

Barnsdale Bar Quarry North-Western Extension

Kirk Smeaton

North Yorkshire

Written Scheme of Investigation for an Archaeological Strip, Map and
Record Excavation

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Written Scheme of Investigation for an Archaeological Strip, Map and Record Excavation at Barnsdale Bar Quarry, Kirk Smeaton

1. Introduction

- 1.1 This Written Scheme of Investigation (WSI) has been prepared by Archaeological Services WYAS (ASWYAS) for Wardell Armstrong on behalf of their client Darrington Quarries Ltd. The WSI details the scheme of works for an archaeological strip, map and record excavation (SMR) as part of the phased north-western extension of Barnsdale Bar Quarry, Kirk Smeaton. The quarry extension will be undertaken in three phases, beginning with a SMR across the southernmost area (Phase 1). Any archaeological mitigation that might be required for the central (Phase 2) and northernmost (Phase 3) areas will be covered in subsequent WSIs.
- 1.2 The archaeological work associated with Phase 1 will comply with the relevant standard of the Chartered Institute for Archaeologists (2014a-c), Historic England's best practice documents (1991, 2006, 2008) and the "Regional statement of good practice for archaeology in the development process, Yorkshire, the Humber & the north east".

2. Site location, topography and land-use

- 2.1 The site is located west of Long Lane, south of Crab Tree Lane and immediately east of the A1 motorway and is centred on grid reference SE 5086 1446 (Fig. 1). The area to be investigated consists of part of one large field which slopes gently down from north to south and lies at c. 57-54m AOD. The site is bound to the east and south by parts of the existing quarry, to the north by arable land and to west by the A1.

3. Geology and soils

- 3.1 The underlying geology of the site comprises Dolostone of the Cadeby Formation (British Geological Survey 2020). The soils are shallow, well-drained calcareous, fine loamy soils of the Aberford Association (511a; Soil Survey of England and Wales 1983). The area was previously occupied by arable land.

4. Archaeological background

- 4.1 The Barnsdale Bar quarry has been intensively investigated since 1989 (Appendix 1, Fig. 1) and Burgess (2001) provides a detailed review of the earlier investigations. Subsequently, evidence for early prehistoric human activity has been recorded during excavations at Area I, comprising of a number of isolated pits and a small group of cremations dating to the Mesolithic/Early Neolithic period (Gidman and Roberts 2005). Nevertheless, the majority of features recorded in the Barnsdale Bar quarry relate to enclosures, field systems, trackways and burials dating from the late prehistoric to the Romano-British period. These have been identified through a programme of aerial

photographic mapping, geophysical survey and archaeological excavation. The presence of Romano-British activity is not surprising given that a Roman road linking Doncaster to Castleford, called the Ridge Road (Margary's 28b), lies immediately to west of the quarry site (Margary 1973; Burgess 2001).

- 4.2 The Barnsdale Bar area as a whole was the subject of a desk-based assessment (Boucher 1996). This was followed by a gradiometer survey of Area F that included part of the eastern limits of the current study area (Fig. 1). This survey identified the presence of an enclosed field system thought to be late prehistoric/Romano-British in date (Cottrell 1996). This was subsequently confirmed by open-area excavation when a sub-rectangular enclosure of Late Iron Age date was identified, accompanied by a trackway, two linear boundaries and the burial of a mature adult man. The latter has been radiocarbon dated to 380 to 170 cal BC. During the Romano-British period, a rectilinear field system was developed in conjunction with a field corner enclosure (Grassam and Ford 2008; Richardson and Rose 2009).
- 4.3 More recently, geophysical survey was undertaken to the north-east of Phase 1 extension (Fig. 1, Area K) which identified a land divisions and a possible trackway (Johnson 2014). This was followed by trial trenching although the lack of dating evidence precluded interpretation beyond a likely prehistoric date (Savine 2015). A subsequent open-area strip confirmed Iron Age and Roman activity by virtue of a few pottery sherds (Richardson 2017).
- 4.4 During 2019, geophysical survey of Phases 2 and 3 of the north-western extension of the quarry was undertaken by Wardell Armstrong (Birtles 2019), which identified further evidence for late prehistoric field systems and enclosures as well as possible discrete features. This was followed by targeted trial trenching on the Phase 2 area with only three pits identified within one trench (Castle 2019; Fig. 1, Area L).

5. Aims and Objectives

- 5.1 The overall aim of the SMR is to provide information on the presence or absence and the extent, character, chronology, depth of burial and degree of archaeological survival across the Phase 1 area. Should further archaeological investigation be required as mitigation by the planning authority, this will be specified in a separate WSI to be agreed with Peter Rowe, Principal Archaeologist for North Yorkshire County Council.
- 5.2 The objectives of this archaeological SMR will be, where possible, to:
- preserve by record the archaeological features and deposits to be impacted upon by the quarry extension;
 - enhance the archaeological record for this part of North Yorkshire;
 - better understand the archaeology of the prehistoric and Roman periods and the transition between them;

- characterise and understand the archaeology of the proposed extraction area; and
- assist in the development of an iterative archaeological mitigation strategy for the site that will ultimately bring the findings into the public domain through deposition of the results in the North Yorkshire HER and through appropriate publication if appropriate.

5.3 Archaeological fieldwork carried out as part of the development process should have regard to both national and local published research agenda, and should have an intention of furthering these agenda. In particular, the Yorkshire Archaeological Research Framework should be considered (Roskams and Whyman 2007).

6. Methodology

- 6.1 All work will be undertaken in accordance with the relevant standards (CIfA 2014a-c; Historic England 1991, 2006, 2008). The SMR will be conducted by an appropriately qualified and experienced archaeologist who will be present during all ground works. The SMR will involve the excavation of 66950m², as shown in Fig. 1.
- 6.2 The stripping will involve the removal of the topsoil and recent overburden down to the first significant archaeological horizon in successive level spits of a maximum 0.2m thickness, by the use of an appropriate machine using a wide toothless ditching blade. Under no circumstances will the machine be used to cut arbitrary trenches down to natural deposits. Any machine work will be carried out under direct archaeological supervision and the machine halted if significant archaeological deposits are encountered. The top of the first significant archaeological horizon may be exposed by the machine, but will then be cleaned by hand and inspected for features where necessary.
- 6.3 Any archaeological features/deposits exposed will be manually excavated in an archaeologically controlled and stratigraphic manner, in order to meet the aims and objectives outlined above.
- 6.4 No archaeological deposits will be entirely removed unless required by Peter Rowe, although all discrete features identified are expected to be half-sectioned as a minimum and the full depth of all archaeological deposits assessed.
- 6.5 Features will be sample excavated employing the following strategy:
- Linear features: sufficient excavation will be carried out to investigate the depth, profile and fills of a ditch or gully and to recover dating and environmental evidence from its fills. Normally this will involve a minimum of 10% sample dispersed along the length of the feature (each sample section to be not less than 1m). Feature intersections will always be excavated in such a way to determine a stratigraphic relationship.

- Discrete features: pits, post-holes and other discrete features will normally be half-sectioned to determine and record their form. The complete excavation of such features may be appropriate, but only following consultation with Peter Rowe.
- 6.6 A full written, drawn and photographic record of all material revealed during the course of the work shall be made. The excavation limits will be surveyed using electronic survey equipment with larger scale hand drawn plans of features, at 1:20 or 1:50, being created as appropriate. Sections of linear and discrete features will be drawn at 1:10 or 1:20. All sections, plans and elevations will include spot-heights related to Ordnance Datum in metres as correct to two decimal places. Tie-in information will be undertaken during the course of the evaluation and will be fixed in relation to nearby permanent structures and roads and to the National Grid. The photographic archive will comprise monochrome negative photographs at a minimum format of 35mm, augmented by digital photographs, taken using cameras with a resolution of at least 10 megapixels.
- 6.7 All excavated archaeological contexts shall be fully recorded by written records, giving details of location, composition, shape, dimensions, relationships, finds, samples, and cross-references to other elements of the record and other relevant contexts, in accordance with best practice. All contexts, and any small finds and samples from them will be given unique numbers. Bulk finds will be collected by context.
- 6.8 All artefacts will be removed from the site for assessment and analysis, and where it is appropriate, their find spots shall, if appropriate, be recorded three dimensionally. Non-modern artefacts from the excavated topsoil and subsoil will be collected. Finds material will be stored in controlled environments, where appropriate. All artefacts recovered will be retained, cleaned, labelled and stored as detailed in the guidelines laid out in the ClfA (2014b). Any necessary conservation work will be undertaken by approved conservators working to UKIC guidelines.
- 6.9 A soil-sampling programme shall be undertaken during the course of the investigation for the identification and recovery of carbonised and waterlogged remains, vertebrate remains, molluscs and small artefactual material. This will comprise the removal of a bulk sample from every securely sealed and hand-excavated context, excepting those with excessive levels of residuality or those with minimal 'soil' content. Bulk samples will comprise representative 40 litre samples. Where a context does not yield 40 litres of material, smaller samples will be taken. The post-excavation processing of all palaeoenvironmental samples will be undertaken in line with Historic England's Environmental Archaeology guidelines (2011).
- 6.10 In the event of human remains being discovered they will, in the first instance, be left *in situ*, covered and protected. The removal of human remains will only take place in compliance with either a faculty issued by the Chancellor of the Diocese, or the Burial Act 1857. In the case of the latter (i.e. in the absence of a faculty) an exhumation licence must be obtained from the Ministry of Justice prior to the removal of the remains.

- 6.11 If two or more pieces of prehistoric metalwork, two or more gold and silver coins over 300 years old and/or ten or more copper alloy coins found in association with each other are recovered, they and all associated objects shall be reported to HM Coroner according to the procedures relating to the Treasure Act (1996) and the Treasure (Designation) Order (2002).
- 6.12 Appropriate specialists will visit the site to advise on sampling strategies if required, and their suggested strategies will then be implemented.
- 6.13 Provision will be made to recover material suitable for scientific dating. Contingency sums will be made available to undertake such dating.
- 6.14 Further contingency provision will be made for additional specialist advice, e.g. for finds analysis and conservation.

7. Analysis and Reporting

- 7.1 Following the conclusion of the fieldwork, an assessment report shall be produced. For all categories of material recovered, including finds, palaeo-environmental, industrial and other specialist samples, an assessment by an appropriately experienced specialist will be undertaken. Samples must be processed and sorted, and any artefacts recovered provided to the appropriate specialist(s) to be considered alongside the hand-recovered material. Basic stratigraphic information will be supplied to the project specialists. All finds are to be treated in accordance with current best practice guidance. For ceramic assemblages, recording shall be carried out in a manner compatible with existing typological series in local pottery reference collections. All ferrous objects and a selection of non-ferrous objects (including all coins), will be x-radiographed. Where material suitable for scientific dating was recovered, sufficient dating will be undertaken to meet the aims of the evaluation. Where further fieldwork is not to be undertaken and assessment has identified the need for further analysis, this will be completed drawing upon the contingency allowed.
- 7.2 The site archive will be assembled in line with the recommended composition provided in Historic England's PPN3 (2008) and UKIC's *Guidelines for the Preparation of Excavation Archives for Long-term Storage* (1990) and ClfA's *Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives* (2014c).
- 7.3 In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain all the data collected during the fieldwork, including records, finds and environmental samples. It will be quantified, ordered, indexed and internally consistent. Archive consolidation will be undertaken immediately following the conclusion of fieldwork and will involve:
- the site record being checked, cross-referenced and indexed as necessary;

- retained finds being cleaned, stabilised, marked and packaged in accordance with the requirements of the recipient museum;
- retained finds being assessed and recorded using *pro forma* recording sheets, by suitably qualified and experienced staff. Initial artefact dating will be integrated within the site matrix; and
- environmental samples being processed by suitably experienced and qualified staff and recorded using *pro forma* recording sheets.

7.4 In addition to the site records, artefacts, ecofacts and other sample residues, the archive shall contain:

- a summary report synthesising the context record;
- a summary of the artefact record; and
- a summary of the environment record.

7.5 The integrity of the primary field record will be preserved. Security copies will be maintained where appropriate.

7.6 Provision (including the agreement of costs) will be made for the deposition of the archive, artefacts and environmental material in a relevant museum, subject to the permission of the landowner. The museum will be contacted prior to work commencing to discuss archiving requirements (e.g. marking and labelling requirements, accession number). The archive will be prepared following the 'Archaeological Archive Deposition Policy for Museums in Yorkshire and the Humber', produced by Renaissance Yorkshire. This requires the completion and submission of forms to the relevant museum service at the project initiation, mid-point review and completion stages. The archive will otherwise be prepared in accordance with the UKIC (1990), the Museums and Galleries Commission (1994) and ClfA (2014c) guidelines. Provision will be made for the stable storage of paper records and their long-term storage.

7.7 Upon completion of the investigations, the artefacts, ecofacts and stratigraphic information shall be assessed to ascertain their potential and significance for further analysis.

7.8 An assessment report will be prepared within an agreed timescale following the completion of on-site archaeological investigations and include the following:

- a non-technical summary of the results of the work;
- a summary of the project's background;
- the dates the fieldwork took place;

- the site location, including National Grid Reference;
- an account of the method;
- the results of the evaluation, including phasing and interpretation of the site sequence;
- conservation assessment;
- an assessment of the stratigraphic and other written, drawn and photographic records;
- a catalogue of the archaeological material recovered during the evaluation;
- assessment reports for each material category of finds recovered, including their types, quantities and concentrations, illustrations and/or photographs as appropriate;
- a summary of the contents of the project archive and its location.

7.9 The assessment report will be produced within an agreed time-scale. It will be supported by an overall plan of the site, accurately identifying the location of the evaluation and any findings.

7.10 The assessment report will outline the archaeological significance of the deposits identified, and provide an interpretation of the results in relation to other sites in the vicinity.

7.11 Digital copies of the report will be supplied, if required, to Darrington Quarries Ltd. A digital copy will also be supplied to the North Yorkshire SMR and to Historic England's Science Advisor. Bound paper copies can also be supplied if requested.

7.12 Upon completion of the work, the archaeological contractor will make their work accessible to the wider research community by submitting digital data and copies of reports online to OASIS (<http://ads.ahds.ac.uk/project/oasis/>).

7.13 It is possible that the excavation findings will warrant further reporting and recommendations of the specialists will need to be undertaken in order to produce a final report. Discussions with Peter Rowe at NYCC will be held to establish the level of any further reporting required. Given the expectation that the quarry will extend into Phases 2 and 3, publication is not expected at the conclusion of Phase 1, but it should be anticipated at a later stage in the programme.

7.14 A recommendation on whether further analysis is considered appropriate will first be discussed with Peter Rowe and then be clearly expressed in the assessment report.

8. Copyright, Confidentiality and Publicity

- 8.1 Copyright in the documentation prepared by the archaeological contractor and specialist sub-contractors should be the subject of additional licences in favour of the repository accepting the archive to use such documentation for their statutory educational and museum service functions, and to provide copies to third parties as an incidental to such functions.
- 8.2 Under the Environmental Information Regulations 2005 (EIR), information submitted to the HER becomes publicly accessible, except where disclosure might lead to environmental damage, and reports cannot be embargoed as 'confidential' or 'commercially sensitive'.
- 8.3 Requests for sensitive information are subject to a public interest test, and if this is met, then the information has to be disclosed. The archaeological contractor will inform the client of EIR requirements, and ensure that any information disclosure issues are resolved before completion of the work. Intellectual property rights are not affected by the EIR.
- 8.4 Unless the client commissioning the project wishes to state otherwise, the copyright of any written, graphic or photographic record and reports will rest with the originating body (the archaeological contractor).

9. Health and Safety

- 9.1 The archaeological contractor must have its own Health and Safety policy which has been compiled using national guidelines. These guidelines must conform to all relevant Health and Safety legislation.
- 9.2 In addition each project should undergo a 'Risk Assessment' which sets project specific Health and Safety requirements to which all members of staff are made aware of prior to on-site work commencing. Health and Safety will take priority over archaeological matters. Necessary precautions will be taken over underground services and overhead lines at the outset of the project.

10. Insurance

- 10.1 Appropriate insurance and indemnities must be held by the archaeological contractor.

11. Monitoring

- 11.1 Access to the site will be arranged through Darrington Quarries Ltd.
- 11.2 The project will be monitored by the Peter Rowe to whom notification will be sent before the start of the work. A minimum of one week's notice of the commencement of fieldwork is required.

- 11.3 If appropriate, the advice of the Regional Advisor for Archaeological Science (Yorkshire and the Humber Region) at Historic England will be called upon.
- 11.4 The archaeological contractor will ensure that any significant results are brought to the attention of the client as soon as is practically possible.
- 11.5 Site inspections will be arranged so that the general site stratigraphy can be assessed in the initial stage of stripping and/or so that the site can be inspected when fieldwork is near to completion.

12. Resourcing

- 12.1 The archaeological contractor will need to provide details of key project personnel and post-excavation specialists prior to on-site work commencing, but the following specialists have experience of this landscape and should be contacted where necessary.

- 12.2 Post-excavation specialists:

Prehistoric pottery:	Dr Chris Cumberpatch
Roman pottery:	Dr Ruth Leary or Ian Rowlandson
Medieval pottery:	Dr Chris Cumberpatch
Ceramic building material	Dr Phil Mills
Flint specialist:	Dr Ian P Brooks
Environmental:	Dr Diane Alldritt
Faunal analyst:	Dr Jane Richardson
Human bone:	Malin Holst MA
Metalwork:	Gail Hama
Artefact conservation:	Ian Panter

Appendix 1: Summary of previous archaeological investigations at Barnsdale Bar (see Fig. 1)

Area	Type of Investigation	Date	Reference	Contractor
A	Gradiometer survey	Oct 1996	Webb 1996	ASWYAS
B	Magnetometer survey	Mar 1989	Abramson 1989a	ASWYAS
B	Trial trenches	Oct 1989	Abramson 1989b	ASWYAS
B	Magnetometer survey	Dec 1989	Abramson 1990	ASWYAS
B	Watching brief and trial trenches	May-June 1990	Simpson 1990; 1991	ERARC
C	Gradiometer survey	April 1997	Webb 1997	ASWYAS
C	Trial trenches	June 1997	O'Neill 1997	ASWYAS
D	Geophysical survey	May 1994	Stratascan 1994	Stratascan
D	Fieldwalking and gradiometer survey	Sept-Oct 1995	Webb 1995	ASWYAS
D	Trial trenches	Oct 1996	Speed 1997	ASWYAS
E	Gradiometer survey	July 1993	Boucher 1993	ASWYAS
E	Trial trenches	Sept 1993	Webb 1993	ASWYAS
E	Watching brief	Sept 1996	Brown and Morris 1997	ASWYAS
F	Gradiometer and magnetic susceptibility survey	Feb 1996	Cottrell 1996	ASWYAS
F	Trial trenches	Oct 1998	O'Neill and Whittingham 1999	ASWYAS
F	Open area excavation	April-May 2003, May-June 2004, May 2006, May-June 2008	Grassam and Ford 2008, Richardson and Rose 2009	ASWYAS
G	Gradiometer survey	Nov 1998	O'Neill and Whittingham 1999	ASWYAS
H	Gradiometer survey	Sept 1999-Feb 2000	Webb 2000	ASWYAS
H	Test pitting and trial trenching	March-April 2000	Burgess 2001	ASWYAS
H	Open area excavation	July-Oct 2000	Burgess 2001	ASWYAS
I	Desk-based appraisal and mitigation proposal	July 2003	Roberts 2003	ASWYAS
I	Geophysical Survey	Aug 2003	Webb 2003	ASWYAS
I	Trial trenches	May - June 2004	Gidman 2004	ASWYAS

Area	Type of Investigation	Date	Reference	Contractor
I	Open area excavation	Oct-Dec 2004	Gidman and Roberts 2005	ASWYAS
J	Geophysical survey	May 1994	Stratascan 1994	Stratascan
K	Geophysical survey and trial trenching, followed by open-area excavation	Nov 2014, Sept 2015, Sept 2016	Johnson 2014, Savine 2015, Richardson 2017	Trent and Peak Archaeology, York Archaeological Trust, ASWYAS
L	Geophysical survey and trial trenching	June 2019	Birtles 2019, Castle 2019	Wardell Armstrong

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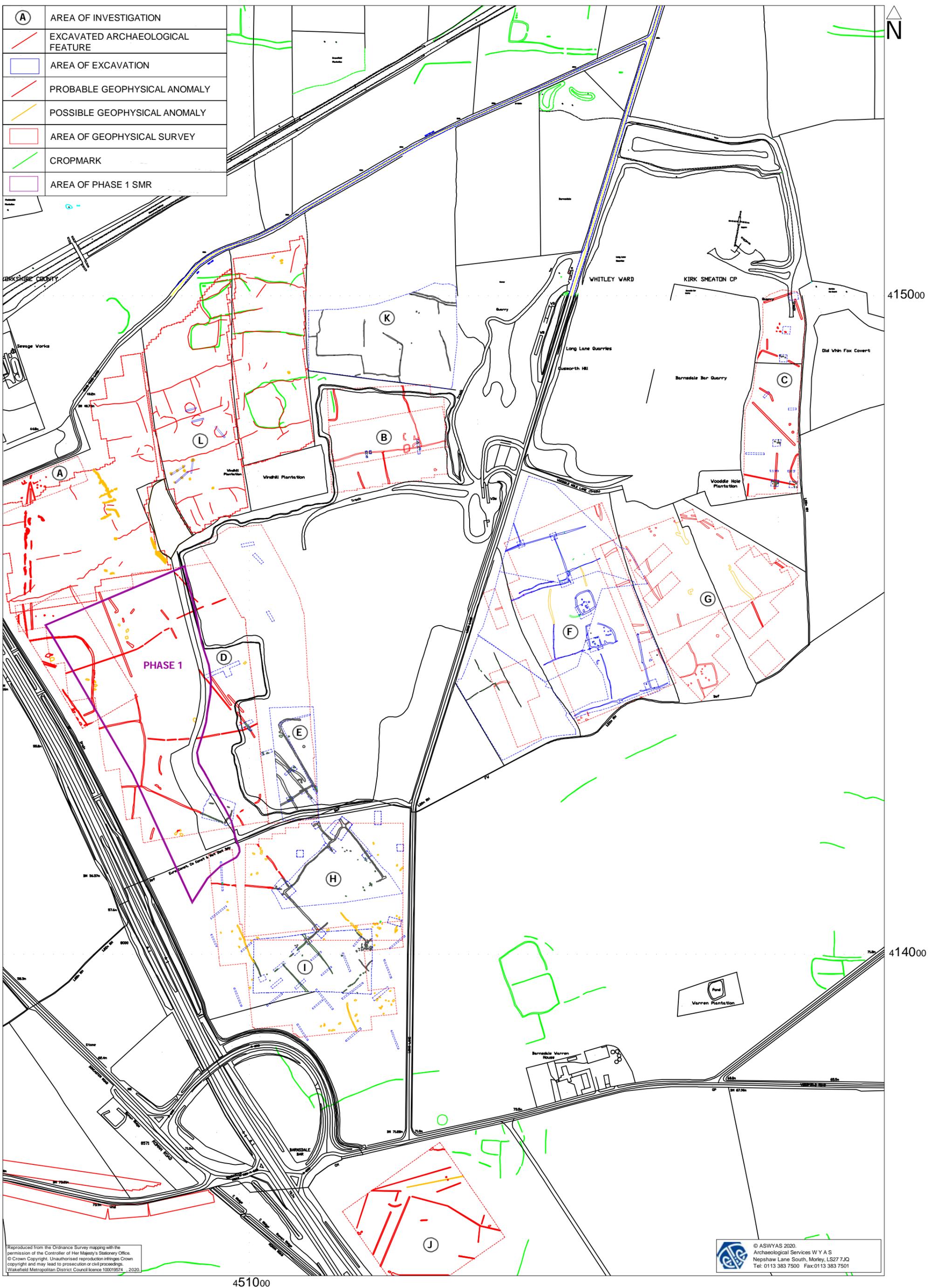


Fig. 1. Location of previous archaeological investigations, cropmark data and proposed Phase 1 Strip, Map and Record (1:5000 scale)