Data Repository 2002099

TABLE DR1. MAJOR ELEMENT OXIDE, TRACE AND RARE EARTH ELEMENT CONCENTRATIONS

	Lava Mountains Andesite (Tl)								
Sample	LM96-1	LM96-4	LM96-4X	LM96-5	LM96-6	LM97-20	LM97-23	LM97-23X	LM97-24X
long (°W)	117.425	117.548	117.548	117.437	117.437	117.520	117.520	117.520	117.520
lat (°N)	35.368	35.452	35.452	35.360	35.360	35.437	35.438	35.438	35.438
SiO_2	66.50	63.35	58.09	65.34	65.40	63.65	64.41	58.52	59.20
TiO_2	0.48	0.70	0.92	0.47	0.47	0.69	0.67	0.97	1.02
Al_2O_3	16.86	17.03	15.64	16.52	16.05	16.38	16.57	17.57	17.46
Fe_2O_3T	3.44	4.38	5.78	3.36	3.24	3.94	3.97	5.39	5.17
MnO	0.06	0.06	0.10	0.06	0.06	0.06	0.06	0.09	0.09
MgO	1.60	2.78	4.77	1.54	1.51	2.41	2.36	4.12	4.62
CaO	3.88	4.65	6.43	3.80	4.14	4.34	4.43	6.76	6.58
Na_2O	4.27	4.18	3.49	4.07	4.03	3.82	4.14	3.75	3.80
K_2O	2.42	2.31	1.54	2.50	2.57	2.68	2.66	2.13	2.14
P_2O_5	0.19	0.23	0.39	0.15	0.18	0.23	0.19	0.45	0.38
LOI	0.86	0.82	0.50	2.27	1.82	1.76	1.45	1.56	1.35
Total	100.6	100.5	97.7	100.1	99.5	99.9	100.9	101.3	101.8
Rb	40.8	33.6	23.0	39.6	40.8	48.7	40.9	35.0	37.0
Th	2.70	2.63	2.57	2.76	3.10	2.64	2.82	2.94	3.03
Ba	1273	1246	1532	1323	1303	1395	1409	1364	1331
Sr	843	783	1101	763	787	802	775	1103	1111
La	17.46	25.19	28.18	18.82	17.19	25.53	27.19	34.54	32.78
Ce	32.9	46.54	52.98	34.66	32.18	46.57	47.29	62.65	58.08
Pr	3.68	5.19	6.15	3.93	3.66	5.14	5.19	7.22	7.00
Nd	14.4	19.76	24.09	15.34	14.47	19.52	20.51	29.01	28.56
Sm	3.2	3.85	4.73	3.27	3.05	3.68	3.80	5.33	5.41
Eu	0.96	1.11	1.44	0.94	0.90	1.01	1.06	1.47	1.50
Gd	2.72	2.93	3.69	2.78	2.65	2.89	2.97	4.14	4.22
Tb	0.41	0.41	0.51	0.42	0.40	0.40	0.41	0.56	0.56
Dy	2.3	2.21	2.74	2.38	2.30	2.19	2.29	3.03	3.14
Ho	0.45	0.40	0.51	0.47	0.45	0.40	0.42	0.56	0.57
Er	1.2	1.03	1.26	1.25	1.15	1.04	1.06	1.39	1.36
Tm	0.18	0.15	0.15	0.17	0.18	0.15	0.15	0.20	0.19
Yb	1.08	0.86	1.02	1.14	1.07	0.86	0.91	1.14	1.12
Lu	0.17	0.13	0.17	0.18	0.17	0.14	0.15	0.18	0.18
Y	12.5	11.1	16.0	13.3	12.5	11.4	13.4	15.1	16.7
Cs	1.95	1.11	0.75	1.92	1.96	1.21	1.21	0.95	1.06
Nb	8.58	8.49	10.08	7.65	7.78	7.09	1.28	5.02	10.50
Hf	4.32	3.69	3.51	3.37	3.29	3.93	4.04	3.91	3.80
Zr	213	168	190	147	151	195	206	227	219
Sc	6.2	9.0	14.8	6.4	6.3	8.0	8.6	12.8	13.3
Cr	23.1	48.5	147	19.2	22.8	30.9	31.4	86.0	101
Ni	20.2	65.6	129	12.5	14.7	41.5	48.5	71.8	85.6

	Lava Mountains Andesite (Tl)					*Almond Mountain Volcanic rocks (Ta)*			
Sample	LM97-25X	LM97-26	LM97-27	LM97-28X	LM97-47	LM96-7	LM96-8	LM96-16	LM96-17
long (°W)	117.520	117.527	117.527	117.548	117.478	117.440	117.542	117.555	117.538
lat (°ſN)	35.438	35.448	35.447	35.452	35.425	35.365	35.428	35.428	35.432
SiO_2	58.57	65.65	64.47	59.14	64.1	66.33	68.16	65.39	62.23
TiO_2	0.95	0.63	0.61	1.02	0.62	0.59	0.57	0.56	0.64
Al_2O_3	17.09	16.45	15.68	17.00	17.4	16.75	16.86	16.60	16.46
Fe_2O_3T	5.49	3.72	3.70	5.56	3.82	3.46	3.37	3.29	3.68
MnO	0.07	0.05	0.05	0.07	0.06	0.06	0.02	0.04	0.09
MgO	3.80	1.98	1.88	4.26	2.01	1.62	0.250	1.61	1.98
CaO	6.46	3.85	3.86	6.34	4.20	3.90	3.48	4.05	3.62
Na_2O	3.94	4.21	3.91	3.97	3.65	3.75	4.14	4.27	2.63
K_2O	1.96	2.60	2.74	2.06	2.32	2.78	2.69	2.49	3.07
P_2O_5	0.57	0.19	0.16	0.32	0.22	0.19	0.13	0.17	0.17
LOI	1.78	1.63	2.14	1.25	3.30	1.63	0.76	1.54	5.44
Total	100.7	101.0	99.5	101.0	101.7	101.0	100.4	100.0	100.0
Rb	31.6	47.4	49.1	31.5	50.1	38.5	42.3	48.2	61.5
Th	2.67	2.81	2.74	2.64	3.45	2.26	2.58	2.37	2.99
Ba	1433	1295	1288	1208	1141	1283	1343	1277	1247
Sr	1064	663	638	977	713	642	625	743	736
La	32.09	23.90	23.80	28.26	24.84	20.95	18.47	17.77	24.99
Ce	58.05	43.13	42.32	53.13	42.54	37.49	34.52	30.28	45.68
Pr	6.89	4.85	4.81	6.36	4.91	4.20	3.53	3.53	4.95
Nd	27.67	18.86	19.02	25.97	18.96	16.57	13.34	13.78	19.13
Sm	5.23	3.59	3.72	5.17	3.71	3.31	2.63	2.65	3.58
Eu	1.50	0.99	0.98	1.47	1.01	0.98	0.78	0.83	1.01
Gd	4.01	3.04	3.03	4.11	3.06	2.74	2.06	2.23	3.02
Tb	0.55	0.43	0.45	0.56	0.43	0.39	0.29	0.31	0.42
Dy	2.85	2.45	2.59	3.01	2.47	2.16	1.51	1.71	2.36
Ho	0.53	0.45	0.48	0.54	0.48	0.42	0.29	0.31	0.45
Er	1.30	1.16	1.22	1.39	1.17	1.05	0.71	0.76	1.10
Tm	0.18	0.17	0.18	0.18	0.17	0.15	0.10	0.11	0.17
Yb	1.02	1.02	1.08	1.13	1.02	0.93	0.61	0.66	0.99
Lu	0.16	0.17	0.17	0.17	0.16	0.15	0.09	0.10	0.16
Y	17.6	16.7	14.1	17.2	15.3	11.6	8.05	8.48	12.57
Cs	0.96	1.26	0.91	1.01	1.44	1.22	1.26	0.84	3.69
Nb	8.04	5.65	6.86	6.86	8.29	7.84	7.44	6.51	9.52
Hf	3.71	4.30	4.27	3.77	4.16	3.67	3.60	3.76	4.30
Zr	224	201	206	208	193	156	157	181	204
Sc	11.6	7.0	6.6	12.7	7.0	7.0	6.2	7.0	6.8
Cr	81			93.3		23.4	24.6	26.1	27.4
Ni	85.3	29.5	25.7	101		22.0	16.0	21.5	26.6

Almond Mountain Volcanic rocks (Ta)

Sample	LM97-22	LM97-38	LM98-46	LM98-48	LM98-K1	LM98-K2	LM98-K4	LM98-K6	LM98-K7
long (°W)	117.533	117.507	117.438	117.477	117.558	117	117	117.555	117.560
lat (°N)	35.445	35.385	35.375	35.425	35.408	35	35	35.427	35.428
SiO_2	63.54	66.88	61.0	63.5	63.05	64.20	66.49	64.20	65.05
TiO_2	0.58	0.55	0.56	0.67	0.56	0.60	0.51	0.51	0.47
Al_2O_3	16.42	16.37	16.8	17.2	16.66	16.56	16.17	15.56	15.40
Fe_2O_3T	3.51	3.29	3.82	4.33	3.47	3.53	3.12	3.04	2.69
MnO	0.06	0.05	0.19	0.07	0.04	0.06	0.05	0.05	0.04
MgO	2.14	0.89	1.44	1.98	1.34	1.76	0.88	1.18	1.07
CaO	3.80	3.37	4.23	4.38	3.82	3.77	3.10	3.40	2.84
Na_2O	3.27	3.58	3.06	4.14	3.00	3.84	3.56	3.24	2.98
K_2O	3.07	2.70	2.32	2.30	2.94	2.44	2.66	2.77	2.80
P_2O_5	0.20	0.18	0.05	0.25	0.18	0.18	0.16	0.19	0.16
LOI	3.42	2.13	8.20	1.11	4.95	3.07	3.29	5.32	6.51
Total	100.0	100.0	101.8	99.9	100.0	100.0	100.0	99.4	100.0
Rb	68.6	52.1	41.4	46.1	76.8	57.0	44.3	52.8	55.8
Th	3.32	3.38	3.38	3.13	3.01	2.86	2.92	3.07	3.41
Ba	1080	1348	1140	1283	1192	1296	1380	1533	1445
Sr	737	627	706	797	654	783	664	609	576
La	24.41	23.88	21.89	24.01	17.99	20.29	18.09	25.67	24.82
Ce	44.22	41.75	37.99	43.91	33.54	36.52	33.31	45.28	44.15
Pr	4.91	4.60	4.51	4.91	3.89	4.11	3.61	4.95	4.89
Nd	19.24	17.39	17.62	18.99	14.84	15.69	13.94	18.96	17.72
Sm	3.81	3.08	3.37	3.62	2.94	3.11	2.76	3.59	3.51
Eu	1.01	0.86	0.85	0.99	0.81	0.83	0.77	0.94	0.89
Gd	3.11	2.57	2.76	2.97	2.52	2.72	2.20	2.78	2.63
Tb	0.45	0.35	0.40	0.42	0.40	0.38	0.34	0.39	0.37
Dy	2.54	1.93	2.26	2.36	2.20	2.17	1.91	2.22	2.04
Ho	0.49	0.37	0.42	0.45	0.43	0.42	0.36	0.40	0.38
Er	1.23	0.94	1.07	1.14	1.14	1.10	0.93	1.06	0.96
Tm	0.18	0.13	0.16	0.16	0.16	0.15	0.13	0.15	0.13
Yb	1.09	0.78	0.97	0.97	0.99	0.93	0.81	0.91	0.83
Lu	0.17	0.12	0.15	0.15	0.16	0.15	0.14	0.15	0.14
Y	13.58	7.18	9.30	12.00	12.57	11.50	9.63	11.60	10.14
Cs	1.95	0.81	1.29	1.26	3.09	1.00	0.86	1.12	1.08
Nb	9.07	6.86	7.20	7.16	6.30	6.87	6.52	7.88	6.44
Hf	3.98	3.93	4.00	3.82	3.12	3.75	3.44	4.60	4.11
Zr	186	173	181	193	160	183	163	209	200
Sc	7.3	6.2	7.7	7.6	6.8	6.9	5.8	7.6	4.5
Cr	31.4	108	45		24.0				
Ni	29.9	250	234						

	Almond Mountain Volcanic rocks (Ta)						*Dove Spring Fm. (Tds)*		
Sample	LM98-K8	LM98-K9	LM98-K10	LM98-K11	LM98-K12	LM98-K13	LM98-K14	LM98-K15	LM98-K16
long (°W)	117.560	117.560	117.560	117.558	117.440	117.438	117.978	117. 980	117.982
lat (°N)	35.428	35.428	35.428	35.427	35.375	35.378	35.370	35.352	35.363
SiO_2	65.02	65.31	64.85	64.50	61.97	66.47	69.80	66.20	71.16
TiO_2	0.47	0.49	0.51	0.55	0.60	0.53	0.07	0.12	0.16
Al_2O_3	15.34	15.76	16.06	15.45	16.69	16.64	12.16	14.02	12.18
Fe_2O_3T	2.67	2.85	2.94	3.44	3.71	3.33	0.92	3.07	2.98
MnO	0.04	0.04	.04	0.06	0.05	0.06	0.05	0.05	0.06
MgO	0.96	1.32	1.21	1.23	1.58	1.11	0.45	0.35	0.47
CaO	3.23	3.14	3.03	3.63	3.65	3.75	0.90	1.51	0.91
Na_2O	2.98	2.79	2.47	3.81	2.05	4.33	2.98	2.70	1.93
K_2O	3.20	2.78	2.60	3.09	2.48	2.53	2.36	3.08	2.38
P_2O_5	0.20	0.17	0.17	0.22	0.22	0.17	0.04	0.06	0.04
LOI	5.89	5.35	6.12	4.02	7.01	1.08	9.94	8.85	7.25
Total	100.0	100.0	100.0	100.0	100.0	100.0	99.7	100.0	99.5
Rb	53.7	51.4	48.7	53.4	49.5	53.4	103	169	110
Th	3.29	3.52	3.46	3.02	3.10	2.92	11.66	10.11	6.38
Ba	1445	1423	1323	1552	1173	1531	633	418	398
Sr	589	592	588	650	762	675	150	150	129
La	24.77	26.54	25.18	26.81	20.88	20.97	14.42	12.99	12.73
Ce	43.36	47.04	46.43	47.13	37.00	36.73	24.71	21.86	15.89
Pr	4.82	5.17	4.95	5.07	4.21	4.02	2.17	1.58	1.43
Nd	18.29	18.54	18.40	19.24	16.6	15.67	8.67	7.42	5.19
Sm	3.34	3.43	3.43	3.61	3.24	2.96	1.76	1.55	1.08
Eu	0.87	0.88	0.89	1.01	0.86	0.83	0.18	0.20	0.21
Gd	2.59	2.57	2.68	2.96	2.72	2.55	1.56	1.29	0.85
Tb	0.38	0.38	0.39	0.42	0.39	0.37	0.26	0.18	0.13
Dy	2.04	1.99	2.17	2.29	2.26	2.13	1.35	0.88	0.67
Ho	0.39	0.38	0.38	0.43	0.43	0.39	0.25	0.14	0.12
Er	0.99	1.01	1.01	1.08	1.10	1.02	0.62	0.30	0.27
Tm	0.14	0.14	0.14	0.15	0.16	0.14	0.09	0.04	0.04
Yb	0.86	0.85	0.87	0.95	0.95	0.83	0.54	0.24	0.23
Lu	0.14	0.14	014	0.15	0.16	0.13	0.08	0.04	0.04
Y	10.69	10.59	12.30	12.20	10.95	6.76	6.76	3.54	2.91
Cs	1.08	1.21	1.05	1.14	1.31	0.80	7.57	17.85	7.74
Nb	6.28	6.67	7.18	7.56	6.89	5.75	4.84	11.30	11.84
Hf	4.25	4.23	4.46	4.46	3.80	3.38	2.68	2.91	2.71
Zr	195	197	207	212	181	166	83	82	95
Sc	4.7	5.0	5.2	5.6	7.3	7.0	1.6	3.6	3.7
Cr									
Ni									

	Dove Spring Fm. (Tds)			*Summit Diggings andesite (Tsd)*					*Ttw*
Sample	LM98-K17	LM98-K18	LM98-K19	LM96-2	LM96-3	LM96-11	LM96-12	LM97-21	LM96-13
long (°W)	117.978	117.975	117.982	117.547	117.543	117.620	117.617	117.532	117.413
lat (°N)	35.363	35.423	35.383	35.448	35.448	35.445	35.458	35.440	35.497
SiO_2	70.53	42.46	52.20	63.32	63.32	62.63	62.82	62.58	50.62
TiO_2	0.06	0.43	1.44	0.72	0.70	0.59	0.60	0.64	1.37
Al_2O_3	11.90	8.67	15.05	16.85	17.50	16.92	17.41	17.22	14.41
Fe_2O_3T	0.66	2.61	10.27	4.43	4.41	4.57	4.77	3.87	10.98
MnO	0.03	0.07	0.15	0.06	0.07	0.05	0.09	0.03	0.15
MgO	0.39	1.52	6.22	3.09	2.99	2.54	2.74	1.72	6.87
CaO	1.28	21.18	8.92	4.73	4.81	4.80	5.07	4.07	9.85
Na_2O	2.74	1.25	2.50	4.11	4.21	4.05	3.98	4.34	2.77
K_2O	1.73	1.28	0.58	2.29	2.16	2.16	2.17	2.62	0.91
P_2O_5	0.04	0.23	0.29	0.22	0.23	0.21	0.19	0.19	0.30
LOI	11.29	20.28	2.37	1.49	1.49	2.52	1.38	1.23	1.38
Total	100.7	100.0	100.0	101.3	101.9	101.0	101.2	98.5	99.6
Rb	83.6	50.6	17.3	38.4	32.4	64.5	65.4	52.1	16.7
Th	12.50	4.98	2.97	2.72	2.53	6.79	6.54	1.96	2.04
Ba	531	503	390	1263	134	1019	1039	1189	393
Sr	239	343	343	798	810	1025	1011	713	446
La	7.25	22.57	17.13	26.00	25.09	16.06	17.51	18.01	16.68
Ce	13.68	33.14	33.13	48.14	45.74	29.28	32.18	32.71	33.41
Pr	1.43	4.74	3.82	5.36	5.15	3.44	3.71	3.74	4.11
Nd	5.07	18.61	16.14	20.60	19.80	14.08	14.90	15.02	1.64
Sm	1.14	3.95	4.65	4.09	4.02	2.81	3.21	3.04	4.44
Eu	0.07	0.95	1.46	1.18	1.15	0.97	0.99	0.89	1.48
Gd	1.10	3.75	4.70	3.12	3.04	2.69	2.86	2.60	4.36
Tb	0.19	0.62	0.76	0.44	0.43	0.41	0.42	0.37	0.70
Dy	1.11	3.51	4.79	2.39	2.32	2.19	2.41	2.11	4.10
Ho	0.21	0.74	0.89	0.44	0.44	0.45	0.46	0.39	0.78
Er	0.56	2.21	2.22	1.11	1.07	1.16	1.21	0.99	1.97
Tm	0.08	0.32	0.30	0.16	0.15	0.16	0.17	0.14	0.28
Yb	0.50	1.84	1.90	0.96	0.95	1.02	1.06	0.88	1.60
Lu	0.07	0.31	0.28	0.15	0.14	0.17	0.17	0.14	0.24
Y	2.97	24.23	22.79	12.00	11.60	7.73	12.71	11.23	20.36
Cs	3.57	2.99	0.27	1.23	1.06	2.26	5.16	0.85	0.61
Nb	9.85	7.82	11.01	8.19	8.45	5.89	5.23	6.03	9.26
Hf	2.55	2.63	2.95	3.82	3.74	2.91	2.97	3.56	2.69
Zr	90	101	107	174	176	161	172	180	116
Sc	1.4	7.7	24.7	9.4	9.1	10.7	10.7	6.5	23.3
Cr			203	51.4	44.2	48.9	38.9	19.1	322
Ni			93.4	57.6	53.0	55.8	34.8	9.5	138

	Teagle Wash basalt (Ttw)			*Black Hills dacite (Tbh)*			*Tv*		*Tr*
Sample	LM96-14	LM99-50	LM99-59	LM97-37	LM98-44	LM98-45	LM96-15	LM97-18	LM97-19
long (°W)	117.413	117.401	117.431	117.322	117.298	117.298	117.573	117.540	117.500
lat (°N)	35.497	35.502	35.445	35.352	35.333	35.333	35.453	35.451	35.428
SiO_2	51.32	52.38	52.74	63.44	64.08	63.8	68.42	62.04	71.31
TiO_2	1.40	1.39	1.39	0.60	0.64	0.61	0.44	1.16	0.26
Al_2O_3	14.54	15.16	15.18	17.21	17.26	17.5	15.75	19.50	15.76
Fe_2O_3T	11.08	11.10	11.23	4.35	4.40	4.25	2.76	2.42	2.20
MnO	0.15	0.15	0.20	0.07	0.07	0.07	0.05	0.06	0.06
MgO	6.31	6.83	6.28	1.71	2.55	2.37	0.47	0.35	0.39
CaO	10.05	9.70	12.78	5.28	4.44	5.17	3.06	5.42	2.28
Na_2O	2.78	2.72	2.53	3.80	4.20	4.04	3.53	3.73	4.15
K_2O	0.96	1.01	0.31	2.20	2.25	2.37	3.05	2.81	3.29
P_2O_5	0.29	0.31	0.19	0.22	0.20	0.27	0.14	0.25	0.07
LOI	1.53	1.12		1.97	0.85	1.15	2.76	4.42	0.96
Total	100.4	101.9	100.7	100.9	101.7	101.6	100.4	102.2	100.7
Rb	15.5	18.3	22.77	47.2	57.2	56.2	92.1	87.0	67.7
Th	2.05	3.09		5.15	6.09	5.78	6.55	7.11	2.84
Ba	413	443		1579	1227	1195	1042	652	1594
Sr	459	457	462	885	996	1008	456	374	527
La	16.68	18.67		24.81	15.66	14.95	20.37	25.19	24.35
Ce	33.35	36.96		41.83	29.12	28.00	34.58	47.85	41.23
Pr	4.12	4.46		5.19	3.41	3.28	3.73	5.44	4.38
Nd	17.76	19.06		20.49	13.58	13.06	14.06	21.55	15.89
Sm	4.44	4.74		4.02	2.76	2.68	2.90	5.13	2.77
Eu	1.48	1.51		1.10	0.86	0.79	0.74	1.52	0.69
Gd	4.48	4.67		3.82	2.68	2.43	2.64	4.87	2.41
Tb	0.71	0.74		0.55	0.39	0.36	0.42	0.80	0.35
Dy	4.19	4.39		3.24	2.18	2.16	2.51	4.81	2.16
Ho	0.80	0.85		0.63	0.43	0.40	0.47	0.96	0.41
Er	2.04	2.14		1.63	1.13	1.02	1.31	2.63	1.10
Tm	0.28	0.30		0.23	0.15	0.15	0.20	0.39	0.17
Yb	1.63	1.76		1.36	0.92	0.92	1.27	2.47	1.10
Lu	0.25	0.27		0.21	0.16	.015	0.20	0.39	0.19
Y	21.3	21. 9		19.2	8.3	10.7	14.4	26.2	12.9
Cs	0.54	095		2.13	3.12	1.94	2.79	3.10	1.28
Nb	9.63	9.75	8.53	6.48	5.67	5.38	11.84	13.52	8.36
Hf	2.74	2.89		3.42	3.15	3.01	3.63	5.22	4.4
Zr	112	107	106	176	166	171	152	211	183
Sc	24.4	24.2		8.4	9.2	9.1	4.4	14.8	1.2
Cr	338	349	331	27.5	32.0	30.0	21.0	29.5	11.1
Ni	148	154	133	175			15.7	18.0	7.2

	Tsr	*Kg*	*Tr*	*Td*	*Mzg*	*Mzg*	*Ka*	*Tr*	*Ti*
Sample	LM97-29	LM97-30	LM97-31	LM97-32	LM97-33	LM97-34	LM97-35	LM97-36	LM98-40
long (°W)	117.603	117	117	117	117.268	117.365	117.527	117	117.577
lat (°N)	35.463	35	35	35	35.356	35.338	35.460	35	35.405
SiO_2	67.89	65.47	75.63	54.58	68.76	76.64	69.08	75.26	65.41
TiO_2	0.42	0.87	0.06	1.63	0.32	0.07	0.62	0.20	0.64
Al_2O_3	15.34	17.16	14.30	17.41	16.60	13.27	15.75	14.08	16.77
Fe_2O_3T	2.84	4.18	0.71	8.19	2.69	0.41	3.29	0.71	3.44
MnO	0.07	0.06	0.04	0.14	0.11	0.03	0.05	0.001	0.04
MgO	0.479	1.45	0.075	4.05	0.755	0.046	0.797	0.204	1.57
CaO	4.87	4.39	0.69	7.13	4.13	0.47	2.78	0.23	4.00
Na_2O	4.03	3.62	3.42	3.96	4.24	3.58	3.60	2.69	3.26
K_2O	3.36	2.69	4.46	1.49	2.08	4.86	3.42	4.36	2.78
P_2O_5	0.13	0.24	0.02	0.27	0.12	0.03	0.05	0.02	0.22
LOI	2.77	0.41	0.49	2.76	0.63	0.22	1.13	1.44	3.18
Total	102.2	100.5	99.9	101.6	100.4	99.6	100.7	99.2	101.3
Rb	94.7	68.0	205	31.7	49.0	262	105	173	79.6
Th	8.58	8.39	15.0	3.48	2.96	26.8	11.2	14.6	4.24
Ba	887	1358	389	394	1034	62	998	871	12.67
Sr	559	819	87.9	385	556	72	562	95	784
La	21.77	46.96	13.40	17.20	16.9	15.02	31.63	38.17	26.96
Ce	37.56	79.81	23.16	32.45	27.30	10.91	57.62	65.35	48.14
Pr	4.12	8.62	2.53	3.86	2.87	0.61	6.15	6.72	5.41
Nd	15.81	32.64	9.71	16.20	10.33	1.59	23.03	23.34	20.27
Sm	3.29	6.25	3.09	4.19	2.09	0.22	4.42	4.65	3.74
Eu	0.71	1.50	0.36	1.51	0.68	0.07	1.03	0.52	0.92
Gd	2.96	4.28	3.85	4.45	1.91	0.16	3. 15	3.90	3.22
Tb	0.47	0.57	0.79	0.74	0.30	0.02	0.41	0.62	0.45
Dy	2.82	2.87	5.16	4.66	180	0.13	2.16	3.75	2.60
Ho	0.57	0.49	1.06	0.94	0.36	0.03	0.38	0.75	0.48
Er	1.54	1.15	2.89	2.54	1.08	0.08	091	2.10	1.25
Tm	0.23	0.16	0.43	0.36	0.17	0.02	0.13	0.32	0.18
Yb	1.43	0.92	2.78	2.35	1.20	0.13	0.78	2.08	1.14
Lu	0.22	0.14	0.42	0.36	0.22	0.03	0.13	0.33	0.16
Y	18.7	9.87	27.3	27.6	5.12		5.88	13.2	9.3
Cs	5.18	1.12	2.58	0.53	2.50	5.00	1.58	5.41	2.03
Nb	4.86	13.91	14.72	14.86	8.16	2.19	11.75	12.78	8.58
Hf	3.60	5.33	3.45	3.80	2.70	2.78	4.80	5.34	4.32
Zr	171	253	70.9	178	124	57.1	198	181	213
Sc	4.8	5.6	1.3	24.2	3.9	1.5	4.0	2.6	6.7
Cr				86.7			30.0		
Ni	15.3	12.3	12.6	43.3	9.3	4.9	319	14.1	

	Tv	*Tt*	*Tbp*	*Tt*	*Mzr*	*Tv*	*Tds*
Sample	LM98-49	LM99-51	LM99-53	LM99-54	LM99-57	LM99-58	RRC970704-a
long (°W)	117	117.405	117.440	117.442	117.650	117.601	
lat (° N)	35	35.504	35.445	35.467	35.387	35.467	
SiO_2	73.81	70.36	64.26	72.65	49.12	75.46	52.36
TiO_2	0.44	0.07	0.61	0.06	1.61	0.27	1.25
Al_2O_3	15.41	13.47	16.78	14.99	14.37	12.99	14.9
Fe_2O_3T	0.49	1.33	3.77	1.09	11.23	1.18	11.0
MnO	0.002	0.02	0.04	0.03	0.20	0.03	0.02
MgO	0.02	0.29	1.28	0.53	6.58	0.35	8.11
CaO	2.34	1.06	4.24	1.01	12.78	0.34	9.08
Na_2O	3.74	2.83	1.05	2.89	2.53	1.03	2.64
K_2O	3.11	4.06	2.59	3.67	0.31	7.20	0.03
P_2O_5	0.14	0.04	0.18	0.04	0.19	0.07	0.02
LOI	1.12	5.44	1.33	3.05	2.84	2.65	
Total	100.6	99.0	99.1	100.0	101.8	101.5	99.4
Rb	90.2	204	29.3	135	7.6	194	5.0
Th		13.3	2.63	8.58	0.21	8.10	2.15
Ba		623	1246	640	30	400	235
Sr	475	164	795	251	293	268	366
La		21.57	23.02	13.09	4.14	20.76	12.44
Ce		40.31	41.86	21.74	11.81	35.71	26.84
Pr		4.46	4.59	2.56	1.94	3.61	3.50
Nd		17.43	17.93	9.78	10.72	12.92	14.61
Sm		4.36	3.48	2.90	4.16	2.60	3.50
Eu		0.68	1.00	0.50	1.55	0.52	1.17
Gd		4.23	2.80	2.34	5.52	2.14	3.83
Tb		0.71	0.39	0.31	1.06	0.34	0.68
Dy		4.05	2.16	1.38	7.05	1.99	3.60
Ho		0.74	0.40	0.22	1.52	0.39	0.70
Er		1.79	1.02	0.52	4.12	1.06	1.89
Tm		0.25	0.14	0.07	0.59	0.15	
Yb		1.49	0.84	0.42	3.61	0.97	1.64
Lu		0.22	0.14	0.07	0.57	0.16	0.25
Y	16.9	21.80	11.29	6.72	39.94	11.48	19.39
Cs		7.24	0.21	5.80	0.51	9.90	0.49
Nb	18.0	13.25	7.02	14.68	2.44	7.92	8.9
Hf		3.41	3.81	2.83	2.63	3.10	2.43
Zr	161	98	174	84	92	122	99
Sc		1.8	6.6	1.6	49.0	9.9	21.6
Cr			25.2		351		215
Ni					82.6		117

Note: Major element oxides and trace elements (Rb, Sr, Y, Zr, Cr, Ni) by XRF analysis were done at the Rock Chemistry Laboratory, University of Nevada, Las Vegas. Other trace and rare earth elements by ICP-MS analysis were done at the GeoAnalytical Laboratory, WSU. Tl, Lava Mountains Andesite; Ta, Almond Mountain Volcanic rocks; Tds, Dove Spring Fm.; Tsd, Summit Diggings andesite; Ttw, Teagle Wash basalt; Tbh, Black Hills dacite; Tv, Tertiary volcanic rocks; Tr; Tertiary rhyolite; Tsr, Summit Range dacite; Td, Tertiary diorite; Tt, Tertiary tuff; Ti, Tertiary intrusive rocks; Tbp, volcanic clast in Bedrock Spring Fm.; Ka, Atolia Quartz Monzonite; Kg, Cretaceous granodiorite; Mzr, Rand Schist; Mzg, Mesozoic granitic rocks.

TABLE DR2. Sr, Nd, AND Pb ISOTOPE RATIO AND TRACE ELEMENT ANALYSES

Sample no.	$^{87}Sr/^{86}Sr_i$	Sm	Nd	$^{147}Sm/^{144}Nd$	$^{143}Nd/^{144}Nd$	ε_{Nd}	Pb	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{204}Pb$	$^{208}Pb/^{204}Pb$
Lava Mountains Andesite										
LM96-4	0.706373	3.645	21.02	0.10484	0.512503	-2.53	14.28	19.236	15.700	38.969
LM96-4x	0.706386	4.721	26.90	0.10609	0.512507	-2.44	12.04	19.233	15.696	38.980
LM96-6	0.706586	2.946	15.45	0.11528	0.512483	-2.92	19.60	19.189	15.695	39.002
LM97-26	0.706570	3.643	20.16	0.10922	0.512486	-2.90	14.83	19.183	15.661	38.870
LM97-28x	0.706327	4.813	26.57	0.10951	0.512508	-2.48	12.37	19.190	15.659	38.850
Almond Mountain Volcanic rocks										
LM96-7	0.706137	3.128	12.67	0.14923	0.512505	-2.54	11.68	19.211	15.676	38.897
LM96-8	0.706371	2.598	20.57	0.07636	0.512538	-1.80	12.69	19.269	15.702	38.989
LM96-17	0.706592	2.564	14.48	0.10702	0.512528	-2.09	17.33	19.237	15.671	38.911
LM98-46	0.706513	2.920	16.13	0.10942	0.512504	-2.50	13.65	19.197	15.658	38.838
LM98-K1	0.706543	2.366	12.55	0.11398	0.512494	-2.76	n.d.	19.203	15.655	38.896
LM98-K2	0.706386	2.836	15.31	0.11206	0.512502	-2.54	13.60	19.212	15.658	38.851
LM98-K4	0.706381	2.451	13.57	0.10919	0.512519	-2.21	13.05	19.220	15.663	38.870
LM98-K6	0.706468	3.107	17.82	0.10539	0.512526	-2.07	14.02	19.496	15.913	39.510
LM98-K8	0.706643	2.552	14.62	0.10552	0.512549	-1.67	n.d.	19.222	15.684	38.916
LM98-K11	0.706449	3.140	18.07	0.10506	0.512532	-1.95	13.36	19.112	15.556	38.496
LM98-K12	0.706344	2.953	16.16	0.11045	0.512507	-2.44	13.42	19.204	15.666	38.856
LM98-K13	0.706453	2.346	12.75	0.11127	0.512495	-2.74	n.d.	19.219	15.666	38.873
Teagle Wash basalt										
LM96-13	0.705407	4.294	18.88	0.13749	0.512698	+1.17	4.27	19.288	15.677	38.943
LM96-14	0.705475	4.286	19.02	0.13621	0.512723	+1.65	4.47	19.270	15.671	38.904
Dove Spring Formation, member 4 basalt										
LM98-K19	0.705337	3.185	13.265	0.14518	0.512739	2.00	n.d.	19.316	15.672	38.970
Summit Diggings andesite										
LM96-2	0.706372	3.844	22.04	0.10543	0.512563	-1.35	14.78	19.178	15.663	38.860
LM96-11	0.706514	2.810	14.08	0.12072	0.512501	-2.58	14.46	19.161	15.650	38.871
LM96-12	0.706426	3.098	15.79	0.11866	0.512495	-2.69	21.76	19.143	15.639	38.827
LM97-21	0.706328	3.048	16.19	0.11380	0.512477	-3.04	12.86	19.210	15.667	38.881
Black Hills dacite										
LM97-37	0.706761	4.496	23.58	0.11528	0.512448	-3.60	14.52	19.175	15.638	38.874
LM98-44	0.706635	2.003	9.974	0.12141	0.512488	-2.83	18.68	19.190	15.649	38.860
LM98-45	0.706687	2.474	12.42	0.12046	0.512510	-2.40	20.27	19.216	15.681	38.957
Summit Range dacite										
LM97-29	0.706134	3.230	16.52	0.11822	0.512629	-0.08	19.96	19.208	15.661	38.892
Dove Spring Formation, member 2 tuff										
LM98-K14	0.706951	1.2455	6.278	0.11448	0.512702	1.30	n.d.	19.146	15.644	38.806
LM98-K16	0.707125	0.7514	3.614	0.12572	0.512640	0.08	n.d.	n.d.	n.d.	n.d.
LM98-K17	0.707260	0.8901	4.041	0.13317	0.512797	3.14	3.58	19.193	15.649	38.890
other Tertiary volcanic rocks										
LM96-15	0.705942	2.895	15.23	0.11495	0.512703	+1.37	16.67	19.180	15.664	38.854
LM96-18	0.705360	4.869	23.05	0.12773	0.512710	+1.49	11.64	19.157	15.647	38.945
LM97-19	0.706565	2.871	17.18	0.10101	0.512460	-3.25	20.71	19.028	15.638	38.798
LM97-31	0.708809	2.640	9.747	0.16377	0.512591	-0.84	15.37	19.225	15.679	39.141
LM97-32	0.704075	3.619	15.78	0.13867	0.512876	+4.78	4.25	19.023	15.607	38.714
LM97-36	0.708750	n.d.	n.d.	n.d.	n.d.	n.d.	4.52	19.399	15.690	39.202

Note: Isotopic analyses by isotope dilution performed at the Isotope Geochemistry Laboratory, University of Kansas.