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AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM PINTO CANYON RANCH, SOUTHWESTERN TEXAS

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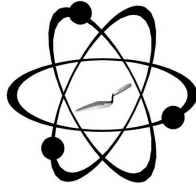
Shackley, M. Steven

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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM PINTO CANYON RANCH, SOUTHWESTERN TEXAS

30 September 2019

Bryon Schroeder
Sul Ross University/CBBS
Box C-71
Alpine, TX 79832

Dear Bryon:

The mix of sources is similar to the previous study (Shackley 2019) with the addition of sources to the west of the Sierra Madre ridgeline in Sonora (see Table 1 and Figure 1; Kibler et al. 2014; Shackley 2005). The TX Unknown A type is also present as well as Jemez Mountains obsidian most likely procured from Rio Grande Quaternary alluvium, and the two Chihuahuan source present in the previous study (Church 2000; Shackley 2012). The assignment to Lago Barreal is not confident with some elements outside the range of the source standards and that there are only eight source standards known from that source (Shackley 2005). See previous study for a more extensive discussion of sources and regional geology (Shackley 2019).

Specific instrumental methods can be found at <http://www.swxrflab.net/analysis.htm>, and Shackley et al. (2016). Source assignment was made by comparison to Shackley (2005) as well as Kibler et al. (2014). Analysis of the USGS RGM-1 standard indicates high instrument precision for the elements of interest (Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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<http://www.swxrflab.net/>

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

CBBS#	Ti	Mn	Fe	Zn	Rb	Sr	Y	Zr	Nb	Ba	Source
69	1686	1004	2912 9	334	271	14	154	1660	130	0	Los Jagueyes, CHIH
70	1271	681	1637 8	236	269	9	81	721	107	0	TX Unknown A
71	1605	772	1964 2	211	269	13	74	652	40	0	TX Unknown A
72	1608	742	1812 1	272	280	11	86	728	96	0	TX Unknown A
73	1327	836	2546 9	272	280	13	145	1444	130	0	Los Jagueyes, CHIH
74	1077	747	1781 1	192	285	14	96	788	110	5	TX Unknown A
75	900	522	1105 3	106	214	9	61	190	102	0	Cerro Toledo Rhy
76	1449	359	1022 5	59	199	87	30	199	22	1169	Agua Fria, SON
77	1191	330	1051 4	58	278	39	65	160	37	178	Sierra Fresnal, CHIH
78	1462	821	2566 3	272	264	13	157	1483	134	0	Los Jagueyes, CHIH

79	1579	974	2860 6	330	291	12	154	1509	128	0	Los Jagueyes, CHIH
80	1029	337	1735 6	435	357	16	209	530	173	10	Lago Barreal?
81	955	288	1510 4	349	333	16	207	527	178	19	Lago Barreal?
82	1610	404	1129 4	76	164	132	24	142	17	1509	Selene, SON
RGM1- S4	1633	299	1320 8	47	147	108	26	215	13	833	standard

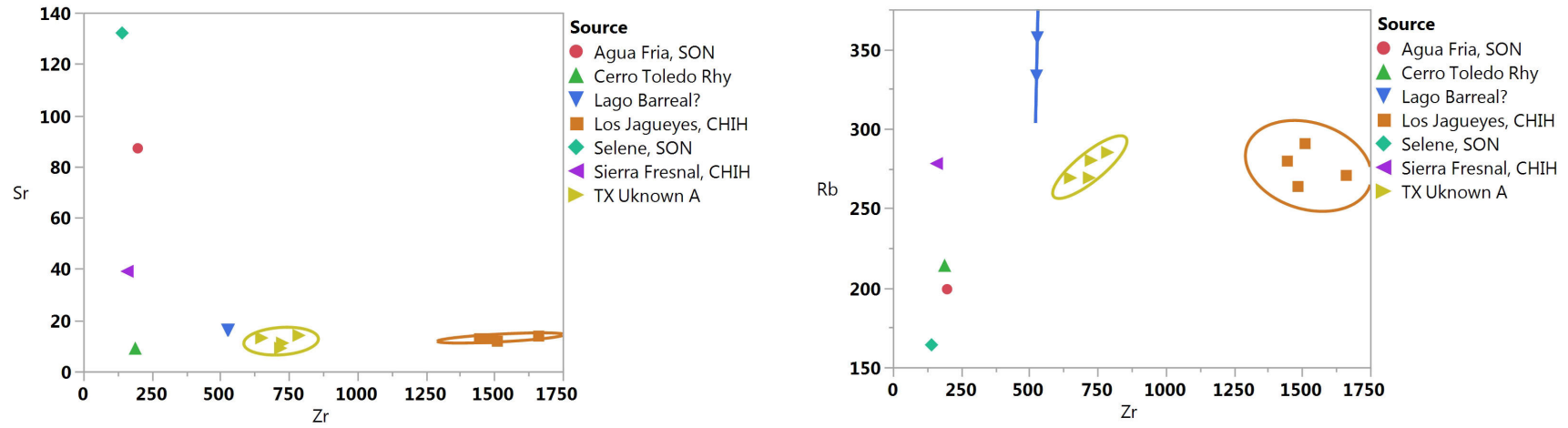


Figure 1. Zr/Sr and Zr/Rb bivariate plots of the archaeological samples. Confidence intervals at 95%.