

**Appendix 1: Whole-rock Major Element Analysis (fusion ICP)**

**Detected Values**

Major element oxide values are in weight percent. Negative values equal not detected at that lower limit.

SAMPLE	PI-01	PI-02	BC-02	BC-04	SR-03	SR-07	SR-010	LM-01	BC-01	PC-06	PJ-01	PC-01	PC-02	U04-02	99802	PC-03	CO-02	CO-01	EP-01
Member	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	PCR	PCR	PCR	PCR	PCR	EPR	EPR	EPR
wt. % SiO2	68.6	68.7	67.3	62.5	62.0	63.1	69.6	67.6	69.0	67.7	67.4	71.5	70.9	64.1	70.3	73.0	76.6	76.8	77.6
wt. % Al2O3	14.16	13.90	13.67	13.92	15.17	14.90	13.35	14.34	13.55	13.83	14.02	11.52	11.14	14.95	10.92	10.74	11.08	11.05	10.50
wt. % Fe2O3	4.57	4.74	5.71	7.71	7.96	7.65	4.61	5.59	4.53	5.13	5.45	5.62	5.19	6.88	7.48	4.89	2.67	2.70	2.79
wt. % MnO	0.08	0.03	0.12	0.13	0.16	0.13	0.06	0.09	0.10	0.11	0.10	0.10	0.08	0.14	0.00	0.08	0.03	0.03	0.03
wt. % MgO	0.04	0.04	0.04	0.08	0.04	0.03	0.06	0.07	0.05	0.04	0.05	-0.01	0.02	0.02	0.04	0.05	0.01	-0.01	0.01
wt. % CaO	0.20	0.43	1.21	2.07	1.63	1.66	0.25	0.52	1.08	1.26	0.39	0.50	0.58	1.25	0.47	0.36	0.10	0.13	0.07
wt. % Na2O	4.76	4.68	5.35	5.32	6.26	5.79	6.73	4.52	4.83	5.46	4.63	5.17	4.86	5.96	5.11	5.23	4.04	4.07	3.83
wt. % K2O	5.32	5.15	4.98	4.99	5.47	5.35	3.77	5.20	4.94	5.14	5.22	4.57	4.86	5.20	4.45	3.28	4.48	4.60	4.38
wt. % TiO2	0.32	0.32	0.36	0.41	0.44	0.44	0.29	0.44	0.29	0.34	0.36	0.31	0.31	0.35	0.30	0.27	0.17	0.16	0.16
wt. % P2O5	0.03	0.04	0.04	0.06	0.07	0.06	0.03	0.07	0.04	0.03	0.11	0.02	0.02	0.09	0.01	0.02	0.02	0.04	0.02
LOI	1.02	1.22	1.20	2.05	0.79	0.91	1.21	1.11	1.65	1.02	1.69	0.65	1.16	0.90	0.00	1.37	0.59	0.52	0.80
TOTAL	99.1	99.2	99.9	99.2	100.0	100.0	100.0	99.5	100.0	100.1	99.4	99.9	99.1	99.8	99.0	99.3	99.8	100.1	100.1
A.I.	0.96	0.96	1.04	1.02	1.07	1.03	1.14	0.91	0.98	1.05	0.95	1.17	1.19	1.03	1.21	1.18	1.04	1.06	0.96

**Detected Values**

SAMPLE	EP-02	EP-03	EP-04	CO-07	SR-05	SR-09	PC-04	PC-05	U04-04	CROWN-VIT	SR-08	LA-01	CO-03	CO-04	CO-06	LM-02	AP-01	KB-01	PP-03
Member	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR
wt. % SiO2	77.13	76.92	76.87	76.77	76.22	75.87	71.74	76.07	74.28	72.61	74.11	73.70	73.21	75.56	76.38	75.90	75.67	76.84	75.76
wt. % Al2O3	10.80	10.89	10.87	10.81	10.44	11.27	11.01	11.30	11.99	10.96	12.13	10.58	10.70	10.76	10.79	11.94	10.04	10.54	11.56
wt. % Fe2O3	2.64	2.65	2.62	2.61	4.09	2.87	2.83	0.61	3.28	2.89	3.29	2.51	2.55	2.68	2.61	2.26	3.46	2.61	2.32
wt. % MnO	0.03	0.03	0.03	0.03	0.07	0.03	0.04	0.00	0.03	0.04	0.03	0.03	0.03	0.04	0.03	0.02	0.04	0.03	0.02
wt. % MgO	0.01	0.02	-0.01	-0.01	-0.01	0.03	-0.01	0.03	0.04	0.01	0.01	0.03	0.07	0.05	0.01	0.01	0.05	0.01	0.03
wt. % CaO	0.18	0.27	0.18	0.25	0.34	0.13	0.78	1.62	0.33	0.77	0.29	0.64	1.08	0.38	0.32	0.14	0.60	0.34	0.22
wt. % Na2O	3.98	4.05	4.05	4.10	4.08	3.27	4.13	3.29	3.98	4.02	4.22	4.09	3.84	4.17	4.18	4.31	3.53	4.11	3.61
wt. % K2O	4.43	4.62	4.38	4.40	3.70	4.65	3.63	4.81	5.01	3.45	4.99	3.74	3.49	4.51	4.49	4.29	4.50	3.78	4.66
wt. % TiO2	0.16	0.15	0.15	0.15	0.26	0.20	0.18	0.17	0.22	0.18	0.22	0.15	0.15	0.16	0.14	0.14	0.21	0.14	0.14
wt. % P2O5	0.03	0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.04	0.01	0.02	0.01	0.02	0.02	0.18	0.02	0.02	0.02	0.02
LOI	0.58	0.68	0.64	0.40	0.68	1.58	5.66	2.12	0.77	4.99	0.64	4.31	4.81	1.56	0.92	0.94	1.08	1.01	1.12
TOTAL	99.98	100.30	99.83	99.53	99.91	99.90	100.01	100.04	99.97	99.94	99.97	99.79	99.95	99.88	100.04	99.98	99.18	99.43	99.45
A.I.	1.05	1.05	1.07	1.06	1.11	0.91	1.05	0.83	0.97	1.03	0.97	1.02	1.06	1.00	1.12	1.05	0.95	1.16	0.82

Notes:

(1) Negative values indicate less than the reporting limit.

**Appendix 1 (continued)**

**Normalized Values**

Major element oxide values are in weight percent. Negative values equal not detected at that lower limit.

SAMPLE	PI-01	PI-02	BC-02	BC-04	SR-03	SR-07	SR-010	LM-01	BC-01	PC-06	PJ-01	PC-01	PC-02	U04-02	99802	PC-03	CO-02	CO-01	EP-01
Member	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	PCR	PCR	PCR	PCR	PCR	EPR	EPR	EPR
wt. % SiO2	69.96	70.08	68.13	64.29	62.51	63.66	70.47	68.66	70.12	68.35	68.97	71.98	72.37	64.78	70.94	74.56	77.21	77.12	78.07
wt. % Al2O3	14.44	14.19	13.85	14.33	15.29	15.03	13.52	14.57	13.77	13.97	14.35	11.60	11.37	15.12	11.03	10.97	11.17	11.10	10.57
wt. % Fe2O3	4.66	4.84	5.78	7.94	8.02	7.72	4.67	5.68	4.61	5.18	5.58	5.66	5.30	6.96	7.55	4.99	2.69	2.71	2.81
wt. % MnO	0.08	0.03	0.12	0.13	0.16	0.14	0.06	0.09	0.11	0.11	0.10	0.10	0.08	0.14	0.00	0.08	0.03	0.03	0.03
wt. % MgO	0.04	0.04	0.04	0.08	0.04	0.03	0.06	0.07	0.05	0.04	0.05	-0.01	0.02	0.02	0.04	0.05	0.01	-0.01	0.01
wt. % CaO	0.20	0.44	1.23	2.13	1.64	1.67	0.25	0.53	1.10	1.27	0.40	0.50	0.59	1.26	0.47	0.37	0.10	0.13	0.07
wt. % Na2O	4.85	4.78	5.42	5.48	6.31	5.84	6.82	4.59	4.91	5.51	4.74	5.21	4.96	6.03	5.16	5.34	4.07	4.09	3.86
wt. % K2O	5.42	5.26	5.04	5.14	5.51	5.40	3.82	5.28	5.02	5.19	5.34	4.60	4.96	5.26	4.49	3.82	4.52	4.62	3.51
wt. % TiO2	0.32	0.33	0.37	0.42	0.44	0.44	0.29	0.44	0.29	0.34	0.37	0.32	0.31	0.36	0.30	0.27	0.17	0.16	0.16
wt. % P2O5	0.03	0.04	0.04	0.06	0.07	0.06	0.03	0.07	0.04	0.03	0.11	0.02	0.02	0.09	0.01	0.02	0.02	0.04	0.02
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

**Normalized Values**

SAMPLE	EP-02	EP-03	EP-04	CO-07	SR-05	SR-09	PC-04	PC-05	U04-04	CROWN-VIT	SR-08	LA-01	CO-03	CO-04	CO-06	LM-02	AP-01	KB-01	PP-03
Member	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR
wt. % SiO2	77.60	77.21	77.50	77.44	76.81	77.17	76.04	77.69	74.88	76.47	74.61	77.19	76.95	76.85	77.06	76.64	77.14	78.07	77.05
wt. % Al2O3	10.87	10.93	10.96	10.90	10.52	11.46	11.67	11.54	12.09	11.54	12.21	11.08	11.25	10.94	10.89	12.06	10.23	10.71	11.76
wt. % Fe2O3	2.66	2.66	2.64	2.63	4.12	2.92	3.00	0.62	3.31	3.04	3.31	2.63	2.68	2.73	2.63	2.28	3.53	2.65	2.36
wt. % MnO	0.03	0.03	0.03	0.03	0.07	0.03	0.04	0.00	0.03	0.04	0.03	0.03	0.03	0.04	0.03	0.02	0.04	0.03	0.02
wt. % MgO	0.01	0.02	-0.01	-0.01	-0.01	0.03	-0.01	0.03	0.04	0.01	0.01	0.03	0.07	0.05	0.01	0.01	0.05	0.01	0.03
wt. % CaO	0.18	0.27	0.18	0.25	0.34	0.13	0.83	1.65	0.33	0.81	0.29	0.67	1.14	0.39	0.32	0.14	0.61	0.35	0.22
wt. % Na2O	4.00	4.07	4.08	4.14	4.11	3.33	4.38	3.36	4.01	4.23	4.25	4.28	4.04	4.24	4.22	4.35	3.60	4.18	3.67
wt. % K2O	4.41	4.45	4.66	4.42	4.54	4.57	4.66	3.78	4.69	4.52	4.53	3.96	4.90	3.69	4.85	5.06	3.52	5.07	3.34
wt. % TiO2	0.16	0.15	0.16	0.15	0.26	0.20	0.19	0.17	0.22	0.19	0.22	0.16	0.16	0.17	0.15	0.15	0.22	0.15	0.14
wt. % P2O5	0.03	0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.04	0.01	0.02	0.01	0.02	0.02	0.18	0.02	0.02	0.02	0.02
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100	100.0	100	100	100	100	100.0	100	100.00	100.00	100.0	100.00

Notes: (1) Negative values indicate less than the reporting limit.

**Appendix 2: Whole-Rock Trace Element Analysis (fusion ICP/MS)**

Trace element values are in parts per million. Negative values equal not detected at that lower limit.

Sample:	PI-01	PI-02	BC-02	BC-04	SR-03	SR-07	SR-010	LM-01	BC-01	PC-06	PJ-01	PC-01	PC-02	U04-02	99802	PC-03	CO-02	CO-01	EP-01
Member	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	BRM	PCR	PCR	PCR	PCR	PCR	EPR	EPR	EPR
<b>Rb</b>	192.81	192.64	181.05	150.48	162.51	165.71	146.59	124.24	191.33	215.55	160.95	422.46	399.28	174.55	413.00	254.69	301.04	317.24	353.27
<b>Sr</b>	8.82	10.60	10.72	12.75	11.20	12.93	8.70	59.45	13.10	13.47	16.55	6.67	7.11	10.82	8.00	7.62	4.32	2.78	3.05
<b>Y</b>	83.15	78.73	78.57	54.65	58.42	60.19	77.68	48.46	81.49	91.98	68.35	161.25	147.28	70.07	164.00	79.82	64.85	87.42	46.57
<b>Zr</b>	1010.0	1010.0	794.2	586.3	620.8	682.1	909.4	638.1	1030.0	1140.0	836.0	1850.0	1710.0	818.2	1850.0	1380.0	839.8	860.9	739.2
<b>Nb</b>	108.62	115.51	108.75	77.38	83.40	83.64	117.00	62.44	112.56	133.45	99.74	228.44	212.47	105.42	225.00	186.17	124.31	133.64	147.20
<b>Ba</b>	121.73	106.05	70.49	105.54	112.78	101.95	24.94	964.24	70.30	63.74	245.68	11.69	11.81	88.43	9.00	14.36	18.76	13.22	7.19
<b>La</b>	133.56	127.43	113.06	84.75	104.35	99.15	132.38	80.80	122.91	152.21	114.94	285.41	252.95	119.93	258.00	219.71	79.70	80.80	19.36
<b>Ce</b>	260.69	246.16	225.02	170.02	203.85	190.27	241.26	162.11	244.90	271.63	235.04	524.46	608.91	233.62	484.00	445.04	159.07	172.64	64.96
<b>Pr</b>	28.86	27.23	24.36	19.05	22.56	21.68	27.89	18.19	26.38	30.98	25.55	57.77	51.25	25.57	58.80	44.10	18.24	19.99	4.37
<b>Nd</b>	103.31	98.44	89.98	69.96	88.18	86.33	106.82	66.68	95.99	119.78	98.68	220.16	196.36	99.18	192.00	167.17	63.63	71.65	14.53
<b>Sm</b>	20.49	19.38	18.19	13.76	16.66	16.09	19.47	13.48	19.38	22.03	18.74	39.67	36.75	18.26	33.80	28.96	14.75	17.87	3.95
<b>Eu</b>	1.76	1.63	1.85	1.79	2.17	2.16	1.09	2.23	1.49	1.71	2.06	1.85	1.79	2.33	1.80	1.37	0.19	0.19	0.06
<b>Gd</b>	16.48	15.69	14.35	10.89	13.27	13.49	16.03	10.41	15.48	18.93	15.56	33.95	30.66	14.89	32.60	22.88	12.64	16.00	4.85
<b>Tb</b>	3.02	2.89	2.80	2.00	2.33	2.33	2.84	1.79	2.96	3.25	2.70	5.98	5.85	2.66	5.10	3.55	2.37	3.15	1.49
<b>Dy</b>	16.57	15.79	15.20	10.66	12.49	12.52	16.31	10.19	16.10	18.22	14.72	32.65	32.73	14.39	28.20	17.72	14.12	18.79	11.08
<b>Ho</b>	3.20	3.03	2.95	2.07	2.34	2.31	3.05	1.91	3.12	3.42	2.75	6.02	5.97	2.70	5.70	2.98	2.77	3.67	2.50
<b>Er</b>	9.55	9.12	8.92	6.15	7.03	6.89	9.34	5.78	9.34	10.22	8.18	18.20	17.06	8.14	16.80	8.84	8.92	11.19	9.13
<b>Tm</b>	1.38	1.33	1.27	0.86	1.03	1.00	1.37	0.82	1.34	1.51	1.21	2.67	2.44	1.19	2.30	1.30	1.35	1.65	1.61
<b>Yb</b>	8.19	8.03	7.92	5.47	6.41	6.11	8.21	5.32	8.38	9.06	7.26	15.94	14.56	7.39	14.70	7.88	8.59	10.13	10.34
<b>Lu</b>	1.17	1.16	1.14	0.81	0.99	0.97	1.24	0.78	1.18	1.37	1.11	2.29	2.09	1.11	2.00	1.20	1.24	1.42	1.60
<b>Hf</b>	23.95	24.04	20.56	13.75	16.12	15.32	22.07	15.75	24.54	27.68	20.57	47.78	44.25	19.49	48.00	36.58	25.83	25.87	22.18
<b>Th</b>	24.27	25.63	18.52	15.46	16.01	16.22	25.36	14.47	25.66	26.37	18.67	51.32	55.72	20.14	46.00	54.15	32.76	34.74	27.81

Notes: (1) Negative values indicate less than the reporting limit.

**Appendix 2 (continued)**

Trace element values are in parts per million. Negative values equal not detected at that lower limit.

Sample:	EP-02	EP-03	EP-04	CO-07	SR-05	SR-09	PC-04	PC-05	U04-04	CROWN-VIT	SR-08	LA-01	CO-03	CO-04	CO-06	LM-02	AP-01	KB-01	PP-03
Member	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR	EPR
<b>Rb</b>	330.63	328.37	325.48	298.46	133.96	307.78	349.40	309.01	278.10	374.11	292.42	315.53	330.38	264.62	294.53	190.15	389.46	278.96	230.04
<b>Sr</b>	5.82	4.66	3.16	-2.00	7.67	8.40	13.10	16.72	7.16	21.21	5.30	86.85	102.01	9.71	4.14	6.03	12.05	20.97	8.52
<b>Y</b>	63.61	107.05	76.35	104.42	66.03	84.15	112.05	37.29	93.34	118.21	123.01	113.59	101.96	82.76	114.93	70.23	164.70	119.71	62.50
<b>Zr</b>	864.1	843.2	871.9	803.8	819.8	931.5	877.4	794.1	865.0	912.0	828.8	807.6	773.9	763.1	447.9	508.2	1440.0	866.0	607.6
<b>Nb</b>	147.58	137.23	142.05	130.72	97.36	138.80	134.96	134.45	133.88	141.20	134.96	129.67	119.78	110.82	122.73	111.88	185.04	146.18	128.01
<b>Ba</b>	11.20	8.19	12.54	4.93	52.65	26.51	7.89	22.94	29.56	9.77	16.40	117.62	13.01	26.82	15.28	20.83	23.85	16.53	32.85
<b>La</b>	65.57	97.20	72.68	85.44	109.43	61.29	121.68	17.86	160.75	123.67	199.30	98.06	97.12	97.74	94.97	65.82	189.08	93.31	71.83
<b>Ce</b>	185.77	198.12	161.24	185.30	202.26	119.99	246.82	34.63	326.38	252.66	343.25	202.37	207.08	210.42	200.25	185.20	354.24	218.28	222.36
<b>Pr</b>	15.04	23.90	17.10	21.15	23.45	13.46	27.61	4.03	33.98	28.23	45.64	23.12	23.35	23.31	23.75	14.06	41.95	23.28	15.18
<b>Nd</b>	54.78	93.48	64.70	77.26	91.08	51.03	108.67	15.20	128.58	110.89	184.38	92.68	85.84	84.89	88.06	48.23	161.72	89.81	50.15
<b>Sm</b>	12.27	22.36	14.70	20.06	17.35	12.23	23.61	3.78	23.12	24.31	35.13	21.65	21.19	19.80	22.91	10.46	35.26	21.59	10.80
<b>Eu</b>	0.14	0.22	0.15	0.19	1.58	0.21	0.37	0.05	0.51	0.34	0.78	0.25	0.24	0.22	0.22	0.24	0.50	0.20	0.26
<b>Gd</b>	11.12	21.54	13.86	18.58	14.39	11.43	21.45	4.02	18.84	22.05	29.78	20.80	18.86	16.02	20.67	8.22	32.42	20.37	6.98
<b>Tb</b>	2.37	4.04	2.72	3.68	2.48	2.64	4.14	1.09	3.43	4.06	4.95	4.07	3.62	3.07	3.98	2.04	6.07	4.25	2.04
<b>Dy</b>	14.18	23.11	16.35	21.37	13.79	17.04	23.37	8.21	19.28	23.13	26.51	23.39	21.02	18.03	22.77	13.18	35.13	24.93	12.98
<b>Ho</b>	2.84	4.30	3.14	4.10	2.50	3.51	4.31	1.95	3.67	4.39	4.81	4.35	3.96	3.46	4.40	2.65	6.66	4.77	2.78
<b>Er</b>	9.08	12.85	9.81	12.41	7.34	11.13	12.68	7.13	11.06	13.11	14.30	12.92	11.75	10.83	13.49	8.59	19.62	14.29	9.20
<b>Tm</b>	1.50	1.98	1.59	1.82	1.08	1.75	1.93	1.32	1.67	1.93	2.05	1.94	1.71	1.59	1.92	1.27	2.89	2.16	1.46
<b>Yb</b>	8.91	11.34	9.65	10.96	6.34	10.44	11.39	8.62	9.88	11.50	11.78	11.21	10.42	9.30	11.18	7.52	17.29	12.67	8.54
<b>Lu</b>	1.38	1.64	1.44	1.51	0.96	1.52	1.62	1.34	1.41	1.70	1.64	1.55	1.40	1.29	1.50	1.04	2.42	1.79	1.22
<b>Hf</b>	28.41	27.06	28.28	26.39	18.59	27.19	27.27	24.77	24.78	28.08	25.27	25.51	24.46	23.03	21.51	16.73	43.11	28.54	20.32
<b>Th</b>	27.16	28.74	29.03	33.01	17.67	24.43	31.14	26.21	29.11	31.92	31.88	29.17	30.24	28.22	32.23	23.44	47.03	33.09	28.49

Notes: (1) Negative values indicate less than the reporting limit.

**Appendix 3: Whole Rock Data from Holt (1998)**

**Detected Values**

Major element oxide values are in weight percent. Negative values equal not detected at that lower limit.

SAMPLE	92201	92204	921007	921102	921103	92212	92213	92215	92506	921002	921011	92514	921020	92517
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
Wt. % SiO2	72.73	72.61	73.74	74.16	73.05	73.72	72.06	72.92	73.41	74.00	73.14	73.27	72.94	72.01
wt. % Al2O3	12.10	11.76	10.93	10.82	11.25	11.31	12.49	11.79	11.88	11.11	11.57	11.94	11.80	12.54
Wt. % FeO	3.61	3.68	3.98	4.04	4.17	3.68	3.47	3.78	3.77	3.50	3.55	3.79	3.92	3.85
Wt. % MnO	0.08	0.07	0.08	0.09	0.10	0.07	0.06	0.06	0.08	0.08	0.07	0.11	0.09	0.10
Wt. % MgO	0.09	0.09	0.10	0.04	0.06	0.01	0.03	0.01	0.08	0.03	0.02	0.04	0.01	0.00
Wt. % CaO	0.28	0.32	0.36	0.34	0.30	0.26	0.33	0.30	0.28	0.37	0.31	0.44	0.37	0.05
wt. % Na2O	5.13	4.80	3.88	4.29	4.50	4.94	4.74	4.67	4.54	4.83	4.72	4.62	5.12	5.17
Wt. % K2O	4.86	4.76	4.85	4.80	5.01	4.82	4.88	5.11	4.59	4.60	4.62	5.11	4.68	4.83
Wt. % TiO2	0.35	0.18	0.28	0.37	0.33	0.21	0.30	0.34	0.50	0.14	0.17	0.51	0.41	0.52
wt. % P2O5	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.00
LOI	0.78	1.73	1.83	1.04	1.24	1.05	1.66	1.01	0.85	1.36	1.83	0.16	0.74	0.93
TOTAL	99.22	98.27	98.17	98.96	98.76	98.95	98.34	98.99	99.15	98.64	98.17	99.84	99.26	99.07
A.I.	1.12	1.11	1.06	1.13	1.14	1.18	1.05	1.12	1.05	1.16	1.10	1.10	1.13	0.89

**Normalized Values**

SAMPLE	92201	92204	921007	921102	921103	92212	92213	92215	92506	921002	921011	92514	921020	92517
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
Wt. % SiO2	73.30	73.89	75.11	74.94	73.98	74.50	73.28	73.66	74.04	75.02	74.50	73.39	73.48	72.69
wt. % Al2O3	12.20	11.99	11.13	10.93	11.39	11.43	12.70	11.91	11.98	11.26	11.79	11.96	11.89	12.66
Wt. % FeO	4.04	4.16	4.51	4.54	4.69	4.02	3.92	4.24	4.23	3.94	4.13	4.22	4.39	4.33
Wt. % MnO	0.08	0.07	0.08	0.09	0.10	0.07	0.06	0.06	0.08	0.08	0.07	0.11	0.09	0.10
Wt. % MgO	0.09	0.09	0.10	0.04	0.06	0.01	0.03	0.01	0.08	0.03	0.02	0.04	0.01	0.00
Wt. % CaO	0.28	0.33	0.37	0.34	0.30	0.26	0.34	0.30	0.28	0.38	0.32	0.44	0.37	0.05
wt. % Na2O	5.17	4.88	3.95	4.34	4.56	4.99	4.82	4.72	4.58	4.90	4.81	4.63	5.16	5.22
Wt. % K2O	4.90	4.84	4.94	4.85	5.07	4.87	4.96	5.16	4.63	4.66	4.71	5.12	4.71	4.88
Wt. % TiO2	0.36	0.18	0.29	0.37	0.33	0.21	0.31	0.34	0.61	0.14	0.17	0.51	0.41	0.52
wt. % P2O5	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.00
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Notes:

(1) Negative values indicate less than the reporting limit.

**Appendix 4: Whole Rock Data from Adams (2004)**

**Detected Values**

SAMPLE	O30302	O30303	O31001	O31005	O31007	O31008	O31009	O31011	O31012	O31014	O31101	O31103	O31105	O21012
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
wt. % SiO <sub>2</sub>	72.79	74.71	74.07	73.03	75.11	73.05	71.10	74.00	74.51	71.35	75.94	76.57	72.01	74.52
wt. % Al <sub>2</sub> O <sub>3</sub>	11.82	11.04	11.02	11.64	11.10	11.72	12.67	11.43	10.94	12.34	10.86	10.85	12.19	10.41
wt. % FeO	3.90	4.67	4.71	3.92	4.35	3.89	4.01	4.50	4.70	4.20	4.45	3.59	4.01	5.86
wt. % MnO	0.10	0.08	0.08	0.11	0.06	0.10	0.12	0.09	0.08	0.11	0.07	0.05	0.11	0.10
wt. % MgO	0.00	0.07	0.02	0.07	0.06	0.00	0.04	0.08	0.12	0.00	0.03	0.00	0.01	0.11
wt. % CaO	0.14	0.20	0.70	0.47	0.36	0.00	0.41	0.18	0.25	0.00	0.19	0.07	0.08	0.38
wt. % Na <sub>2</sub> O	4.96	4.53	4.54	5.22	4.14	4.57	5.53	4.47	4.43	5.22	4.45	4.19	4.72	3.78
wt. % K <sub>2</sub> O	4.86	4.61	4.55	4.53	5.06	5.15	4.97	4.69	4.57	4.87	4.48	4.68	5.29	4.69
wt. % TiO <sub>2</sub>	0.19	0.20	0.20	0.21	0.20	0.17	0.21	0.22	0.23	0.19	0.19	0.20	0.19	0.25
wt. % P <sub>2</sub> O <sub>5</sub>	0.00	0.02	0.02	0.00	0.01	0.00	0.00	0.01	0.02	0.00	0.02	0.02	0.00	0.01
LOI	0.00	0.67	0.57	0.00	0.67	0.00	0.00	0.69	0.84	0.19	0.27	0.39	0.00	1.07
TOTAL	98.37	100.33	100.01	98.81	100.68	98.26	98.66	100.36	100.22	97.86	100.50	100.24	98.21	100.57
A.I.	1.14	1.13	1.12	1.16	1.11	1.12	1.14	1.09	1.12	1.12	1.12	1.10	1.11	1.08

**Normalized Values**

SAMPLE	O30302	O30303	O31001	O31005	O31007	O31008	O31009	O31011	O31012	O31014	O31101	O31103	O31105	O21012
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
wt. % SiO <sub>2</sub>	74.00	74.96	74.49	73.91	75.10	74.34	72.07	74.25	74.97	73.05	75.77	76.69	73.32	74.90
wt. % Al <sub>2</sub> O <sub>3</sub>	12.02	11.08	11.08	11.78	11.10	11.93	12.84	11.47	11.01	12.63	10.84	10.87	12.41	10.46
wt. % FeO	3.97	4.68	4.74	3.97	4.34	3.96	4.07	4.51	4.73	4.30	4.43	3.59	4.08	5.27
wt. % MnO	0.10	0.08	0.08	0.11	0.06	0.10	0.13	0.09	0.08	0.11	0.07	0.05	0.11	0.10
wt. % MgO	0.00	0.07	0.02	0.07	0.06	0.00	0.04	0.08	0.12	0.00	0.03	0.00	0.01	0.11
wt. % CaO	0.14	0.20	0.70	0.48	0.36	0.00	0.42	0.18	0.25	0.00	0.19	0.07	0.08	0.38
wt. % Na <sub>2</sub> O	5.04	4.55	4.57	5.28	4.14	4.65	5.61	4.48	4.46	5.34	4.44	4.20	4.81	3.80
wt. % K <sub>2</sub> O	4.94	4.63	4.58	4.58	5.06	5.24	5.04	4.71	4.60	4.99	4.47	4.69	5.39	4.71
wt. % TiO <sub>2</sub>	0.19	0.20	0.20	0.21	0.20	0.17	0.21	0.22	0.23	0.19	0.19	0.20	0.19	0.26
wt. % P <sub>2</sub> O <sub>5</sub>	0.00	0.02	0.02	0.00	0.01	0.00	0.00	0.01	0.02	0.00	0.02	0.02	0.00	0.01
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Notes:

(1) Negative values indicate less than the reporting limit.

**Appendix 5: Whole-Rock Trace Element Analyses from Holt (1998)**

Trace element values are in parts per million. Negative values equal not detected at that lower limit.

Sample ID:	92201	92204	921007	921102	921103	92212	92213	92215	92506	921002	921011	92514	921020	92517
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
Rb	424.00	442.00	504.00	494.00	472.00	447.00	420.00	430.00	419.00	425.00	426.00	422.00	418.00	433.00
Sr	9.00	6.00	6.00	8.00	7.00	4.00	14.00	4.00	8.00	5.00	4.00	7.00	4.00	4.00
Y	92.00	90.00	163.00	181.00	185.00	112.00	136.00	126.00	144.00	128.00	13.00	106.00	117.00	120.00
Zr	1296.0	1011.0	1503.0	1522.0	1521.0	315.0	1376.0	1318.0	1344.0	1149.0	1324.0	994.0	1161.0	1356.0
Nb	234.00	233.00	370.00	372.00	355.00	234.00	247.00	247.00	251.00	237.00	229.00	236.00	237.00	245.00
Ba	15.00	20.00	23.00	5.00	13.00	5.00	6.00	10.00	48.00	11.00	19.00	15.00	30.00	26.00
La	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ce	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pr	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eu	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gd	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tb	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dy	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ho	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Er	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tm	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Yb	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lu	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hf	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Th	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes: (1) Negative values indicate less than the reporting limit.

**Appendix 6: Whole Rock Trace Element Analyses from Adams (2004)**

Sample ID:	O30302	O30303	O31001	O31005	O31007	O31008	O31009	O31011	O31012	O31014	O31101	O31103	O31105	O21012
Member	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM	BUM
Rb	386.00	370.00	371.00	301.00	396.00	257.00	--	373.00	343.00	356.00	337.00	372.00	301.00	498.00
Sr	5.00	5.00	6.00	10.00	5.00	1.00	0.00	4.00	12.00	6.00	5.00	6.00	6.00	10.00
Y	0.00	86.20	99.20	0.00	116.00	0.00	0.00	85.20	92.40	0.00	118.00	117.00	0.00	177.00
Zr	1198.0	1190.0	1302.0	1135.0	1350.0	1226.0	--	1320.0	1130.0	1342.0	1330.0	1270.0	1138.0	1690.0
Nb	0.00	177.00	180.00	0.00	187.00	0.00	0.00	195.00	166.00	0.00	188.00	183.00	0.00	300.00
Ba	10.00	24.00	18.00	16.00	19.00	17.00	12.00	33.00	44.00	18.00	15.00	14.00	9.00	17.00
La	--	137.00	145.00	--	188.00	--	--	174.00	130.00	--	169.00	173.00	--	235.00
Ce	--	243.00	243.00	--	318.00	--	--	235.00	274.00	--	304.00	306.00	--	439.00
Pr	--	25.60	27.90	--	36.90	--	--	33.00	26.20	--	32.80	33.80	--	--
Nd	--	91.90	101.00	--	134.00	--	--	118.00	93.40	--	118.00	122.00	--	--
Sm	--	17.90	20.10	--	25.40	--	--	22.20	18.80	--	23.00	23.80	--	34.20
Eu	--	0.38	0.44	--	0.54	--	--	0.46	0.47	--	0.48	0.50	--	1.03
Gd	--	15.40	17.90	--	21.60	--	--	19.40	15.90	--	20.20	21.00	--	--
Tb	--	2.99	3.26	--	3.76	--	--	3.20	3.10	--	3.81	3.76	--	--
Dy	--	16.40	18.10	--	20.50	--	--	17.10	17.40	--	20.80	20.30	--	--
Ho	--	3.14	3.50	--	3.98	--	--	3.31	3.45	--	4.15	3.92	--	--
Er	--	9.99	11.40	--	12.90	--	--	10.80	11.30	--	13.50	12.20	--	--
Tm	--	1.50	1.76	--	1.94	--	--	1.70	1.75	--	2.09	1.77	--	--
Yb	--	9.10	10.80	--	11.70	--	--	10.60	10.80	--	12.70	10.10	--	17.20
Lu	--	1.35	1.67	--	1.76	--	--	1.60	1.64	--	1.95	1.51	--	2.38
Hf	--	32.00	34.10	--	34.50	--	--	34.20	29.10	--	34.50	33.90	--	49.50
Th	35.60	29.50	36.60	47.30	52.10	47.20	47.20	38.40	44.80	37.00	52.10	40.70	48.40	75.80

Notes: (1) Negative values indicate less than the reporting limit.

### Appendix 7: General Mineral Analysis (EPMA)

Mineral:	K-spar	K-spar	K-spar	Cpx	Cpx	Ilm	Ilm	Ilm	Ilm	Mt	Mt	Ang	Ang	Amph	Bio
Sample:	PC-06	99802	CO-02	PC-06	99802	PC-06	BC-02	99802	CO-02	PC-06	CO-02	PC-06	99802	99802	CO-02
Member:	BRM	PCR	EPR	BRM	PCR	BRM	BRM	PCR	EPR	BRM	EPR	BRM	PCR	PCR	EPR
SiO2	66.24	67.62	66.07	47.28	47.31	0.03	0.81	0.00	0.03	0.07	0.17	40.04	39.54	48.26	35.51
TiO2	--	--	--	0.52	0.31	49.90	46.73	50.84	46.83	22.05	15.27	6.65	8.18	0.39	3.66
Al2O3	19.14	19.44	18.84	0.49	0.23	0.00	0.17	0.00	0.00	0.03	0.06	0.37	0.71	0.23	5.55
FeO*	0.20	0.48	0.26	30.54	30.18	46.91	45.14	45.63	43.26	70.47	74.03	43.20	39.26	33.39	38.40
MnO	--	--	--	0.98	0.99	1.43	0.77	2.04	0.79	2.69	0.43	0.80	1.07	0.81	0.54
MgO	--	--	--	0.30	0.11	0.02	0.01	0.02	0.01	0.00	0.00	0.04	0.05	0.12	0.02
CaO	0.34	0.05	0.01	19.12	18.69	0.04	0.02	0.00	0.22	0.03	0.04	0.36	0.42	2.97	0.13
Na2O	7.10	7.67	6.61	0.49	1.01	0.01	0.11	0.04	0.00	0.01	0.03	6.96	6.65	7.88	0.12
K2O	6.82	6.19	7.17	0.01	0.00	0.02	0.05	0.00	0.00	0.01	0.01	0.04	0.18	1.35	8.61
Total	99.84	101.46	98.95	99.72	98.83	98.35	93.80	98.55	91.16	95.36	90.04	98.47	96.06	95.40	94.85
Formula															
Si	2.98	2.98	2.99	1.97	1.99	0.00	0.02	0.00	0.00	0.00	0.01	5.94	5.925	7.90	6.26
Ti	--	--	0.00	0.02	0.01	0.96	0.94	0.98	0.97	0.64	0.47	0.74	0.922	0.05	0.49
Al	1.01	1.01	1.01	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.06	0.125	0.04	1.15
Fe <sup>3+</sup>	0.01	0.02	0.01	0.03	0.07	0.08	0.07	0.04	0.05	0.72	1.05	--	--	0.85	--
Fe <sup>2+</sup>	--	--	--	1.03	0.99	0.93	0.95	0.93	0.95	1.55	1.46	5.36	4.920	3.72	5.66
Mn	--	--	--	0.03	0.04	0.03	0.02	0.04	0.02	0.09	0.01	0.10	0.136	0.11	0.08
Mg	--	--	--	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.010	0.03	0.01
Ca	0.02	0.00	0.00	0.85	0.84	0.00	0.00	0.00	0.01	0.00	0.00	0.06	0.068	0.52	0.02
Na	0.62	0.66	0.58	0.04	0.08	--	--	--	--	--	--	2.00	1.933	2.50	0.04
K	0.39	0.35	0.41	0.00	0.00	--	--	--	--	--	--	0.01	0.035	0.28	1.94
Anions	8	8	8	6	6	3	3	3	3	4	4	20	20	23	22
Class:	Or <sub>39</sub>	Or <sub>35</sub>	Or <sub>41</sub>	Wo <sub>44</sub> Fs <sub>55</sub>	Wo <sub>46</sub> Fs <sub>54</sub>	Ilm <sub>96</sub>	Ilm <sub>97</sub>	Ilm <sub>98</sub>	Ilm <sub>97</sub>	Mt <sub>57</sub>	Mt <sub>53</sub>			Fe-rich	Annite

## Appendix 8: Feldspar Analysis (EPMA)

Sample & Member:	PC-01 (PCR)												
Point:	1	2	3	4	5	6	7	8	9	10	11	12	13
SiO <sub>2</sub>	67.19	67.43	67.01	67.98	67.95	67.08	67.67	68.14	67.38	67.77	68.24	67.06	67.71
Al <sub>2</sub> O <sub>3</sub>	19.50	19.58	18.82	19.26	18.98	18.94	18.81	19.97	19.42	19.18	19.42	19.31	18.99
FeO	0.28	0.64	0.64	0.33	0.54	0.83	0.40	0.32	0.56	0.33	0.40	0.78	0.50
CaO	0.06	0.10	0.00	0.00	0.03	0.00	0.06	0.13	0.00	0.01	0.00	0.00	0.00
Na <sub>2</sub> O	7.58	7.75	7.33	7.49	7.65	7.23	7.59	7.72	11.67	7.10	7.28	7.18	7.24
K <sub>2</sub> O	5.70	5.78	5.84	6.04	5.62	5.64	5.78	5.93	6.22	5.83	5.86	5.86	5.95
Total:	100.3	101.3	99.7	100.1	100.8	99.7	100.3	102.2	105.3	100.2	101.2	100.2	100.4
mol. %													
An	0.29	0.48	0.00	0.00	0.15	0.00	0.29	0.61	0.00	0.05	0.00	0.00	0.00
Ab	66.70	66.76	65.61	65.33	67.32	66.08	66.43	66.02	74.04	64.89	65.38	65.06	64.90
Or	33.00	32.76	34.39	34.67	32.54	33.92	33.28	33.37	25.96	35.06	34.62	34.94	35.10

  

Sample:	CO-06 (EPR)												
Point:	14	15	16	17	18	19	20	21	22	23	24	25	26
SiO <sub>2</sub>	67.03	66.23	67.58	66.77	67.06	64.91	65.65	66.13	66.30	63.24	66.15	65.20	65.15
Al <sub>2</sub> O <sub>3</sub>	21.28	20.74	20.53	21.12	20.88	19.84	20.79	21.05	20.25	20.74	21.84	20.61	21.34
FeO	0.35	0.15	0.14	0.14	0.11	0.20	0.11	0.24	0.27	0.17	0.26	0.29	0.08
CaO	0.04	0.07	0.10	0.13	0.15	0.06	0.13	0.08	0.16	0.09	0.13	0.12	0.64
Na <sub>2</sub> O	6.74	6.73	7.00	7.16	7.02	3.33	6.77	6.80	7.10	5.15	6.64	6.57	4.54
K <sub>2</sub> O	7.53	6.58	6.86	7.16	6.74	12.92	7.30	7.17	7.19	13.08	6.54	6.96	8.54
Total:	103.0	100.5	102.2	101.9	101.3	100.7	101.5	101.3	102.5	101.6	99.8	100.3	100.1
mol. %													
An	0.19	0.35	0.48	0.60	0.72	0.28	0.62	0.38	0.74	0.36	0.65	0.59	3.36
Ab	57.53	60.64	60.51	59.95	60.84	28.07	58.14	58.81	59.57	37.30	60.28	58.58	43.19
Or	42.29	39.01	39.02	39.45	38.44	71.68	41.25	40.80	39.69	62.34	39.07	40.83	53.45

- Notes:
- (1) Operating conditions: 15 kV accelerating voltage, 10 nA sample current, 5000 x minimum raster spot.
  - (2) Crystals selected: TAP for SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, and Na<sub>2</sub>O; PET for CaO and K<sub>2</sub>O; and LiF for FeO.
  - (3) Calibration standards: USNM 133868 (K anorthoclase feldspar) for SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub>; USNM 137041 (anorthite plagioclase feldspar) for FeO and CaO; USNM 143996 (microcline feldspar) for Na<sub>2</sub>O and K<sub>2</sub>O.

