

Table 3 (CD-ROM). Compilation of ⁴⁰Ar/³⁹Ar age determinations for Tertiary volcanic rocks, northeastern San Juan region, southwestern Colorado

[Samples analyzed 2004-2006, at New Mexico Geochronology Research Laboratory, Socorro, NM. Italic, weighted mean of multiple samples from different field sites. Listed uncertainty is standard error of the weighted mean. Blue, analyses by A. Calvert, at U.S. Geological Survey, Menlo Park, Calif.. Ages calibrated relative to Fish Canyon @28.02 Ma Renne and others, 1998].

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data					Comments	
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s		Age(Ma) ± 2sd*
HINSDALE FORMATION														
00L-1	Basalt flow	Houghland Hill	38°07.43'	106°17.68'	54993-01	NM-179H	groundmass	Plateau	7	97.1	14.3	0.8 ± 0.8	21.81 ± 0.21	Fairly flat spectrum; overlies Carpenter Ridge Tuff
CREEDE CALDERA CYCLE														
Fisher Dacite														
06L-42	Dacite lava flow	N Fisher Mtn, W side	37°39.47'	106°56.20'	56777	NM-203B	sanidine	SCLF	7		1.1	4.3 ± 5.5	26.75 ± 0.05	Post-resurgence flow (brackets Creede Fm)?
06L-43	Dacite lava flow	N Fisher Mtn, W side	37°39.60'	106°56.28'	56778	NM-203B	sanidine	SCLF	8		0.6	3.0 ± 4.8	26.78 ± 0.05	Post-resurgence flow (brackets Creede Fm)?
05L-36	Dacite lava flow (pre-resurgent)	McCall Creek	37°45.10'	107°00.33'	55966	NM-192F	sanidine	SCLF	14		3.3	49.2 ± 44.3	26.81 ± 0.08	Pre-resurgence flow
05L-37	Dacite lava flow (pre-resurgent)	McCall Creek	37°45.10'	107°00.33'	55959	NM-192E	sanidine	SCLF	12		1.8	54.0 ± 57.0	26.82 ± 0.06	Pre-resurgence; same flow as 05L-36
Snowshoe Mountain Tuff														
04L-36	Outflow tuff, partly welded upper	Cattle Mtn 10,540'	37°34.48'	106°40.25'	55422	NM-186F	sanidine	SCLF	12		1.0	50.6 ± 26.9	26.88 ± 0.04	Best outflow section
04L-36	Outflow tuff, partly welded upper	Cattle Mtn 10,540'	37°34.48'	106°40.25'	55479-01	NM-186G	biotite	Plateau	8	57.4	2.6	7.1 ± 11.9	27.48 ± 0.83	Low radiogenic yields, older than san
04L-37	Outflow tuff, partly welded lower	Cattle Mtn 10,220'	37°34.37'	106°40'.32'	55423	NM-186F	sanidine	SCLF	12		1.5	59.9 ± 22.1	26.88 ± 0.04	Best outflow section
04L-37	Outflow tuff, partly welded lower	Cattle Mtn 10,220'	37°34.37'	106°40'.32'	55480-01	NM-186G	biotite	Plateau	6	55.1	3.4	8.5 ± 8.8	28.40 ± 0.87	Low radiogenic yields, older than san
04L-34	Intracaldera tuff, uppermost	Point of Rocks	37°47.28'	106°58.82'	55420	NM-186F	sanidine	SCLF	7		4.2	42.1 ± 56.8	26.90 ± 0.21	Few good san crystals, not well grouped
04L-34	Intracaldera tuff (repeat)	Point of Rocks	37°47.28'	106°58.82'	56002	NM-192L	Sanidine	SCLF	10		0.6	41.9 ± 44.9	26.92 ± 0.10	Partly welded
04L-34	Intracaldera tuff (repeat)	Point of Rocks	37°47.28'	106°58.82'	55477-01	NM-186G	biotite	Plateau	9	98.0	1.3	10.8 ± 17.9	27.56 ± 0.09	
04L-35	Intracaldera tuff, deep	Deep Creek	37°47.76'	106°55.23'	55421	NM-186F	sanidine	SCLF	14		0.9	58.5 ± 46.3	26.86 ± 0.04	Densely welded
	Snowshoe Mtn Tuff, wt. mean								4		0.6		26.87 ± 0.02	
SAN LUIS-COHCETOPA CALDERA COMPLEX														
Baldy Cinco Dacite														
05L-25	Dacite lava flow, uppermost	Baldy Cinco, summit	37°57.33'	107°06.14'	55968	NM-192F	sanidine	SCLF	5		0.1	31.9 ± 27.5	25.88 ± 0.08	Uppermost flow, strat. sequence
05L-26	Dacite lava flow	Baldy Cinco, W slope	37°57.22'	107°06.33'	55953	NM-192E	sanidine	SCLF	14		4.7	60.2 ± 18.7	26.08 ± 0.07	
05L-27	Dacite lava flow	Baldy Cinco, W slope	37°57.22'	107°06.33'	55956	NM-192E	sanidine	SCLF	14		5.2	62.8 ± 13.6	26.14 ± 0.07	
05L-28	Dacite lava flow, lowest	Baldy Cinco, W slope	37°57.36'	107°07.33'	55950	NM-192E	sanidine	SCLF	14		2.0	45.0 ± 27.7	26.16 ± 0.06	Lowermost flow
Cochetopa Dome Rhyolite														
00L-31A	Aphyric lava flow	West side, flow #3	38°13.55'	106°43.92'	55004-01	NM-179AA	glass	Plateau	3	71.0	12.9	16.8 ± 8.2	26.91 ± 0.20	Ar loss spectrum; obsidian apache tears
01L-25	Crystal-rich flow	West side, local flow	38°12.92'	106°42.88'	54964	NM-179E	sanidine	SCLF	14		3.0	69.5 ± 33.6	26.81 ± 0.04	
COCH2	Crystal-poor lava flow	South side, flow #2	38°12.38'	106°41.76'	54058	NM-166	sanidine	SCLF	14		1.3	45.8 ± 12.8	26.97 ± 0.16	Sample provided by Allen Stork
01L-27	Crystal-poor lava flow	West side, flow #2	38°12.60'	106°43.00'	54983	NM-179G	sanidine	SCLF	14		4.4	50.1 ± 10.5	26.88 ± 0.05	Small crystals; prob. same flow as Stork sample
02L-51	Crystal-poor lava flow	East side, flow #1	38°12.83'	106°40'33"	54945	NM-179C	sanidine	SCLF	9		4.2	38.8 ± 30.7	26.99 ± 0.14	
03L-35	Moat tuff, nonwelded ash flow	Quarter Circle road	38°10.70'	106°42.10'	54943	NM-179C	sanidine	SCLF	10		0.8	53.6 ± 7.6	26.83 ± 0.05	Same unit as Stork Ar-Ar sample?
03L-36	Moat tuff, large pumice blocks	East side	38°37.22'	106°39.60'	54956	NM-179D	sanidine	SCLF	12		1.4	42.9 ± 15.5	26.90 ± 0.04	Large pumice lapilli
COCH1	Moat tuff	SE side	38°12.03'	106°40.66'	54057	NM-166	sanidine	SCLF	4		1.5	44.6 ± 7.4	26.85 ± 0.21	Sample provided by Allen Stork
	Cochetopa Dome, wt. mean								8		2.3		26.86 ± 0.03	
High-silica rhyolite intrusions														
01L-16	Crystal-poor dike	Sage Park	38°16.95'	106°40.32'	54939	NM-179C	sanidine	SCLF	10		2.2	94.1 ± 14.0	27.07 ± 0.06	
03L-48A	Crystal-poor plug, flow laminated	Prosser Rock	38°20.83'	106°40.73'	54984	NM-179G	sanidine	SCLF	11		2.1	84.6 ± 11.7	27.14 ± 0.05	Flow laminated, without basalt inclusions
03L-48B	Crystal-poor plug, basaltic inclusions	Prosser Rock	38°20.83'	106°40.73'	54947	NM-179C	sanidine	SCLF	14		1.9	67.6 ± 44.4	27.08 ± 0.05	Choked with basalt blebs

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data					Comments	
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s		Age(Ma) ± 2sd*
Hi-Si rhyolite intrusions, wt. mean								3	2.2			27.10 ± 0.04	<i>Older than Coch Dome lavas: real difference?</i>	
Nelson Mountain Tuff														
04L-31	Intracaldera	Spring Creek, 10,000'	38°01.60'	106°59.20'	55418	NM-186F	sanidine	SCLF	11		1.1	47.6 ± 25.5	26.93 ± 0.05	Lowest exposed; transitional dacite-rhyolite
04L-31	Intracaldera	Spring Creek, 10,000'	38°01.60'	106°59.20'	55474-01	NM-186G	biotite	Plateau	7	91.1	0.9	13.4 ± 13.6	25.82 ± 0.73	Fairly flat spectrum, younger than sanidine
04L-30	Intracaldera	Cebolla trail, 11,400'	38°00.82'	106°59.22'	55417	NM-186F	sanidine	SCLF	6		0.2	66.0 ± 75.2	26.88 ± 0.08	Crystal-rich dacite
04L-38	Intracaldera	W Willow Cr, 11,230'	37°55.93'	106°57.60'	55481-01	NM-186G	biotite	Plateau	3	53.9	3.7	7.5 ± 18.5	27.01 ± 0.16	Crystal-rich dacite
04L-39	Dacite, densely welded	S Nelson Mtn, 11,900'	37°54.80'	106°56.00'	55424	NM-186F	sanidine	SCLF	10		1.0	42.9 ± 26.3	26.82 ± 0.05	Type area, proximal outflow tuff
04L-32	Dacite, upper partly welded	N Clear Cr Falls	37°51.06'	107°08.84'	55419	NM-186F	sanidine	SCLF	4		0.7	59.5 ± 30.2	26.97 ± 0.09	Only a few small san crystals (n=4)
04L-32	Dacite, upper partly welded	N Clear Cr Falls	37°51.06'	107°08.84'	55475-01	NM-186G	biotite	Plateau	4	55.4	1.9	18.2 ± 14.8	28.49 ± 0.21	
05L-34	Rhyolite, nonwelded	S Clear Cr Falls	37°49.03'	107°08.05'	55964	NM-192F	Sanidine	SCLF	12		4.4	46.9 ± 36.4	26.88 ± 0.08	Nonwelded, crystal-poor
00L-6	Rhyolite, nonwelded	Mexican Joe Gulch	38°08.61'	106°41.65'	54965	NM-179E	sanidine	SCLF	6	55.4	3.6	54.1 ± 15.5	26.93 ± 0.08	Nonwelded dacite, distal, abundant xenocrysts
03L-34A	Rhyolite, welded	West-side quarry	38°18.13'	106°44.30'	54938	NM-179C	sanidine	SCLF	14		3.1	33.0 ± 21.3	26.95 ± 0.06	Rhyolite, same as 00L-29A; under dome flows
03L-34B	Dacite, densely welded	West-side quarry	38°18.13'	106°44.30'	54955	NM-179D	sanidine	SCLF	15		3.6	49.8 ± 8.6	26.93 ± 0.04	Dacite, same as 00L-29B; under dome flows
03L-34B	Dacite, densely welded	West-side quarry	38°18.13'	106°44.30'	54961-02	NM-179E	biotite	Plateau	9	98.6	0.9	7.1 ± 10.7	27.16 ± 0.08	Fairly flat spectrum, older than sanidine
06L-47	Rhyolite, nonwelded	Wheeler Monument	37°52.46'	106°46.88'	56781	NM-203B	sanidine	LF	6		1.2	15.5 ± 35.1	26.87 ± 0.05	Below caprock of welded dacite
06L-47	Rhyolite, nonwelded	Wheeler Monument	37°52.46'	106°46.88'	57170	NM-208J	sanidine	SCLF	22		1.3	41.1 ± 8.3	26.89 ± 0.04	Below caprock of welded dacite
Nelson Mountain Tuff, wt. mean								10	2.7			26.90 ± 0.03		
Cebolla Creek Tuff														
04L-33	Nonwelded distal tuff	S Clear Cr Falls rd	37°49.24'	107°08.64'	55476-01	NM-186G	biotite	Plateau	4	54.6	2.6	14.1 ± 7.0	26.35 ± 0.67	Nonwelded, bronzy biotite
NM-3045	Densely welded mafic dacite	Los Pinos Pass	38°05.90'	106°59.36'	55874-01	NM-191G	hornblende	Plateau	8	98.7	1.1	0.1 ± 0.2	27.07 ± 0.19	Densely welded
NM-3045	Densely welded mafic dacite	Los Pinos Pass	38°05.90'	106°59.36'	55875-01	NM-191G	biotite	Plateau	7	86.8	2.9	27.1 ± 46.7	27.07 ± 0.15	Densely welded
NM-3044	Vitrophyric mafic dacite	Los Pinos Pass	38°05.90'	106°59.05'	55878-01	NM-191G	hornblende	Plateau	9	98.5	0.9	0.1 ± 0.3	27.06 ± 0.17	
NM-3044	Vitrophyric mafic dacite	Los Pinos Pass	38°05.90'	106°59.05'	55879-01	NM-191G	biotite	Plateau	9	98.0	1.6	9.3 ± 7.2	27.13 ± 0.10	
Cebolla Creek Tuff, wt. mean								4	0.1			27.10 ± 0.07	<i>Bio and Hbl ages slightly too old?</i>	
Rat Creek Tuff														
04L-40	Dacite, welded	S Nelson Mtn, 11,700'	37°54.61'	106°55.90'	55425	NM-186F	sanidine	SCLF	15		1.4	46.4 ± 16.5	26.95 ± 0.05	Dacite, directly below 04L-39
03L-33	Dacite, nonwelded	Lower Los Pinos Cr	38°11'58"	106°50'36"	54963	NM-179E	sanidine	SCLF	6		1.7	62.1 ± 24.2	26.88 ± 0.06	Partly welded tuff at McDonough Reservoir
NM-3046	Dacite, welded	Los Pinos Pass	38°05.89'	106°59.34'	55878-01	NM-191G	hornblende	Plateau	9	99.4	0.8	0.1 ± 0.2	26.84 ± 0.17	Dacite, below NM 3045
NM-3046	Dacite, welded	Los Pinos Pass	38°05.89'	106°59.34'	55877-01	NM-191G	biotite	Plateau	8	94.0	1.5	14.6 ± 26.3	27.08 ± 0.09	Dacite, below NM 3045
05L-38	Dacite, welded	Rat Creek	37°54.67'	106°59.97'	55961	NM-192F	sanidine	SCLF	36		1.9	15.6 ± 43.7	26.83 ± 0.08	Densely welded dacite, type area
06L-44	Rhyolite nonwelded	Pt Bennett section	37°51.46'	107°05.38'	56779	NM-203B	sanidine	LF	10		1.4	35.7 ± 26.5	26.96 ± 0.04	Crystal-poor rhyolite
06L-45	Rhyolite nonwelded	Wheeler Monument	37°52.27'	106°47.16'	56780	NM-203B	sanidine	LF	6		0.5	17.1 ± 36.9	26.88 ± 0.06	Crystal-poor rhyolite
06L-45	Rhyolite nonwelded	Wheeler Monument	37°52.27'	106°47.16'	57169	NM-208J	sanidine	SCLF	23		1.0	44.6 ± 15.3	26.91 ± 0.03	Crystal-poor rhyolite
06L-48	Rhyolite nonwelded	Wheeler Monument	37°52.20'	106°47.06'	56782	NM-203B	sanidine	LF	7		0.9	19.9 ± 34.2	26.89 ± 0.04	Crystal-poor rhyolite
06L-48	Rhyolite nonwelded	Wheeler Monument	37°52.20'	106°47.06'	57171	NM-208J	sanidine	SCLF	25		0.9	43.0 ± 7.7	26.91 ± 0.04	Crystal-poor rhyolite
Rat Creek Tuff, wt. mean								8	2.4			26.91 ± 0.02		
05L-39	Dacite of McKenzie Mountain	Rat Cr road	37°53.74'	106°58.37'	55998-01	NM-192K	biotite	Plateau	12	100.0	1.8	11.6 ± 15.1	27.08 ± 0.08	Below Rat Cr Tuff; premonitory lava
OLDER UNITS, ASSOCIATED WITH CENTRAL SAN JUAN CALDERAS														
Wason Park Tuff														
00L-17	Distal crystal-poor tuff	Still Creek	38°09.10'	106°53.15'	55001	NM-179I	sanidine	SCLF	12		1.7	25.7 ± 1.2	27.44 ± 0.05	Welded top of distal section, above Tcr
00L-18	Distal crystal-poor tuff	Still Creek	38°09.07'	106°52.78'	54997	NM-179I	sanidine	SCLF	11		0.9	25.7 ± 1.9	27.41 ± 0.04	Basal welded part of distal section
02L-2	Distal crystal-poor tuff	Hat Creek	38°05.85'	106°29.39'	54966	NM-179E	sanidine	SCLF	13		1.6	26.6 ± 8.4	27.57 ± 0.21	Poor precision, small crystals

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data						Comments
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s	Age(Ma) ± 2sd*	
02L-50	Distal crystal-poor tuff	Sheep Creek	38°09.85'	106°27.50'	54994	NM-179I	sanidine	SCLF	13	3.5	25.4 ± 1.6	27.35 ± 0.05	Most easterly known exposure; above Tcr	
NM-3043	Distal crystal-poor tuff	Sheep Creek	38°09.87'	106°27.44'	55880	NM-191G	sanidine	SCLF	20	0.8	32.9 ± 29.2	27.35 ± 0.05	Resample, 02L-50	
05L-35	Densely welded crystal-rich tuff Wason Park Tuff, wt. mean	S Clear Cr Falls	37°49.03'	107°08.05'	55965	NM-192F	sanidine	SCLF	13	1.2	22.2 ± 11.6	27.30 ± 0.05	Densely welded, typical of Creede area	
									5	5.2		27.38 ± 0.05		
Andesite of Lion Mountain Creek														
06L-32-B	Xenocrystic basaltic flow, upper	Head, W Park Cr	38°00.99'	106°26.74'	56985-01	NM-205K	groundmass	Plateau	5	80.7	1.5	2.0 ± 2.3	27.46 ± 0.11	Overlies Carpenter Ridge Tuff
06L-32-A	Xenocrystic basaltic flow, base	Head, W Park Cr	38°00.99'	106°26.74'	56953-01	NM-205D	groundmass	Plateau	6	88.0	1.6	2.1 ± 1.9	27.51 ± 0.16	Overlies Carpenter Ridge Tuff
06L-31	Xenocrystic basaltic flow	Head, Mtn Lion Cr	38°01.82'	106°26.74'	56952-01	NM-205D	groundmass	Plateau	6	71.8	0.6	1.2 ± 1.4	27.50 ± 0.11	Clearly overlies CR Tuff
03L-10	Andesite flow	Round Park	38°01.57'	106°31.70'	54989-01	NM-179H	groundmass	Plateau	5	88.4	4.1	2.2 ± 0.3	27.81 ± 0.16	Alternatively, possible Huerto Andesite?
Carpenter Ridge Tuff														
03L-32	Clast, in landslide breccia	Los Pinos Cr	38°11.90'	106°50.75'	54951	NM-179D	sanidine	SCLF	14	3.3	42.3 ± 15.6	27.59 ± 0.05	In landslide breccia, with dominant Fish Canyon Tuff	
03L-40	Clast, in landslide breccia	N of Hwy 114	38°15'37"	106°39.35'	54950	NM-179D	sanidine	SCLF	12	3.3	41.4 ± 10.3	27.48 ± 0.05	In landslide breccia (same as 02L-2)	
02L-20A	Densely welded outflow tuff	Hwy 114	38°10.48'	106°28.63'	54995	NM-179I	sanidine	SCLF	11	1.8	38.2 ± 23.5	27.53 ± 0.04	Hwy 114, above upper gas-cavity zone	
02L-20B	Densely welded outflow tuff Carpenter Ridge Tuff, wt. mean	Hwy 114	38°10.48'	106°28.63'	54996	NM-179I	sanidine	SCLF	15	3.1	44.6 ± 8.6	27.60 ± 0.06	Hwy 114, just above vitrophyre; overlies Tfc	
									4	4.7		27.55 ± 0.05		
05L-30	Crystal Lake Tuff	San Juan Ranch	37°47.38'	107°08.39'	58797	NM-222G	sanidine	SCLF	15	0.8	39.4 ± 24.8	27.61 ± 0.12	Bove and others, 2001: 27.80±0.07	
Huerto Andesite (northern equivalent)														
05L-46	Hbl andesite flow	Caps Spruce Mtn	38°01.02'	106°21.51'	55987-01	NM-192J	hornblende	Plateau	3	54.6	28.6	0.1 ± 0.1	25.68 ± 0.79	Poor plateau
02L-58	Trickle Mountain flow	Trickle Mountain	38°09.12'	106°23.42'	55007-01	NM-179AA	hornblende	Plateau	4	73.6	2.7	0.1 ± 0.1	27.92 ± 0.19	Flat spectrum, high yield
03L-44A	Olivine andesite	Lion Mountain	38°03.67'	106°23.50'	54990-01	NM-179H	groundmass	Plateau	3	59.3	4.2	2.0 ± 0.5	27.96 ± 0.11	Recoil spectrum
03L-44B1	Xenocrystic andesite	Lion Mountain	38°03.75'	106°23.57'	54988-01	NM-179H	groundmass	Plateau	2	56.5	2.3	3.2 ± 1.2	27.64 ± 0.12	Fairly flat spectrum
03L-44B2	Xenocrystic andesite	Lion Mountain	38°03.75'	106°23.57'	54992-01	NM-179H	groundmass	Plateau	3	54.8	28.0	2.6 ± 1.6	28.32 ± 0.31	Somewhat disturbed spectrum
06L-17	Xenocrystic andesite	Mill Creek	38°03.28'	106°20.12'	56988	NM-205L	sanidine	SCLF	14	0.8	48.4 ± 35.2	27.79 ± 0.06	Amazing xenocrystic texture, minerals!	
06L-19-B	Andesite flow	Storm King Mtn	37°57.02'	106°24.90'	56986-01	NM-205K	groundmass	Plateau	6	83.6	3.0	0.8 ± 1.0	28.00 ± 0.24	Previously "Hinsdale", Durango 2° map
06L-19-A	Andesite flow	Storm King Mtn	37°57.02'	106°24.91'	56982-01	NM-205J	groundmass	Plateau	5	71.8	2.2	1.4 ± 0.4	28.14 ± 0.13	Previously "Hinsdale", Durango 2° map
Fish Canyon Tuff												28.02	Monitor age (and others., 1998)	
WESTERN SAN JUAN IGIMBRITES														
Sapinero Mesa Tuff														
03L-45	Partly welded distal tuff	Houselog Creek	38°05.93'	106°21.95'	54944	NM-179C	sanidine	SCLF	13	2.6	33.6 ± 2.6	28.20 ± 0.06	Bove and others, 2001: 28.38±0.03 (FCT @28.02 Ma)	
NM-3048	Densely welded, devitrified	Gateview	38°17.52'	107°11.81'	55882	NM-191G	sanidine	SCLF	14	1.1	45.8 ± 117.4	28.31 ± 0.07	Distal Sapinero Mesa Tuff?	
06L-63	Rhyolite vitrophyre	Poison Park section	37°32.76'	107°14.35'	56786	NM-203B	sanidine	LF	4	1.3	21.0 ± 33.8	28.25 ± 0.11	Typical proximal densely welded tuff	
06L-63	Rhyolite vitrophyre Sapinero Mesa Tuff, wt. mean	Poison Park section	37°32.76'	107°14.35'	57172	NM-208J	sanidine	SCLF	16	1.7	29.4 ± 13.8	28.30 ± 0.06	Exceptional strat section, SW San Juan Mtns	
									4	2.6		28.27 ± 0.06	Exceptional strat section, SW San Juan Mtns	
Dillon Mesa Tuff														
05L-17	Nonwelded rhyolite	S Alpine Plateau	38°10.71'	107°20.58'	55951	NM-192E	sanidine	SCLF	9	1.3	30.9 ± 13.0	28.42 ± 0.06	Bove and others, 2001: 28.58±0.04 (FCT @28.02 Ma)	
05L-19	Nonwelded rhyolite	Gateview	38°18.27'	107°13.06'	55952	NM-192E	sanidine	SCLF	13	1.5	26.0 ± 2.5	28.34 ± 0.06	Nonwelded crystal-poor rhyolite	
06L-62	Rhyolite vitrophyre	Poison Park section	37°32.74'	107°14.38'	56785	NM-203B	sanidine	LF	3	0.3	3.5 ± 4.5	28.53 ± 0.10	Bit young; perhaps basal Sapinero Mesa Tuff?	
06L-62	Rhyolite vitrophyre Dillon Mesa Tuff, wt. mean	Poison Park section	37°32.74'	107°14.38'	57173	NM-208J	sanidine	SCLF	11	0.5	30.3 ± 10.6	28.48 ± 0.07	Exceptional strat section, SW San Juan Mtns	
									4	4.7		28.42 ± 0.08	Exceptional strat section, SW San Juan Mtns	

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data					Age(Ma) ± 2sd*	Comments
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s		
Blue Mesa Tuff													Bove and others, 2001: 28.58±0.07 (FCT @28.02 Ma)	
05L-18	Densely welded rhyolite	S Alpine Plateau	38°10.98'	107°20.82'	55954	NM-192E	sanidine	SCLF	15	1.8	31.1 ± 6.9	28.48 ± 0.06	Typical of unit	
05L-20	Densely welded rhyolite	Gateview	38°17.97'	107°12.61'	55955	NM-192E	sanidine	SCLF	13	1.6	32.4 ± 3.7	29.02 ± 0.05	Too old?? Actually Ute Ridge Tuff?	
06L-61	Devitrified rhyolite tuff	Poison Park section	37°32.72'	107°14.40'	56784	NM-203B	sanidine	LF	6	0.7	32.5 ± 3.2	28.44 ± 0.06	Exceptional strat section, SW San Juan Mtns	
Blue Mesa Tuff, wt. mean													28.46 ± 0.04	
Ute Ridge Tuff													Bove and others, 2001: 28.81±0.05 (FCT @28.02 Ma)	
05L-16	Densely welded dacite	Big Blue Creek	38°13.18'	107°23.00'	55957	NM-192E	sanidine	SCLF	14	2.2	32.2 ± 6.9	28.56 ± 0.06	Not same unit as 06L-60?	
06L-60	Devitrified dacite tuff	Poison Park section	37°32.66'	107°14.42'	56783	NM-203B	sanidine	LF	6	0.9	33.6 ± 4.5	29.12 ± 0.05	Exceptional strat section, SW San Juan Mtns	
CONEJOS FORMATION, UPPER UNITS														
Rhyolite of Barret Creek														
03L-20B	Crystal-rich rhyolite-dacite	Lions Head	38°22.28'	106°37.78'	55468	NM-186O	sanidine	SCLF	12	0.8	63.5 ± 29.8	29.85 ± 0.04	Crystal-rich flow	
03L-23	Crystal-rich rhyolite-dacite	S of Lions Head	38°19.47'	106°38.17'	55470	NM-186O	sanidine	SCLF	14	1.8	45.0 ± 15.3	29.83 ± 0.05	Crystal-rich flow	
04L-07	Coarsely crystal-rich flow	Barret Creek	38°21.85'	106°35.75'	55467	NM-186O	sanidine	SCLF	12	3.1	62.9 ± 31.1	29.63 ± 0.06	Large crystals	
04L-21	Crystal-poor rhyolite flow	Green Mountain	38°21.15'	106°31.49'	55469	NM-186O	sanidine	SCLF	15	1.2	63.7 ± 22.5	29.79 ± 0.05	Crystal-poor; flow layered	
03L-24B	Crystal-rich rhyolite-dacite	S of Lions Head	38°19.77'	106°37.71'	55466-01	NM-186O	biotite	Plateau	6	88.3	1.6	13.4 ± 15.7	30.08 ± 0.09	
Basalt of Point Benny														
03L-42	Basaltic flow	Point Benny	38°10.07'	106°32.77'	54991-01	NM-179H	groundmass	Plateau	6	94.2	20.4	0.9 ± 0.8	30.16 ± 0.23	Fairly flat spectrum
05L-21	Pt Benny dike, no xenocrysts	Point Benny	38°10.08'	106°32.70'	55970-01	NM-192G	groundmass	Plateau	8	99.8	3.2	0.9 ± 1.0	30.31 ± 0.17	
05L-22	Pt Benny dike, abund. xenocrysts	Point Benny	38°10.08'	106°32.70'	55971-01	NM-192G	groundmass	Plateau	8	99.1	11.4	1.1 ± 1.1	30.54 ± 0.29	
05L-23	Pt Benny, lava lake	Pt Benny E. Side	38°10.27'	106°32.55'	55972-01	NM-192G	groundmass	Plateau	5	79.9	4.5	1.3 ± 1.3	30.20 ± 0.14	
05L-24	Xenocrystic flow	East of Pt Benny	38°09.95'	106°32.21'	55973-01	NM-192G	groundmass	Plateau	5	69.3	0.7	1.3 ± 1.6	30.17 ± 0.11	Above Luders Cr debris flow
Basalt of Point Benny, wt. mean													30.22 ± 0.10	
05L-40	Andesite of Lone Tree Gulch	S of Lone Tree Gul	38°09.38'	106°22.41'	56013-01	NM-192M	groundmass	Plateau	5	81.5	2.2	1.2 ± 1.4	30.21 ± 0.17	Above Tuff of Big Dry Gulch
03L-46	Tuff of Big Dry Gulch	Big Dry Gulch	38°07.08'	106°24.25'	54999-01	NM-179I	biotite	Plateau	4	64.0	0.4	6.5 ± 12.3	30.47 ± 0.08	No san, excess Ar bio spectrum
05L-41	Aphanitic andesite, hill 9519'	E of Sheep Cr	38°09.58'	106°26.96'	56012-10	NM-192M	groundmass	Plateau	5	78.8	3.9	0.3 ± 0.3	29.98 ± 0.31	Below Luders Cr debris flow
05L-42	Hbl andesite flow, hill 9519'	E of Sheep Cr	38°09.70'	106°26.72'	55986-01	NM-192J	Hornblende	Plateau	4	60.2	19.6	0.1 ± 0.0	30.41 ± 0.79	Poor plateau
NORTH PASS CALDERA CYCLE														
Luders Creek Tuff														
02L-26	Densely welded upper dacite	Luders Creek	38°10.15'	106°34.93'	54946	NM-179C	sanidine	SCLF	10	4.4	26.0 ± 6.2	32.15 ± 0.06	Type area	
02L-28	Partly welded lower rhyolite	Luders Cr (roadcut)	38°09.97'	106°35.52'	54982	NM-179G	sanidine	SCLF	14	2.6	27.5 ± 6.4	32.22 ± 0.05	Type area	
02L-10	Partly welded lower rhyolite	N of Hwy 114-W	38°14.40'	106°35.12'	54985	NM-179G	sanidine	SCLF	9	1.7	30.0 ± 4.5	32.14 ± 0.05		
03L-43	Dacite (clast in debris flow)	Mt Lion area	38°03.37'	106°23.32'	54940	NM-179C	sanidine	SCLF	15	3.6	28.3 ± 8.3	32.15 ± 0.05	Sample from far to E	
Luders Creek Tuff, wt. mean													32.17 ± 0.04	
Dacite of East Pass Creek														
03L-26	Columnar jointed dacite flow	Hwy 114, E side	38°11.80'	106°32.28'	54959-01	NM-179E	biotite	Plateau	6	91.8	5.1	10.3 ± 10.2	32.31 ± 0.13	Nearly glassy
03L-39	Dacite lava flow	N of Hwy 114	38°14.38'	106°35.15'	54960-01	NM-179E	biotite	Plateau	8	93.7	4.4	14.9 ± 25.7	32.07 ± 0.17	Above 02L-10
03L-41	Dacite lava flow	E of Cochetopa Pass	38°10.58'	106°34.37'	55003-01	NM-179I	biotite	Plateau	6	87.8	4.2	7.1 ± 10.4	32.22 ± 0.12	Somewhat oxidized
05L-3	Dacite of East Pass Creek(?)	Fourmile Creek	38°04.81'	106°36.24'	55981-01	NM-192J	biotite	Plateau	5	76.0	1.3	14.1 ± 39.3	32.82 ± 0.08	May define S caldera wall (a bit old)

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data						Comments
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s	Age(Ma) ± 2sd*	
05L-3	Dacite of East Pass Creek(?)	Fourmile Creek	38°04.81'	106°36.24'	55982-02	NM-192J	Hornblende	Plateau	8	98.0	2.0	0.2 ± 0.7	32.75 ± 0.18	May define S caldera wall (a bit old)
05L-43	Rhyolite of Taylor Canyon	Benny Cr	38°10.67'	106°33.57'	56018	NM-192N	sanidine	SCLF	15		4.4	31.2 ± 4.3	32.15 ± 0.10	Below dacite flows of Cochetopa Hills
Saguache Creek Tuff														
01L-11	Basal vitrophyre	Salaya Creek	38°12.67'	106°37.90'	54957	NM-179D	sanidine	SCLF	12		1.5	12.8 ± 9.6	32.21 ± 0.07	Small crystals
01L-11	Basal vitrophyre	Salaya Creek	38°12.67'	106°37.90'	02Z0087		sanidine	LF	10			15.9 ± 4.7	32.48 ± 0.17	Analysis by A. Calvert (Fish Canyon @28.02 Ma)
99L-20A	Basal vitrophyre	Hwy 114 roadcut	38°08.70'	106°20.53'	54954	NM-179D	sanidine	SCLF	13		3.5	13.3 ± 10.8	31.95 ± 0.18	Poor precision, small crystals
01L-21	Partly welded vapor-phase tuff	N of Alkali Cr	38°17.74'	106°47.09'	54952	NM-179D	sanidine	SCLF	13		3.9	14.5 ± 5.7	32.26 ± 0.07	Deposited on Wall Mtn; Saguache Cr Tuff?
01L-21	Partly welded vapor-phase tuff	N of Alkali Cr	38°17.74'	106°47.09'	54958-01	NM-179E	glass (perlite)	Integrated	11	100.0		0.3 ± 10.0	21.52 ± 0.12	Major Ar loss
02L-33	Partly welded vapor-phase tuff	Soldier Park Rd	38°22.47'	106°52.83'	54942	NM-179C	sanidine	SCLF	11		1.0	16.2 ± 5.9	32.27 ± 0.05	Deposited on Wall Mtn; Saguache Cr Tuff?
01L-31	Large pumice block, nonwelded	Cooper Mtn	38°22.20'	106°50.23'	54941	NM-179C	sanidine	SCLF	11		1.3	13.4 ± 6.8	32.29 ± 0.05	Lowest nonwelded Saguache Cr Tuff?
03L-38	Nonwelded megabreccia matrix	Hwy 114, W side	38°13.43'	106°35.32'	54949	NM-179D	sanidine	SCLF	10		0.5	32.3 ± 69.2	32.10 ± 0.30	Poor precision, small crystals
	Saguache Creek Tuff, wt. mean								6		3.2		32.25 ± 0.05	
Precursor(?) lava and intrusion														
08L-13	Intrusive dacite	Cochetopa Pass road	38°09.65'	106°37.13'	58803	NM-222G	Sanidine	SCLF	9		0.7	28.1 ± 4.5	32.19 ± 0.13	Altered matrix; truncated by caldera rim
08L-2	Rhyolite dome (00L-7)	Archuleta Creek	38°09.70'	106°37.61'	58802	NM-222G	Sanidine	SCLF	15		1.0	28.6 ± 4.9	32.17 ± 0.06	On SW caldera rim
Precursor(?) tuff of Spanish Creek														
02L-34A	Densely welded devitrified tuff	Spanish Creek	38°14.50'	106°32.55'	54986	NM-179G	sanidine	SCLF	11		2.4	85.2 ± 13.8	32.48 ± 0.05	Distinctive welded vitrophyre tuff
02L-34B	Basal vitrophyre	Spanish Creek	38°14.70'	106°32.63'	54967	NM-179E	sanidine	SCLF	12		3.0	81.6 ± 29.8	32.55 ± 0.05	Devitrified tuff, directly overlies 02L-34A
02L-54A	Tuff of Spanish Creek	North of Samora Creek	38°15.28'	106°36.77'	FCtepd		sanidine	SCLF	19		0.5		32.40 ± 0.05	Analysis by A. Calvert (Fish Canyon @28.02 Ma)
02L-55	Clast, tuff of of Spanish Cr	Hwy 114	38°13.23'	106°36.09'	58796	NM-222G	Sanidine	SCLF	13		0.8	51.6 ± 39.2	32.45 ± 0.05	Clast, caldera-collapse breccia
03L-30	Tuff of Spanish Creek, nonwelded	Squaw Creek	38°06.04'	106°27.53'		NM-179D	sanidine	SCLF	10		6.3	68.9 ± 26.6	32.49 ± 0.07	Pre-Saguache Tuff (too much qtz for Bonanza Tuff)
NM-3042	Tuff of Spanish Creek, nonwelded	Squaw Creek	38°06.10'	106°27.56'	55881	NM-191G	sanidine	SCLF	14		1.2	52.2 ± 25.3	32.49 ± 0.06	2nd sample, same area as 03L-30
	Tuff of Spanish Creek, wt. mean								5		1.5		32.48 ± 0.03	
OLDER NORTHEASTERN TUFFS AND RELATED LAVAS														
NM-3047	Conejos rhyolite	Cebolla Creek	38°07.08'	107°02.17'	55999-01	NM-192K	biotite	Plateau	6	87.1	4.4	43.4 ± 55.9	31.49 ± 0.14	Below Blue Creek Tuff
05L-44	Rhyolite breccia	S of Spanish Cr	38°13.33'	106°31.36'	56019	NM-192N	sanidine	SCLF	15		4.5	69.5 ± 25.8	32.44 ± 0.08	At NE margin, North Pass caldera
01L-29	Crystal-rich dacite flow	Top, Sawtooth Mt	38°16.43'	106°51.90'	54962-01	NM-179E	biotite	Plateau	10	99.4	1.6	11.4 ± 9.0	32.00 ± 0.09	Flat spectrum
05L-45	Coarsely porphyritic dacite flow	Carneros Pass	37°59.73'	106°25.99'	55967	NM-192F	sanidine	SCLF	15		2.6	29.5 ± 19.0	32.71 ± 0.10	Highest flow (below Tfc)
06L-39	Porphyritic dacite, intrusion roof zone	Long Branch	38°18.19'	106°24.30'			biotite	Plateau	8	99.6	1.2	33.6 ± 34.0	33.01 ± 0.10	Intrusive core of Sargents Mesa volcano?
			38°18.19'	106°24.30'			hornblende	Plateau	5	93.4	1.6	0.1 ± 0.0	32.98 ± 0.21	
Bonanza Tuff														
03L-37	Megabreccia block	Hwy 114, W side	38°13.25'	106°36.23'	54987	NM-179G	sanidine	SCLF	15		2.6	27.4 ± 2.9	33.17 ± 0.06	Bonanza age?
06L-2	Densely welded dacite, low elev	Big Bend Creek	38°21.13'	106°22.72'			sanidine	SCLF	14		1.2	28.2 ± 7.0	33.18 ± 0.06	Low-elev valley fill
06L-30	Lower rhyolite, densely welded	Long Branch	38°20.87'	106°24.62'			sanidine	SCLF	15		1.0	26.6 ± 5.5	33.19 ± 0.05	Below dacite
06L-3	Dacite flow, below Bonanza Tuff	Marshall Creek	38 22.42	106 22.85			biotite	Plateau	9	98.8	6.6	34.9 ± 39.9	33.67 ± 0.19	
06L-23	Dacite flow, below Bonanza Tuff	Long Branch	38 22.92	106 24.61			biotite	Plateau	5	90.1	0.9	18.7 ± 17.2	33.60 ± 0.09	

Sample	Unit name, lithology	Location	Latitude	Longitude	Lab No.	Irrad No.	Mineral	Analytical data					Age(Ma) ± 2sd*	Comments
								Method	n	% ³⁹ Ar	MSWD	K/Ca ± 2s		
03L-31	Hornblende-rich dike	Hwy 114, Coch Cr	38°17.25'	106°45.00'	55000-01	NM-179I	hornblende	Plateau	5	96.9	1.4	0.1 ± 0.0	34.61 ± 0.16	Hbl, flat spectrum
Needle Creek Intrusion														
05L-12	Intermediate composition (bi-hb-pl)	Left Hand Needle Cr	38°20.62'	106°31.78'	55983-02	NM-192J	hornblende	Plateau	12	98.7	1.2	0.2 ± 0.7	34.42 ± 0.21	Small phenocrysts of bio, hbl, plag
05L-13	Hornblende-rich intrusion	Needle Rock	38°21.53'	106°33.17'	55984-01	NM-192J	hornblende	Plateau	10	96.0	2.4	0.1 ± 0.3	34.39 ± 0.23	
05L-15	Dike	Barret Cr	38°22.69'	106°35.40'	55985-01	NM-192J	hornblende	Plateau	5	58.9	0.9	0.1 ± 0.1	34.28 ± 0.18	
04L-20	Crystal-rich dacite (sanidine-bearing)	Left Hand Needle Cr	38°20.09'	106°31.71'	55471	NM-186O	sanidine	SCLF	21		1.4	62.8 ± 47.4	34.10 ± 0.05	Oldest dated lava, date looks good
05L-10	Crystal-rich dacite (sanidine-bearing)	Left Hand Needle Cr	38°20.39'	106°31.64'	55960	NM-192F	sanidine	SCLF	13		4.5	53.2 ± 29.1	33.98 ± 0.08	Same flow as 04L-20
Early rhyolite flows														
06L-5	Rhyolite dome	Tracy Canyon	38°02.95'	106°10.55'	58823-01	NM-222I	biotite	Plateau	18	94.2	11.9	42.8 ± 69.0	34.07 ± 0.29	
08L-1	Rhyolite flow (01L-20)	Alkali Cr (Coch narrows)	38°17.74'	106°45.81'	58808	NM-222H	sanidine	SCLF	13		1.7	62.0 ± 65.1	37.13 ± 0.09	Near-basal lava flow
Wall Mountain Tuff														
01L-30	Densely welded devitrified tuff	Bead Park	38°20.12'	106°50.30'	02Z0088		sanidine	LF	10			25.0 ± 3.5	36.95 ± 0.15	Analysis by A. Calvert (Fish Canyon @28.02 Ma)
01L-30	Densely welded devitrified tuff	Bead Park	38°20.12'	106°50.30'	56000	NM-192K	sanidine	SCLF	14		3.8	24.7 ± 4.0	36.85 ± 0.08	

Notes:

%³⁹Ar is percent of ³⁹Ar released that is included on plateau (does not apply to SCLF results)

* **In bold type:** most reliable ages; used in calculating weighted means; uncertainty for individual sample is reported to 2 s.d. (95% confidence level).

Analytical methods:

SCLF, mean of laser-fusion analysis of individual phenocryst fragments, with number of analyzed fragments listed under "n"

LF, mean of laser-fusion analysis of 1-5 phenocryst fragments per run, with number of analyses listed under "n"

Plateau: incremental heating analysis, with number of steps used in age listed under "n" (biotite, hornblende, and groundmass separates determined at NM Lab)

Integrated: laser total-fusion analysis (obsidian and perlite glasses determined at NM Lab)