar dark clay fills.

*Trench 23*

A bell pit was recorded in Trench 23, located to the western end of the trench and partially beyond the trench limits [2308]. It was sub-circular in plan; its base could not be observed. It measured c2.70m long and was filled with dark black loose coal debris.

*Trench 24*

Two bell pits were located on opposite sides in the north part of Trench 24 (Fig 4). Bell pit [2409] was recorded in plan and had sub-circular shape, c2.35m wide. Its fill was dark grey/black friable silty sand with rubble ash and coal matrix, (2408).

Bell pit [2407] was situated within a large filled depression, [2405] (Fig 13). This was probably natural in formation, being sub-circular in plan and lying partially beyond the trench limits. It had near vertical sides and was 4.18m long and 0.58m deep. Its fill, (2404), comprised sterile dark brown loose silty sand. Bell pit [2407], which was cut into [2405] was circular in plan with moderately steep sides. It measured 1.92m wide and 0.52m deep and its fill, (2406), was light grey compact clay containing rubble and coal (Fig 13).



Trench 24, Bell pit [2407], looking east Fig 13

*Trench 25*

One medium-sized bell pit (c2.35m wide) was recorded in the trench; cut [2506] was circular and partially within the trench limits. It contained two separate fills. The lower fill, (2505), was sterile dark brown-grey friable silty sand and was 0.40m wide. The upper fill, (2504), was black loose coal debris with rubble and was c1.50m wide (Fig 14).



Trench 25, Bell pit [2506] with its two distinctive fills, looking south Fig 14

*Trench 26*

Bell pit [2613] was located to the south-west limit of the trench at its north-east edge (Fig 15). It was c3.00m wide and semi-circular in plan. It was filled with dark grey/black loose coal debris (2612).



Trench 26, Bell pit [2613] in the background to the right, looking north-east Fig 15

*Trench 27*

Four near-identical circular bell pits approximately 1.50m in diameter were located in the centre of the trench and recorded in plan. Another, larger pit, c2.60m wide, was



located towards the west end of the trench. All the pits contained similar fill, a dark grey/black firm sandy silt with abundant of coal fragments (Fig 16).



Trench 27, Large bell pit at the west end of trench and group of four bell pits in the background, looking east Fig 16

**Bell pits in geotechnical test-pits (Fig 2)**

Additional bell pits were recorded during the geotechnical test pit monitoring works in southern part of the site. Test-pits TP 101, 102, 104, and 114 were excavated through bell pits to reveal the natural horizon underneath, allowing the depth of the bell pits to be measured (Figs 17 and 18). In general, the excavated bell pits were filled with loose coal-like mud/siltstone sealed beneath a dark grey clay layer. On average they were between 4.00m and 4.70m deep (Fig 19). No finds or dating evidence were recovered from any of the bell pits.



TP210, South end of test pit, section facing east, looking west Fig 17



TP212, North-west end of test pit, section facing south-west, looking north-east Fig 18



TP 113, Large bell pit with unstable sides, looking north Fig 19

Twelve bell pits were recorded during monitoring in the test trenches in the southern field. They were located within three trenches (TP 201, 204, and 205). In TP 201 one bell pit was located at the north end of the trench. It lay partially within the trench



limits (c65%) and its fill was dark grey sterile compact clay, identical to fills found in bell pits of the evaluation phase (Fig 20).



TP 201, Bell pit in TP 201, looking east Fig 20

In TP 204 four bell pits were present across the trench. In TP 205 seven bell pits were uncovered. All bell pits were recorded in plan. They contained similar type of material which was dark grey sterile compact clay. They appeared to be spaced randomly (Fig 21, 22).



TP204, Series of bell pits within trench, looking south-east Fig 21



TP205, Series of bell pits within trench, looking north-west Fig 22

### **Open-pit mining**

Evidence for open-pit mining was found during the evaluation in four trial trenches (Trenches 20, 21, 22, 46). The remains were concentrated mainly in the centre of evaluated area of the northern field. Evidence for open-cast mining in this part of the site has previously been identified on Ordnance Survey historic maps and during the geophysical surveys (Fig 4).

#### *Trench 20*

An irregular cut of a large pit used for coal extraction was recorded in Trench 20 (Fig 23). Cut [2006] was irregular in shape and covered a greater part of the trench (c60%). The pit seems to have been deliberately backfilled with light grey redeposited natural clay mixed with coal fragments (2005).





Trench 20, Extensive open-cast mining pit cut in the background, [2006], looking south Fig 23

*Trench 21*

Two large features related to open-cast mining were recorded in plan in the trench. Mining pits [2105] and [2106] were filled with almost identical material differing only in the type of inclusion. The c14.50m wide pit [2105] was filled with stiff dark grey clay mixed with occasional rubble (2104). Pit [2106], c10.50m wide, was filled with stiff dark grey clay mixed with an abundance of coal debris (2102) (Fig 24).



Trench 21, Extensive open-pit cuts, [2105] and [2106], on both ends of the trench, looking east Fig 24



*Trench 22*

A linear feature [2204], a probable extraction cut was located at the southern end of Trench 22 along its western perimeter. It was orientated north-south and was c9.00m long and 0.85m wide. It was filled with (2203), a light grey compact clay with coal fragments (Fig 25).



Trench 22, Linear extraction cut [2204] (left of ranging poles), looking north Fig 25

*Trench 46*

A disturbed area was recorded in plan in the centre of Trench 46 (Fig 26). Cut [4607] was irregular and measured c4.00m wide. Its fill, (4606), was dark grey firm silty sand with brick fragments. It is unclear whether the feature was caused by mining activity or instead related to the adjacent field boundary visible on the Ordnance Survey historic mapping (Fig 3).



Trench 46, Cut [4607], looking north-west Fig 26

### *Brick structure*

A possible brick-built structure [2306] lay partially beyond the trench limits. The feature was sub-square, 2.30m long by over 0.96m wide and 0.90m deep. The edges of the structure were constructed of mortared red brick around three bricks wide and surviving to three courses high. The fill, (2305), was light grey-yellow ash and hard clay (Fig 27 and 33, Section 7). The feature may be a small brick-lined shaft, associated with the large open-cast mining taking place nearby.



Trench 23, Brick-built structure [2306] in the northern part of the trench, looking north Fig 27

### **Other features**

The evaluation identified six ditches in five trenches (1, 3, 4, 2 and 6). These could not be clearly identified as belonging to any marked features on the historic mapping or the geophysical survey data. However, they are on a similar alignment to nearby linear features, such as the field boundary at the southern end of Trench 4 or the trackway to the north of Trench 1 (Figs 3 and 4).

#### *Trench 1*

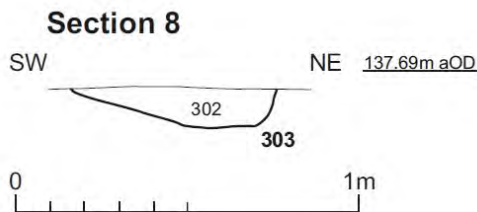
A linear ditch was identified at the north-west end of Trench 1. Ditch [103] was orientated north-west by south-east and measured 0.16m wide by 0.75m deep. Its profile had shallow sides and a concave base and its single fill, (102), was mid red-brown friable silty sand (Fig 28 and 33, Section 4). It contained single sherd of 15th to 17th-century pottery and a greater quantity of post-medieval fragments.



Trench 1, cut [103] of ditch, looking east Fig 28

*Trench 3*

One feature was recorded in Trench 3. Cut [303] is thought to be natural due to its irregular shape. It had shallow sides and a flattish base. It measured 0.50m wide by 0.12m deep. Its fill, (302), was mid red-brown friable silty sand (Fig 29).



Trench 3, Section through Ditch [303], facing south-east Fig 29

*Trench 4*

A linear ditch was recorded in plan around 7m from the southern edge of the trench (Fig 4). Ditch [404] was c0.45m wide with irregular edges and had a north-west by south-east alignment. Its fill was mixed dark grey and orange silt with loose yellow sand and occasional modern brick fragments, indicative of recent backfill. It is possible that this feature represents a section of BD2.

*Trench 26*

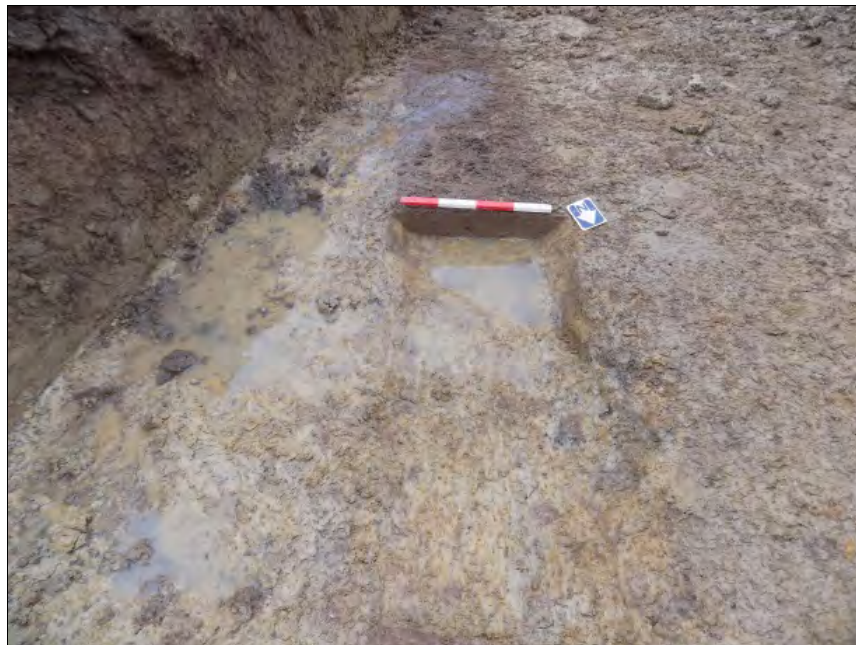
At the north-east end of the trench two undated and intercutting ditches were recorded. Ditch [2607] was orientated roughly east-west. It was 2.05m long by 0.62m wide and 0.15m deep. It had moderately steep, symmetrical sides and a flattish base. Its fill, (2606), comprised mid brown-grey friable silty clay (Fig 30 and 33, Section 2).





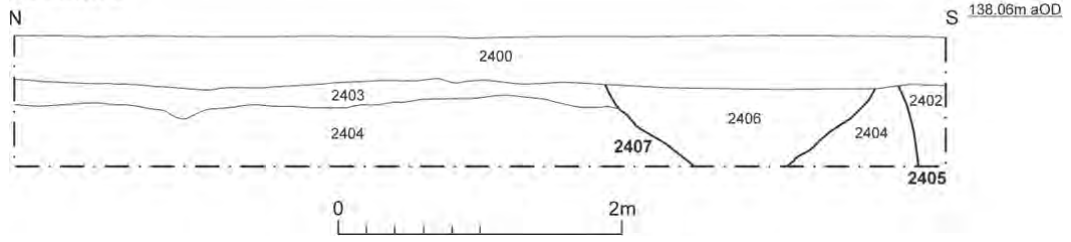
Trench 26, Ditch [2607], looking west Fig 30

Ditch [2605] truncated [2607]. It was orientated roughly north by south and was c5.70m long by 0.45m wide and 0.09m deep. Its fill, (2604), was strong dark brown friable sandy silt, similar to the fills of the open-pit mining features recorded in the area (Fig 31 and 33, Section 1).



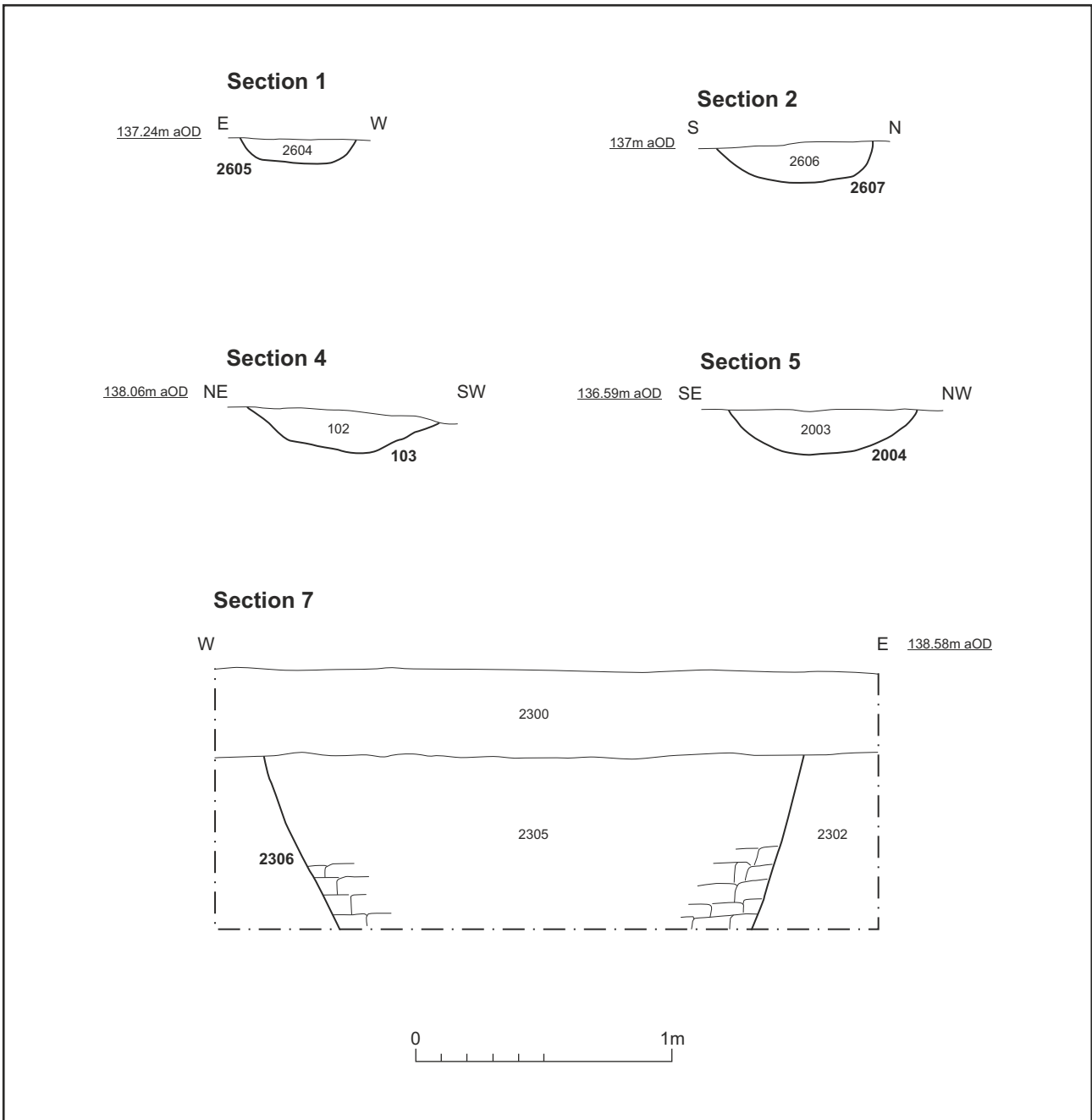
Trench 26, Ditch [2605], looking south Fig 31

Section 6



Scale 1: 50

Trench 24, Section through bell pit [2407] Fig 32



Scale 1:25

Sections 1, 2, 4, 5 and 7 Fig 33

**6 THE FINDS** by Liz Muldowney, Jules Agnew and Tora Hylton

**6.1 Pottery**

Thirty-eight sherds of pottery were recovered from eight of the trenches excavated within the proposed development area. The assemblage dated from the late medieval period into the early 20th century AD (Table 1). The earliest material was recovered from ditch [103] in Trench 1 at the northern end of the site, which also represented the largest assemblage of pottery. Of the eleven sherds recovered one dated from the late medieval period with the majority dated from the 18th or 19th century AD into the 20th century AD. Pottery was recovered from ditches, a pit and extraction pits in very low numbers, usually only one to two sherds in each case. The spread of coal debris (2403) in Trench 24 contained a slightly larger assemblage comprising 6 sherds of mocha type ware, typically dating from the 18th into 19th centuries AD.

*Table 1: Pottery quantification*

Fill/Cut/Type	Fabric	No. Sherds	Weight (g)	Date
102/103/Ditch	1 x Midland purple 2x early post med iron glazed earthenware 8 x post med mocha type ware	11	317.5	c.1450-1600 Early Post Med  18th to 19th century AD
604/605/Ditch	Pancheon type bowl	1	53.6	Post-medieval
2003/2004/Ditch	1 x English stoneware 1 x printed dinner plate	2	106.4	Post-medieval c.1900
2102/2106/Ext. Pit	Utilitarian whiteware	1	56.5	c.1900
2104/2105/Ext. Pit	Stone ware mixing bowl	1	38.5	20th century AD
2403/Layer	Mocha type ware	6	64	Post-medieval
2504/2505/Pit	Stoneware jar	1	17.2	Post-medieval
2608/2609/Ditch	1 x bowl 1 x Iron glazed earthenware	2	47.7	20th century AD
<b>Total</b>	-	<b>25</b>	<b>701.4</b>	-

**6.2 Ceramic building material**

A small amount of ceramic building material was identified on site. The majority of the material comprised rubble of modern brick and was not retained. One small fragment of brick was recovered from the fill of field boundary ditch [2004] (Table 2 below). It was found in association with pottery dating from the 19th to 20th century AD and is likely to be of a similar period.

## 6.2 Kiln furniture

A quantity of possible kiln furniture was recovered from features in three trenches within the northern part of the development area (Table 2).

Possible kiln stilts were recovered from a layer of coal waste material (2403) in Trench 24 and also from the fill of ditch [4503] in Trench 45. These possible stilts were recovered as residual waste material in secondary contexts. No further evidence for kilns or possible pottery manufacture was recovered during the evaluation. However, the recovery of these probable kiln stilts does suggest that pottery production was located in the vicinity as the waste is unlikely to have been deposited at great distance from its source.

*Table 2: Ceramic building material quantification*

Fill/Cut/Type	Type	No. Sherds	Weight (g)	Date
2003/2004/Ditch	Brick	1	52.9	Post-medieval/ modern
2403/Layer	Kiln stilt	7	102.4	Post-medieval/modern
4502/4503/Ditch	Kiln stilt	6	86.2	Post-medieval/ modern
<b>Total</b>	-	<b>14</b>	<b>241.5</b>	-

## 6.3 Glass

One sherd of glass was recovered from field boundary ditch BD1 [4404] in Trench 44 (Table 3). It may have derived from an etched table water bottle or possibly a soda siphon. Comparable complete examples were made by Barnett and Foster of London in the early 20th century.

*Table 3: Glass*

Fill/Cut/Type	Type	No. Sherds	Weight (g)	Date
4403/4404/Ditch	Bottle fragment	1	62.1	Early 20th century
<b>Total</b>	-	<b>1</b>	<b>62.1</b>	



## 7 DISCUSSION

An archaeological trial trench evaluation has been conducted by MOLA on land off Butt Lane, Blackfordby, Leicestershire. Twenty-eight trenches were excavated during the evaluation. Following this, the excavation of 14 geotechnical test-pits and 12 test-trenches was monitored.

Twelve trenches contained archaeological features. Two large boundary ditches (BD1, BD2) were identified in eight trenches. They were parallel, spaced some 50m apart, and aligned north-west by south-east across the site. The ditches formed part of the post-medieval field system visible on 1883 and 1959 Ordnance Survey maps and in the geophysical survey data (Fig 2, 3). A small assemblage of post-medieval to modern pottery was found.

Trenches 24 and Trench 45 contained six possible kiln stilts, a type of post-medieval kiln furniture. No further structural evidence of pottery kilns was identified within the excavated trenches. However, the possible stilts do suggest that pottery production was taking place in the vicinity.

Mining and quarrying activity has been observed across the site, generally clustered to the north and east. It is known that there was a rapid expansion of coal mining in Leicestershire and nationally in general throughout the 19th century and early 20th century when the coal industry significantly increased (Hayes 2018). There is the potential that this activity would have had a substantial impact on surviving archaeological remains within the investigated area due to type and the depth of the disturbance. However, there is no evidence that any earlier features were present on the site.

A series of extraction pits (bell pits) has been recorded across the area. They were present in nine excavated trenches, in three geotechnical test-trenches and in three geotechnical test-pits. No dateable evidence was found directly within the bell pits although six fragments of pottery dating from the 18th-19th centuries AD have been found in a related context of coal debris in Trench 24.

Extensive anomalies have been identified in the geophysical survey plan. Features correlating with the geophysical anomalies were observed in three central trenches (20, 21 and 22). It is believed that these features are probably later than the bell pits and they comprised elements of open-pit mining which followed after mechanisation of the coal industry in the later 1940s (Hayes 2018). The remnant of those large mining pits may have been depicted on the 1959 Ordnance Survey map as ponds (Fig 4).

In the area of Trench 5 and 6 a substantial layer of made ground was recorded. It is probable that this layer derived from the soil mound accumulated during the open-pit activity. The two large spoil-mounds can be seen at 1959 Ordnance Survey map (Fig 4).

The evaluation also identified six ditches in five trenches not depicted on Ordnance Survey maps or identified in the geophysical survey data. Some of these features, i.e. in Trench 1 and 4, may correlate to other known field boundaries (Trench 4) or trackways (Trench 1) (Fig 3, 4) which were marked in a slightly incorrect location on the historic mapping.

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MOLA Northampton

26 January 2018, revised 13 February 2018

**APPENDIX 1: Trench Inventory**

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>1</b>	<b>30m x 1.80m, W-E</b>		<b>W138.51/E 136.46</b>	<b>0.32m – 0.37m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/ Samples</b>
100	Topsoil	Dark grey-brown friable sandy silt	0.32m – 0.37m deep	
101	Natural	Light yellow-grey loose sand/silty sand with brown streaks of manganese	Met at 0.32m – 0.37m	
102	Fill of [103]	Mid red-brown friable silty sand	0.75m deep	Pottery
103	Cut of ditch	Linear, NW-SE orientated with shallow sides and concave base	0.16m wide x 0.75m deep	

*Notes: Linear plough-marks parallel to Ditch [103] present across the trench*

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>2</b>	<b>30m x 1.80m, N-S</b>		<b>N135.87/S134.94</b>	<b>0.32m – 0.35m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/ Samples</b>
200	Topsoil	Mid grey firm silty clay	0.32m – 0.35m deep	
201	Natural	Light orange-brown firm silty clay	Met at 0.32m – 0.35m	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
3	30m x 1.80m, N-S		N138.17/S137.07	0.35m – 0.36m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
300	Topsoil	Mid grey-brown friable silty sand	0.35m – 0.36m deep	
301	Natural	Light yellow-orange-grey loose sand with grey clay pockets	Met at 0.35m – 0.36m	
302	Fill of [303]	Mid red-brown friable silty sand	0.12m deep	
303	Cut of feature	Imperceptible shape of possible natural feature. Sub-linear with irregular edges, shallow sides with flattish base	0.50m wide x 0.12m deep	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
4	30m x 1.80m, N-S		N134.26/S134.94	0.35m – 0.36m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
400	Topsoil	Mid grey firm silty clay	0.35m – 0.36m deep	
401	Natural	Light orange-brown firm silty clay	Met at 0.35m – 0.36m	
402	Fill of [403]	Mixed dark grey and orange silt with loose yellow sand and occasional brick fragments, probably recent backfill	c0.45m wide	
403	Cut of feature	Recorded in plan, NW/SE, Sub-linear shape with irregular edges.	c0.45m wide	



<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>5</b>	<b>30m x 1.80m, W-E</b>		<b>W135.73/E134.36</b>	<b>0.61m – 0.76m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
500	Topsoil	Light grey-brown silty sand with occasional sub-angular flint	0.21m – 0.30m deep	
501	Subsoil	Light grey-brown friable silty clay	0.10m deep	
502	Made up layer	Mixed dark grey compacted natural clay with moderate modern brick and concrete fragments	0.20m – 0.36m deep	
503	Natural	Light yellow-grey firm silty sand with pockets of grey clay	Met at 0.61m – 0.76m	
504	Buried soil	Layer sealed by made-up material (502), containing homogeneous dark brown friable silty sand	Up to 0.11m deep	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
6	30m x 1.80m, N-S		N134.21/S132.90	0.60m – 1.05m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
600	Topsoil	Light grey-brown silty sand with occasional sub-angular flint	0.20m – 0.32m deep	
601	Made up layer	Mixed dark grey compacted natural clay with moderate modern brick and concrete fragments	0.24m – 0.55m deep	
602	Buried soil	Layer sealed by made-up material (601), containing homogeneous dark brown friable silty sand	0.20m – 0.28m deep	
603	Natural	Light yellow-grey firm clay/silty clay	Met 0.60m – 1.05m	
604	Fill of [605]	Mid red-brown friable sandy silt containing moderate brick and ceramic large pipe fragments	0.65m deep	Pottery
605	Cut of ditch	Linear in plan, NW-SE orientation with moderately steep sides and concave base, present in Trench 18 and 19	c1.35m wide x 0.65m deep	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
7	30m x 1.80m, W-E		W132.49/E132.32	0.30m – 0.44m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
700	Topsoil	Light grey-brown silty sand with occasional sub-angular flint	0.30m – 0.44m deep	
701	Natural	Mid green-yellow firm sandy silt with pockets of grey clay	Met at 0.30m – 0.44m	

Notes: Modern rubble containing bricks and concrete fragments scattered at eastern end of trench

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
8	30m x 1.80m, N-S		N132.08/S131.18	0.30m – 0.56m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
800	Topsoil	Light grey-brown silty sand with occasional sub-angular flint	0.25m – 0.33m deep	
801	Alluvium	Light yellow-green sterile loose silty sand	0.15m – 0.23m deep	
802	Natural	Dark brown to light yellow friable sandy silt/sand with pockets of grey clay	Met at 0.30m – 0.56m	
803	Fill of [804]	Dark grey sterile compact clay	c2.30m wide	
804	Cut of bell pit	Fragment of possibly circular in plan pit. Base unseen.	c2.30m wide	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
14	30m x 1.80m, N-S		N132.39/S131.73	0.30m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
1400	Topsoil	Dark grey friable silty clay	0.30m deep	
1401	Natural	Mid brown friable silty sand	Met at 0.30m	

Notes: A series of seven distinctive bell pits noted in plan. Each measuring approximately 3.60m to 4.00m in diameter

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
17	30m x 1.80m, NW-SE		NW133.16/SE132.75	0.57m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
1700	Topsoil	Dark grey friable silty clay	0.57m deep	
1701	Natural	Dark brown friable sandy silt with moderate to frequent small sub-angular flint	Met at 0.57m	

Notes: Four large bell pits noted in plan. Each measuring approximately up to 4.00m in diameter

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
18	30m x 1.80m, N-S		N134.86/S133.41	0.32m – 0.45m
Context	Context type	Description	Dimensions (Lm x Wm x Dm)	Artefacts/Samples
1800	Topsoil	Light grey-brown silty sand with occasional sub-angular flint	0.30m – 0.35m deep	
1801	Subsoil	Light grey firm silty clay	0.15m deep	
1802	Fill of [1803]	Mid red-brown friable sandy silt containing moderate brick and ceramic large pipe fragments	c1.80m wide	
1803	Cut of ditch	Same as [605] and [1904]. Linear ditch present at geo survey plan. Probable modern feature	c1.80m wide	
1804	Natural	Mid orange-yellow clayey silt with moderate pockets of light grey mudstone deposit	Met at 0.32m – 0.45m	

Notes: A modern rubble material scattered at northern end of the trench

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
19	30m x 1.80m, N-S		N135.26/S133.90	0.54m
Context	Context type	Description	Dimensions (Lm x Wm x Dm)	Artefacts/Samples
1900	Topsoil	Mid grey firm silty clay	0.20m deep	
1901	Subsoil	Mid brown friable silty sand	0.25m deep	
1902	Natural	Mid orange-yellow clayey silt with moderate pockets of light grey mudstone deposit	Met at 0.54m	
1903	Fill of [1904]	Mid red-brown friable sandy silt containing moderate brick and ceramic large pipe fragments	c1.20m wide	
1904	Cut of ditch	Same as [605] and [1803]. Linear ditch present at geo survey plan. Probable modern feature	c1.20m wide	

Notes: Three large semi-circular mining/bell pits areas present in southern part of the trench



<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>20</b>	<b>30m x 1.80m, N-S</b>		<b>N137.32/S136.06</b>	<b>0.40m – 0.53m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2000	Topsoil	Light grey-brown friable silty sand with occasional small sub-angular flint	0.25m – 0.35m deep	
2001	Made up layer	Firm yellow-grey sand and clay matrix	0.10m – 0.15m deep	
2002	Natural	Mid orange-yellow grey friable sand and silt, prob. glacial dep.	Met at 0.40m – 0.53m	
2003	Fill of [2004]	Mid/dark red-black burnt friable silty clay with occasional small pockets of yellow sand and occasional rubble	0.17m deep	Pottery, CBM
2004	Cut of ditch	Linear ditch of NW-SE alignment with moderately steep sides with flattish base. Same as [2206]. Depicted at geo plan	0.74m wide x 0.17m deep	
2005	Fill of [2006]	Light grey redeposit natural clay mixed with coal debris. Mining backfill	Covers c80% of the trench	
2006	Extraction cut	Irregular and extensive cut of coal extraction area within the trench. Unexcavated	As above	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>21</b>	<b>30m x 1.80m, W-E</b>		<b>W135.64/E136.40</b>	<b>0.45m – 0.90m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2100	Topsoil	Dark grey-black firm clayey silt with occasional small to medium angular stone	0.30m – 0.35m deep	
2101	Subsoil	Dark brown friable silty sand appears to be backfill	0.15m – 0.45m deep	
2102	Fill of [2106]	Dark grey stiff clay with abundance of coal debris	c10.50m wide	Pottery
2103	Layer	Dark grey/black layer of loose coal below (2101) in centre of trench	c7.00m wide x 0.10m deep	
2104	Fill of [2105]	Backfill of open-cast mining pit. Dark grey stiff clay with occasional rubble material	c14.50m wide	Pottery
2105	Extraction cut	Irregular and extensive cut of coal extraction area at eastern end of trench. Unexcavated	c14.50m wide	
2106	Extraction cut	Irregular and extensive cut of coal extraction area at western end of trench. Unexcavated	c10.50m wide	
2107	Natural	Mid orange-yellow grey friable sand and silt, prob. glacial dep.	Met at 0.45m – 0.90m	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>22</b>	<b>30m x 1.80m, N-S</b>		<b>N137.51/S136.39</b>	<b>0.65m – 0.90m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2200	Topsoil	Dark grey firm silty clay with occasional small to medium angular stone	0.31m – 0.34m deep	
2201	Made up layer	Dark and stiff clay and coal matrix	0.50m – 0.56m deep	
2202	Alluvium	Dark brown sandy silt, sterile and friable with moderate brown streaks of manganese	0.34m deep	
2203	Fill of [2204]	Light grey compacted clay with coal, backfill of extraction pit	c9.00m long x 0.85m wide	
2204	Extraction cut	Linear cut of probable extraction cut located at southern end of trench	As above	
2205	Fill of [2206]	Mid/dark red-black burnt friable silty clay with occasional small pockets of yellow sand and occasional rubble	c0.92m wide	
2206	Cut of ditch	Linear boundary ditch of NW-SE alignment. Same as [2004]. Depicted at geo plan	c0.92m wide	
2207	Fill of [2208]	Mid brown friable sandy silt prob. glacial dep.	c0.88m wide	
2208	Cut of ditch	Linear boundary ditch of NW-SE alignment truncated by extraction cut [2204]. Depicted at geo plan	c0.88m wide	
2209	Natural	Mid orange-yellow grey friable sand and silt, prob. glacial dep.	Met at 0.65m – 0.90m	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>23</b>	<b>30m x 1.80m, W-E</b>		<b>W139.30/E139.00</b>	<b>0.30m – 1.45m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2300	Topsoil	Dark grey friable silty sand	0.30m deep	
2301	Subsoil	Dark brown friable silty sand with manganese streaks	0.20m deep	
2302	Alluvium	Mid brown-red silt with manganese and charcoal flecks	0.30m – 0.85m deep	
2303	Natural	Solid bedrock, green-grey mud/sandstone with pockets of red hard clay in the centre of trench	Met at 0.30m – 1.45m	
2304	Layer	Dark black coal debris, seals (2302)	c0.10m deep	
2305	Fill of [2306]	Light grey-yellow ash and hard clay containing bricks and mortar	0.90m deep	
2306	Extraction cut (poss. bell pit)	Sub-circular in plan, partially within the trench with near vertical sides. Base unseen	2.30m long x 0.96m wide x 0.90m deep	
2307	Fill of [2308]	Dark black loose coal debris		
2308	Extraction cut (poss. bell pit)	Sub-circular in plan, partially within the trench with near vertical sides. Base unseen	c2.70m long	



<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>24</b>	<b>30m x 1.80m, N-S</b>		<b>N139.02/S137.65</b>	<b>0.42m – 0.77m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2400	Topsoil	Dark grey friable and sterile silty sand	0.36m – 0.42m deep	
2401	Subsoil	Dark brown friable sandy silt	0.30m deep	
2402	Natural	Mid brown-orange friable sandy silt with medium to large sub-angular flint and sandstone	Met at 0.42m – 0.77m	
2403	Layer	Dark black coal debris, partially seals (2404)	c0.15m deep	Pottery
2404	Fill of [2405]	Dark brown loose sterile silty sand	0.58m deep	
2405	Cut of feature	Sub-circular elongated in plan, partially perceptible cut with near vertical sides and imperceptible base	4.18m long x 0.58m deep	
2406	Fill of [2407]	Light grey compact clay, rubble and coal matrix. Backfill of bell pit	0.52m deep	
2407	Extraction cut (poss. bell pit)	Circular in plan with moderately steep sides and imperceptible base. Cut into (2404)	1.92m wide x 0.52m deep	
2408	Fill of [2409]	Dark grey/black friable silty sand with rubble ash and coal matrix	c2.35m wide	
2409	Extraction cut (poss. bell pit)	Sub-circular in plan cut of possible bell pit	As above	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>25</b>	<b>30m x 1.80m, W-E</b>		<b>W137.85/E136.93</b>	<b>0.38m – 0.68m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2500	Topsoil	Dark grey friable/soft sterile silt	0.36m – 0.42m deep	
2501	Layer	Light yellow-black friable sandy silt, probable made up	0.30m deep	
2502	Natural	Light orange-brown firm silty sand	Met at 0.42m – 0.77m	
2503	Upper fill of [2505]	Black loose coal debris with rubble	c1.50m wide	
2504	Lower fill of [2505]	Dark brown-grey sterile and friable silty sand	0.40m wide	Pottery
2505	Cut of bell pit	Circular in plan, partially within trench limits	c2.35m wide	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
<b>26</b>	<b>30m x 1.80m, NE-SW</b>		<b>NE138.02/ SW136.57</b>	<b>0.31m – 0.78m</b>
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2600	Topsoil	Dark grey friable sandy silt	0.26m – 0.31m deep	
2601	Subsoil	Dark brown friable silty sand	0.24m – 0.40m deep	
2602	Alluvium	Light grey-yellow friable silt	0.10m deep	
2603	Natural	Light brown-grey firm sandy silt	Met at 0.31m – 0.78m	
2604	Fill of [2605]	Strong dark brown friable sandy silt	0.09m deep	
2605	Cut of ditch	Linear in plan, N-S alignment with moderately steep, symmetrical sides and flattish base	c5.70m long x 0.45m wide x 0.09m deep	
2606	Fill of [2607]	Mid brown-grey friable silty clay	0.15m deep	
2607	Cut of ditch	Linear in plan, W-E alignment with moderately steep, symmetrical sides and flattish base	0.62m wide x 2.05m long x 0.15m deep	
2608	Fill of [2609]	Black friable sandy silt containing occasional burnt stone	0.28m deep	Pottery
2609	Cut of ditch	Linear NW-SE alignment with moderately steep sides and flattish base. Recut of [2611].	1.03m wide x 2.10m long x 0.28m deep	
2610	Fill of [2611]	Light red-brown friable sandy silt	0.28m deep	
2611	Cut of ditch	Linear ditch NW-SE alignment with moderately steep sides and flattish base.	2.10m long x 0.68m wide x 0.28m deep	
2612	Fill of [2613]	Dark grey/black loose coal debris	c3.00m wide	
2613	Extraction cut (poss. bell pit)	Semi-circular cut of bell pit	As above	

<b>Trench No</b>	<b>Length &amp; alignment</b>	<b>NGR</b>	<b>Surface height (aOD)</b>	<b>Depth of natural</b>
27	30m x 1.80m, E-W		E134.28/ W133.93	0.26m – 0.32m
<b>Context</b>	<b>Context type</b>	<b>Description</b>	<b>Dimensions (Lm x Wm x Dm)</b>	<b>Artefacts/Samples</b>
2700	Topsoil	Dark green-yellow friable sandy silt with occasional small to medium sub-angular flint	0.36m – 0.42m deep	
2701	Subsoil	Mid brown-grey sterile firm clayey silt	0.10m deep	
2702	Natural	Light orange-grey compact clay with moderate to frequent manganese streaks	Met at 0.26m – 0.32m	

*Note: Four identical circular bell pits approximately 1.50m in diameter located in the centre of the trench. Another, larger pit, c2.60m, located at the west end of the trench*



Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
28	30m x 1.80m, NE-SW		NE134.12/ SW133.15	0.32m – 0.35m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
2800	Topsoil	Dark grey friable silty sand	0.32m – 0.35m deep	
2801	Natural	Light yellow/yellow-grey compact clay	Met at 0.32m – 0.35m	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
37	30m x 1.80m, N-S		N134.34/ S133.37	0.32m – 0.33m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
3700	Topsoil	Dark grey friable silty sand	0.32m – 0.33m deep	
3701	Natural	Light yellow/yellow-grey compact clay	Met at 0.32m – 0.33m	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
42	30m x 1.80m, N-S		N134.62/ S133.68	0.31m – 0.33m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4200	Topsoil	Mid green-yellow friable sandy silt with occasional small to medium sub-angular flint	0.31m – 0.33m deep	
4201	Natural	Light orange-grey compact clay with moderate to frequent manganese streaks	Met at 0.31m – 0.33m	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
43	30m x 1.80m, NE-SW		NE134.86/ SW134.02	0.28m – 0.30m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4300	Topsoil	Mid green-yellow friable sandy silt with occasional small to medium sub-angular flint	0.31m – 0.33m deep	
4301	Natural	Light orange-grey compact clay with moderate to frequent manganese streaks	Met at 0.31m – 0.33m	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
44	30m x 1.80m, N-S		N135.86/ S134.62	0.40m – 0.56m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4400	Topsoil	Dark grey friable sandy silt	0.26m – 0.30m deep	
4401	Subsoil	Mid yellow-grey friable sandy silt	0.10m – 0.30m deep	
4402	Natural	Light grey-orange hard clay/silty clay	Met at 0.40m – 0.56m	
4403	Fill of [4404]	Dark brown grey firm clay containing ceramic pipe	1.32m wide	Glass
4404	Cut of ditch	Linear, E-W orientated boundary ditch present at Geo survey plan	As above	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
45	30m x 1.80m, N-S		N136.29/ S134.98	0.24m – 0.30m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4500	Topsoil	Mid grey friable sandy silt	0.26m – 0.30m deep	
4501	Natural	Light yellow-grey firm silty sand with brown manganese streaks	Met at 0.40m – 0.56m	
4502	Fill of [4503]	Dark brown grey firm clay containing ceramic pipe	1.18m wide	Pottery

4503	Cut of ditch	Same linear boundary ditch as in Trench 44 and 46, E-W orientated present at Geo survey plan	As above	
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Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
46	30m x 1.80m, N-S		N136.73/ S135.45	0.34m – 0.60m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4600	Topsoil	Mid grey friable sandy silt	0.25m – 0.34m deep	
4601	Layer of made up	Grey compact clay and modern rubble matrix	0.20m – 0.25m deep	
4602	Buried soil layer	Mid grey-brown friable sandy silt	0.15m deep	
4603	Natural	Light yellow-grey firm silty sand with brown manganese streaks	Met at 0.34m – 0.60m	
4604	Fill of [4605]	Dark brown grey firm clay containing ceramic pipe and fragment of asbestos sheet	0.90m wide	
4605	Cut of ditch	Same linear boundary ditch as in Trench 44 and 46, SE-NW orientated present at Geo survey plan	As above	
4606	Fill of [4607]	Dark grey firm silty sand with brick fragments	c4.00m wide	
4607	Extraction cut	Irregular in plan cut of probable mining	As above	

Trench No	Length & alignment	NGR	Surface height (aOD)	Depth of natural
47	30m x 1.80m, N-S		N136.73/ S135.45	0.28m – 0.30m
<i>Context</i>	<i>Context type</i>	<i>Description</i>	<i>Dimensions (Lm x Wm x Dm)</i>	<i>Artefacts/Samples</i>
4700	Topsoil	Mid grey friable sandy silt	0.28m – 0.30m deep	
4701	Natural	Light yellow-grey firm silty sand with brown manganese streaks	Met at 0.28m – 0.30m	

## APPENDIX 2: Geotechnical test-pit location

### Geo test-pits and trenches

#### Watching brief at Blackfordby, Butt Lane, 16-18/01/2018

Test pits 101-114 dug with 0.6m toothless bucket, 3m long. Coordinates taken in the centre of each trench

Test Pit No	Coordinates (SK/BNG)	DG Photo	Orientation	Notes
TP101	32609/18131	91-96	W-E	-
TP102	32607/18118	97-112	NW-SE, NE-SW	2 crossed trenches each c5m long
TP103	32592/18104	113-114	NNE-SSW	-
TP104	32595/18104	115-122	WNW-ESE	-
TP105	32589/18083	127-128	WNW-ESE	-
TP106	32528/18162	148-155	NNE-SSW	-
TP107	32634/18239	176-178	W-E	Dug in 1 line with 3m gap
TP108	32634/18239	176-178	W-E	Dug in 1 line with 3m gap
TP109	32532/18276	179-180	W-E	-
TP110	32519/18241	181	NNE-SSW	-
TP111	32659/18232	182-183	W-E	Dug in 1 line with 3m gap
TP112	32659/18232	182-183	W-E	Dug in 1 line with 3m gap
TP113	32655/18217	184	W-E	-
TP114	32607/18150	185-195	W-E	-

Test trenches 201-212 dug with 1.8m toothless ditching bucket, 15m long except TP205 (17m). Coordinates taken in the centre of each trench

Test Pit No	Coordinates (SK/BNG)	DG Photo	Orientation	Notes
TP201	32612/18091	91-96	N-S	-
TP202	32592/18064	97-112	W-E	-
TP203	32575/18108	113-114	N-S	-
TP204	32589/18142	115-122	W-E	-
TP205	32605/18112	127-128	W-E	-
TP206	32546/18182	148-155	NE-SW	-
TP207	32533/18124	176-178	NNW-SSE	-
TP208	32514/18139	176-178	W-E	-
TP209	32505/18172	179-180	NNE-SSW	-
TP210	32494/18212	181	N-S	-
TP211	32465/18214	182-183	N-S	-
TP212	32475/18180	184	NW-SE	-

## **APPENDIX 3:**

### **Phase 2: Archaeological monitoring of engineering works on land at Butt Lane, Blackfordby**

**Leicestershire**

**April to May 2018**

Authors: Rachel Clare and Claire Finn

Illustrations: Olly Dindol

#### *Abstract*

*MOLA was commissioned by CgMs Heritage to carry out monitoring of remedial engineering works following earlier evaluation and watching brief that had identified extensive undated extraction 'bell' pits, and post-medieval boundaries. The Phase 2 watching brief recorded the exposed extent and nature of the sub-circular extraction pits, boundary features and a large undated kiln. A fragment of late medieval pottery, probably residual, was recovered from one ditch. Other ditches contained late post-medieval to early modern pottery, glass and CBM. Also a few fragments of kiln stilts were identified in two post-medieval contexts indicating possible post-medieval pottery production in the vicinity. This report is an addendum to the trial trenching report and Phase 1 WB report and should be read in conjunction with that publication. It presents the results of the Phase 2 watching brief that monitored the entirety of the south-east area of the site.*

## **AP3.1 INTRODUCTION**

### **AP3.1.1 Phase 2 Watching Brief**

In December 2017 MOLA was commissioned by CgMs Heritage, on behalf of Davidsons Homes to carry out the initial archaeological evaluation on land off Butt Lane, Blackfordby, Leicestershire, prior to residential development (Fig 1, NGR SK 32566 18251). This was in response to a condition attached to planning. The planning permission was subsequently granted at Appeal (Appeal Ref: App/G2435/W/15/3137258). Following the trial trench evaluation, geotechnical trenching was also subject to archaeological monitoring in January 2018.

A second phase of watching brief was requested for the further geotechnical remediation works and a Written Scheme of Investigation (WSI) was prepared by CgMs Heritage and submitted to and approved by North West Leicestershire District Council (CgMs Heritage 2018). This report outlines the results of the second phase of monitoring works, outlined above. It should be considered an addendum to the previously published trial trench and Phase 1 watching brief report and should be read in conjunction with that document (Orzechowski 2017). For details of the background to the project please refer to the aforementioned trial trench report and the WSI for this phase of works prepared by CgMs Heritage (2018).



### AP3.1.2 Methodology

The topsoil and subsoil overlying the south-eastern area was removed under archaeological supervision and the resulting plan of the archaeological features was created using Leica Viva RTK GPS operating to +/- 0.02m tolerance. The Written Scheme of Investigation (WSI) prepared by CgMs Heritage stipulated that should further extraction 'bell' pits be uncovered elsewhere within the site then further remediation and archaeological monitoring would be required (CgMs Heritage 2018) and where these were encountered these were also planned and investigated following the prescribed safe system of work (Appendix Figs 1 and 2).

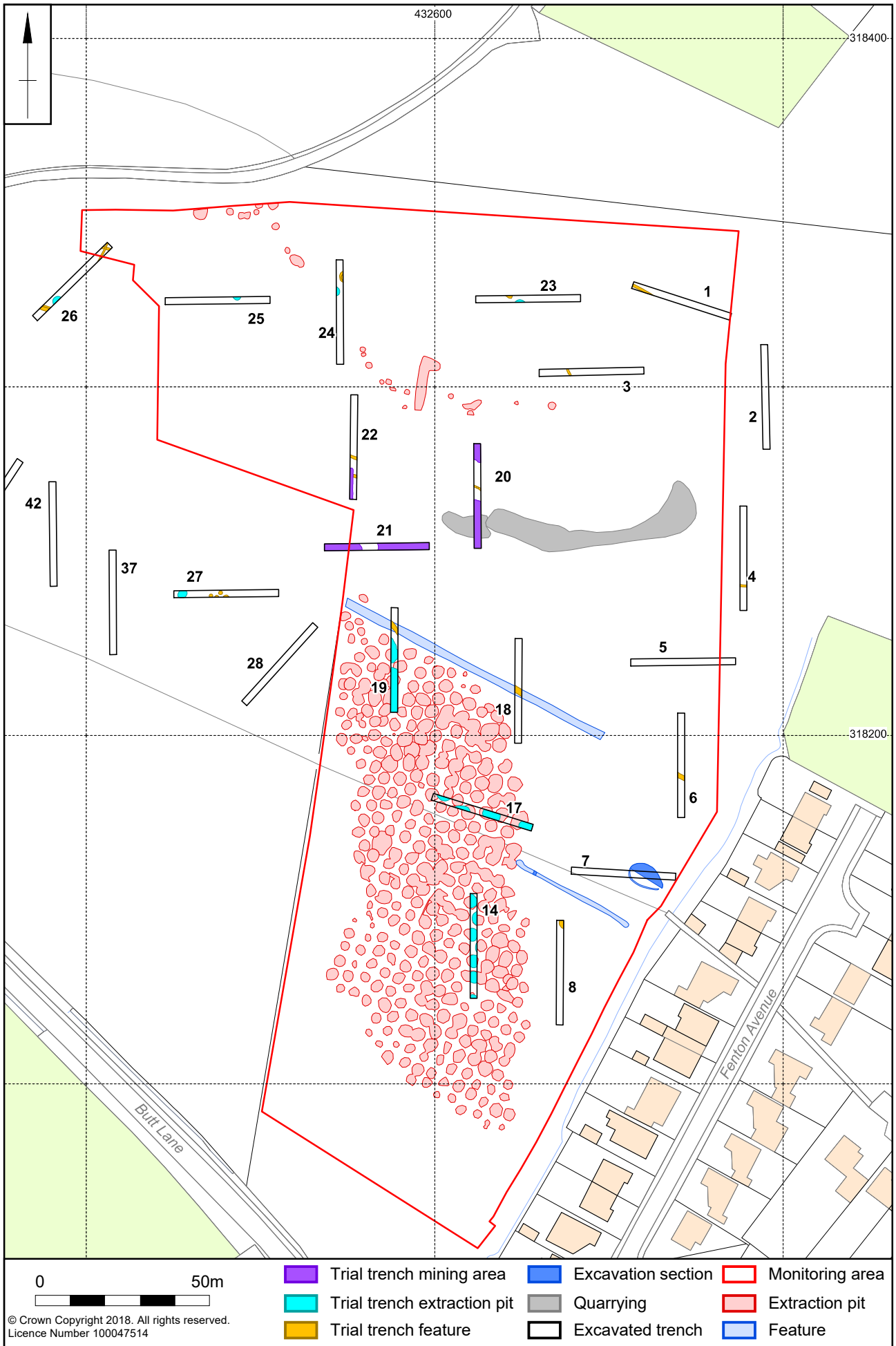
All works were carried out in accordance with the Chartered Institute for Archaeologists' *Code of Conduct* (CIfA 2014a) and *Standard and Guidance for Archaeological Watching Brief* (CIfA 2014b). All works conformed to Historic England's *Management of Research Projects in the Historic Environment* (HE 2015).

### AP3.2 RESULTS

All the features recorded during the watching brief related to industrial activity or land subdivision. Dating evidence was sparse in the extreme, and predominantly derived from the backfill deposits in the disused post-medieval boundary ditches.

#### AP3.2.1 Kiln

At the eastern side of the monitored area a large oval feature [11], was exposed (Appendix Figs 3, 4 and 5). Extending 10.55m in length and 6.50m in width and 0.32m deep, it was aligned south-east to north-west on its main axis with an opening on the downslope to the south-east. It was shallow with steep sides and a flattish base, the edges of the feature had been scorched to a maximum depth of 0.05m. Isolated areas of heat affected substrate below the feature were noted (labelled (10) on Appendix Fig 3 and visible in images in Appendix Fig 4). The primary fill (9) was confined to the edge of the kiln and consisted of dark grey sandy silt with frequent inclusions of charcoal and is indicative of burning in situ (see section 3.2). The upper fill (8) represented natural silting, possibly caused by flooding of the area (Appendix Fig 5), this material contained no artefacts or indicators of the primary function.



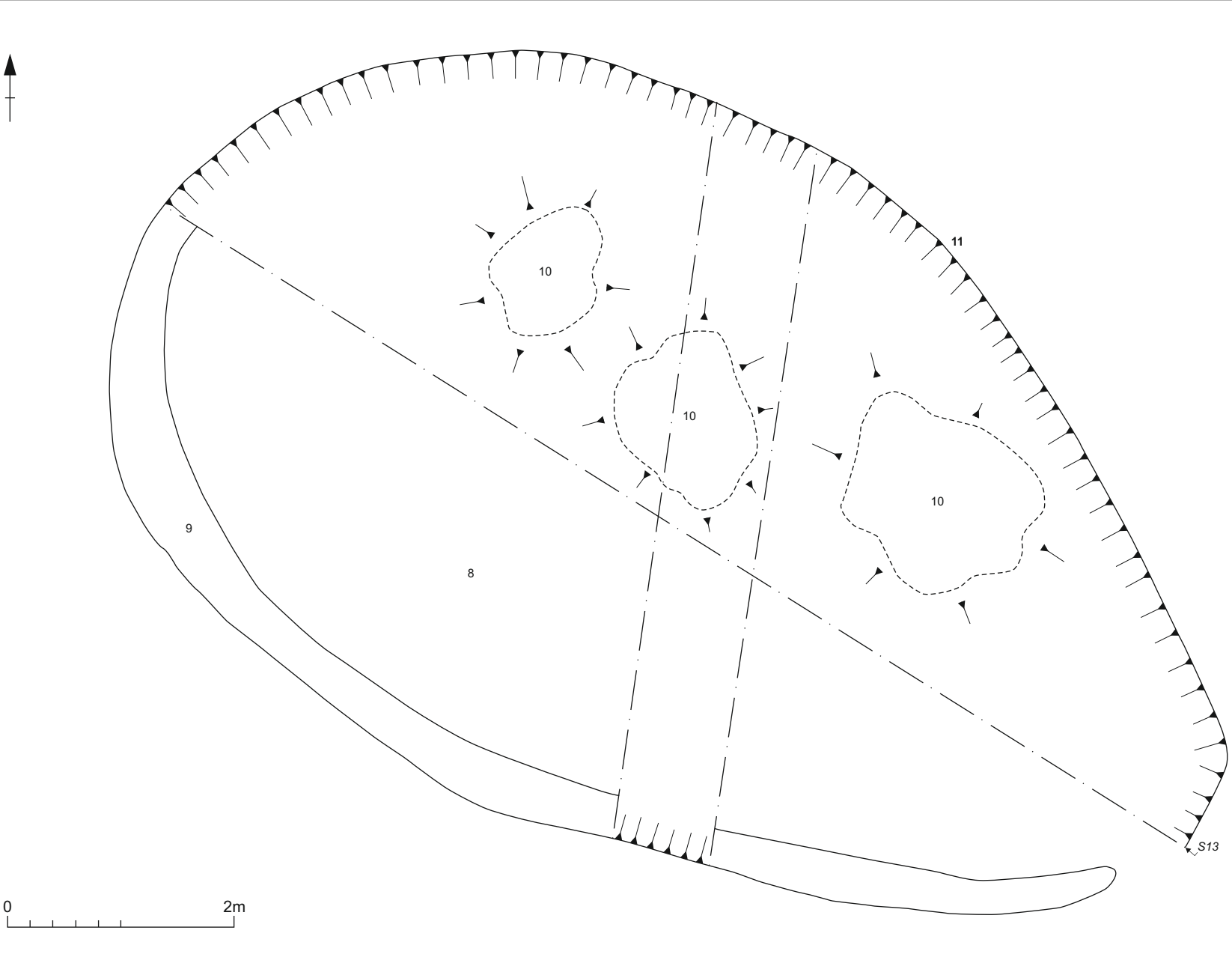
Scale 1:1500

All features plan

Appendix 3 Fig 1



UAV image of monitoring area during stripping, provided by GRM Appendix Fig 2



Scale 1:50

Plan of Kiln [11] Appendix Fig 3





Fully exposed kiln, looking north-west



Base of kiln showing isolated reddening of substrate, looking north-west

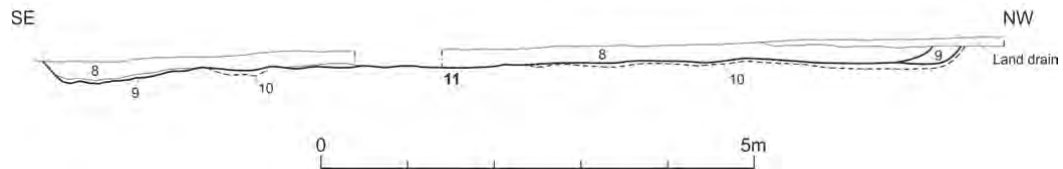


Kiln [11] heat affected edge showing minimal scorching, looking north-west



Kiln [11] following investigation, looking south-east





North-east facing section of kiln [11]

Appendix Fig 5

### AP3.2.2 Post-medieval boundary ditches

Two parallel boundary ditches were recorded, one of which was previously identified and investigated in the evaluation (Trenches 18 and 19). The second ditch was identified on the same north-west to south-east alignment 70m to its south. This ditch was only clearly recorded on the eastern side of the extraction pits (Appendix Fig 1), however, the UAV aerial photograph indicates its continuation to the west within the extraction area (Appendix Fig 2). It is thought that the extraction post-dated the use of the ditch.

The ditch was orientated north-west to south-east and extended a minimum of 25m in length [5]. It was 1.30m in width and had a maximum depth of 0.28m and was truncated by a ceramic land drain (Appendix Fig 6). It contained a single deliberate backfill (4) that contained nine sherds of modern earthenware pottery, seven of which were waster sherds. Twelve fragments of kiln furniture were also retained, most of which were three arms stilts composed of the same white clay as the aforementioned pottery sherds. Aside from one later sherd of pottery, all of the waste material within this ditch relates to the production of 'Yellow Ware' pottery (see section 3.1).

### AP3.2.3 Extraction 'bell' pits

The full extent of the previously identified 'bell pits' were exposed. The extraction pits were concentrated to the south, across a rectangular area covering 2,286 m<sup>2</sup> (see Appendix Figs 1, 2 and 7). The northern limit of the main area of pits was defined by the boundary ditch recorded in Trenches 18 and 19. The pits were generally circular with an average diameter of 4m, laid close together in a defined grid pattern. All of the pits were filled with sterile dark grey clay and shale mixture. Several of these pits were also noted in the north of the area, though they were more sporadic in plan, lacking the grid layout. The pits were extremely deep, extending more than 5m in places.



South-east facing section through field boundary ditch [5] Appendix Fig 6



Extraction 'bell' pits after scraping Appendix Fig 7

### AP3.3 THE FINDS AND ENVIRONMENTAL REMAINS

#### AP3.3.1 Pottery and kiln furniture by Paul Blinkhorn

The pottery assemblage comprised 15 sherds with a total weight of 253g. It was all of 19th century date, and included kiln waste in the form of biscuit-fired wasters and kiln furniture.

Most of the non-waste pottery is 19th-century Mocha/Yellow Ware, a type which generally came into production around 1830. Such pottery does not have a specific code in the Leicestershire County type-series (Sawday 1994), and is classified under the general fabric EA10, 'modern earthenwares'. Four sherds (62g) of such pottery occurred in the stockpiling area, along with two fragments (33g) of unglazed wasters in an identical fabric.

Further pottery occurred in ditch 5, in the form of a sherd of transfer-printed white earthenware (19g) of 19th–20th-century date, and a sherd of Yellow Ware (31g), and seven further unglazed, biscuit-fired waster sherds (108g).

A quantity of kiln furniture was also noted. The stockpiling area produced 12 fragments (134g) of largely broken, three-armed stilts in a white clay identical to the waste pottery, along with a single spur (3g) in the same fabric, and another comprising a disc with a small central spike in a red-firing earthenware (10g). Context 5 produced nine fragments (158g) of three-armed stilts in the same fabric to those from the stock-piling area. Some of the stilts, in both cases, had drips of yellow glaze on them, showing that they were used in Yellow Ware manufacture. The source of this kiln waste could be from any one (or more) of a number of potteries in Woodville and the surrounding area shown on the 1883 map. One possible candidate is that of Hall and Son of the Rawdon Pottery, the only one listed as manufacturers of "Yellow Ware" in a broadly contemporary publication (White 1846, 305).

#### AP3.3.2 Environmental analysis by Sander Aerts

##### Introduction

One sample of 40 litres was taken from fill (9), a burnt layer within kiln [11]. The sample was processed in its entirety at MOLA Northampton though manual flotation. This was carried out using a siraf tank fitted with a 1 millimetre mesh for the residue, and a 500 micron mesh to retrieve the flots. The residues and flots were dried and hand sorted, and identified using a low-powered binocular microscope (40X) where possible.

##### Results

The environmental remains all relate directly to the burning inside the kiln, as the assemblage comprises solely of charred botanic remains and is associated with slag. This mainly consists of small charcoal fragments and carbonised twigs. One rush seed (*Juncus* sp.) was observed along with a possibly cultivated cereal grain in the flot. The latter could not be identified due to the high degree of fragmentation.

##### Discussion

The charred plant remains are all a direct results of the firing inside the kiln. However, as these kilns were most likely used for pottery production, the burnt seed and grain are probably incidental occurrences.

## AP3.4 DISCUSSION

### AP3.4.1 Extraction 'bell' pits

The site at Blackfordby identified a large number of circular extraction shafts, probably dating to the post-medieval period. Such shafts are usually referred to by the name 'bell pits', although there is some debate as to the appropriateness of this term (Gill 2016, 97).

The research framework for the archaeology of mining and quarrying in England describes bell pits in the following way:

*A bell pit is a shallow shaft which 'bells out' at the bottom to extract as much of the seam as possible over a relatively small area. Work would continue until flooding, lack of ventilation, or the danger of collapse necessitated abandonment of a shaft and commencement of another nearby. Sinking-dirt and other spoil could be used to backfill the neighbouring, abandoned pits so, at the surface, this was likely to produce a cluster of shallow hollows surrounded by minimal amounts of spoil. Weathering, ploughing or land improvement may have obliterated all obvious traces of such slight features (Gill 2016, 97).*

While the term 'bell pit' has been applied to a number of different types and periods of extraction, it is most traditionally applied to coal and ironstone mining, where bell pits of the traditional hand-bell shape are identified. Both of these material types lie in horizontal beds and after the sinking of a shaft can be worked out laterally in all directions (Roe 2008). It is not clear what mineral resource was being extracted at Blackfordby, a number of possibilities are feasible and are discussed below.

#### *Ironstone*

'Bell pit' mining, while often associated with coal extraction, probably developed as a process in the medieval period when iron was of much greater use and value than coal (Claughton 2016, 117). The process of ironstone extraction took place as follows:

*The nodular form is sometimes called clay-band, argillaceous, or clay-ironstone, and its manner of formation is not clear...It is very common in the Coal Measures...Normally it will underlie the coal, and where seams outcrop, the beds of iron ore nodules may also appear. In the medieval period this material was mined by digging 'bell-pits' (not always bell-shaped) through the shale and coal. In many cases no attempt was made to use the coal, and the coal that had to be moved to get at the ore below was back-filled with the shale (Tylecote 1987).*

As mentioned above, shafts dug to extract ironstone were often backfilled with unwanted coal from an adjacent shaft and no attempt was made to extract coal from the seam (Claughton 2016, 117).

An example of bell pits cut for iron extraction are seen at Bentley Grange Farm in Kirklees, where an area of probably 16th-century iron mining is scheduled under NHLE UID 1005786 (HE 2018a). The activity on the site may be as early as medieval but it is thought more likely to date into the post-medieval period just before the Industrial Revolution. The site comprises at least 60 shafts from bell pit mining, situated in a rough grid pattern around 50m apart. The diameter of the shafts is not known, but the mound earthworks of spoil surrounding each shaft varied between 25m-40m in diameter. In this instance the shafts are thought to have been worked outwards once they reached the ironstone seam and interconnected underground with the adjacent shafts. The surviving upstanding earthworks are very well preserved here and it has been suggested that the form and size of the shaft mound

above ground can be used to identify the specific use of the shaft; for ventilation, winding shafts, water pumping or ladder shafts (Moorhouse and Wilmott 1985; HE 2018b).

### *Coal*

The site at Blackfordby lies on the boundary between the Pennine Lower Coal Measures Formation bedrock to the south and Moira Formation Breccia to the north (BGS 2018). While it is stated that ironstone is found as nodules in the mudstone bands in the Leicestershire Coalfield and that these have been extensively worked (NE 2014, 9) there is no record of this activity taking place in the northern coalfield near to Blackfordby, and the ironstone in Leicestershire is notably poor (BGS 2002). The site lies within the North-West Leicestershire Coalfield adjacent to the Ashby Anticline, and although no coal is recorded in the exact location of the site, immediately to the west across Butt Lane, the British Geological Survey Mineral Resources map indicates the presence of a known coal seam with less than 50m overburden (*ibid*).

Coal mining in Britain, and in Leicestershire in particular, seems to have begun on a significant scale during the 13th century, with documentary records of this period referencing works at Swannington, Worthington and Swadlingcote (Derbyshire). By the 14th century, more significant extraction in the form of outcropping was taking place at Staunton Harold and Overton Saucy, later becoming Coleorton (Gill 2016, 92; HE 2018b). It was probably around this time that the types of extraction changed from the cutting of drifts from pits or along outcrops to the sinking of regularly spaced shafts (Bell and de Bruyn 1999, 226). Medieval shafts at Coleorton were shown to be square, 0.9-1.52m wide and lined with timber (Hartley 1994, 91); later shafts were lined with brick or stone, or left unlined (Gill 2016, 98).

By the late 15th century at Coleorton, 6.6km east of Blackfordby, 'pillar and stall' extraction was taking place; another form of mining which utilised multiple regularly spaced shafts in a manner which on the surface may appear very similar to bell pit shafts (Gill 2016, 92, 98; HE 2018d), although this method tended to be preferred over bell pits if the coal seam was more than 7m below the ground (Bell and de Bruyn 1999, 226). During pillar and stall mining, shafts were often positioned between 20-30m apart, although the distance could also be significantly less, and at Coleorton may have been up to 30m deep (Gill 2016, 92). This type of extraction is thought to have developed in the 16th century (Bell and de Bruyn 1999, 226), although most archaeological sites of this type, when dated, are often between 17th to 19th century (Gill 2016). During detailed earthwork survey at Middleton Park, Leeds, it was concluded that closely spaced shafts with a cover of less than 20m above the coal seam were likely to be bell pits, while shafts which were more widely spaced and under deeper cover probably formed part of pillar and stall workings (Roe 2008).

The Ashby region was altered dramatically by coal mining; in the early 19th century, the Earl of Moira established collieries, an ironworks and a new settlement (Moira) just 2.7km to the south of Blackfordby, which was served by the Ashby Canal. Due to the extraction of fireclay as a byproduct of coal mining in this area (see below), most collieries had an adjacent brick and tile works during the 19th and 20th centuries, and the majority of sites were now connected by a network of railways and a canals connecting the industrial landscape (Gill 2016).

The nearest opencast mining to the site is recorded by the BGS as taking place 1.2km to the south-east on the far side of Blackfordby (BGS 2002), and an intense area of industrial activity, associated with the site at Moira, comprising clay pits, brick works, coal mines, sanitary pipe works and tramways are depicted on historic



Ordnance Survey maps from 1885 to the late 20th century around 1.2km to the west of the site between Boothorpe and Woodville. Additionally, historic Ordnance Survey maps depict a number of relevant features closer to the site within fields around Blackfordby, including *Blackfordby Mine (Coal and Clay)* on the 1881 map around 300m to the north of the site at approximate NGR: SK32521840 and the 1901 map at NGR: SK 32331 18540; *Blackfordby Mine, shaft and Old Clay shaft* between NGR: SK 32331 18540 and SK 32005 18555; and *old shaft* in the same location on the 1923 to 1955 maps. It is recorded that shafts and tracks at these sites were visible as cropmarks on aerial photographs in 1993 (Boutwood 1993). No shafts or pits are labelled within the area of the site itself, so it is possible the bell pits at Blackfordby were backfilled pre-dating the earliest OS map.

Four historic coal mining sites in the Coleorton area are Scheduled Monuments:

*Appendix Table 1: Scheduled mining sites*

Site name	NHLE UID	Grid Reference	Dating
Coal mining remains at The Conery, 500m south of Coleorton Hall	1018464	SK 16833 39086	13th-15th centuries
Coal mining remains in Lount Wood	1018465	SK 18779 38059	Pre mid-15th century
Coal mining remains 600m south west of Smoile Farm	1018463	SK 19081 39604	15th-18th centuries
Coal mining remains at Birch Coppice and Rough Park, 950m and 1.5km south of Smoile Farm	1018462	SK 18640, SK 39249 39326 18090	13th-20th century

It has been suggested that the shafts of bell pit collieries were usually around 1.3m in diameter, with some research indicating pits were generally no deeper than 12m (Bell and de Bruyn 1999), and this can largely be supported by evidence from nearby mining sites. Mining remains at Louth Wood (NHLE 1018465) comprise densely clustered vertical 'bell-pit' shafts, surviving as hollows surrounded by spoil mounds. The shafts themselves are between 1m-1.5m deep and 1.5m-3m wide. The workings trace the coal seam on a north-east to south-west alignment. These may date earlier than the mid-15th century (HE 2018c).

Similar remains were identified at Birch Coppice and Rough Park (NHLE 1018462; HE 2018d) and The Conery (NHLE 1018464; HE 2018b), where early mining evidence in the area was identified from at least the 13th century, where coal was picked up or mined in shallow opencuts. On both of these sites, outcropping was succeeded by a dense arrangement of bell pits, extant as hollows of up to 0.5m depth and low spoil mounds. The Conery was not mined beyond the medieval period, but at Birch Coppice and Rough Park mid 15th-century pillar and stall mining later took place in the north of the site. This was again replaced in the early 17th century by longwall mining. Tramways, horse 'gin' platforms, drainage soughs and shaft linings have also been identified here from later post-medieval activity (HE 2018d).

At Smoile Farm (NHLE 1018463), well-preserved shaft mounds are extant, 1.5m-2m high and up to 12m wide, with evidence of horse platforms for drainage and winding apparatus (HE 2018e). The shafts are dispersed throughout the site, with larger ones particularly evident in the east.

A number of other comparable bell pit extraction sites are recorded close by in neighbouring counties which are not scheduled. Several areas of bell pit extraction are known in Derbyshire in the Ticknall area (SMR no 61056). Around 4.3km north-

east of the site was a widely exploited area of bell pits, where several hundreds of 18th century pits are known from within an area 700m long by 400m wide at South Wood, Ticknall (NT 2018a). The pits varied in form and density, with the smallest, most densely clustered shafts and their spoil heaps together measuring between 5-9m, spaced up to 14m apart. Two small additional groups of coal extraction bell pits are located in Long Alders Plantation (15-20 pits) and Heath Farm (6-8 pits) around 3.6km north of the Blackfordby site at Calke Abbey. The shafts at both sites were marked by spoil mounds of soil and coal shale measuring between 11m and 12m in diameter and spaced between 10m and 20m apart. The mining activity is dated from the early 18th century (NT 2018b; NT 2018c).

Further afield, around 30km to the south-west and north-east, several other post-medieval collieries have a similar date and form. Numerous bell pits have been identified at Brereton Hayes Wood and Beaudesert Old Park in Staffordshire, where it is known that coal (and ironstone) extraction were taking place from the later 14th century and continued in various forms through to the 20th century (SCC 2015). On the outskirts of Nottingham, a Scheduled Monument site NHLE 1017654 comprises earthworks and buried remains of shaft workings at Broad Oak Farm, Strelley. This colliery was established in the 16th century and is well documented in the historic record; the late 16th century the Strelley and Wollaton pits were the largest and most productive coal mines outside Tyneside. They continued to be successful into the 17th century (HE 2018f). At Salterwood, Derbyshire, bell pits were identified during opencast coal extraction. The coal shafts measured between 3.5m and 6m in diameter and probably dated from the 16th century. The largest bell pit was around 4.9m long at the top of the shaft and 5.8m at the base and was around 6m deep. Interestingly, the coal shafts were interspersed with narrower later cut shafts which were sunk solely to extract ironstone during the late 18th-19th century (Griffin 1969).

### *Fireclay*

Additional to coal and ironstone, another mineral resource on the site which is likely to have been exploited was fireclays, which is usually found as seatearths (fossil soils) underlying shallow coal seams. Opencast coal mining sites provide a source of this material as 'a low cost by-product' (BGS 2002). While in this area of Leicestershire, the large majority of fireclays are recovered from the South Derbyshire Coalfield to the south, small quantities of fireclay have also been extracted previously from the Leicestershire Coalfield, and it is known to have been produced from the south and west of Blackfordby at the Albion, Moira, Woodville and Donington Island coal mines (*ibid*). Fireclays are formed of kaolinite, hydrous mica (illite), and quartz in various amounts and have a particularly high alumina content which makes them particularly suitable for the production of refractory bricks and crucibles (Claughton 2016b; BGS 2002).

*Fireclay can be modelled as a system containing two mutually insoluble components, silica (SiO<sub>2</sub>) and alumina (Al<sub>2</sub>O<sub>3</sub>). At high temperatures, a silica polymorph, cristobalite, and a new mineral called mullite (3Al<sub>2</sub>O<sub>3</sub>-2SiO<sub>2</sub>) form (Callister 2002, 409). The solidus of the silica-alumina system, within the normal composition range of natural fireclay, is 1587 ± 10°C. This temperature is only just above the melting point of iron at 1538°C (Claughton 2016b, 129).*

It has been noted that this usage was much more significant prior to the 1950s and particularly from the 18th century, when advancements in blast furnaces and steam power led to an increase in demand for refractory brick (BGS 2002, Claughton 2016b, 132). A number of brickworks were in the vicinity of the Blackfordby site, which suggests that fireclay was likely to be extracted during the mining works at Blackfordby, Butt Lane, with the shafts being backfilled with waste shale material

after extraction. Any other mineral resource present that had value would most likely have been extracted and exploited where possible.

#### *Dating*

The bell pits did not produce any material to help date them. However, the rigid grid pattern, the regular shape and size of the shafts and the presence of 18th-19th century pottery from a related context of coal debris in Trench 24 (Orzechowki 2017) all indicate an early modern date rather than a medieval or post-medieval date. The absence of the shafts on the historic Ordnance Survey mapping, when other similar extraction in the area is marked, suggests the area might have finished being worked by the date of the first Ordnance Survey map in 1883. When combined, the probable date for these extraction pits is from the late 18th to early 19th centuries.

#### **AP3.4.2 The kiln**

The kiln's function and date is uncertain. The absence of wasters and debris suggest that it was not likely to be contemporary with the other industrial features identified in the site. Its form is not inconsistent with prehistoric/Romano-British pottery kilns but equally it could have been used for some other industrial purpose before being allowed to silt up during a period of little or no human activity within the vicinity. Therefore, although unlikely to have dated from the later post-medieval period when activity in this field was fairly intense, a prehistoric to medieval date is possible.

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5th July 2018