

8. APPENDIX 1: ANALYSIS OF BLACK RESIDUE ON TWO CERAMIC SHERDS FROM BALURE

Susanna Kirk

Two small ceramic sherds (<100> SF116) from Balure with a black residue on their inner surfaces were analysed non-destructively by XRF to check for inorganic residues. The XRF system used was an Oxford Instruments ED 2000 with Oxford Instruments software ED2000SW version 1.31. The analysed area was irradiated with a primary X-ray beam produced by a Rhodium target X-ray tube. The primary beam was collimated to give an analysed area of about 4 × 2mm. Secondary X-rays were detected with a silicon (lithium) solid state detector. The detection limit varies depending on the elements, matrix and analytical conditions, but typically in the range of 0.05%–0.2%. As the

analytical technique has a limited penetration depth, the reported compositions may not represent the bulk of the alloy if there is a chemically distinct surface layer. Spectra were collected under the conditions ‘Old XRF’. This uses operating voltage of 46kV and a current of up to 1000µA (set automatically for a 45% dead time) without a primary beam filter to ensure detection of all elements of atomic number 19 or above.

The XRF results show no visible difference in spectra from the residue and the exterior of sherds. There are no elements present that would be unexpected in fired clays. No traces of inorganic residues were found, the analyses of the inside and outside of the fragments being very similar. This suggests that the residues are not inorganic in nature and would require further analysis using different techniques to identify them.