Environmental research design for a project at Longstone Edge, Derbyshire, CAS 472

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1 Introduction

1.1 The types of ecofacts that are often recovered from excavations include animal and human bone, mollusca, insects, plant macrofossil remains and pollen. Other ecofacts may be recovered including diatoms, ostracods, phytoliths and foraminifera. Pedological evidence may also be examined to enable an understanding of soil formation processes. The preservation of ecofacts is dependent on soil conditions and these may preclude preservation of some categories of ecofacts.

1.2 The solid geology at the site consists of limestone. The soils at the site are of the XXXXXXXX association and this suggests that preservation of ecofactual remains may include bone, charred remains, molluscan remains and pollen.

1.3 The quality and quantity of ecofacts that will be recovered from this excavation is unknown. However a single fragment of human bone was recovered during evaluation.

2 Aims

2.1 The aims of the environmental strategy are to:

2.1.1 Recover ecofacts which will give evidence of environmental and economic change both spatially and temporally using features which are securely stratified and well dated;

2.1.2 Examine ecofactual material from features which may be of unknown purpose to determine possible function;

2.1.3 Examine site formation and taphonomic processes.

3 Methods: Sample recovery

3.1 The environmental strategy will adopt methods which will enhance the retrieval of ecofacts without bias against the recovery of artefactual remains.

3.2 All samples will consist of whole earth, that is, no ecofacts or artefacts will be removed unless the sample processing will have a detrimental effect on the find itself. In some cases small finds may require three dimensional recording before a soil sample can be collected. If fragile finds are removed from a soil sample, these will be labelled with both the context and sample number. If a sample is suspected of containing a number of fragile artefacts, the sample will be examined manually before processing.

3.3 Within most of the trenches, samples should be taken at set intervals for each stratigraphic layer. These will be determined as appropriate by the PO in consultation with the EA and specialists (and FO where appropriate) in the initial stages of the project.

3.4 It is recommended that features should be half sectioned and sampled from the unexcavated half of the feature after recording. The sampling strategy may be adjusted by the PO in consultation

with the specialists and EA (and FO where appropriate) for some features after initial assessment of samples on site. The change in sampling strategy must be recorded in the site records as appropriate.

3.5 Each bulk sample should consist of a minimum of 20 litres of soil (two blue buckets). Larger samples may be collected from features and layers where required; collection of these larger samples will be determined by the PO in consultation with the EA and specialists (and the FO where appropriate). These larger samples may be recovered, for example, from a cremation or from early prehistoric deposits.

3.6 If a layer of burnt material representing a cremation is noted, this will be gridded and 100% sample of the material collected.

3.7 If the volume of a feature half sectioned is smaller than 20 litres, 100% of the feature should be sampled.

3.8 The blue buckets used for sampling should be labelled both inside and out with the bucket number, sample number and context number. The sample must be fully recorded on the sample record form. Of particular importance for this site is the volume of samples recovered; this **must** be recorded.

3.9 For the area of Barrow 1 which is adjacent to the cliff edge, the area will be gridded in 0.5m squares and 100% sampling will be undertaken of each spit.

3.10 For any graves noted, the bulk skeletal material and finds will be excavated by hand and the remaining soil collected in blue buckets.

3.11 Sections will be made available to the AML specialists for pedological, pollen analysis and lipid/bone analysis and sampling will be undertaken by the specialists unless the EA is instructed otherwise.

4 Methods: Sample processing

4.1 The time taken to process samples is dependent on the type of soils from which the samples are taken. For this site, the soils of the XXXXXXXX association are very light and this will enable the samples to be processed rapidly.

4.2 Each dry bulk sample (preferred minimum size 20 litres) will be processed by flotation at Fort Cumberland for the recovery of plant macrofossil remains, charcoal, insects, mollusca and bones.

4.3 The mesh sizes used for the flot and residue will be 500µm and 1mm respectively.

4.4 The remainder of the sample after initial flotation of 20 litres will normally be processed by wet sieving at 4mm and/or 1mm to enable recovery of larger bones and artefactual remains. Further samples, for example from cremations, may require flotation as determined by the specialists and the EA. If the samples processed by flotation are found to be unproductive, a discard policy will be instigated by the EA and specialists in consultation with the PO and (and the FO where appropriate) for the bulk samples recovered from the site.

4.5 Samples collected from the cliff edge area will be dry sieved on site using a 10mm mesh for each

grid square, retaining one bucket (10 litres) for flotation at Fort Cumberland to check finds and environmental recovery.

4.6 A single blue bucket from each grave sample will be dry sieved on site using a 10mm mesh as a control sample. If artefacts and environmental remains are abundant, the remainder of the sample will be processed at Fort Cumberland using flotation.

5 Methods: Sorting of samples

5.1 When sorting dry sieved samples on site, all artefacts and ecofacts larger than 10mm should be recovered from the residue. The material which has gone through the garden sieve can be discarded.

5.2 When sorting dry samples from flotation at Fort Cumberland, all artefacts and ecofacts larger than 4mm should be recovered from the residue. A percentage of the 2-4mm residue should be sorted; this is usually 25% unless advised otherwise by specialists in consultation with the EA. The component of the residue less than 2mm in size should not normally be examined but should be retained for specialist assessment and analysis where appropriate.

5.3 A series of minimum default sizes of different material types are to be used for sorting sample residues. These will be modified by consultation with specialists according to the type of site under investigation. For other material types, all fragments should be recovered.

5.4 The minimum default sizes for recovery of material while sorting residues are as follows:

Charcoal: not less than 4mm
Oyster shell: not less than 10mm (1cm)
Other marine shell: not less than 4mm
Bone shaft fragments: not less than 2mm

5.5 The flots from the dry bulk samples will not be sorted on site, but will be examined by specialists.

Time required and tasks

Stationery and equipment lists: 0.5 days, CdeR

Site visit, 12-13 Aug, 2 days, CdeR

Site visit, ?27 August, 1 day, CdeR (dependent on JS and her visits)

Site visit, week of 12 Sept, 2 days, CdeR

If the site continues for 10 weeks, more visits will be required, probably to a total of 4 days. One of the site visits will act as liaison time with Matt Canti (soils) and James Greig (pollen).

Plant macro assessment: 5 days. This can only take place after the bulk samples for flotation have been processed at Fort Cumberland and is a guestimate at the moment. The 5 days includes 3 days to look at the samples and 2 days writing.

Specialist liaison, 2 days: this is to enable exchange of information, discussion of results, drawing together of reports, etc. Please note that if soil micromophology or pollen assessment/analysis is required, then it could be several months before results are made available.

Finds/enviro on site

This will be hopefully done by Sarah Burgess. She is conversant with the CAS finds and environmental recording systems. She will need to be employed for a number of weeks after the excavation has finished, depending on the length of excavation time. The flotation of samples must be undertaken before the plant macro assessment (and any cremations assessed by Simon Mays) is done.