

Table 6.--Analyses of Rainier Mesa Member of Timber Mountain Tuff
[Major oxide analyses 1, 2-5, 9, 11, and 15 by P. L. D. Elmore, Ivan Barlow, S. D. Botts, and G. W. Chloe; 6, 7, 13, 17, and 19 by P. L. D. Elmore, S. D. Botts, G. W. Chloe, Lowell Artis, and H. Smith; 8 and 10 by E. L. Munson; 12 by D. F. Powers; 14 by C. L. Parker; 18 by George Streiger. Minor element analyses 5, 6, 7, 11-14, 16, and 19 by J. C. Hamilton; and 1-4, and 15 by R. G. Havens; 8 and 10 by H. G. Neiman. Leaders, ---, no analyses made or constituent was absent.]

	Upper part							Lower part										Quartz latite (intracaldera)	
	Partially welded, glassy	Densely welded crystallized tuff		Partially welded crystallized tuff	Vitrophyre		Vitrophyre		Partially welded crystallized tuff				Vitrophyre		Partially welded crystallized tuff	Densely welded crystallized tuff	Vitrophyre	Densely welded crystallized tuff	Vitrophyre
Sample localities (figure 2)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Field no-----	PL0861b	Rm4600d	FB0056b	BBRK	61TNEF	RK-63-100S	TM6894	63L-39	FB0056a	63L-19	RM4600b	JD-111D	PC-528	XR-7	BBR1	62L-601	DDH3-251	B374	62ENH40
Chemical laboratory no-----	158594	158593	158592	158597	161725	161725	161150	D100373	158757	D100369	158756	I4068	160076	I4189	158596	162827			160310
Spectrographic laboratory no---	292448	292447	292446	292451	H3555	D111298W	D110390W	D100373	H3552	D100369	H3551	I4068	298848	I4189	292450	D112928W			D110919

A. Major oxides (weight percent), recalculated without H₂O, F, Cl, and CO₂ as CaCO₃

SiO ₂ -----	68.9	70.4	71.1	72.4	73.0	73.6	76.2	76.4	76.5	76.6	76.8	76.9	77.1	77.18	77.4	77.7	77.9	78.53	71.5
Al ₂ O ₃ -----	16.3	16.1	15.3	14.2	14.6	14.3	13.2	12.6	12.9	12.6	13.2	12.7	12.5	12.51	12.6	12.2	12.6	11.73	15.0
Fe ₂ O ₃ -----	1.2	1.2	1.0	1.1	.91	1.4	.63	1.1	.57	1.0	.48	.80	.87	.48	.43	.61	.58	.86	1.7
Sum as FeO-----	1.9	1.6	1.6	1.3	1.29	1.3	.91	1.2	.72	1.12	.62	.77	.87	.73	.59	.75	.63	.90	2.0
FeO-----	.81	.50	.77	.30	.47	.03	.34	.2	.21	.2	.19	.05	.08	.30	.20	.20	.11	.13	.52
MgO-----	.62	.52	.46	1.0	.39	.51	.27	.2	.31	.2	.33	.23	.18	.15	.46	.15	.36	.20	.90
CaO-----	2.2	1.5	1.5	1.2	1.2	.79	.53	.8	.67	.6	.61	.58	.42	.60	.43	.55	.47	.59	1.6
Na ₂ O-----	4.1	4.3	4.1	3.7	3.4	3.8	3.7	3.5	3.7	3.5	3.5	3.7	3.76	3.5	3.4	3.3	3.01	3.01	3.0
K ₂ O-----	5.3	5.0	5.4	5.7	5.6	5.2	5.0	5.0	4.9	5.1	4.7	4.99	4.9	4.83	4.8	5.0	4.5	4.73	5.3
TiO ₂ -----	.37	.32	.29	.25	.24	.24	.09	.2	.13	.2	.10	.14	.18	.13	.10	.14	.10	.18	.39
P ₂ O ₅ -----	.13	.10	.09	.10	.14	.07	.00	.1	.07	.0	.03	.01	.01	.01	.02	.00	.00	.00	.14
MnO-----	.07	.06	.05	.06	.05	.06	.04	.1	.04	.0	.06	.06	.06	.05	.06	.05	.06	.03	.05
Total-----	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.20	100.00	100.00	100.00	100.01	100.00	100.00	100.00	100.00	99.98	99.99	100.10

B. Minor elements (weight percent)

B-----	<.002	<.002	<.002	<.002	<.002	<.002	0.002	<.002	0.002	<.002	0.002	0.002	<.002	0.003	0.003	<.002	-----	-----	0.003
Ba-----	.2	.2	.2	.15	.07	.07	.02	.05	.01	.03	.003	.007	.01	.01	.005	.015	-----	-----	.15
Be-----	.0003	.0002	.0007	<.0001	.0002	.00015	.0002	.0003	.0003	.0003	.0003	.0003	.0005	.0003	.0007	.0003	-----	-----	<.0001
Ce-----	.03	.03	.05	.02	<.02	.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.02	<.015	<.02	-----	-----	.02
Co-----	.0003	.0005	.001	.0003	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	-----	-----	-----
Cr-----	.00015	.0001	.0003	.0001	.00015	<.0001	<.00015	<.0001	<.00015	<.0001	<.0001	<.0001	<.0001	.0002	.0001	<.0001	-----	-----	-----
Cu-----	.0007	.001	.007	.0003	.0005	.0005	.0003	.0003	.0002	.0007	.00015	.0002	.0003	.0005	.0003	.0007	-----	-----	.015
Ga-----	.003	.003	.003	.003	.003	.003	.002	.002	.003	.002	.003	.002	.003	.003	.003	.003	-----	-----	.002
La-----	.015	.015	.02	.01	.005	.007	.007	<.002	.007	<.002	<.002	<.002	.003	.003	<.002	.005	-----	-----	.01
Mo-----	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0007	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	.0007	<.0005	<.0005	-----	-----	<.0005
Nb-----	.002	.003	.003	.003	.0015	<.001	.0015	.0015	.002	.0015	.003	.002	.002	.002	.005	.002	-----	-----	.001
Nd-----	.007	.01	.015	<.01	<.01	<.01	<.01	-----	-----	-----	-----	<.01	<.01	<.01	<.01	<.01	-----	-----	.015
Ni-----	<.0003	<.0003	.003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	<.0003	-----	-----	-----
Pb-----	.005	.005	.005	.003	.002	.002	.002	<.001	.003	<.001	.003	.005	.003	.003	.005	<.001	-----	-----	.15
Sc-----	.0005	.0005	.001	.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	<.0005	.0005	<.005	-----	-----	-----
Sr-----	.07	.05	.05	.05	.02	.02	.01	.015	.01	.02	.005	.007	.003	.003	.003	.003	-----	-----	.05
V-----	.005	.003	.003	.003	.002	.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	.001	-----	-----	-----
Y-----	.005	.005	.005	.005	.002	.0015	.002	.002	.003	.002	.003	.002	.002	.002	.005	.002	-----	-----	.002
Yb-----	.0005	.0005	.0005	.0005	.00015	.0002	.0002	.0002	.0003	.0002	.0003	.0003	.0003	.0003	.0005	.0002	-----	-----	.0002
Zr-----	.03	.03	.03	.02	.015	.015	.01	.01	.007	.015	.005	.007	.005	.007	.007	.007	-----	-----	.02

C. Norms (weight percent), from recalculated analyses

Quartz-----	19.6	22.3	22.8	25.6	29.2	29.8	33.9	35.1	34.5	35.6	36.7	35.6	35.9	35.4	37.2	37.4	39.8	41.4	29.4
Orthoclase-----	31.3	29.7	31.7	33.4	32.8	30.6	29.7	29.8	28.8	29.9	28.0	29.5	28.9	28.5	28.1	29.3	26.8	27.9	31.4
Albite-----	34.8	36.5	35.1	31.3	28.7	31.8	31.2	29.3	31.6	29.3	29.6	30.0	31.1	31.8	29.7	29.2	25.4	25.4	25.5
Anorthite-----	9.8	6.8	6.9	5.0	5.2	3.3	2.7	3.5	2.8	2.9	2.8	2.8	2.0	2.9	2.0	2.6	2.4	2.9	6.9
Corundum-----	.2	1.0	.1	.1	1.1	1.3	.7	.1	.4	.4	1.3	.4	.5	.0	.9	.2	1.4	.6	1.8
Estatite-----	1.5	1.3	1.1	2.6	1.1	1.2	.7	.5	.8	.5	.8	.6	.5	.4	1.2	.4	.9	.5	2.2
Ferrosilite-----	.02	.0	.1	.0	.0	.0	.02	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Magnetite-----	1.7	.9	1.5	.4	1.1	.0	.9	.3	.4	.3	.5	.0	.0	.7	.5	.4	.3	.0	.7
Hematite-----	.0	.6	.0	.8	.2	1.4	.0	.8	.3	.8	.1	.8	.3	.0	.2	.3	.2	.3	1.2
Ilmenite-----	.7	.6	.6	.5	.7	.2	.2	.4	.3	.4	.2	.2	.3	.0	.0	.0	.2	.0	.0
Rutile-----	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7
Apatite-----	.3	.2	.2	.2	.3	.2	.0	.1	.2	.1	.1	.0	.0	.0	.0	.0	.0	.0	.3
Total-----	99.92	99.9	100.1	99.9	100.2	99.9	100.02	99.9	100.1	100.2	100.1	99.9	100.0	100.0	99.9	100.1	100.1	99.9	100.1

D. Minerals (volume percent)

Quartz-----	0.7	2.4	3.3	1.6	2.3	-----	7.3	6.1	2.1	6.2	6.0	4.1	4.0	8.4	2.7	9.2	4.9	10.9	2.3
Alkali feldspar-----	10.0	15.1	10.8	5.5	7.7	-----	10.8	9.9	3.2	7.3	6.6	3.9	4.5	12.9	3.6	11.1	7.4	8.9	9.6
Plagioclase-----	11.4	12.4	10.8	7.0	6.3	-----	4.4	4.0	1.1	4.0	2.2	1.6	1.0	1.7	1.2	2.9	3.8	3.6	10.5
Biotite-----	1.5	1.9	1.5	1.2	1.1	-----	.2	.3	.1	.4	.1	.2	.2	.3	.1	.2	.2	.4	1.1
Clinopyroxene-----	.3	.2	.6	.2	.3	-----	-----	-----	-----	-----	-----	.1	-----	-----	-----	-----	-----	-----	.2
Hornblende-----	tr	-----	tr	tr	tr	-----	-----	-----	-----	-----	-----	-----	-----	-----	tr	-----	-----	-----	.3
Sphene-----	tr	-----	-----	tr	-----	-----	-----	-----	-----	-----	-----	tr	-----	-----	-----	-----	-----	-----	tr
Opacities-----	.6	1.0	.3	.3	.1	-----	.2	.4	.1	.5	.3	.1	.2	.4	tr	.5	.1	.2	.2
Groundmass-----	75.3	67.0	72.7	84.2	82.2	-----	77.1	79.3	93.4	81.6	84.8	90.0	90.1	76.3	92.5	75.9	83.6	76.0	75.8
Modal points counted-----	3177	1173	2870	2800	3430	-----	2000	2000	5880	-----	1852	3024	2122	1120	4210	1470	1000	1000	3330

E. Major oxides (weight percent), original analyses

SiO ₂ -----	63.7	70.0	70.3	70.5	71.0	72.4	74.2	75.73	73.8	76.12	74.6	76.01	75.6	75.23	74.9	76.7	75.6	77.26	68.7
Al ₂ O ₃ -----	15.1	16.0	15.1	13.8	14.2	14.1	12.9	12.46	12.4	12.50	12.8	12.56	12.3	12.19	12.2	12.0	12.2	11.54	14.4
Fe ₂ O ₃ -----	1.1	1.2	1.0	1.1	.89	1.4	.62	1.04	.54	.98	.47	.79	.83	.47	.42	.58	.58	.85	1.6
FeO-----	.75	.50	.70	.30	.46	.03	.33	.21	.20	.23	.18	.05	.08	.29	.19	.20	.11	.13	.48
MgO-----	.57	.52	.45	1.0	.39	.48	.26	.18	.30	.19	.32	.23	.18	.15	.45	.15	.36	.20	.83
CaO-----	4.6	1.5	1.6	1.8	1.4	1.1	.53	.80	2.4	.65	.58	.80	.88	.58	1.4	.52	.54	.58	1.6
Na ₂ O-----	3.8	4.3	4.1	3.6	3.3	3.7	3.6	3.44	3.6	3.44	3.4	3.51	3.6	3.66	3.4	3.4	3.2	2.96	2.9
K ₂ O-----	4.9	5.0	5.3	5.3	5.4	5.1	4.9	5.0	4.7	5.03	4.6	4.93	4.8	4.71	4.6	4.9	4.4	4.65	5.1
H ₂ O+-----	}2.6	}	.55	}1.0	}1.5	}	}	}	}	}	}	}	}	}	}	}	}	}	}
H ₂ O-----																			
TiO ₂ -----	.35	.32	.29	.25	.28	.26	.14	.25	.10	.15	.96	.35	.14	.14	.10	.14	.10	1.03	.36
P ₂ O ₅ -----	.13	.10	.09	.10	.24	.24	.09	.20	.13	.19	.10	.18	.13	.13	.10	.14	.10	.18	.13
MnO-----	.07	.06	.05	.06	.14	.07	.00	.06	.07	.03	.03	.01	.01	.01	.02	.00	.00	----	.05
CO ₂ -----	2.1	< .05	.09	.54	.05	.06	.04	.07	.04	.06	.06	.06	.05	.06	.06	.06	.06	.03	.10
Cl-----	----	----	----	----	.16	.28	< .05	.02	1.4	.18	< .05	.38	.00	.78	< .05	----	----	----	----
F-----	----	----	----	----	----	----	----	.01	----	.03	----	----	----	----	----	----	----	----	----
Subtotal-----	----	----	----	----	----	----	----	.06	----	.05	----	.04	----	.07	----	----	----	----	----
Less Oxygen-----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Total-----	99.77	100.10	100.07	99.85	100.01	99.81	99.96	99.71	100.26	99.80	100.15	99.94	99.64	99.84	99.62	99.56	100.11	100.37	99.55
Powder density-----	2.46	--	--	--	--	2.59	--	--	--	--	--	--	2.53	--	--	--	--	--	--