



## Appendix 8.6

### WRITTEN SCHEME OF INVESTIGATION ARCHAEOLOGICAL EVALUATION

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## APPENDIX 8.6





# Begbroke Innovation District

## Written Scheme of Investigation

### Archaeological Evaluation

July 2023

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## Begbroke Innovation District

### *Written Scheme of Investigation for an Evaluation*

*Centred on 448596, 213539*

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# 1 INTRODUCTION

## 1.1 Project details

- 1.1.1 Oxford Archaeology (OA) has been commissioned by King Technical Consultancy on behalf of Oxford University to prepare an archaeological trial trench evaluation for the proposed expansion of Begbroke Science Park, Begbroke, Oxfordshire, henceforth known as 'the site'. The site is centred on NGR 448596, 213539, and its location is shown on Figure 1. In March 2023 OA completed an archaeological trial trench evaluation on the developable parts of the proposed Begbroke Innovation District. This WSI covers the non-developable, floodplain parts of the site. These areas will henceforth be referred to as the 'developable' and 'floodplain' areas respectively. The floodplain areas are designated for a variety of landscape uses including sports pitches, an allotment, an adventure playground, a social farm, habitat creation and enhancement areas and parkland. Proposed transport infrastructure links crossing the floodplain areas include a secondary vehicle access route, a road bridge over the Cherwell Valley railway line and cycle/pedestrian paths alongside the Rowel Brook. A short section of the proposed primary vehicle access off the A44 is also on the floodplain, but will not be trenched as it occupies land that has previously been subject to trial trenching (Wolf 2022),
- 1.1.2 The work is being undertaken to inform the Planning Authority in advance of submission of a Planning Application. A brief has been set by the Oxfordshire County Archaeological Service (OCAS) detailing the Local Authority's requirements for work necessary to inform the planning process; this document outlines how OA will implement those requirements.
- 1.1.3 This report has been prepared in accordance with the Chartered Institute for Archaeologists (CifA) Standards and Guidance for Field Evaluation (2020) and Planning Practice Guidance (2021) - Historic Environment, published by the Ministry of Housing, Communities and Local Government. The national and local planning policy context is fully detailed in the desk-based assessment (OA 2022).

## 1.2 Location, topography and geology

- 1.2.1 The site is situated 7km north-west of Oxford and lies between the civil parishes of Begbroke and Yarnton, Oxfordshire, to the west of the major village of Kidlington. It comprises approximately 80 hectares of agricultural land and woodland situated within the greenbelt, including roadways and farmsteads. It is bounded to the north by the Rowel Brook, fields, and residential development; to the east by the Oxford Canal (built between 1774 and 1790) and residential development; to the south by Begbroke Science Park, a solar farm and fields; and the A44 (Woodstock Road), fields, and residential development to the west. The Cherwell Valley railway line (originally the Birmingham and Oxford Junction line, built in 1850) transects the site from north to south through the centre, separating the north-western and south-eastern areas.
- 1.2.2 The site extends immediately from the northern and eastern boundaries of the previous archaeological trial trench evaluation on the developable areas and continues into low-lying floodplain zones to the south-east. The majority of the site is

located on floodplains, with areas to the east of the railway line situated on the floodplain of the former channel that preceded the Oxford Canal, joining the main Upper Thames floodplain to the south-east. Land to the west of the railway line also falls within the floodplain of the same former channel, but also contains the active channel of the Rowel Brook and its associated valley areas.

- 1.2.3 The site is situated on relatively flat and low-lying land throughout, with elevations ranging from 68.5m above Ordnance Datum (aOD) in the north, to 60.0m aOD in the south-east. Begbroke Science Park, to the south and west of the site, is located on a raised area and ground levels slope downwards from here to the north, east and south. In the north these slopes gently fall from 66.0m aOD to 63.5m aOD towards the Rowel Brook, which traverses site from west to east in the northern areas. Ground levels rise to the north of the Rowel Brook, from 64.0m aOD to 68.5m aOD, falling to the east as the Rowel Brook enters the floodplain of a former channel system present prior to the construction of the Oxford Canal. Elevations are generally higher in the western areas of site, ranging between 66.0 to 64.0m aOD, and decrease eastwards and southwards, where they reach 60.0m aOD towards the Thames floodplain in the south.
- 1.2.4 The geology throughout the majority of the site is mapped by the British Geological Society (BGS) as Oxford Clay Formation and West Walton Formation (undifferentiated) mudstone. These are extensive throughout the central and southern areas of site, with Kellaways Sand Member interbedded sandstone and siltstone and older Kellaways Clay Member mudstone shown as underlying the north-western parts of site, and Cornbrash Formation limestone underlying the most northerly areas. From recent geotechnical and archaeological trial trenching investigations it is likely that the Kellaways Formations extend much further southwards and may underlie the majority of site rather than the Oxford Clay and West Walton Formations (OA 2023).
- 1.2.5 The bedrock geology is overlain by various superficial deposits, including Summertown-Radley Sand and Gravel Member and Alluvium (clay, silt, sand and gravel). The BGS shows the sand and gravel deposits to be present in north-west parts of site, and the alluvium widespread in the southern and central parts of site, within the valleys of the Rowel Brook and the once natural channel which preceded the Oxford Canal (nd).
- 1.2.6 Historic maps and LiDAR data indicate that the main course of the Rowel Brook formerly formed a loop within the north-eastern part of site and ran in a south-westerly direction towards Yarnton. During the 19th century the main course of the stream was diverted into the Oxford Canal, probably when the railway was built (OA 2022). The southern sections of the former course survive as drainage ditches along the south-western boundary of the site, next to Woodstock Road. The Oxford Canal was constructed along the eastern part of an existing valley system, the remains of which can be seen clearly in LiDAR imagery extending southwards from the River Cherwell at Thrupp and merging with the wider Thames floodplain to the south of Sandy Lane. BGS mapping supports this, showing a tract of alluvium present within the valley on this alignment. The age of this former channel, and the alluvium, is not currently known but it may represent a former outflow of the River Cherwell.

- 1.2.7 It is possible that palaeochannel deposits from the former courses of the Rowel Brook and the channel that preceded the Oxford Canal are present within the site. The geophysical surveys carried out for this project (EM and Magnetometer survey) detected a possible large palaeochannel flowing NW–SE through the south-eastern parts of the site, which may be the course of one of these channels through the floodplain (Stafford, E, pers. comm.). Palaeochannel deposits of a NW-SE flowing watercourse were also identified in the south-eastern parts of the developable site during the previous phase of trial trenching and it can be expected that these continue into the non-developable areas. Geotechnical results highlight the possible continuation of these palaeochannel deposits within the non-developable areas, suggested by more substantial depths of alluvium at the south-eastern extent of site where the NW-SE palaeochannel was detected by the geophysical survey.
- 1.2.8 Available borehole data available for the previous evaluation on the developable areas confirmed soil and subsoil deposits were present up to 1.4m below ground level (BGL), while ‘clayey’ gravel, gravel and sand deposits extended to 4.5m BGL, with Oxford Clay noted as present below this at the eastern end of Begbroke Hill, near Begbroke Science Park (BGS, borehole reference BGS ID: 330704 : BGS Reference: SP41SE6). Observations made in the field during trial trenching in the developable areas confirm these findings with Holocene sediments (topsoil, subsoil, colluvium) typically present to depths between 0.4m BGL to 1.0m BGL. A similar sequence of deposits in the areas of higher ground to the north of the Rowel Brook and in north-western parts of the non-developable areas is shown in borehole data with gravel terrace and bedrock geology occurring <0.5m BGL. Some localised alluvium from the Rowel Brook is present close to the active channel in these areas and was observed to depths of 2.60m BGL.
- 1.2.9 Oxford Archaeology were able to observe a number of machine-excavated test pits conducted as part of the geotechnical works in the non-developable floodplain areas. The location of these is illustrated in the Developable site evaluation trenching report (OA 2023 in prep), along with tabulated detailed sediment descriptions. These broadly show sequences of topsoil and colluvial deposits present along the floodplain edge in western parts of site, changing to topsoil over alluvium to the east. These alluvial deposits become increasingly clayey further eastwards out into the floodplain. Alluvium on the floodplain edge was present up to depths between 0.70m BGL and 1.00m BGL and was noted in geotechnical test pits and window samples generally up to depths of 0.90m BGL across the south-eastern floodplain areas. Greater depths of alluvium were noted in a couple of locations, though these are likely to represent possible palaeochannel deposits rather than floodplain alluvium.

### 1.3 LiDAR, EM and magnetometer data

- 1.3.1 LiDAR (light detection and ranging) data for the site were previously analysed and reported on in the DBA preceding this phase of archaeological investigation (OA 2022), but the most salient details are worth summarising again here. First, the digital terrain model derived from the raw LiDAR data clearly delineates the break of slope that defines the upper edge of the Summertown-Radley terrace. On the western flank of the current zone of investigation this includes a large C-shaped indent immediately

north of Sandy Lane, which on initial in-field inspection appeared to result from a past incidence of large-scale sediment slumping.

- 1.3.2 Second, several substantial linear features were identified crossing the site from east to west, in particular one running across the northern edge of the current Science Park, and one through the fields to its immediate south. Though not themselves illustrated on historic mapping, they do appear to respect the line of former 19th-century field boundaries, and were hypothesised to represent earlier post-Medieval, or possibly Medieval, field boundaries and/or divisions (OA 2022). In-field, these features are not always immediately evident to the naked eye, though they are most obvious in the fields to the west and south of the current Science Park. Geoarchaeological assessment of the underlying sediments suggests they most likely represent past plough headlands, whilst the few incidences of associated archaeology indicate a Medieval or post-Medieval date.
- 1.3.3 EM (electromagnetic) survey data was also reported on in the project DBA (OA 2022), though again two particular features are worth additional discussion. First, whilst the raised Summertown-Radley terrace itself displays low conductivity levels as expected, it is fringed by curvilinear areas of higher conductivity that lie either on or just below the break of slope. Notably, one such area precisely follows the line of the C-shaped slope indent. In-field investigations have revealed these areas of higher conductivity to represent a spring-line that more-or-less circumscribes the edge of the terrace, i.e., the point at which groundwater flushing through the loose terrace sands and gravels seeps out and runs down to lower ground as surface flow. This situation seems especially true for the aforementioned C-shaped indent given its particular geomorphological makeup.
- 1.3.4 The electromagnetic conductivity results from the floodplain area across the eastern portion of the site revealed an area of higher conductivity adjacent to the present-day Oxford Canal. This was initially hypothesised to evidence an older palaeochannel. However, reference to Hydrock ground investigations data suggest that these elevated values are more likely due to the perching of groundwater above the relatively shallow level of the impermeable Oxford Clay bedrock, which here lies between 1.5 and 2.6 m below ground level (bgl) before dipping down to the west. Though indistinct given the site-specific extent of the EM survey coverage, it seems as if slightly higher conductivity values may also evidence a similar situation to the immediate east of the north-south railway line crossing Sandy Lane. It is thus possible to infer that the wide, broadly linear, area of low conductivity running north-south through this area may instead evidence a large palaeochannel cutting the impermeable bedrock, and likely filled by free-draining sands/gravels. This putative palaeochannel would thus be associated with lower, first terrace deposits that post-date, and down-cut through, the higher Summertown-Radley terrace. It would hence date to the later Pleistocene and is likely to have initially carved out the low-lying floodplain to the east of the site that topographically connects the now-separate channels of the Thames and Cherwell river-systems.
- 1.3.5 The magnetometer survey results were again discussed within the project DBA (OA 2022). However, it is worth noting at this stage that the spring-line that follows the C-shaped indent in the eastern slope of the Summertown-Radley Terrace is again picked

up by the magnetometry, in this case even more strongly than for the EM. In this case it seems that the particular characteristics of the clayey colluvium resulting from the slumping episode which created this landform not only serves as an aquitard, but one which when saturated is also magnetically enriched relative to surrounding sediments. The few magnetometer anomalies of similar form evident to the immediate south and east of this spring-line are thus also likely to derive from similar ground conditions.



## 2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND AND POTENTIAL

### 2.1 Archaeological and historical background

#### Introduction

2.1.1 The nature of the archaeological resource within the site and the surrounding study area is described, catalogued and illustrated in full in the separate desk-based assessment report (DBA, OA 2022). The following is a summary based on that report and the Oxfordshire County Council (OCC) brief, focussed on aspects that are relevant to the archaeological potential of the site. Since the desk-based assessment was completed, Oxford Archaeology have undertaken a trial trench evaluation on the developable areas of the Begbroke Science Park expansion, the results of which are being collated at the time of writing (OA in prep.).

#### Previous archaeological investigations

2.1.2 The HER returned 30 records for previous archaeological investigations on or within 1km of the site. These comprised 22 physical interventions such as watching briefs, evaluations and excavations, five geophysical surveys, one DBA, a Monuments Protection Programme assessment and a building survey (OA 2022).

2.1.3 Three geophysical surveys include land adjacent to or close to site. A survey of 55ha of land at Yarnton, an area directly west of site, revealed features consistent with historical agricultural activity, possibly related to nearby medieval settlement, interpreted as ridge and furrow and field boundaries. Modern agricultural activity in the form of plough scarring, drains and 'green waste' was also observed, along with evidence of services. A palaeochannel or former meander was also detected. A geophysical survey of 12.3ha of land east of the A44 at Yarnton, directly adjacent to site to the south, found a wide distribution of sinuous and discrete anomalies that may have been primarily a result of natural site formation. Across the Oxford Canal from the site, a geophysical survey at Stratfield farm found features consistent with medieval to post-medieval ridge and furrow (OA 2022).

2.1.4 There are seven recorded archaeological interventions on site. These are summarised here for clarity, but relevant archaeological information from these and the wider study area are mentioned below by time period. An evaluation was conducted along the length of a proposed access road to Begbroke Science Park. Whilst the majority of the trenches were devoid of archaeological features, five undated linear features that corresponded to cropmarks of possible Bronze Age enclosures and a possible 17<sup>th</sup> to 18<sup>th</sup>-century field boundary were recorded (Joyce 2011). A subsequent strip, map and sample excavation of this area concluded that these features were geological in origin (Tsamis 2011).

2.1.5 A series of major archaeological excavations were carried out by Oxford Archaeology during gravel extraction to the south of Yarnton, just over 1km south of the site, between 1989 and 1998 (Hey 2004; Hey *et al.* 2011; Hey *et al.* 2016). The results of the investigations included extensive settlement evidence dating from the Neolithic, Bronze Age, Iron Age, Roman and medieval periods, provide a valuable understanding of the historic character of Yarnton and the surrounding landscape.

- 2.1.6 Oxford Archaeology also conducted a large archaeological trial trench evaluation on the developable areas that form part of the proposed Begbroke Science Park expansion between December 2022 and March 2023. The results of the trial trenching are being collated at the time of writing, but includes settlement evidence from prehistoric, Roman and medieval and post-medieval periods.

#### **Prehistoric period (500,000 BP – AD 43)**

- 2.1.7 There are no clearly Palaeolithic remains recorded within the study area. The Summertown-Radley gravels underlying the site are of Pleistocene age (mainly dating from Marine Isotope Stages 7 to 6) and have produced Lower Palaeolithic artefacts, although these are likely to be *ex situ* rolled artefacts (Beckley *et al.* 2012). Two Middle Palaeolithic bout-coupé handaxes have been found at Thrupp (approx. 1.6km north of site), while large quantities of palaeolithic artefacts have been recovered within terrace gravel deposits 2.75km south of site at Wolvercote (Hey and Hind 2014).
- 2.1.8 Scattered evidence for Mesolithic activity has been recorded in the wider area, from both the lower-lying floodplain areas and the higher gravel terraces on which the site is situated. The landscape during this period appears to have been characterised by temporary occupation sites reflecting the seasonal exploitation of the floodplain resource (Hey *et al.* 2016). Linear features that were interpreted as being of possible Mesolithic date, along with Neolithic worked flints, were recovered during an evaluation south of Lock Crescent in Kidlington, around 150m east of the site (OA 2022).
- 2.1.9 At the beginning of the Neolithic period, as elsewhere within the Upper Thames Valley, Yarnton and Begbroke were covered by dense mixed deciduous forest (Hey *et al.* 2016). Settlement and animal-based farming practices would have been focussed within small woodland clearings close to the Thames (*ibid.*).
- 2.1.10 There are numerous Neolithic findspots across the site and in the wider study area. These include leaf-shaped and hollow-based arrowheads recovered as individual artefacts from findspots around the science park and also a substantial lithic scatter towards the centre of the developable site, in which 789 artefacts were recovered in the 1960s. This scatter was interpreted as evidence of late Neolithic domestic activity. A Neolithic pottery sherd was also found towards the site's north-eastern corner.
- 2.1.11 Several concentrations of cropmarks have been identified within the study area and are thought to represent possible Bronze Age features. These include possible enclosures, ring ditches, and round barrows located in the northern half of the site. An evaluation of the science park access road route by Cotswold Archaeology (Joyce 2011) confirmed the archaeological potential of some of these features, although did not recover any dating evidence. A subsequent strip, map and sample excavation of the area concluded that the features in this area, including the ring ditch like feature shown in aerial photographs, were 'geological formations or naturally-formed features, caused by tree throw and root action' (Tsamis 2011). The only human-made features were deemed to be a ditch that may have been a previous hedgerow, and a short length of gully, neither of which were dateable. Given the continuation of ring ditch features immediately around and further north and north-east of the access road and their clarity in aerial photographs and geophysical surveys, it seems unlikely that the presence of Bronze Age features of this nature can be discounted (OA 2022).

- 2.1.12 Further potential Bronze Age features, including a faint double concentric ring ditch have been identified 75m north of site as seen in vertical aerial photographs. A Bronze Age barbed-and-tanged flint arrowhead was found in a garden 350m east of site and a pit containing a sherd of late Bronze Age or early Iron Age pottery was recorded during an evaluation 300m south of site at Little Marsh playing fields (OA 2022).
- 2.1.13 During the Iron Age the landscape and settlement pattern in the Yarnton area underwent significant change, with the first permanent nucleated settlements emerging (Hey *et al.* 2011). The location of settlement activity differs from the earlier periods, occurring higher on the Summertown-Radley gravel terrace, rather than on the flood plain as they appear to have been in the earlier periods (Hey *et al.* 2011).
- 2.1.14 An Iron Age roundhouse which was associated with a series of storage pits containing sherds of pottery and hearth debris, was exposed in the Sandy Lane gravel pit towards the centre of the present development site, in the 1920s. Iron Age to Romano-British pits and ditches containing pottery have also been recorded within the area (Anon 1936, 201), in addition to broadly dated prehistoric findspots and scatters in the north and to the west of the site (OA 2022).

#### **Romano-British period (AD 43 – 410)**

- 2.1.15 Romano-British settlement in the Yarnton area continued to be focused on the higher ground of the Summertown-Radley gravels. During this period cultivation moved increasingly away from the lower lying parts of the floodplain, which were prone to seasonal flooding, eventually resulting in their abandonment as arable land. These fields appear to have been replaced by ploughlands on clay soils, whilst the floodplain was utilised for the seasonal grazing of animals (Hey *et al.* 2011).
- 2.1.16 The HER returned four records for Romano-British activity in the wider study area, two of which were within the site. Towards the centre of the development site, below Sandy Lane (in the same area as the Iron Age roundhouse mentioned above), Roman settlement was evidenced by ditches and pits and a bronze brooch. A Roman pottery scatter has also been recorded north of Sandy Lane (OA 2022).
- 2.1.17 Around 50m south of the site there is an area of activity identified by geophysical survey and confirmed by archaeological evaluation which has been interpreted as a possible Roman settlement, and undated field systems. Settlement areas included ring ditches, enclosures, pits and postholes. Undated features, corresponding to a N-S aligned trackway and associated field system ditches were also identified and may date to the medieval or later periods (OA 2022).
- 2.1.18 The Oxford Ridgeway, a routeway represented by the modern Oxford-Banbury Road, is a branch of the Cotswold Ridgeway to Oxford, and is located 770m east of the site. It may have Roman origins and it appears in several Saxon charters (OA 2022).

#### **Early medieval period (AD 410 – 1065)**

- 2.1.19 The place name of Begbroke is from the Old English meaning ‘Becca’s brook’, in reference to the brook that runs east-west across the parish (and forms much of the sites northern border). As noted below, the later medieval hamlet is mentioned in the Domesday Book (1086), which is an indication that the settlement pre-dates the Norman Conquest. The HER returned one potentially early medieval record from the

wider study area in which anomalies consistent with earlier field boundaries and ridge and furrow were revealed during geophysical survey, 400m west of site. On aerial photographs, the fields in this area have well defined ridge and furrow earthworks, aligned roughly NNE–SSW. There are similar well-defined areas of ridge and furrow west and south of the site within the wider study area (OA 2022).

2.1.20 The OA Yarnton excavations revealed important evidence for early and middle Saxon settlement. The early Saxon settlement (dating from the 5th/6th century) respected the location of the preceding Roman settlements on this site, although was of very different character, mainly comprising sunken-featured buildings (Hey 2004). The middle Saxon settlement was probably laid out in the second half of the 7th century. The general absence of late Saxon pottery suggests that occupation probably did not extend beyond the 9th century. The middle Saxon settlement was located about 100m to the east of the Roman and early Saxon settlements and included a wider range of features including rectilinear enclosures containing rectangular post-built halls and further sunken-featured buildings. A small, cemetery of six E–W aligned adult burials was found 100m east of the settlement. These were almost certainly Christian. Three further burials, all sub-adults, were found within the middle Saxon settlement (Hey 2004).

#### **Later medieval period (1066 – 1550)**

2.1.21 At the time of the Domesday Survey in 1086, Begbroke is recorded as a settlement with nine households, putting it in the smallest 40% of settlements recorded in Domesday. It is listed as having ploughlands, meadow and pasture. The village of Yarnton which is south of the site, is recorded as a much larger settlement, with 26 households in the same period and correspondingly greater resources (OpenDomesday, nd). By the late 12<sup>th</sup> century, the manor of Begbroke had been divided into two estates (Baggs *et al.* 1990a). The medieval village, including both manors, appear to have been located within the area of the current village, which is located close to the north-west corner of site (OA 2022).

2.1.22 Begbroke appears to have remained a relatively small settlement through the later medieval and post-medieval periods, the population rarely exceeding 100 until the beginning of the 20<sup>th</sup> century (Baggs *et al.* 1990a) when people working in Oxford in the 1930s began to live in outskirt villages like Begbroke (OA 2022).

2.1.23 The medieval activity recorded by the HER within the site and wider study area is limited. A range of medieval to post-medieval material including 16th to 17th century stone ware, old gun flints, coins and tokens was discovered just south of Begbroke Hill Farmhouse in 1971, and the farmhouse itself has potentially 17th century origins. Two medieval fishponds, bulldozed in the 1970s, were located just east of the site, associated with a moated site (Moat Cottage) which is likely to have been built after the 13th century (OA 2022).

2.1.24 The HER records a possible shrunken medieval village 875m south of site, visible as earthworks and some exposed stone footings. Medieval pottery was also found in this area within a feature of unknown function. Another shrunken medieval village has been identified north of St Michael's Church in Begbroke, 350m north-west of site, comprising indistinct earthworks which may include some crofts nearer the church (OA 2022).

2.1.25 The Grade I listed St Michael's Church is of late 12th century origin, with an associated 14th – 15th century churchyard cross and medieval grave slab. St Bartholomew's Church in Yarnton, also Grade I listed, is about 1km south-west of site and also has 12th century origins and a medieval churchyard cross. Other buildings in the wider study area include 17th century Park Farmhouse to the north which was built in the area of a 16th century park, and a medieval chapel of ease on a bridge 650m south of site (OA 2022).

#### **Post-medieval period (1550-1900)**

2.1.26 The Grade II listed Begbroke Hill Farmhouse, in the centre of the site, was built as the manor house of the Fitzherbert's Begbroke estate in the early 17th century, completed sometime between 1600 and 1630, although there may be traces of an earlier structure beneath (Fearon 1984). The landscape around the farmhouse remained largely agricultural in this period, but would see an increase in transport infrastructure, with a turnpike road built to the west, and the construction of the Oxford Canal and the Great Western Railway (Oxford & Birmingham Section) to the east (OA 2022).

2.1.27 The Stokenchurch, Wheatley, Begbroke and New Woodstock Turnpike Road was completed in 1719, largely following the line of the present-day Woodstock Road (A44) as it passes Begbroke and Yarnton, immediately adjacent to the site's western border. Turnpike roads were operated by trusts which were authorised by Acts of Parliament to build and maintain roads, which were economically vital prior to the advent of the railway. The original 'Begbroke Gate' toll house and weighing machine was located in a small cottage at the junction of Woodstock Road and Kidlington Lane, around 500m south of site. Another toll house is recorded 900m north of the site along this road at Langford Lane. There are two milestone markers on Woodstock Road within 100m of the site boundary (OA 2022).

2.1.28 The Oxford Canal was opened between 1774 and 1790 for the purpose of bringing coal from the Coventry coalfields to Oxford and the River Thames. Many of the post-medieval records in the HER within the wider study area relate to structures associated with the canal and its operation. These include locks, bridges and wharfs (OA 2022). The canal was built along the eastern edge of an existing channel valley, which is visible on the BGS map as a band of alluvium extending south from the river Cherwell at Thrupp, merging with the wider Thames floodplain in the vicinity of Sandy Lane (BGS online). The geophysical surveys carried out for this project (EM and Magnetometer survey) have detected a possible large palaeochannel flowing NW–SE through the south-eastern parts of the site, which may be the course of this stream through the floodplain (Stafford, E, pers. comm.). Palaeochannel deposits of a NW-SE flowing watercourse were identified in the south-eastern parts of site during the trial trench evaluation in the developable areas of the proposed Begbroke Science Park expansion.

2.1.29 The Birmingham and Oxford Junction line opened between Millstream Junction, in Oxford, and Banbury in 1850 as a broad gauge line. It bisects the site, running north-south, and crossing Sandy Lane towards its eastern end (OA 2022).

- 2.1.30 The HER records for this period mainly reference buildings within the wider study area, concentrated in the nearby residential areas of Begbroke, Kidlington and Yarnton. Many of these buildings are former farmhouses and associated farm buildings, such as outbuildings and barns, underlining the originally agricultural nature of the land around the site. The closest building to the site is the Grade II listed Tudor Cottage on Woodstock Road, originally a pair of mid-17th century cottages, adjacent to the site's western border. The remains of a 19th century agricultural building and associated agricultural features are present 100m south of site (OA 2022).
- 2.1.31 Davis' County map of Oxfordshire (1797) shows the site as largely undeveloped. Most of the land below Rowel Brook had been enclosed by this point, with large fields in presumably pastoral use. The land north of the brook, and in the north-west of the site is shown as open fields, potentially arable in nature. Although it is difficult to ascertain the exact site boundary on this map, 'Begbrook Hill' farmhouse is in the same location as the present day and appears to comprise three buildings around a central courtyard. Access to the buildings is from a roadway to the west which connects to Woodstock Road (the present A44), which may be part of what is now Sandy Lane. Rowel Brook is shown to connect to the canal, and both it and Kidlington Lane appear to have much the same trajectory as today. Sandy Lane – if indeed that is the roadway shown east-west across site – does not continue further east than the farmhouse (OA 2022).
- 2.1.32 All but the south-eastern part of the site is present on the 1811 Ordnance Surveyor's drawing (OSD 162) for Woodstock. The portion of land east of Kidlington Lane is depicted on the 1814 drawing (OSD 230) for Ot Moor. These drawings show the site as largely undeveloped, comprising fields of varying sizes. Some field boundaries illustrated in this map appear to be reflected in the current field system, although it is clear that some must have been subsequently amalgamated. The roads across the site, comprising Sandy Lane, Woodstock Road (the present A44) and Kidlington Lane follow the same trajectory as today, as does the Oxford Canal. Despite the suggestion of a roadway or narrow plot of land up to the location of Begbroke Hill farmhouse, no buildings are shown in this area, although small buildings are shown on either side of Sandy Lane, near the kink in the eastern half of the road. Since Begbroke Hill farmhouse has 16th century origins and is shown on maps before and after the production of this one, its absence is likely to be a reflection of the draft nature of the Ordnance Surveyor's drawings rather than genuine absence. There is a small building noted east of Kidlington Lane, located on a field boundary (OA 2022).
- 2.1.33 On the OSD map, and the first Ordnance Survey map, the route of the Rowel Brook is shown to travel south some 300m before the Canal. It continues south past Sandy Lane, and then curves south-west towards Yarnton. In this area it is analogous to the watercourse that appears in this location in the present day. This route is slightly at odds with the Davis' map which shows it continuing to the canal, with no southern branch. It may be that a branch of the watercourse always went to the area of the canal and the southern branch is not shown on the earlier map. It is likely though, that its disappearance on later maps (after the OSD and first OS map) was due to culverting or rerouting of the brook, the most likely context for which is when the railway was built (OA 2022).

- 2.1.34 Despite the large scale of the First Series Ordnance Survey map (1833) it is possible to locate the site fairly accurately. There are no great changes from the OSD, although the building to the east of Kidlington Lane is now labelled as a barn. The route of Sandy Lane, with access via a roadway to Begbroke Hill Farmhouse, is well defined and follows the same route as today (OA 2022).
- 2.1.35 The site appears on two 19th century tithe maps, for Begbroke (1844) and Yarnton (1844) parishes. Tithe maps were created to ascertain which land was still subject to tithes (a tax on agricultural produce paid in kind), who owned it and to whom the tithes were payable. As the site falls into both parishes historically, and part of Begbroke parish was detached, some parts of the site are not fully represented. Begbroke Hill Farmhouse and the surrounding plots of land are listed as belonging to Thomas Robinson, occupied by Matthew Young, and are a mix of pasture and arable land. Woodland is listed along much of the length of the Rowel Brook (south side). A homestead is noted 400m east of Begbroke Hill Farmhouse. On later maps it is labelled as Parker's Farm. It, and the land around it is also a mix of arable and pasture owned by Thomas Robinson, although occupied at this time by Sampson Pratt (OA 2022).
- 2.1.36 The fields east of Yarnton Road (and a plot north of Sandy Lane) have a number of landowners including Thomas Robinson, the Duke of Marlborough and Reverend Ellis but most of the land is also occupied by Matthew Young, and is listed as pasture and meadow. The fields south of Sandy Lane are in Yarnton parish, and belong to a number of landowners including Thomas Robinson, Robert Southerby Esq., the Duke of Marlborough, the Rectors and Scholars of Exeter College and Merton College, Oxford. Again, the land is a mix of arable and pasture. A building on the western boundary of the site, south of the present Gravel Pits Lane is Ivy House, which was built in 1842 for Thomas Robinson (Baggs *et al* 1990b). An agricultural building with a small enclosure around it is shown 200m south of Sandy Lane, east of Ivy House (OA 2022).
- 2.1.37 The 1884 Ordnance Survey map shows a field system on much the same alignment as the present day and some extension and expansion of the buildings within the Begbroke Hill farmstead. Parker's Farm, mentioned above, appears to have at least two buildings and a trackway runs to it from Sandy Lane. The railway line, not present on the previous tithe maps, is now in place, running north-south through the site (OA 2022).

### **Modern**

- 2.1.38 The 1900 OS map shows a few field boundary changes and the introduction of more footpaths across site (along field boundaries south of the brook, to and from the houses around the present day Gravel Pits Lane and between Begbroke Hill Farmhouse, Parker's Farm towards Kidlington). 'Gravel Pits' as a name appears for the first time, indicating the use of the site for extraction, although the exact location of these areas is not marked on the 1900 map. A building is now present south of Sandy Lane, which looks to be a pair of dwellings. These may be associated with extraction in that area. The barn to the east of Kidlington Lane has expanded since the 1880s and is much longer than its predecessor. There are no significant changes on the 1922 OS map, although it notes 'gravel pits' towards the western part of the site (OA 2022).

- 2.1.39 By the time of the 1939 OS map there is a large gravel pit, accessed via Sandy Lane, which takes up much of the square field below Sandy Lane directly south-east of Begbroke Hill Farmhouse (Sandy Lane East historic landfill site). The gravel pit suggested previously to the west of site (Sandy Lane West historic landfill site) is now depicted as taking up the entirety of the field to the east of Gravel Pits Lane, accessed from Sandy Lane. There are some small buildings near the road associated with the gravel pit. These buildings have somewhat expanded by the time of the 1949 OS map and the Sandy Lane East gravel pit has expanded, but there are few other changes to the site at this time. This is once again the case in the 1955 OS map where the gravel pits continue to expand, taking up almost the whole plot of land. Aerial photographs from this period confirm the presence of large extraction sites (OA 2022).
- 2.1.40 There are no significant changes to the site on the 1962 or 1969 OS maps, which continue to show gravel pits in the same locations. The Agricultural Research Council's Weed Research Organisation was established at Begbroke Hill in 1960, and acquired an international reputation (Baggs *et al.* 1990a). Aerial photographs in the 1970s of the area to the south and south-east of the buildings at Begbroke Hill show a mosaic of planted areas and gardening related structures which represent this use of the site, which is particularly clear in images from the 1970s. This facility was closed in 1985 (OA 2022).
- 2.1.41 The gravel extraction sites in and adjacent to the site were subsequently used as landfills. Sandy Lane East is described as having 'received inert and industrial waste with unspecified timeframe', and Sandy Lane West as having 'received inert waste with unspecified timeframe' (Jubb Consulting Engineers 2018). Aerial photographs confirm that the pits were backfilled in the late 20th century. Sandy Lane East is now grassed, whilst Sandy Lane West was developed (OA 2022).
- 2.1.42 An anti-aircraft gun site is known to have been on the site during the Second World War, located in Partridge Pit, off Sandy Lane. There is also a standard polygonal pillbox located 200m north-east of the site, beside the canal. Oxford Kidlington Airport, a former military airfield opened in 1938, is located 1km north of site (OA 2022).

#### **Undated**

- 2.1.43 The HER returned seven undated records. Six of these refer to earthworks and cropmarks within the site, and one within the wider study area. These include several features identified in the national mapping programme (NMP). The five mentioned within the site boundary include a group of six rectilinear partially overlapping enclosures south of the Sandy Lane East landfill site; a single-ditched square enclosure 250m south of Begbroke Hill farmhouse; a bifurcated driveway, field system and settlement to the east of Begbroke Hill farmhouse, two areas of enclosures, pits and linear marks to the north of Begbroke Hill farmhouse; and some faint ovoid enclosures, linear marks that may form part of a field system and a small group of well marked pits to the west of Begbroke Hill farmhouse to the south of the science park access road. These were all investigated as part of the trial trenching phase undertaken over the developable areas of the Begbroke Science Park expansion.
- 2.1.44 Around 500m south of the site, adjacent to Exeter Farm, there is a record for seven undated, shallow linear features (ditches and gullies) that were excavated in 2009 and interpreted as probable boundary or drainage features. Although no dating evidence



was recovered from them, the site produced a small quantity of medieval and post-medieval pot (OA 2022).

### **Aerial photographs**

- 2.1.45 A review of aerial photographs (APs) held at Historic England Archive in Swindon was carried out as part of DBA. A total of 267 aerial photographs comprising vertical and oblique images covering the period 1942 – 2018 were reviewed. National Mapping Programme (NMP) data was available for this area and it is reproduced in the DBA (OA 2022, fig. 9).
- 2.1.46 Ridge and furrow earthworks, a result of medieval and early post-medieval agricultural practises, were identified within the study area. These were mostly located in the western part of the study area (west of Woodstock Road) and in an area to the south and appear predominantly in parts of the study area which overlie geologies of clay or alluvium. Earlier APs indicate that some fields within the site had ridge and furrow (north-east and north-west of Begbroke Hill) but these are now minimal and do not appear on recent satellite images. The absence of ridge and furrow earthworks on the gravels suggests that they may have been utilised for pasture whilst the clays and alluvium were historically favoured for cultivation. Much of the land use within the site was pastoral in nature according to the mid-19th century tithe maps (OA 2022).
- 2.1.47 Some vertical APs show a series of substantial linear features across the study area. Several of these linear features are consistent with former boundaries illustrated on 19th-century mapping. Those not illustrated on historic mapping may represent earlier post-medieval, or possibly medieval, field boundaries and/or divisions (OA 2022).
- 2.1.48 The site took on an unusual appearance in the 1960s to 1980s when it was occupied by the Agricultural Research Council's Weed Research Organisation. The fields around the Begbroke Hill Farmhouse appear full of discrete areas of planting and temporary agricultural structures (OA 2022).

### **LiDAR**

- 2.1.49 The LiDAR data was captured by the Environment Agency (EA) and made available via the EA online archive. In this instance Digital Terrain Model (DTM) tiles for Ordnance Survey Sheet SU41se were downloaded. This data was surveyed at 1m intervals and was collected in 2020. The DTM data were processed using the Relief Visualisation Toolkit (RVT) and visualisations were created using Hill Shade, Sky View factor, open-positive, open-negative and simple local relief model (SLRM) visualisation techniques. Indicative multi-hillshade and SLRM visualisations of site and the surrounding area have been included in the DBA as Figures 21 and 22 respectively, with an annotated version presented as Figure 23 (OA 2022).
- 2.1.50 A series of substantial linear features were identified crossing the site. Several of these linear features are consistent with former boundaries illustrated on 19th-century mapping. Those not illustrated on historic mapping may represent earlier post-medieval, or possibly medieval, field boundaries and/or divisions. A series of features, which were also identified as cropmarks, and visible on the geophysical survey were

identified within the northern part of the site. These are not consistent with any features shown on historic mapping of the site and their date and nature is unknown (OA 2022).

- 2.1.51 Ridge and furrow earthworks are identifiable within the western and southern parts of the study area. The extent of surviving ridge and furrow is much decreased from that shown on historic aerial photographs which is likely a result of modern agriculture and development (OA 2022).

#### **Geophysical survey and interim trenching results from the developable site**

- 2.1.52 Occasional prehistoric activity was identified in the recent trenches in the developable, including a roundhouse and associated features located next to the A44 on the north side of Sandy Lane. The latter is provisionally date to the later prehistoric period.

- 2.1.53 Most of the settlement evidence from the recent evaluation trenches in the developable site dates from the mid-late Roman period, most notably including two broadly contemporary rural settlements that are provisionally interpreted as 'complex farmsteads' using the terminology of the Roman Rural Settlement Project. Each of the two enclosed settlements occupied at least a 4Ha area and is characterised by interior enclosure systems which seem to have been reorganised multiple times within the Roman period. In contrast to the density of features present the Roman artefact assemblages recovered to date are comparatively sparse and there is no evidence for masonry buildings within the areas available for investigation. While some tile and stone rubble has been found in the trenches the quantities are small and consistent with material re-used from elsewhere rather than in situ structures. Drove ways extend westwards from each settlement, in one case linking the settlement to a rectangular probable stock enclosure with no sign of internal features in the trial trenches. Both settlements lie predominantly on well-drained plateaus of terrace gravel but extend down to the adjacent stream floodplain, probably reflecting the importance of livestock in the settlement's economy. Our geoarchaeological studies have shown that the settlements lay beside springs.

- 2.1.54 Complex farmsteads are defined as settlements where there appears to be significant differentiation of space, either as a system of conjoined enclosures or as a principal outer enclosure with many internal subdivisions. They typically have internal zones reflecting different activities such as domestic, storage, livestock or industrial, but lack the high status Romanised dwellings that characterise villas. Complex farmsteads occur most commonly in the most heavily settled 'Central Belt' region of England, with lesser numbers in the North-East, East and South regions. There are particular concentrations around the fens and along river valleys including the Ouse, the Nene and the Middle and Upper Thames. The Begbroke settlements reinforce this river valley distribution. The various types of complex farmstead peak in numbers during the 2nd and 3rd centuries AD. The Begbroke examples seem at this stage to conform to this pattern, with pottery mostly dating from the mid-late Roman period.

- 2.1.55 The internal arrangement of the settlements, coupled with links to drove ways and livestock enclosures in the surrounding landscape, suggests an emphasis on livestock farming, although some complex farmsteads have produced crop driers which suggests that arable farming played some part in their economy. Out of the 2627

excavated Romano-British rural settlements on the Roman Rural Settlement Project database that can be classified by type 245 (9.3%) are complex farmsteads. This makes them slightly rarer than villas (12.4% of the total).

- 2.1.56 The trial trenches have produced widely distributed but important evidence for an Anglo-Saxon presence on the developable site: Distinctive early to middle Anglo-Saxon pottery sherds were found on the western edge of the southern Roman farmstead, in the next trench over from two east-west aligned inhumation burials, which at this stage could equally be late Roman or Anglo-Saxon in date. Cotswold Archaeology previously found Anglo-Saxon pottery in a pit at approximately the same location during a water pipeline watching brief (Hart 2002). Part of an Anglo-Saxon bucket from Trench 138 was associated with an otherwise poorly dated small ditch-defined rectangular enclosure on the north side of Sandy Lane. 500m to the north-east of that, an Anglo-Saxon spindlewhorl was found in Trench 264, on the western edge of the northern Roman farmstead, next to a trackway junction otherwise thought to be of Roman date. The OA Yarnton excavations, 1.6 km to the south, revealed important evidence for early and middle Saxon settlements, as described above (Hey 2004).

#### **Geophysical survey results on the floodplain**

- 2.1.57 Geophysical survey results (Fig. 2) showed a large number of archaeological features across the site. For the most part these results complement and expand on the features known previously from cropmarks and other evidence. For example, the presence of potentially Bronze Age ring features west of the science park (above the access road) and north-east of the science park towards the railway line.
- 2.1.58 There are further similar features noted to the north of Rowel Brook, notably several curvilinear ring features and linear marks (OA 2022). To the south of Rowel Brook, in the north-west of site there are further linear marks, possibly representing partial enclosures that may be associated with activity.
- 2.1.59 In the north-east area there are multiple curvilinear ring features, rectangular enclosures, potential trackways, a field system and linear marks situated at the base of the Summertown-Radley gravel terrace, extending out into the floodplain. They appear to be aligned NW-SE, along the contours of the lower slopes of the gravel terrace, and lie roughly parallel to the natural course of the Rowel Brook. It is likely that these features are prehistoric in date. While these are most likely to be of Neolithic activity on the floodplain in Yarnton may date to this period.
- 2.1.60 On the eastern side of the railway, adjacent to the driveway, field system and settlement activity identified to the east of Begbroke Hill farmhouse are several linear marks. These are likely to represent a continuation of the field systems, driveways and settlement activity excavated during the trial trenching of the developable areas east of Begbroke Hill farmhouse.
- 2.1.61 There is a large and dense cluster of predominantly curvilinear ring features (20+) located in the eastern part of site, running adjacent to the bend in the Oxford Canal for approximately 375m from NW-SE to N-S. These can be seen clearly on the geophysical survey and, although becoming less clear, extend further southwards. Rectilinear enclosures and linear marks are also present in what appears to be a busy area of activity. These are most likely to be prehistoric (Bronze or Iron Age) in date,

but as they are present on the floodplain, could conceivably represent Neolithic settlement activity. Magnetometer survey results show the large possible NW-SE palaeochannel flowing towards this area, before turning north-east towards the Oxford Canal, where the feinter curvilinear features are located but before the clearer features.

- 2.1.62 In the south-eastern corner of site is a small area that contains rectilinear enclosures, curvilinear features, and linear marks. These are morphologically somewhat similar to the middle Anglo-Saxon identified during OA excavations at Yarnton. These comprised comparable looking rectilinear enclosures that contained rectangular post-built halls and sunken-featured buildings. Due to the close proximity of Yarnton to site it is possible that these features date from this time period.
- 2.1.63 Towards the southern limits of site there are further curvilinear ring features that are also likely to be of prehistoric date due to their location within the floodplain and their proximity to the Yarnton excavations.

#### **Previous impacts and survival**

- 2.1.64 The site is predominantly made up of agricultural fields and woodland, though there are a few buildings located within the site. These include buildings between Sandy Lane and the railway line while historic mapping also indicates the presence of buildings no longer on site today, including a small building east of Kidlington Lane. The exact depth and extent of groundworks during the construction of these buildings and any associated landscaping is unknown, although it is likely that any archaeological remains within the footprints of these buildings and former buildings will have been significantly disturbed, or possibly removed. Groundworks for services and attenuation features may also have had an impact upon the archaeological resource (OA 2022).
- 2.1.65 Given the agricultural nature of the site for much of its history, and the presence of the Agricultural Research Council's Weed Research Organisation at Begbroke Hill Farmhouse for two decades, it is likely that smaller structures – such as sheds, greenhouses and so on – have also been present across the site. The groundworks associated with such structures would not have been substantial. It is anticipated that whilst shallow sub-surface deposits may have been damaged or removed within the footprint of these structures archaeological deposits are likely to remain undisturbed (OA 2022).
- 2.1.66 Archaeological deposits along major transportation routes such as the Oxford Canal and the railway are likely to have been wholly truncated. The creation of such infrastructure may also have impacted the adjacent archaeological resource with areas quarried away or disturbed during construction (OA 2022).
- 2.1.67 Beyond these areas, the majority of the site remains undeveloped. Other than the possible disturbance of shallow sub-surface deposits by minor landscaping works and agricultural activities, it is considered that the archaeological horizon is likely to remain intact across much of the area of the site that is currently and historically undeveloped. The clarity of archaeological features on geophysical survey, LiDAR and in aerial photography suggests that many of these features survive well (OA 2022).

2.1.68 Work undertaken during the evaluation on the developable areas have demonstrated that the archaeological horizon is well preserved throughout the majority of site. Buried topsoil and subsoil horizons were present over multiple different areas of the developable site and were truncated by archaeological features. The archaeological horizon was also seen to be sealed at depth beneath Holocene colluvium deposits. It therefore seems likely that the archaeological horizon will be well preserved throughout the non-developable floodplain areas and present within and/or beneath Holocene alluvium deposits found on the floodplain.

## 2.2 Potential

### Archaeological Potential and Significance

- 2.2.1 The site is situated upon low-lying floodplain areas, at the base of Summertown-Radley sand and gravel terrace. Extensive evidence from the wider landscape shows prehistoric and Romano-British occupation occurring on this terrace, which was the focus of the previous trial trench evaluation within the developable areas. Settlement patterns indicate that activity transitioned onto the higher Summertown-Radley gravel terraces from small woodland clearings on floodplain areas during the Iron Age (Hey *et al.* 2011, 2016). Prior to this, settlement activity was focussed within the floodplain and evidence of Neolithic settlement activity was recorded during the OA excavations at Yarnton (*ibid*). Numerous Neolithic and later prehistoric artefacts have also been found within and near to the site, indicating activity in the wider area during these prehistoric periods.
- 2.2.2 A series of cropmark features, ranging in potential date from the Bronze Age to the Romano-British period, have been identified across the site. Many of these features have been identified from historic aerial photographs, but recent geophysical survey and archaeological trial trenching has confirmed the presence of these and further features in the landscape that are likely prehistoric in date. There is therefore a high potential for archaeological remains of prehistoric date on site. Whilst any residual artefacts such as flint or pottery sherds would be of low (local) significance, settlement remains would be of a higher significance and would be of at least moderate (regional) significance (OA 2022).
- 2.2.3 There is evidence for Roman settlement in two areas within the developable part of site, evidenced by ditches and pits and a bronze brooch found towards site centre below Sandy Lane, as well as recent geophysical survey and archaeological trial trenching results. The bifurcated driveway, field system and settlement on the east of the developable site, appears to continue on the eastern side of the railway, albeit less dense than the within the developable areas. The main focus of activity is likely to be concentrated to the west of the railway, however, there is still high potential for archaeological remains of Romano-British date on site. Whilst any residual artefacts such as flint or pottery sherds would be of low (local) significance, settlement remains would be of a higher significance and would be of at least moderate (regional) significance (OA 2022).
- 2.2.4 The OA Yarnton excavations, located 1km to the south of the site, revealed important evidence for early and middle Anglo-Saxon settlement (Hey 2004). Recent geophysical survey shows a number of curvilinear and rectilinear features in the south-eastern

area of site that bear a resemblance to the early and middle Anglo-Saxon settlement found during the OA Yarnton excavations. This suggests that there is a high potential for archaeological remains of date within this area of site.

- 2.2.5 Begbroke is mentioned in the Domesday Book (1086) which is often taken as an indication that the settlement pre-dates the Norman Conquest, but the settlement would have been small and there is no reason to expect it, or another settlement, extended into the site. Therefore, the potential for archaeological remains of this date is low, and their presence, if residual or agricultural, is likely to be of low (local) significance (OA 2022).
- 2.2.6 During the later medieval period the site is likely to have been largely part of an open field system of agriculture to the east of the medieval villages of Begbroke and Yarnton. It is also possible that an earlier phase of Begbroke Hill House was present, in the area of the current (post-medieval) house. Residual medieval artefacts including pottery and metal finds have also been found in the central parts of site. It is therefore highly likely that agricultural features such as field boundaries, possible furrows and drains, as indicated by surveys and LiDAR data, will be present. Similar finds or features would likely be of low (local) significance (OA 2022).
- 2.2.7 The site largely remained in agricultural use during the post-medieval period, with Begbroke Hill farmhouse built between 1600 and 1630. Infrastructure improvements – a turnpike road along the west border of site, a canal and a railway to the east – were undertaken later in the post-medieval period. Expansion of the buildings at Begbroke Hill farmhouse, and the construction of agricultural buildings and other farmsteads within the site was also undertaken in the post-medieval period. It is therefore likely that agricultural features such as field boundaries and farm buildings or their remains will be present across the site. Such remains are likely to be of low (local) significance (OA 2022).
- 2.2.8 The site continued in largely agricultural use, but at least one field within the site became a gravel extraction site, which is one of three in and around Begbroke Science Park. The appearance of ‘Sandy Lane’ and ‘Gravel Pits Lane’ on historic maps prior to the appearances of these more defined gravel extraction sites noted on 20th century maps may indicate some more informal areas of gravel extraction in the area. In the mid-20th century, the site became associated with the agricultural and horticultural endeavours of the Agricultural Research Council's Weed Research Organisation. It is very likely that evidence of these activities survive in the top soils of the site. Such remains are likely to be of at most, low (local) historic significance (OA 2022).

### **2.2.9 Potential Impacts**

- 2.2.10 Illustrative plans for the proposed scheme indicate that the non-developable floodplain areas comprise various landscaping components, some of which are expected to have archaeological impacts. These include the creation of ecological and retention ponds to the south of the Rowel Brook with small-scale play areas and fitness equipment nearby; allotments and a social farm to the northern-most part of site; areas of marshland habitat creation and a green buffer either side of the railway; and adventure playground facilities, formal sports pitches and areas of open parkland to the south and east of site. The development will also include the construction of

transport infrastructure links which extend partly over the floodplain areas, including primary and secondary vehicle access route and cycle paths.

- 2.2.11 The majority of the proposed plans for the non-developable areas are designed to have a minimal impact on the archaeology and the preferred option is to preserve in situ. However, the ecology / retention ponds, sports ground drainage, marshland habitat creation, transport infrastructure and any component that involves breaking ground beneath the topsoil may impact on the archaeological horizon. The footings for the new road bridge over the railway would certainly have a significant impact on any archaeology that may be present.

## **3 PROJECT AIMS**

### **3.1 General**

- 3.1.1 A geophysical survey has already been carried out and these results need to be investigated through a trenched evaluation. As required by the OCC design brief (OCAS October 2022) this evaluation will aim to establish the presence/ absence, extent, condition, character and date of any archaeological deposits within the developable application area. This evidence will form the basis of any proposals for appropriate mitigation measures that may seek to limit the damage to significant archaeological deposits and will aim to define any research priorities that may be relevant should further investigation be required.
- 3.1.2 As the date and function of the features discovered by geophysical survey have not been established at this stage, reference to specific research aims in the Solent-Thames Regional Research Framework (Hey and Hind 2014) will be made in future mitigation WSI's, in light of the trenching results.

### **3.2 Specific aims and objectives**

- 3.2.1 The specific aims and objectives of the evaluation are:
- i. To determine or confirm the general nature of any remains present
  - ii. To determine or confirm the approximate date or date range of any remains by means of artefactual or other evidence
  - iii. To ground-truth the geophysical survey results
  - iv. To inform development design decisions by establishing the depth and fragility of archaeological remains in different parts of the site.



## 4 PROJECT SPECIFIC EXCAVATION AND RECORDING METHODOLOGY

### 4.1 Fieldwork scope

- 4.1.1 The scope required by the OCC brief would normally require a 2% sample of the proposed with contingency for up to another 1% sample if requested by OCC to clarify the results, as was the case for recent trenching in the developable site. In this case much of the floodplain is expected to be preserved *in situ* so the trench coverage is much more limited and targeted rather than based on a percentage sample. Eighty-eight trenches are to be excavated in total, as shown on Figures 3 to 8. Twenty-eight of these are targeted on archaeological sites identified by geophysical survey, to obtain a basic understanding of the date, depth and preservation of each site and inform future management and preservation of the archaeology. The remainder of the trenches are placed to investigate a proposed secondary vehicle access route and cycle/pedestrian paths alongside Rowel Brook, as well as ecology ponds and sports pitches. A small section of the proposed primary vehicle access route, which passes through the floodplain next to the A44, will not be trenched as it lies in a field that has previously been subject to archaeological evaluation by Cotswold Archaeology, in which no significant archaeology was found (Wolf 2022).
- 4.1.2 Each trench will be 30m by 1.8m in plan, to be laid out within the area to test geophysical anomalies and 'blank areas', unless prevented by on site obstructions or archaeological considerations. The site is affected by numerous constraints including utilities, public rights of way and protected ecological sites (protected hedgerows and trees and badger setts). Exclusion zones of variable width will be left on either side of each constraint, as shown on the trench plan (Figs.7 and 8). The trenches in the non-developable parts of the site are largely situated within floodplain areas on clayey geology with alluvium present up to 1.0m BGL.
- 4.1.3 The date of the alluvium is unknown and it is therefore possible for archaeology to be present beneath it. Trial trenches in floodplain areas are expected to encounter potentially significant water ingress and will need to be dug in predominantly dry weather conditions. It is also possible for alluvial deposits to be present >1.0m BGL, and in these instances it may be necessary to excavate these trenches to a greater depth than 1m. Trenches for manual access will not exceed 2m depth and any such trenches will be stepped/ battered using OA's deep trenching methodology. Deeper test pits may be dug, with no manual access, in an attempt to log the geological sequence down to bedrock.
- 4.1.4 The archaeological features visible on the magnetometer plot are expected to be found at shallow depth (immediately below the plough soils) in most trenches. In these cases it is expected that the trial trenches will be excavated to an average depth of 0.5m with no one trench exceeding a safe working depth of approximately 1.0m, depending on ground conditions.

### 4.2 Fieldwork programme

- 4.2.1 It is anticipated that the fieldwork will take approximately 7 weeks to complete, assuming that two 13-20T excavators is used to dig and backfill the trenches in a rolling programme. The programme may be extended as some fields will not be available

until harvested. The OA team will comprise a Project Officer, directing up to six Archaeologists, under the management of Stuart Foreman, BA Hons MCIfA, Senior Project Manager. A qualified geoarchaeologist will form part of the team.

4.2.2 Machine excavation will be undertaken by 13T - 20T tracked excavators hired from David Beecroft Ltd. for the estimated fieldwork duration.

4.2.3 All fieldwork undertaken by Oxford Archaeology (South) is overseen by the Head of Fieldwork, David Score MCIfA.

### **4.3 Site specific methodology**

4.3.1 A summary of OA's general approach to excavation and recording can be found in Appendix A. Standard methodologies for Geomatics and Survey, Environmental evidence, Artefactual evidence and Burials can also be found below (Appendices B, C, D and E respectively). The Data Management Strategy is Appendix J.

4.3.2 Site specific methodologies will be as follows, as required by the OCC brief:

4.3.3 The project will be under the control of a suitably qualified archaeologist who will be a member of the Chartered Institute for Archaeologists (CIfA) (See Para 4.2.1 above). The evaluation will be undertaken in accordance with the CIfA's Standards and guidance for field evaluation, 2020.

4.3.4 The WSI includes a list of specialist consultants who might be required to conserve and/or report on finds and advise, or report on, other aspects of the investigation (See Appendix G).

4.3.5 The whole range of investigative /recording techniques will be considered. These should be presented and, if discounted, a supporting statement should provide an explanation. In this case a full range of standard non-intrusive assessment methods appropriate to the site have been used in the desk-based assessment, including analysis of historic maps, documentary sources, cropmarks, BGS geology mapping, HER data and Lidar data (OA 2022). Magnetometer survey has also been completed throughout the site as the most appropriate geophysical survey method for detecting and mapping archaeological features buried at shallow depth over large areas. A non-standard geophysical survey method (EM survey) has also been undertaken in an attempt to map palaeochannels in floodplain parts of the development site (Magnitude Surveys, October 2022). Metal-detectors will be used to scan the trenches during excavation. Drone surveys will not be used as not an appropriate method for mapping evaluation trenches.

4.3.6 A plan at an appropriate scale showing the proposed location and extent of trenches is included as Figure 2 and 3. All trenches will be machine-excavated.

4.3.7 When machine-opened trial trenches are employed:

4.3.8 An appropriate machine will be used, with an appropriate bucket, usually a wide toothless ditching blade. Toothed buckets should not be used without agreement of OCAS. Choice should be influenced by prevailing site conditions, and the machine must be able to carry out a clean job. In this case the trenches will be dug on silt, clay, sand and gravel geology using two 13T tracked excavators fitted with wide ditching buckets and operated by experienced drivers with valid CITB operator certificates.

- 4.3.9 All machine work must be carried out under the direct supervision of an archaeologist. All OA machine supervisors are archaeologists with at least two years' experience who have completed a Safe Working with Plant safety training course.
- 4.3.10 All topsoil or recent overburden will be removed down to the first significant archaeological horizon in successive level spits. The continued use of machinery beyond this point should only take place when specifically agreed with OCAS as necessary for the particular type of evaluation.
- 4.3.11 The top of the first significant archaeological horizon may be cleared by the machine but must then be cleaned by hand and inspected for features.
- 4.3.12 Sufficient of the archaeological features and deposits identified must be excavated by hand through a specified or agreed sampling procedure to enable their date, nature and condition to be described (See Appendix A).
- 4.3.13 No archaeological deposits should be entirely removed unless it is unavoidable. It is not necessarily expected that all trial trenches will be fully excavated to natural subsoil, but the depth of archaeological deposits across the whole site must be assessed. The stratigraphy of all trial trenches will be recorded even where no archaeological deposits have been identified. Spoil heaps will be monitored to allow analysis of the spatial distribution of artefacts. Metal detectors will be used to recover metal finds from the spoil.
- 4.3.14 All excavation, either by machine and by hand, must be undertaken with a view to avoiding damage to any archaeological features or deposits, which appear to be worthy of preservation *in situ*.
- 4.3.15 If any finds are made that could qualify as 'Treasure' under the Code of Practise of the Treasure Act 1996, OA will immediately notify the coroner, OCAS and the client/landowner (See Appendix D).
- 4.3.16 Any human remains encountered will initially be left *in situ*. If removal is necessary, this must comply with relevant Ministry of Justice regulations. OCAS will be informed of any human remains encountered (See Appendix E).
- 4.3.17 The data collection strategy forms part of a structured academic research agenda based on local and national research priorities. Data management, recovery and recording levels will be clearly defined and will be appropriate to the particular stratified deposits under investigation. The Selection Strategy and data Management Plan is specifically set out in the WSI (See Appendix J).
- 4.3.18 No trenches will be backfilled without prior approval in writing from OCAS.

## **5 PROJECT SPECIFIC REPORTING AND ARCHIVE METHODOLOGY**

### **5.1 Programme**

5.1.1 The report will be completed within six weeks of the completion of the fieldwork.

### **5.2 Content**

5.2.1 The content of this report will be as defined in Appendix F. The level of reporting will depend on the results of the evaluation. It is envisaged that it will comprise a grey literature report and a summary in an appropriate regional journal.

5.2.2 A draft copy of the report will be issued to the client and OCAS for comment prior to being finalised and prior to formal submission to the Planning Authority.

5.2.3 Digital copies of the completed report in Adobe Acrobat (.pdf) format will be provided to the client and OCC.

5.2.4 A digital copy of the report will also be submitted to Oxfordshire HER and a copy of the final report will be placed on the OA digital library and available for public six months after issue, unless the client, or their representative, requests otherwise.

5.2.5 Digital data, including GIS .shp files, will be made available to OCAS on request.

### **5.3 Specialist input**

5.3.1 OA has a large pool of internal specialists, as well as a network of external specialists with whom OA have well established working relationships. A general list of these specialists is presented in Appendix G; in the event that additional input should be required, an updated list of specialists can be supplied.

### **5.4 Archive**

5.4.1 The site archive (including artefacts recovered) will be deposited with the Oxfordshire County Museum following completion of the project. The museum has been notified that the work is imminent. Any finds made belong to the landowner. The museum cannot accept artefacts into its collection unless ownership has been transferred to them in writing. OA have a Transfer of Title proforma letter for this purpose which will need to be signed by the landowner once the finds are known. As Oxford University is both landowner and developer in this case no difficulty is anticipated in transferring ownership of the archive to the museum.

5.4.2 A summary of OA's general approach to documentary archiving can be found in Appendix H.

## **6 HEALTH AND SAFETY**

### **6.1 Roles and responsibilities**

- 6.1.1 The Senior Project Manager, Stuart Foreman CITB SMSTS, has responsibility for ensuring that safe systems of work are adhered to on site. He/she delegates elements of this responsibility to the Project Officer, Mariusz Gorniak, CITB SMSTS, who implements these on a day to day basis.
- 6.1.2 The Director with responsibility for Health and Safety at OA is Dan Poore Tech IOSH (Chief Business Officer).

### **6.2 Method statement and risk assessment**

- 6.2.1 A summary of OA's general approach to health and safety can be found in Appendix I. A risk assessment has also been undertaken and approved and will be kept on site, along with OA's standard Health and Safety file, which will contain all relevant health and safety documentation.
- 6.2.2 The Health and Safety file will be available to view at any time.

### **6.3 Monitoring of works**

- 6.3.1 At least 10 days' notice of the commencement of the trenching works will be given to OCAS who will have free access to the site (subject to Health and Safety considerations) and all records to ensure the works are being carried out in accordance with this WSI and all other relevant standards.

## 7 SITE SELECTION POLICY AND DATA MANAGEMENT PLAN

- 1.1.1 All digital data will be collected, stored and selected in line with the Oxford Archaeology (OA) Data Management Plan (forthcoming). The project specific Digital Data Management Plan is attached to this WSI as an Appendix. This is a 'living' document and will be reviewed and amended throughout the project. Should any substantial amendments be made to the plan, then the revised version will be submitted to CHET.
- 1.1.2 The project specific Digital Data Management Plan has been prepared in relation to the following standards and guidelines:
- Historic England and Dig Ventures 2019. Work Digital/Think Archive. A guide to managing digital data generated from archaeological investigations. <https://digventures-thepixelparlour.netdna-ssl.com/wp-content/uploads/2019/12/WDTA-Guide-FINAL.pdf>
  - Archaeology Data Service/Digital Antiquity. Guides to good practice. <http://guides.archaeologydataservice.ac.uk/g2gp/MainADS>
  - Archaeology Data Service. Guidelines for Depositors <http://archaeologydataservice.ac.uk/advice/guidelinesForDepositors>
  - Historic England 2015. Digital Image Capture and File Storage. Guideline for Best Practice. <https://historicengland.org.uk/images-books/publications/digital-image-capture-and-file-storage/heag059-digital-images/>
  - Oxford Archaeology (forthcoming). Data Management Plan.
- 1.1.3 The data to be collected and created comprises that specific to the project. It does not include related information from the same development, such as site works undertaken by other contractors, except where the findings are fully integrated into this analysis. The OA evaluation trenching archive is fully integrated and will be deposited under same accession number.
- 1.1.4 Site survey data is captured using Leica survey equipment and imported into ArcGIS via FTP transfer. Final versions of site plans will be produced in ArcGIS, AutoCAD and/or Adobe Illustrator.
- 1.1.5 Section drawings are created by hand on drafting film and paper context records are created by hand on standard OA pro forma recording forms. Selected data will be transferred to digital format in line with OA archive preparation guidance. Digital photographic images are taken in accordance with OA digital data guidance in Photographic Recording Manual.
- 1.1.6 Analytical data created during post-excavation will comprise a postgresQL database downloaded as .csv or .xlsx files from OA's cloud-based Digital Recording System. Where appropriate, site stratigraphic matrices will be created using MSEXcel. Individual contributing specialists create MSEXcel, MSWord and/or MSAccess datasheets which may stand alone from the site database. Analytical data may also include GIS files, charts and figures in MSEXcel and hand-drawn visuals.

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## OA STANDARD FIELDWORK METHODOLOGY APPENDICES

The following methods and terms will apply, where appropriate, to all OA fieldwork unless varied by the accompanying detailed Written Scheme of Investigation.

Copies of all OA internal standards and guidelines referred to below are available on request.

### APPENDIX A GENERAL EXCAVATION AND RECORDING METHODOLOGY

#### A.1 Standard methodology – summary

##### *Mechanical excavation*

- A.1.1 An appropriate mechanical excavator will be used for machine excavation. This will normally be a JCB or 360° tracked excavator with a 1.5 m to 2 m wide toothless ditching bucket. For work with restricted access or working room a mini excavator may be used.
- A.1.2 All mechanical excavation will be undertaken under direct archaeological supervision.
- A.1.3 All undifferentiated topsoil or overburden of recent origin will be removed down to the first significant archaeological horizon, in successive, level spits.
- A.1.4 Following mechanical excavation, all areas that require examination or recording will be cleaned using appropriate hand tools.
- A.1.5 Spoil heaps will be monitored in order to recover artefacts to assist in the analysis of the spatial distribution of artefacts. Modern artefacts will be noted but not retained.
- A.1.6 After recording, evaluation trenches and test pits will usually be backfilled with excavated material in reverse order of excavation, and compacted as far as is practicable with the mechanical excavator. Area excavations will not normally be backfilled.

##### *Hand excavation*

- A.1.7 All investigation of archaeological levels will usually be by hand, with cleaning, examination and recording both in plan and section.
- A.1.8 Within significant archaeological levels the minimum number and proportion of features required to meet the aims of the excavation will be hand excavated. Pits and postholes will usually be subject to a 50% sample by volume. Linear features will be sectioned as appropriate. More complex features such as those associated with funerary activity will usually be subject to 100% hand excavation.
- A.1.9 In the case of evaluations, it is not necessarily the intention that all trial trenches will be fully excavated to natural stratigraphy, but the depth of archaeological deposits across the site will be assessed. The stratigraphy of a representative sample of the evaluation trenches will be recorded even where no archaeological deposits have been identified. Any excavation, both by machine and by hand, will be undertaken

with a view to avoiding damage to any archaeological features or deposits, which appear to be worthy of preservation in situ.

### **Recording**

- A.1.10 Written descriptions will be recorded on proforma sheets comprising factual data and interpretative elements.
- A.1.11 Where stratified deposits are encountered a Harris matrix will be compiled during the course of the excavation.
- A.1.12 Plans will normally be drawn at 1:100, but on urban or deeply stratified sites a scale of 1:50 or 1:20 will be used. Detailed plans will be at an appropriate scale. Burials will be drawn at scale 1:10 or recorded using geo-referenced digital photography.
- A.1.13 The site grid will be accurately tied into the National Grid and located on the 1:2500 or 1:1250 map of the area.
- A.1.14 A register of plans will be kept.
- A.1.15 Long sections of showing layers will be drawn at 1:50. Sections of features or short lengths of trenches will be drawn at 1:20.
- A.1.16 A register of sections will be kept.
- A.1.17 Generally, all sections will be tied in to Ordnance Datum.
- A.1.18 A full photographic record, illustrating in both detail and general context the principal features and finds discovered will be maintained. The photographic record will also include working shots to illustrate more generally the nature of the archaeological work.
- A.1.19 Photographs will be recorded on OA Photographic Record Sheets.

## **A.2 Relevant industry standards and guidelines**

- A.2.1 The Chartered Institute for Archaeologists (CIfA) Standard and Guidance notes relevant to fieldwork are:
- Standard and guidance for archaeological field evaluation, 2014 (updated 2020)
  - Standard and guidance for archaeological excavation, 2014 (updated 2020)
  - Standard and guidance for an archaeological watching brief, 2014 (update 2020)

- A.2.2 These will be adhered to at all times.

## **A.3 Relevant OA manual and other supporting documentation**

- A.3.1 All fieldwork will be undertaken in accordance with the requirements of the OA Field Manual (ed. D Wilkinson 1992), and the revised OA fieldwork manual (publication forthcoming).
- A.3.2 Further guidance is provided to all excavators in the form of the OA 'Fieldwork Crib Sheets - a companion guide to the Fieldwork Manual'. These have been issued ahead of formal publication of the revised Fieldwork Manual.

## APPENDIX B GEOMATICS AND SURVEY

### B.1 Standard methodology - summary

- B.1.1 The aim of OA methodology is to provide comprehensive survey cover of all investigation areas. Additionally, it is designed to provide coverage for any areas, beyond the original scope of the project, which arise as a result of further work. It provides digital plans of all required elements of the project and locates them within an overall grid.
- B.1.2 It also maintains all necessary survey data and ensures that the relevant information is copied into the primary record, in order to ensure the integrity of the project archive. Furthermore, it ensures that all core data is securely stored and backed up. It establishes accurate project reference systems utilising a series of control stations and permanent base lines.
- B.1.3 The survey will be conducted using a combination of GPS/GNSS (Global Positioning System/Global Navigation Satellite System), hand-measured elements, Total Station Theodolite (TST) survey utilising Reflectorless Electronic Distance Measurement (REDM), or photogrammetry where appropriate.
- B.1.4 Before the main work commences, a network of control stations will be laid out encompassing the area as necessary. Control stations will be tied in to known points or existing features using rigorous metric observation. The control network will be set in using a TST to complete a traverse or using techniques as appropriate to ensure sufficient accuracy. A GNSS, or other appropriate method, will be used to orientate the control network to National Grid or other recognised coordinate system.
- B.1.5 Control stations will be checked by closed traverse and/or GNSS, as appropriate. The accuracy of these control stations will be accessed on a regular basis and re-established accordingly. Control stations will be recorded on Survey Control Station sheets.
- B.1.6 Each control station will be marked with a PGM (Permanent Ground Marker). Witness diagrams will include the full 3-D co-ordinates generated, a sketch diagram and measurements to at least three fixed details, written description of the mark and a photograph of the control point in its environs.
- B.1.7 Prior to entry into the field all equipment will be checked, and all pre-survey information will be uploaded onto survey equipment as appropriate. Prior to conducting the survey, the site will be reconnoitred for locations for a viable control network and check the line of sight and any possible hindrance to survey. Daily record sheets will be kept recording daily tasks and conditions as appropriate.
- B.1.8 All spatial data will be periodically downloaded uploaded and backed up to our central servers via ftp. It will be cleaned, validated and inspected.
- B.1.9 All survey data will be documented on daily survey record sheets as necessary. Information entered on these sheets includes key set up information (Instrument height etc.) as well as daily variables and errors/comments. All survey data will be digitally recorded in a raw format and translated during the download process this

shall allow for any errors to be cross referenced with the daily survey record and corrected accordingly.

- B.1.10 A summary of survey work will be produced as needed to access development and highlight problems. Technical support for the survey equipment and download software shall be available at all times. In those instances, where sites are remotely operated, all digital data will be backed up regularly via ftp to Oxford on a regular basis.
- B.1.11 A site plan will initially be created by a rapid survey of relevant archaeological features by mapping their extent using a combination of TST and GNSS. This will form the basis for deciding excavation strategy and will be updated as the excavation clarifies the extent of, and relationships between, archaeological features.
- B.1.12 Areas of complex stratigraphy will be hand drawn or recorded by photogrammetry as appropriate. Where hand drawn, at least two Drawing Points (DPs) will be set in as a baseline and measurements taken off this by tape and offset. The hand drawn plans will be referenced to the digitally captured pre-site plan by measuring in the DPs with a TST or GNSS. These hand drawn elements will then be scanned in, geo-referenced using the DPs as reference points and digitised following OA's digitising protocols. For further details on hand planning procedure please refer to the fieldwork guidelines.
- B.1.13 Photogrammetry may also be used to record standing structures or burials. This will be carried out in line with Standard OA procedures for photogrammetry.
- B.1.14 Survey data recorded in the field will be downloaded using appropriate downloading software, and saved as an AutoCAD Map DWG file, or an ESRI Shapefile. These files will be regularly updated and backed up with originals being stored on an OA server in Oxford.
- B.1.15 All drawings will be composed of closed polygons, polylines or points in accordance with the requirements of GIS construction and OA Geomatics protocols. Once created, additional GIS/CAD work will normally be carried out at the local OA central office or at on-site remote locations when appropriate. Support for all GIS/CAD work will be available from OA's Oxford Office during normal office hours. The aim of the GIS/CAD work is to produce workable draft plans, which can be produced as stand-alone products, or can be readily converted to GIS format. Any hand-drawn plans will be scanned and digitised on site in the first instance. Subsequent plans will be added to the main drawing as it develops.
- B.1.16 All plan scans will be numbered according to their plan site number. Digital plans will be given a standard new plan number taken out from the site plan index.
- B.1.17 Information (metadata) on all other digital files will be created and stored as appropriate. At the end of the survey all data recorded will be made available for archiving purposes.

## **B.2 Relevant industry standards and guidelines**

- B.2.1 Historic England, 2017 Understanding the Archaeology of Landscapes A Guide to Good Recording Practice
- B.2.2 Historic England, 2015 Metric Survey Specifications for Cultural Heritage (3rd edn)

- B.2.3 Historic England, 2016 Understanding Historic Buildings: A Guide to Good Recording Practice
- B.2.4 Historic England, 2017 Photogrammetric Applications for Cultural Heritage: Guidance for Good Practice

### **B.3 Relevant OA manual and other supporting documentation**

- B.3.1 OA South Metric Survey, Data Capture and Download Procedures
- B.3.2 OA South Digitising Protocols
- B.3.3 OA South GIS Protocols
- B.3.4 These will be superseded by the OA South Geomatics Manual (in progress).

## APPENDIX C ENVIRONMENTAL EVIDENCE

### C.1 Standard methodology – summary

- C.1.1 Different environmental and geoarchaeological sampling strategies may be employed according to established research targets and the perceived importance of the strata under investigation. Where possible an environmental specialist(s) will visit the site to advise on sampling strategies. Sampling methods will follow guidelines produced by Historic England and Oxford Archaeology. A register of samples will be kept. Specialists will be consulted where non-standard sampling is required (e.g. TL, OSL or archaeomagnetic dating) and if appropriate will be invited to visit the site and take the samples.
- C.1.2 Geoarchaeological sampling methods are site specific, and methodologies will be designed in consultation with the geoarchaeological manager on a site by site basis.
- C.1.3 Bulk soil samples, where possible of 40 litres or 100% of a deposit if less is available, will be taken from potentially datable features and layers for flotation for charred plant remains and for the recovery of small bones and artefacts. Larger soil samples (up to 100L) may be taken for the complete recovery of animal bones, marine shell and small artefacts from appropriate contexts. Smaller bulk samples (general biological samples) of 10-20 litres will be taken from any waterlogged deposits present for the recovery of macroscopic plant remains and insects. Series of incremental 2L samples may be taken through buried soils and deep feature fills for the recovery of snails and/or waterlogged plant remains, depending on the nature of the stratigraphy and of the soils and sediments. Columns will be taken from buried soils, peats and waterlogged feature fills for pollen and/or phytoliths, diatoms, ostracods and foraminifera if appropriate. Soil samples will be taken for soil investigations (particle size, organic matter, bulk chemistry, soil micromorphology etc.) and possibly for metallurgical analysis in consultation with the appropriate specialists.
- C.1.4 Bulk samples from dry deposits will be processed by standard water flotation using a modified Siraf-style machine and meshes of 0.25mm (flot) and 0.5 or 1mm depending on sediment type and like modes of preservation (residue). Heavy residues will be wet sieved, air dried and sorted. Samples taken exclusively for the recovery of bones, marine shell or artefacts will be wet sieved to 2mm. Waterlogged samples (1L sub-sample) and snail samples (2L) will be processed by hand flotation with flots and residues collected to 0.25mm (waterlogged plants) and 0.5mm (snails) respectively; these flots and residues will be sorted by the specialist. Samples specifically taken for insects, pollen, other microflora and microfauna, metallurgy and soil analysis will be submitted as whole earth to the appropriate specialists or processed following their instructions.

### C.2 Relevant industry standards and guidelines

- C.2.1 Historic England, 2010 Waterlogged Wood: Guidelines on the recording, sampling, conservation and curation of waterlogged wood.
- C.2.2 Historic England, 2018 Waterlogged Organic Artefacts: Guidelines on their Recovery, Analysis and Conservation.

- C.2.3 Historic England, 2011 Environmental Archaeology. A guide to the theory and practice of methods, from sampling and recovery to post excavation, (2nd ed)
  - C.2.4 Historic England, 2004 Dendrochronology: Guidelines on Producing and Interpreting Dendrochronological Dates (revision due 2020).
  - C.2.5 University of Bradford, 2019 Archaeomagnetism: Magnetic Moments in the Past <https://www.brad.ac.uk/archaeomagnetism/>
  - C.2.6 Historic England, 2008 Luminescence Dating. Guidelines on Using Luminescence Dating in Archaeology (revision due 2020).
  - C.2.7 Historic England, 2008 Guidelines for the Curation of Waterlogged Macroscopic Plant and Invertebrate Remains (currently being revised).
  - C.2.8 Historic England, 2015 Archaeometallurgy. Guidelines for Best Practice.
  - C.2.9 Historic England, 2015 Geoarchaeology. Using Earth Sciences to Understand the Archaeological Record.
  - C.2.10 Historic England, 2017 Organic Residue Analysis and Archaeology.
  - C.2.11 Baker, P and Worley, F, 2019 Animal Bones and Archaeology: Recovery to archive. Historic England
- C.3 Relevant OA manual and other supporting documentation**
- C.3.1 Oxford Archaeology 2017. Environmental Sampling Guidelines, 4th ed.

## APPENDIX D ARTEFACTUAL EVIDENCE

### D.1 Standard methodology - summary

- D.1.1 Before a site begins arrangements concerning the finds will be discussed with the Finds Team Leader. Information will be provided by the project manager about the nature of the site, the expected size and make-up of the finds assemblage and any site specific finds retrieval strategies. On-site requirements will be discussed and a conservator appointed who can be called on to make site visits if required. Special requirements regarding particular categories of material will be raised at this early stage for instance the likelihood of recovering assemblages of waterlogged material, large timbers, quantities of structural stone or ceramic building material. Specialists may be required to visit sites to discuss retrieval strategies.
- D.1.2 The project manager will supply the Finds Team Leader with contact details of the landowner of the site so that consent to deposit any finds resulting from the investigation can be sought.
- D.1.3 The on-site retrieval, lifting and short term packaging of bulk and small finds will follow the detailed guidelines set out in the OA Finds Manual (sections 2 and 3), First Aid for Finds and the UKIC conservation guidelines No.2.
- D.1.4 All finds recovered from site will be transported to an OA regional office for processing; local sites will return finds at the end of each day, away based sites at the end of each week. Special arrangements can be discussed for certain sites with the Team Leader before the start of a project. Larger long running sites may in some instances set up on-site processing units to deal with the material from a particular site.
- D.1.5 All finds qualifying as Treasure will be removed to a safe place and reported to the local Coroner according to the procedures relating to the Treasure Act (1996), and the Treasure (Designation) Order 2002. Where removal cannot be effected on the same working day as the discovery, suitable security measures will be taken to protect the finds from theft.
- D.1.6 Each box of finds will be accompanied by a finds context checklist itemising the finds within each box. The number of bags of finds from each context and individual small find from each context will be recorded. A member of the processing team will check the list when it arrives in the department. There are separate forms for finds recovered from fieldwalking.
- D.1.7 The processing programme is reviewed on a weekly basis and priorities are worked out after discussions with the Fieldwork Team Leader and the Post-excavation Team Leader. Project managers will keep the Finds Team Leader informed of any pressing deadlines that they are aware of. All finds from evaluations are dealt with as a matter of priority.
- D.1.8 All bulk finds are washed (where appropriate), marked, bagged and boxed by the processing team according to the guidelines set out in section 4 and 5 of the OA Finds Manual, First-aid for finds and the UKIC guidelines No.2. They must also take into account the requirements of the receiving museum. Primary data recording count and weight of fragments by material from each context is recorded on the site database.



- D.1.9 Unstable and sensitive objects are recorded onto the database and then packaged and stored in controlled environments according to their individual requirements. The advice of a conservator will be sought for sensitive objects in need of urgent conservation. All metalwork will be x-rayed prior to assessment (and to meet the requirements of most receiving museums).
- D.1.10 Finds recovered from the environmental sample processing will be incorporated into the main assemblage and added to the database.
- D.1.11 On completion of the processing and data entry a finds file for each archaeological investigation will be produced, a summary of which is available for the project manager. The assemblage is allocated an OA number for storage purposes. Bulk finds are stored on a roller racking system, metals in a secure controlled storage and organic finds are refrigerated where possible.
- D.1.12 The movement of finds in and out of the storage areas is strictly monitored and recorded. Carbon copy transit forms exist to record this information. Finds will not be removed from storage without the prior knowledge of the Finds Team Leader.
- D.1.13 Finds information summarised in the finds compendium is used to assess the finds requirements for the post excavation stages of the project. The Team Leader holds a list of all specialists used by OA (see below) both internal and external.
- D.1.14 On completion of the post excavation stage of the project the team prepares the finds assemblage for deposition with the receiving museum. Discussions will be held with the museum, the excavator and the Finds Team Leader to finalise any selection, retention or discard policy. Most museums issue strict guidelines for the preparation of archives for deposition with their individual labelling, packaging and recording requirements.

## **D.2 Relevant industry standards and guidelines**

- D.2.1 ClfA, 2014 (updated 2020) Standard and guidance for the collection, documentation, conservation and research of archaeological materials
- D.2.2 Society of Museum Archaeologists, 1993 Selection, retention and dispersal of Archaeological Collections. Download available via <http://www.socmusarch.org.uk/publica.htm>
- D.2.3 UKIC, 1983 Packaging and Storage of Freshly-Excavated Artefacts from Archaeological Sites. Conservation Guidelines No.2. Archaeology Section, United Kingdom Institute for Conservation.
- D.2.4 UKIC, 1988 Excavated Artefacts and Conservation: UK sites Revised Edition. Conservation Guidelines No.1. Archaeology Section, United Kingdom Institute for Conservation.
- D.2.5 Watkinson, D E & Neal, V, 1998 First Aid for Finds (3rd edition). RESCUE & UKIC

## **D.3 Relevant OA manual and other supporting documentation**

- D.3.1 Allen, L, and Cropper, C (internal publication only) Oxford Archaeology Finds Manual.

## APPENDIX E HUMAN REMAINS

### E.1 Standard methodology - summary

- E.1.1 Human remains will not be excavated without a relevant licence/faculty and, where applicable (for example, a post medieval cemetery), a risk assessment from the local environmental officer.
- E.1.2 All human remains will be treated with due care and regard to the sensitivities involved, and will be screened from the public throughout the course of the works.
- E.1.3 Excavation will be undertaken in accordance with ClfA (Roberts and McKinley 1993), Historic England (2018), the Advisory Panel on the Archaeology of Burials in England (APABE, 2015, 2017) and British Association of Biological Anthropology and Osteoarchaeology Code of Practice (2019) and Code of Ethics (2019). For crypts and post-medieval burials, the recommendations set out by the ClfA (Cox 2001) and by the Association of Diocesan and Cathedral Archaeologists and APABE (2010) are also relevant.
- E.1.4 In accordance with recommendations set out in the Historic England and Church of England (2005) and updated by the Advisory Panel on the Archaeology of Burials in England (2017), skeletons will not be excavated beyond the limits of the trench, unless they are deemed osteologically or archaeologically important.
- E.1.5 Where any soft tissue survives and/or materials (for example, inner coffins, mattresses and other paddings) soaked in body liquor, no excavation or handling of the remains will take place until an appropriate risk assessment has been undertaken. Relevant protocols (i.e. Cox 2001) for their excavation, recording and removal will be adhered to.
- E.1.6 OA does not excavate or remove modern burials (those less than 100 years old) and does not remove or open sealed lead coffins. Appropriate PPE (e.g. chemical suit, latex gloves) will be worn by all staff when working with lead coffins.
- E.1.7 Graves and their contents will be hand excavated in plan. Each component (for example, skeleton, grave cut, coffin (or remains of), grave fill) will be assigned a unique context number from a running sequence. A group number will also be assigned to all of these, and small finds numbers to features such as coffin nails, hobnails and other grave goods (as appropriate).
- E.1.8 Soil samples will be normally taken during the excavation of inhumations, usually from the region of the skull, chest, right hand, left hand, abdomen and pelvis, right foot and left foot. Infants (circa. less than 5 years) will normally be recovered as bulk samples. Soil samples will also be taken from graves that appear to contain no human bone.
- E.1.9 Burials (including the skeleton, cremation, coffin fittings, coffin, urn, grave goods / other) will be recorded by photographic and written record using specialised pro forma context sheets, although these records may only include schematic representations of the location and position of the skeletons, depending on the nature and circumstances of the burial.

- E.1.10 Where digital imaging is used it will be done in accordance with the British Association of Biological Anthropology and Osteoarchaeology Recommendations on the Ethical Issues Surrounding 2D and 3D Digital Images of Human Remains (2019).
- E.1.11 Where necessary, hand drawn plans (usually at 1:10, sometimes 1:5) will be made, especially of contexts where required details cannot be adequately seen using photography (for example, urned cremations; undisturbed hob nails).
- E.1.12 Levels will be taken. For inhumations this will be on the skull, pelvis and feet as a minimum.
- E.1.13 Human remains that are exhumed will be bagged and labelled according to skeletal region and carefully packed into suitable containers (for example, acid free cardboard boxes) and transported to a suitable storage location. Any associated coffins and coffin fittings will be contained with the human remains wherever possible.
- E.1.14 Urned cremations will not usually be half sectioned, but excavated in spits and/or quadrants (i.e. large deposits or spreads), or recovered as a bulk sample.
- E.1.15 Wherever possible, urned cremations will be carefully bandaged, recovered whole and will be excavated in spits in the laboratory, as per the recommendations of McKinley (2004, 2017).
- E.1.16 Unless deemed osteologically or archaeologically important disarticulated bone / chanel will be collected and reserved for re-burial if immediate re-internment as close to its original position is not practicable. In some instances, a rapid scan of this material may be undertaken by a qualified osteologist, if deemed relevant.
- E.1.17 If undisturbed, pyre sites will normally be excavated in quadrants, at the very least in 0.5 m blocks of 0.5 m spits.
- E.1.18 Pyre debris dumps will be half sectioned or quadrant and will be subject to 100% sampling.
- E.1.19 Wooden and lead coffins and any associated fittings, including fixing nails will be recorded on a pro forma coffin recording sheet. All surviving coffin fittings will be recorded by reference to Reeve and Adams (1993) and the unpublished master catalogue that is being compiled by OA. Where individual types cannot be paralleled, they will be drawn and/ or photographed and assigned a style number. Biographical details obtained from legible departum plate inscriptions will be recorded and further documentary research will be made.
- E.1.20 Funerary structures, such as brick shaft graves and/or vaults will be recorded by photogrammetry or hand-drawn at a scale of 1:10 or 1:20, as appropriate. Location, dimensions and method of construction will be noted, and the structure added to the overall trench plan.
- E.1.21 Memorials, including headstones, revealed within the areas of development will be recorded irrespective of whether they are believed to be in situ.
- E.1.22 Where required, memorials will be accorded an individual context number and will also be included as part of the grave group, if the association with a burial is clear.

E.1.23 Memorials will be recorded on pro-forma context sheets, based on and following the guidelines set out by Mytum (2002), and will include details of:

- Shape
- Dimensions
- Type of stone used
- Condition, completeness and fragmentation of stones, no longer in original positions
- Iconography (an illustration may best describe these features)
- Inscription (verbatim record of inscription; font of the lettering)
- Stylistic type

## E.2 Relevant industry standards and guidelines

- E.2.1 Advisory Panel on the Archaeology of Burials in England, 2013 Science and the Dead. A guideline for the destructive sampling of archaeological human remains for scientific analysis. English Heritage Publishing.
- E.2.2 Advisory Panel on the Archaeology of Burials in England, 2017 Guidance for Best Practice for the Treatment of Human Remains Excavated from Christian Burial Grounds in England
- E.2.3 Advisory Panel on the Archaeology of Burials in England, 2015 Large Burial Grounds. Guidance on sampling in archaeological fieldwork projects
- E.2.4 Association of Diocesan and Cathedral Archaeologists and APABE, 2010 Archaeology and Burial Vaults. A guidance note for churches. Guidance Note 2
- E.2.5 British Association of Biological Anthropology and Osteoarchaeology. 2019a Code of Practice (<http://www.babao.org.uk/index/ethics-and-standards>)
- E.2.6 British Association of Biological Anthropology and Osteoarchaeology. 2019b Code of Ethics (<http://www.babao.org.uk/index/ethics-and-standards>)
- E.2.7 British Association of Biological Anthropology and Osteoarchaeology, 2019c Recommendations on the Ethical Issues Surrounding 2D and 3D Digital Images of Human Remains (<http://www.babao.org.uk/index/ethics-and-standards>)
- E.2.8 Cox, M, 2001 Crypt archaeology. An approach. ClfA Paper No. 3
- E.2.9 English Heritage, 2002 Human Bones from Archaeological Sites. Guidelines for producing assessment documents and analytical reports
- E.2.10 Historic England, 2018 The Role of the Human Osteologist in an Archaeological Fieldwork Project. Swindon, Historic England
- E.2.11 McKinley, J, and Roberts, C, 1993 Excavation and post-excavation treatment of cremated and inhumed human remains, ClfA Technical Paper No. 13
- E.2.12 McKinley, J, 2004 Compiling a skeletal inventory: cremated human bone. In Brickley, M, and McKinley, J (eds) Guidelines to the Standards for Recording Human Remains, ClfA Technical Paper No. 7. 9-13

- E.2.13 McKinley, J, 2017 Compiling a skeletal inventory: cremated human bone. In Mitchell P, and Brickley, M (eds) Updated Guidelines to the Standards for Recording Human Remains, ClfA 14-19
- E.2.14 Mitchell P, and Brickley, M (eds) Updated Guidelines to the Standards for Recording Human Remains, ClfA 2017
- E.2.15 Mytum, H, 2000 Recording and Analysing Graveyards. CBA Handbook No. 15
- E.2.16 Reeve, J, and Adams, M, 1993 The Spitalfields Project. Volume I – The Archaeology Across the Styx. CBA Research Report No. 85
- E.2.17 The Human Tissue Act 2004

### **E.3 Relevant OA manual and other supporting documentation**

- E.3.1 Loe, L, 2008 The Treatment of Human Remains in the Care of Oxford Archaeology. Oxford Archaeology internal policy document
- E.3.2 Oxford Archaeology 2018 *Fieldwork Manual Human Remains* unpublished

## APPENDIX F REPORTING

### F.1 Standard methodology - summary

F.1.1 For Watching Briefs and Evaluations, the style and format of the report will be determined by OA, but will include as a minimum the following:

- A location plan of trenches and/or other fieldwork in relation to the proposed development.
- Plans and sections of features located at an appropriate scale.
- A section drawing showing depth of deposits including present ground level with Ordnance Datum, vertical and horizontal scale.
- A summary statement of the results.
- A table summarising the features, classes and numbers of artefacts contained within, spot dating of significant finds and an interpretation.
- A reconsideration of the methodology used, and a confidence rating for the results.
- An interpretation of the archaeological findings both within the site and within their wider landscape/townscape setting.

F.1.2 For Excavations, a Post-Excavation Assessment and Project Design will generally be prepared, as prescribed by Historic England Management of Research Projects in the Historic Environment (MoRPHE) 2015, Section 2.3. This will include a Project Description containing:

- A summary description and background of the project.
- A summary of the quantities and assessment of potential for analysis of the information recovered for each category of site, finds, dating and environmental data. Detailed assessment reports will be contained within appendices.
- An explicit statement of the scope of the project design and how the project relates to any other projects or work preceding, concurrent with or following on from it.
- A statement of the research aims of the fieldwork and an illustrated summary of results to date indicating to what extent the aims were fulfilled.
- A list of the project aims as revised in the light of the results of fieldwork and the current post-excavation assessment process.

F.1.3 A section on Resources and Programming will also be produced, containing:

- A list of the personnel involved indicating their qualifications for the tasks undertaken, along with an explanation of how the project team will communicate, both internally and externally.
- A list of the methods which will be used to achieve the revised research aims.

- A list of all the tasks involved in using the stated methods to achieve the aims and produce a report and research archive in the stated format, indicating the personnel and time in days involved in each task. Allowance should be made for general project-related tasks such as monitoring, management and project meetings, editorial and revision time.
- A cascade or Gantt chart indicating tasks in the sequence and relationships required to complete the project. Due allowance will be made for leave and public holidays. Time will also be allowed for the report to be read by a named academic referee as agreed with the County Archaeological Officer, and by the County Archaeological Officer.
- A report synopsis indicating publisher and report format, broken down into chapters, section headings and subheadings, with approximate word lengths and numbers and titles of illustrations per chapter. The structure of the report synopsis should explicitly reflect the research aims of the project.

F.1.4 The Project Design will be submitted to the County Archaeological Officer or equivalent for agreement.

F.1.5 Under certain circumstances (e.g. with very small mitigations), and as agreed with the County Archaeological Officer or equivalent, a formal Assessment and Project Design may not be required and either the project will continue straight to full analysis, or a simple Project Proposal (MoRPHE 2015 Section 2.1) will be produced prior to full analysis. This proposal may include:

- A summary of the background to the project
- Research aims and objectives
- Methods statement outlining how the aims and objectives will be achieved
- An outline of the stages, products and tasks
- Proposed project team
- Estimated overall timetable and budget if appropriate.

F.1.6 Once the post-excavation Project Design or Project Proposal has been accepted, the County Archaeological Officer or their appointed deputy will monitor the progress of the post-excavation project at agreed points. Any significant variation in the project design will be agreed with the County Archaeological Officer.

F.1.7 The results of the project will be published in an appropriate archaeological journal or monograph. The appropriate level of publication will be dependent on the significance of the fieldwork results and will be agreed with the County Archaeological Officer. An OASIS (Online Access to the Index of Archaeological Investigations) form will be completed for each project as per Historic England guidelines.

## F.2 Relevant industry standards and guidelines

F.2.1 Oxford Archaeology (OA) adheres to the national standards in post-excavation procedure as outlined in Historic England's Management of Research Projects in the Historic Environment (MoRPHE; HE 2015). Furthermore, all post-excavation projects

take into account the appropriate regional research frameworks as well as national research agendas such as the Framework for Historic Environment Activities & Programmes in Historic England (SHAPE; EH 2008).



## APPENDIX G LIST OF SPECIALISTS REGULARLY USED BY OA

G.1.1 Below are two tables, one containing 'in-house' OA specialists, and the other containing a list of external specialists who are regularly used by OA.

### Internal archaeological specialists used by OA

Specialist	Specialism	Qualifications
John Cotter	Medieval and Post Medieval pottery, Clay Pipe and CBM	BA (Hons), MCIfA
Dr Alex Davies	Prehistoric Pottery	BA (Hons), MA, PhD, ACIfA
Edward Biddulph	Roman Pottery	BA (Hons), MA, MCIfA
Kate Brady	Roman Pottery	BA, ACIfA
Cynthia Poole	CBM and Fired Clay	BA (Hons), MSc
Leigh Allen	Metalwork and worked bone	BA (Hons), PGDip
Anni Byard	Metalwork, coins and glass	MSx, MCIfA
Dr Ruth Shaffrey	Worked stone artefacts	BA, PhD, MCIfA
Dr Rebecca Nicholson	Fish and Bird Bone	BA (Hons), MA, D.Phil, MCIfA, FSA Scot
Dr Mairead Rutherford	Pollen	BSc, MSc
Ian Smith	Animal Bone	BA (Hons), MSc, PCIfA
Dr Martyn Allen	Animal Bone	BA (Hons), MA, PhD
Adrienne Powell	Animal Bone	BA (Hons), MA
Dr Denise Druce	Charred plant remains, charcoal and pollen	BA (Hons), PhD, MCIfA
Sharon Cook	Charred plant remains	BSc, MSc, ACIfA
Elizabeth Stafford	Geoarchaeology and land snails	BA (Hons), MSc
Carl Champness	Geoarchaeology	BA (Hons), MSc, ACIfA
Nicola Scott	Archaeological archive deposition	BA (Hons Dunelm)
Mike Donnelly	Flint	BSc, MCIfA
Dr Louise Loe	Human Bone	BA PhD, MCIfA, BABAO
Helen Webb	Human Bone	BSc, MSc, MCIfA, BABAO
Mark Gibson	Human Bone	BA, MSc, ACIfA, BABAO
Dr Lauren McIntyre	Human Bone	BSc, MSc, PhD, MCIfA, BABAO
Zoe Ui Choileain	Human Bone	Pg Dip, MA, Msc, BABAO
Natasha Dodwell	Human Bone	BA, MSc, BABAO

External archaeological specialists regularly used by OA

<b>Specialist</b>	<b>Specialism</b>	<b>Qualifications</b>
Lynne Keys	Slag	BA (Hons)
Quita Mould	Leather	BA, MA
Penelope Walton Rogers, The Anglo Saxon Laboratory	Identification of Medieval Textiles	FSA, Dip.Acc
Dana Goodburn-Brown	Conservation	BSc (Hons), BA, MSc
Steve Allen, York Archaeological Trust	Conservation	BA, MA, MAAIS
Dr Richard Macphail	Soils, especially Micromorphology	BA (Hons), MSc, PhD
Dana Challinor	Charcoal	MA, MSc
Dr Nigel Cameron	Diatoms	BSc, MSc, PhD
Dr David Smith	Insects	BA (Hons), MA, PhD
Professor Adrian Parker	Phytoliths and pollen	BSc (Hons), D.Phil
Dr David Starley	Metalworking Slag	BSc (Hons), PhD
Wendy Carruthers	Charred and waterlogged plant remains	BA (Hons)
Dr John Whittaker	Ostracods and Foraminifera	BA (Hons), PhD
Dr John Crowther	Soil Chemistry	MA, PhD
Dr Martin Bates	Geoarchaeology	BSc, PhD
Dr Dan Miles	Dendrochronology	D.Phil, FSA
Dr Jean-Luc Schwenninger	Optically Stimulated Luminescence Dating	PhD
Dr David Higgins	Clay Pipe	BA, PhD, MCIfA
Dr Hugo Anderson- Wymark	Flint	BSc, PhD, FSA Scot, MCIfA
Dr Damian Goodburn- Brown	Ancient Woodwork	BA, PhD
Dr David Dungworth	Archaeometallurgy and Glassworking	BA (Hons), PhD

## APPENDIX H DOCUMENTARY ARCHIVING

### Standard methodology – summary

- H.1.1 The documentary archive constitutes all the written, drawn, photographic and digital records relating to the set-up, fieldwork and post-excavation phases of the project. This documentary archive, together with the artefactual and environmental ecofact archive collectively forms the record of the site. The report is part of the documentary archive, and the archive must provide the evidence that supports the conclusions of the report, but the archive may also include data which exceeds the limitations of research parameters set down for the report and which could be of significant value to future researchers.
- H.1.2 At the outset of the project OA Archive manager will contact the relevant local receiving museum or archive repository to notify them of the imminent start of a new fieldwork project in their collecting area. Relevant local archiving guidelines will be observed and site codes, which integrate with the receiving repository, will be agreed for labelling of archives and finds.
- H.1.3 Where there is currently no receiving museum for the project archive, although responsibility for the archive ultimately lies with the client, OA will hold the archive on their behalf for a period of up to 3 years after completion of the report, after which time (in the event that a suitable depository has not been secured) provision for further storage of the archive will be made in agreement with Oxford Archaeology, the client and the relevant planning archaeologist.
- H.1.4 During the course of the project the Archive team will assist the Project Manager in the management of the archive including the cataloguing and development technique suitable for photographic archive requirements.
- H.1.5 The hard copy site archive will be security copied by scanning to PdFA and a copy of this will be housed on the OA Archive Server. A full digital copy of the archive, including scanned hard copy and born digital data, will be deposited with and made publicly available on-line through the ADS. A further copy will be maintained on the OA server and if requested a copy on disk will also be sent to the receiving museum with the hard copy. This will act as a safeguard against the accidental loss and the long-term degeneration of paper records and photographs.
- H.1.6 Born digital data will only be printed to hard copy for the receiving museum where practical. Archive elements that need maintaining in digital form will be sent to ADS in accordance with Arches Standard and ADS guidelines. A copy will be sent to the receiving museum by CD and back-up copies will be stored on the OA digital network. In most cases a digital copy of the report will be included in the OASIS project library hosted by ADS.
- H.1.7 Prior to deposition the Archive team will contact the museum regarding the size and content of the archive and discuss any retention and dispersal policies which may be applicable in line with local and SMA Guidelines ' Selection, Retention & Dispersal of Archaeological Collections' 1993.

- H.1.8 The site archive will then be deposited with the relevant receiving museum or repository at the earliest opportunity unless further archaeological work on the site is expected. The documentary archive will include correspondence detailing landowner consent to deposit the artefacts and any copyright licences in accordance with the receiving museum guidelines. Deposition charges will be required from the client as part of the project costs, but the level of the fee is set by the receiving body and may be subject to change during the lifespan of the project. Changes to archiving charges beyond OA's control will be passed across to the client.
- H.1.9 Oxford Archaeology will retain full copyright of any commissioned reports, tender documents, or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it will provide the receiving repository or museum for the archive with a full licence for use to the client in all matters directly relating to the project as described in the Written Scheme of Investigation, and in line with the relevant receiving body guidelines.
- H.1.10 OA will advise the receiving repository or museum for the archive of 3<sup>rd</sup> party materials supplied in the course of projects which are not OA's copyright.
- H.1.11 OA undertakes to respect all requirements for confidentiality about the client's proposals provided that these are clearly stated. It is expected that such conditions shall not unreasonably impede the satisfactory performance of the services required. Archaeological findings and conclusions can be kept confidential for a limited period but will be made publicly available in line with the above procedure either after a specified time period agreed with the client at the outset of the project, or where no such period is agreed, after a reasonable period of time. It is expected that clients respect OA's general ethical obligations not to suppress significant archaeological data for an unreasonable period.

## **H.2 Relevant industry standards and guidelines**

- H.2.1 At the end of the project the site archive will be ordered, catalogued, labelled and conserved and stored according to the following national guidelines:
- H.2.2 EAC, 2014 A Standard and Guide to Best Practice for Archaeological Archiving in Europe (EAC Guidelines 1)
- H.2.3 ClfA, 2014 (Updated 2020) Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives
- H.2.4 Brown, D, 2011 Archaeological Archives A Guide to Best Practice in Creation, Compilation, Transfer and Curation. AAF
- H.2.5 UKIC, 1990 Guidelines for the preparation of excavation archives for long-term storage
- H.2.6 SMA, 2020 Standards and Guidance in the Care of Archaeological Collections
- H.2.7 Local museum guidelines such as Museum of London Guidelines: (<http://www.museumoflondonarchaeology.org.uk/English/ArchiveResearch/DeposR> esource) will be adopted where appropriate to the archive collecting area.
- H.2.8 The site archive will be prepared to at least the minimum acceptable standard defined in Management of Archaeological Projects 2, Historic England 1991.

## **H.3 Relevant OA manual and other supporting documentation**

### **H.3.1 The OA Archives Policy.**

## **APPENDIX I                    HEALTH AND SAFETY**

### **I.1        Standard Methodology - summary**

- I.1.1 All work will be undertaken in accordance with the current OA Health and Safety Policy, the OA Site Safety Procedures Manual, a site-specific Risk Assessment and, if required, Safety Plan or Method Statement. Copies of the site-specific documents will be submitted to the client or their representative for approvals prior to mobilisation, and all relevant H and S documentation will be available on site at all times. The Health and Safety documentation will be read in conjunction with the project WSI.
- I.1.2 Where a project falls under the Construction (Design and Management) Regulations (2015), all work will be carried out in accordance with the Principal Contractor's Construction Phase Plan (CPP).

### **I.2        Relevant industry standards and guidelines**

- I.2.1 All work will be carried out according to the requirements of all relevant legislation and guidance, including, but not exclusively:
  - I.2.2 The Health and Safety at Work Act (1974).
  - I.2.3 Management of Health and Safety at Work Regulations (1999).
  - I.2.4 Manual Handling Operations Regulations 1992 (as amended).
  - I.2.5 The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013).
  - I.2.6 The Construction (Design and Management) Regulations (2015).
  - I.2.7 Relevant OA manual and other supporting documentation
  - I.2.8 The OA Health and Safety Policy.
  - I.2.9 The OA Site Safety Procedures Manual.
  - I.2.10 The OA Risk Assessment templates.
  - I.2.11 The OA Method Statement template.
  - I.2.12 The OA Construction Phase Plan template.

## APPENDIX J SITE SPECIFIC DIGITAL DATA MANAGEMENT PLAN

Administrative Data	
Project Site Code	*****
Museum Accession Code	*****
Project Name	Land South-East of Begbroke
Project Manager	Stuart Foreman
Author	Stuart Foreman
Date Plan Created	01/11/2022
Version (add revision number and date)	1
Related Documentation	<p><b>OA Fieldwork Recording Manual 2017</b></p> <p>OA Archive Checklist 2019</p> <p>Historic England and Dig Ventures 2019. <i>Work Digital/Think Archive. A guide to managing digital data generated from archaeological investigations.</i>  <a href="https://digventures-thepixelparlour.netdna-ssl.com/wp-content/uploads/2019/12/WDTA-Guide-FINAL.pdf">https://digventures-thepixelparlour.netdna-ssl.com/wp-content/uploads/2019/12/WDTA-Guide-FINAL.pdf</a></p> <p>Archaeology Data Service/Digital Antiquity. <i>Guides to good practice.</i>  <a href="http://guides.archaeologydataservice.ac.uk/g2gp/MainADS">http://guides.archaeologydataservice.ac.uk/g2gp/MainADS</a></p> <p>Archaeology Data Service. <i>Guidelines for Depositors</i>  <a href="http://archaeologydataservice.ac.uk/advice/guidelinesForDepositors">http://archaeologydataservice.ac.uk/advice/guidelinesForDepositors</a></p> <p>Historic England 2015. <i>Digital Image Capture and File Storage. Guideline for Best Practice.</i> <a href="https://historicengland.org.uk/images-books/publications/digital-image-capture-and-file-storage/heag059-digital-images/">https://historicengland.org.uk/images-books/publications/digital-image-capture-and-file-storage/heag059-digital-images/</a></p> <p>Oxford Archaeology (forthcoming). <i>Data Management Plan.</i></p> <p>CifA Standards and guidance for the creation, compilation, transfer and deposition of archaeological archives  <a href="https://www.archaeologists.net/sites/default/files/CIFAS%26GArchives_4.pdf">https://www.archaeologists.net/sites/default/files/CIFAS%26GArchives_4.pdf</a></p> <p>CifA Deposition Toolkit: <a href="https://www.archaeologists.net/selection-toolkit/toolkit-overview">https://www.archaeologists.net/selection-toolkit/toolkit-overview</a></p>
Data Collection/Creation	
Data to be collected/created	The digital archive is expected to comprise the following data types (formats):
	<ul style="list-style-type: none"> <li>• Final report (.pdfa)</li> <li>• Final analytical specialist reports (.doc, .docx)</li> <li>• Final analytical supporting data (.xls, .xlsx)</li> </ul>

	<ul style="list-style-type: none"> <li>• Selected digital photographic images (.jpeg)</li> <li>• Digital x-rays (.jpeg)</li> <li>• Selected finds illustrations for publication and archive record (.pdfa, .ai)</li> <li>• Site survey GIS data (.shp)</li> <li>• postgresQL database exported as .csv or .xlsx files including context data and interpretive data produced during analysis.</li> </ul>
Data collection/creation method	<p>The data to be collected and created comprises data specific to the excavation project defined above. It does not include related information from the same development, such as evaluations and site works undertaken by other contractors, except where the findings are fully integrated into this analysis.</p> <p>Site survey data is captured using Leica survey equipment and imported into ArcGIS via FTP transfer. Final versions of site plans will be produced in ArcGIS, AutoCAD and/or Adobe Illustrator.</p> <p>Section drawings are created by hand on drafting film and paper context records are created by hand on standard OA pro forma recording forms. Selected data will be transferred to digital format in line with OA archive preparation guidance. Digital photographic images are taken in accordance with OA digital data guidance in Photographic Recording Manual</p> <p>Analytical data is created during post-excavation using a project-specific MS Access database. Site stratigraphic matrices are created using MSEXcel. Individual contributing specialists create MSEXcel, MSWord and/or MSAccess datasheets which may stand alone from the site database. Analytical data may also include GIS files, charts and figures in MSEXcel and hand-drawn visuals.</p>
<b>Data exclusion</b>	
	The following types of data will be excluded from the archive:
	<ul style="list-style-type: none"> <li>• Draft and working reports and documents</li> <li>• Draft and working datasheets</li> <li>• Draft and working survey and GIS data</li> <li>• Administrative and financial data</li> <li>• Digital images that are not part of the primary site record (working pictures, outreach/publicity images, videos)</li> <li>• Repetitive, uninformative and sub-standard images</li> <li>• Images and information not generated by the project/ reproduced from other sources</li> </ul>
<b>Documentation and Metadata</b>	
Documentation	OA internal and regionally or nationally recognised code lists will form part of the data set or accompanying documentation where relevant.
Metadata	Metadata will be created to the standard set out by the Archaeology Data Service (ADS). Specific codes and specialist keys will be supplied through named supporting documents.



Ethics and Legal Compliance	
Data Security	Personal data (including digital images) collected, will be with the consent of any individuals involved and will be stored on OA’s secure servers in line with OA’s GDPR procedures.
Intellectual Property Rights	<p>Third Party data, such as Ordnance Survey mapping, is reproduced under licence.</p> <p>Other third party data may be reproduced under appropriate licences/agreements as arising during analysis.</p> <p>Data produced by sub-contractors will be granted under licence to OA to allow inclusion in the final report, the digital archive and other outreach/publicity/academic dissemination as may be required (in accordance with individual sub-contracts).</p>
Data Storage	
Storage and Backup	<p>Data will be stored on OA file servers, including our own hosted NextCloud server</p> <p>All OA file servers are kept up to date and patched systematically</p> <p>Standard project data is backed up once per day to disk, and replicated each night to another OA site</p> <p>Data identified as more critical is backed up more frequently, and is also replicated once per night to another site.</p> <p>Data management is the responsibility of the Project Manager, with advice from IT where necessary</p>
Access and Security	<p>Data is accessible to OA employees via the secure OA. Sensitive and confidential data is stored in restricted access folder locations. Personal data will be stored in line with OA’s GDPR procedures.</p> <p>Copies of data, or access to a separate shared server, is provided to external project members. Secure server access via OA secured server infrastructure is provided only employees of those respective companies.</p>
Selection and Preservation	
Data to be Preserved	All project data other than duplicated files will be stored by OA while the project is ongoing. Upon project completion selected data will be transferred to the relevant repositories detailed below.
Data Preservation Plan	The paper and material archive will be transferred to the Cambridgeshire County Council Stores in line with their guidance and standards and following the implementation of the project’s agreed finds retention policy.

	The digital archive will be deposited with the ADS following OA standard quality control procedures.
<b>Data Sharing</b>	
Archive and publication	<p>The digital data from this project will be accessible to the public via the ADS.</p> <p>The finds and other data cared for by Cambridgeshire County Council Stores will be publicly accessible in accordance with their policies and practices.</p> <p>As a minimum, a summary report on the project will be prepared for the <i>Proceedings of the Cambridge Antiquarian Society Journal</i>.</p> <p>OA and/or the client and Museum may wish to use the results of the project on website outreach, exhibitions, presentations and other published articles (subject to data sharing restrictions).</p>
Data Sharing Restrictions	There are no known restrictions on the use of the data after project completion. Any references to OA intellectual property must be credited.
<b>Responsibilities and Resources</b>	
Responsibility for Data Management	The OA IT Manager, Archives & Finds Manager and Project Managers are responsible for ensuring the Data Management Plan is implemented and reviewed. OA will have no ongoing responsibilities for data management once the data has been deposited with the relevant repositories.
Resources	The resources required to deliver this plan form part of the resources committed to the project.

## **APPENDIX K      OCAS BRIEF**

X:\BEGBRKGE\_Begbroke\_Oxfordshire\_University\_Developments\Geomatics\02\_GIS Projects\Figures\2023-03-23\_WSI\_phase2\BEGBRKGE\_2023-03-23\_WSI\_Figure\_1.mxd\*caroline.souday\*06/03/2023

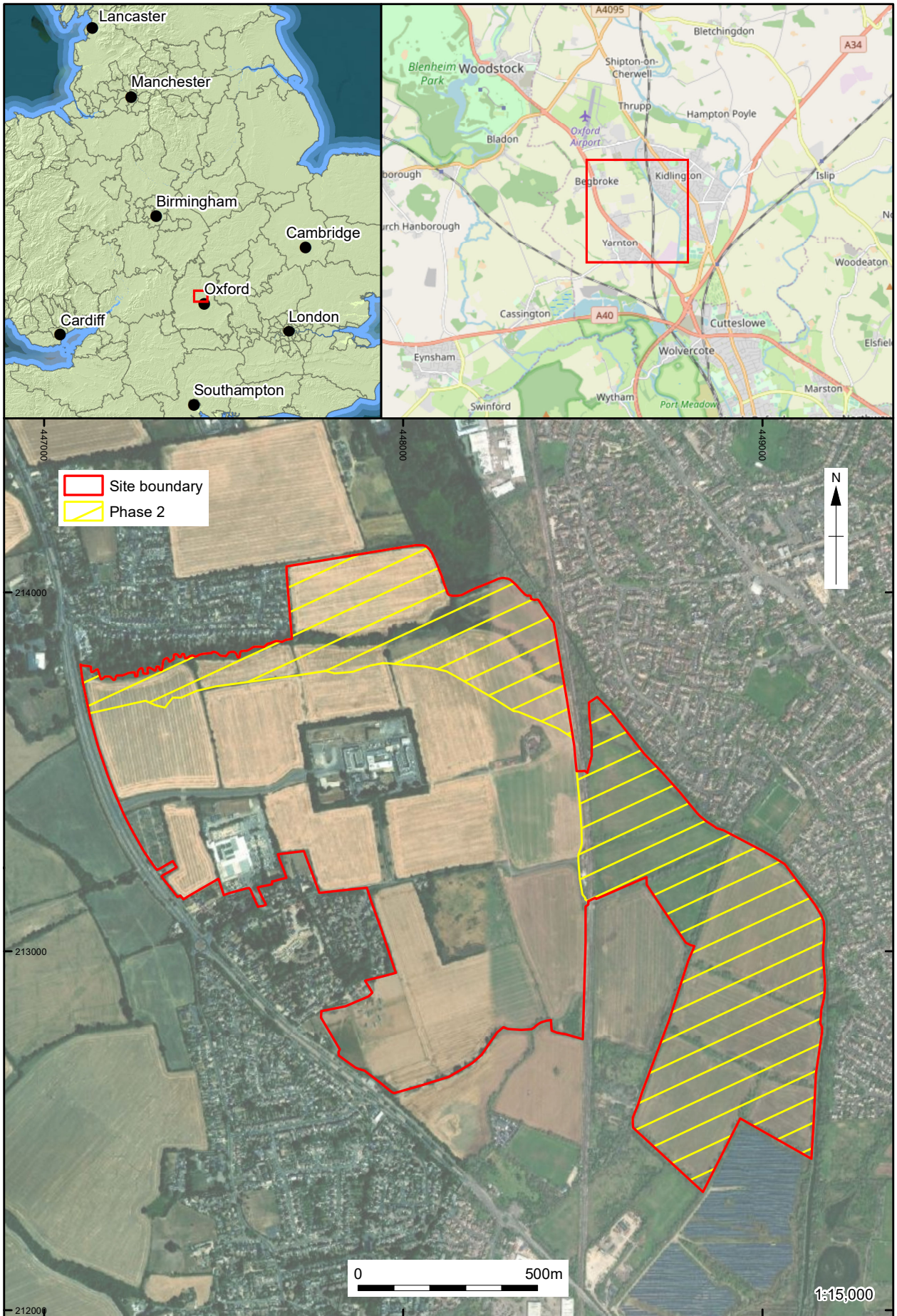


Figure 1: Site location plan

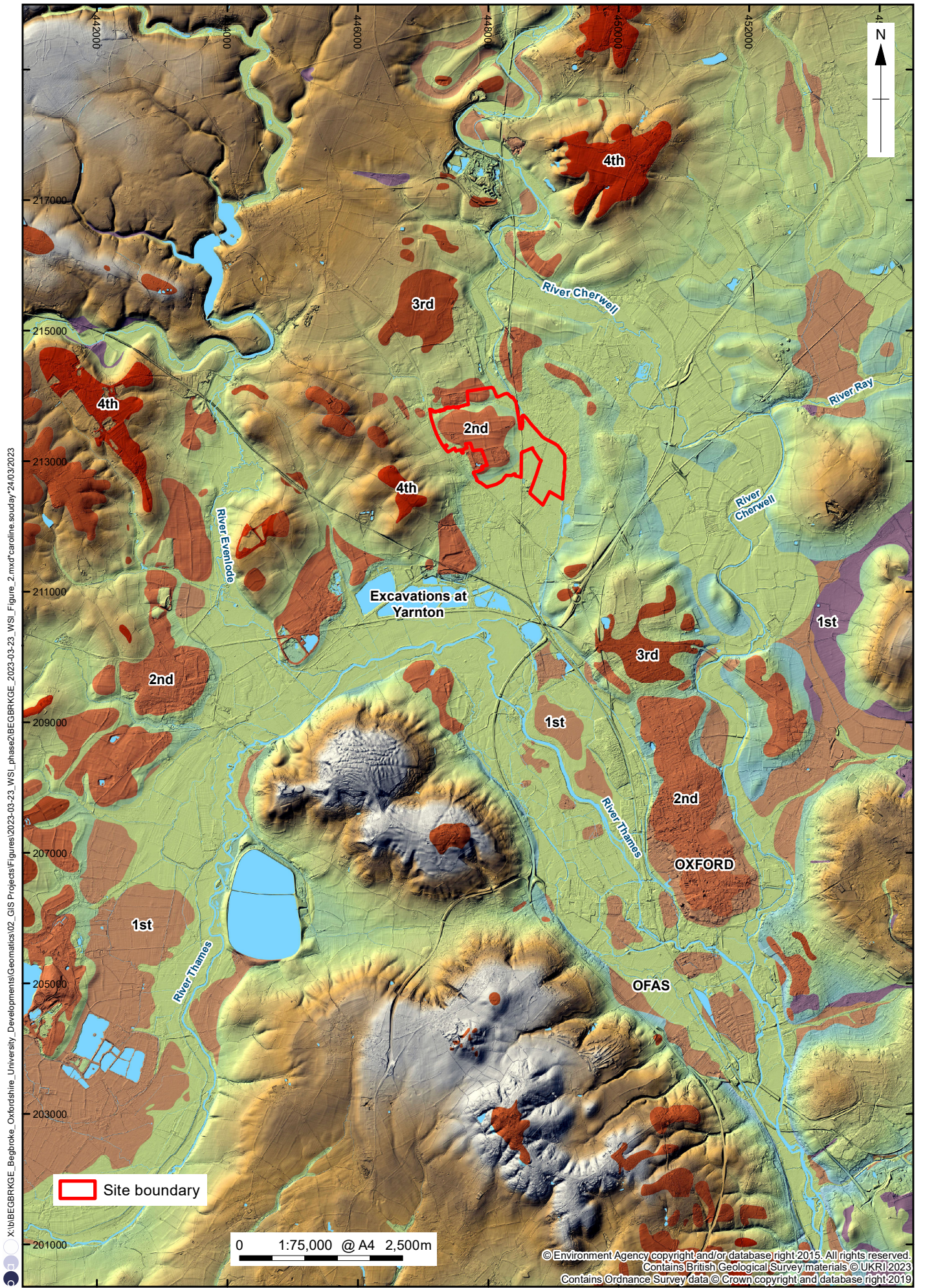


Figure 2: Begbroke wider landscape: LiDAR DTM, overlain with BGS superficial geology (illustrating the extent of mapped 1st Northmoor (upper floodplain), 2nd Summertown-Radley, 3rd Wolvercote and 4th Hanborough Pleistocene River Terraces