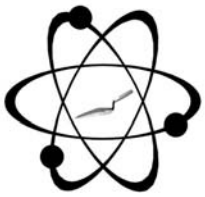

GEOARCHAEOLOGICAL XRF LAB

GEOARCHAEOLOGICAL X-RAY FLUORESCENCE SPECTROMETRY LABORATORY
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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM TWO SITES NEAR NUTT MOUNTAIN, SIERRA COUNTY, NEW MEXICO

19 November 2015

John D. Cater
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PO Box 1156
Aztec, NM 87410-1156

Dear John,

The analysis here of four obsidian artifacts from two sites near Nutt Mountain, southern New Mexico indicates local procurement of the ash flow deposit Nutt Mountain obsidian source nearby, and the Grants Ridge source from Mount Taylor, northern New Mexico, although the latter is available in Rio Grande Quaternary alluvium to the east of the sites (see Church 2000 and Shackley 2012, 2014; Table 1 and Figure 1 here). The Nutt Mountain source was relatively recently discovered by Tim Church and sampled, mapped, and analyzed by this laboratory in 1996, 2008, and 2013 (Shackley 2014). The Nutt Mountain marekanites are part of an ash flow sheet distributed over a large area east of the Nutt Mountain rhyolite neck. It is not clear, as yet, what the relationship is between Nutt Mountain and the obsidian, but they are both likely from the same magma source. Specific instrumental methods can be found at http://www.swxrflab.net/anlysis.htm, and Shackley (2005). Source assignment was made by comparison to source standard data in the laboratory. Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Shackley 2011; Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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http://www.swxrflab.net/

REFERENCES CITED

Church, T., 2000, Distribution and sources of obsidian in the Rio Grande Gravels of New Mexico. *Geoarchaeology* 15:649-678.

Shackley, M.S. ,2005, *Obsidian: Geology and Archaeology in the North American Southwest*. University of Arizona Press, Tucson.

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Shackley, M.S., 2012, The Secondary distribution of archaeological obsidian in Rio Grande Quaternary sediments, Jemez Mountains to San Antonito, New Mexico: inferences for prehistoric procurement and the age of sediments. Poster presentation at the Society for American Archaeology, Annual Meeting, Memphis, Tennessee.

Shackley, M.S., 2014, Elemental and isotopic variability in Mogollon-Datil Volcanic Province obsidian, western New Mexico: issues in XRF analysis. Poster presented at the 40th International Symposium on Archaeometry, Los Angeles.

Table 1. Elemental concentrations for the archaeological samples and USGS RGM-1 obsidian standard. All measurements in parts per million (ppm).

Site/Sample	Ti	Mn	Fe	Zn	Rb	Sr	Y	Zr	Nb	Source
012-11-OB1	1113	477	11756	62	181	25	29	119	22	Nutt Mtn Rhy
012-11-OB2	705	462	11043	71	195	29	27	120	21	Nutt Mtn Rhy
012-15-OB1	866	490	11379	99	203	27	30	123	23	Nutt Mtn Rhy
012-15-OB	516	759	11620	200	567	12	79	115	192	Grants Ridge, Mt Taylor
RGM1-S4	1530	290	13751	40	150	106	27	220	9	standard

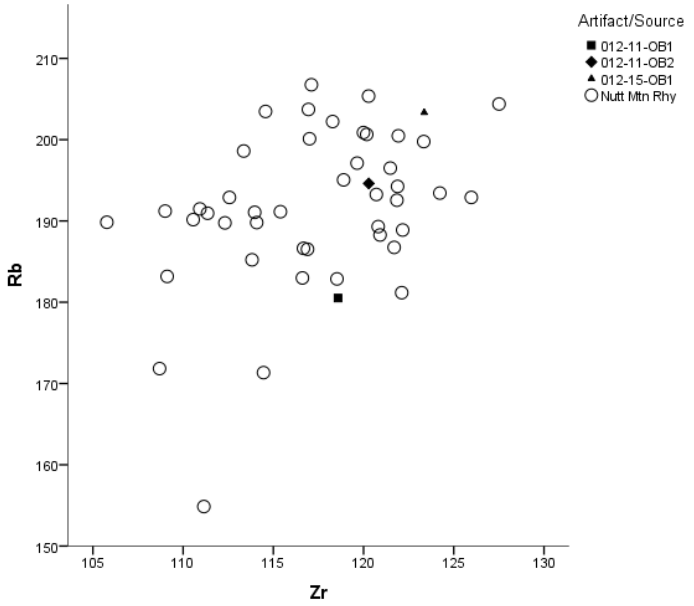

Figure 1. Zr versus Rb bivariate plot of the artifact and Nutt Mountain source data (from Shackley 2014).