

Data Repository item 2004026

DATA REPOSITORY: Analytical Methods

Whole rock geochemistry was completed on splits from 2–5 kg samples of McCoy sandstone. Samples were crushed in steel and WC jaw crushers and ground in a WC mill. Analyses for most major elements were performed on fused glass disks on a Rigaku SMAX in the X-ray Spectrographic Laboratory at Michigan State University. Precision is about 1% for most major and minor elements. Standards used for calibration were USGS rock standards. Ignition loss was performed at 1000°C on samples dried at 110°C.

Zircons were separated from 1–5 kg samples of McCoy sandstone and associated granitic rocks using standard processing techniques. Individual zircons from mineral separates were mounted in epoxy, polished, and coated with gold prior to analysis. Interiors of zircons from the metasedimentary rocks were analyzed based on reflected light photomicrographs, without any attempt to sort by size, shape, or color. Zircons from granitic rocks were imaged with cathodoluminescence (CL) scanning electron microscopy prior to analysis to guide selection of analysis points in what are most commonly heterogeneous grains. U-Th-Pb analyses were carried out on the SHRIMP-RG (Sensitive High Resolution Ion MicroProbe – Reverse Geometry) ion microprobe at Stanford University. A ~30 μm diameter, 8–12 nA O₂⁻ primary beam was used to sputter the zircon grains for analysis, following 90 seconds of rastering to remove potential surface contamination. Resulting analyses show ²⁰⁴Pb is generally <0.01% of total Pb. U, Th, and Pb concentrations were standardized against Sri Lankan zircon standards SL-13 and CZ3, and isotope ratios were calibrated against Duluth Gabbro zircon standard AS57 (1099 Ma; Paces and Miller, 1993) and Braintree Complex zircon R33 (419 Ma; R. Mundil, personal communication, 1999; S.L. Kamo, personal communication, 2001). Data reduction procedures followed methods described by Williams (1997), using the SQUID program of K.R. Ludwig (2002). Pb/U ratios were corrected for common Pb using the model Pb evolution curve of Stacey and Kramers (1975). Errors on spot ages of individual zircons grains are reported at 1 sigma, and weighted mean and concordia intercept ages were calculated at the 95% confidence level.

REFERENCES CITED

- Ludwig, K.R., 2002a, Squid: Berkeley Geochronology Center Special Publication 2, (kludwig@bgc.org).
- Ludwig, K.R., 2002b, Isoplot/Ex, a geochronology toolkit for Microsoft Excel: Berkeley Geochronology Center Special Publication 1 (kludwig@bgc.org).
- Paces, J.B., and Miller, J.D., 1993, U-Pb ages of the Duluth Complex and related mafic intrusions, northeastern Minnesota: Geochronologic insights into physical petrogenetic, paleomagnetic and tectonomagmatic processes associated with the 1.1 Ga Mid-Continent rift system: Journal of Geophysical Research, v. 98, p. 13,997–14,013.

Table 1. Geochemistry of sandstones from the McCoy Mountains Formation

Sample	01-320	01-321	01-322	01-324	01-325	01-326	01-327	01-328	MC3	MC4	MC5	MC7	MC7A	MC9
SiO ₂	66.20	67.95	89.28	73.88	83.26	93.97	70.02	70.88	67.70	70.97	76.64	71.55	74.13	80.00
TiO ₂	0.61	0.37	0.19	0.35	0.35	0.14	0.56	0.57	0.66	0.46	0.37	0.24	0.20	0.14
Al ₂ O ₃	15.04	12.01	5.38	13.98	6.88	2.88	13.75	14.54	13.52	13.64	11.59	4.48	3.76	3.79
Fe ₂ O ₃	4.17	2.58	1.55	2.71	1.97	0.32	3.79	4.23	4.37	2.88	2.37	1.71	1.17	0.61
MnO	0.05	0.09	0.04	0.07	0.03	0.00	0.05	0.07	0.06	0.04	0.03	0.07	0.12	0.04
MgO	1.38	1.29	0.56	0.55	0.27	0.23	1.93	2.02	1.85	1.61	0.92	0.42	3.86	0.13
CaO	3.55	6.60	0.62	2.90	3.23	0.50	2.09	0.41	3.04	2.21	0.61	9.74	5.88	7.82
Na ₂ O	4.46	3.63	0.22	2.85	0.36	0.12	3.82	3.66	2.55	2.50	1.69	1.14	0.44	0.15
K ₂ O	1.82	1.36	0.99	1.37	1.71	0.75	1.52	1.79	2.89	2.87	3.84	0.67	0.46	1.00
P ₂ O ₅	0.13	0.10	0.05	0.10	0.09	0.05	0.12	0.12	0.13	0.11	0.10	0.05	0.05	0.05
LOI	3.17	5.53	1.62	1.64	3.55	0.94	2.91	2.08	3.87	3.22	1.38	8.45	9.29	6.68
sum	100.58	101.51	100.50	100.40	101.70	99.90	100.56	100.37	100.64	100.51	99.54	98.52	99.36	100.41
Q	28	48	51	26			43		43	38	41	59		92
F	28	23	6	46			25		22	31	38	11		2
L	44	29	43	28			32		35	31	21	30		6

Table 2. SHRIMP-RG U-Pb zircon data for sandstones from the McCoy Mountains Formation

	U ppm	Th ppm	238U/206Pb	207Pb/206Pb		206Pb*/238U age, Ma#		207Pb*/206Pb* age, Ma
Basal Sandstone Member 2 [Member C] 33 46.380 114 54.240								
01-320-1	109	98	45.4008	3.3	0.0623	9.5	141.5	5.6
01-320-2	705	318	40.8991	1.4	0.0465	4.5	156.7	2.3
01-320-3	487	490	36.8950	1.6	0.0485	5.4	174.6	3.5
01-320-4	358	167	52.7018	1.9	0.0489	6.3	121.7	2.5
01-320-5	155	109	3.8135	1.3	0.0874	2.0	1508.6	18.7
01-320-6	202	177	37.3608	2.1	0.0469	9.0	171.7	4.2
01-320-7	775	746	35.8806	1.3	0.0501	3.5	178.6	2.7
01-320-8	236	264	37.1659	2.2	0.0511	7.7	173.0	4.8
01-320-9	296	31	2.3294	1.0	0.1532	0.9	2303.7	20.4
01-320-10	112	40	42.0426	2.9	0.0467	10.8	150.0	4.7
01-320-11	240	222	41.2951	2.0	0.0528	6.6	155.0	3.7
01-320-12	759	280	41.3004	1.3	0.0498	4.0	154.8	2.2
01-320-13	446	276	36.6433	1.6	0.0479	5.3	174.4	3.1
01-320-14	429	394	36.3448	1.6	0.0482	5.1	175.0	3.3
01-320-15	173	118	43.5670	2.5	0.0640	8.0	146.7	4.2
01-320-16	111	155	43.1777	1.4	0.0504	5.3	146.1	3.0
01-320-17	295	324	39.1211	0.8	0.0494	3.1	160.0	1.8
01-320-18	209	88	5.9500	0.6	0.0789	1.2	994.7	5.7
01-320-19	216	53	3.6429	0.5	0.1002	0.8	1561.9	7.5
01-320-20	164	153	42.6587	1.1	0.0495	4.3	148.5	2.1
01-320-21	30	27	6.0072	1.5	0.0746	3.1	983.4	16.0
01-320-22	451	219	54.4237	0.7	0.0515	2.7	116.5	0.9
01-320-23	71	78	2.9441	0.9	0.1187	1.1	1880.3	17.1
01-320-24	322	316	35.7560	0.7	0.0506	2.8	175.7	1.7
01-320-25	591	573	38.1414	0.7	0.0511	2.1	166.7	2.4
01-320-26	2144	1456	37.0204	0.3	0.0497	1.1	171.0	0.9
01-320-27	283	91	51.1462	1.1	0.0518	3.5	123.8	1.4
01-320-28	76	59	3.3317	0.8	0.1091	1.2	1683.8	13.9
01-320-29	616	285	44.0246	0.6	0.0498	2.2	144.6	0.9

01320-30	101	24	4.6580	0.8	0.0805	1.4	1252.0	8.9	1167.0	29.9
01320-31	141	65	4.3059	0.6	0.0872	1.1	1343.1	8.0	1366.0	20.6

Basal Sandstone Member 2 [Member C] 33 46.332 114 54.266

01-321-1	571	384	37.2921	1.4	0.0472	4.3	171.1	2.7		
01-321-2	338	180	54.9486	2.0	0.0442	7.1	116.8	2.5		
01-321-3	65	41	6.4488	1.9	0.0676	4.5	931.7	17.9		
01-321-4	193	139	29.0669	1.9	0.0548	6.1	219.9	4.8		
01-321-5	501	199	53.2425	1.6	0.0477	5.4	120.2	2.1		
01-321-6	182	66	5.2896	1.3	0.0747	2.4	1114.5	14.0	1059.8	48.3
01-321-7	89	68	2.0327	1.4	0.1760	1.5	2569.7	33.9	2601.0	26.8
01-321-8	357	158	30.1821	1.6	0.0548	4.7	210.3	3.5		
01-321-9	301	232	5.7895	1.2	0.0753	2.0	1027.5	12.4	1077.2	39.4
01-321-10	62	13	6.1971	2.2	0.0791	5.1	958.8	20.1	1175.1	101.7
01-321-11	157	54	4.7019	1.4	0.0814	2.7	1241.5	16.9	1157.3	62.8
01-321-12	451	201	40.8275	1.6	0.0513	4.9	155.9	2.6		
01-321-13	204	244	38.1401	2.7	0.0599	8.9	166.1	5.9		
01-321-14	265	153	4.8119	1.2	0.0785	2.0	1217.7	14.5		
01-321-15	303	191	3.1330	1.1	0.1017	1.4	1792.7	18.9	1654.7	25.9
01-321-16	574	402	58.2648	1.5	0.0533	5.1	109.4	2.0		
01-321-17	134	62	4.2472	1.3	0.0874	2.3	1361.9	17.5	1368.6	44.0
01-321-18	341	234	43.1511	1.7	0.0523	5.9	148.1	2.9		
01-321-19	114	92	5.1131	1.4	0.0800	2.9	1155.1	17.5	1197.7	57.2
01-321-20	285	108	4.5814	1.2	0.0878	1.9	1272.4	14.2	1313.8	60.0
01-321-21	254	150	41.4642	1.9	0.0527	6.7	153.9	3.3		
01-321-22	247	99	3.7390	1.2	0.1026	1.7	1521.6	17.4	1672.5	31.8
01-321-23	2058	807	4.9149	1.0	0.0901	1.0	1197.4	11.0	1395.0	23.3
01-321-24	639	348	5.6078	1.0	0.0771	1.5	1059.3	10.9	1123.6	29.9
01-321-25	1103	620	52.5441	1.4	0.0521	4.3	122.0	1.9		
01-321-26	173	123	2.9775	2.1	0.1205	1.6	1869.7	37.4	1963.2	28.9
01-321-27	201	60	3.4698	1.2	0.1030	1.7	1633.5	18.0	1645.4	38.6
01-321-28	665	280	53.2125	1.4	0.0505	4.6	120.6	1.9		
01-321-29	213	121	3.7742	1.2	0.0925	1.8	1520.1	17.4	1478.5	33.7

01-321-30	685	391	55.5115	1.6	0.0442	5.8	115.5	2.0		
01321-31	89	38	5.8164	0.8	0.0742	1.7	1022.3	8.5	1047.1	33.4
01321-32	239	17	5.6490	0.4	0.0750	0.9	1052.4	4.5	1057.5	18.8
01321-33	111	73	5.1887	0.7	0.0786	1.4	1131.1	8.2	1149.2	28.7
01321-34	666	269	18.6911	0.4	0.0540	1.2	335.4	1.3		
01321-35	106	80	6.9765	0.7	0.0713	1.7	857.3	7.0	947.2	37.1
01321-36	292	337	3.9784	0.4	0.0905	0.6	1437.2	6.4	1430.9	12.5
01321-37	349	139	6.0162	0.4	0.0732	1.1	990.6	3.6	1005.1	22.7
01321-38	111	64	5.5188	0.7	0.0764	1.4	1070.4	7.4	1092.4	29.2
01321-39	131	103	41.1425	1.2	0.0472	4.5	153.7	2.2		
01321-40	180	131	14.8191	0.7	0.0562	2.1	420.0	3.3		
01321-41	1199	662	28.9086	0.3	0.0514	1.1	217.9	0.8		
01321-42	346	123	4.2385	0.4	0.0857	0.7	1364.5	5.7	1332.4	13.1
01321-43	196	72	4.4445	0.5	0.0864	0.8	1308.7	5.9	1346.6	16.0
01321-44	169	90	4.9791	0.5	0.0799	1.0	1175.7	6.4	1194.4	20.5
01321-45	263	48	4.8406	0.5	0.0802	1.0	1209.2	5.4	1204.0	19.4
01321-46	108	52	14.1246	1.6	0.0505	5.2	439.4	7.8		
01321-47	219	43	4.1310	0.4	0.0890	0.7	1396.6	5.5	1405.2	13.9
01321-48	127	40	6.2275	0.7	0.0725	1.3	959.4	6.4	987.1	27.4
01321-49	138	103	4.1894	0.6	0.0886	0.9	1377.3	9.2	1381.8	17.4
01321-50	235	20	2.8504	0.4	0.1266	0.5	1938.3	6.0	2046.2	8.5
01321-51	248	145	3.5500	0.4	0.1069	0.5	1595.0	5.6	1720.3	13.0
01321-52	435	261	15.0154	0.4	0.0550	1.1	414.2	1.7		

Mudstone Member [Member E] 33 45.492 114 54.312

01-322-1	362	174	32.8968	1.5	0.0484	4.8	193.5	3.2		
01-322-2	226	182	26.8700	2.0	0.0546	5.6	237.7	5.6		
01-322-3	147	58	4.8970	1.3	0.0871	2.3	1204.0	16.2	1363.5	44.5
01-322-4	308	109	32.4104	1.7	0.0534	7.0	196.6	3.5		
01-322-5	235	137	3.2979	1.1	0.0999	1.4	1713.1	18.1	1621.7	26.2
01-322-6	310	72	33.5610	1.8	0.0482	5.8	189.5	3.5		
01-322-7	238	79	33.1384	1.8	0.0491	6.2	191.8	3.7		
01-322-8	356	25	32.4188	1.6	0.0498	5.7	195.9	3.1		

01-322-9	44	28	34.2357	4.2	0.0517	15.1	185.2	8.9		
01-322-10	210	82	3.9428	1.2	0.0890	1.8	1461.7	16.2	1404.0	33.8
01-322-11	455	409	27.9173	1.4	0.0523	3.8	228.9	3.7		
01-322-12	16	9	11.3949	4.1	0.0808	11.1	561.9	23.4		
01-322-13	220	88	31.7841	1.9	0.0476	6.4	200.1	4.1		
01-322-14	603	170	32.4611	1.4	0.0507	3.9	195.4	2.8		
01-322-15	487	251	33.9323	1.4	0.0484	4.3	188.7	2.9		
01-322-16	484	386	38.5743	1.5	0.0510	4.9	166.2	3.0		
01-322-17	294	104	4.2655	1.2	0.0889	2.0	1360.5	15.0	1401.9	37.6
01-322-18	658	637	38.6468	1.3	0.0491	4.2	165.3	2.7		
01-322-19	1086	483	14.2754	1.1	0.0899	1.9	439.1	4.9	1312.9	59.2
01-322-20	713	210	5.5691	1.0	0.1001	1.2	1071.1	10.7	1589.1	27.4
01-322-21	154	16	32.4225	2.3	0.0489	8.4	196.6	4.5		
01-322-22	238	82	33.5890	1.7	0.0507	5.9	188.8	3.5		
01-322-23	373	15	4.6558	1.1	0.0875	1.4	1257.7	12.8	1371.6	27.9
01-322-24	146	105	30.7028	2.2	0.0588	7.3	206.5	5.2		
01-322-25	580	157	3.7248	1.0	0.1058	0.9	1540.1	13.8	1727.9	17.4
01-322-26	120	75	33.5381	2.3	0.0417	9.5	190.8	4.9		
01-322-27	214	181	28.8623	1.7	0.0509	5.8	219.5	4.5		
01-322-28	85	39	34.6961	2.8	0.0557	10.0	181.1	5.6		

Upper Sandstone Member [Member F] 33 39.270 114 49.957

01-327-1	337	234	64.7024	2.1	0.0493	7.3	98.7	2.4		
01-327-2	142	100	4.2644	1.4	0.0886	2.4	1365.6	18.5	1395.8	45.1
01-327-3	300	296	4.0893	1.1	0.0873	1.5	1418.2	16.1	1342.3	33.5
01-327-4	504	158	60.8725	1.7	0.0453	5.8	105.0	1.9		
01-327-5	292	253	64.2028	2.2	0.0529	7.4	101.2	2.6		
01-327-6	435	172	60.9176	1.9	0.0468	6.6	105.1	2.1		
01-327-7	3133	4957	65.0635	1.1	0.0478	2.9	99.6	1.5		
01-327-8	470	339	64.7934	1.9	0.0476	8.9	99.4	2.1		
01-327-9	709	28	3.1588	0.9	0.1025	0.8	1773.9	14.7	1666.3	14.7
01-327-10	340	112	24.1352	1.5	0.0499	4.4	261.2	4.0		
01-327-11	72	76	38.9521	3.5	0.0431	13.2	162.9	7.3		

01-327-12	125	103	3.1856	1.4	0.0962	2.7	1771.7	23.5	1551.3	50.0
01-327-13	6856	507	8.7396	0.9	0.0773	0.5	698.3	5.9	1117.9	10.6
01-327-14	270	187	69.0153	2.2	0.0521	8.4	92.7	2.4		
01-327-15	115	238	3.4020	1.4	0.0987	2.2	1670.1	29.1	1600.0	41.0
01-327-16	208	105	3.3223	1.1	0.1054	1.5	1698.9	18.4	1721.6	26.9
01-327-17	614	143	3.6197	1.0	0.1016	1.2	1575.4	14.5	1643.1	22.9
01-327-18	49	36	3.4975	1.8	0.1016	3.2	1624.7	28.8	1653.8	59.3
01-327-19	234	148	70.4482	2.4	0.0444	9.8	90.7	2.5		
01-327-20	433	105	8.2781	1.1	0.0994	1.8	713.4	8.6	1536.4	39.8
01-327-21	425	363	3.5779	1.0	0.1026	1.1	1583.7	16.2	1661.1	21.8
01-327-22	630	436	69.4043	1.6	0.0497	5.4	92.0	1.7		
01-327-23	293	161	32.8660	1.7	0.0488	5.9	194.1	3.6		
01-327-24	1145	223	7.0920	0.9	0.1026	1.0	847.9	7.7	1612.0	28.0
01-327-25	1119	83	6.4656	0.9	0.0999	0.9	922.9	8.3	1589.8	22.2
01-327-26	1519	730	9.9919	1.0	0.0984	1.0	608.8	6.3	1415.2	48.8
01-327-27	334	212	38.5345	1.8	0.0614	6.0	162.5	3.4		
01-327-28	419	322	38.8424	1.7	0.0503	5.9	164.1	3.2		

Siltsone Member [Member G] NE1/4SW1/4 Section 18 T6S R21E

MC3-1	859	676	65.4120	1.4	0.0458	4.6	98.5	1.7		
MC3-2	486	188	3.3458	1.0	0.1035	1.0	1689.8	15.7	1673.7	19.5
MC3-3	846	91	3.2185	0.9	0.1025	0.8	1749.2	14.5	1665.7	14.4
MC3-4	2097	878	64.6781	1.3	0.0529	2.9	98.6	1.3		
MC3-5	246	142	3.3100	1.1	0.1021	1.4	1707.9	18.1	1662.9	26.0
MC3-6	360	118	3.4056	1.0	0.1030	1.2	1659.0	16.1	1666.3	23.1
MC3-7	584	441	42.4055	1.4	0.0482	4.5	150.4	2.5		
MC3-8	315	148	38.2083	1.9	0.0519	6.1	166.5	3.4		
MC3-9	683	213	63.9027	1.6	0.0503	5.2	99.1	1.7		
MC3-10	1815	134	5.9393	0.9	0.0978	0.8	999.7	8.6	1490.3	24.4
MC3-11	1079	603	3.3407	0.9	0.1055	0.7	1698.1	14.8	1710.3	13.5
MC3-12	682	515	64.9749	1.6	0.0569	4.8	98.3	1.8		
MC3-13	1604	582	61.1349	1.3	0.0494	3.5	104.8	1.4		
MC3-14	278	149	3.2128	1.1	0.1020	1.3	1750.4	17.9	1649.8	25.4

MC3-15	300	124	68.0256	2.2	0.0640	7.5	92.8	2.3		
MC3-16	1700	75	5.0212	0.9	0.1007	0.6	1171.1	9.8	1625.9	11.6
MC3-17	351	272	67.4723	2.1	0.0457	8.2	95.7	2.3		
MC3-18	633	76	3.3719	1.0	0.1034	0.9	1674.8	15.0	1676.9	16.9
MC3-19	556	253	65.9620	1.7	0.0490	6.0	97.4	1.8		
MC3-20	1301	165	4.0512	0.9	0.1043	0.7	1423.0	11.9	1693.7	13.0
MC3-21	103	167	43.3836	2.8	0.0482	11.1	143.2	6.3		
MC3-22	767	276	62.8265	1.5	0.0486	5.0	102.1	1.6		
MC3-23	357	190	3.4216	1.1	0.1005	1.2	1657.1	17.3	1624.7	23.7
MC3-24	967	584	3.2628	0.9	0.1057	0.7	1730.8	15.6	1724.0	13.0
MC3-25	119	101	3.3668	1.4	0.1037	2.2	1682.7	23.4	1649.7	51.4
MC3-26	506	719	36.7555	1.4	0.0490	4.5	174.7	3.3		
MC3-27	390	144	3.4814	1.0	0.1024	1.2	1631.2	15.6	1646.8	24.2
MC3-28	642	237	67.9203	1.6	0.0471	5.7	94.3	1.6		
MC3-29	218	30	5.5871	1.3	0.0752	2.3	1060.8	13.3	1072.8	47.0
MC3-30	323	103	66.4438	2.2	0.0522	12.9	96.4	2.2		

Siltsone Member [Member H] NE1/4SW1/4 Section 18 T6S R21E

MC4-1	647	302	40.9718	1.3	0.0539	3.6	155.4	2.2		
MC4-2	341	177	3.2707	1.0	0.1006	1.1	1724.5	16.6	1628.0	21.3
MC4-3	869	336	3.9139	1.1	0.1031	0.8	1476.5	14.7	1674.0	15.3
MC4-4	390	135	3.2720	1.0	0.1018	1.0	1723.6	16.0	1629.4	24.1
MC4-5	1077	682	3.9952	0.9	0.1036	0.6	1447.6	13.2	1683.2	12.3
MC4-6	153	63	3.3081	1.3	0.1044	1.6	1704.2	21.0	1686.4	32.8
MC4-7	361	247	64.8335	2.0	0.0967	6.2	93.5	2.4		
MC4-8	116	88	50.6452	2.9	0.2901	6.1	86.9	6.7		
MC4-9	1461	1117	64.8039	1.2	0.0530	3.3	98.8	1.4		
MC4-10	250	162	3.2791	1.1	0.1030	1.3	1719.4	18.0	1657.0	26.5
MC4-11	755	279	20.3778	1.1	0.0545	3.0	309.9	3.7		
MC4-12	95	52	11.4292	2.0	0.0847	4.9	555.1	11.7	1308.1	95.5
MC4-13	517	422	37.0816	1.4	0.0522	4.3	172.2	2.8		
MC4-14	518	347	68.7220	1.7	0.0461	6.2	93.2	1.8		
MC4-15	1059	271	4.3428	1.0	0.1014	1.0	1337.3	12.5	1650.4	18.5

MC4-16	614	369	39.2501	1.6	0.0552	4.5	162.5	2.9		
MC4-17	923	378	3.3794	0.9	0.1038	0.8	1671.0	14.4	1689.9	14.3
MC4-18	519	224	34.6060	1.5	0.0472	4.6	183.5	3.0		
MC4-19	701	132	4.3073	1.1	0.1036	0.9	1364.0	13.6	1689.6	17.1
MC4-20	9032	1637	66.5019	1.2	0.0501	2.4	95.9	1.2		
MC4-21	373	102	3.3862	1.0	0.1048	1.5	1669.3	15.8	1700.2	27.8
MC4-22	4045	228	3.5039	0.9	0.1036	0.3	1619.8	12.6	1685.5	6.8
MC4-23	1230	723	69.9833	1.3	0.0484	3.9	92.0	1.3		
MC4-24	60	44	4.4898	1.8	0.0841	3.6	1302.2	23.6	1295.4	70.5
MC4-25	111	76	3.4816	1.4	0.1051	2.2	1633.9	22.1	1715.9	39.6
MC4-26	599	501	37.4566	1.3	0.0490	4.1	169.2	2.7		
MC4-27	377	238	5.7546	1.1	0.0754	1.7	1033.6	12.0	1078.3	34.2
MC4-28	504	261	3.3383	1.0	0.1067	1.1	1689.2	15.8	1744.7	20.1
MC4-29	1045	183	5.0403	0.9	0.1015	0.9	1154.1	10.4	1646.2	17.2
MC4-30	415	222	26.3991	1.5	0.0531	4.9	240.7	4.0		

Siltsone Member [Member L] SW1/4SE1/4 Section 27 T6S R21E

MC5-1	386	188	3.3863	0.6	0.1028	1.2	1658.2	16.2	1675.6	22.1
MC5-2	334	143	3.4148	0.7	0.1004	1.7	1645.3	16.6	1631.8	31.8
MC5-3	3680	253	4.6541	0.2	0.1004	0.5	1247.1	10.1	1628.4	8.9
MC5-4	156	115	75.2749	2.9	0.0568	11.4	84.1	3.0		
MC5-5	679	108	4.3595	0.5	0.1040	1.0	1322.5	12.0	1675.1	20.1
MC5-6	439	104	5.3052	0.6	0.0903	1.4	1101.7	11.0	1403.0	33.2
MC5-7	1080	169	3.3764	1.3	0.1069	6.0	1661.0	22.8	1746.6	110.2
MC5-7	502	284	3.3552	0.6	0.1026	1.0	1673.3	16.5	1655.7	20.4
MC5-8	952	583	59.3509	1.1	0.0464	5.4	107.2	1.7		
MC5-9	171	162	40.0097	2.6	0.0732	9.2	157.3	5.4		
MC5-10	380	207	3.1022	0.6	0.1013	1.1	1791.1	17.4	1592.2	29.5
MC5-11	163	75	3.0701	1.1	0.1052	1.9	1812.3	23.8	1648.7	50.0
MC5-12	73	40	3.3909	2.2	0.0954	3.3	1659.4	37.1	1536.2	61.3
MC5-13	969	254	3.2801	1.2	0.1054	0.3	1697.7	3.5	1722.1	6.3
MC5-14	426	149	3.3697	1.2	0.1034	0.5	1674.8	5.6	1686.7	9.9
MC5-15	92	95	36.1707	1.9	0.0517	5.3	172.1	3.1		

MC5-16	45	40	3.4486	1.6	0.1017	1.6	1636.3	15.0	1655.3	30.4
MC5-17	384	169	3.1920	1.2	0.1071	0.6	1750.2	5.6	1750.9	10.1
MC5-18	535	182	65.9988	1.4	0.0473	3.0	98.6	0.8		
MC5-19	271	260	39.6451	1.4	0.0486	3.2	161.4	1.7		
MC5-20	996	289	52.5797	1.3	0.0515	2.1	120.0	0.6		
MC5-21	138	76	72.2607	2.1	0.0487	6.1	90.0	1.8		
MC5-22	503	267	73.8904	1.4	0.0488	3.2	86.7	0.8		
MC5-23	172	82	3.3612	1.3	0.1032	0.9	1696.7	8.4	1681.9	16.1
MC5-24	603	326	77.3981	1.4	0.0490	3.2	84.9	0.7		
MC5-25	883	530	65.3866	1.3	0.0494	2.4	99.2	0.7		
MC5-26	341	126	3.4348	1.2	0.1030	0.6	1677.4	5.2	1679.4	11.1
MC5-27	278	93	4.7186	1.3	0.1066	0.8	1252.1	5.8	1720.7	16.0
MC5-28	1363	683	35.5811	1.2	0.0491	1.4	182.9	2.4		
MC5-29	287	268	3.3641	1.3	0.1031	0.7	1671.6	6.3	1681.5	12.3
MC5-30	167	54	3.4397	1.3	0.1043	0.9	1660.4	7.6	1701.4	16.6
MC5-31	75	39	3.4996	1.5	0.1038	1.4	1628.4	11.9	1655.5	32.2

Basal Sandstone Member 1 [Member A] 693.816 3739.695

MC7-1	679	142	5.4297	1.7	0.0744	0.7	1087.5	17.0	1040.0	17.2
MC7-2	770	416	3.4893	22.5	0.1028	0.9	1631.5	349.7	1663.8	17.9
MC7-3	114	41	3.1021	1.8	0.1096	0.9	1799.4	27.7	1785.5	17.1
MC7-4	64	19	6.2281	1.9	0.0701	2.2	960.0	17.1	930.4	45.3
MC7-5	87	46	5.0920	1.9	0.0769	1.6	1154.3	20.1	1098.6	35.5
MC7-6	211	74	2.9913	1.7	0.1113	0.9	1855.6	27.5	1795.1	23.0
MC7-7	114	38	31.6349	2.0	0.0497	4.3	199.6	4.1		
MC7-8	496	274	5.6733	1.7	0.0774	0.9	1042.0	16.8	1106.6	21.3
MC7-9	457	43	4.7099	1.7	0.1013	0.6	1240.4	18.3	1648.4	12.0
MC7-10	124	23	33.3830	2.1	0.0511	3.9	189.9	3.8		
MC7-11	734	72	6.5911	1.7	0.0701	1.0	911.0	13.7	920.1	20.1
MC7-12	139	62	3.1162	2.1	0.1049	0.9	1796.2	32.7	1705.6	17.0
MC7-13	224	103	3.3196	1.8	0.1033	0.7	1695.7	25.9	1678.5	13.8
MC7-14	54	14	3.1750	1.9	0.1047	1.4	1764.8	28.9	1709.2	25.0
MC7-15	110	35	6.2906	1.8	0.0720	1.6	950.6	15.9	986.8	32.3

MC7-16	81	80	4.9628	1.9	0.0779	1.5	1186.1	22.2	1095.5	36.8
MC7-17	121	49	3.1600	1.8	0.1033	0.9	1769.6	27.3	1678.5	16.9
MC7-18	41	46	5.2164	2.0	0.0762	2.3	1125.6	24.2	1034.4	54.5
MC7-19	274	17	4.3744	1.8	0.0854	1.0	1329.4	20.3	1319.5	20.4
MC7-20	114	22	32.4266	2.1	0.0506	4.4	195.6	3.9		
MC7-21	242	210	28.1985	1.8	0.0494	2.6	224.1	4.4		
MC7-22	67	18	5.1905	1.9	0.0779	1.6	1135.0	19.8	1143.7	32.5
MC7-23	238	112	3.8963	1.7	0.0903	0.7	1471.4	22.7	1429.2	13.7
MC7-24	61	55	27.6971	2.3	0.0504	4.9	228.6	6.1		
MC7-25	110	44	3.2060	1.8	0.1089	0.8	1749.7	26.9	1781.4	15.3
MC7-26	73	32	35.2549	2.1	0.0588	4.9	179.5	3.9		
MC7-27	115	54	3.6227	1.8	0.1025	0.9	1570.2	24.8	1670.0	17.0
MC7-28	469	411	29.4269	1.8	0.0497	1.8	214.5	4.1		
MC7-29	373	49	4.4530	1.7	0.0901	0.6	1307.8	19.2	1421.3	11.6
MC7-30	24	3	4.7798	2.3	0.0779	2.6	1224.7	25.0	1039.5	74.3

Basal Sandstone Member 1 [Member A] 693.607 3740.091

MC9-1	83	50	3.2383	1.7	0.1076	1.0	1725.5	29.0	1752.3	18.7
MC9-2	30	27	3.1740	1.9	0.1087	2.0	1758.7	33.5	1777.7	35.7
MC9-3	267	198	4.5045	1.6	0.0859	0.7	1286.0	21.2	1331.4	14.4
MC9-4	55	16	5.9856	1.9	0.0703	2.1	996.0	18.2	937.5	42.5
MC9-5	101	59	33.1087	1.9	0.0508	5.0	191.2	4.0		
MC9-6	376	50	4.9725	1.6	0.0989	0.9	1184.8	17.4	1580.9	19.4
MC9-7	1038	3	5.5230	1.6	0.0760	0.4	1072.8	15.5	1091.8	8.3
MC9-8	81	26	5.3089	1.7	0.0763	2.0	1110.5	18.8	1102.6	40.3
MC9-9	509	130	4.4326	1.6	0.1078	0.7	1309.7	20.0	1725.1	16.1
MC9-10	77	77	3.7721	1.7	0.0928	1.3	1498.5	29.1	1469.1	25.1
MC9-11	57	29	5.3739	1.8	0.0765	1.9	1097.0	19.7	1108.7	38.3
MC9-12	263	87	5.4677	1.6	0.0732	0.9	1081.0	17.0	1013.9	19.0
MC9-13	54	51	5.4268	1.8	0.0728	2.1	1085.6	21.6	952.0	50.3
MC9-14	354	98	9.4359	1.6	0.0803	1.0	652.7	10.3	1203.3	18.8
MC9-15	207	167	12.8305	1.7	0.0571	1.7	480.1	9.1		
MC9-16	399	130	4.2195	1.6	0.0898	0.6	1367.9	20.7	1374.5	15.2

MC9-17	288	333	14.0497	1.6	0.0546	1.6	441.1	8.7		
MC9-18	111	35	5.8748	1.8	0.0699	1.5	1011.9	18.1	902.2	32.4
MC9-19	164	45	4.7847	1.6	0.0756	1.2	1220.6	19.0	1084.3	24.7
MC9-20	101	72	4.3618	1.9	0.0752	2.0	1331.0	25.8	1073.4	39.5
MC9-21	659	159	3.6279	1.6	0.1019	0.5	1570.8	22.7	1659.3	9.2
MC9-22	335	103	34.6077	1.8	0.0507	2.2	183.4	3.5		
MC9-23	96	56	5.8531	1.7	0.0896	1.6	1043.1	17.9	1355.0	35.8
MC9-24	156	81	1.7478	1.6	0.2072	0.4	2913.2	40.2	2880.9	6.7
MC9-25	30	22	5.7822	2.0	0.0779	2.5	1025.9	21.2	1145.1	50.6
MC9-26	185	64	5.6421	1.6	0.0748	1.1	1050.3	16.7	1052.0	21.7
MC9-27	175	51	3.9197	1.6	0.0905	0.8	1460.7	22.3	1437.1	16.2
MC9-28	91	39	3.4748	1.7	0.0978	1.1	1627.7	26.0	1574.0	21.6
MC9-29	261	38	4.6999	1.6	0.0789	0.8	1242.7	18.6	1170.6	16.3
MC9-30	178	69	20.1787	1.7	0.0534	2.2	310.9	5.5		
MC9-31	355	181	28.0213	1.6	0.0499	2.1	225.5	4.0		
MC9-32	30	18	1.7113	1.8	0.2044	0.9	2957.3	46.7	2858.3	14.2
MC9-33	441	211	28.0653	1.6	0.0507	2.5	224.6	3.9		
MC9-34	314	92	15.1793	1.7	0.0641	4.2	412.1	7.1		
MC9-35	461	288	15.3486	1.6	0.0554	1.1	404.1	7.1		

Notes:

#errors on spot ages are 1 sigma

Table 3. SHRIMP-RG U-Pb zircon data for eastern Mojave Desert and eastern Transverse Ranges igneous rocks

	U ppm	Th ppm	238U/206Pb	207Pb/206Pb	206Pb*/238U age, Ma#			
Coxcomb granodiorite 33 53.223 115 17.829								
01-329-1	170	52	82.9553	3.3	0.0693	10.9	75	3
01-329-2	337	132	3.7587	0.7	0.0895	1.4	1530	10
01-329-3	152	37	89.5072	3.3	0.0549	12.5	71	2
01-329-4	372	75	84.4597	2.1	0.0495	8.1	76	2
01-329-5	262	87	90.2560	2.6	0.0505	9.9	71	2
01-329-6	188	35	83.3300	2.9	0.0518	10.9	76	2
01-329-7	515	79	86.3207	1.6	0.0515	6.5	74	1
01-329-8	165	45	85.5544	2.9	0.0642	10.7	73	2
01-329-9	298	109	86.7679	2.2	0.0693	8.0	72	2
01-329-10	233	74	85.2022	2.3	0.0630	8.8	74	2
01-329-11	3487	1565	27.8595	0.5	0.0540	1.4	226	1
01-329-12	685	76	3.5367	0.5	0.1047	0.9	1595	8
01-329-14	513	713	41.0755	1.2	0.0510	5.5	155	2
Porcupine Wash granodiorite 33 50.000 115 45.455								
01-330-1	359	218	84.7046	2.0	0.0613	7.3	74	2
01-330-2	448	279	89.0604	1.8	0.0520	7.4	72	1
01-330-3	383	276	82.2041	2.7	0.0537	7.4	77	2
01-330-4	264	192	82.9940	2.3	0.0531	13.1	77	2
01-330-5	419	378	83.7613	1.8	0.0541	7.1	76	1
01-330-6	309	192	84.6288	2.0	0.0580	8.7	75	2
01-330-7	530	433	82.2969	1.6	0.0497	6.8	78	1
Kessler Springs adamellite 35 18.701 115 32.763								
01-331-1	505	296	76.7078	1.5	0.0486	6.5	83	1
01-331-2	256	235	80.3805	2.3	0.0542	8.9	79	2
01-331-3	537	447	74.4323	1.5	0.0456	6.4	86	1
01-331-4	742	588	75.4769	1.3	0.0516	5.2	84	1
01-331-5	1296	108	4.5706	0.3	0.1496	0.6	1178	4
01-331-6	271	303	79.5949	2.2	0.0619	8.1	79	2
01-331-7	765	744	75.1186	1.6	0.0798	5.1	82	1
01-331-8	5094	637	76.4533	0.8	0.0807	6.4	80	1
01-331-9	441	280	76.0720	1.6	0.0495	6.7	84	1
01-331-10	676	539	77.2246	1.3	0.0499	5.4	83	1
01-331-11	392	216	78.3993	1.8	0.0669	6.8	80	2
01-331-12	460	299	77.7135	1.6	0.0481	6.7	82	1

01-331-13	592	267	3.3132	0.5	0.1120	0.8	1685	8
01-331-14	187	94	3.2297	0.8	0.1066	1.5	1739	14
01-331-15	781	111	3.5329	0.8	0.1045	0.8	1597	13

Mid Hills adamellite 35 09.826 115 26.643

01-332-1	568	216	73.6821	1.5	0.0556	7.4	86	1
01-332-2	1080	882	71.8096	1.1	0.0522	4.4	89	1
01-332-3	563	318	70.8923	1.4	0.0494	6.0	90	1
01-332-4	533	256	71.5753	1.5	0.0554	6.0	89	1
01-332-5	364	145	72.5874	1.8	0.0489	7.8	88	2
01-332-6	500	231	73.3532	1.8	0.0503	7.3	87	2
01-332-7	703	430	71.7923	1.3	0.0579	5.2	88	1

Cadiz Valley granodiorite 34 15.411 115 42.988

01-333-1	302	73	85.0632	2.1	0.0422	9.4	76	2
01-333-2	388	139	88.8404	3.0	0.0520	7.5	72	2
01-333-3	263	72	84.8270	2.2	0.0594	8.5	74	2
01-333-4	664	208	84.5754	1.4	0.0490	5.9	76	1
01-333-5	378	172	84.3080	1.9	0.0597	7.2	75	1
01-333-6	482	203	88.1743	1.7	0.0558	6.7	72	1
01-333-7	239	58	88.6487	2.6	0.0755	9.1	70	2

Blue granodiorite 33 55 40.8 116 10 24.0

JW340-1	207	339	76.5047	2.7	0.0467	4.7	84	2
JW340-2	832	42	3.5742	2.6	0.1003	1.6	1586	40
JW340-3	142	174	76.3170	2.8	0.0493	5.9	84	2
JW340-4	206	62	77.0542	2.6	0.0518	5.1	83	2
JW340-5	85	129	42.2064	2.8	0.0456	6.0	152	4
JW340-6	264	178	80.2739	2.6	0.0500	4.2	80	2
JW340-7	145	101	76.2655	2.8	0.0588	5.4	83	2
JW340-8	189	147	76.9873	2.7	0.0522	5.0	83	2
JW340-9	201	241	77.1202	2.7	0.0495	4.9	83	2
JW340-10	191	180	78.2407	2.7	0.0516	5.1	81	2
JW340-11	235	328	79.8366	2.6	0.0517	4.6	80	2

Palms granite 34 01 33.2 116 10 27.0

JW341-1	3151	563	84.1862	2.4	0.0499	1.2	76	2
JW341-2	1448	405	84.3742	2.4	0.0488	2.1	76	2
JW341-3	198	67	85.3171	2.8	0.0540	5.1	75	2
JW341-4	706	298	83.6459	2.5	0.0472	2.9	77	2
JW341-5	675	598	84.7346	2.5	0.0483	2.9	76	2

JW341-6	385	197	82.3800	2.5	0.0525	3.7	77	2
JW341-7	916	312	86.0399	2.4	0.0488	2.5	74	2
JW341-8	830	361	86.7274	2.5	0.0459	3.1	74	2
Dome Rock tuff 694.732 3740.736								
MC13-1	495	293	38.2386	1.3	0.0526	2.5	166	2
MC13-2	1288	1177	38.5605	1.2	0.0478	1.7	165	2
MC13-3	440	239	38.0322	1.3	0.0502	2.8	167	2
MC13-4	436	250	39.6818	1.4	0.0475	2.9	160	2
MC13-5	789	501	40.2079	1.3	0.0488	2.2	158	2
MC13-6	500	293	39.5465	1.3	0.0500	2.7	161	2
MC13-7	627	512	38.6948	1.3	0.0507	2.4	164	2
MC13-8	889	671	38.1549	1.3	0.0506	2.7	167	2
MC13-9	781	565	38.9476	1.3	0.0487	2.2	163	2
MC13-10	349	182	37.6343	1.4	0.0519	3.2	168	2

Notes:

#errors on spot ages are 1 sigma