YORK ARCHAEOLOGICAL TRUST

ARCHAEOLOGICAL INVESTIGATIONS AT BARNSDALE BAR QUARRY, KIRK SMEATON, NORTH YORKSHIRE

By Ben Savine

EVALUATION REPORT

Report Number 2015/47 September 2015

YORK ARCHAEOLOGICAL TRUST

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Abbreviations

AOD **Above Ordnance Datum**

YAT **York Archaeological Trust**

MLSWY **Magnesian Limestone in South and West Yorkshire Archaeological Assessment Project**

NON-TECHNICAL SUMMARY

An archaeological evaluation was undertaken in advance of a proposed extension to Barnsdale Bar Quarry (SE 5122 1496), Kirk Smeaton, North Yorkshire (Figure 1). The site lies close to the west of Crab Tree lane. The nearest post code is that of the Quarry, WF8 3JX.

Work commenced on the 8th of September 2015 and was completed on the 14th of September 2015. Nine trenches were opened with a mechanical excavator, seven measured 50m by 2m and two 25m by 2m (Figure 2). Four of the trenches contained no features of archaeological interest. The remaining trenches contained ditches that formed parts of a field boundary, an enclosure and a track-way. Most of these features were undated, but the limited artefactual evidence suggests a probable prehistoric date.

KEY PROJECT INFORMATION

Project Name	Barnsdale Bar Quarry Extension Evaluation
YAT Project No.	5871
Report status	Draft for comment
Type of Project	Evaluation
Client	FCC Environment
Planning Application No.	NY/2014/0234/SCO
NGR	SE 5122 1496
OASIS Identifier	yorkarch1 - 224557

REPORT INFORMATION

Version	Produced by		Edited by		Approved by	
	Initials	Date	Initials	Date	Initials	Date
1	BS	17/9/15	IDM	23/9/15	DA	23/09/15

1 INTRODUCTION

In advance of a proposed extension to Barnsdale Bar Quarry (SE 5122 1496) in a field situated to the north of the existing quarry workings (Figure 1) an archaeological evaluation, consisting of geophysical survey and trail trenching, was undertaken by York Archaeological Trust for FCC Environment. A desk based assessment produced by YAT in 2014 highlighted extensive prehistoric remains and some limited evidence for Romano-British activity within the site's immediate surroundings (Evans et al. 2014).

The geophysical survey element of the work was undertaken by Trent and Peak Archaeology, part of York Archaeological Trust, in November 2014. The survey identified a number of features possessing either probable or possible archaeological significance. Their report informed the location of nine evaluation trenches, targeting anomalies identified as having archaeological potential (Figure 3).

The evaluation trenches confirmed a number of ditches relating to field/boundaries, an enclosure and a probable track-way indicated by the results of the geophysical survey. Although undated these features are consistent with prehistoric and Romano-British features highlighted in the DBA.

2 METHODOLOGY

The aim of the work was to assess the level of survival of any archaeological remains, and determine their date and character leading to an assessment of their significance. This will enable the local authority to decide any requirements for further archaeological work at the site.

The evaluation involved the excavation of nine trenches, consisting of seven 50m by 2m, and two 25m by 2m, providing a total evaluation area of 800m^2. The trenches were located to investigate linear features probably representing ditches or other cut features (Johnson 2014), including two closely set parallel ditches that may represent a drove-way, and smaller rectilinear and curvilinear features possibly relating to domestic activity.

Trench 2 was positioned approximately 10m north-west of its intended location along its planned orientation. This variation was likely due either to an error when transcribing the stakeout coordinates prior to survey in the field or the gps signal connection not being properly established, or dropping out during the course of survey. Trench 7 was move 2m to the east of its proposed location to avoid the possibility of disturbing an adjacent borehole position.

The evaluation was conducted as per the agreed Written Scheme of Investigation (Appendix 3). A 14tn mechanical excavator, equipped with a 2m wide toothless grading bucket, was used to remove the plough soil and colluvial deposits in successive spits until archaeological deposits or natural was encountered. The excavated depth of the trenches ranged from 0.32m to 0.7m. This phase of the works was undertaken under the supervision of a competent archaeologist.

Where potential archaeological features were identified these were hand cleaned. In the case of discrete features these were half sectioned, linear features were sampled with 1m wide sections excavated to a minimum of 25% of their length.

The trenches were recorded in accordance with the methodology laid out in the York Archaeological Trust Fieldwork Recording Manual (2009). All archaeological features, soils and natural deposits were assigned a unique context number and recorded on a proforma context card, in addition the stratigraphy of each trench was recorded even where no archaeological features were identified.

Survey and trench layout was carried out using a Leica Viva GNSS-GS14 GPS unit (accurate to 10 mm). In addition each trench, including those with no archaeological features present, was planned at a scale of 1:50 and a 1m sample section was drawn at a scale of 1:10. Archaeological features also had sections drawn at a scale of 1:10, and where appropriate were planned at 1:20. All of these had AOD heights established using the Leica Viva GNSS-GS10 GPS unit, those points taken at sections were then transferred to the relevant drawing.

All site photography adhered to accepted photographic record guidelines. These comprised of a combination of black and white and colour slide 35mm film utilising an appropriate scale, supplementary digital photographs were also taken. Each trench, example section, archaeological feature and a selection of natural features were photographically recorded in this way.

The site records are currently stored with York Archaeological Trust under the project number 5871.

3 LOCATION, GEOLOGY & TOPOGRAPHY

The site is situated at NGR SE 5122 1496, some 1.77km south-south-west of Kirk Smeaton, North Yorkshire and 1.22km north-north-east of the Barnsdale Bar Interchange on the A1 in South Yorkshire (Figure 1). The site consists of the south part of one field which slopes down from south to north and lies at *c*. 38 – 47m AOD. The site is a sub-rectangular area measuring *c*. 230m east-west and *c*. 210m north-south, and covers an area of approximately 3.5 hectares. The site is bounded to the east and south by parts of the existing quarry and to the north and west by arable fields.

The underlying geology of the site consists of Cadeby Formation-Dolostone. This is a sedimentary bedrock formed approximately 251–271 million years ago in the Permian period. No superficial deposits are recorded (British Geological Survey).

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The presence of a number of archaeological sites within a 1 km radius of the site was identified by a DBA undertaken by YAT. Given the results of the DBA the potential for archaeological remains within the study area was recognised (Evans et al. 2014).

Summarised below is the historical information established for the site by the DBA produced by Evans et al, 2014.

4.1 Prehistory (To AD 43)

Visible on an aerial photograph of land to the west of the southern part of the quarry are at least seventeen ring ditches. Although these are undated, their shape and clustering would most strongly suggest that they are a Bronze-Age Round Barrow cemetery. They lie in an area with the quarry to the east and the A1 to the west.

An evaluation excavation to the south-west of the site identified two enclosures several pits and evidence for internal sub-division thought to have been of late prehistoric or Romano-British date.

4.2 Romano-British (AD 43 – 410)

Following approximately the line of the A1 is the Roman Road now known as Ermine Street. Another Roman road, the Roman Ridge or Watling Street, lies just beyond the south-west limit of the study area. There is also evidence for a Romano-British field system to the south-east of the site.

4.3 Early Medieval (AD 410 – 1066)

The place name evidence for Kirk Smeaton and the early date of its church may indicate that settlement and associated activity of this date could be located a short distance north of the site.

4.4 Medieval (1066 – 1540)

No evidence for this period was established by the DBA.

4.5 Post-Medieval and Modern (1540 – Present)

The HER monuments search did not find any evidence for this period from the study area. However, the quarry and much of the surrounding landscape belong or are likely to belong to this period.

4.6 Undated/Other

Cropmarks to the immediate north of Crab Tree Lane indicate an enclosure of uncertain but probably later prehistoric or Romano-British date. Archaeological work to the near south-west, adjacent to the Windhill Plantation has revealed a crouched inhumation, a ditch and two gullies, believed to be prehistoric. A geophysical survey on land immediately south of the proposed development area in 1989-90 produced evidence for a ditch, field system, wall, crouched inhumation and sub-circular enclosure of uncertain but possibly prehistoric date. Cropmarks seen on an aerial photograph of the area to the north of the Windhill Plantation show an irregular five sided enclosure and two pairs of possible pits all undated and, close by, aerial photographs indicate a small complex of ditches, again undated. The above aerial photographs also show, as cropmarks, a ditch and track-way of uncertain date. Also visible on these is another ditch and track-way, date unknown.

A possible track-way is known from an aerial photograph of land, now lost to the quarry, to the east of Long Lane, as is an enclosure close by. Another enclosure with a possible central pit is recorded from this location. An aerial photograph of land to the immediate west of the present site shows two small irregular enclosures and traces of ditches, probably part of an undated field system. Close to the junction of Crab Tree Lane and Long Lane an aerial photograph depicts a double-ditched track-way and a short distance to the west this aerial photograph indicates a small enclosure attached to the northern ditch of the double ditched

track-way. It is possible that another enclosure may be attached to the southern ditch of the track-way. An undated enclosure with associated ditches is known from an aerial photograph of land between Long Close Plantation and Broomfield Plantation north of the line of the Hull and Barnsley Railway. Immediately to the north-west, visible on aerial photographs is a faintly visible enclosure with a gap on the southeast side and close to the northern end of Long Close Plantation cropmarks indicates enclosures, track-ways and elements of field systems.

One cropmark feature with the potential to extend into the site is recorded by the 2006 Magnesian Limestone in South and West Yorkshire Archaeological Assessment Project (MLSWY). This feature is situated to the north of Crab Tree Lane and appears to be a trackway. The track runs west before veering south-west towards the proposed development area. While the known extent of the feature does not run to the south of the lane, it is possible that previously unrecorded sub-surface archaeological deposits extend beyond the lane and into the site. The MLSWY data also records two sides of a possible enclosure in an area to the east of the sewage works and the north of Crab Tree Lane.

It is clear that the site lies within an area of significant prehistoric activity that continued, albeit less intensively, into later periods.

5 RESULTS

In total five of the nine trenches excavated contained archaeological features. With the exception of a possible track-way surface all of these features were field, boundary or enclosure ditches or ditches associated with the track-way. All of the features appear characteristic of an agricultural landscape dating to the prehistoric through to the medieval periods.

Attributing an accurate date to the features was not possible due to the paucity of dateable material recovered during the course of excavation. Only a single sherd of post-medieval pottery was recovered, this coming from the topsoil in Trench 3.

5.1 Natural

The earliest deposit seen was limestone bed rock which ranged in colour from white, to cream, to pale yellow (Contexts 1002, 2002, 3002, 4002, 5002, 6002, 7002, 8002 and 9002, (Plate 1). In all of the trenches the top of the bed rock was decayed, being either soft or fractured. Extensive bands of firm light to mid orange brown clayey sand ran through the limestone in all trenches. Patches of pink clay, although somewhat less frequent in extent and abundance, were found in the majority of the trenches. The variations in the natural deposits were noted on the 1:50 scale trench plans. Plans and sections of the trenches containing archaeological features are provided in this report (Figures 4 and 5), but the remaining trenches are not illustrated as they were archaeologically sterile. Plan and section drawings of those trenches were no archaeology was encountered do however form part of the site archive.

A number of features investigated were determined to be of natural origin. These included shallow hollows in Trench 2 (Plates 2 and 3) and an extensive area of root runs in Trench 3 (Plate 4 and 5). The material backfilling these natural features was a clean mid orange brown

clayey sand very much like the overlying colluvial deposits seen in many of the trenches (see 5.5).

5.2 Prehistoric enclosure ditch

A broadly rectilinear feature measuring approximately 25m x 20m on a NNE to SSW axis was identified by the geophysical survey. The northern extent of this feature was picked up in Trench 4, where a ditch (Context 4004, Figure 5 Plate6) with a 'v' shaped profile was investigated; three fragments of heat fractured cobble were recovered from its backfill. These artefacts indicate that a prehistoric date can be reasonably attributed to this feature.

5.3 Undated field/boundary ditch

A number of undated ditches were seen across the site (Figure 4). Of these features the sections of ditch investigated in Trenches 5 and 6 are a close match for the curvilinear feature identified by the geophysical survey (Figure 3). The alignment of this feature is from SSW to NNE with a roughly 90° turn to WNW.

There is some variation in the profile of the sections of ditch excavated in these trenches. The ditch in Trench 5 (Context 5006, Figure 5, Plate 7) has a very clear 'v' shaped profile where as the ditch in Trench 6 (Context 6004, Figure, Plate 8) is more shallow with a broad 'u' shape. These differences could be attributed to variation in the natural deposits into which they had been dug and their relative topographical positions. Trench 6 is situated close to the top of a high point where the topsoil is approximately 0.4m thick, no sub soil was identified at the west end of the trench where the ditch (Context 6004) is located. In addition the natural deposits through which the ditch is cut is a soft sand and likely explains the gradual concave profile. In contrast at the point where the ditch passes through Trench 5 (Context 5006) a 0.4m depth of topsoil and 0.2m of subsoil overlies the ditch which itself is cut into a compact deposit of fractured limestone and sand. As such the ditch in Trench 5 will have been less vulnerable to erosion.

The ditch could be of any date from prehistoric to post-medieval. The lack of datable artefacts within these sections of ditch indicates a likely earlier date within this time frame.

5.4 Undated track-way

Trenches 7 and 8 were positioned to run across the line of what had been identified by the geophysical survey as a possible ditched track-way. A bore hole position had been identified from client mapping as being close to the west side of Trench 7, and although this was not observed on the ground the trench was repositioned two meters to the east to avoid disturbing it.

Excavation of Trench 7 revealed a clean compact strip of limestone (context 7009), aligned east-north-east to west-south-west, measuring approximately two meters wide and with ditches on either side (Figures 5 and 6, Plate 9). A slot 0.15m deep was excavated through this material where it came away to a flat plane of compact sand along the south side of its extent, moving to the north this sharp interface gave way to a much less distinct uneven area of limestone fragments. This material does not make for a convincing surface, the limestone fragments are poorly sorted, and they do not appear to have been laid.

Ditch 7006 extended along the south side of the track-way (Figure 5, Plate 10). The most convincing of the track side ditches, it measured 1.5m wide and 0.74m deep, and had flat,

moderately steep sides and a flat base. A single fragment of large animal bone was recovered from the upper backfill (context 7003) of this ditch. On the north side of the track-way ditch 7008 had a shallow concave profile with an uneven base (Figure 5, Plate 11). It measured 2.34m wide and 0.34m deep. The shape of the profile is suggestive of a re-cutting; this was not however reflected by the backfilling material (context 7007) where the distribution of limestone fragments was even throughout.

Trench 8, situated approximately 12m to the east of Trench 7, was also placed to cross the line of the track-way but at a point where there was a break in the parallel ditches. There was no evidence for a continuation of the clean compact track-way seen in Trench 7, however a possible ditch (Figure 5, Plate 12) running north-east to south-west was uncovered. This may be a spur projecting from the northern of the two ditches.

5.5 Colluvium

The undulating topography of the site, generally sloping down from south to north, has resulted in a varying depth of colluvial deposition across the site. This material is a firm mid orange brown clayey sand. Little or no colluvium was detected in trenches at the top of the slope, for example in Trenches 2 and 6. As would be expected this material increased in thickness down-slope. Trench 3 was positioned along the slope, here the colluvium ranged between 0.15m and 0.26m from south to north. In Trench 4, situated across a low point where the slope begins to flatten out, this deposit varied between 0.3m and 0.42m thick. No dateable material was recovered from the colluviums or the deposits that it sealed, as such the date from which it accumulated remains uncertain.

6 SUMMARY

Limited archaeological remains were uncovered during the Barnsdale Bar Quarry extension evaluation. Despite a lack of dateable artefacts associated with these features they are interpreted as being prehistoric, although a later date cannot be entirely discounted.

It is notable that a significant proportion of the probable and possible archaeological features identified by the geophysical survey were discounted. The rectilinear and curved responses, interpreted as potential sites of small structures or domestic activity, stand out as not equating to any equivalent archaeological feature on the ground.

Areas of natural clayey sand, consistently clean and extremely compact, were found within the extent of all the trenches. Where investigated these were found to be either very shallow or amorphous. If as suggested these are tree bowls and root runs they are indicative of a wooded landscape.

Where archaeological features were encountered they largely differentiated from the natural orangey brown clayey sands by having a slightly lighter tone in colour and the presence of abundant small limestone fragments. With the exception of the track-way the features were exclusively ditches forming rectilinear enclosures. The only artefacts to be recovered from any of these features were a few heat fractured stones. This indicates a likely prehistoric date for the ditch in Trench 4. The similar profiles of the ditches across the site could be seen as an indicator of at least a broad contemporary association.

The archaeological remains investigated fall within the pattern of prehistoric activity identified within the vicinity. They are of low significance and the archaeological potential of the site is also low.

LIST OF SOURCES

British Geological Survey - http://mapapps.bgs.ac.uk/geologyofbritain/home.html accessed on 17/9/2015

BIBLIOGRAPHY

Evans, D.T., Stenton, M. & Antoni, B. 2014. *Barnsdale Bar Quarry, Kirk Smeaton, North Yorkshire. Desk-based Assessment Report*. York Archaeological Trust, 2014/35. Grey literature report.

Jonhson, P., 2014. *Barnsdale Bar Quarry, Kirk Smeaton, North Yorkshire. Report on geophysical surve. Trent and Peak Archaeology, 148/2014.*

ACKNOWLEDGEMENTS

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Illustrations – C. Brown, B. Savine, A. Shaw and K. Weston.

APPENDIX 1 – INDEX TO ARCHIVE

Item	Number of items
Context sheets	56
Levels register	-
Photographic register	2
Sample register	-
Drawing register	2
Original drawings	26
B/W photographs (films/contact sheets)	2
Colour slides (films)	2
Digital photographs	176
Written Scheme of Investigation	1
Report	1

Table 1 Index to archive

APPENDIX 2 – CONTEXT LIST

Trench	Context no.	Description
1	1000	Plough-soil. Friable, mid red brown, silty sand.
1	1001	Sub-soil. Firm, light red brown, clayey sand.
1	1002	Natural. Fractured pale yellow white limestone, mid brown red clay and light red brown sand.
2	2000	Plough-soil. Friable, mid red brown, silty sand.
2	2001	Sub-soil. Firm, mid orange brown, clayey sand.
2	2002	Natural. Fractured pale yellow white limestone and sand, mid to light red brown clayey sand and mid brown red clay.
2	2003	Backfill. Firm, mid orange brown, clayey sand.
2	2004	Cut. Tree bowl.
3	3000	Plough-soil. Friable, mid red brown, silty sand.
3	3001	Sub-soil. Firm, mid orange brown, clayey sand.
3	3002	Natural. Fractured pale yellow white limestone, mid brown red clay and light red brown sand.
3	3003	Backfill. Firm, mid orange brown, clayey sand.
3	3004	Cut. Root disturbance.
3	3005	Backfill. Firm, mid orange brown, clayey sand.
3	3006	Cut. Root disturbance.
4	4000	Plough-soil. Friable, mid red brown, silty sand.
4	4001	Sub-soil. Firm, mid orange brown, clayey sand.
4	4002	Natural. Bands of mottled light and mid brown sand, light yellowish brown sand with limestone fragments. Occasional patches of pink clay.
4	4003	Ditch backfill. Firm, mid orange brown sand. Frequent small limestone fragments, occasional cobbles and charcoal flecks.
4	4004	Ditch cut. North-south aligned V shaped ditch.
5	5000	Plough-soil. Friable, mid red brown, silty sand.
5	5001	Sub-soil. Firm, mid orange brown, clayey sand.
5	5002	Natural. Fractured pale yellow white limestone, mid brown red clay and light red brown sand.
5	5003	Backfill. Firm, orange brown clayey sand (natural?).
5	5004	Cut of natural hollow.
5	5005	Ditch backfill. Firm, mid to light orange brown clayey sand. Frequent limestone fragments, occasional pebbles.
5	5006	Ditch cut. North-east to south-west aligned V shaped ditch.
5	5007	Ditch backfill. Firm, dark orange brown clayey sand. Moderate limestone fragments.
6	6000	Plough-soil. Friable, mid brown grey, silty sand.
6	6001	Sub-soil. Firm, light brown, clayey sand.
6	6002	Natural. Fractured pale yellow white limestone, mid brown red clay and light red brown sand.
6	6003	Sub-soil. Firm, light brown, clayey sand.
6	6004	Ditch backfill. Firm, mid orange clayey sand.
7	7000	Plough-soil. Firm to friable mid brown clayey sand.
7	7001	Sub-soil. Firm, mid orange brown, clayey sand.
7	7002	Natural. Fractured pale yellow white limestone, mid orange brown sand.

7	7003	Ditch backfill. Firm, mid orange brown clayey sand. Moderate limestone fragments.
7	7004	Ditch backfill. Friable light orange brown clayey sand and limestone fragments.
7	7005	Ditch backfill. Friable mid orange brown sand. Occasional limestone fragments.
7	7006	Ditch cut. North-west to south-east alignment. Moderately steep flat sides, flat base.
7	7007	Ditch backfill. Firm, mid orange brown sand. Frequent limestone fragments.
7	7008	Ditch cut. North-west to south-east alignment. Irregular profile.
7	7009	Possible surface. Compact limestone fragments (natural?).
7	7010	Possible construction cut. Aligned north-west to south-east.
8	8000	Plough-soil. Firm to friable mid brown silty sand.
8	8001	Sub-soil. Firm, mid orange brown, clayey sand.
8	8002	Natural. Fractured pale yellow white limestone, mid orange brown clayey sand.
8	8003	Backfill. Firm, dark orange brown clayey sand (natural?).
8	8004	Cut. Small shallow oval scoop/hollow (natural?).
8	8005	Ditch backfill. Firm, mid orange brown clayey sand. Occasional limestone fragments.
8	8006	Ditch cut. North-east to south-west aligned. Irregular profile.
9	9000	Plough-soil. Friable mid brown clayey sand.
9	9001	Sub-soil. Firm to friable, mid orange brown, clayey sand.
9	9002	Natural. Fractured pale yellow white limestone, mid orange brown clayey sand.
9	9003	Backfill. Friable, mid orange brown sand (natural?).
9	9004	Linear cut. North-west to south-east alignment. Irregular profile. Probable natural root disturbance.

Table 2 Context list

APPENDIX 3 – PLATES

Plate 1, Natural as seen in Trench 6, facing west, scale units 0.5m

Plate 2, Trench 2, probable tree bowl, facing north-west, scale units 0.1m

Plate 3, Trench 2, probable tree bowl, facing north-west, scale units 0.1m

Plate 4, Trench 3, probable tree bowl, facing north-west, scale units 0.5m

Plate 5, Trench 3, probable tree bowl, facing north-east, scale units 0.1m

Plate 6, Trench 4, ditch 4004, drawing 10, facing south-east, scale units 0.5m

Plate 7, Trench 5, ditch 5006, drawing 17, facing east, scale units 0.5m

Plate 8, Trench 6, ditch 6004, drawing 19, facing south-west, scale units 0.1m

Plate 9, Trench 7, general view of ditched track-way, facing south-east, scale units 0.5m

Plate 10, Trench7, ditch 7006, drawing 25, facing east, scale units 0.5m

Plate 11, Trench 7, ditch 7008, drawing 25, facing east, scale units 0.5m

Plate 12, Trench 8, drawing 19, facing south-west, scale units 0.1m

APPENDIX 4 – FIGURES

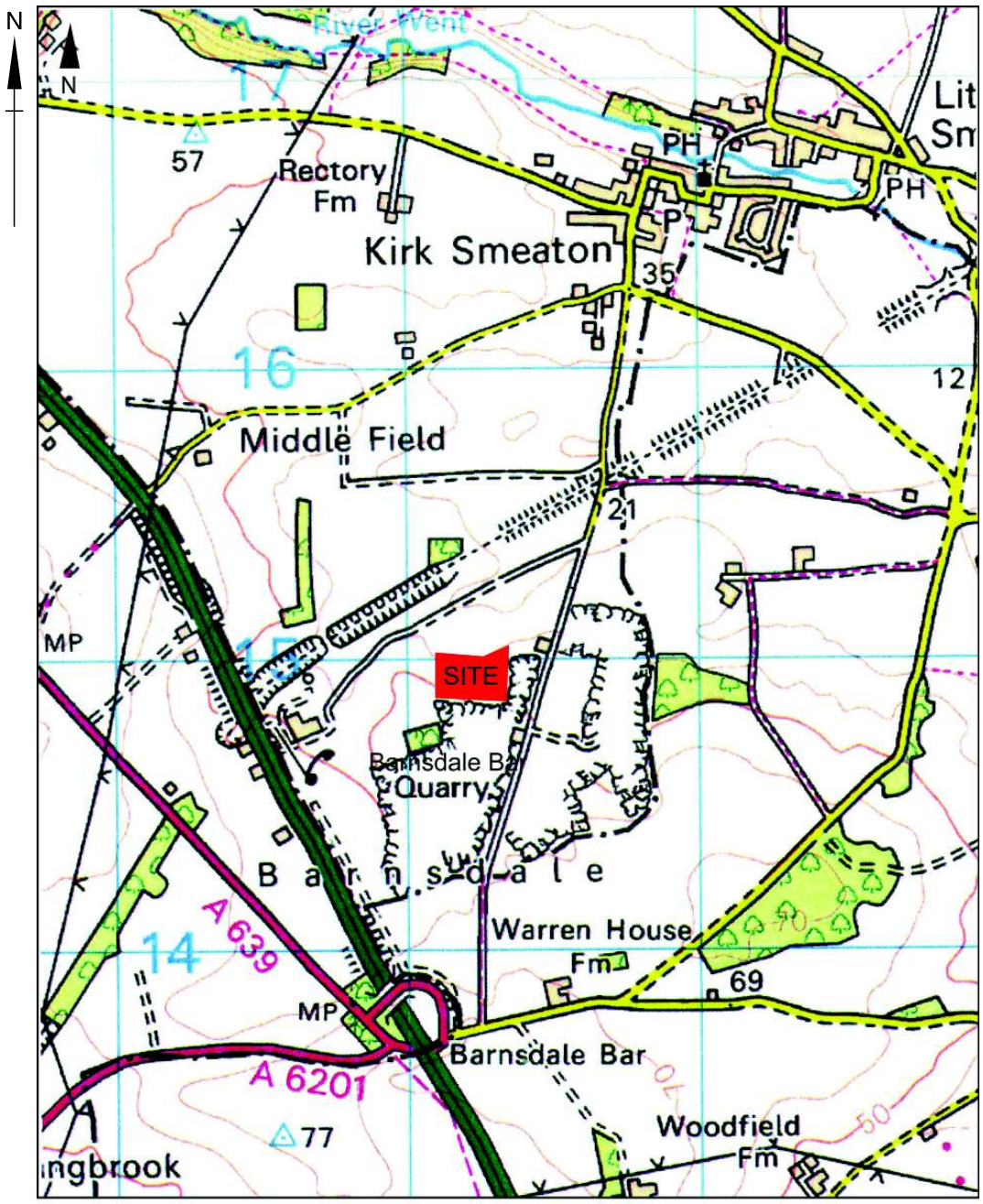


Figure 1: Location of Site

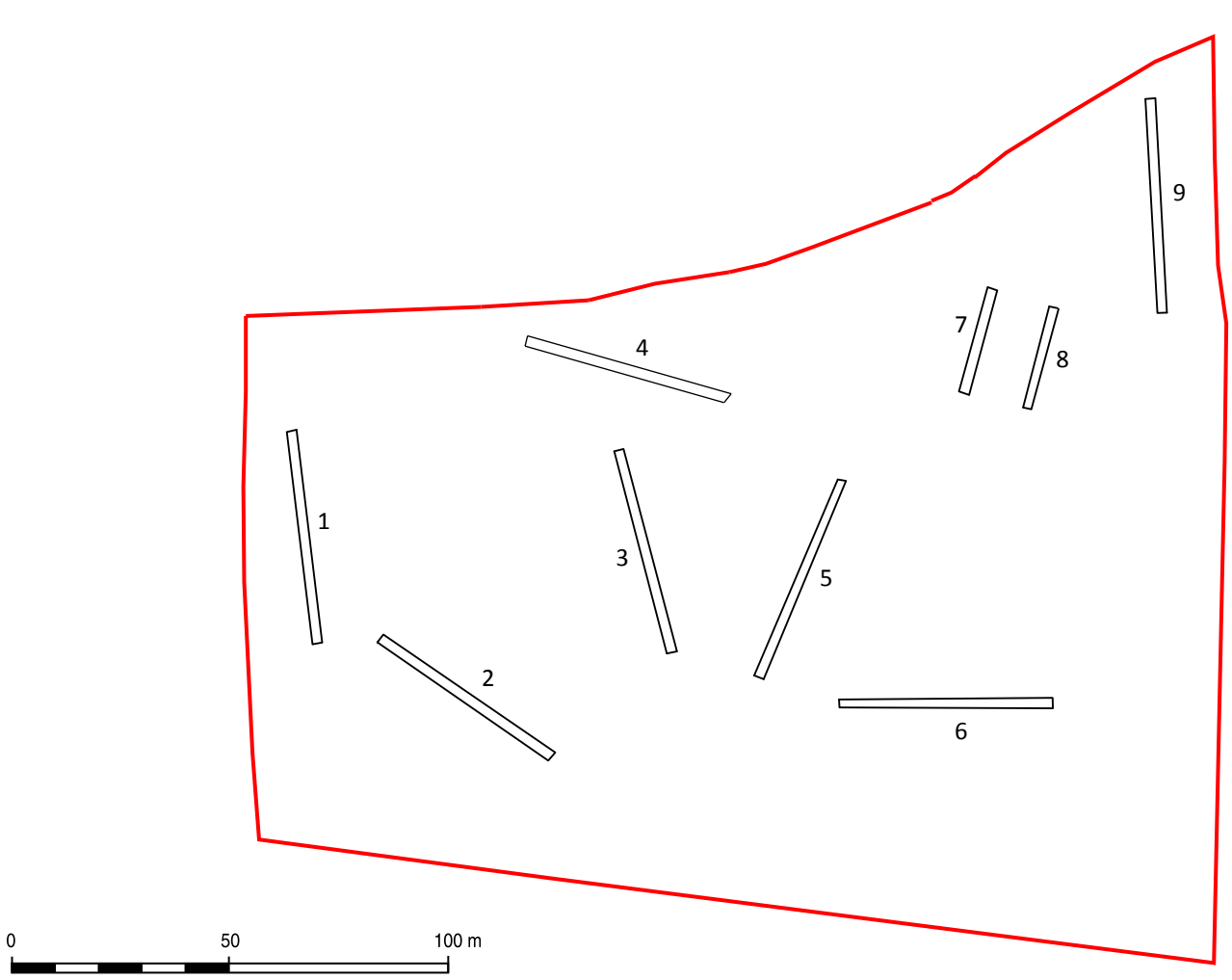


Figure 2: Trench location

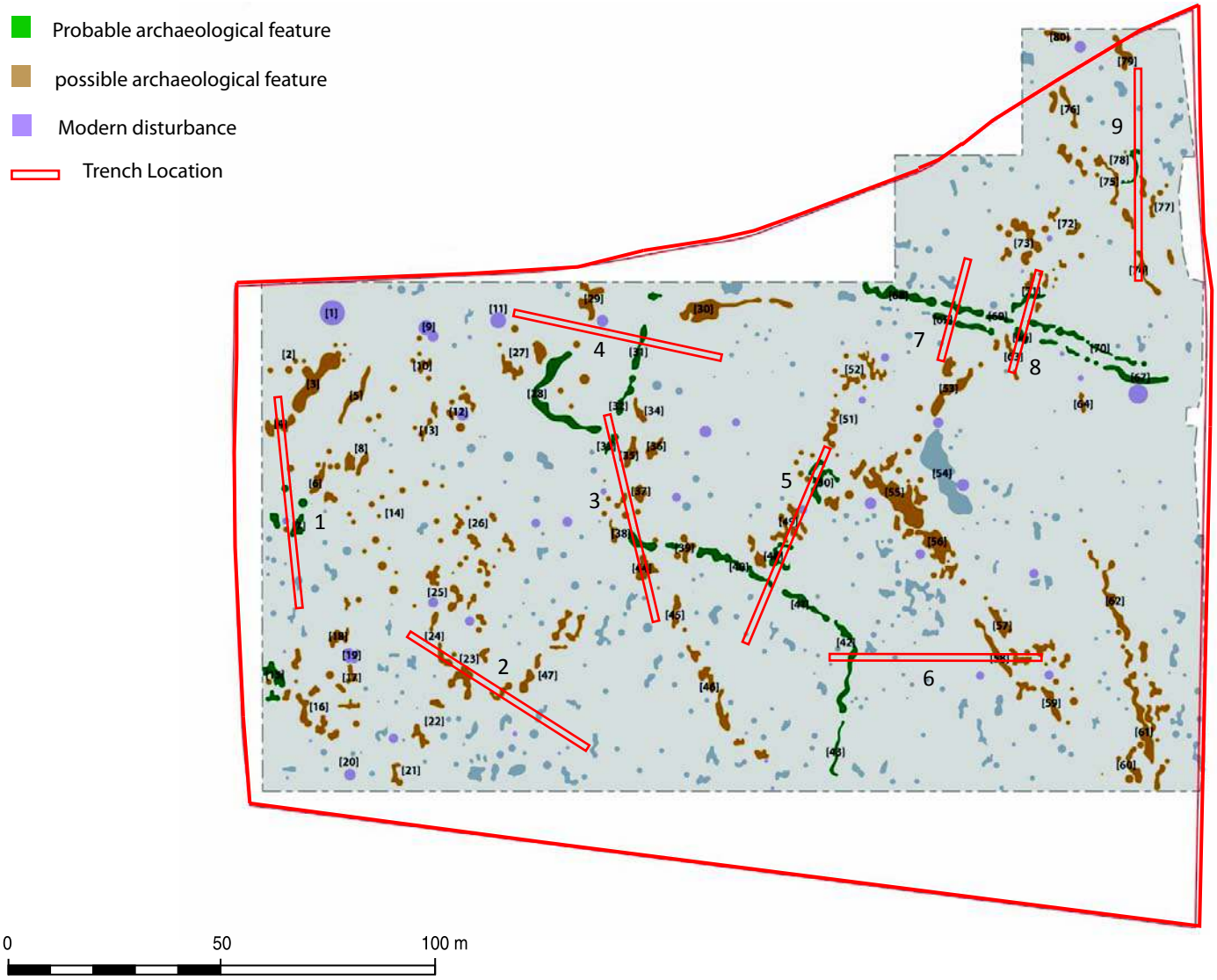
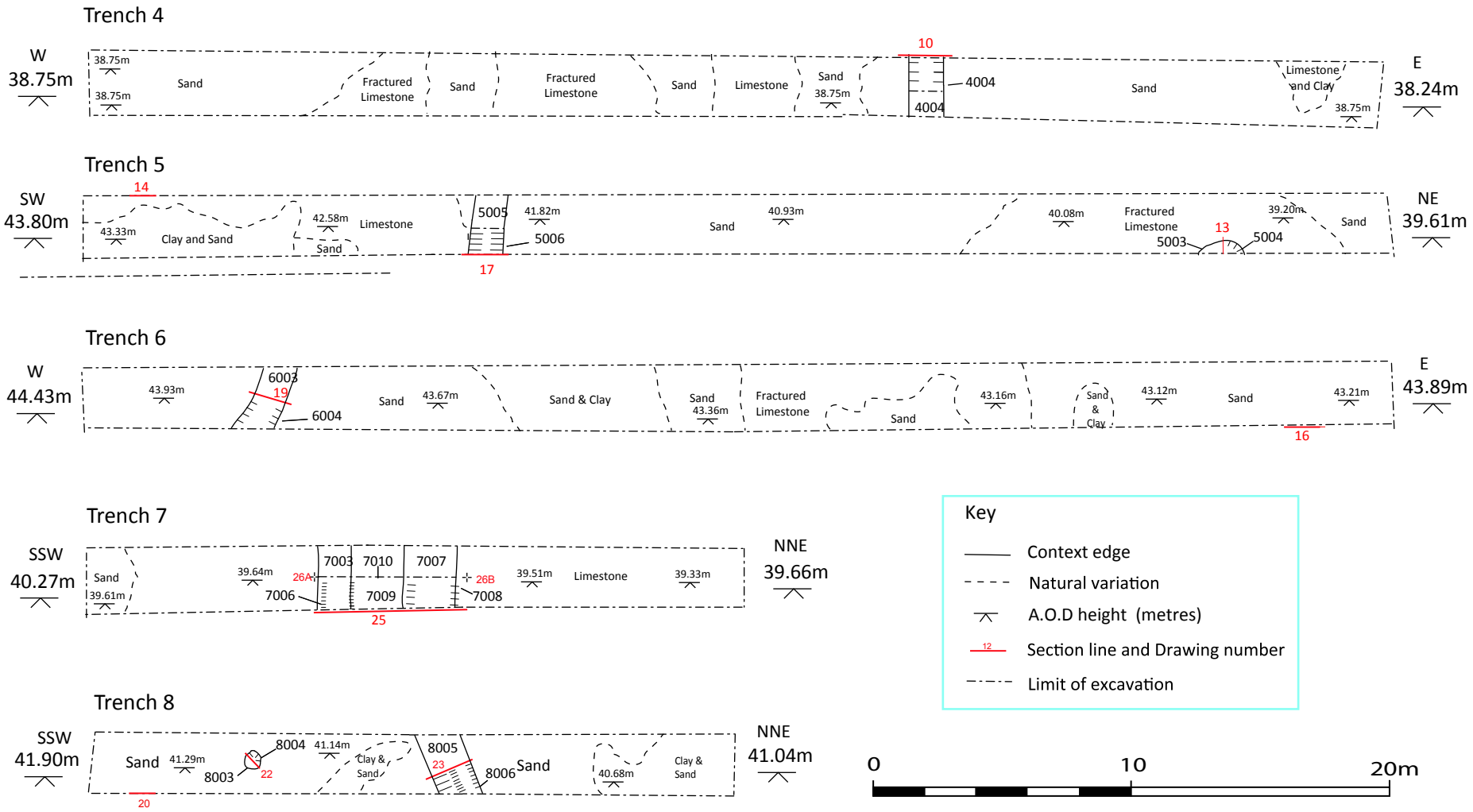


Figure 3: Geophysical survey



All levels are AOD

Figure 4: Plan of Trenches 4 to 8

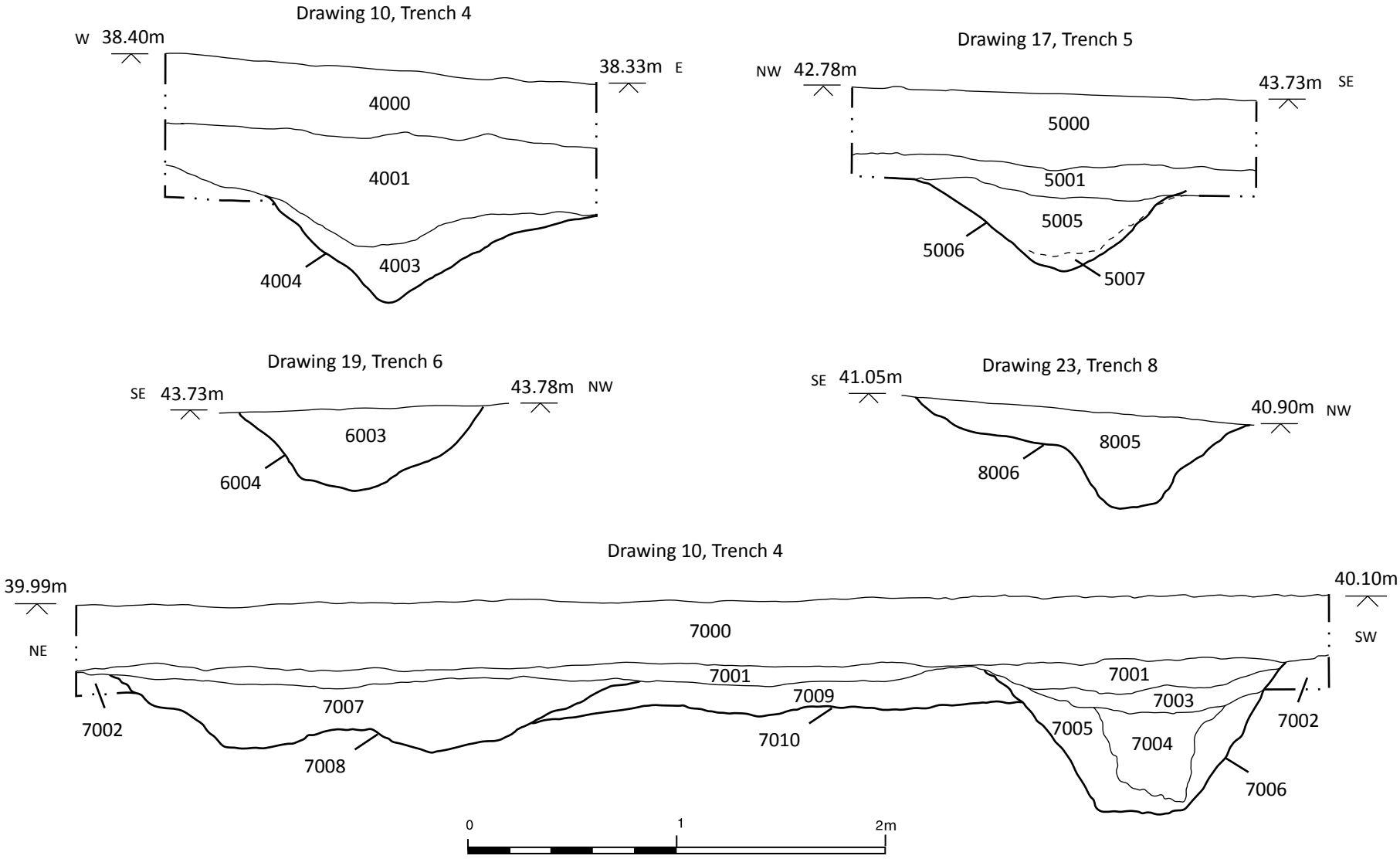


Figure 5: Section Drawings

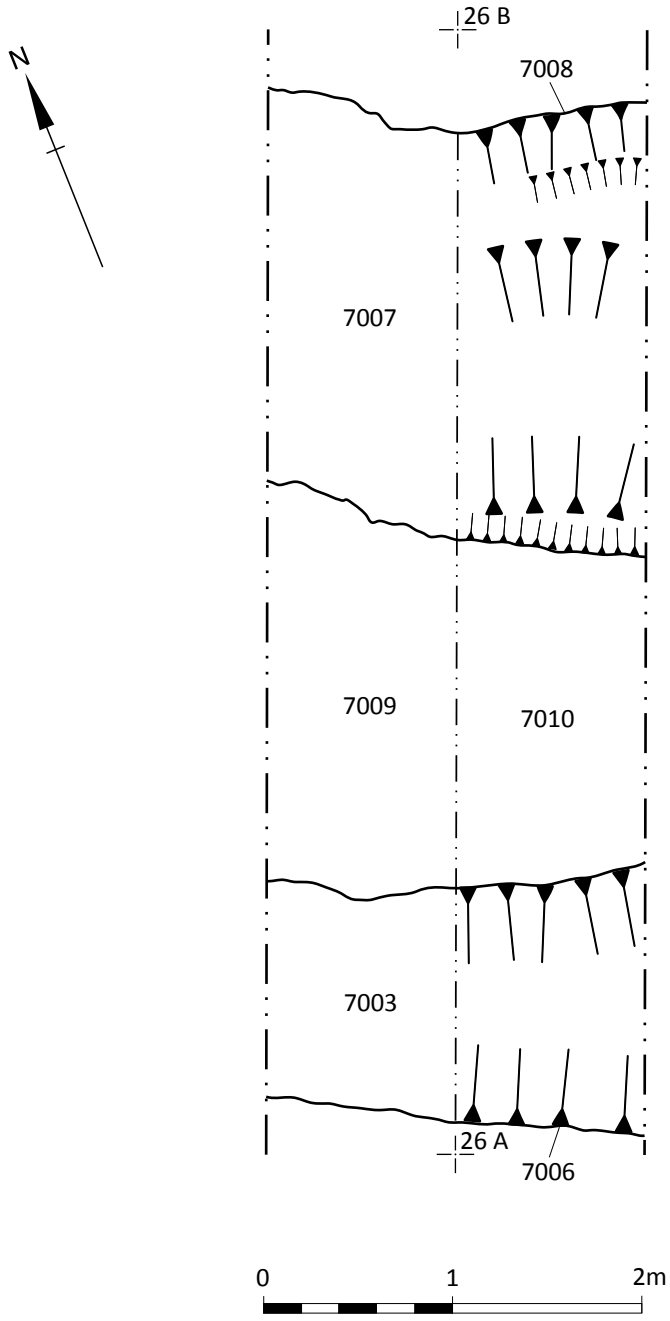


Figure 6: Trench 7 Ditches and Trackway

APPENDIX 5 – WRITTEN SCHEME OF INVESTIGATION

WRITTEN SCHEME OF INVESTIGATION FOR ARCHAEOLOGICAL INVESTGATIONS, BARNSDALE BAR QUARRY, KIRK SMEATON, NORTH YORKSHIRE.

Site Location: Barnsdale Bar Quarry, Kirk Smeaton, North Yorkshire

NGR: SE 5122 1496

Proposal: Extension of existing Quarry

Planning ref: NY/2014/0234/SCO

Prepared for: FCC Environment on behalf of Darrington Quarries Limited

Version	Produced by		Edited by		Approved by	
	Initials	Date	Initials	Date	Initials	Date
1	KW	03/09/15	IDM	03/09/15	DA	03/09/15

1 SUMMARY

1.1 FCC Environment are applying for planning consent on behalf of Darrington Quarries to extend the existing Barnsdale Bar quarry.

1.2 A trial trench archaeological evaluation is required to support this application.

1.3 This Written Scheme of Investigation (WSI) has been prepared in response to a Brief supplied by FCC Environment. The work will be carried out in accordance with the Brief and this WSI, and according to the principles of the Institute for Archaeology (IfA) Code of Conduct and all relevant standards and guidance.

2 SITE LOCATION & DESCRIPTION

2.1 The site is situated at NGR SE 5122 1496, some 1.77km south-south-west of Kirk Smeaton, North Yorkshire and 1.22km north-north-east of the Barnsdale Bar Interchange on the A1 in South Yorkshire (Figure 1). The site consists of part of one field which slopes down from south to north and lies at *c*.40 – 44m AOD, and consists of a sub- rectangular area measuring *c*.230m east-west and *c*.210m north-south, and covering an area of approximately 3.5 hectares. The site is bounded to the east and south by parts of the existing quarry and to the north and west by arable fields.

3 DESIGNATIONS & CONSTRAINTS

3.1 There are no Scheduled Ancient Monuments or Listed Buildings within the site. The site does not lie within a Conservation Area.

3.2 The site is situated adjacent to a working quarry and therefore particular care should be taken when working, especially in the south edge of the site which is adjacent to the quarry.

3.3 Trenches have been located at least two meters away from the field boundary which ensures that the headland will be left clear.

3.4 The site can be accessed from Kirk Smeaton via Long Lane and Crab Tree Lane. This access route avoids a potentially dangerous turning from an alternative access route via the A1.

4 ARCHAEOLOGICAL INTEREST

4.1 The site has been the subject of a desk based assessment (York Archaeological Trust, Oct 2014) and a geophysical survey (Trent and Peak Archaeology, Nov 2014). The results of the desk based assessment are summarised as follows:

No archaeological remains have been recorded from the site itself, but it is located in fairly close proximity to the probable line of a Roman road and there is considerable evidence of prehistoric and probably Roman activity, and possibly occupation, to the south of the site. As the site has remained in agricultural use to the present, there has been no recent activity that would preclude the presence of archaeological remains. Taken together, this evidence suggests the potential for as yet unrecognised below ground archaeological remains being present within the development area.

Geophysical Survey results are summarised in the Geophysical Survey report as follows:

The geomagnetic response to the survey revealed an exceptionally high density of anomalies within which, several large-scale features could be easily recognised within the dataset. Smaller-scale features were also recognisable within the survey area. Likely archaeological features were represented by positive magnetic anomalies. The overall character of the geophysical anomalies revealed by the survey strongly suggests the presence of archaeological remains within the area surveyed.

The geophysical survey results may indicate the presence of cut features and ditches which could relate to land divisions, enclosures or possible drove-ways. Smaller features with higher magnetic responses are suggestive of buildings or locations of domestic activity.

4.2 No previous invasive archaeological investigations have been carried out within the site itself though there have been a number of archaeological events and investigations within the wider area, mainly in the quarry ahead of progressive expansions. A previous evaluation ahead of quarry extension consisting of seven trenches identified two enclosures to the south of the quarry, thought to be of late prehistoric or Roman-British date.

AIMS

5.1 The aims of the evaluation are:

- to determine the extent, condition, character, importance and date of any archaeological remains present
- to provide information that will enable the remains to be placed within their local, regional, and national context and for an assessment of the significance of the archaeology of the proposal area to be made
- to provide information to enable the local authority to decide any requirements for further archaeological mitigation for the site

6 EXCAVATION METHODOLOGY

6.1 The evaluation will comprise the excavation of 9 archaeological evaluation trenches targeted in areas to enable investigation of the possible presence of archaeological features as indicated by Geophysical Survey.

Please note that further stages of work or other mitigation measures could be required by the local authority, depending upon the results of the evaluation.

6.2 A series of nine trenches will be excavated. The location of the trenches is shown on Figure 2. Trenches will be stepped if necessary, to ensure their stated size at the base of the trench.

No.	Size (m)	Rationale
1	50 x 1.8	Investigation of ditch/cut features
2	50 x 1.8	Investigation of possible archaeological features in SW area of site
3	50 x 1.8	Investigation of ditches/cut features and their relationship to one another.
4	50 x 1.8	Investigation of ditch/cut feature
5	50 x 1.8	Investigation of small, rectilinear cut features and disturbance which may relate to domestic activity.
6	50 x 1.8	Investigation of southern end of curvilinear ditch and possible archaeological features to the E
7	25 x 1.8	Investigation of parallel cut features – possible drove-way
8	25 x 1.8	Investigation of break in parallel cut features – possible drive-way
9	50 x 1.8	Investigation of curvilinear feature possibly relating to domestic activity

6.3 The trench locations will be accurately plotted using an EDM Total station, by measurement to local permanent features shown on published Ordnance Survey maps. All measurements will be accurate to +/-10cm, and the trenches locatable on a 1:2500 Ordnance Survey map. This is to ensure that the trenches can be independently relocated in the event of future work.

6.4 Overburden such as turf, topsoil or other superficial fill materials would be removed by a machine fitted with a toothless bucket. Mechanical excavation equipment would be used

judiciously, under archaeological supervision down to the top of archaeological deposits, or the natural subsoil, whichever appears first. If archaeology is present machining will cease and excavation will normally proceed by hand. Where deep homogenous deposits, or deposits such as rubble infills, are encountered, these may be carefully removed by machine, after consultation with the Principle Archaeologist for North Yorkshire County Council.

6.5 The use of mechanical, air-powered, or electrical excavation equipment may also be appropriate for removing deep intrusions (e.g. modern brick and concrete floors or footings) or through deposits to check that they are of natural origin, after consultation with the Principle Archaeologist for North Yorkshire County Council. The machine will not be used to cut arbitrary sondages down to natural deposits.

6.6 All trenches will be sufficiently cleaned by hand to enable potential archaeological features to be identified and recorded; areas without archaeological features will be recorded as sterile and no further work will take place in these areas. The stratigraphy of all trenches will be recorded on trench record sheets even where no archaeological features are identified.

6.7 A sufficient sample of any archaeological features and deposits revealed will be excavated in an archaeologically controlled and stratigraphic manner in order to establish the aims of the evaluation.

- Discrete features will be half-sectioned in the first instance.
- Linear features will be sample excavated (to a minimum of 25% of their length) with each sample being not less than 1m in length
- Deposits at junctions or interruptions in linear features will be sufficiently excavated to allow relationships to be determined.
- Structures will be sample excavated to a degree whereby their extent nature, form, date, function and relationships to other features and deposits can be established.

7 RECORDING METHODOLOGY FOR EXCAVATION

7.1 All archaeological features will be recorded using standardised pro forma record sheets. Plans, sections and elevations will be drawn as appropriate and a comprehensive photographic record will be made where archaeological features are encountered.

7.2 Archaeological deposits will be planned at a basic scale of 1:50, with individual features requiring greater detail being planned at a scale of 1:20. Larger scales will be utilised as appropriate. Cross-section of features will be drawn to a basic scale of 1:10 or 1:20 depending on the size of the feature. All drawings will be related to Ordnance Datum. Where it aids interpretation, structural remains will also be recorded in elevation.

7.3 Each context will be described in full on a pro forma context record sheet in accordance with the accepted context record conventions. Each context will be given a unique number. These field records will be checked and indexes compiled.

7.4 Photographs of work in progress and post-excavation of individual and groups of features will be taken. This will include general views of entire features and of details such as sections as considered necessary. The photographic record will comprise 35mm format black and white film. Digital photography may be used in addition, but will not form any part of the formal site archive. All site photography will adhere to accepted photographic record guidelines.

7.5 Areas which do not contain any archaeological deposits will be photographed and recorded

as being archaeologically sterile. The natural stratigraphic sequence within these areas will be recorded.

7.6 All finds will be collected and handled following the guidance set out in the IfA guidance for archaeological materials. Unstratified material will not be kept unless it is of exceptional intrinsic interest. Material discarded as a consequence of this policy will be described and quantified in the field. Finds of particular interest or fragility will be retrieved as Small Finds, and located on plans. Other finds, finds within the topsoil, and dense/discrete deposits of finds will be collected as Bulk Finds, from discrete contexts, bagged by material type. Any dense/discrete deposits will have their limits defined on the appropriate plan.

7.7 All artefacts and ecofacts will be appropriately packaged and stored under optimum conditions, as detailed in the RESCUE/UKIC publication *First Aid for Finds,* and recording systems must be compatible with the recipient museum. All finds that fall within the purview of the Treasure Act (1996) will be reported to HM Coroner according to the procedures outlined in the Act, after discussion with the client and the local authority.

7.8 Other samples will be taken, as appropriate, in consultation with York Archaeological Trust specialists and the English Heritage Regional Science Advisor, as appropriate (e.g. dendrochronology, soil micromorphology, monolith samples, C14, etc.). Samples will be taken for scientific dating where necessary for the development of subsequent mitigation strategies. Material removed from site will be stored in appropriate controlled environments.

7.9 In the event of human remains being discovered during the evaluation these will be left *in-situ*, covered and protected, in the first instance. The removal of human remains will only take place in compliance with environmental health regulations and following discussions with, and with the approval of, the Ministry of Justice. If human remains are identified, the Ministry of Justice and the Principle Archaeologist for North Yorkshire County Council will be informed immediately. An osteoarchaeologist will be available to give advice on site.

- If **disarticulated** remains are encountered, these will be identified and quantified on site. If trenches are being immediately backfilled, the remains will be left in the ground. If the excavations will remain open for any length of time, disarticulated remains will be removed and boxed, for immediate reburial by the Church.
- If **articulated** remains are encountered, these will be excavated in accordance with recognised guidelines (see 6.12) and retained for assessment.
- Any grave goods or coffin furniture will be retained for further assessment.

7.10 Where a licence is issued, all human skeletal remains must be properly removed in accordance with the terms of that licence. Where a licence is not issued, the treatment of human remains will be in accordance with the requirements of Civil Law, IfA Technical Paper 13 (1993) and English Heritage guidance (2005).

8 SPECIALIST ASSESSMENT

8.1 The stratigraphic information, artefacts, soil samples, and residues will be assessed as to their potential and significance for further analysis and study. The material will be quantified (counted and weighted). Specialists will undertake a rapid scan of all excavated material. Ceramic spot dates will be given. Appropriately detailed specialist reports will be included in the report.

8.2 Materials considered vulnerable should be selected for stabilisation after specialist recording. Where intervention is necessary, consideration must be given to possible

investigative procedures (e.g. glass composition studies, residues on or in pottery, and mineral-preserved organic material). Allowance will be made for preliminary conservation and stabilization of all objects and a written assessment of long-term conservation and storage needs will be produced. Once assessed, all material will be packed and stored in optimum conditions, in accordance with Watkinson and Neal (1998), IfA (2007) and Museums and Galleries (1992).

8.3 All finds will be cleaned, marked and labelled as appropriate, prior to assessment. For ceramic assemblages, any recognised local pottery reference collections and relevant fabric Codes will be used.

8.4 Allowance will be made for the recovery of material suitable for scientific dating and contingency sums will be made available to undertake such dating, if necessary. This will be decided in consultation with the Principle Archaeologist for North Yorkshire County Council.

9 REPORT & ARCHIVE PREPARATION

9.1 Upon completion of the site work, a report will be prepared to include the following:

a) A non-technical summary of the results of the work.

b) An introduction which will include the planning reference number, grid reference and dates when the fieldwork took place.

c) An account of the methodology and detailed results of the operation, describing structural data, archaeological features, associated finds and environmental data, and a conclusion and discussion.

d) A selection of photographs and drawings, including a detailed plan of the site accurately identifying the areas monitored, trench locations, selected feature drawings, and selected artefacts, and phased feature plans where appropriate.

e) Specialist artefact and environmental reports where undertaken, and a context list/index.

f) Details of archive location and destination (with accession number, where known), together with a context list and catalogue of what is contained in that archive.

g) A copy of the key OASIS form details

h) Copies of the Brief and WSI

i) Additional photographic images may be supplied on a CDROM appended to the report

9.2 Three copies of the report will be submitted to the commissioning body. A bound and digital copy of the report will be submitted direct to North Yorkshire County Council for planning purposes, and subsequently for inclusion into the SMR/HER.

9.3 A field archive will be compiled consisting of all primary written documents, plans, sections and photographs. Catalogues of contexts, finds, soil samples, plans, sections and photographs will be produced. York Archaeological Trust will liaise with Wakefield Museum prior to the commencement of fieldwork to establish the detailed curatorial requirements of the museum and discuss archive transfer and to complete the relevant museum forms. The relevant museum curator would be afforded access to visit the site and discuss the project results.

9.4 The owner of the Intellectual Property Rights (IPR) in the information and documentation arising from the work, would grant a licence to the Local Authority and the museum

accepting the archive to use such documentation for their statutory functions and provide copies to third parties as an incidental to such functions. Under the Environmental Information Regulations (EIR), such documentation is required to be made available to enquirers if it meets the test of public interest. Any information disclosure issues would be resolved between the client and the archaeological contractor before completion of the work. EIR requirements do not affect IPR.

9.5 Upon completion of the project an OASIS form will be completed at http://ads.ahds.ac.uk/project/oasis/.

10 POST EXCAVATION ANALYSIS & PUBLICATION

10.1 The information contained in the evaluation report will enable decisions to be taken regarding the future treatment of the archaeology of the development site and any material recovered during the evaluation.

10.2 If further archaeological investigations (mitigation) take place, any further analyses (as recommended by the specialists, and following agreement with Principle Archaeologist for North Yorkshire County Council) may be incorporated into the post-excavation stage of the mitigation programme unless such analysis are required to provide information to enable a suitable mitigation strategy to be devised. Such analysis will form a new piece of work to be commissioned.

10.3 In the event that no further fieldwork takes place on the site, a full programme of post excavation analysis and publication of artefactual and scientific material from the evaluation may be required by the Principle Archaeologist for North Yorkshire County Council. Where this is required, this work will be a new piece of work to be commissioned.

10.4 If further site works do not take place, allowance will be made for the preparation and publication in a local and/or national journal of a short summary on the results of the evaluation and of the location and material held within the site archive.

11 HEALTH AND SAFETY

11.1 Health and safety issues will take priority over archaeological matters and all archaeologists will comply with relevant Health and Safety Legislation.

11.2 A Risk Assessment will be prepared prior to the start of site works.

12 PRE-START REQUIREMENTS

12.1 The client will be responsible for ensuring site access has been secured prior to the commencement of site works, and that the perimeter of the site is secure.

12.2 The client will provide York Archaeological Trust with up to date service plans and will be responsible for ensuring services have been disconnected, where appropriate.

12.3 The client will be responsible for ensuring that any existing reports (e.g. ground investigation, borehole logs, contamination reports) are made available to York Archaeological Trust prior to the commencement of work on site.

13 REINSTATEMENT

13.1 Following excavation and recording the spoil from the trenches will be backfilled unless requested otherwise. The backfill material will be levelled and compressed as far as possible with the mechanical excavator bucket, but will not be compressed to a specification. York Archaeological Trust are not responsible for reinstating any surfaces, including reseeding, unless specifically commissioned by the client who will provide a suitable specification for the work.

13.2 During the first monitoring visit (see section 15) an agreement on a suitable staged backfill timetable for the trenches will be agreed, to avoid leaving all trenches open at once for health and safety reasons.

14 TIMETABLE & STAFFING

14.1 The fieldwork is anticipated to commence week beginning 7th September

14.2 Specialist staff available for this work are as follows:

- Human Remains – Ruth Whyte (Dickinson Laboratory for Bio-archaeology)
- Palaeoenvironmental remains – Dr Jennifer Miller (Dickinson Laboratory for Bio-archaeology
- Head of Curatorial Services - Christine McDonnell
- Finds Researchers - Nicky Rogers and Karen Weston
- Pottery Researcher - Anne Jenner
- Finds Officers - Rachel Cubitt and Nienke Van Doorn
- Archaeometallurgy & Industrial Residues – Rachel Cubitt and Dr Rod Mackenzie
- Conservation - Ian Panter

15 MONITORING OF ARCHAEOLOGICAL FIELDWORK

15.1 As a minimum requirement, the Principle Archaeologist for North Yorkshire County Council will be given a minimum of one week's notice of work commencing on site, and will be afforded the opportunity to visit the site during and prior to completion of the on-site works so that the general stratigraphy of the site can be assessed and to discuss the requirement any further phases of archaeological work. York Archaeological Trust will notify the Principle Archaeologist for North Yorkshire County Council of any discoveries of archaeological significance so that site visits can be made, as necessary. Any changes to this agreed WSI will only be made in consultation with Principle Archaeologist for North Yorkshire County Council.

15.2 With the client's agreement illustrated notices will be displayed on site to explain the nature of the works.

16 COPYRIGHT

16.1 York Archaeological Trust retain the copyright on this document. It has been prepared expressly for the named client, and may not be passed to third parties for use or for the purpose of gathering quotations.

KEY REFERENCES

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See also the **HELM** website for a full list of English Heritage Guidance documents: http://www.helm.org.uk/server/show/nav.19701

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