Title
An Energy-Dispersive X-Ray Fluorescence Major Oxide and Trace Element Analysis of Two Artifacts from AZ EE:9:1 (ASM)

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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE MAJOR OXIDE AND TRACE ELEMENT ANALYSIS OF TWO ARTIFACTS FROM AZ EE:9:1 (ASM).

21 April 2015

Dr. Barnet Pavao-Zuckerman  
Department of Anthropology  
University of Arizona  
Tucson, AZ 85721-2976

Dear Barney,

As you suspected, the one projectile point (FN 1636) is likely bottle glass given the oxide and trace element chemistry, and the one small piece (FN 308) is likely a lead slag fragment given the high Pb and As concentrations (Table 1). It appears that there was some smelting at the site, at least for lead, perhaps for weapon balls. I’ve seen many bottle glass projectile points in Mission period Kumeyaay sites in San Diego County as well. Specific instrumental methods can be found at http://www.swxrflab.net/anlysis.htm, and Shackley (2005).

Sincerely,

M. Steven Shackley, Ph.D.  
Director

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INTERNET: shackley@berkeley.edu  
http://www.swxrflab.net/
REFERENCE CITED

Shackley, M.S.

Table 1. Major and minor oxide and trace element concentrations for the archaeological sample, and USGS RGM-1 obsidian standard. All measurements in parts per million (ppm).

<table>
<thead>
<tr>
<th>Sample</th>
<th>Na2O</th>
<th>MgO</th>
<th>Al2O3</th>
<th>SiO2</th>
<th>P2O5</th>
<th>Cl</th>
<th>K2O</th>
<th>CaO</th>
<th>TiO2</th>
<th>MnO</th>
<th>Fe2O3</th>
<th>As2O5</th>
<th>Zn</th>
<th>Ga</th>
<th>Rb</th>
<th>Sr</th>
<th>Y</th>
<th>Zr</th>
<th>Nb</th>
<th>Ba</th>
<th>Pb</th>
<th>Th</th>
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<tr>
<td>1636</td>
<td>2.965</td>
<td>4.42</td>
<td>6.486</td>
<td>60.06</td>
<td>0.261</td>
<td>0.55</td>
<td>3.303</td>
<td>18.35</td>
<td>0.318</td>
<td>0.25</td>
<td>2.72</td>
<td>0.003</td>
<td>181</td>
<td>13</td>
<td>39</td>
<td>1159</td>
<td>18</td>
<td>122</td>
<td>2</td>
<td>1053</td>
<td>68</td>
<td>9</td>
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<tr>
<td>308</td>
<td>15.31</td>
<td>1.779</td>
<td>2.621</td>
<td>30.71</td>
<td>2.057</td>
<td>0.593</td>
<td>3.319</td>
<td>11.65</td>
<td>0.336</td>
<td>0.556</td>
<td>5.786</td>
<td>0.944</td>
<td>26870</td>
<td>20</td>
<td>25</td>
<td>156</td>
<td>1</td>
<td>84</td>
<td>0</td>
<td>1349</td>
<td>4034</td>
<td>3</td>
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<td>RGM1-H2</td>
<td>4.065</td>
<td>0</td>
<td>13.25</td>
<td>74.38</td>
<td>0</td>
<td>0.038</td>
<td>4.563</td>
<td>1.309</td>
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<td>0.037</td>
<td>1.949</td>
<td>0.001</td>
<td>26</td>
<td>18</td>
<td>144</td>
<td>109</td>
<td>26</td>
<td>212</td>
<td>12</td>
<td>680</td>
<td>22</td>
<td>11</td>
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