

A geoarchaeological approach to evaluating large land parcels

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In this case study, Clive Waddington, MD of ClfA Registered Organisation ARS Ltd, sets out the case for using a wider spectrum of techniques for evaluation. He argues that a phased approach based on high-quality data from a wider range of non-intrusive techniques supports more targeted, question-led trial trenching and, ultimately, better decision-making. Engaging the services of accredited archaeologists who have committed to working to professional standards at an early stage means they are able to advise clients on the most effective approaches for their development to create positive outcomes for both clients and the public.



Aerial view of the wetland basin after soil stripping where two pond-side Early Mesolithic camps were discovered ©Archaeological Research Services Ltd



Excavation of one of the Early Mesolithic tepee-type structures with the hearth and the remains of its last fire visible in the foreground ©Archaeological Research Services Ltd

Finding rapid, cost-effective ways to evaluate large land parcels for archaeological and palaeoenvironmental remains has always been a challenge for developers and archaeologists. Archaeologists acting for developers have used various techniques over the years to evaluate sites in advance of development, with some, such as aerial photograph transcription, general remote sensing and geophysical surveys, making huge contributions to the number and location of new sites. For those areas where there is little pre-existing remote sensing data or which have geologies, soils or ground conditions unfavourable to crop or soil mark formation, and/or which have restricted scope for geophysical survey, other approaches for evaluation of these areas need to be found.

Following an in-depth study in the Till-Tweed basin by the author and colleagues, a geoarchaeological methodology has been devised, termed the 'landform element' approach. Importantly, this is a phased approach, whereby archaeologists initially map,

take sediment cores and survey a given land parcel to partition it into a series of discrete landforms. For each of these landforms they identify the archaeological potential and the types of methods most appropriate to their evaluation and they use this to drive the subsequent evaluation of the area.

The case study from Killerby Quarry, North Yorkshire was approached in this way. Here, as part of the desk-based assessment for this new quarry, we created a detailed geoarchaeological landform element map for the land parcel. We followed this with a phased programme of evaluation that included targeted sediment coring, range finder dating and assessment of data collected from ancient features on the floodplain, such as buried channels and basins, that could tell us about past environmental conditions. We undertook an extensive fieldwalking survey at close spaced intervals to maximise finds recovery, with a particular emphasis on chipped stone artefacts. Following



Aerial view of excavations following initial stripping and sampling works on one of the kettle holes
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on from these studies we conducted targeted geophysical survey and evaluation trenching. Once this site received planning permission, we undertook archaeological recording, analysis and dissemination of the results, based on a scalable watching brief or strip, map and sample planning condition, together with the targeted sample excavation of specific floodplain features.

We selected this approach as it provided an appropriate method for rapidly and accurately assessing a large land parcel. The planning authority required a high level of information to inform its planning decision on this large-scale development. The approach enabled us

to devise the most appropriate approach to post-permission works and gave confidence to the developer regarding what the scale and cost was likely to be. By creating a tailored, question-led approach we could determine what was significant about this landscape and the type of archaeological and geoarchaeological records it contained. From the outset and in a phased approach, we targeted the investigation in a way that avoided the need for digging several hundred evaluation trenches across this landscape. This meant that

- there was virtually no impact on surviving sub-surface archaeological remains during the evaluation
- we left no large scars on the field surface



View across the Late Mesolithic timber platform, built out into the kettle hole pond where chipped flints and timber posts were found ©Archaeological Research Services Ltd

- we avoided a high carbon footprint from extensive machining
- we could work quickly
- our clients considered the cost of the works good value for money

This phased approach meant that the bulk of the client's investment took place after planning permission was granted, when the client's revenue was assured, and it was spent on gathering new and significant information in a targeted programme of archaeological investigation.

The technique proved highly successful, as we were able to focus on a kettle hole (a type of

hollow formed by melting ice) and enclosed wetland basins, examining their archaeological remains as well as their palaeoenvironmental sequence for one of the first times in British commercial archaeology. The results have been stunning and have added genuinely new knowledge and data to our understanding of the transition period from the end of the last Ice Age. This has included the discovery of three Early Mesolithic pond-side camps, with the structural timbers and hearth of the tepee-like dwellings surviving in remarkable condition, despite dating to about 9000 BC. We found a substantial Late Mesolithic timber platform dating to about 5500 BC, extending out into a small pond inside a kettle hole



*Recording a well preserved sediment stack within the kettle hole containing the Late Mesolithic timber platform. A detailed and highly informative paleoenvironmental record from the Late Glacial through to the mid-Holocene was retrieved.
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along with finds of cattle teeth, chipped flints and a stone rubbing tool, as well as posts, postholes and other features. We have interpreted this as a platform for processing animal skins and potentially curing hides in the pond. This site also had successive occupation in the Neolithic and Bronze Age, stratified above the Mesolithic remains. In both cases these well-preserved archaeological remains also had preserved alongside them a continuous palaeoenvironmental sequence of deposits that can tell us about landscape development and human activity in the immediate surrounding landscape.

These are remarkable discoveries that have been found as a result of the application of a specific evaluation technique and not by chance. We have ground tested the landform element approach in real-world settings on a large scale and on several sites. It has proved effective in identifying the best range and use of evaluation techniques, recovering what is archaeologically significant about an area, as well as in directing the best use of spend, at the right times, in the discharge of planning requirements.