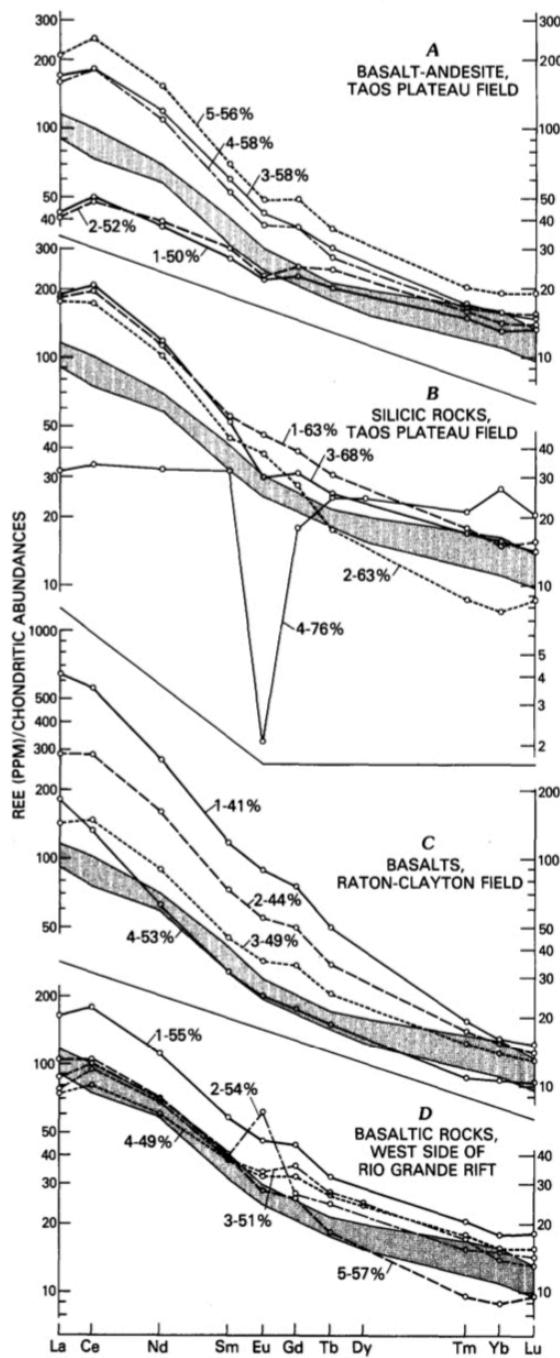


## Data Repository Figure DR1, and Brief Comment



**Figure DR1.** Chondrite-normalized REE compositions of upper Cenozoic basaltic rocks of the Southern Rocky Mountains (from Lipman, 1987, Fig. 9). For comparison, stippled pattern indicates field of intermediate-composition lavas from the Platoro caldera area. Reference numbers of samples are followed by whole-rock SiO<sub>2</sub> contents (calculated volatile-free). Anomalously low values and resulting La/Ce ratios for the suite of upper-Cenozoic rocks are probably due to an analytical problem.

**A:** Basaltic to andesitic rocks of the Taos Plateau volcanic field, within the Rio Grande rift in northern New Mexico. Samples 1 and 2 are tholeiitic basal; sample 3 is a xenocrystic basaltic andesite; samples 4 and 5 are olivine andesites.

**B:** Silicic rocks of the Taos Plateau volcanic field. Samples 1 and 2 are silicic dacites; sample 3 is a dacite; and sample 4 is a rhyolite obsidian.

**C:** Alkalic basalts of the Raton-Clayton field, on the High Plains east of the Rio Grande rift, northeastern New Mexico.

**D:** Basaltic rocks along the west side of the Rio Grande rift in southern Colorado and northern New Mexico. Samples 1 and 5 are xenocrystic basaltic andesites from the Tusas Mountains and southeastern San Juan Mountains; samples 2 and 3 are high- and low-K silicic-alkalic basalt, respectively, from the 5- Ma Los Mogotes volcano at the southeastern San Juan Mountains; sample 4 is silicic-alkalic Brazos Basalt from the Tusas Mountains.

**Brief comment: Compositional variations and magma-generation processes in continental-arc magmas: possible relation to crustal thickness**

The large variations in La, Yb, and other REE among mafic to silicic Cenozoic volcanic rocks in the Southern Rocky Mountains (for example, Fig. DR1) have been inferred to result from diverse magma-generation processes at varying depths and pressures in the continental lithosphere (Lipman, 1987). Even for the most mafic magmas in this region, melting and initial magma generation in the upper mantle was likely modified by variable assimilation of lower crust, followed crystal fractionation in the middle and upper crust (Lipman et al., 1978; Johnson, 1991; Riciputi et al., 1995; Lipman and Bachmann, 2015; Sliwinski et al., 2019).

How such processes and resulting compositional variations may relate to the thicknesses of continental crust remains incompletely understood, but some perspectives are provided by mafic lavas of the region that were less compositionally modified by crustal processes than the more silicic rocks (Fig. DR1, B). Other than tholeiitic lavas that are confined to the axis of the Rio Grande rift in northern New Mexico (Fig. DR1, A1-2), these mainly are silicic-alkalic basalts and basaltic andesites that have La and Yb contents and ratios as high or higher than the intermediate-composition rocks of the SRMVF that have been used as proxies to estimate paleo-crustal thicknesses. The mafic lavas tend to become more alkalic with distance from the Rio Grande rift (Fig. DR1, C). These compositional variations among Cenozoic basaltic rocks of the Southern Rocky Mountain region are broadly similar to those from oceanic volcanic islands, compositions that have long been ascribed to variable percentages of mantle melting over a range of depths and pressures in the upper mantle (Lipman, 1987, and references therein).

The high values for light REE and large La/Yb ratios of Cenozoic basalts, as well as intermediate-compositions volcanic rocks in the Southern Rocky Mountains, have also been interpreted as indications of melting or fractionation at depths and pressures where garnet is a stable residue. Some variability in the intermediate-composition rocks of the SRMVF thus is likely to have been inherited from mantle sources, with additional complexities resulting from the assimilation of lower crust and further fractionation at

shallower crustal levels. Basaltic compositions are rare among mid-Cenozoic rocks of the SRMVF (Lake and Farmer, 2017), and pervasive assimilation of granulitic lower crust is suggested by isotopic compositions of more-silicic volcanic rocks (Lipman et al. 1978; Johnson and Lipman, 1988; Johnson and Fridrich, 1990; Riciputi et al., 1995). Values of Yb and other heavy REE tend even to be even slightly lower for mid-Cenozoic intermediate-composition centers, such as Platoro (Fig. DR1, A), than for younger basaltic lavas that were dominantly mantle-derived. Such a relationship would be consistent with fractionation and assimilation at lower-crustal depths where garnet was residual. The intermediate-composition rocks (<~65% SiO<sub>2</sub>) also typically lack Eu anomalies, indicating absence of any sizable role for feldspar fractionation in generating the high light REE compositions and large La/Yb ratios. In contrast, substantial feldspar fractionation in the more silicic rocks, as indicated by Eu anomalies, is typically accompanied by decreases in light REE contents ((Fig. DR1, B4; Lipman, 1987).

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DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1YLa/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source
<b>SAWATCH RANGE AND CENTRAL SRMVF</b>																
<b>Mount Aetna caldera cycle</b>																
<b>Postcaldera intrusion</b>																
7219	Mt Aetna quartz monzonite		61.8	1.8	128	733	--	57	2.1	27.1	18.4	--	--	--	0.17	14
7435	Mt Aetna quartz monzonite		63.8	1.6	139	679	--	58	2.1	27.6	18.8	--	--	--	0.20	14
MPRM-21	Mt Aetna quartz monzonite		64.61	1.46	122	654	20.2	61.6	1.8	34.2	23.2	30.5	20.7	32.4	0.19	11.2
			Avg.: 63.4	S.D.: 1.4						29.7	20.1			32.4		12
<b>Caldera ignimbrite (Badger Cr Tuff)</b>																
MPRM-30	Badger Creek Tuff		64.20	0.81	145	676	18.9	67.2	1.9	35.4	24.0	35.6	24.2	35.8	0.21	9.9
7723	Badger Creek Tuff, intracaldera		64.7	1.3	140	601	--	58	2.2	26.4	17.9	--	--	--	0.23	14
7849	Badger Creek Tuff, intracaldera		65.0	1.2	137	629	--	62	2.1	29.5	20.1	--	--	--	0.22	14
7877	Badger Creek Tuff, intracaldera		65.3	1.1	135	605	--	53	1.8	29.4	20.0	--	--	--	0.22	14
14L-27	Badger Creek Tuff, Marshall Cr		65.37	0.66	144	618	19	49	--	--	25.8	17.5	32.5	0.23	8	
7877	Badger Creek Tuff, intracaldera		65.6	1.2	128	707	--	55	2.0	27.5	18.7	--	--	--	0.18	15
BCTI-1-142	Badger Creek Tuff, intracaldera		65.63	1.30	139	644	22	52.3	2.1	24.9	16.9	23.8	16.1	29.3	0.22	10.5
BCT 3-85	Badger Creek Tuff		66.37	1.42	128	651	19	56.8	1.8	31.6	21.4	29.9	20.3	34.3	0.20	10.6
7833	Badger Creek Tuff, intracaldera		66.4	1.1	127	622	--	55	2.0	27.5	18.7	--	--	--	0.20	14
			Avg.: 65.4	S.D.: 0.6						29.0	19.7	28.8	19.5	33.0		
<b>Mount Princeton batholith</b>																
7437	Mt Pomeroy quartz monzonite		61.7	2.4	152	499	--	68	2.6	26.2	17.8	--	--	--	0.30	14
MPRM-6	Mt Princeton quartz monzonite		63.29	1.78	124	491	24.7	52.6	2.2	23.9	16.2	21.3	14.5	19.9	0.25	11.2
82013	Mt Pomeroy quartz monzonite		63.3	3.2	171	518	--	67	2.5	26.8	18.2	--	--	--	0.33	14
MPRM-33	Mt Princeton quartz monzonite		63.34	2.11	164	463	26.4	74.0	2.5	29.6	20.1	28.0	19.0	17.5	0.35	10.6
7571	Mt Princeton quartz monzonite		65.9	1.5	117	570	--	55	1.6	34.4	23.4	--	--	--	0.21	14
7179	Mt Princeton quartz monzonite		65.9	2.5	107	544	--	54	1.6	33.8	22.9	--	--	--	0.20	14
7438	Mt Princeton quartz monzonite		66.0	1.4	120	238	--	55	2.3	23.9	16.2	--	--	--	0.50	14
			Avg.: 64.2	S.D.: 1.7						28.4	19.3	24.7	16.8	18.7		Avg.: S.D.: AVG.: 0.5
<b>Calico Mountain Andesite (precaldera?)</b>																
7201	Interned-comp lava		59.3	1.7	135	655	--	76	3.1	24.5	16.7	--	--	--	0.21	14
7867	Interned-comp lava		59.5	3.1	138	686	--	71	3.0	23.7	16.1	--	--	--	0.20	14
7864	Interned-comp lava		59.8	1.3	148	374	--	78	2.8	27.9	18.9	--	--	--	0.40	14
7720	Interned-comp lava		60.4	1.8	140	633	--	78	3.0	26.0	17.7	--	--	--	0.22	14
			Avg.: 59.8	S.D.: 0.5						25.5	17.3					
<b>Guffy volcano, lavas and intrusions</b>																
R-66	(not reported)		55.40	3.51	85	1139	20	--	--	--	--	--	--	57.0	0.07	15
R-71	(not reported)		56.18	0.86	76	1050	17	--	--	--	--	--	--	61.8	0.07	15
KS-24	(not reported)		57.23	1.27	118	1338	25	80.3	2.81	28.6	19.4	32.1	21.8	53.5	0.09	8.9
R-26	(not reported)		57.64	2.19	119	1131	21	--	--	--	--	--	--	53.9	0.11	15
KS-98	(not reported)		57.78	1.66	105	1266	21	--	--	--	--	--	--	60.3	0.08	15
R-30	(not reported)		57.88	1.51	43	1176	15	--	--	--	--	--	--	78.4	0.04	15
KS-95	(not reported)		60.50	1.30	108	896	27	72.3	3.03	23.9	16.2	26.8	18.2	33.2	0.12	8.9
R-14	(not reported)		61.47	1.45	102	786	17	--	--	--	--	--	--	46.2	0.13	15
KS-29	(not reported)		61.49	0.96	119	998	24	--	--	--	--	--	--	41.6	0.12	15
KS-93	(not reported)		61.63	1.30	115	990	24	73	2.51	29.1	19.8	30.4	20.7	41.3	0.12	9.6
KS-44	(not reported)		61.76	1.19	118	997	20	--	--	--	--	--	--	49.9	0.12	15
KS-46	(not reported)		61.80	1.21	120	991	21	--	--	--	--	--	--	47.2	0.12	15
R-62	(not reported)		61.84	0.92	105	1018	16	--	--	--	--	--	--	63.6	0.10	15
KS-86	(not reported)		62.29	0.98	122	1019	24	--	--	--	--	--	--	42.5	0.12	15
R-63	(not reported)		62.58	1.03	111	1002	20	83.9	2.8	30.0	20.4	42.0	28.5	50.1	0.11	7.1
			Avg.: 59.8	S.D.: 2.5						27.9	18.9	32.8	22.3	52.0		
<b>Buffalo Peaks volcano</b>																
BPA-1-32	Andesite		58.14	4.04	50	672	27	--	--	--	--	--	--	24.9	0.07	1
BPA-1-31	Andesite		58.32	3.71	76	726	27	--	--	--	--	--	--	26.9	0.10	1
BPA-2-109	Andesite		58.59	3.22	66	743	29	--	--	--	--	--	--	25.6	0.09	1
BCT-7-110	Tuff		61.54	2.79	75	630	27	--	--	--	--	--	--	23.3	0.12	1
BPA-3-114	Andesite		62.90	2.12	89	653	23	--	--	--	--	--	--	28.4	0.14	1
BCT-8-111	Tuff		63.12	2.14	95	634	22	--	--	--	--	--	--	28.8	0.15	1
BCT-1-33	Tuff		63.50	2.12	82	630	26	--	--	--	--	--	--	24.2	0.13	1
			Avg.: 60.87	S.D.: 2.4										26.3		
<b>Intrusions of Colorado Mineral Belt (Mid Cenozoic)</b>																
HS-82-11	Qtz monzonite, Ruby-Irwin	30	61.3	--	--	--	--	51.0	1.48	34.5	23.4	--	--	--	--	13
HS-82-21	Quartz diorite, Italian Mtn	33	61.8	--	--	--	--	50.0	2.59	19.3	13.1	--	--	--	--	13
HS-82-73	Monzodiorite, Augusta	29	61.9	--	--	--	--	63.6	1.60	39.8	27.0	--	--	--	--	13
HS-82-69	Qtz monzonite, Elkton sill	29	62.1	--	--	--	--	46.1	1.98	23.3	15.8	--	--	--	--	13
HS-82-05	Qtz monzonite, Ruby Peak	31	64.2	--	--	--	--	44.9	2.01	22.3	15.2	--	--	--	--	13
HS-82-13	Qtz monzonite, Mount Axtell	29	64.4	--	--	--	--	40.2	1.96	20.5	13.9	--	--	--	--	13
HS-82-22	Granodiorite, Italian Mtn	33	64.5	--	--	--	--	35.4	1.73	20.5	13.9	--	--	--	--	13
HS-82-66	Granodiorite, Turquoise Lake	36	65.2	--	--	--	--	45.1	1.18	38.2	26.0	--	--	--	--	13
HS-82-71	Qtz monzonite, Augusta	29	65.6	--	--	--	--	39.8	1.92	20.7	14.1	--	--	--	--	13
HS-82-53	Qtz monzonite, Gothic	29	66.0	--	--	--	--	50.4	1.73	29.1	19.8	--	--	--	--	13
HS-82-44	Qtz monzonite, Paradise Pass	29	66.1	--	--	--	--	45.1	1.60	28.2	19.1	--	--	--	--	13
			Avg.: 63.9	S.D.: 1.8						26.9	18.3					
<b>Intrusions of Colorado Mineral Belt (Laramide)</b>																
HS-82-39	Hbl monzonite, Caribou	60	56.1	--	--	--	--	49.8	2.93	17.0	11.5	--	--	--	--	13
HS-82-41	Granodiorite, Jamestown	70	61.1	--	--	--	--	47.4	1.93	24.6	16.7	--	--	--	--	13
HS-82-38	Syenite, Apex	60	62.0	--	--	--	--	86.2	2.82	30.6	20.8	--	--	--	--	13
HS-82-10	Syenite, Jamestown	45	65.3	--	--	--	--	38.5	1.82	21.2	14.4	--	--	--	--	13
HS-82-40	Qtz monzonite, Eldora	62	66.9	--	--	--	--	59.0	2.85	20.7	14.1	--	--	--	--	13
			Avg.: 62.3	S.D.: 4.2						22.8	15.5					
<b>NORTHEAST SAN JUAN REGION</b>																
<b>North Pass caldera cycle</b>																
<b>Dacite of Pass</b>																

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source
<b>Precaldera lavas &amp; intrusions (Conejos Fm ~35-32.2</b>																
03L-31	Hbl-rich dike, Hwy 114	56.94	3.61	58	958	23	46	--	--	20.0	13.6	41.7	0.06	8		
02L-38	Aphyric mafic lava, Middle Baldy	57.11	3.71	73	1180	28	75	--	--	26.8	18.2	42.1	0.06	8		
03L-18	Intrusion, upper Needle Creek	58.49	3.68	54	1040	20	60	--	--	30.0	20.4	52.0	0.05	8		
05L-15	Hbl-bio-pl dike, Barret Creek	59.19	2.92	56	882	25	47	--	--	18.8	12.8	35.3	0.06	8		
03L-17	Granodiorite, upper Needle Creek	59.97	2.67	61	865	22	58	--	--	26.4	17.9	39.3	0.07	8		
03L-20A	Dike, Needle Rock	60.06	2.69	56	918	23	48	--	--	20.9	14.2	39.9	0.06	8		
01L-19	Andesite, Razor Creek Dome	60.59	2.08	58	980	22	49	--	--	22.3	15.1	44.5	0.06	8		
01L-18	Andesite, Razor Creek Dome	61.54	1.62	59	947	23	43	--	--	18.7	12.7	41.2	0.06	8		
PC-2	Porphyritic lava, N Sawtooth Mtn	61.70	2.14	76	850	22	50	--	--	22.7	15.4	38.6	0.09	8		
05L-12	Bio-hbl intrusion, Needle Cr	61.98	1.68	67	985	22	68	--	--	30.9	21.0	44.8	0.07	8		
00L-20	Lava, fine-grained hbl dacite	62.17	1.51	56	870	23	42	--	--	18.3	12.4	37.8	0.06	8		
01L-15	Granodiorite dike, Sage Park	62.32	1.50	62	840	22	46	--	--	20.9	14.2	38.2	0.07	8		
01L-29	Dacite lava, Sawtooth Mtn	63.20	2.00	96	775	23	49	--	--	21.3	14.5	33.7	0.12	8		
	AVG.:	60.4								22.9	15.6	40.7				
	S.D.:	2.0								4.3	2.9	4.7				
<b>Bonanza caldera cycle</b>																
<b>Postcaldera intrusions</b>																
33.0-32.9																
08L-14	Granodiorite, Peterson Creek	55.13	4.33	124	717	35	81	--	--	22.8	15.5	20.3	0.17	9		
06L-35	Coarse diorite, Turquoises Mine	55.17	3.68	161	751	35	110	--	--	31.4	21.3	21.5	0.21	9		
11L-30	Granodiorite, Rawley Gulch	55.68	3.96	87	975	27	63	--	--	23.6	16.0	36.4	0.09	9		
07L-35	Fine-grain diorite, SE Hayden Pk	55.90	2.89	173	811	35	92	--	--	26.2	17.8	23.1	0.21	9		
09L-22	Granodiorite, Elkhorn Gulch	56.11	4.05	86	1012	27	60	--	--	22.1	15.0	37.6	0.09	9		
12L-7	Andesite dike, Kerber Creek	57.60	2.66	69	802	29	47	--	--	16.3	11.1	28.0	0.09	9		
07L-52	Granodiorite, Greenback Gulch	58.88	2.74	160	634	32	82	--	--	25.4	17.3	19.7	0.25	9		
12L-6	Andesite dike, Squirrel Gulch	61.60	1.86	119	651	27	57	--	--	20.9	14.2	24.0	0.18	9		
11L-2	Dacite, Slaughterhouse cirque	62.12	1.63	119	732	33	96	--	--	29.2	19.8	22.3	0.16	9		
08L-4B	Granodiorite, N of Kelly Creek	62.42	0.72	72	985	24	63	--	--	26.6	18.1	41.4	0.07	9		
06L-40	Dacite, Kerber Creek junction	63.71	1.54	104	443	27	65	--	--	24.1	16.4	16.4	0.23	9		
	AVG.:	58.6								24.4	16.6	26.4				
	S.D.:	3.3								4.1	2.8	8.3				
<b>Bonanza caldera-fill lava</b>																
33.1-33.0																
07L-23	Fine-grain flow	55.98	2.87	66	889	26	50	--	--	19.1	13.0	33.9	0.07	9		
08L-49	Dark vesicular andesite	56.70	3.14	59	910	29	53	--	--	18.3	12.4	31.5	0.07	9		
07L-32	Plag andesite (w/bio, san)	57.12	2.81	103	787	28	67	--	--	23.7	16.1	27.9	0.13	9		
09L-16	"Malpais" andesite	57.69	2.69	62	933	32	51	--	--	15.9	10.8	29.1	0.07	9		
10L-19B	"Malpais" andesite	58.69	2.47	72	931	26	43	--	--	16.5	11.2	35.4	0.08	9		
12L-9	Cone breccia	58.81	2.88	83	838	26	55	--	--	21.7	14.7	32.9	0.10	9		
07L-56	Squirrel Gulch Andesite	58.85	2.81	70	831	23	64	--	--	27.5	18.7	35.5	0.08	9		
07L-19	Squirrel Gulch Andesite	59.78	2.07	102	852	28	68	--	--	24.6	16.7	31.0	0.12	9		
12L-5	Squirrel Gulch Andesite	59.81	2.41	94	731	27	72	--	--	26.8	18.2	27.2	0.13	9		
09L-31	Plag andesite flow, caldera fill	59.89	2.29	93	823	27	68	--	--	25.1	17.1	30.6	0.11	9		
09L-30	"Dacite" flow, caldera fill	60.25	1.84	100	660	28	71	--	--	25.2	17.1	23.3	0.15	9		
10A-4	Hbl andesite flow	60.83	1.86	86	841	26	58	--	--	22.6	15.3	32.6	0.10	9		
12L-4	"Dacite" flow, caldera fill	61.45	1.57	99	671	28	76	--	--	27.5	18.6	24.3	0.15	9		
10L-3	Small-crystal dacite	62.32	1.34	72	859	28	67	--	--	24.0	16.3	30.6	0.08	9		
10L-2	Valley-fill dacite	65.57	1.06	141	559	28	77	--	--	28.1	19.1	20.3	0.25	9		
10L-12	Small-crystal dacite	65.58	1.16	135	557	28	70	--	--	25.4	17.2	20.1	0.24	9		
08L-44	Large-sanidine dacite flow	65.65	1.65	122	583	23	63	--	--	28.1	19.1	25.9	0.21	9		
	AVG.:	60.3								23.5	16.0	28.9				
	S.D.:	3.0								4.0	2.7	4.8				
<b>Bonanza Tuff, dacite</b>																
33.12																
11L-10A	Mafic scoria, upper unit (no K-f)	59.72	1.94	103	825	32	92	--	--	28.3	19.2	25.5	0.13	9		
11L-9A	Mafic scoria, basal unit (no K-f)	61.83	1.92	164	795	26	71	--	--	27.7	18.8	30.8	0.21	9		
09L-8C	Bonanza T, top, lower dacite	62.06	1.27	132	711	32	99	--	--	30.5	20.7	22.0	0.19	9		
11L-10B	Mafic scoria, upper unit (no K-f)	62.24	1.57	99	668	36	112	--	--	31.5	21.4	18.8	0.15	9		
02L-14	Dacite vitrophyre	63.09	1.35	121	626	31	102	--	--	32.9	22.4	20.2	0.19	9		
11L-9B	Mafic scoria, basal unit (no K-f)	63.39	1.45	193	703	26	71	--	--	27.2	18.5	27.1	0.27	9		
09L-8D	Bonanza T, mid lower dacite	63.49	1.06	196	710	30	80	--	--	26.8	18.2	23.8	0.28	9		
09L-8E	Bonanza T, near base, lower dacite	63.55	1.09	132	911	27	68	--	--	25.1	17.1	33.5	0.15	9		
09L-33B	Mafic scoria, resorb K-feld	63.91	0.96	125	593	35	105	--	--	30.0	20.4	17.0	0.21	9		
02L-22B	Vitrophyric main dacite	64.28	1.03	126	659	30	101	--	--	33.7	22.9	22.0	0.19	9		
09L-33A	Mafic scoria, resorb K-feld	64.52	1.02	132	553	34	98	--	--	28.6	19.4	16.1	0.24	9		
	AVG.:	62.9								29.3	19.9	23.3				
	S.D.:	1.4								2.7	1.8	5.5				
<b>Sargent's Mesa volcano, precaldera</b>																
~33.2																
09L-18	"Tan" andesite	63.03	0.81	76	970	30	69	--	--	22.9	15.6	32.4	0.08	9		
09L-19	"Tan" andesite	62.92	0.90	78	989	27	60	--	--	22.0	15.0	36.1	0.08	9		
06L-39	Dacite intrusion	61.23	1.81	73	709	24	62	--	--	25.8	17.5	29.5	0.10	9		
10L-8	Tan andesite	60.38	1.51	98	772	26	62	--	--	23.5	16.0	29.2	0.13	9		
09L-17	"Tan" andesite	57.68	2.74	61	935	33	53	--	--	16.2	11.0	28.8	0.07	9		
	AVG.:	61.0								22.1	15.0	31.2				
	S.D.:	2.2								3.6	2.4	3.1				
<b>Rawley volcano(es), precaldera</b>																
33.8-33.2																
07L-22	Aphanitic andesite	56.58	2.66	73	1150	28	80	--	--	28.8	19.5	41.4	0.06	9		
07L-1	Glassy pl andesite	57.25	3.74	75	892	24	53	--	--	22.3	15.2	37.5	0.08	9		
07L-3-RE	Dark plag andesite	57.41	3.09	77	878	25	48	--	--	19.6	13.3	35.5	0.09	9		
07L-3	Dark plag andes															

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source
06L-38	Dacite lava flow		64.26	1.56	114	635	24	71	--	--	--	29.6	20.1	26.5	0.18	9
10L-17A	Eutaxitic base, dacite flow		64.38	1.34	119	692	24	62	--	--	--	26.0	17.7	29.2	0.17	9
		AVG.:	61.3									25.6	17.4	34.8		
		S.D.:	2.1									3.8	2.5	8.9		
<b>Northeastern Conejos volcanoes</b>																
<b>Jacks Creek volcano</b>																
07L-61	Hbl-cpx andesite dike	34-33	55.22	3.06	30	1081	25	61	--	--	--	24.8	16.8	43.9	0.03	9
07L-60	Fine-grain andesite lava		56.22	3.62	31	1178	24	63	--	--	--	26.3	17.9	48.9	0.03	9
07L-58	Fine-grain andesite lava		57.00	3.40	57	1252	22	66	--	--	--	29.6	20.1	56.4	0.05	9
07L-81	Xl-poor hbl andesite breccia		59.57	2.84	56	853	20	41	--	--	--	20.6	14.0	43.1	0.07	9
07L-26	F.G. diorite intrusion		59.62	3.20	64	994	21	63	--	--	--	30.2	20.5	47.3	0.06	9
07L-83	Plag andesite lava		59.95	3.21	57	887	21	52	--	--	--	25.3	17.2	43.1	0.06	9
SRM-1	Fine-grain granodiorite		60.65	2.53	65	940	19	61	1.65	37.0	25.1	32.4	22.0	50.0	0.07	11.4
09L-34A	Andesite dike		62.59	1.86	75	1049	21	70	--	--	--	32.9	22.3	49.0	0.07	9
		AVG.:	58.9									27.8	18.9	47.7		
		S.D.:	2.5									4.2	2.9	4.5		
<b>Tracy volcano</b>																
SRM-5	Fine-grain granodiorite	33.5-32.5	56.79	4.83	71	983	25	60	2.17	27.7	18.8	24.1	16.4	39.5	0.07	11.5
11L-39	Radial andesite dike		57.14	2.95	53	933	27	53	--	--	--	19.9	13.5	35.0	0.06	9
11L-36	Fine-grain andesite		57.63	2.98	57	955	27	56	--	--	--	20.9	14.2	35.9	0.06	9
11L-31	Upper andesite lava		59.61	2.94	59	1058	22	56	--	--	--	25.6	17.4	48.6	0.06	9
11L-43	Ponded andesite lava (sill?)		59.67	2.29	57	1030	24	55	--	--	--	23.1	15.7	43.3	0.06	9
11L-37	Plagioclase andesite		60.36	1.70	69	894	28	63	--	--	--	22.6	15.3	31.8	0.08	9
11L-42	Ponded andesite lava		60.56	1.95	62	1083	23	57	--	--	--	25.4	17.3	48.0	0.06	9
11L-35	Plagioclase andesite		61.11	1.14	70	932	29	64	--	--	--	21.7	14.8	31.7	0.08	9
11L-40A	Xenocystic (qtz) andesite		61.89	2.72	65	870	17	41	--	--	--	24.1	16.4	51.6	0.08	9
06L-12	Fine-grain "andesite" lava		63.76	1.61	76	678	26	55	--	--	--	21.2	14.4	26.1	0.11	9
11L-41	Ponded "andesite" lava		63.95	1.11	78	656	27	67	--	--	--	25.0	17.0	24.6	0.12	9
06L-13	Vitrophyric (red) dacite lava		64.15	2.70	62	784	14	39.0	--	--	--	27.9	18.9	56.0	0.08	9
06L-10	Dacite (fine-grain), upper lavas		65.34	1.45	82	614	21	56	--	--	--	26.7	18.1	29.2	0.13	9
		AVG.:	60.9									23.7	16.1	38.6		
		S.D.:	2.8									2.4	1.6	10.2		
<b>SOUTHEAST SAN JUAN REGION: Platoro caldera complex</b>																
<b>Platoro granitoid intrusions</b>																
67L-113	Alamosa River pluton	29-27	56.6	3.6	--	--	--	38	2.8	13.6	9.2	--	--	--	--	5
67L-84B	Bear Creek pluton		58.9	3.1	--	--	--	29	2.4	12.1	8.2	--	--	--	--	5
70L-16	Cat Creek pluton		59.6	2.4	--	--	--	32	1.9	16.8	11.4	--	--	--	--	5
66L-155	Alamosa River pluton		59.9	3.3	--	--	--	44	2.8	15.7	10.7	--	--	--	--	5
SRM-24	Alamosa River pluton		60.24	3.50	103	601	26	39.4	2.37	16.6	11.3	15.4	10.5	23.5	0.17	10.8
SRM-26	Granodiorite, Cat Creek		60.28	2.54	81	764	22	34.9	1.87	18.7	12.7	12.7	10.8	34.7	0.11	11.8
SRM-22	Alamosa River pluton		62.10	2.93	109	566	25	32.6	2.38	13.7	9.3	13.2	9.0	22.9	0.19	10.4
SRM-25	Granodiorite, Jasper pluton		62.20	2.62	131	563	27	44.6	2.57	17.4	11.8	16.8	11.4	21.2	0.23	10.4
SRM-33	F.g. granodiorite, Crater Creek		62.56	2.27	80	678	22	42.3	1.92	22.0	15.0	19.1	12.9	30.6	0.12	11.6
ACL-2694	Alamosa River pluton		63.3	1.5	--	--	--	33	2.2	15.0	10.2	--	--	--	--	5
SRM-23	Resurgent intrusion		64.12	1.36	85	573	20	36.3	1.98	18.3	12.5	17.8	12.1	28.1	0.15	10.3
		AVG.:	60.9									16.4	11.1	16.3	26.8	
		S.D.:	2.2									2.8	1.9	2.0	1.4	5.2
<b>Platoro caldera: postcollapse lavas and dikes</b>																
16L-42	Andesite dike, N of Rito Gato	30-28.8	55.06	4.02	70	993	22	33.4	2.14	15.6	10.6	15.0	10.2	44.5	0.07	10.4
16L-41	Lava, Summitville Andesite		56.15	3.57	66	787	24	33.4	2.30	14.5	9.9	13.6	9.3	32.2	0.08	10.6
71J-1	Summitville Andesite		56.4	3.2	--	--	--	31	2.3	13.5	9.2	--	--	--	--	5
67L-126	Summitville Andesite		57.3	3.1	--	--	--	37	2.3	16.1	10.9	--	--	--	--	5
16L-36	Andesite dike, Rito Gato		57.50	3.49	76	1076	25	34.4	2.37	14.5	9.9	13.5	9.2	42.2	0.07	10.7
16L-31	Andesite dike, Three Forks road		57.52	2.49	34	611	33	25.6	3.24	7.9	5.4	7.7	5.3	18.4	0.05	10.2
16L-40	Lava, Summitville Andesite		57.82	3.21	86	719	25	38.3	2.42	15.8	10.8	15.1	10.2	28.3	0.12	10.5
16L-30	Andesite dike, S of Adams Fork		58.07	2.80	30	469	29	27.8	2.96	9.4	6.4	9.7	6.6	16.3	0.06	9.7
16L-34	Andesite dike, small		58.22	1.97	47	596	32	26.7	3.22	8.3	5.6	8.5	5.7	18.9	0.08	9.8
16L-28	Andesite dike, Cat Creek rd		58.48	3.92	66	435	26	33.9	2.57	13.2	9.0	13.1	8.9	16.8	0.15	10.1
66L-48A	Andesite lava, Green Ridge		58.8	3.0	--	--	--	35	2.3	15.2	10.3	--	--	--	--	5
67L-125	Summitville Andesite		60.6	2.3	--	--	--	29	2.9	10.0	6.8	--	--	--	--	5
71L-38	Dacite of Fisher Gulch		62.5	1.5	--	--	--	39	2.4	16.3	11.0	--	--	--	--	5
		AVG.:	58.0									13.1	8.9	12.0	8.2	27.2
		S.D.:	1.9									3.1	2.1	2.9	2.0	11.5
<b>Precaldera lavas and intrusions (Conejos Fm35-31 Ma)</b>																
16L-22	Plag andesite dike, Sparks Creek	29-27	55.93	3.57	70	682	28	34.5	2.31	14.9	10.1	12.5	8.5	24.7	0.10	11.9
17L-6	Plag andesite dike, Rio Blanco Rd		56.39	2.88	70	693	24	32.5	2.17	15.0	10.2	13.6	9.3	29.1	0.10	11.0
CoV-115	Lava, Horsehoe Mountain Member		56.91	3.01	37	772	25	25.4	2.19	11.6	7.9	10.2	6.9	30.9	0.05	11.4
CoV-95	Horsehoe Mountain Member		57.53	3.42	38	826	24	31.4	2.44	12.9	8.7	13.1	8.9	34.4	0.05	9.8
16L-35	Hbl andesite dike, Adams Fork		58.38	3.11	54	572	29	27.8	2.73	10.2	6.9	9.6	6.5	19.8	0.09	10.6
16L-1	Andesite dike, f.gr.		58.45	2.60	47	573	29	35.7	2.71	13.2	8.9	12.4	8.4	19.9	0.08	10.6
16KA-1	Fine-gr andesite dike, Flattop Mtn		59.36	3.04	89	605	28	37.2	2.70	13.8	9.4	13.3	9.0	21.6	0.15	10.4
68L-16	Upper lava unit		59.80	1.40	--	--	--	35	3.1	11.3	7.7	--	--	--	--	5
CoV-142	Lava, Willow Mountain Member		60.10	2.40	119	628	28	35.5	2.50	14.2	9.6	12.7	8.6	22.4	0.19	11.2
CoV-87a	Lava, Horsehoe Mountain Member		60.29	2.38	63	675	20	28.4	2.27	12.5	8.5	14.2	9.6	33.8	0.09	8.8
16KA-2	Hbl andesite dike, Flattop Mtn		60.43	1.84	57	695	24	32.0	2.37	13.5	9.2	13.2	8.9	28.6	0.08	10.3
CoV-21	Lava, Willow Mountain Member		60.87	2.47	73	640	27	31.7	2.81	11.3	7.7	11.7	8.0	23.7	0.11	9.6
16L-32	Hbl-andesite dike, Three Forks rd		61.17	2.00	64	463	25	29.3	2.52	11.6	7.9	11.6	7.9	18.4	0.14	10.0
68L-91	Hbl andesite lava, Navajo Peak		62.00	--	--	--	--	38	3.0	12.7	8.6	--	--	--	--	5
CoV-079	Lava, Willow Mountain Member		62.75	1.91	81	760	24									

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source	
6-1-12b	Dacite intrusion	65.00	1.1	132	435	25	65	3.4	19.1	13.0	26.0	17.7	17.4	0.30	7.4	3	
LC2004-24	Dacite intrusion	65.4	1.4	142	--	29	64.1	2.78	23.1	15.7	22.1	15.0	--	--	10.4	3	
6-1-5R	Dacite intrusion	65.4	1.7	143	488	25	65	3.1	21.0	14.2	26.0	17.7	19.5	0.29	8.1	3	
6-1-1C	Dacite lava	65.5	1.8	165	406	25	64	3.2	20.0	13.6	25.6	17.4	16.2	0.41	7.8	3	
SRM-12	Granodiorite, Alpine Gulch	65.59															
	AVG.:	64.8			157	509	34	76.9	3.09	24.9	16.9	22.6	15.3	14.9	0.31	11.0	17
	S.D.:	0.9								20.5	13.9	23.2	15.8	16.6			
										3.2	2.2	3.5	2.4	2.4			
<b>CENTRAL SAN JUAN REGION</b>																	
Creede caldera cycle																	
Postcollapse lavas																	
88L-31-A	Overslies Snowshoe Mtn Tuff	26.8	56.41	3.32	55	857	24	39.3	2.89	13.6	9.2	16.4	11.1	35.7	0.06	8.3	6
DY89-11-B	Devitrified	59.21	2.11	69	776	29	39	--	--	--	--	13.4	9.1	26.8	0.09	6	
88L-31-B	Overslies Snowshoe Mtn Tuff	60.56	0.71	63	749	28	43	--	--	--	--	15.4	10.4	26.8	0.08	6	
88L-31-C	Overslies Snowshoe Mtn Tuff	61.17	1.86	57	696	24	41	--	--	--	--	17.1	11.6	29.0	0.08	6	
DS89-014	Devitrified	62.09	1.13	72	872	25	55	--	--	--	--	22.0	14.9	34.9	0.08	6	
DY89-12	Devitrified	62.62	1.33	79	794	24	47	--	--	--	--	19.6	13.3	33.1	0.10	6	
DY89-11-A	Flow layered	63.43	1.59	86	756	24	54	--	--	--	--	22.5	15.3	31.5	0.11	6	
DS89-012	Devitrified	63.51	1.08	78	791	24	42	--	--	--	--	17.5	11.9	33.0	0.10	6	
LR88-642	Along road, Spring Gulch	63.76	1.77	90	630	23	42	--	--	--	--	18.3	12.4	27.4	0.14	6	
DS89-001	W of Palo Alto Creek	63.78	1.75	82	724	24	45	--	--	--	--	18.8	12.7	30.2	0.11	6	
LR88-538	Upper unit, SW of Mill Park	64.44	2.08	107	610	24	43	--	--	--	--	17.9	12.2	25.4	0.18	6	
LR88-644	Along road, Spring Gulch	64.51	1.68	109	614	24	42	--	--	--	--	17.5	11.9	25.6	0.18	6	
LR88-643	Along road, Spring Gulch	64.76	1.72	86	602	21	44	--	--	--	--	21.0	14.2	28.7	0.14	6	
	AVG.:	62.3								13.6	9.2	18.2	12.4	29.8			
	S.D.:	2.4										2.6	1.7	3.5			
Snowshoe Mountain Tuff																	
DS87-140-B	Palmer Mesa	26.84	59.94	2.20	104	740	27	42	--	--	--	15.6	10.6	27.4	0.14	6	
69L-15	Palmer Mesa	60.50	1.81	74	720	26	47	--	--	--	--	18.1	12.3	27.7	0.10	6	
SJ85-16	Cattle Mountain, uppermost	62.15	2.32	119	634	25	43.6	2.85	15.3	10.4	17.4	11.8	25.4	0.19	8.8	6	
SJ85-20	Cattle Mtn, topmost	62.28	1.33	107	704	20	38.5	2.21	17.4	11.8	19.3	13.1	35.2	0.15	9.0	6	
SJ85-18	Cattle Mtn, lowermost	62.50	1.54	94	679	18	36.9	1.86	19.8	13.5	20.5	13.9	37.7	0.14	9.7	6	
LR88-580pur	Cattle Mountain, pumice lens	63.92	2.06	157	563	31	43.3	2.77	15.6	10.6	14.0	9.5	18.2	0.28	11.2	6	
SJ85-13	Cattle Mtn, basal fall bed	65.13	1.96	160	509	32	45	--	--	--	--	14.1	9.6	15.9	0.31	6	
DS89-004	W flank, Fisher Mtn	66.33	1.14	109	550	20	39	2.10	--	18.6	12.6	19.5	13.2	27.5	0.20	9.5	6
	AVG.:	62.8								17.4	11.8	17.3	11.7	26.9			
	S.D.:	2.2								1.9	1.3	2.5	1.7	7.4			
Nelson caldera cycle																	
Postcollapse lavas and intrusions																	
LR87-718-2	Mix-lava, N of Nelson Mtn	56.95	2.19	84	759	32	46	--	--	--	--	14.4	9.8	23.7	0.11	6	
DS88-010	Andesite lava, N. Mineral Mtn	57.16	2.94	80	678	31	43	3.08	14.0	9.5	13.9	9.4	21.9	0.12	10.1	6	
LR87-718-3	Mix-lava dome, N of Nelson Mtn	57.45	1.54	84	765	33	47	--	--	--	--	14.5	9.8	23.5	0.11	6	
DS85-116	Crystal-poor andesite, E Willow Creek	58.45	2.95	90	782	28	41.1	2.69	15.3	10.4	14.7	10.0	27.9	0.12	10.4	6	
DS88-030	Dike, upper Stewart Creek	58.87	2.16	97	635	32	40	--	--	--	--	12.5	8.5	19.8	0.15	6	
DS88-002	Lava, Stewart Peak Volcanics	59.59	2.83	101	674	26	43	--	--	--	--	16.5	11.2	25.9	0.15	6	
DS88-003	Lava, Stewart Peak Volcanics	59.71	2.13	89	630	32	39	--	--	--	--	12.2	8.3	19.7	0.14	6	
DS88-015	Lava, Stewart Peak Volcanics	59.78	2.27	88	630	34	42	--	--	--	--	12.4	8.4	18.5	0.14	6	
DS88-016	Lava, Stewart Peak Volcanics	59.79	1.72	97	597	29	48	--	--	--	--	16.6	11.2	20.6	0.16	6	
LR88-505	Lava, Baldy Alto summit	59.95	2.60	104	637	26	41.4	2.75	15.1	10.2	16.2	11.0	25.0	0.16	9.3	6	
DS88-001	Plagi-rich lava, E of Spring Creek	59.97	2.55	105	660	27	44	--	--	--	--	16.3	11.1	24.4	0.16	6	
DS88-017	Lava, Stewart Peak Volcanics	60.04	2.40	107	654	26	43	--	--	--	--	16.5	11.2	25.2	0.16	6	
LR88-569	Lava, Stewart Peak Volcanics	60.23	2.12	86	543	27	42	--	--	--	--	15.6	10.6	20.1	0.16	6	
DS88-014	Lava, Stewart Peak Volcanics	60.31	2.16	107	624	25	49	--	--	--	--	19.6	13.3	25.0	0.17	6	
DS88-004	Lava, Stewart Peak Volcanics	60.40	2.44	105	617	27	47	--	--	--	--	17.4	11.8	22.9	0.17	6	
LR88-565	Lava, top of 13,034' peak	60.70	2.08	98	524	29	47	--	--	--	--	16.2	11.0	18.1	0.19	6	
DS85-121	Stewart Pk, lower lava	60.85	1.81	115	644	27	41.6	2.73	15.2	10.4	15.4	10.5	23.9	0.18	9.9	6	
LR88-566	Lava, Stewart Peak Volcanics	60.88	2.36	98	559	32	41	--	--	--	--	12.8	8.7	17.5	0.18	6	
LR88-568	Lava, Stewart Peak Volcanics	60.94	2.25	96	627	31	43	--	--	--	--	13.9	9.4	20.2	0.15	6	
DG 1289	Intrusion, Equity Mine	61.02	1.97	174	432	20	41.4	1.83	22.6	15.3	20.4	13.8	21.3	0.40	11.1	17	
LR88-567	Lava, Stewart Peak Volcanics	61.32	2.15	112	632	35	47	--	--	--	--	13.4	9.1	18.1	0.18	6	
DG 1135	Intrusion, Equity Mine	63.37	0.74	105	531	25	41.3	2.23	18.5	12.6	16.5	11.2	21.2	0.20	11.2	17	
LR88-503	Intrusion, Spring Creek	64.25	1.95	121	518	25	39	--	--	--	--	15.6	10.6	20.7	0.23	6	
SRM-8	Monzonite, Nelson caldera	64.64	1.83	108	515	26	43.0	2.55	16.8	11.4	16.3	11.1	19.5	0.21	10.3	17	
DG 1031	Intrusion, Equity Mine	65.58	0.83	156	434	21	37.3	1.80	20.7	14.1	17.9	12.1	20.7	0.36	11.6	17	
	AVG.:	60.5								17.3	11.7	15.5	10.5	21.8			
	S.D.:	2.1								3.1	2.1	2.1	1.4	2.8			
Nelson Mountain Tuff (dacite)																	
LR88-611	Upper pw xl-rich dacite	62.17	1.78	99	614	26	44	--	--	--	--	16.9	11.5	23.6	0.16	6	
DS88-011	NW of Bondholder	62.41	1.77	101	605	20	41	--	--	--	--	20.5	13.9	30.3	0.17	6	
DS88-012	Pt Pumice, W of Spring Creek	63.04	1.98	77	684	23	44.5	2.06	21.6	14.7	19.3	13.1	29.7	0.11	11.2	6	
DS88-012	Bondholder Meadow	63.50	1.77	104	634	20	41	--	--	--	--	20.5	13.9	31.7	0.16	6	
LR89-013	Dacite rim, E of Spring Creek	64.40	0.75	112	573	25	45	1.90	23.7	16.1	18.0	12.2	22.9	0.20	6		
85L-29A	Upper welded xl-rich dacite	64.43	1.08	105	566	19	44.8	2.73	16.4	11.1	23.6	16.0	29.8	0.19	7.0	6	
94L-18B	Snow Mesa, upper partly welded	64.79	1.18	102	600	24	30	--	--	--	--	12.5	8.5	25.0	0.17	6	
93L-2B	Top of caprock, Palmer Mesa	65.13	1.78	116	510	30	55	--	--	--	--	18.3	12.5	17.0	0.23	6	
LR88-609	Upper welded xl-rich dacite	65.46	1.16	116	551	24	45	--	--	--	--	18.8	12.7	23.0	0.21	6	
LR89-013pur	Pumice lens, E of Spring Creek	66.21	0.89	117	534	22	41	--	--	--	--	18.6	12.7	24.3	0.22	6	
85L-10S	Whited Creek "cleaver", vitrophyre	66															

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source		
BH-27	S slope of Bristol Head	59.48	2.45	103	807	31	36.8	2.61	14.1	9.6	11.9	8.1	26.0	0.13	11.9	6		
LR88-535	East Bellows Creek	60.40	2.15	101	697	23	51	--	--	--	--	22.2	15.1	30.3	0.14	6		
LR87-717-6	Blue Park, along road	60.97	2.13	103	685	25	44.3	2.14	20.7	14.1	18.0	12.2	27.8	0.15	11.5	6		
DS88-079	N of Shallow Creek	61.16	1.68	23	105	24	75	--	--	--	--	31.3	21.2	4.4	0.22			
DS88-080	N of Shallow Creek	61.47	1.44	103	939	24	74	--	--	--	--	30.8	20.9	39.1	0.11	6		
LR87-717-8	Blue Park, just north of fault	61.60	2.03	103	670	25	51	--	--	--	--	20.4	13.9	26.8	0.15	6		
LR88-534	East Bellows Creek	61.69	1.97	107	653	26	51	--	--	--	--	19.6	13.3	25.1	0.16	6		
LR88-533	East Bellows Creek	61.79	1.98	111	653	24	49	--	--	--	--	20.4	13.9	27.2	0.17	6		
LR87-716-5	West of lower Rat Creek road	62.62	2.07	111.33	615	27	45	--	--	--	--	16.9	11.5	23.1	0.18	6		
94L-20	Capping lava, Bristol Head	63.07	1.60	104	700	30	30	--	--	--	--	10.0	6.8	23.3	0.15	6		
BH-21	E side of Bristol Head summit	63.65	1.07	97	778	26	51.1	2.04	25.0	17.0	19.7	13.4	29.9	0.12	12.7	6		
SJ85-3	NE rid+A59:B62ge of Bristol Head	63.71	1.93	116	628	19	39.5	2.14	18.5	12.5	20.8	14.1	33.1	0.18	8.9	6		
	AVG.:		61.8									19.6	13.3	20.2	13.7	26.3		
	S.D.:		1.3									4.6	3.1	6.2	4.2	8.2		
<b>South River caldera cycle</b>																		
<b>Postcollapse lavas &amp; intrusions</b>																		
88L-34	Andesite intrusion, W Fork SJ River	57.55	2.40	54	1065	35	59	--	--	--	--	16.9	11.5	30.4	0.05	~27.3		
89L-135A	Andesite intrusion, Sawtooth Mtn trail	57.80	2.53	47	774	33	44	--	--	--	--	13.3	9.1	23.5	0.06	6		
88L-36	Fine-grain diorite, E ridge Piedra Peak	58.31	2.36	43	843	30	37	--	--	--	--	12.3	8.4	28.1	0.05	6		
DY89-18	Andesite, east of Goose Lake	58.71	2.74	57	881	31	49	--	--	--	--	15.8	10.7	28.4	0.06	6		
88L-65	Andesite, capping flow South River Pk	58.72	2.79	49	920	25	46.7	2.73	17.1	11.6	18.7	12.7	36.8	0.05	9.2	6		
89L-122	Andesite, near trail, at Goose Lake	58.73	2.67	55	896	28	49	--	--	--	--	17.5	11.9	32.0	0.06	6		
88L-62A	Hbl dacite lava, NW of South River Pk	58.76	2.98	59	808	26	42	--	--	--	--	16.2	11.0	31.1	0.07	6		
DS89-009	Andesite, southeast of Goose Lake	58.77	2.69	55	880	32	54	--	--	--	--	16.9	11.5	27.5	0.06	6		
DY89-16	Andesite, east of Goose Lake	58.81	2.44	55	870	34	48	--	--	--	--	14.1	9.6	25.6	0.06	6		
88L-61	Andesite intrusion, Piedra Pass	58.99	2.42	59	830	21	51	--	--	--	--	24.3	16.5	39.5	0.07	6		
DS89-019	Andesite, south of Beautiful Mountain	59.33	2.14	62	877	29	47	--	--	--	--	16.2	11.0	30.2	0.07	6		
89L-147B	Andesite intrusion, upper Goose Cr	59.50	3.02	80	512	31	38	--	--	--	--	12.3	8.3	16.5	0.16	6		
88L-70	Andesite, west slope of Red Mountain	59.66	2.10	60	880	29	45	--	--	--	--	15.5	10.5	30.3	0.07	6		
DS89-010	Andesite, southeast of Fisher Creek	59.81	2.36	55	891	25	44	2.8	15.7	10.7	17.6	12.0	35.6	0.06	8.9	6		
DS89-017	Andesite, south of Beautiful Mountain	59.92	2.07	56	912	28	47	--	--	--	--	16.8	11.4	32.6	0.06	6		
DY89-17	Andesite, east of Goose Lake	60.06	2.21	61	867	30	50	--	--	--	--	16.7	11.3	28.9	0.07	6		
S-175B	Hbl dacite lava, SE L Humphreys	60.32	1.70	110	748	17	43	2.4	17.9	12.2	25.3	17.2	44.0	0.15	7.1	6		
DS89-007	Andesite, east of Goose Lake	60.40	2.22	58	821	30	49	--	--	--	--	16.3	11.1	27.4	0.07	6		
DS89-029	Hbl dacite lava, SE Beautiful Mountain	60.57	2.89	66	716	25	37	--	--	--	--	14.8	10.1	28.6	0.09	6		
89L-115	Andesite, head of Ivy Creek	60.79	2.35	61	813	29	49	--	--	--	--	16.9	11.5	28.0	0.08	6		
DS89-030	Andesite, east ridge, Beautiful Mountain	61.09	1.62	76	627	29	43	--	--	--	--	14.8	10.1	21.6	0.12	6		
89L-101	Dacite lava, upper Ivy Creek	61.22	2.32	76	923	20	51	--	--	--	--	25.5	17.3	46.2	0.08	6		
88L-66	Andesite, north ridge of South River Pk	61.27	2.34	62	788	20	53	--	--	--	--	26.5	18.0	39.4	0.08	6		
DS89-008	Andesite, south of Goose Lake	61.30	2.22	71	804	24	44	--	--	--	--	18.3	12.5	33.5	0.09	6		
88L-32	Andesite dike, S of Piedra Peak	61.45	1.95	54	603	29	39	--	--	--	--	13.4	9.1	20.8	0.09	6		
89L-128	Andesite, east of South River Peak	61.68	1.76	71	738	33	46	--	--	--	--	13.9	9.5	22.4	0.10	6		
88L-62B	NW of South River Peak	61.75	2.37	68	674	24	40	--	--	--	--	16.7	11.3	28.1	0.10	6		
DS89-035	Hbl dacite lava, SE Beautiful Mountain	62.25	2.24	73	657	27	40	--	--	--	--	14.8	10.1	24.3	0.11	6		
DY89-8	Hbl dacite lava, SE Beautiful Mountain	62.36	2.35	78	644	29	42	--	--	--	--	14.5	9.8	22.2	0.12	6		
DY89-7	Hbl dacite lava, SE Beautiful Mountain	62.70	1.96	97	678	48	84	--	--	--	--	17.5	11.9	14.1	0.14	6		
89L-123	Hbl dacite lava, at Goose Lake	62.73	2.29	80	907	20	57	--	--	--	--	28.5	19.4	45.4	0.09	6		
89L-130	Hbl dacite lava, lahar clast	62.73	1.84	107	652	38	60	2.92	20.5	13.9	15.8	10.7	17.2	0.16	13.0	6		
DY89-9	Hbl dacite lava, SE Beautiful Mountain	62.78	2.03	83	762	27	41	--	--	--	--	15.2	10.3	28.2	0.11	6		
89L-135B	Mafic dacite intrusion, upper Goose Cr	63.04	1.56	49	742	22	32	--	--	--	--	14.5	9.9	33.7	0.07	6		
88L-62C	Hbl dacite lava, NW of South River Peak	63.12	2.40	57	550	16	37	--	--	--	--	23.1	15.7	34.4	0.10	6		
89L-102	Dacite lava, upper Ivy Creek	63.18	2.31	89	663	22	44	--	--	--	--	20.0	13.6	30.1	0.13	6		
88L-62D	Hbl dacite lava, NW of South River Peak	63.18	2.59	57	376	20	42	--	--	--	--	21.0	14.3	18.8	0.15	6		
89L-144	Mafic dacite intrusion, upper Goose Cr	63.19	1.88	41	673	26	36	--	--	--	--	13.8	9.4	25.9	0.06	6		
88L-58	Hbl dacite lava, summit, Piedra Peak	63.24	1.38	48	664	18	47	--	--	--	--	26.1	17.7	36.9	0.07	6		
DS89-015	Hbl dacite lava, S of Fisher Mountain	63.30	2.10	74	681	22	44	--	--	--	--	20.0	13.6	31.0	0.11	6		
89L-112	Dacite lava, low in Fisher Creek	63.56	2.08	99	650	27	47	--	--	--	--	17.4	11.8	24.1	0.15	6		
DY89-6	Dacite lava, Ivy Creek	64.54	1.84	80	687	22	47	--	--	--	--	21.4	14.5	31.2	0.12	6		
88L-62E	Hbl dacite lava, NW of South River Peak	64.55	1.12	72	721	19	51	--	--	--	--	26.8	18.2	37.9	0.10	6		
DS89-006	Dacite lava, low in Fisher Creek	64.66	1.88	94	621	23	47	--	--	--	--	20.4	13.9	27.0	0.15	6		
89L-120	Dacite lava, upper Ivy Creek	64.70	1.76	86	679	21	44	--	--	--	--	21.0	14.2	32.3	0.13	6		
DS89-034	Hbl dacite lava, SE Beautiful Mountain	64.81	1.96	79	634	25	39	2.02	19.1	12.9	15.4	10.5	25.4	0.12	12.4	6		
DS89-016	Dacite lava, low in Fisher Creek	64.92	1.26	88	650	24	50	--	--	--	--	20.8	14.2	27.1	0.14	6		
	AVG.:		61.4									18.1	12.3	18.1	12.3	29.5		
	S.D.:		2.1									1.8	1.2	4.2	2.9	7.1		
<b>Blue Creek caldera (concealed)</b>																		
<b>Postcaldera lavas</b>																		
LR87-717-3	Andesite flow, upper Blue Creek	60.26	2.40	110	697	26.75	39.7	2.23	17.8	12.1	14.8	10.1	26.1	0.16	12.0	6		
LR88-553	Dacite flow, Ute Peak,	61.78	1.30	93	694	25	43	--	--	--	--	17.2	11.7	27.8	0.13	6		
DS87-028V	Dacite flow, East Bellows Creek	63.91	1.66	144	467	26	57	--	--	--	--	21.9	14.9	18.0	0.31	6		
LR88-555	Dacite flow, Ute Peak	64.69	1.19	121	611	26	49.6	2.05	24.2	16.4	19.1	13.0	23.5	0.20	12.7	6		
LR88-537a	Dacite flow, East Bellows Creek	65.56	0.96	157	604	26	54	--	--	--	--	20.8	14.1	23.2	0.26	6		
	AVG.:		63.2									AVG.:	21.0	14.3	18.8	12.7	23.7	
	S.D.:		0.6									S.D.:	4.5	3.1	2.8	1.9	3.7	
<b>Blue Creek Tuff</b>																		
87-154	Palisades, above campground	63.27	2.27	11	668	26	36	--	--	--	--	13.8	9.4	25.7	0.02	6		
87-152	Palisades, campground	63.69	2.40	115	639	28	45	--	--	--	--	16.1	10.9	22.8	0.1			

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , %	MgO, %	Rb, ppm	Sr, ppm	Y, ppm	La, ppm	Yb, ppm	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source	
HU 47	Andesite lava		55.30	2.87	51	639	46	49.9	3.8	13.1	8.9	10.8	7.4	13.9	0.08	12.1	6
LR88-630	Andesite lava		55.54	2.57	77	615	36	46	--	--	--	12.8	8.7	17.1	0.13	6	
HA 36	Olivine andesite		55.54	3.30	35	695	29	26	--	--	--	9.0	6.1	24.0	0.05	6	
HA-27	Olivine andesite, Ribbon Mesa rd		55.66	2.22	66	681	34	34	2.6	13.1	8.9	10.0	6.8	20.0	0.10	6	
HA 34	Olivine andesite		55.70	3.23	48	662	31	29	--	--	--	9.4	6.4	21.4	0.07	6	
LR88-629	Andesite lava		55.84	2.27	60	616	33	34	--	--	--	10.3	7.0	18.7	0.10	6	
HU 49	Andesite lava		56.33	2.37	82	582	33	49	3.7	13.2	9.0	14.8	10.1	17.6	0.14	8.9	6
HA 14	Hbl andesite, W Fk San Juan River		56.63	2.93	38	737	26	28	2.3	12.2	8.3	10.8	7.3	28.3	0.05	11.3	6
HU 42	Andesite lava		56.73	2.14	66	707	41	38.9	3.5	11.1	7.5	9.5	6.4	17.2	0.09	11.7	6
HA 30	Olivine andesite		56.74	2.02	113	504	47	48	--	--	--	10.2	6.9	10.7	0.22	6	
HU 26	Ribbon Mesa road		57.14	1.83	71	717	42	39.8	3.5	11.4	7.7	9.5	6.4	17.1	0.10	12.0	6
HA 9	Hbl andesite, W Fk San Juan River		57.18	3.03	45	698	27	29	--	--	--	10.7	7.3	25.9	0.06	6	
DY89-20	Northwest of Table Mountain		57.27	2.41	39	764	35	36	3.1	11.6	7.9	10.3	7.0	21.8	0.05	11.3	6
HU 25	Ribbon Mesa road		57.31	1.70	79	704	44	39.4	3.4	11.6	7.9	9.0	6.1	16.0	0.11	12.9	6
HA 39	Olivine andesite		57.35	1.82	81	578	37	39	2.5	15.6	10.6	10.5	7.2	15.6	0.14	6	
LR88-590	Ribbon Mesa, along road		57.42	2.38	69	656	33	45	--	--	--	13.6	9.3	19.9	0.11	6	
HA 33	Olivine andesite		57.44	2.30	112	495	47	50.5	3.9	12.9	8.8	10.7	7.3	10.5	0.23	12.1	6
HA 13	Hbl andesite, W Fk San Juan River		57.48	2.66	37	705	27	27	--	--	--	10.0	6.8	26.1	0.05	6	
HU 18	S of Demijohn Peak		57.57	1.74	86	645	40	41.9	3.3	12.7	8.6	10.5	7.1	16.1	0.13	12.1	6
HU 7	NE of Corral Park		58.22	1.64	101	590	31	47.9	3.6	13.3	9.0	15.5	10.5	19.0	0.17	8.6	6
HA-29	Olivine andesite, Ribbon Mesa rd		58.23	1.87	96	582	34	48	2.7	17.8	12.1	14.1	9.6	17.1	0.16	12.6	6
HU 3	NE of Corral Park		58.38	1.74	93	593	20	40.3	2.9	13.9	9.4	20.2	13.7	29.7	0.16	6.9	6
HU 17	N of Beaver Cr. Reservoir		58.39	1.78	76	661	37	41.1	2.8	14.7	10.0	11.1	7.5	17.9	0.11	6	
HA-28	Olivine andesite, Ribbon Mesa rd		58.42	1.75	92	602	34	38	2.6	14.6	9.9	11.2	7.6	17.7	0.15	6	
HA 6	Hbl andesite, W Fk San Juan River		58.75	2.31	42	765	25	41	2.28	18.0	12.2	16.4	11.1	30.6	0.05	11.0	6
DY89-26	Sawtooth Mountain area		58.83	2.33	39	662	27	36	--	--	--	13.3	9.1	24.5	0.06	6	
LR88-589	Ribbon Mesa road		58.84	1.72	94	552	36	46	--	--	--	12.8	8.7	15.3	0.17	6	
HU 15	NE of Corral Park		58.85	1.99	100	567	34	44.7	3.4	13.1	8.9	13.1	8.9	16.7	0.18	10.0	6
LR88-631	Andesite lava		58.90	1.80	97	497	46	50	--	--	--	10.9	7.4	10.8	0.20	6	
LR88-601	Table Mountain area		59.11	2.56	40	790	32	34	--	--	--	10.6	7.2	24.7	0.05	6	
LR88-600	Table Mountain area		59.13	2.01	43	789	25	35	--	--	--	14.0	9.5	31.6	0.05	6	
HA 12	hbl andesite, W Fk San Juan River		59.18	2.18	53	744	29	34	--	--	--	11.7	8.0	25.7	0.07	6	
LR88-599	Table Mountain area		59.20	2.06	41	761	33	42	--	--	--	12.7	8.6	23.1	0.05	6	
LR88-603	Table Mountain area		59.31	2.14	40	757	35	42	--	--	--	12.0	8.2	21.6	0.05	6	
LR88-602	Table Mountain area		59.44	2.47	47	765	26	35	--	--	--	13.5	9.1	29.4	0.06	6	
HA 7	Hbl andesite, W Fk San Juan River		59.44	2.25	48	644	27	31	--	--	--	11.5	7.8	23.9	0.07	6	
HA 31	Olivine andesite		59.81	1.20	107	463	36	40	2.7	14.8	10.1	11.1	7.5	12.9	0.23	6	
DY89-24B	Sawtooth Mountain area		60.09	1.56	42	726	29	40	--	--	--	13.8	9.4	25.0	0.06	6	
HA 16	Hbl andesite, Rainbow Creek		60.30	2.68	47	785	19	21	--	--	--	11.1	7.5	41.3	0.06	6	
DY89-22	Northwest of Table Mountain		60.38	1.20	46	779	31	36	--	--	--	11.6	7.9	25.1	0.06	6	
LR88-604	Table Mountain area		60.43	1.70	43	753	31	43	--	--	--	13.9	9.4	24.3	0.06	6	
LR88-594b	Table Mountain area		60.63	2.04	41	718	27	41	--	--	--	15.2	10.3	26.6	0.06	6	
DY89-24	Sawtooth Mountain area		60.74	1.70	52	656	30	38	--	--	--	12.7	8.6	21.9	0.08	6	
HA 10	Hbl andesite, W Fk San Juan River		60.93	2.16	43	785	21	28.3	2.22	12.7	8.7	13.5	9.2	37.4	0.05	9.5	6
HA 11	Hbl andesite, W Fk San Juan River		61.10	2.24	41	770	23	17	--	--	--	7.4	5.0	33.5	0.05	6	
HA 22	Hbl andesite, Beaver Creek		61.11	2.22	50	729	27	23.6	2.1	11.2	7.6	8.7	5.9	27.0	0.07	12.9	6
HA 19	Hbl andesite, Beaver Creek		61.32	1.98	50	673	28	42	--	--	--	15.0	10.2	24.0	0.07	6	
HA 18	Hbl andesite, Beaver Creek		61.80	1.64	44	725	32	32.3	3.1	10.4	7.1	10.1	6.9	22.7	0.06	10.3	6
HA 17	Hbl andesite, Rainbow Creek		63.27	1.64	48	721	20	20.6	1.43	14.4	9.8	10.3	7.0	36.1	0.07	6	
AVG.:			58.5							13.4	9.1	11.9	8.1	22.3			
S.D.:			1.9							1.9	1.3	2.3	1.6	6.9			
<b>Hornblende dikes, low Yb</b>																	
EMA 13	Dike, hbl andesite, Eagle Mtn area		61.45	1.66	36	708	13	23.8	0.85	28.0	19.0	18.3	12.4	54.5	0.05	15.3	6
HA 4	Dike, hbl andesite, Fourmile Lake		61.48	1.75	54	770	15	20	--	--	--	13.3	9.1	51.3	0.07	6	
DA 4	Dike, hbl andesite, Eagle Mtn area		61.55	1.99	46	851	14	22.9	0.9	25.4	17.3	16.4	11.1	60.8	0.05	15.6	6
EMA 4	Dike, hbl andesite, Eagle Mtn area		61.67	1.83	55	888	19	23.8	0.8	29.8	20.2	12.5	8.5	46.7	0.06	23.8	6
DA 10	Dike, hbl andesite, Eagle Mtn area		62.35	1.73	65	796	16	22.9	0.9	25.4	17.3	14.3	9.7	49.8	0.08	17.8	6
EMA 9	Dike, hbl andesite, Eagle Mtn area		62.94	1.55	53	909	17	25.2	0.9	28.0	19.0	14.8	10.1	53.5	0.06	18.9	6
HA 1	Dike, hbl andesite, Fourmile Lake		63.20	1.43	41	781	11	21.6	0.7	30.9	21.0	19.6	13.3	71.0	0.05	15.7	6
HA 2	Dike, hbl andesite, Fourmile Lake		63.35	1.53	41	762	11	26	--	--	--	23.6	16.1	69.3	0.05	6	
AVG.:			62.2							27.9	19.0	16.6	11.3	57.1			
S.D.:			0.8							2.2	1.5	3.7	2.5	9.0			
<b>Fish Canyon Tuff</b>																	
LR89-016	Gateview area, Hwy 149		66.31	0.76	101	525	24	51	2.25	23.6	16.0	21.3	14.4	21.9	0.19	6	
LR89-016pur	Gateview area		68.33	0.83	118	407	24	53	2.25	23.6	16.0	22.1	15.0	17.0	0.29	10.7	6
BFC 18	N of Columbine Creek		65.57	1.24	106	519	24	41	--	--	--	17.1	11.6	21.6	0.20	6	
BFC 19	Deckers Creek section		66.21	1.35	106	505	23	42	--	--	--	18.3	12.4	22.0	0.21	6	
BFC 21	Deckers Creek section		66.30	1.21	105	509	23	43	--	--	--	18.7	12.7	22.1	0.21	6	
BFC 23	Deckers Creek section		66.08	1.03	105	513	23	40	--	--	--	17.4	11.8	22.3	0.20	6	
BFC 24	Deckers Creek section		66.54	1.18	110	493	25	42	--	--	--	16.8	11.4	19.7	0.22	6	
BFC 28	Deckers Creek section		65.70	1.45	106	531	24	40	--	--	--	16.7	11.3	22.1	0.20	6	
BFC 49	Alberta Peak		68.00	0.93	115	453	24	45	2.59	17.4	11.8	18.8	12.7	18.9	0.25	9.3	6
BFC 50	N ridge, Heart Mtn		66.85	1.20	88	502	21	40	--	--	--	19.0	12.9	23.9	0.18	6	
BFC 84	E of Turkey Creek Lake		65.97	1.46	133	499	24	42	--	--	--	17.6	12.0	21.0	0.27	6	
BFC 113	Aqua Ramon Mtn		67.70	1.02	116	461	21	42	--	--	--	20.3	13.8	22.3	0.25	6	
BFC 124	Vitrophyre		67.47	0.92	110	487	22	41	2.21	18.6	12.6	18.6	12.7	22.1	0.23	10.	

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>a</sup>	SiO <sub>2</sub> , % <sup>b</sup>	MgO, % <sup>b</sup>	Rb, ppm <sup>b</sup>	Sr, ppm <sup>b</sup>	Y, ppm <sup>b</sup>	La, ppm <sup>b</sup>	Yb, ppm <sup>b</sup>	La/Yb	La/Yb(n)	La/0.1Y La/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source	
			Avg.: 66.654							19.52	13.3 #	19.2	13.0	21.9			
			S.D.: 1.0							2.8	1.9	1.8	1.2	2.2			
Precaldera Conejos Formation, Central SJ		~35-30															
LR87-707-6	Andesite lava, Hogback Mtn		55.79	3.25	36	660	21	38	--	--	--	18.1	12.3	31.4	0.05	6	
LR88-556	Andesite lava		57.03	3.49	120	553	36	60	--	--	--	16.7	11.3	15.4	0.22	6	
LR88-560	Andesite lava		58.33	3.24	116	538	37	64	--	--	--	17.3	11.8	14.5	0.22	6	
LR88-557	Andesite lava		58.36	3.27	110	545	36	62	3.48	17.8	12.1	17.2	11.7	15.1	0.20	10.3	
LR87-716-3c	Andesite lava		58.80	2.70	45	750	26	44	--	--	--	16.9	11.5	28.8	0.06	6	
LR88-672	Hbl andesite lava		58.81	2.45	45	588	27	39	--	--	--	14.4	9.8	21.8	0.08	6	
LR88-561	Andesite lava		58.90	2.38	140	531	37	58	--	--	--	15.7	10.6	14.4	0.26	6	
LR88-673	Andesite lava		59.74	1.77	38	670	27	34	--	--	--	12.6	8.6	24.8	0.06	6	
LR88-660	Andesite lava		60.00	2.23	104	756	26	56	--	--	--	21.5	14.6	29.1	0.14	6	
LR88-658	Andesite lava		60.09	2.19	90	746	26	54	3.48	15.5	10.5	20.8	14.1	28.7	0.12	7.5	
15L-31	Cobble, conglomerate: Hwy 160		60.43	2.58	67	973	18	37	--	--	--	20.8	14.2	55.2	0.07	10	
94L-8	Hornblende-rich lava, Shallow Creek		63.07	1.64	82	580	33	39	--	--	--	11.8	8.0	17.6	0.14	6	
LR87-716-3	Dacite lava		63.27	1.47	104	611	26	46	--	--	--	17.7	12.0	23.5	0.17	6	
LR88-664	Dacite lava		64.22	1.44	131	579	31	55	--	--	--	17.7	12.1	18.7	0.23	6	
LR88-661	Dacite lava		64.29	1.13	64	536	31	43	--	--	--	13.9	9.4	17.3	0.12	6	
			Avg.: 60.1							16.7	11.3	16.9	11.5	23.8			
			S.D.: 2.6							1.6	1.1	2.9	2.0	10.5			
Precaldera Conejos Formation, Eastern SJ																	
Biedell-Lime complex		35-33															
18L-13	Dense black andesite		55.27	3.80	49	844	29	36.6	2.54	14.4	9.8	12.7	8.7	29.4	0.06	11.3	
18L-15	Hbl? (or cpx) andesite dike		56.33	3.56	50	923	28	43.1	2.58	16.7	11.3	15.2	10.3	32.5	0.05	11.0	
18L-16	Lowest pyroxene andesite		56.98	3.75	48	885	25	40.1	2.54	15.8	10.7	16.0	10.9	35.4	0.05	9.8	
18L-19	Typical hbl andesite lava		60.64	2.41	61	790	20	40.5	1.79	22.6	15.4	20.3	13.8	39.7	0.08	11.1	
18L-17	Highest hbl andesite lava		60.98	1.06	66	874	27	44.0	2.83	15.5	10.6	16.1	10.9	31.9	0.08	9.7	
94716CC	??		60.99	2.89	62	878	21	43.5	2.02	21.5	14.6	20.7	14.1	41.8	0.07	10.4	
18L-11A	Hbl-andesite dike		61.14	1.81	55	1129	26	53.7	2.38	22.6	15.3	20.5	13.9	43.1	0.05	11.0	
18L-6	Dacite of Sanderson Gulch		62.31	1.78	68	640	26	44.4	2.3	19.3	13.1	17.1	11.6	24.6	0.11	11.3	
18L-18	Fine-grain dacite intrusion		62.35	1.71	71	738	25	40.5	1.79	22.6	15.4	16.5	11.2	30.1	0.10	17	
18L-1	Dacite dike		62.45	2.38	72	693	24	45.6	2.44	18.7	12.7	18.9	12.8	28.7	0.10	9.9	
18L-7	Ridge-capping bio dacite		62.47	2.03	72	665	26	40.1	2.32	17.3	11.7	15.2	10.4	25.3	0.11	11.3	
18L-9	Large fat dike, hbl andesite		63.43	2.17	68	906	22	47.7	1.74	27.4	18.6	22.1	15.0	42.0	0.07	12.4	
17L-16	Biotite dacite mix lava		63.81	1.31	74	684	25	49.7	2.46	20.2	13.7	20.0	13.6	27.5	0.11	10.1	
18L-14	Dacite intrusion		63.89	1.82	71	699	23	41.0	2.42	16.9	11.5	17.8	12.1	30.3	0.10	9.5	
94705CC	??		63.92	2.26	68	915	22	50	1.97	25.4	17.3	22.8	15.5	41.6	0.07	11.2	
94724CC	??		65.96	1.90	78	655	25	49	2.45	20.0	13.6	19.6	13.3	26.2	0.12	10.2	
			Avg.: 61.4							19.8	13.5	18.2	12.4	33.1			
			S.D.: 3.0							3.7	2.5	2.8	1.9	6.5			
Summer Coon volcano		33.5-32.5															
65L-225	Andesite dike		55.80	4.20	37	930	--	32	1.8	17.8	12.1	--	--	--	0.04	16	
85911	??		56.07	5.04	38	764	28	30.8	2.20	14.0	9.5	11.0	7.5	27.3	0.05	12.7	
DS-35	Andesite lava		57.40	4.80	65	930	--	30	1.5	20.0	13.6	--	--	--	0.07	16	
EL-SC-04	Andesite dike		59.88	3.82	64.8	669	15.8	36.0	1.5	24.0	16.3	22.8	15.5	42.3	0.10	10.5	
87705	??		60.31	3.35	58	794	28	36.4	2.40	15.2	10.3	13.0	8.8	28.4	0.07	11.7	
SRM-31	Central intrusion		61.38	2.03	57	880	21.5	50.0	1.83	27.3	18.6	23.3	40.9	40.9	0.06	17	
65L-279	Mafic dacite, lava		61.70	3.40	81	810	--	30	1.3	23.1	15.7	--	--	--	0.10	16	
65L-192A	Dacite dike		64.50	2.90	55	730	--	25	1.1	22.7	15.4	--	--	--	0.08	16	
65L-297	Dacite dike		64.90	1.90	68	--	--	25	1.1	22.7	15.4	--	--	--	--	16	
87703	??		62.21	3.09	54	815	20	36.1	1.32	27.3	18.6	18.1	12.3	40.8	0.07	15.2	
83408	??		65.72	2.87	64	649	19	32.1	1.12	28.7	19.5	16.9	11.5	34.2	0.10	17.0	
			Avg.: 60.9							4.4	3.0	6.4	4.4	8.0			
			S.D.: 3.3														
Baughman Creek volcano		~33															
18L-26	Granitoid intrusion		56.40	3.26	60	759	25	37.1	2.32	--	--	14.8	10.0	30.3	0.08	17	
18L-25	Dacite intrusion		64.17	1.69	52	500	17	29.3	1.34	--	--	16.8	11.4	28.7	0.10	17	
			Avg.: 60.3							--	--	15.8	10.7	29.5			
			S.D.: 5.5							--	--	1.4	1.0	1.1			
LATIR-QUESTA LOCUS, N NM (Calc-alkaline rocks only)																	
Postcaldera intrusions		26-23															
80L-6A	Mafic granodiorite, Rio Hondo		62.1	3.00	94	781	17	57.3	1.8	31.5	21.4	33.7	22.9	5.5	0.12	9.3	7
81L-53	Granodiorite, Columbine Creek		63.4	2.30	--	13	44.1	1.3	35.0	23.8	--	--	--	--	--	10.3	7
82QC-44	Red River, monzonite		65.7	2.30	--	11	48.4	2.7	17.7	12.0	--	--	--	--	4.0	7	
79L-65	Dacite, Comanche Point		66.0	2.40	75	1390	12	37.2	1.2	31.3	21.2	31.0	21.1	6.3	0.05	10.1	7
78L-181	Dacite, Lemos Creek		66.2	1.90	81	1400	9	35.0	1.4	25.5	17.4	38.9	26.4	9.0	0.06	6.6	7
78L-190	Dacite, Lemos Creek		66.2	1.60	59	1280	15	34.9	1.6	22.2	15.1	23.3	15.8	3.9	0.05	9.6	7
Precaldera lavas		27-23															
79L-63	Augite-bearing lava, Comanche Cr		63.4	1.80	75	1030	20	41.7	2.0	21.3	14.5	20.9	14.2	51.5	0.07	10.2	7
79L-45	Slabby andesite, Costilla Creek		66.0	0.51	113	444	36	45.0	2.1	21.4	14.6	12.5	8.5	12.3	0.25	7	
79L-62	Hornblende-rich lava, Comanche Cr		66.2	2.20	81	762	13	39.1	1.7	22.6	15.4	30.1	20.4	58.6	0.11	7.5	7
			Avg.: 65.0							25.4	17.3	27.2	18.5	21.0			
			S.D.: 1.6							5.8	4.0	8.9	6.0	23.5			
SPANISH PEAKS INTRUSIVE COMPLEX		26-24															
150	Syenodiorite		56.0	--	--	--	--	56	2.50	22.4	15.2	--	--	--	--	--	5
108	Syenodiorite		57.7	--	--	--	--	53	1.80	29.4	20.0	--	--	--	--	--	5
132	Syenodiorite		59.0	--	--	--	--	49	1.30	37.7	25.6	--	--	--	--	--	5
113	Syenodiorite		60.5	--	--	--	--	57	2.1	27.1	18.4	--	--	--	--	--	5
86	Syenite		61.8	--	--	--	--	60	2.70	22.2	15.1	--	--	--	--	--	5
112	Syenodiorite		64.0	--	--	--	--	53	1.80	29.4	20.0	--	--	--	--	--	5
87	Syenite		65.6	--	--	--	--	42	1.40	30.0	20.4	--	--	--	--	--	5
			Avg.: 60.7							28.3	19.2					10.7	
			S.D.: 3.4							5.3	3.6					2.2	</

DATA REPOSITORY TABLE 1: SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD, CHEMICAL DATA FOR PALEO-CRUSTAL-THICKNESS ESTIMATES

Sample No.	Rock type	Age, Ma <sup>#</sup>	SiO <sub>2</sub> ,%* <sup>*</sup> MgO, %Rb, ppmSr, ppm Y, ppm La, ppm Yb, ppm	La/Yb	La/Yb(n)	La/0.1YLa/0.1Y(n)	Sr/Y	Rb/Sr	Y/Yb	Data source
8	Lipman, P.W., and McIntosh, W.C., 2008, Eruptive and non-eruptive calderas, northeastern San Juan Mountains, Colorado: where did the ignimbrites come from?: Geological Society of America Bulletin, v. 120, p. 771-795.									
9	Lipman, P.W., Zimmerer, M., and McIntosh, W.C., 2015, An ignimbrite caldera from the bottom up: Erosionally exhumed floor and fill of the resurgent Bonanza caldera, Southern Rocky Mountain volcanic field, Colorado: Geosphere, v. 11, p. 1902-1947									
10	Lipman, P.W., and Zimmerer, M., 2019, Magmatic-tectonic links: ignimbrite calderas, regional dike swarms, and the transition from arc to rift in the Southern Rocky Mountains: Geosphere, v. 15, p. 1893-1926									
11	Parker, D.F., et al., 2005, Origin of rhyolite by crustal melting and the nature of parental magmas in the Oligocene Conejos Formation, San Juan Mountains, Colorado, USA: Journal of Volcanology and Geothermal Research, v. 139., p. 185– 210									
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**Notes:**

- # Ages calibrated to Fish Canyon Tuff at 28.02 Ma  
 \* Analytical data in red: inconsistent, or otherwise deemed less reliable

DATA REPOSITORY TABLE 2. SOUTHERN ROCKY MOUNTAIN VOLCANIC FIELD: SUMMARY OF CRUSTAL-THICKNESS ESTIMATES																	
Thickness estimates calibrated to data from young volcanic arcs (Profeta et al., 2015, Fig. 1)																	
Volcano	Age, Ma <sup>#</sup>	SiO <sub>2</sub> , %		La/Yb, ppm			La/0.1Y			Sr/Y, ppm			Crustal-thickness est., km*				
		Average	Range	N	Average	S.D.	La/Yb(n)	N	Average	S.D.	La/0.1Y(n)	N	Average	S.D.	La/Yb(n)	La/"Y"(n)	Sr/Y
<b>SAWATCH RANGE AND CENTRAL SRMVF</b>																	
Mount Aetna caldera																	
Postcaldera intrusion	~34	63.4	61.8-64.6	3	29.7	4.0	20.1	1	30.5	--	20.7	1	32.4	--	63.5	64	44
Caldera ignimbrite (Badger Cr Tuff)	34	64.2	64.2-66.4	9	29.0	2.2	19.7	4	28.8	3.1	19.5	4	33.0	2.5	63	63	45
Mount Princeton batholith	36	63.8	61.7-66.0	7	28.4	4.4	19.3	2	24.7	4.8	16.8	2	18.7	1.7	63	60.5	30
Calico Mountain Andesite	~37	59.8	59.3-60.4	4	25.5	1.8	17.3	--	--	--	--	--	--	--	61	--	--
Guffy volcano	~36-37	59.8	55.4-62.6	4	27.9	2.7	18.9	4	32.8	6.5	22.3	15	52.0	11.2	62.5	>65	67
Buffalo Peaks volcano	~38	60.9	58.1-63.5	--	--	--	--	--	--	--	7	26.3	2.1	--	--	37	1
Colorado Mineral Belt (Mid Cenozoic)	36-29	63.9	61.3-66.1	11	26.9	5.1	18.3	--	--	--	--	--	--	--	62	--	--
Colorado Mineral Belt (Laramide)	70-45	62.3	56.1-66.9	5	22.8	5.1	15.5	--	--	--	--	--	--	--	58.5	--	--
<b>NORTHEAST SAN JUAN REGION</b>																	
North Pass caldera cycle																	
Dacite of Pass Creek (postcaldera)	32	64.1	61.4-65.6	--	--	--	--	4	28.3	4.5	19.2	4	28.0	5.9	--	62.5	39
Precaldera Conejos Fm, NE central	~35-32.2	60.4	56.9-63.2	--	--	--	--	13	22.9	4.3	15.6	13	40.7	4.4	--	59	55
Bonanza caldera cycle																	
Postcaldera intrusions	33.0-32.9	58.6	55.1-63.7	--	--	--	--	11	24.4	4.1	16.6	11	26.4	8.3	--	60	37
Bonanza caldera-fill lava	33.1-33.0	60.3	56.0-65.6	--	--	--	--	17	23.5	4.0	16.0	17	28.9	4.5	--	59	40
Bonanza Tuff, dacite scoria	33.12	62.9	59.7-64.5	--	--	--	--	11	29.3	2.7	19.9	--	23.3	5.5	--	63.5	33
Sargent's Mesa volcano	33.2	--	--	--	--	--	--	5	22.1	3.6	15.0	5	31.2	3.1	--	58	43
Rawley volcano(es)	33.8-33.2	61.4	56.6-64.4	--	--	--	--	25	25.6	3.8	17.4	25	34.8	8.9	--	61	47
Eastern Conejos volcanoes																	
Jacks Creek volcano	34-33	58.9	55.2-62.6	--	--	--	--	8	27.8	4.2	18.9	8	47.7	4.5	--	62.5	62
Tracy volcano	~33.5-32.5	60.9	56.8-63.3	--	--	--	--	12	23.7	2.4	16.1	12	38.6	10	--	59.5	51
<b>SOUTHEAST SAN JUAN REGION: Platoro caldera complex</b>																	
Platoro granitoids (Gilmer)	29-27	61.0	58.5-64.6	16	15.6	3.4	10.6	16	15.1	2.8	10.3	16	28.2	4.8	51	50.5	39
Platoro granitoid intrusions	29-27	60.9	56.6-64.1	11	16.4	2.8	11.1	6	16.3	2.0	11.1	6	26.8	5.2	52	52	37
Caldera lavas and dikes	30-28.8	58.0	55.1-62.5	13	13.1	3.1	8.9	8	12.0	2.9	8.2	8	27.2	12	47	45.5	38
Precaldera lavas and intrusions	~35-31	60.2	55.9-63.6	19	13.5	2.1	9.2	16	12.9	1.8	8.8	16	26.9	6.5	48	47	37
<b>WESTERN SAN JUAN REGION</b>																	
San Juan-Silverton calderas	28.5-27.5	65.4	63.3-66.4	3	23.5	3.8	16.0	3	21.3	1.3	14.5	3	28.0	11.8	59.5	57	39
Lake City Caldera	23	64.4	63.0-65.6	9	20.5	3.2	13.9	7	23.2	3.2	13.9	7	16.6	2.4	56	59	28
<b>CENTRAL SAN JUAN REGION</b>																	
Creede caldera								0									
Postcollapse lavas	26.85	62.3	56.4-64.8	1	13.6	--	9.2	13	18.2	2.6	12.4	13	29.8	3.5	48	52	41
Caldera ignimbrite (Snowshoe Mtn T)	26.88	62.8	59.9-66.3	5	17.4	1.9	11.8	8	17.3	2.5	11.7	8	26.9	7.4	53	53	37
San Luis caldera complex																	
Nelson caldera, postcollapse lavas	26.9	60.5	57.0-65.6	8	17.3	3.1	11.7	24	15.5	2.1	10.5	24	21.8	2.8	53	51	31
Caldera ignimbrite (Nelson Mtn T)	26.90	64.3	62.2-66.3	4	19.7	3.5	13.4	10	18.6	2.7	12.7	10	25.2	4.7	56	55	35
Cebolla Creek caldera	26.9	63.4	59.5-66.6	4	17.4	0.9	11.8	7	16.2	1.6	11.0	7	23.0	3.0	53	52	33
Rat Cr caldera, ignimbrite	26.91	63.6	60.5-65.8	2	16.0	2.7	10.9	3	16.8	3.2	11.0	3	23.2	1.9	52	52	33
Precursor lavas	~27	61.8	59.5-63.7	4	19.6	4.6	13.3	12	20.2	6.2	13.7	12	26.3	8.2	56	56	37
South River caldera	~27.5																
Postcollapse lavas	~27.3	61.4	58.7-64.6	5	18.1	1.1	12.3	47	18.1	2.8	12.3	55	31.4	7.5	54	54	45
Ignimbrite (Wason Park Tuff)	27.35	69.3	69.7-69.9	2	21.1	0.7	14.3	2	20.6	1.0	14.0	2	13.9	2.7	57	57	25
Blue Creek caldera (concealed)																	
Postcollapse lavas	~27.4	63.2	60.3-65.6	2	21.0	4.5	14.3	5	18.8	2.8	12.7	5	23.7	3.7	57	55	34
Ignimbrite (Blue Creek Tuff)	~27.4	64.8	63.3-66.0	3	17.5	2.5	11.9	13	16.7	2.4	11.4	13	20.9	2.6	53	53	30
La Garita caldera				4													
Huerto Andesite, main	~28	58.5	55.3-63.3	23	13.4	1.9	9.1	49	11.9	2.3	8.1	49	22.3	6.9	48	45	32
Huerto Andesite, hbl dikes	~28	62.4	61.4-63.4	6	28.3	2.3	19.2	9	17.0	3.6	11.5	9	58.6	9.8	64	53	>65
Ignimbrite (Fish Canyon Tuff)	28	66.6	65.6-68.3	5	19.5	2.8	13.3	21	19.2	1.8	13.0	21	21.9	2.2	56	55	32
Precaldera Conejos Fm, central SJ	~35-30	60.1	55.8-64.3	2	16.7	1.6	11.3	15	16.9	2.9	11.5	15	23.8	11	53	53	34
Precaldera Conejos volcanoes E SJ																	
Biedell-Lime complex	~35-33	61.4	55.8-66.0	--	--	--	--	16	18.2	2.8	12.4	16	33.1	6.5	--	54	45
Summer Coon volcano	~33.5-32.5	60.9	55.8-65.7	11	20.8	4.4	14.1	6	17.5	5.0	11.9	8	35.6	6.7	58	53	48
Baughman Creek volcano	~33.5-32.5	60.3	53.7-64.2	--	--	--	--	2	15.8	1.4	10.7	2	29.5	1.1	--	51	41
<b>LATIR-QUESTA LOCUS, N NM</b>																	
Precaldera lavas, postcaldera intrusions	27-23	65.0	63.4-66.2	9	25.4	5.8	17.3	7	27.2	8.9	18.5	7	21.0	25.3	61	62	30
<b>SPANISH PEAKS INTRUSIVE COMPLEX</b>																	
				ALL:	AVERAGE:	20.8	3.1		20.7	3.3	14.0		28.9		56.1	55.6	39.2
					TOTAL:	221			442				459				
References (full citations in Supplement file 1)																	
1	Campbell, 1994																
2	Colucci et al., 1991																
3	Kennedy et al., 2015																
4	Lake and Farmer, 2015																
5	Lipman, 1987																
6	Lipman, 2004 (and references therein)																



DATA REPOSITORY TABLE 3. CHEMICAL ANALYSES, BEIDELL-LIME &amp; BAUGHMAN CREEK VOLCANIC CENTERS

Sample Number	Rock type	Location	Latitude		Longitude		[XRF analyses, weight percent, normalized to original totals without LOI]											[XRF & ICP-MS analyses, ppm]																					
			Deg	Min	Deg	Min	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeT <sub>2</sub> O <sub>3</sub>	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	LOI TOTAL	Zn	Rb	Sr	Y	Zr	Nb	Pb	Th	Ba	La	Ce	Nd	Cu	V	U	Cr	Cs	Ga	Mo	Ni	Sc	
18L-11B	Cumulus clot, andesite dike	Lower Carnero Cr	37	52.28	106	21.42	49.20	1.83	13.11	10.75	0.16	8.13	9.85	2.77	2.00	0.62	1.70	98.42	##	28	###	30	121	12	8	0	1326	38	81	52	39	288	0	337	0	19	1	148	35
18L-13	Dense black andesite	E of Hill 10,389'	37	54.27	106	18.78	55.27	1.18	17.13	8.25	0.14	3.80	6.80	3.57	2.53	0.45	1.40	99.10	94	49	844	29	181	15	9	4	1109	36	80	37	41	189	3	20	0	20	2	15	18
18L-15	Hbl? (or cpx) andesite dike	S of Biedell Creek	37	54.09	106	1812	56.33	1.12	16.98	7.52	0.14	3.56	6.49	4.02	2.70	0.47	0.69	99.31	92	50	923	28	200	17	11	5	1301	42	87	40	48	165	2	43	2	20	3	26	17
18L-16	Lowest pyroxene andesite	Lower Biedell Creek	37	53.55	106	16.18	56.98	1.10	15.26	7.74	0.15	3.75	6.92	3.73	2.82	0.38	1.33	98.83	##	48	885	25	170	13	9	4	2289	41	75	38	62	183	3	145	1	19	3	66	22
18L-19	Typical hbl andesite lav	Biedell Cr, at Texas Star Drive	37	54.70	106	17.36	60.64	0.84	16.45	6.13	0.08	2.41	4.11	3.95	3.63	0.36	2.37	98.60	76	61	790	20	183	14	18	4	1494	40	76	35	27	118	2	27	0	20	1	20	13
18L-17	Highest hbl andesite lava	Lower Biedell Creek	37	53.59	106	16.22	60.98	0.65	17.93	5.32	0.26	1.06	4.84	4.38	3.40	0.49	1.03	99.30	92	66	874	27	222	16	13	6	1640	41	89	41	7	72	3	9	0	22	4	6	6
18L-11A	Hbl-andesite dike	Lower Carnero Cr	37	52.28	106	21.42	61.14	0.95	16.48	6.06	0.08	1.81	4.91	4.16	3.49	0.50	1.49	99.56	92	55	###	26	231	14	16	6	1777	52	101	48	35	139	1	21	0	21	1	19	13
18L-6	Dacite of Sanderson Gulch	E side of high point	37	56.93	106	17.09	62.31	0.66	17.22	5.14	0.12	1.78	4.19	4.15	3.43	0.38	1.91	99.39	80	68	640	26	229	15	16	6	1382	44	92	41	16	76	3	7	0	20	1	7	9
18L-18	Fine-grain dacite intrusion	Sanderson Creek	37	57.11	106	17.89	62.35	0.65	17.49	4.91	0.12	1.71	4.20	4.02	3.56	0.39	1.56	99.38	76	71	738	25	226	15	18	6	1488	45	96	42	17	69	2	9	1	20	1	4	8
18L-1	Dacite dike	Old mill site, Biedell Creek	37	55.10	106	17.40	62.45	0.73	16.26	5.25	0.10	2.38	4.39	3.76	3.56	0.33	1.00	99.23	81	72	693	24	208	17	18	6	1314	42	92	40	26	95	3	30	0	18	1	16	11
18L-7	Ridge-capping bio dacite	S of Lime Creek	37	54.91	106	10.55	62.47	0.74	15.94	5.44	0.10	2.03	4.71	3.90	3.44	0.30	0.65	99.07	74	72	665	26	200	16	16	5	1257	42	83	35	30	105	4	60	0	18	2	21	12
18L-9	Large fat dike, hbl andesite	S of Biedell Creek	37	54.19	106	18.15	63.43	0.70	15.73	5.18	0.08	2.17	3.69	4.25	3.59	0.29	0.83	99.13	87	68	906	22	224	14	18	9	1590	47	97	40	35	96	5	56	3	20	3	29	10
17L-16	Biotite dacite mix lava	S of mouth Cottonwood Gulch	37	55.96	106	13.34	63.81	0.57	16.95	4.35	0.12	1.31	4.07	3.94	3.73	0.34	1.28	99.19	80	74	684	25	224	15	18	7	1475	46	96	44	10	59	2	4	0	18	2	3	7
18L-14	Dacite intrusion	Within silicified focus	37	54.74	106	18.02	63.89	0.64	16.65	4.73	0.11	1.82	3.51	3.93	3.65	0.33	1.16	99.27	85	71	699	23	198	16	16	7	1394	37	80	36	16	76	2	20	0	18	2	11	9
06L-13	Vitrophic (red) dacite lava	S of Tracy Canyon	38	0.65	106	16.41	64.15	0.63	15.45	5.13	0.09	2.70	4.35	3.55	3.41	0.32	2.25	99.77	48	62	784	14	163	9	25	<4	1650	39	68	35	7	60	<4	62	12	<2	18		
06L-73	Inclusion-rich dacite lava	Lower San Juan Cr	37	57.96	106	11.99	65.01	0.57	15.98	4.43	1.62	0.08	3.77	4.11	3.72	0.32	0.47	99.60	52	51	837	14	156	9	19	<2	1820	37	73	51	15	67	<4	11	15	<2	5		
17L-17	Hbl-plag lava	S of mouth Cottonwood Gulch	37	56.38	106	13.73	65.77	0.51	16.24	3.63	0.07	1.26	2.90	4.17	3.88	0.23	1.38	98.64	64	69	785	14	185	14	19	4	1691	39	87	34	19	63	3	19	3	20	1	12	7
17L-21	Aplitic granite dike	Little Cottonwood Gulch	37	58.25	106	17.02	65.96	0.55	15.37	4.17	0.08	1.92	3.39	3.93	3.72	0.25	1.07	99.33	70	70	811	17	165	10	25	7	1726	40	73	30	28	82	5	52	1	18	1	28	8
06L-22	Red dacite lava	Redrock Canyon	37	59.18	106	12.90	67.35	0.50	16.10	3.75	0.98	0.04	2.93	4.23	3.51	0.28	1.85	99.66	70	53	868	11	148	9	22	<4	1800	32	60	34	35	18	<4	12	14	<2	3		
17L-22	Sandine dacite lava	Red Rock Canyon	37	59.38	106	14.51	67.60	0.45	15.45	3.28	0.06	1.29	2.84	4.03	4.01	0.18	0.60	99.19	58	73	711	16	179	12	22	7	1522	35	69	28	23	61	2	22	1	19	1	11	7
17L-15	Crystal-rich san siicic dome	W margin SL Valley	37	54.82	106	13.27	68.54	0.35	16.29	2.54	0.09	0.68	2.10	4.29	3.95	0.24	1.53	99.06	66	73	487	20	212	16	23	7	1453	38	79	33	5	22	4	3	0	19	1	2	4
18L-3	Mine dacite	Crystal Hill	37	56.38	106	18.46	68.57	0.41	16.36	3.20	0.09	0.67	2.72	3.72	3.90	0.23	3.34	99.86	69	85	378	21	212	14	18	7	1370	38	82	34	4	29	3	10	10	17	1	5	4
17L-18	Biotite-rich dacite	8540 ft hill	37	57.07	106	15.44	70.23	0.31	15.32	2.15	0.07	0.54	2.01	4.17	4.27	0.15	0.44	99.23	55	82	466	18	197	14	20	6	1425	43	87	32	5	19	3	7	0	18	0	3	3
18L-5	Crystal rich phase of rhyolite	Sanderson-Cottonwood divide	37	56.62	106	16.54	70.71	0.32	15.50	1.83	0.02	0.65	2.03	3.84	4.19	0.14	1.61	99.24	42	82	401	20	205	15	21	8	1342	37	81	32	1	18	2	6	2	17	1	4	4
06L-71	Rhyolite breccia (Tracy volc?)	Lower San Juan Cr	37	57.58	106	13.06	71.59	0.27	15.53	1.16	0.33	0.04	1.86	4.23	4.21	0.20	0.82	99.43	16	81	581	18	284	18	21	<2	1950	90	142	84	<2	8	<4	<5	13	<2	3		
06L-16	Crystal-rich rhyolite lava	Lime Creek	37	56.13	106	20.04	73.31	0.19	14.80	1.27	0.42	0.04	1.22	3.83	4.53	0.14	1.37	99.75	30	75	459	11	132	14	23	<4	1670	62	99	64	<2	7	<4	<5	11	<2	2		
18L-26	Granitoid intrusion	Cyclone Mountain	37	48.53	106	30.76	56.40	1.13	17.37	7.42	0.13	3.26	6.15	3.81	3.01	0.39	1.06	99.07	94	60	759	25	224	15	9	3	1181	38	77	34	46	183	1	22	0	21	3	20	15
18L-25	Dacite intrusion	Upper Baughman Cr	37	48.41	106	32.53	64.17	0.66	16.29	4.93	0.09	1.69	4.32	3.82	3.09	0.27	2.15	99.34	83	52	500	17	159	10	9	2	1008	26	60	30	19	75	2	15	2	19	0	9	7
18L-21	Xl-poor ("rhyolite") dike	Rd to Groundhog Park	37	48.86	106	33.47	68.29	0.30	16.45	2.30	0.04	0.48	1.81	4.58	4.75	0.13	0.61	99.13	74	97	444	26	354	19	16	5	1655	50	96	38	2	7	4	9	0	18	1	3	2
18L-20	Crystal-rich rhyolite	Hill S of lower Seitz Creek	37	46.29	106	30.48	71.98	0.26	14.93	1.62	0.09	0.58	1.52	3.85	4.23	0.15	1.25	99.23	58	86	251	26	213	17	16	6	1270	39	82	33	2	10	3	10	0	16	0	3	3