LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM FREMONT COUNTY, SOUTH-CENTRAL COLORADO

23 May 2012

Kevin Black
Office of Archaeology and Historic Preservation
History Colorado Center
1200 Broadway
Denver, CO 80203

Dear Kevin,

As you suspected, all the artifacts were produced from one of the sources in the Jemez Mountains, one from Valles Rhyolite (Cerro del Medio), and three from El Rechuelos, the latter available as secondary deposits in the Rio Chama and Rio Grande north and east of the Jemez Mountains (Shackley 2005; Table 1 here). One sample was not obsidian, the high Fe and Mn suggest iron ore or slag (Table 1).

The samples were analyzed using a Thermo Scientific Quant’X EDXRF spectrometer in the Archaeological XRF Laboratory, Albuquerque, New Mexico. Source assignments were made by comparison to published source standard data and the source standard collection at this laboratory (Shackley 1995, 2005). Instrumental methods can be found at http://www.swxrflab.net/anlysis.htm. Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Govindaraju 1994; Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

VOICE: (510) 393-3931
E-mail: shackley@berkeley.edu
http://www.swxrflab.net/
REFERENCES CITED


Table 1. Elemental concentrations for the archaeological samples. All measurements in parts per million (ppm).

<table>
<thead>
<tr>
<th>Sample</th>
<th>Ti</th>
<th>Mn</th>
<th>Fe</th>
<th>Rb</th>
<th>Sr</th>
<th>Y</th>
<th>Zr</th>
<th>Nb</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2663</td>
<td>975</td>
<td>404</td>
<td>1057</td>
<td>168</td>
<td>12</td>
<td>41</td>
<td>170</td>
<td>63</td>
<td>Valles Rhyolite (Cerro del Medio)</td>
</tr>
<tr>
<td>2349-1</td>
<td>921</td>
<td>391</td>
<td>7412</td>
<td>145</td>
<td>12</td>
<td>19</td>
<td>68</td>
<td>44</td>
<td>El Rechuelos</td>
</tr>
<tr>
<td>2658</td>
<td>984</td>
<td>453</td>
<td>8213</td>
<td>167</td>
<td>13</td>
<td>24</td>
<td>74</td>
<td>49</td>
<td>El Rechuelos</td>
</tr>
<tr>
<td>2601-3</td>
<td>7089</td>
<td>1191</td>
<td>6577</td>
<td>2</td>
<td>75</td>
<td>17</td>
<td>46</td>
<td>0</td>
<td>not obsidian</td>
</tr>
<tr>
<td>2666-1</td>
<td>1060</td>
<td>421</td>
<td>8273</td>
<td>151</td>
<td>14</td>
<td>23</td>
<td>67</td>
<td>47</td>
<td>El Rechuelos</td>
</tr>
<tr>
<td>RGM1-S4</td>
<td>1576</td>
<td>283</td>
<td>1333</td>
<td>148</td>
<td>110</td>
<td>27</td>
<td>216</td>
<td>6</td>
<td>standard</td>
</tr>
</tbody>
</table>