

# Ferruginous material from Four Crosses, DFC 04

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## Abstract

*Four samples tentatively identified as slag and nine samples of magnetic separates from site DFC 04 were examined to identify any possible anthropogenic input.*

*Investigation showed only two sand-sized particles possibly identifiable as slag, but these were too small for a certain identification. The remainder of the assemblages comprised a mixture of natural stone, burnt organic matter and a material with a flake morphology which was probably natural, but which might be rust from metallic iron.*

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## Description

Summary descriptions of the samples are provided in Table 1, below. The following categories of material have been recognised:

### 1. Non-magnetic Fe-rich weathered stone.

This material dominates the assemblages tentatively identified as slag. The material is highly weathered, and appears to be mainly associated with weathered fault rock. Several pieces show slickensides, and the most likely original mineralogy is an iron-rich carbonate.

### 2. Magnetic particles with a flake morphology.

This material is difficult to identify with certainty, since the weathered crusts formed on pieces of iron, and on iron-rich rocks may be very similar. These particles are certainly not hammer-scale. The most likely source of this material is weathered iron-rich fine-grained rocks (shale), but if iron artefacts are present in any of these contexts then they may just be "rust".

### 3. Magnetic particles with a rounded morphology.

This material seems to be dominated by a slightly reddish or brownish siltstone. Natural weathering of iron-rich minerals might produce sufficient magnetism to explain the properties of these grains, but this would certainly be aided if the grains had been heated.

### 4. Burnt organic matter – BOM.

The small particles of BOM recorded may be difficult to assign to a precise material. Some of them are certainly charcoal, others less certainly and a contribution from burnt bone or other materials (e.g. pot residues) would be hard to exclude.

### 5. Iron pan and Fe-Mn coated grains.

These non-magnetic particles appear in some of the "slag" samples are natural products of deposition of Fe-Mn rich precipitates within the natural gravels.

### 6. Slag

Only one tiny grain (in sample 26) may possibly be crystalline slag. This is a dark granular magnetic material, with a slightly metallic lustre. Without detailed analysis it is not possible to be certain of the origin of this grain, and in the absence of other slag material its identification should remain suspect.

### 7. Dark glass

A single grain of dark glassy material (in sample 1) might be slag, but similar materials do occur naturally. Without further analysis identification is uncertain.

### 8. Magnetic Fe-rich films.

This material formed curved fragments, with a yellowish brown colour. They are likely to be deposits of iron-rich weathering products, and are therefore probably natural.

## Discussion

Apart from the possible slag particle in sample 26, context 1476, and the glassy material in sample 1, context 1058, there were no materials which were likely to derive from metallurgical processes.

The dominant magnetic material comprised rounded grains, apparently of a fine-grained sediment, which were quite strongly magnetic. It is possible that the magnetic properties of these materials have been enhanced by heating. In all but one sample, these rounded grains were accompanied by a more flake-like material, which is probably derived from the weathering of an iron-rich shale, although some particles may be rust.

Burnt organic matter, dominantly charcoal, occurred in three of the four "slag" samples.

Context	Sample	Label	Description
1058	1	slag	lots of Fe-rich, weathered stone, 1 piece flake, 1 piece BOM, 1 piece dark glass, 1 organic object.
1081	2	magnetic	2 pieces of flake, 1 rounded grain, 4 pieces of Fe-rich film
1081	2	slag	weathered Fe-rich stone
1216	3	slag	approx 80 pieces BOM (mainly charcoal), 1 piece Fe-cemented sediment
1216	3	magnetic	6 pieces of flake, 2 rounded grains
1234	4	slag	1 piece Fe-pan sediment, 1 Fe-Mn coated stone, 8 pieces BOM
1234	4	magnetic	c. 35 pieces of flake, 1 rounded grain
1345	7	magnetic	24 rounded grains, 4 pieces of flake
1355	8	magnetic	43 rounded grains
1367	12	magnetic	1 piece flake, 27 rounded grains
1376	16	magnetic	8 pieces of flake, 9 rounded grains
1408	19	magnetic	c15 pieces of flake, 27 rounded grains
1476	26	magnetic	3 pieces flake, 1 piece possible slag, 5 rounded grains plus a few quartz grains (non-mag)

*Table 1. List of samples with summary descriptions*