Title
An Energy-Dispersive X-Ray Fluorescence Analysis of Obsidian Artifacts from Archaeological Sites Near Deming, New Mexico

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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM ARCHAEOLOGICAL SITES NEAR DEMING, NEW MEXICO

9 January 2002

Dr. David Kirkpatrick
Human Systems Research, Inc.
PO Box 728
Las Cruces, NM 88204

Dear David,

The artifact assemblage exhibited a remarkably diverse source provenance. The cruciform from LA 134706 was produced from one of the Mule Creek sources, but Sample 303 from LA 135139 is probably a chert flake. The one unknown does not match any known samples from north or south of the border (Shackley 2003). Samples 149 or 321 assigned to Cerro Toledo Rhyolite, could have been procured from the Rio Grande alluvium where this and other sources from northern New Mexico have been deposited (Shackley 1997, 2003).

The samples were analyzed with a Spectrace (ThermoNoran) QuanX EDXRF spectrometer in the Archaeological XRF Laboratory, University of California, Berkeley. Instrumental methods can be found at http://obsidian.pahma.berkeley.edu/analysis.htm. Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Govnidaraju 1994; Table 1 here). Source determination was made using source standards at Berkeley, and reference to Shackley (1995, 2003).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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INTERNET: shackley@uclink.berkeley.edu
http://obsidian.pahma.berkeley.edu/
REFERENCES CITED

Davis, M.K., T.L. Jackson, M.S. Shackley, T. Teague, and J.H. Hampel  
1998 Factors Affecting the Energy-Dispersive X-Ray Fluorescence (EDXRF) Analysis of  
Archaeological Obsidian. In Archaeological Obsidian Studies: Method and Theory, edited by  
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Govindaraju, K.  
1994 1994 Compilation of Working Values and Sample Description for 383  

Shackley, M.S.  
1995 Sources of Archaeological Obsidian in the Greater American Southwest: An Update and  

1997 An Energy-Dispersive X-Ray Fluorescence (EDXRF) Analysis of Kaake and Phelps  
Collection Obsidian Cruciforms From Texas and Chihuahua. Report prepared for Jeff Kaake  
and Arizona State Museum. Ms. in possession of author.

2003 Little Black Rocks in the Desert: The Geology and Archaeology of Obsidian in the North  

Table 1. Elemental concentrations for the archaeological sample. 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>Th</th>
<th>Source</th>
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<td>1159</td>
<td>421</td>
<td>10817</td>
<td>344</td>
<td>23</td>
<td>38</td>
<td>105</td>
<td>31</td>
<td>40</td>
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<tr>
<td>321</td>
<td>1204</td>
<td>518</td>
<td>10577</td>
<td>172</td>
<td>0</td>
<td>47</td>
<td>144</td>
<td>89</td>
<td>0</td>
<td>Cerro Toledo Rhy*</td>
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<tr>
<td>303</td>
<td>936</td>
<td>138</td>
<td>4364</td>
<td>0</td>
<td>17</td>
<td>5</td>
<td>11</td>
<td>3</td>
<td>0</td>
<td>not obsidian</td>
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<tr>
<td>LA 134706</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>76</td>
<td>1240</td>
<td>376</td>
<td>10165</td>
<td>231</td>
<td>26</td>
<td>40</td>
<td>110</td>
<td>23</td>
<td>23</td>
<td>Mule Cr/AC-MM</td>
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<td>149</td>
<td>1157</td>
<td>546</td>
<td>10513</td>
<td>200</td>
<td>11</td>
<td>62</td>
<td>181</td>
<td>100</td>
<td>18</td>
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<tr>
<td>RGM-H1</td>
<td>1828</td>
<td>311</td>
<td>14031</td>
<td>149</td>
<td>113</td>
<td>22</td>
<td>220</td>
<td>5</td>
<td>11</td>
<td>standard</td>
</tr>
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</table>

* This sample was small enough that the elemental concentrations are slightly outside the range for Cerro Toledo  
Rhyolite obsidian, but highly likely to have been produced from that source (see Davis et al. 1998).