UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

ANALYTICAL RESULTS FOR 122 WATER SAMPLES FROM MOUNT BELKNAP CALDERA, UTAH

by

John B. McHugh, Jerry M. Motooka,

and Robert E. Tucker

Open-File Report 80-820

This report is preliminary and has not been
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U.S. Geological Survey standards

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Analytical Results for 122 Water Samples from from Mount Belknap Caldera, Utah

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ABSTRACT

One hundred and twenty-two water samples were collected from the Mount Belknap caldera, south-central Utah, during the summer of 1979, as a part of the hydrogeochemical study of the caldera. The water samples were analyzed for calcium, magnesium, sodium, potassium, lithium, strontium, barium, boron, beryllium, silica, alkalinity, sulfate, chloride, fluoride, zinc, copper, molybdenum, lead, arsenic, iron, manganese, aluminum, and uranium. Temperature, specific conductance, and pH were also measured. Sample analyses and localities are presented in this report.

INTRODUCTION

One hundred and twenty-two water samples were collected from thirty-nine springs and eighty-three surface streams, during the summer of 1979, from the Mount Belknap caldera, Utah. The Mount Belknap caldera is located in the Tushar Mountains about 20 kilometers (12 miles) northeast of Beaver, Utah. The study area covered approximately 310 square kilometers (125 square miles) and includes the Mount Belknap caldera. Figure 1 is an index map of the study area. Figure 2 is a sample locality map.

Temperatures were measured at the sample site. The pH was measured on the day of collection but not at the sample site. The remaining analyses were completed at the U.S. Geological Survey laboratory in Denver, Colorado. The results of the analyses are given in this report.

SAMPLE COLLECTION TECHNIQUE

Samples were collected using acid-rinsed polyethylene bottles. At each locality, a 60-mL sample was collected and filtered through a 0.45-μm membrane filter and acidified with reagent-grade concentrated nitric acid to pH <2. An untreated 0.5-L sample was also taken.

ANALYTICAL TECHNIQUES

Water temperature was measured at the sample site. The pH was measured on the day of collection but not at the sample site. The remaining analyses were determined in the U.S. Geological Survey's Denver laboratory. Alkalinity, sulfate, chloride, fluoride, and specific conductance were determined, using the untreated sample. Calcium, magnesium, sodium, potassium, lithium, strontium, barium, boron, beryllium, silica, zinc, copper, molybdenum, lead, arsenic, iron, manganese, aluminum, and uranium were determined using the 0.45 um-filtered and acidified sample. The analytical methods used for the analysis of each constituent are shown in table 1.

RESULTS

Analytical data for each sample locality is shown in table 2. The thirty-nine spring samples are marked by a black dot after the sample number in table 2. To check on analytical and sampling error, four samples were duplicated. Sample numbers TS 7937 and TS 7938, TS 7987 and TS 7988, TS 7993 and TS 7994, TS 8008 and TS 8009, are duplicates.

Table 3 is a summary of all chemical analyses for the 122 Mount Belknap caldera water samples showing each variable with its minimum and maximum values, mean, geometric mean, standard deviation, and geometric deviation.

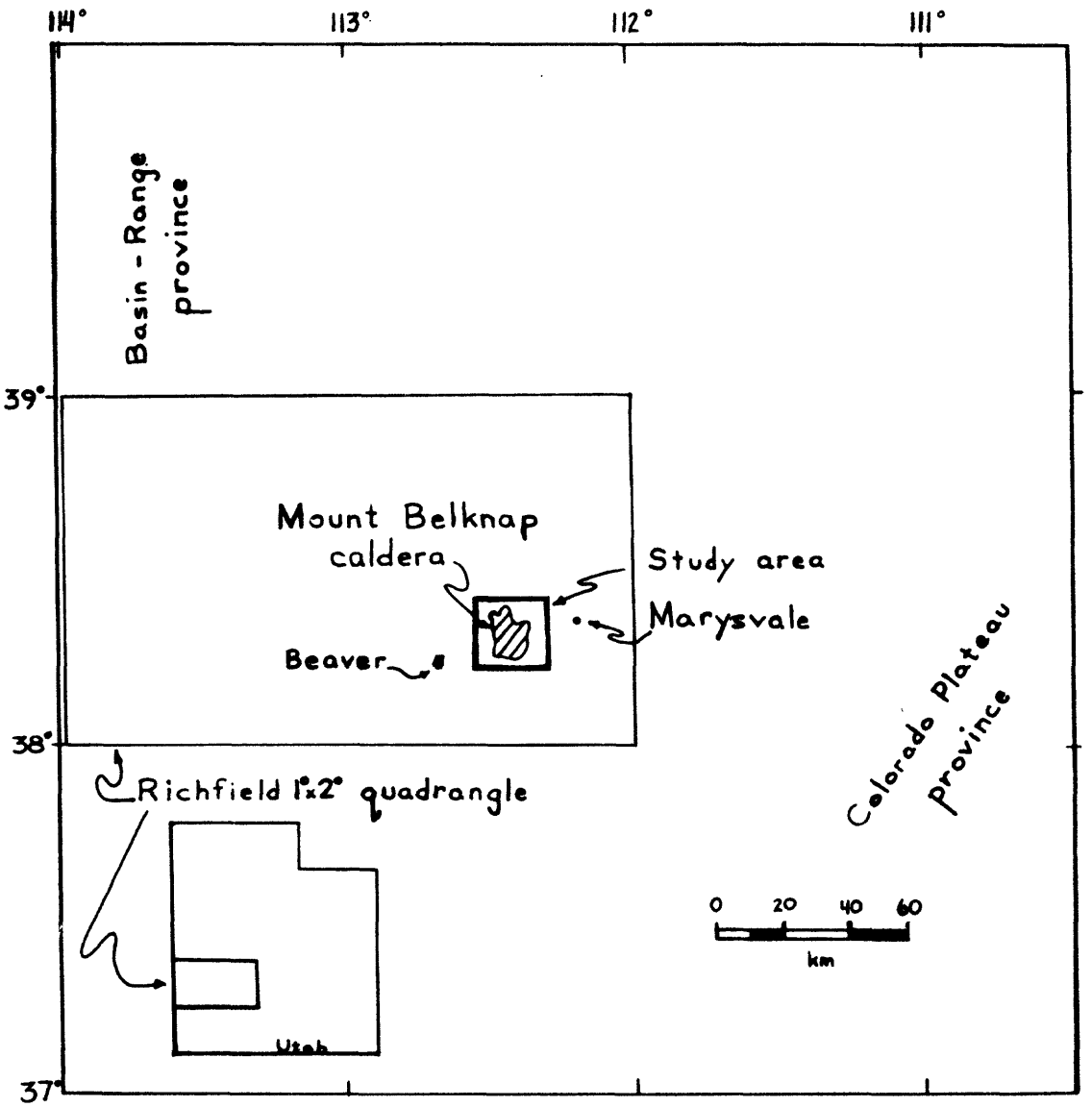

Figure 1

Index map of the Mount Belknap caldera area, Utah.

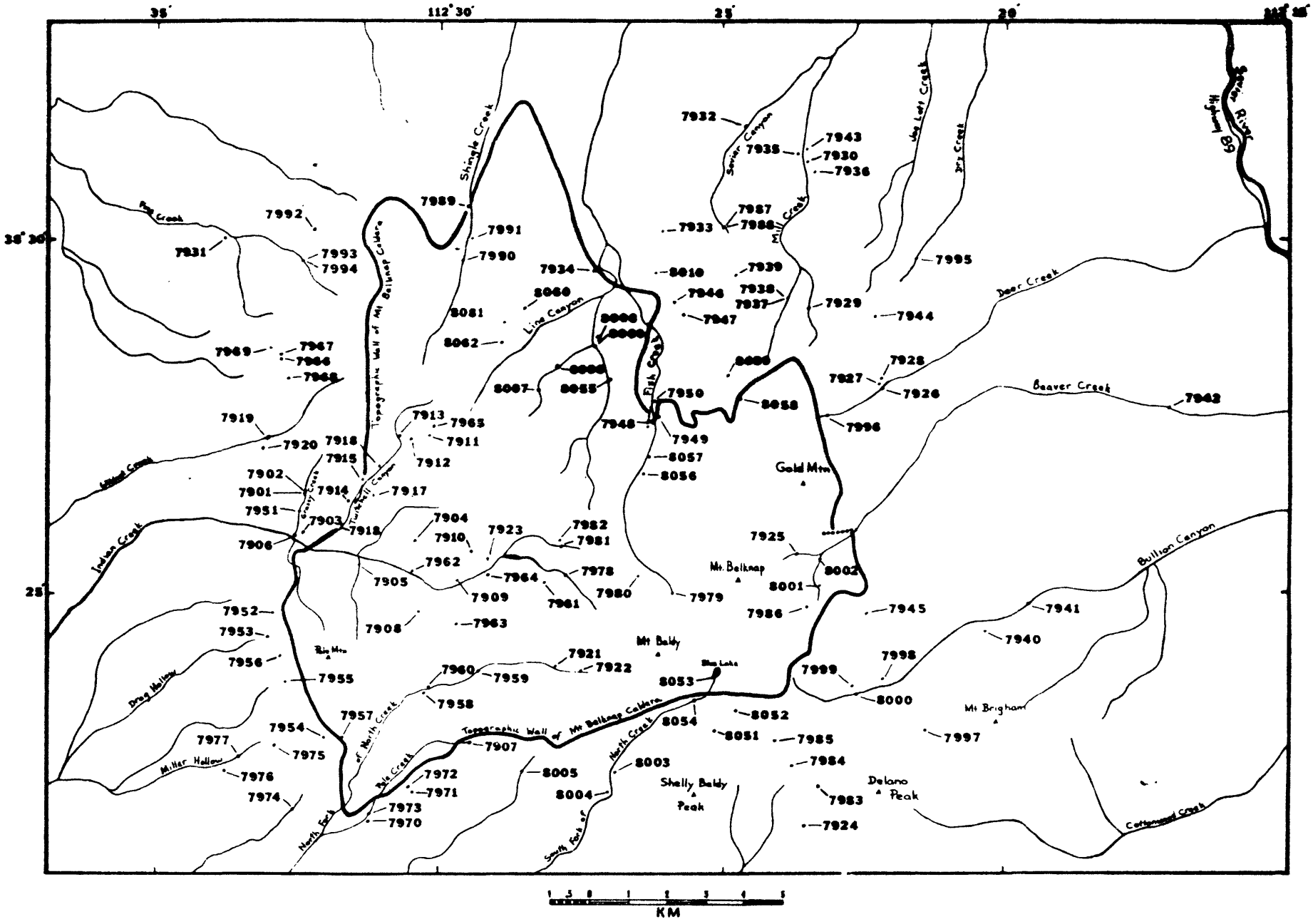

Figure 3 Sample sites, Mount Belknap caldera area, Utah

Table 3.--Analytical methods used for water analyses, Mt. Belknap Caldera, Utah

Constituent	Method	Reference
Alkalinity	Gran's plot potentiometric titration	Orion Research, Inc. (1975).
Sulfate	Ion chromatography	Smee and Hall (1978).
Chloride	do	Do.
Fluoride	do	Do.
Calcium	Flame atomic absorption spectrophotometry	Perkin-Elmer Corp. (1976).
Magnesium	do	Do.
Sodium	do	Do.
Potassium	do	Do.
Lithium	do	Do.
Silica	do	Do.
Zinc	do	Do.
Copper	Flameless atomic absorption spectrophotometry	Perkin Elmer Corp. (1977).
Molybdenum	do	Do.
Lead	do	Do.
Arsenic	do	Do.
Iron	do	Do.
Strontium	Induction-coupled-plasma-atomic-emission-spectrometry (ICP)	No reference
Barium	do	Do.
Boron	do	Do.
Beryllium	do	Do.
Manganese	do	Do.
Aluminum	do	Do.
Uranium	Fluorometric	McHugh (1979).
Specific conductance	Conductivity bridge	Brown, Skougstad, and Fishman (1970).

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH

sample	LAT	LONG	CA(mg/L)	MG(mg/L)	NA(mg/L)	K(mg/L)	LI(ug/L)	SR(ug/L)	BA(ug/L)	B(ug/L)
TS7901	38 26 22	112 32 21	68.0	18.00	10.00	3.50	5	540	75	19
TS7902●	38 26 22	112 32 21	53.0	15.00	9.40	2.40	3	396	35	19
TS7903●	38 25 48	112 32 17	90.0	29.00	18.00	2.90	70	270	19	14
TS7904	38 25 44	112 30 24	5.5	1.10	3.90	.61	2	25	3	<10
TS7905	38 25 25	112 31 24	11.0	2.40	6.20	1.30	2	50	4	<10
TS7906●	38 25 46	112 32 31	53.0	17.00	13.00	3.20	8	360	47	26
TS7907	38 22 52	112 29 47	10.0	1.90	4.10	.89	2	92	14	<10
TS7908	38 24 48	112 30 23	9.0	1.60	5.40	1.10	7	44	4	<10
TS7909●	38 25 7	112 29 40	7.9	1.10	6.00	.89	7	32	2	<10
TS7910	38 25 34	112 29 30	7.5	1.40	5.50	1.10	<2	33	3	<10
TS7911	38 27 13	112 30 17	6.2	1.30	3.70	.96	2	27	2	<10
TS7912●	38 27 11	112 30 29	10.0	2.10	6.70	.98	4	46	3	<10
TS7913	38 27 9	112 30 42	6.8	1.40	4.30	1.10	2	27	2	<10
TS7914	38 26 14	112 31 33	70.0	4.50	41.00	5.20	63	750	45	13
TS7915	38 26 33	112 31 20	21.0	8.20	10.00	1.30	10	380	33	13
TS7916●	38 26 42	112 31 8	6.7	1.40	5.00	.95	<2	29	2	<10
TS7917	38 26 21	112 31 18	10.0	2.10	10.00	.54	14	41	<1	<10
TS7918●	38 25 51	112 31 52	18.0	2.90	9.60	1.00	9	112	6	<10
TS7919	38 27 9	112 33 11	39.0	8.50	9.40	1.40	2	440	59	<10
TS7920	38 27 2	112 33 4	85.0	20.00	13.00	2.80	<2	540	100	17
TS7921	38 23 59	112 27 58	7.6	1.60	9.40	2.40	2	38	5	<10
TS7922	38 23 53	112 27 34	2.5	.50	2.60	.58	<2	13	4	<10
TS7923●	38 25 28	112 29 6	7.5	1.20	5.30	1.01	2	35	2	<10
TS7924	38 21 42	112 23 34	12.0	2.20	3.10	.17	<2	160	5	<10
TS7925	38 25 28	112 23 53	2.9	.40	1.70	.46	<2	10	2	<10
TS7926	38 27 57	112 22 11	11.0	1.30	2.90	.31	<2	48	4	<10
TS7927	38 27 57	112 22 13	11.0	1.10	3.20	.34	2	50	2	<10
TS7928	38 28 1	112 22 12	11.0	1.60	4.70	.70	<2	57	5	<10
TS7929	38 28 56	112 23 27	14.0	1.70	3.70	.51	<2	71	8	<10
TS7930●	38 31 3	112 23 34	82.0	10.00	57.00	.64	22	1,200	79	34
TS7931	38 30 2	112 33 46	72.0	16.00	25.00	1.70	14	1,060	178	25
TS7932	38 31 33	112 24 42	22.0	3.80	7.50	1.50	4	126	13	12
TS7933	38 30 7	112 26 0	15.0	3.60	10.00	.44	6	80	5	15
TS7934	38 29 31	112 27 16	12.0	1.90	11.00	.62	6	42	2	<10
TS7935●	38 31 10	112 23 37	27.0	1.40	20.00	1.01	15	41	8	<10
TS7936	38 30 54	112 23 24	26.0	4.10	13.00	.99	4	373	36	<10
TS7937	38 29 6	112 23 52	5.6	.95	3.00	.20	<2	300	2	<10
TS7938	38 29 6	112 23 52	5.2	.90	3.00	.26	<2	300	2	<10
TS7939●	38 29 32	112 24 42	31.0	3.30	3.60	.17	<2	85	3	<10
TS7940	38 24 32	112 20 17	44.0	5.30	2.70	.57	2	475	30	<10
TS7941	38 24 49	112 19 37	27.0	2.30	2.10	.38	2	306	29	<10
TS7942	38 27 32	112 17 8	20.0	2.00	4.60	.44	<2	256	14	<10
TS7943	38 31 13	112 23 34	14.0	1.90	5.70	.64	<2	87	8	<10
TS7944	38 28 48	112 22 9	17.0	2.90	4.00	.95	4	84	16	<10
TS7945●	38 24 36	112 22 24	9.1	.80	1.10	.14	<2	85	40	<10

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH--continued

sample	BE(ug/L)	SIO2(mg/L)	ALK(mg/L	SO4(mg/L	CL(mg/L)	F(mg/L)	ZN(ug/L)	CU(ug/L)	MO(ug/L)	PB(ug/L)
TS7901	<.4	15.0	105.00	87.00	13.70	.20	6	4.4	.60	1.5
TS7902	<.4	15.0	79.00	54.00	12.30	.30	7	4.0	.40	<.5
TS7903	26.0	34.0	.01	364.00	33.00	27.00	290	5.7	1.50	1.4
TS7904	<.4	15.0	17.00	3.00	3.60	.21	6	.5	.40	3.4
TS7905	<.4	29.0	35.00	4.80	7.20	.10	4	1.1	.40	.5
TS7906	1.5	13.0	94.00	82.00	21.00	4.20	20	3.9	.80	<.5
TS7907	<.4	17.0	36.00	4.20	2.10	.40	8	2.5	.50	4.1
TS7908	1.0	19.0	30.00	3.60	4.80	.37	5	9.2	.30	1.6
TS7909	1.0	21.0	25.00	4.80	3.60	.52	5	.5	.40	2.2
TS7910	<.4	13.0	26.00	3.00	5.50	.49	6	1.1	.30	1.7
TS7911	1.0	19.0	21.00	3.00	3.50	.17	5	.2	.30	1.7
TS7912	.6	23.0	36.00	4.20	5.90	.40	10	.6	.30	.7
TS7913	1.0	25.0	22.00	3.00	3.90	.13	5	.3	.30	.5
TS7914	<.4	10.0	56.00	179.00	12.00	2.90	6	4.5	6.80	1.3
TS7915	<.4	27.0	135.00	5.40	8.10	.20	5	1.6	.40	.5
TS7916	1.0	23.0	20.00	3.60	4.30	.25	4	.3	.30	1.2
TS7917	1.0	29.0	43.00	7.80	8.10	.68	4	.4	.30	1.5
TS7918	<.4	23.0	44.00	6.60	7.20	.35	4	.9	.40	.7
TS7919	<.4	21.0	134.00	10.00	7.20	.10	5	2.3	.30	.8
TS7920	<.4	13.0	221.00	60.00	14.00	.10	7	3.0	.40	<.5
TS7921	2.0	44.0	12.00	39.00	2.00	.82	36	1.1	.60	5.8
TS7922	<.4	17.0	.01	4.80	1.20	.10	8	.1	.50	<.5
TS7923	1.0	23.0	31.00	3.60	3.30	.41	5	.2	.40	.5
TS7924	1.0	13.0	44.00	1.80	.51	.10	5	.5	.30	1.1
TS7925	<.4	8.4	.01	7.20	.51	.51	10	.3	.40	<.5
TS7926	<.4	10.0	36.00	1.80	1.80	.40	4	.7	.40	.9
TS7927	.6	10.0	35.00	2.40	1.70	.51	5	.4	.70	<.5
TS7928	<.4	15.0	38.00	4.20	2.60	.13	5	.4	.40	1.1
TS7929	<.4	8.4	49.00	2.30	2.60	.28	4	1.3	.40	1.9
TS7930	1.0	44.0	244.00	24.00	42.00	1.01	9	1.8	.60	.6
TS7931	<.4	32.0	243.00	12.00	46.00	.21	5	1.6	.30	.9
TS7932	<.4	23.0	44.00	9.70	7.10	.19	4	.9	.50	1.2
TS7933	.6	40.0	24.00	6.30	12.00	.11	2	.2	.30	<.5
TS7934	<.4	29.0	29.00	4.60	11.00	.82	4	1.5	.60	.9
TS7935	<.4	38.0	70.00	17.00	20.00	.36	6	1.8	.40	.6
TS7936	<.4	34.0	74.00	5.10	16.00	.16	3	1.0	.30	1.0
TS7937	<.4	10.0	16.00	1.70	1.40	.28	3	.2	.40	<.5
TS7938	<.4	10.0	18.00	1.70	1.30	.28	2	.1	.30	.6
TS7939	<.4	8.4	91.00	4.60	3.30	.11	2	1.2	.50	.7
TS7940	<.4	6.3	81.00	50.00	.95	.21	1	4.1	.90	1.8
TS7941	<.4	4.2	47.00	18.00	.66	.17	4	4.2	.70	.9
TS7942	<.4	13.0	46.00	9.70	2.60	.50	4	2.9	.50	1.1
TS7943	<.4	17.0	51.00	4.60	3.30	.39	5	1.2	2.40	1.1
TS7944	.6	21.0	56.00	8.00	3.30	.20	3	1.4	.80	2.0
TS7945	<.4	4.2	26.00	2.90	.29	.04	2	1.1	.40	.5

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH--continued

sample	AS(ug/L)	FE(ug/L)	MN(ug/L)	AL(ug/L)	U(ug/L)	SP.COND. (µmohms/cm)	pH	TEMP.(C)
TS7901	3.0	6.0	21	<50.000	.30	540	7.55	14.0
TS7902	3.3	13.0	3	117.000	.20	450	6.90	9.0
TS7903	11.2	140.0	1,805	14,280.000	490.00	780	5.60	11.0
TS7904	1.1	60.0	<3	168.000	1.90	60	7.80	13.0
TS7905	2.3	80.0	<3	245.000	<.20	116	7.95	8.0
TS7906	3.3	5.0	<3	89.000	200.00	490	7.85	13.0
TS7907	2.0	33.0	<3	127.000	3.70	92	7.55	7.0
TS7908	1.7	80.0	<3	340.000	<.20	91	7.35	6.0
TS7909	1.8	35.0	<3	79.000	.70	84	7.55	7.0
TS7910	1.9	10.0	<3	<50.000	<.20	83	8.25	14.0
TS7911	1.4	70.0	3	201.000	.20	68	7.30	6.0
TS7912	2.1	90.0	11	234.000	<.20	108	7.45	12.0
TS7913	1.7	70.0	3	240.000	<.20	74	7.95	7.0
TS7914	6.0	8.0	<3	<50.000	.20	570	7.85	16.0
TS7915	3.3	2.0	3	92.000	2.30	320	8.30	13.0
TS7916	2.1	80.0	<3	286.000	.20	77	7.55	5.0
TS7917	2.5	90.0	<3	255.000	2.30	136	7.70	7.0
TS7918	2.6	32.0	<3	108.000	2.70	160	7.85	4.5
TS7919	3.4	9.0	3	67.000	.80	310	8.25	17.0
TS7920	3.1	2.0	4	85.000	<.20	580	7.70	23.0
TS7921	2.2	14.0	6	100.000	.30	128	6.75	14.0
TS7922	1.5	47.0	14	88.000	.20	35	7.15	9.0
TS7923	1.7	11.0	<3	<50.000	.20	80	7.15	4.5
TS7924	2.1	5.0	<3	100.000	<.20	96	7.70	4.0
TS7925	1.4	5.0	21	93.000	.30	32	7.70	6.0
TS7926	1.8	14.0	<3	92.000	<.20	86	7.75	7.0
TS7927	1.6	19.0	<3	98.000	<.20	85	7.90	9.0
TS7928	2.0	19.0	4	93.000	<.20	98	7.85	11.0
TS7929	1.8	6.0	<3	<50.000	<.20	106	8.05	13.0
TS7930	5.4	3.0	21	84.000	5.20	600	8.00	14.0
TS7931	4.5	2.0	<3	78.000	2.80	540	8.40	15.5
TS7932	2.9	.5	<3	<50.000	<.20	190	8.10	15.0
TS7933	2.6	23.0	<3	118.000	<.20	165	7.35	13.5
TS7934	2.0	32.0	<3	143.000	1.60	150	7.95	14.0
TS7935	6.5	6.0	6	<50.000	1.50	260	7.95	16.0
TS7936	3.4	19.0	<3	88.000	.20	240	8.05	14.5
TS7937	2.1	17.0	<3	84.000	<.20	52	8.15	7.0
TS7938	2.6	13.0	<3	85.000	<.20	52	7.55	7.0
TS7939	3.6	4.0	<3	99.000	<.20	220	7.50	7.0
TS7940	3.6	2.0	<3	69.000	.30	300	8.15	8.5
TS7941	3.2	3.0	<3	<50.000	.20	180	8.15	7.0
TS7942	3.6	6.0	5	71.000	1.60	155	8.35	9.5
TS7943	2.5	11.0	4	60.000	1.10	128	8.05	9.0
TS7944	2.5	140.0	9	343.000	1.50	140	8.05	8.5
TS7945	1.7	23.0	<3	69.000	<.20	64	8.25	3.5

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA CAREA, UTAH--continued

sample	LAT	LONG	CA(mg/L)	MG(mg/L)	NA(mg/L)	K(mg/L)	LI(ug/L)	SR(ug/L)	BA(ug/L)	B(ug/L)
TS7946	38 28 58	112 26 12	25.0	5.80	6.70	1.10	8	170	15	<10
TS7947	38 28 39	112 25 57	40.0	8.30	7.20	1.10	4	290	22	<10
TS7948	38 27 26	112 26 11	4.5	.70	4.90	.95	2	18	<1	<10
TS7949	38 27 28	112 26 8	4.8	.60	3.70	.57	<2	26	<1	<10
TS7950	38 27 40	112 26 11	8.2	1.40	3.90	.41	<2	37	2	<10
TS7951	38 26 7	112 32 25	64.0	17.00	12.00	3.60	<2	550	68	22
TS7952 ●	38 24 41	112 32 56	102.0	19.00	15.00	1.30	4	636	151	16
TS7953	38 24 21	112 33 7	67.0	14.00	17.00	2.20	6	350	125	24
TS7954	38 22 58	112 32 3	64.0	23.00	16.00	2.10	10	1,200	40	25
TS7955 ●	38 23 44	112 32 41	48.0	11.00	18.00	2.40	6	320	65	31
TS7956 ●	38 24 6	112 32 52	110.0	26.00	29.00	3.70	20	389	56	33
TS7957 ●	38 22 57	112 31 42	18.0	4.60	10.00	1.60	6	122	13	17
TS7958 ●	38 23 38	112 30 19	3.4	.70	4.40	.98	2	17	2	<10
TS7959	38 23 51	112 29 24	3.0	.60	3.30	.94	2	13	<1	<10
TS7960 ●	38 23 41	112 30 10	5.6	1.10	8.10	1.50	<2	26	5	<10
TS7961	38 25 7	112 28 9	3.7	.85	2.90	.78	<2	18	<1	<10
TS7962 ●	38 25 13	112 30 17	6.9	1.20	5.70	.95	4	33	3	<10
TS7963 ●	38 24 36	112 29 44	5.4	1.40	4.10	.86	2	31	<1	<10
TS7964 ●	38 25 11	112 29 2	6.7	1.40	5.40	1.20	6	30	<1	<10
TS7965 ●	38 27 18	112 30 7	6.2	1.40	3.60	.95	<2	28	2	<10
TS7966 ●	38 28 16	112 32 42	28.0	6.20	9.60	2.30	2	56	<1	20
TS7967 ●	38 28 17	112 32 42	53.0	5.70	9.10	.99	2	168	3	<10
TS7968	38 28 1	112 32 37	72.0	17.00	25.00	1.30	8	1,010	116	20
TS7969 ●	38 28 24	112 32 53	19.0	4.70	8.90	1.20	4	125	<1	<10
TS7970 ●	38 21 46	112 31 19	65.0	9.00	8.50	1.70	10	325	35	<10
TS7971 ●	38 22 10	112 30 29	18.0	6.10	10.00	5.30	8	9	2	<10
TS7972 ●	38 22 8	112 30 33	18.0	4.40	9.50	3.60	22	67	<1	<10
TS7973	38 21 48	112 31 19	15.0	3.40	5.10	1.60	<2	118	31	<10
TS7974 ●	38 21 54	112 32 36	63.0	22.00	24.00	3.20	12	503	61	56
TS7975 ●	38 22 47	112 32 53	100.0	71.00	13.00	1.30	14	2,100	24	17
TS7976 ●	38 22 28	112 33 48	115.0	56.00	40.00	.58	20	1,890	88	40
TS7977 ●	38 22 38	112 33 34	130.0	54.00	45.00	1.80	8	1,800	96	35
TS7978	38 25 13	112 27 47	3.2	.70	2.90	.78	2	14	<1	<10
TS7979 ●	38 24 51	112 25 49	6.4	.70	7.00	1.60	<2	20	<1	<10
TS7980	38 25 6	112 26 25	1.3	.30	1.50	.42	<2	5	<1	<10
TS7981	38 25 39	112 27 54	5.2	1.10	5.40	.57	<2	23	<1	<10
TS7982	38 25 41	112 27 56	5.9	1.3	5.80	.61	<2	27	2	<10
TS7983	38 22 14	112 23 23	13.0	2.40	3.30	.16	<2	242	10	<10
TS7984 ●	38 22 33	112 23 47	7.2	2.50	8.50	.27	<2	76	4	<10
TS7985 ●	38 22 50	112 24 5	9.2	3.10	2.20	.04	<2	77	5	<10
TS7986 ●	38 24 47	112 23 49	1.3	.20	.92	.30	<2	5	<1	<10
TS7987	38 30 8	112 24 57	23.0	3.50	5.80	.74	2	144	12	<10
TS7988	38 30 8	112 24 57	23.0	3.40	5.80	.76	6	137	12	<10
TS7989	38 30 18	112 29 30	5.8	1.20	4.30	.75	<2	28	4	<10
TS7990 ●	38 29 42	112 29 42	4.9	1.10	3.60	.56	2	10	<1	<10

Table 2.--WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH--continued

sample	BE(ug/L)	SIO2(mg/L)	ALK(mg/L	SO4(mg/L	CL(mg/L)	F(mg/L)	ZN(ug/L)	CU(ug/L)	MO(ug/L)	PB(ug/L)
TS7946	<.4	10.0	52.00	18.00	4.70	.39	3	1.9	1.70	<.5
TS7947	<.4	10.0	88.00	28.00	5.00	.37	4	2.8	.80	<.5
TS7948	3.0	23.0	.01	13.00	1.20	1.40	10	.3	.40	.8
TS7949	1.0	19.0	4.00	7.00	1.50	1.01	4	.3	.50	.7
TS7950	<.4	15.0	29.00	2.90	2.00	.57	5	.7	.40	.5
TS7951	<.4	15.0	52.00	80.00	16.00	.26	6	3.0	.40	.5
TS7952	<.4	23.0	249.00	27.00	18.00	.22	8	2.0	.40	<.5
TS7953	.6	25.0	193.00	19.00	34.00	.15	7	2.4	.40	.5
TS7954	<.4	27.0	201.00	59.00	17.00	.29	5	2.5	.40	.8
TS7955	<.4	32.0	189.00	13.00	25.00	.29	3	3.1	.50	1.4
TS7956	<.4	27.0	135.00	74.00	205.00	.88	6	2.3	.60	.7
TS7957	<.4	36.0	52.00	9.90	13.00	.24	4	.6	.60	.9
TS7958	6.0	25.0	.01	9.60	1.80	1.50	22	.1	.40	.8
TS7959	2.0	23.0	.01	9.40	1.01	1.01	10	.2	.40	2.8
TS7960	3.0	23.0	.01	16.00	5.70	1.90	13	.5	1.50	.5
TS7961	<.4	17.0	9.00	2.00	1.60	.60	9	.2	.90	.8
TS7962	1.0	21.0	20.00	5.30	3.50	.50	6	.2	.70	<.5
TS7963	<.4	23.0	10.00	3.50	3.20	.08	5	.1	.60	.9
TS7964	1.0	27.0	6.00	19.00	2.80	.83	6	.4	.60	1.0
TS7965	1.0	23.0	23.00	2.60	3.20	.19	8	.3	.50	.8
TS7966	<.4	36.0	95.00	5.80	13.00	.31	35	.8	.60	.9
TS7967	<.4	40.0	170.00	4.80	11.00	.18	3	1.1	.50	.5
TS7968	<.4	38.0	308.00	7.50	17.00	.47	2	1.8	.50	1.1
TS7969	<.4	34.0	48.00	5.50	17.00	.11	3	.7	.50	<.5
TS7970	<.4	17.0	154.00	35.00	7.70	.52	5	3.4	.90	.6
TS7971	<.4	25.0	.01	83.00	5.00	.37	40	3.8	.50	1.4
TS7972	<.4	38.0	.01	61.00	6.50	1.01	28	1.9	.50	<.5
TS7973	<.4	21.0	25.00	19.00	4.50	.39	2	1.4	.80	<.5
TS7974	<.4	63.0	256.00	14.00	27.00	.22	3	1.5	.50	<.5
TS7975	<.4	27.0	279.00	91.00	43.00	.29	3	2.3	.50	.5
TS7976	<.4	32.0	257.00	103.00	66.00	.26	4	1.9	.70	.9
TS7977	<.4	21.0	361.00	152.00	48.00	.29	4	2.5	1.10	[illegible]
TS7978	<.4	21.0	1.01	5.40	1.40	.83	16	.5	.60	[illegible]
TS7979	9.5	38.0	.01	36.00	.84	2.50	180	.4	.50	.9
TS7980	<.4	15.0	.01	3.00	.60	.15	12	.3	.60	.5
TS7981	<.4	23.0	21.00	2.70	2.20	.95	3	.5	1.01	<.5
TS7982	.6	25.0	26.00	3.20	2.50	.97	7	.9	.70	<.5
TS7983	<.4	8.4	53.00	4.30	.46	.08	4	1.9	.60	<.5
TS7984	<.4	13.0	53.00	1.50	.83	.13	2	.6	.60	<.5
TS7985	<.4	4.2	45.00	.47	.15	.06	3	.3	.60	<.5
TS7986	<.4	6.3	.01	2.10	.32	.24	2	.2	.50	<.5
TS7987	.6	19.0	61.00	11.00	5.00	.24	1	1.5	.60	<.5
TS7988	.6	19.0	66.00	11.00	5.00	.26	3	1.5	1.10	<.5
TS7989	<.4	21.0	22.00	1.90	2.50	.29	3	.4	.60	.8
TS7990	<.4	19.0	10.00	1.70	2.10	.18	2	.2	.50	1.2

Table 2.--WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH- continued

sample	AS(ug/L)	FE(ug/L)	MN(ug/L)	AL(ug/L)	U(ug/L)	SP.COND. (umohms/cm)	pH	TEMP.(C)
TS7946	3.3	25.0	<3	59.000	.60	215	8.30	14.5
TS7947	4.2	8.0	<3	81.000	.30	310	8.25	10.0
TS7948	1.9	14.0	21	188.000	.20	64	7.70	7.5
TS7949	1.9	13.0	<3	<50.000	.30	56	7.55	6.5
TS7950	2.0	18.0	<3	75.000	<.20	78	7.65	6.0
TS7951	3.5	3.0	4	<50.000	1.01	540	8.20	21.0
TS7952	5.6	2.0	6	<50.000	.60	600	7.90	10.0
TS7953	4.6	2.0	<3	87.000	.80	520	8.25	16.0
TS7954	3.9	4.0	4	86.000	3.40	580	7.80	10.0
TS7955	4.7	200.0	17	340.000	1.90	420	7.80	16.0
TS7956	4.2	7.0	60	90.000	.90	900	7.00	13.0
TS7957	2.9	58.0	55	<50.000	.40	200	6.75	12.0
TS7958	2.0	90.0	4	630.000	.60	56	6.05	8.0
TS7959	2.0	22.0	9	178.000	.60	47	6.55	9.5
TS7960	2.2	150.0	736	107.000	.40	92	6.20	16.0
TS7961	1.7	42.0	<3	130.000	.30	45	6.65	10.0
TS7962	2.0	80.0	3	212.000	.70	79	6.80	7.0
TS7963	1.2	90.0	<3	291.000	.80	67	7.05	8.0
TS7964	1.9	33.0	<3	85.000	.30	90	7.30	10.0
TS7965	1.9	80.0	<3	320.000	<.20	70	7.55	7.0
TS7966	4.5	6.0	<3	<50.000	2.10	260	7.75	9.0
TS7967	4.7	3.0	<3	<50.000	1.70	350	7.55	7.0
TS7968	5.4	2.0	3	<50.000	2.50	570	8.10	17.0
TS7969	2.6	90.0	65	<50.000	<.20	205	6.80	7.0
TS7970	4.8	3.0	<3	<50.000	20.00	430	6.95	8.0
TS7971	4.2	29.0	88	92.000	.40	245	5.95	7.0
TS7972	4.2	23.0	<3	69.000	1.20	22	6.55	8.0
TS7973	3.1	10.0	<3	<50.000	.40	155	7.75	17.0
TS7974	5.5	6.0	12	<50.000	1.20	580	7.40	21.0
TS7975	3.9	7.0	81	74.000	5.60	820	7.65	6.0
TS7976	4.2	2.0	<3	<50.000	2.30	790	7.15	16.0
TS7977	3.9	10.0	140	<50.000	6.20	1,050	7.65	13.0
TS7978	2.0	43.0	16	104.000	1.20	45	5.95	5.0
TS7979	2.5	740.0	2,270	1,358.000	1.30	136	4.40	6.0
TS7980	2.0	7.0	26	<50.000	.30	20	7.55	3.0
TS7981	2.0	20.0	6	<50.000	.80	66	7.70	6.0
TS7982	1.5	27.0	<3	69.000	.40	75	8.00	7.0
TS7983	2.4	2.0	<3	<50.000	.80	110	8.05	7.0
TS7984	2.6	4.0	<3	<50.000	.40	97	7.85	3.0
TS7985	1.6	29.0	<3	<50.000	.20	84	7.75	11.0
TS7986	2.0	14.0	<3	60.000	.20	15	7.75	3.0
TS7987	3.0	7.0	<3	<50.000	.40	180	7.40	6.0
TS7988	2.8	7.0	<3	<50.000	.40	180	7.45	6.0
TS7989	1.7	210.0	<3	216.000	.20	65	7.80	8.0
TS7990	1.7	110.0	<3	190.000	.30	56	7.55	6.0

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH--continued

sample	LAT	LONG	CA(mg/L)	MG(mg/L)	NA(mg/L)	K(mg/L)	LI(ug/L)	SR(ug/L)	BA(ug/L)	B(ug/L)
TS7991 ●	38 30 4	112 29 23	6.2	1.60	4.50	.88	4	35	5	<10
TS7992 ●	38 30 8	112 32 13	39.0	4.60	22.00	.27	6	205	7	13
TS7993	38 29 37	112 32 18	11.0	2.50	5.10	.79	4	55	3	<10
TS7994	38 29 37	112 32 18	11.0	2.50	5.00	.80	2	54	3	<10
TS7995	38 29 41	112 21 38	6.1	1.50	3.50	.64	2	24	3	<10
TS7996	38 27 28	112 23 8	2.8	.50	2.40	.33	<2	12	<1	<10
TS7997	38 22 59	112 21 28	20.0	1.20	1.60	.25	<2	351	18	<10
TS7998	38 23 44	112 22 19	23.0	1.80	1.50	.39	<2	288	37	<10
TS7999	38 23 39	112 22 41	22.0	2.00	1.20	.38	<2	368	48	<10
TS8000	38 23 33	112 22 45	9.7	1.10	1.90	.17	<2	153	18	<10
TS8001	38 25 6	112 23 14	9.3	1.20	2.90	.45	<2	133	13	<10
TS8002	38 25 26	112 23 18	8.7	.95	2.10	.50	<2	75	6	<10
TS8003	38 22 30	112 26 44	13.0	1.60	2.30	.45	<2	170	8	<10
TS8004	38 22 9	112 27 4	9.3	2.50	2.60	.68	<2	40	12	<10
TS8005	38 22 29	112 28 31	3.7	1.10	2.40	.55	<2	28	10	<10
TS8006	38 28 8	112 27 56	6.9	1.40	5.50	.98	2	29	3	<10
TS8007	38 27 51	112 28 17	5.2	1.10	3.40	.76	<2	23	<1	<10
TS8008	38 28 27	112 27 16	7.8	1.40	7.20	.96	2	38	2	<10
TS8009	38 28 27	112 27 16	7.8	1.40	7.20	.98	<2	39	3	<10
TS8010 ●	38 29 32	112 26 13	72.0	12.00	23.00	1.30	4	600	67	13
TS8051	38 23 3	112 25 9	3.6	.70	1.40	.30	<2	40	<1	<10
TS8052	38 23 20	112 24 45	10.0	1.60	2.00	.25	<2	171	6	<10
TS8053	38 23 50	112 25 7	2.5	.30	2.40	.74	<2	12	2	<10
TS8054	38 23 28	112 25 28	4.2	.60	2.40	.65	<2	44	2	<10
TS8055	38 27 58	112 26 54	31.0	3.60	8.80	.59	6	165	4	<10
TS8056	38 26 38	112 26 37	4.1	.65	3.20	.48	<2	12	<1	<10
TS8057	38 26 53	112 26 14	3.5	.50	2.90	.53	<2	11	<1	<10
TS8058	38 27 39	112 24 44	3.6	.70	3.20	.30	<2	15	<1	<10
TS8059	38 28 3	112 24 54	13.0	2.60	4.40	.58	2	63	5	<10
TS8060	38 29 1	112 28 30	9.1	2.00	5.00	.92	2	37	<1	<10
TS8061	38 28 49	112 28 54	6.7	1.50	3.90	1.10	2	29	<1	<10
TS8062	38 28 31	112 29 4	5.9	1.40	3.60	1.60	<2	25	2	<10

Table 2.-- WATER ANALYSES FROM MT. BELKNAP CALDERA AREA, UTAH--continued

sample	BE(ug/L)	SIO2(mg/L)	ALK(mg/L	SO4(mg/L	CL(mg/L)	F(mg/L)	ZN(ug/L)	CU(ug/L)	MO(ug/L)	PB(ug/L)
TS7991	<.4	21.0	22.00	2.80	3.70	.06	2	.4	.50	.7
TS7992	<.4	21.0	143.00	4.20	23.00	.63	1	1.8	.50	<.5
TS7993	<.4	23.0	53.00	2.00	3.00	.13	3	.6	.60	<.5
TS7994	<.4	23.0	52.00	2.00	3.00	.15	3	.6	.50	<.5
TS7995	<.4	29.0	18.00	5.10	3.20	.11	1	.3	.50	<.5
TS7996	<.4	15.0	8.00	1.10	1.01	.47	13	2.4	.60	<.5
TS7997	<.4	4.2	46.00	16.00	.37	.18	1	3.2	.50	.7
TS7998	<.4	4.2	61.00	11.00	.87	.05	2	2.8	.50	.7
TS7999	<.4	2.1	61.00	7.90	.85	.06	2	2.5	.60	.7
TS8000	<.4	4.2	33.00	3.00	.55	.08	2	1.2	.50	.7
TS8001	<.4	15.0	9.00	19.00	.72	.15	4	.8	1.20	<.5
TS8002	1.0	10.0	10.00	16.00	.60	.60	5	.6	.90	.5
TS8003	<.4	13.0	48.00	3.00	.87	.10	4	.7	.90	.9
TS8004	<.4	10.0	30.00	8.00	1.10	.24	3	.8	.90	.6
TS8005	<.4	13.0	13.00	2.40	1.01	.08	3	.3	.80	.9
TS8006	1.0	19.0	20.00	3.30	3.20	.45	4	.4	.70	<.5
TS8007	<.4	17.0	7.00	2.40	2.60	.15	3	.3	.70	<.5
TS8008	<.4	25.0	17.00	11.00	3.40	.52	4	.4	.70	.9
TS8009	.6	25.0	10.00	11.00	3.40	.52	4	.3	.70	1.4
TS8010	<.4	17.0	201.00	41.00	39.00	.16	5	2.5	1.01	<.5
TS8051	<.4	13.0	16.00	1.20	.64	.06	3	.3	.70	.6
TS8052	<.4	6.3	28.00	3.70	.28	.08	4	1.0	.60	1.2
TS8053	3.0	15.0	.01	8.50	.74	.83	20	.2	.60	<.5
TS8054	2.0	13.0	.01	7.80	.74	.70	8	.2	.60	.5
TS8055	.6	23.0	99.00	5.00	7.50	.11	2	1.1	.50	<.5
TS8056	1.0	17.0	8.00	1.90	1.40	1.90	3	.2	1.10	<.5
TS8057	1.0	17.0	5.00	2.40	1.30	1.30	4	.1	.70	<.5
TS8058	<.4	15.0	8.00	2.30	1.60	.57	10	1.0	.60	<.5
TS8059	<.4	10.0	52.00	3.00	3.20	.23	4	1.3	.60	<.5
TS8060	<.4	29.0	45.00	2.40	5.50	.15	4	.5	.60	.5
TS8061	<.4	27.0	21.00	2.10	3.70	.19	6	.2	.60	.9
TS8062	<.4	29.0	24.00	2.60	3.20	.13	3	.3	.60	.8

Table 2.--WATER ANALYSES FROM MT. BALKNAP CALDERA AREA, UTAH--continued

sample	AS(ug/L)	FE(ug/L)	MN(ug/L)	AL(ug/L)	U(ug/L)	SP.COND. (µmohms/cm)	pH	TEMP.(C)
TS7991	1.6	150.0	<3	379.000	.20	73	7.45	8.5
TS7992	4.1	4.0	<3	<50.000	6.50	340	7.55	11.0
TS7993	2.0	70.0	<3	134.000	.40	108	7.75	11.0
TS7994	1.7	52.0	4	107.000	.20	108	7.75	11.0
TS7995	2.3	90.0	<3	108.000	.20	68	8.40	5.0
TS7996	1.8	28.0	<3	63.000	.30	33	8.55	7.0
TS7997	2.8	3.0	<3	<50.000	.20	136	7.90	5.0
TS7998	2.[illegible]	17.0	4	<50.000	<.20	150	8.00	8.0
TS7999	2.2	12.0	<3	<50.000	<.20	144	7.90	7.0
TS8000	1.7	13.0	<3	<50.000	.20	73	7.70	5.0
TS8001	1.5	13.0	<3	<50.000	.30	88	7.85	3.5
TS8002	1.6	10.0	9	70.000	.50	78	7.65	4.0
TS8003	2.1	3.0	<3	<50.000	.80	97	8.40	5.0
TS8004	1.8	9.0	<3	<50.000	.60	91	8.05	8.0
TS8005	1.5	42.0	<3	79.000	.40	45	7.95	5.0
TS8006	1.9	20.0	<3	73.000	.20	80	7.35	10.0
TS8007	1.7	55.0	<3	120.000	.40	60	7.35	7.0
TS8008	1.8	42.0	<3	94.000	.50	98	7.40	10.0
TS8009	2.2	38.0	<3	95.000	.60	100	7.45	10.0
TS8010	4.8	10.0	5	<50.000	2.00	560	7.20	7.5
TS8051	2.0	16.0	4	<50.000	.50	34	7.75	2.0
TS8052	2.4	5.0	<3	<50.000	.60	82	7.75	3.0
TS8053	1.9	20.0	106	290.000	.90	39	6.80	8.0
TS8054	1.8	14.0	21	117.000	.70	49	6.95	8.0
TS8055	3.5	9.0	<3	<50.000	2.80	240	8.20	7.0
TS8056	1.6	37.0	<3	98.000	1.10	48	8.15	9.5
TS8057	1.6	22.0	<3	78.000	1.30	42	7.75	6.0
TS8058	2.1	30.0	<3	68.000	.60	45	7.60	7.0
TS8059	2.1	8.0	<3	<50.000	.60	122	7.65	8.5
TS8060	2.0	53.0	<3	107.000	.30	97	7.60	8.5
TS8061	1.9	60.0	<3	115.000	.30	76	7.45	9.0
TS8062	1.6	70.0	<3	272.000	<.20	70	7.50	8.0

Table 3.--Summary of chemical analyses of 122 water samples, Mt. Belknap Caldera, Utah

Variable	Minimum	Maximum	Mean	Geometric mean	Standard deviation	Geometric deviation
Ca (mg/L)	1.3	130.	23.7	13.3	28.1	2.90
Mg (mg/L)	0.20	71.	5.70	2.45	10.6	3.27
Na (mg/L)	0.92	[illegible]	8.20	5.63	9.03	2.28
K (mg/L)	0.04	5.3	1.09	0.803	0.961	2.24
Li (µg /L)	1.0	70.	4.83	2.45	9.20	2.77
Sr (µg/L)	5.0	2100.	215.	82.4	363.	3.98
Ba (µg/L)	0.50	178.	19.1	5.42	32.2	5.39
B (µg/L)	3.0	56.	7.19	4.53	9.36	2.27
Be (µg/L)	0.10	26.	0.734	0.215	2.57	3.48
SiO_2 (mg/L)	2.1	63.	20.3	17.6	10.2	1.80
Alkalinity (mg/L)	0.01	361.	60.5	15.5	74.7	17.1
SO_4 (mg/L)	0.47	364.	20.0	7.58	42.8	3.52
Cl (mg/L)	0.15	205.	9.41	3.59	21.2	3.83
F (mg/L)	0.04	27.	0.676	0.300	2.47	2.74
Zn (µg/L)	1.0	290.	9.89	4.86	30.7	2.38
Cu (µg/L)	0.10	9.2	1.33	0.809	1.39	2.85
Mo (µg/L)	0.30	6.8	0.654	0.565	0.635	1.57
Pb (µg/L)	0.10	5.8	0.807	0.577	0.774	2.34
As (µg/L)	1.1	11.	2.73	2.48	1.39	1.51
Fe (µg/L)	0.50	740.	38.8	16.7	75.8	3.72
Mn (µg/L)	1.0	2270.	47.6	2.70	269.	5.14
Al (µg/L)	25.	14280.	228.	74.6	1291.	2.76
U (µg/L)	0.10	490.	6.67	0.513	47.7	4.19
Sp. Cond. (µmhos/cm)	15.	1050.	201.	129.	212.	2.51
pH	4.4	8.55	7.58	--	0.619	--
Temp (C°)	2.0	23.	9.21	8.34	4.12	1.58

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