

ARCHAEOLOGICAL BOREHOLE  
ASSESSMENT AT  
THE PROPOSED WORCESTER  
PARKWAY STATION,  
NORTON,  
WORCESTERSHIRE



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WR1 3PB

Status:  
Date: 04 October 2013  
Author: Nicholas Daffern ([ndaffern@worcestershire.gov.uk](mailto:ndaffern@worcestershire.gov.uk))  
Contributors:  
Illustrator: Carolyn Hunt  
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## **Archaeological borehole assessment at the proposed Worcester Parkway Station, Norton, Worcestershire**

Nicholas Daffern

### **Summary**

An archaeological borehole assessment was undertaken at land off the B4084, Norton, Worcestershire (National Grid Reference SO 8930 5096), as the site has been proposed as the location of a new Worcester Parkway railway station. It was commissioned by Worcestershire City Council (the Client).

Six boreholes were sunk to a maximum depth of 5.00m below ground surface with no *in situ* archaeological or palaeoenvironmental remains or deposits being encountered. The sole material of archaeological interest were post-medieval artefacts including ceramic building material, glass, glazed pottery and clay pipe which lay disturbed upon the surface of the ploughed field.

Overall, the sequence was very shallow, with the natural Lias clay being encountered on average less than a metre below ground surface across the site.

## Report

### 1 Background

#### 1.1 Reasons for the project

An archaeological borehole assessment was undertaken at land off the B4084, Norton, Worcestershire (National Grid Reference SO 8930 5096), as the site has been proposed as the location of a new Worcester Parkway railway station. It was commissioned by Worcestershire City Council (the Client).

The proposed development site contains no designated heritage assets but there is potential for the presence of organic deposits preserving palaeoenvironmental remains.

The project conforms to a brief prepared by Mike Glyde (Worcestershire County Council; WAAS 2013) and for which a project proposal (including detailed specification) was produced (WA 2013). It also conforms to the *Standard and guidance for archaeological field evaluation* (IfA 2009).

The event reference for this project, given by the Historic Environment Record is WSM 49799.

### 2 Aims

The aims of this assessment are:

- to describe and assess the significance of the heritage asset with archaeological interest;
- to establish the nature, importance and extent of the archaeological site;
- to assess the impact of the application on the archaeological site.

### 3 Methods

#### 3.1 Personnel

The project was undertaken by Nicholas Daffern (BA Hons M.Sc.; Senior Environmental Archaeologist); who joined Worcestershire Archaeology in 2007 and has been practicing archaeology since 2004. The project manager responsible for the quality of the project was Tom Rogers (M.Sc.). Illustrations were prepared by Carolyn Hunt.

#### 3.2 Documentary research

Prior to fieldwork commencing a search was made of the Historic Environment Record (HER), the report of which (Cornah 2013) will be provided to the client upon submission of this report.

#### 3.3 List of sources consulted

##### *Cartographic sources*

- 1885 Ordnance Survey 1:2500 map, Worcestershire
- 1886–1892 Ordnance Survey 1:10,560 map, Worcestershire
- 1904 Ordnance Survey 1:2500 map, Worcestershire
- 1905 Ordnance Survey 1:10,560 map, Worcestershire
- 1938 Ordnance Survey 1:10,560 map, Worcestershire
- 1954–1955 Ordnance Survey 1:10,560 map, Worcestershire

##### *Documentary sources*

Published and grey literature sources are listed in the bibliography.



### 3.4 Fieldwork strategy

A detailed specification has been prepared by Worcestershire Archaeology (WA 2013), and the fieldwork was undertaken on 26 September 2013, the site reference number and site code being WSM 49799. Six boreholes were sunk under the supervision of a Senior Environmental Archaeologist (Fig 2), and using a Competitor mini-tracked percussive auger rig to recover continuous/windowless cores of c 100-80mm in diameter and 1m length, with the aim of sampling alluvial and/or organic deposits that could be assessed for environmental remains and their potential for geoarchaeological analysis. The location and surface height above Ordnance Datum (AOD) of each borehole was recorded using a Leica Viva NetRover (Table 1).

Borehole Number	Easting	Northing	Height (m AOD)	Achieved?
1	389200.188	250874.142	36.50	✘
2	389236.020	250905.034	36.40	✘
3	389275.602	250930.307	36.12	✓
4	389313.842	250958.373	36.04	✓
5	389347.208	250979.659	35.82	✓
6	389387.622	251004.157	35.84	✘
7	389242.996	251080.439	38.74	✘
8	389262.244	251043.880	37.29	✘
9	389292.387	251001.935	36.27	✘
10	389348.667	250915.934	36.12	✘
11	389368.826	250881.658	36.54	✘
12	389323.474	251018.970	36.36	✓
13	389355.389	250926.402	35.90	✓
14	389414.557	250999.143	36.14	✓

*Table 1 Borehole locations and AOD height*

### 3.5 Structural analysis

All fieldwork records were checked and cross-referenced. Analysis was effected through a combination of structural, artefactual and ecofactual evidence, allied to the information derived from other sources.

### 3.6 Geoarchaeology methodology

The plastic sleeves containing the cores from the boreholes were slit open and the retained sediments cleaned to expose a fresh face, photographed and then described according to standard geological criteria (Tucker 1982, Jones *et al* 1999).

Core recovery, overall, was very good with an average recovery of 95%. Despite this, recovery was not possible below 5 metres due to the strength of the clay and the softness of the ground surface resulting in the front of the rig sinking when it attempted to pull/retrieve the cores.

#### 3.6.1 Discard policy

The samples will be discarded after a period of 6 months after the submission of this report, unless there is a specific request to retain them.

### 3.7 Statement of confidence in the methods and results

Having undertaken the project the following comments may be made with regard to the methods adopted. The inaccessibility of multiple boreholes due to the fields being ploughed was

unfortunate, as several outlier boreholes (BH 1, 2, 6, 7, 8, 10, 11) could not be sunk and a complete spatial distribution could not, therefore, be achieved, although attempts to mitigate for this were made by sinking Boreholes 12, 13 and 14.

Despite this deviation from the original sampling strategy, the author feels that a good moderate–high degree of confidence can be maintained that the aims of the project were achieved. The focus of the investigation was the stream flowing through the centre of the site and the potential for palaeoenvironmental preservation in this wetter location. Given that four boreholes were sunk along this course over a relatively wide area with two perpendicular boreholes to establish the nature of the deposits peripheral to the stream, it is possible to make firm statements regarding the underlying stratigraphy of the site and the potential for the presence of palaeoenvironmental remains.

Excavation of the upper one metre of deposits was undertaken by the geotechnical contractor using a post hole digger to avoid damage to land drains at the request of the landowner. This caused recording to be somewhat problematic as deposits were disturbed and not in-situ making exact depth difficult to record. Despite this, the overall stratigraphic sequence was recorded and the results can be relied upon when designing further works and discussing the potential for archaeological or palaeoenvironmental remains.

## **4 The application site**

### **4.1 Geology and Soils**

The Soil Survey of England and Wales (1983) mapped the site as having soils of the 411b EVESHAM 2 soil association characterised as follows: 'Slowly permeable calcareous clayey soils. Some slowly permeable seasonally waterlogged non-calcareous clayey and fine loamy or fine silty over clayey soils. Landslips and associated irregular terrain locally'. The superficial deposits of the site are mapped by the British Geological Survey as being alluvium (ie clay, silt, sand and gravel, deposited by the stream, presumably of Holocene age).

The underlying geology of the site is complex, with four different members/formations being present; from north to south these are the Westbury Formation (200–204 million years old (Ma)), the Cotham Member (200–204 Ma), the Wilmcote Limestone Member (197–204 Ma) and the Salford Shale Member (197–204 Ma). The cause of this complex geology is that this area marks the boundary between the Triassic Mercia Mudstone Group to the north and west and the younger, Jurassic Lias Group to the south and east. The four members/formations identified on this site all belong to the Lias Group and represent inundation of the Triassic basin associated with a marine transgression during the Jurassic due to global sea level rise.

### **4.2 Archaeological context**

LiDAR indicates that the site lies at the head of a small valley, and field-name evidence from the tithe map suggests an area of ground that historically has always been wet, as it is today. The main field, according to the tithe map is called Slade Meadow, 'slade' meaning 'land in a marshy valley' (WAAS 2013).

There are no designated heritage assets within the area of interest, and to date there have been no archaeological field investigations.

There are a few records of non-designated assets including a former Holloway (WSM 41483) which crosses the site in a N-S orientation. This is thought to date between the late 11<sup>th</sup>–19<sup>th</sup> centuries ground (Cornah 2013).

#### *Environs of development area*

Medieval ridge and furrow is abundant generally in the vicinity (WSM07747, WSM07748, WSM23264, WSM39134, WSM39135, WSM39136, WSM48068) although there are no indication of this within the development area, probably due to the wet nature of the site (Cornah 2013).

The Portable Antiquities Scheme (PAS) has 22 records of finds from the parish of Drakes Broughton and Wadborough (WSM38621) (Cornah 2013) ranging from the Neolithic to the medieval, including a Neolithic awl, a Bronze Age socketed axe, Roman pottery, coins and brooches and medieval coins, jewellery and horse trappings. No PAS finds have been identified within the site boundary.

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Several non-designated assets related to World War II activity are also present in the vicinity, such as a pillbox to the east (WSM27388), the Morgan Crucible shadow factory to the north (WSM33284) and the Littleworth relief landing ground (WSM24739) to the south (Cornah 2013).

### 4.3 Current land-use

The site is currently open farmland with smaller internal divisions. Aerial photograph indicates that the site has previously been used for livestock grazing but arable cultivation is also undertaken given the ploughed nature of the site during fieldwork.

## 5 Results

### 5.1 Stratigraphy

The detailed results are presented in Appendix 1.

Core recovery was overall very good with an average recovery of 95%. Despite this, recovery was not possible below 5 metres due to the strength of the clay and the softness of the ground surface resulting in the front of the rig sinking when it attempted to pull/retrieve the cores. Recording of the upper metre was difficult, as this had to be hand-dug with a posthole digger by the geotechnical contractor to avoid damage to any existing land drains.

#### 5.1.1 Phase 1: Natural

The natural deposits consisted of very firm, light bluish grey to mid grey clay representing the Lias Group. Typically the upper margins of this deposit contain yellow/orange mottling and fragments of the Jurassic–Cretaceous mollusc *Gryphaea* were sporadically present. These were encountered between 35.46m AOD (BH12) and 34.54m AOD (BH14).

#### 5.1.2 Phase 2: Undated

The sand and gravel encountered in Boreholes 12 and 14 remains undated as it cannot be stated with any certainty what their origin is. They consist of rounded–sub rounded gravel supported in a matrix of coarse orange sand. Given that they unconformably overlay the Lias group and exhibit no indications of bioturbation or 'recent' inclusions, they may be patchy relicts of late Devensian gravel, yet given their sporadic distribution, this must remain uncertain.

The subsoil, a firm, mid–light brown clay with occasional rounded – sub rounded pebbles with occasional bioturbation was encountered in all boreholes to a maximum depth of 34.83m AOD in Borehole 14. No artefacts or archaeological features were identified; therefore, no date can be assigned to this deposit.

#### 5.1.3 Phase 3: Post-medieval/modern

The sole deposit that could be assigned this date was the topsoil. This consisted of firm/pliable, mid–light brown clay with occasional rounded–sub-rounded pebbles with frequent bioturbation. Occasional artefacts were recovered from the ploughed surface during the fieldwork. These included ceramic building material (indeterminate brick/tile fragments), glass, glazed pottery and clay pipe, and all were preliminary assigned post-17<sup>th</sup> century to modern dates (Laura Griffin, pers comm).

## 6 Synthesis

The archaeological borehole works undertaken have given a brief insight into the stratigraphic sequence that may be expected during further intrusive works upon the site. No *in situ* archaeological or palaeoenvironmental remains were identified during the fieldwork, and the sole material of archaeological interest were disturbed post-medieval artefacts which were recovered from the surface of the ploughed field. Overall, the sequence was very shallow, with the natural Lias clay being encountered on average less than a metre below ground surface across the site, and this tends to confirm that there has been little or no build-up of deposits to the site as a result of human activity. However, the nature of the works carried mean that it cannot be ruled out that features of archaeological interest could still be present on the site.

## 6.1 Research frameworks

No archaeological remains were encountered during the works and, therefore, the deposits encountered during these works cannot contribute towards the local and regional research frameworks.

## 7 Significance

Due to the absence of archaeological or palaeoenvironmental remains encountered both during the fieldwork and the subsequent assessment, the site can be stated to have a LOW archaeological potential and LOW archaeological significance, although the limited extent of these works should be borne in mind.

## 8 Recommendations

No further archaeological work is recommended upon the cores although evaluation via trenching and monitoring of geotechnical works is recommended to ensure that isolated remains or deposits are not overlooked.

## 9 Publication summary

Worcestershire Archaeology has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, Worcestershire Archaeology intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

*An archaeological borehole assessment was undertaken at land off the B4084, Norton, Worcestershire (National Grid Reference SO 8930 5096) as the site has been proposed as the location of a new Worcester Parkway railway station. It was commissioned by Worcestershire City Council (the Client).*

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*Overall, the depositional sequence was very shallow, with the natural Lias clay being encountered on average less than a metre below ground surface across the site.*

## 10 Acknowledgements

Worcestershire Archaeology would like to thank the following for their kind assistance in the successful conclusion of this project: Tom Delaney, Peter Blackley, Mike Glyde (Worcestershire County Council), Peter Brymer (Network Rail), and Graham Hartwright (landowner).

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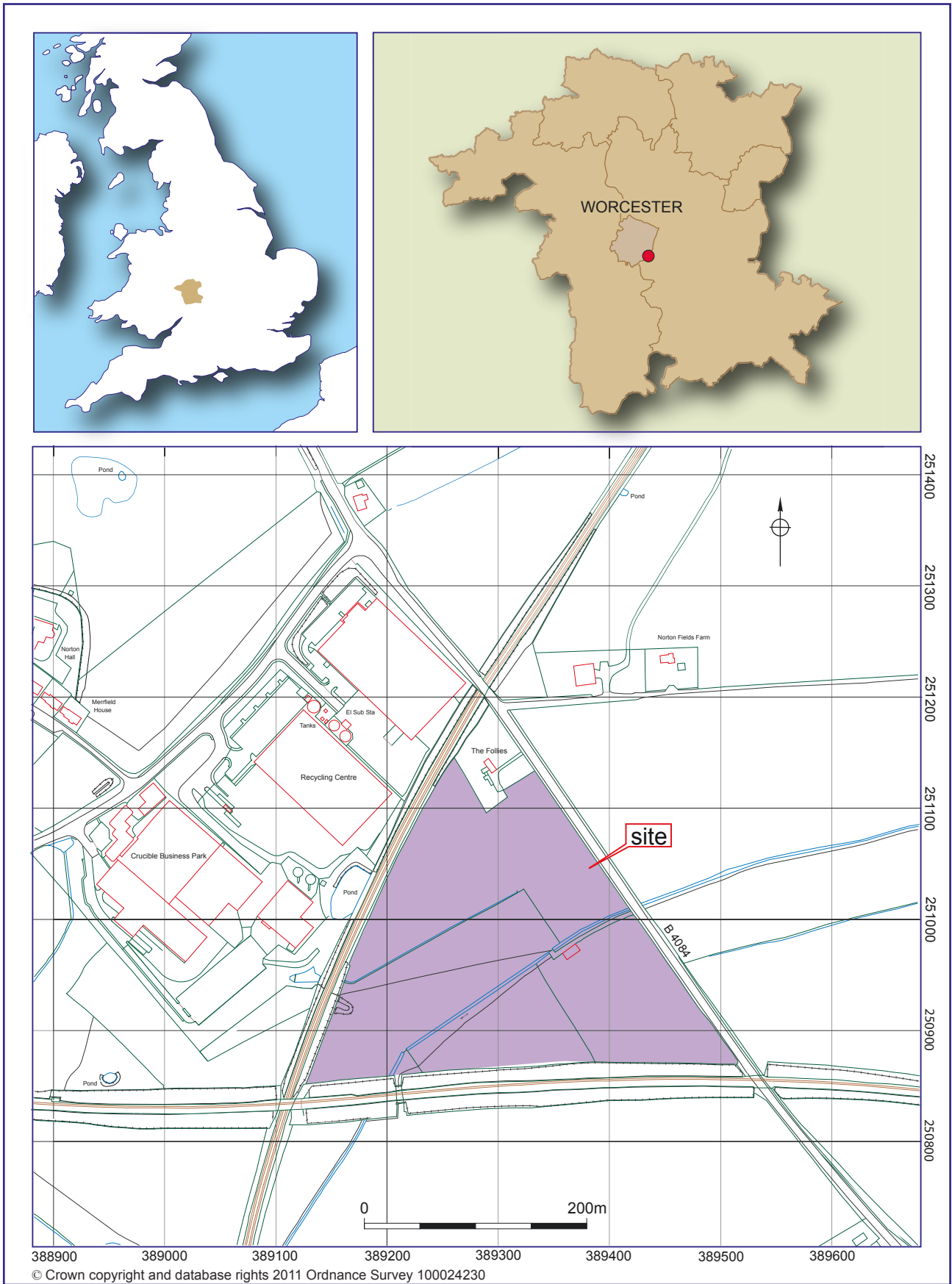
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**Figures**

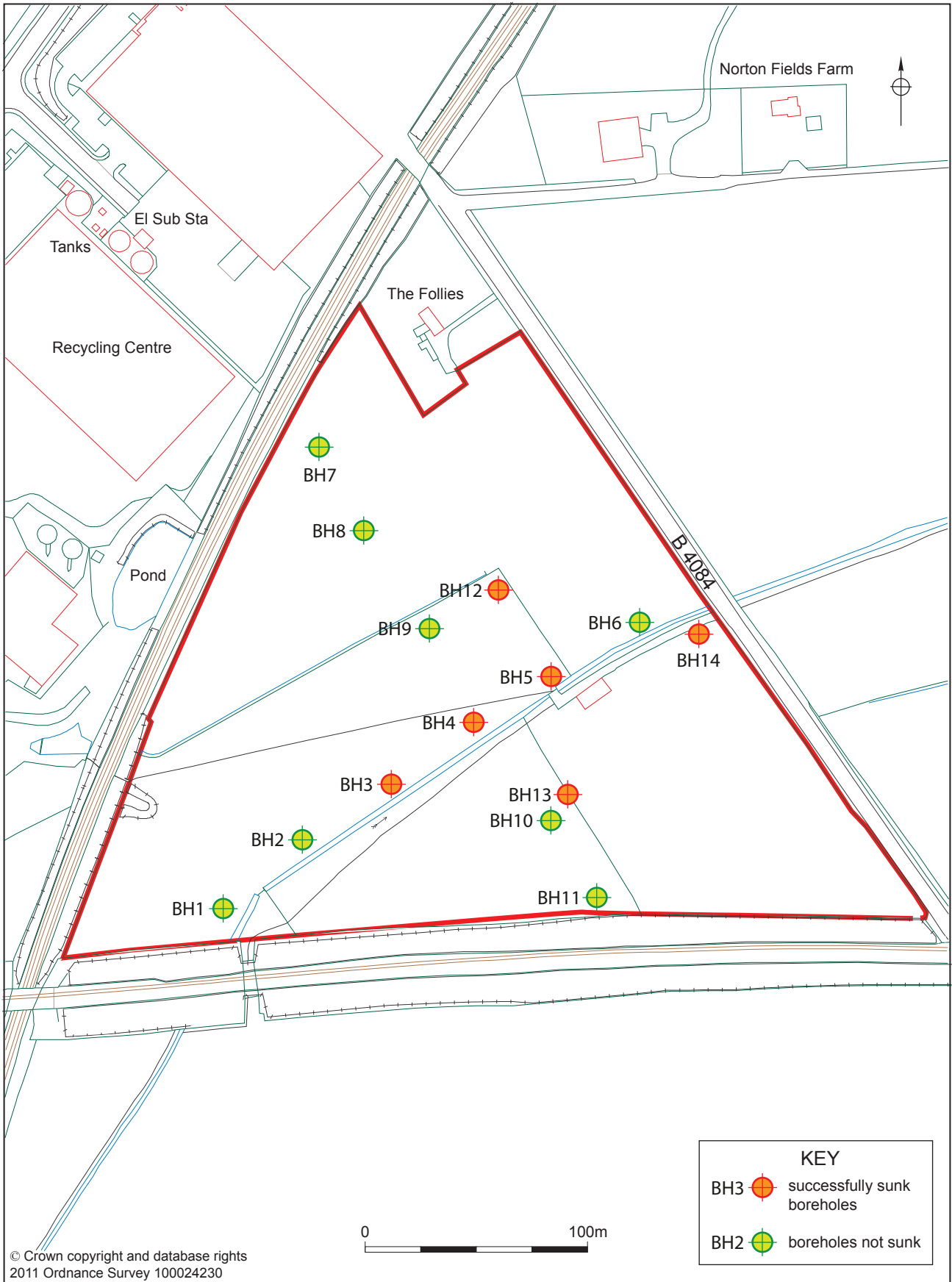
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Location of the site

Figure 1





Borehole locations

Figure 2

**Plates**



*Plate 1 Site overview, looking east*



*Plate 2 Site overview, looking south*

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*Plate 3 Borehole rig in operation at Borehole 3*



*Plate 4 Typical sequence: BH5 1–2m Top*



*Plate 5 Typical sequence: BH5 1–2m Bottom*



*Plate 6 Typical sequence: BH5 2–3m Top*

Archaeological borehole works at the proposed Worcester Parkway Station, Norton

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**Plate 7 Typical sequence: BH5 2–3m Bottom**



**Plate 8 Typical sequence: BH5 3–4m Top**



**Plate 9 Typical sequence: BH5 3–4m Bottom**



**Plate 10 Typical sequence: BH5 4–4.73m Top**



**Plate 11 Typical sequence: BH5 4–4.73m Bottom**

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*Plate 12 Surface conditions as a result of ploughing which limited the access of the borehole rig*



*Plate 13 Surface conditions as a result of ploughing which limited the access of the borehole rig*

## Appendix 1 Archaeological recording

### Borehole 3

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	36.12m – 35.87m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–sub rounded pebbles with frequent bioturbation and occasional post-medieval artefacts
0.25m – 0.80m	35.87m – 35.32m	Subsoil	Firm, mid–light brown clay with occasional rounded–sub rounded pebbles with occasional bioturbation
0.80m – 1.17m	35.32m – 34.95m	Natural Lias Clay	Firm, light bluish grey with frequent yellow/orange mottles and occasional molluscan ( <i>Gryphaea</i> ) fragments
1.17m – 2.65m	34.95m – 33.47m	Natural Lias Clay	Firm, light bluish grey with rare/occasional yellow/orange mottles and rare molluscan ( <i>Gryphaea</i> ) fragments Mottles decrease with depth
2.65m – 5.00m	33.47m – 31.12m	Natural Lias Clay	Firm, mid grey clay
5.00m +	31.12m +		REFUSAL

### Borehole 4

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	36.04m – 35.79m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–sub rounded pebbles with frequent bioturbation and occasional post-medieval artefacts
0.25m – 0.80m	35.79m – 35.24m	Subsoil	Firm, mid–light brown clay with occasional rounded–sub rounded pebbles with occasional bioturbation
0.80m – 1.35m	35.24m – 34.69m	Natural Lias Clay	Firm, light bluish grey with frequent light yellow/ orange mottles
1.35m – 1.55m	34.69m – 34.49m	Natural Lias Clay	Firm, light bluish grey with frequent yellow/ orange mottles and occasional molluscan ( <i>Gryphaea</i> ) fragments
1.55m – 2.31m	34.49m – 33.73m	Natural Lias Clay	Firm, light bluish grey with frequent light yellow/ orange mottles with rare molluscan ( <i>Gryphaea</i> ) fragments
2.31m – 4.76m	33.73m – 31.28m	Natural Lias Clay	Firm, mid grey clay
4.76m +	31.28m +		REFUSAL

### Borehole 5

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	35.82m – 35.57m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–sub rounded pebbles with frequent bioturbation and occasional post-medieval artefacts

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.25m – 0.80m	35.57m – 35.02m	Subsoil	Firm, mid–light brown clay with occasional rounded–sub–rounded pebbles with occasional bioturbation
0.80m – 1.77m	35.02m – 34.05m	Natural Lias Clay	Firm, light bluish grey with frequent mid yellow/orange mottles with rare molluscan ( <i>Gryphaea</i> ) fragments
1.77m – 2.43m	34.05m – 33.39m	Natural Lias Clay	Firm, mid grey with frequent mid yellow/orange mottles with rare molluscan ( <i>Gryphaea</i> ) fragments
2.43m – 2.82m	33.39m – 33.00m	Natural Lias Clay	Firm, mid grey with frequent mid yellow/orange mottles with occasional/frequent pockets of light bluish grey clay with frequent mid yellow/ orange mottles and rare molluscan ( <i>Gryphaea</i> ) fragments
2.82m – 3.43m	33.00m – 32.39m	Natural Lias Clay	Firm, mid grey with frequent mid yellow/ orange mottles with rare molluscan ( <i>Gryphaea</i> ) fragments
3.43m – 4.73m	32.39m – 31.09m	Natural Lias Clay	Firm, dark–mid grey clay
4.73m +	31.09m +		REFUSAL

### Borehole 12

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	36.36m – 36.11m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–sub–rounded pebbles with frequent bioturbation and occasional post–medieval artefacts
0.25m – 0.80m	36.11m – 35.56m	Subsoil	Firm, mid–light brown clay with occasional rounded–sub–rounded pebbles with occasional bioturbation
0.80m – 0.90m	35.56m – 35.46m	Gravel	Friable yet firm, coarse sand and gravel Gravel is rounded–sub rounded
0.90m – 2.31m	35.46m – 34.05m	Natural Lias Clay	Firm, light blue grey clay with frequent yellow/ orange mottles
2.31m – 2.66m	34.05m – 33.70m	Natural Lias Clay	Mid–dark grey
2.66m +	33.70m +		BOREHOLE LINER SHREDDED REFUSAL

### Borehole 13

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	35.90m – 35.65m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–sub–rounded pebbles with frequent bioturbation and occasional post–medieval artefacts
0.25m – 0.80m	35.65m – 35.10m	Subsoil	Firm, mid–light brown clay with occasional rounded–sub rounded pebbles with occasional bioturbation
0.80m –	35.10m –	Natural Lias Clay	Firm, light bluish grey with frequent mid yellow/ orange mottles

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B.G.S depth	Height OD	Lithology	Geoarchaeological description
1.60m	34.30m		
1.60m – 1.90m	34.30m – 34.00m	Natural Lias Clay	Firm, mid grey with frequent light yellowish brown mottles
1.90m – 2.00m	34.00m – 33.90m		VOID
2.00m – 2.36m	33.90m – 33.54m	Natural Lias Clay	Firm, mid grey clay with frequent light grey mottles
2.36m – 3.84m	33.54m – 32.06m	Natural Lias Clay	Firm, dark–mid grey clay
3.84m – 4.00m	32.06m – 31.90m	Natural Lias Clay	Firm, dark grey clay
4.00m +	31.90m +		REFUSAL

**Borehole 14**

B.G.S depth	Height OD	Lithology	Geoarchaeological description
0.00m – 0.25m	36.14m – 35.89m	Topsoil	Firm–pliable, mid–light brown clay with occasional rounded–subrounded pebbles with frequent bioturbation and occasional post-medieval artefacts
0.25m – 1.22m	35.89m – 35.34m	Subsoil	Firm, mid-light brown clay with occasional rounded–sub-rounded pebbles with occasional bioturbation
1.22m – 1.31m	34.92m – 34.83m	Subsoil	Firm, dark brownish grey with occasional mid orange mottles with rare–occasional rounded–sub-angular pebbles
1.31m – 1.60m	34.83m – 34.54m	Gravel	Friable yet firm, mid orangish red, mid sandy clay with occasional/frequent rounded–sub-angular pebbles
1.60 – 2.61m	34.54m – 33.53m	Natural Lias Clay	Firm, light blue grey clay with occasional mid yellow orange mottles with a single rounded cobble lithorelict
2.61m – 3.30m	33.53m – 32.84m	Natural Lias Clay	Firm, mid blue grey clay with occasional mid yellow orange mottles with a single rounded cobble lithorelict
3.30m – 4.00m	32.84m – 32.14m	Natural Lias Clay	Mid–dark grey clay
4.00m +	32.14m +		REFUSAL