TABLE 2. LITHOLOGIC DESCRIPTION OF THE TUFFS OF EL CANELO IN THE ARROYO LA CANTERA AREA.

Unit	**Tickness (m)**	**Lithologic description: Tuff of El Canelo**
Tmc7(?)	5.0-10.0	Light-grey to white, unwelded ash flow tuff, 15-20% lithic lapilli, <10% phenocryst, massive. This unit crops out locally beneath the Tuff of Mesa El Tábano. Its association to Tmc is uncertain.
Tmc6	70.0	Dark-purple, densely welded ash-flow tuff, 5-10% lithics, 20-25% phenocrysts: plagioclase > orthopyroxene (hypersthene-bronzite) ≥ clinopyroxene (augite) = opaques. Strong eutaxitic foliation with lithophysae, black basal vitrophyre.
Tmc5	15.0	Orange-yellow, lithic-lapilli, tuff breccia; 30-40% lithics (rhyolite > andesite); < 5% phenocrysts: plagioclase > quartz > opaques. Plagioclase microphenocrysts and phenocrysts with resorption textures.
Tmc4	95.0	Yellow-pink, densely welded to unwelded ash flow tuff; 20% lithics, 5% phenocrysts: plagioclase > pyroxene ≥ opaques.
Tmc3	1.5	Grey-white, bedded ash and lithic-lapilli, unwelded. Possible airfall deposit. Grades upward into an orange-color pumiceous lapillistone probably related to Tmc2.
Tmc2	130.0	Reddish-purple ash flow tuff, densely welded to non-welded upward; 15-20% lithics, 5-10% phenocrysts: plagioclase > clinopyroxene > opaques, and hornblende.
tephra (Tmrl)	1.0-1.5	Light-yellow, lithic and pumice-lapilli (less 2cm thick), clast and partially matrix-supported (ashy matrix), airfall deposit, with planar bedding 1-10 cm thick. Lithics mostly rhyolite and fragments of hydrothermally altered rhyolite (smectite, pyrophyllite and zeolite). Similar beds are found between Tmrl flows and locally underlie Tmc1.
Tmc1	5.0-7.0	Pink to white, unwelded ash-flow tuff, 20% lithics, 25-30% phenocrysts: plagioclase > quartz ≥ alkali feldspar > opaques. Overlies Tmrl and related to airfall deposits. Sample 9 (Table 1) dated at 6.44 ± 0.02 Ma (sanidine).

Note: Location of the stratigraphic column in Fig. 3, site A.

TABLE 3. LITHOLOGIC DESCRIPTION OF THE TUFF OF LOS HEME.

Unit	Thickness (m)	Lithologic description: Tuff of Los Heme
Tph29	1.0	Light-purple, densely welded, largely devitrified ash flow tuff with a basal vitrophyre. Top of section at site B (Fig. 3).
Tph28	13.9	Purple-brown welded tuff with two partial cooling breaks and a brown glassy base. Crystals 10% (plagioclase > pyroxene > opaques); lithics < 5%; glass 85%. Sample 11 (Table 1) dated at 2.65 ± 0.02 Ma (plagioclase).
Tph27	4.2	White bedded tephra, 1.0 m thick, overlied by mixed dark and white pumice lapilli airfall deposit, 1.0 to 2.0 m thick, covered by an orange sand-sized epiclastic deposit, 0.7 m thick and by a light brown nonwelded ash-flow tuff.
Tph26	7.5	Reddish to black, basalt or andesite agglutinated spatter lava flow.
Tph25	0.5	Grey-green ash and pumice lapilli bedded airfall tuff.
Tph24	17.5	Composite unit of ash fall and debris flow (non welded).
Tph23	3.5	Fiamme-lithic rich, red-brown welded tuff.
Tph22	1.2	White-beige ash fall with some yellow pumiceous tephra.
Tph21	7.5	Yellow-orange, clast-supported, pumiceous airfall tephra, less than 10% lithics.
Tph20	6.0	White fine ash fall, with some lithic rich horizons.
Tph19	7.0	Fiamme-lithic-rich welded tuff.
Tph18	1.0	Matrix supported, lithic-rich debris flow(?). Mostly andesitic, and welded tuff fragments.
Tph17	14.0	Compound unit of ash falls, debris flows, welded tuff and epiclastic material. Includes a tan color, lithic rich pumice-lapilli tuff, partially welded. White ash with mafic lithic clasts at the base.
Tph16	9.3	Pink lithic-rich welded tuff with large black fiamme.
Tph15	28.3	Yellow ochre tephra (airfall?) and pumice and lithic lapilli pyroclastic flow. Incipient basal vitrophyre within a pumice lapilli rich bed. Lithics concentrated up to 30% in layers; crystals 15% (plagioclase > opaques ≥ pyroxene).
Tph14	1.5-2.0	Yellow-orange, ash and pumice-lapilli deposit, poorly consolidated. This unit fills topography and is laterally irregular.
Tph13	13.2	Fiamme rich, ash flow tuff, with a black basal vitrophyre. The vitrophyre contains 10-15% phenocrysts and 15-20% lithic. Upward this units increase to 15-20% lithics and abundant fiamme, crystals 10%
Tph12	39.0	Lithic-lapilli rich, ash-flow tuff, welded in the middle part, with spherulites and empty voids due to weathering. Crystals, 15% (plagioclase > opaques = pyroxenes); lithics, 20-30%; pumice, %. Base of outcrops in site B (Fig. 3)

Note: Location of stratigraphic composite column in Fig. 3, site B, and B'.

TABLE 3. (Continued).

Tph11	8.5	Red-purple ash flow tuff, moderately welded, with basal vitrophyre ~10 cm thick orange-yellow. Crystals 20% (plagioclase > opaques > pyroxene). Abundant fiamme and lithophysae. Top of stratigraphic section at site B' (Fig. 3).
Tph10	1.5	Ash and lithic lapilli tuff, unwelded and slightly consolidated.
Tph9	1.5	Grey ash flow tuff, slightly to well consolidated in the middle part, and slightly welded on top. Crystals, <10%; lithics, 15-20%; ashy matrix, 70%.
Tph8	13.9	Ash and pumice and lithic lapilli, poorly consolidated, with fragments of granitic rocks (up to 20 cm in diameter). The limits above and below are not well exposed.
Tph7	15.2	Purple-pink ash unwelded at the base and on top, sligtly welded in the middle part, with abundant fiammes upward. <10%lithics, <10% phenocryst (plagioclase > opaques > pyroxenes).
Tph6	36.2	Lithic-lapilli, moderately welded ash flow tuff, purple-pink, fiamme-rich, vugs (empty) devitrified. 15-20% lithic lapilli; 30-35% fiammes; <10% crystals (plagioclase > oxidized mafics > opaques; 45% ashy matrix.
Tph5	>20.0	Ash flow tuff, grey color, weathers to yellow ocher.
Tph4	3.0	Pumice and ash airfall tephra, poorly consolidated.
Tph3	10.0	Welded ash-flow tuff, fairly crystal rich (15-20%), with 20% fiammes and abundant lithophysae. Black-yellowish basal vitrophyre at the base. The unit overlies an orange color, pumice-lapilli tephra, 1.0 m thick.
Tph2	>20.0	Red-purple ash-flow tuff, densely welded, less welded upward with a basal vitrophyre. Unwelded ash bed beneath the basal vitrophyre. Crystals < 10% (plagioclase > opaques > pyroxene). Lithics 5%.
Tph1	>15.0	Yellow-orange, pumice-lapilli pyroclastic flow. Lithics, 20-25%; pumice, 30-40%; phenocrysts, 20-25%; matrix of pumiceous ash. Phenocryst: plagioclase > biotite > pyroxenes > opaques. Lithics fragments include granitic rocks, rhyolite and andesite (aphanitic). Fills topography and overlies a rhyolite dome with a variable. This unit correlates with the Tuff of Valle Curbina dated at 3.27 ± 0.04 Ma. Base of section at site B' (Fig. 3).

Note: Location of stratigraphic composite column in Fig. 3, site B, and B'.

TABLE 4. SELECTED CHEMICAL ANALYSES FROM BASALT AND ANDESITE ROCKS IN THE NORTHERN PUERTECITOS VOLCANIC PROVINCE.

	Group 1				Group 2		Group 3		
sample ID	VC87-10	VC87-54	VC86-99	P38-1	30IV-4	2V-2	VP-1	VP-2	MT91-67
subunit	Mb1*	Mb3*	Mb4*	Tma	Tba	Tba	Tpa	Tpa	Tpa
rock type	lava flow	lava flow	lava flow	lava flow	dike	lava flow	lava flow	lava flow	lava flow
map ID	15	16	14	13	4	18	8	19	20
lat.	30.4715	30.4534	30.5134	30.2411	30.3577	30.3341	30.2356	30.2328	30.4633
long.	-114.9516	-114.9444	-114.9575	-114.7210	-114.6689	-114.6771	-114.6489	-114.6630	-114.8804
	(2)	(2)	(2)	(1)	(1)	(1)	(2)	(2)	(2)
SiO2	50.89	55.07	55.38	57.00	57.17	62.49	61.63	60.95	58.08
TiO2	1.25	1.16	1.16	0.83	1.16	0.59	0.64	0.58	0.67
Al2O3	13.71	18.68	17.16	16.55	16.86	17.92	16.93	16.40	17.46
FeO*	6.21	4.46	5.27	6.47	6.29	4.30	3.72	3.82	4.30
MnO	0.15	0.12	0.11	0.11	0.11	0.08	0.08	0.08	0.10
MgO	13.63	4.98	6.51	6.13	4.57	2.88	4.80	6.54	5.45
CaO	9.02	8.48	8.93	7.07	9.01	7.23	6.80	6.64	9.43
Na2O	2.26	3.99	3.64	4.10	3.99	3.94	4.36	4.09	3.62
K2O	2.81	2.37	1.47	1.46	0.63	0.45	0.90	0.78	0.74
P2O5	0.07	0.69	0.37	0.28	0.21	0.12	0.14	0.12	0.15
H2O+	..	..	..	1.44	0.95	..	..	..	..
orig. total	99.90	99.51	100.21	99.87	99.22	100.55	100.01	99.96	99.68
Mg#	0.80	0.67	0.69	0.63	0.56	0.54	0.70	0.75	0.69
Rb	62.0	55.3	28.5	26.0	20.6	13.3	12.1	12.2	12.0
Ba	1428	1490	850	1105	408	309	441	419	469
Sr**	1213	1009	818	777	341	536	408	406	765
Nb	9.90	20.6	9.81	6.54	5.88	2.93	3.43	3.39	5.09
Ta	0.43	1.04	0.56	0.34	0.40	0.18	0.23	0.22	0.29
Zr**	362	244	180	139	109	78	110	112	59
Hf	8.60	4.80	3.69	3.37	2.77	1.49	2.71	2.72	1.54
Y	23.3	27.2	21.6	16.3	20.9	11.7	13.8	14.3	9.90
Th	2.58	5.99	3.06	1.36	1.72	0.68	1.03	0.97	0.97
U	1.00	1.55	0.86	0.43	0.55	0.31	0.38	0.38	0.33
V**	178	146	151	..	..	100	..	..	..
Cr**	736	90	270	..	..	31	..	..	..
Ni**	398	50	145	157	29	27	119	120	61
Pb	11.7	14.1	8.59	9.53	4.34	3.91	4.11	3.68	4.74
Cs	0.85	0.63	0.71	0.70	0.80	0.50	0.19	0.16	0.43
Ga**	17	20	19	..	..	16	..	..	..
Zn**	82	79	81	..	..	52	..	..	..
La	53.8	59.9	29.1	21.2	11.0	6.68	10.7	10.4	9.78
Ce	116	112	57.1	43.1	22.4	11.9	21.8	21.3	18.8
Pr	15.0	13.3	7.11	5.44	2.89	1.68	2.75	2.74	2.40
Nd	63.8	53.4	30.0	22.6	13.3	7.67	11.8	11.6	9.98
Sm	12.3	10.8	6.41	4.93	3.58	2.05	2.94	2.92	2.42
Eu	3.09	2.95	1.85	1.44	1.19	0.72	0.95	0.93	0.84
Gd	8.63	8.64	5.76	4.60	3.82	2.13	2.97	2.86	2.35
Tb	1.01	1.07	0.79	0.59	0.66	0.34	0.46	0.46	0.37
Dy	5.22	5.59	4.37	3.38	4.12	2.11	2.74	2.72	2.06
Ho	0.9	1.01	0.83	0.63	0.84	0.43	0.55	0.55	0.40
Er	2.31	2.75	2.25	1.78	2.31	1.23	1.54	1.48	1.13
Tm	0.30	0.37	0.30	0.23	0.32	0.16	0.21	0.21	0.15
Yb	1.80	2.21	1.88	1.46	1.99	1.02	1.32	1.31	0.94
Lu	0.27	0.35	0.28	0.23	0.30	0.15	0.20	0.20	0.14
K/Rb	360	341	414	340	248	282	595	508	491

Notes: * Samples 14, 15 and 16 (ID numbers) are described in Stock (1989; 1993)

FeO: * as total iron

Major oxides by XRF analyzed at (1) San Diego State University, (2) at University of Massachussetts, Amherst.

** Trace elements analyzed by XRF at UMass. All others trace elements analyzed by ICP-MS at Washington State University, Pullman, WA. Confidence levels for ICP-MS at 10 %.

TABLE 5. SELECTED CHEMICAL ANALYSES (XRF) OF SYNRIFT DACITE TO RHYOLITE LAVAS AND PYROCLASTIC ROCKS.

			Group 2	(Tba-Tmr)			
sample ID	VC86-208	VC86-223	MT90-58	MT89-:	MT90-21	MT90-62	VC89-73
subunit	Ma2**	Ma2**	Mr6*	Mwt*	f4*/Tmru	t9*/Tmc7?	f3*
rock type	lava	lava	lava	ut	dome	ut	vitric lava
lat.	30.4480	30.4728	30.4619	*****	30.4986	30.4586	30.5181
long.	-115.0799	-115.0548	-114.7615	*****	-114.8186	-114.7606	-114.8833
SiO2	64.64	68.87	70.51	72.86	75.78	75.34	76.41
TiO2	0.56	0.53	0.50	0.20	0.17	0.25	0.10
Al2O3	18.62	17.06	15.23	14.68	12.77	13.97	13.24
FeO	2.93	2.51	2.16	1.32	1.72	0.65	0.93
MnO	0.06	0.10	0.05	0.07	0.05	0.00	0.03
MgO	1.61	1.31	1.54	0.95	0.16	0.59	0.14
CaO	6.44	3.01	3.22	2.17	0.91	1.07	0.88
Na2O	4.45	4.66	3.96	4.44	4.48	3.70	4.00
K2O	0.59	1.74	2.73	3.23	3.94	4.40	4.25
P2O5	0.10	0.21	0.10	0.08	0.02	0.03	0.02
orig. total	98.47	99.07	98.88	99.21	98.60	99.90	99.60
Mg #	0.49	0.48	0.56	0.56	0.14	0.62	0.21
Rb	7	31	100	80	115	127	114
Ba	407	745	786	705	1184	899	1075
Sr	550	416	263	254	72	92	86
Nb	1.9	11.2	7.6	13.3	19.5	16.2	7.6
Zr	66	250	197	98	416	323	121
Y	8	20	21	24	47	36	20
Th	1	3	9	4	10	11	10
U	1	1	3	2	3	4	2
V	88	5	42	16	5	13	1
Cr	1	..	6	2	..	8	..
Ni	12	5	16	3	6	8	3
Pb	5	10	11	16	28	8	15
Ga	17	17	17	19	19	17	16
Zn	53	72	52	74	80	24	46
La	5	24	23	13	30	33	27
Ce	14	55	48	20	81	73	59
K/Rb	698	465	226	334	284	287	309

TABLE 5. (Continued).

	Group 3 (Tpr)					
sample ID	VP93-9	EH93-21-1	MT90-71	MT91-23	EH93-21-1C	MT90-72
subunit	Tph2	Tph29	Tpd*/Tpt-c	t3*/Tpt-b	Tph10	Pte*/Tpt-a
rock type	airfall	wt	wt-dv	wt-dv	wt	wt
lat.	30.0841	30.0891	30.4888	30.4826	30.0891	300.4867
long.	-114.2499	-114.2447	-114.7774	-114.9017	-114.2447	-114.7774
SiO2	68.89	71.25	71.39	73.45	74.03	74.73
TiO2	0.65	0.45	0.44	0.23	0.26	0.29
Al2O3	14.88	13.58	13.45	13.47	12.77	13.19
FeO	3.72	2.93	3.26	1.57	2.74	2.32
MnO	0.09	0.07	0.10	0.04	0.05	0.02
MgO	0.67	0.47	0.43	0.38	0.50	0.30
CaO	2.46	2.32	3.00	2.29	1.18	1.09
Na2O	5.23	4.92	4.83	4.52	5.15	4.25
K2O	3.48	3.26	3.01	4.02	3.42	3.77
P2O5	0.12	0.08	0.09	0.03	0.03	0.04
orig. total	100.19	93.33	98.73	99.39	99.68	98.75
Mg #	0.24	0.22	0.19	0.30	0.03	0.19
Rb	108	97	83	111	105	109
Ba	844	941	1034	1156	975	1141
Sr	143	138	201	110	85	110
Nb	14	14	14.4	15.7	16	16.5
Zr	396	342	368	314	388	432
Y	53	50	44	37	57	44
Th	8	9	8	11	13	10
U	..	..	3	4	..	3
V	28	12	12	20	0	9
Cr	2	3	..	..	2	..
Ni	6	8	2	2	11	3
Pb	14	16	8	17	7	13
Ga	22	19	19	18	21	18
Zn	92	49	74	56	57	65
La	29	29	29	31	44	34
Ce	92	78	48	56	87	63
K/Rb	267	278	300	300	270	286

APPENDIX 1

Complete $^{40}Ar/^{39}Ar$ results are presented in Data Repository. The $^{40}Ar/^{39}Ar$ step-heating experiments were performed at the Geochronology laboratory of the University of Alaska at Fairbanks. All errors are reported at the 1σ level. Decay constants are those of Steiger and Jäger, 1977. The fractions selected for plateau calculation are indicated with an asterisk. The samples were crushed and washed in deionized water then weighed and wrapped in aluminum foil. For the irradiation they were arranged in two levels, within aluminum cans of 2.5 cm diameter and 4.5 cm height. The samples were irradiated at the uranium enriched research reactor of MacMaster University in Hamilton, Ontario. Samples of Bern 4B biotite (17.25 Ma) were included with each set of unknowns to monitor the neutron flux. The samples and monitors were fused in a double wall tantalum furnace, fabricated by Modifications Ltd. The monitors were fused in one step at 1600°C. The samples were step-heated from about 500 to 1600°C. On average eight gas fractions were collected for each sample. The purified argon isotopes were analyzed on a Nuclide 6-60-SGA mass spectrometer. The mass discrimination of the spectrometer was determined before and after sample measurement through the analysis of atmospheric argon. The isotopes were corrected for mass discrimination, and interference reactions from calcium, potassium and chlorine, fractionation factors were applied when necessary. The weighted mean of the results obtained on the monitor samples was used on the ensuing calculations for their corresponding set of samples.

The $^{40}Ar/^{39}Ar$ single step laser fusion experiments were performed at the Geochronology Center of the Institute of Human Origins (IHO). The analytical technique is described in Deino and Potts (1990). Six single crystals of 0.6 to 1.3 mm size from each sample were individually fused with an Ar-ion laser and analyzed separately. Seven additional fractions from each sample, consisting of 3-6 grains each, were analyzed in two steps. The first step used a defocussed (ca. 2 mm diameter) 0.5 W beam ; the second used a focussed (ca. 50 µm diameter) 0.5 W beam. In most cases the second step of these analyses showed a significant reduction in atmospheric Ar contamination relative to the first. Procedural blanks were measured every three samples, their values (in moles, $\pm 1\ \sigma$) averaged $(2.3 \pm 0.6) \times 10^{-16}$ for ^{40}Ar, $(4.3 \pm 3.9) \times 10^{-18}$ for ^{39}Ar, $(3.9 \pm 3.7) \times 10^{-19}$ for ^{38}Ar, $(2.1 \pm 0.5) \times 10^{-18}$ for ^{37}Ar, and $(1.1 \pm 0.4) \times 10^{-18}$ for ^{36}Ar. Mass discrimination was determined to be 1.0065 ± 0.0017 per atomic mass unit through automated analyses of ten gas aliquots from an on-line air pipette interspersed with the samples. Fish Canyon sanidine (27.84 Ma) was used as a neutron flux monitor, yielding an integrated J-value of 0.000347 ± 0.000010 for all the samples. Correction for interfering nuclear reactions applied were those reported by Renne et al. (1992). The potassium derived $(^{40}Ar/^{39}Ar) = 0.0024 \pm 0.0007$ for this Cd-shielded irradiation was measured with $KFeSiO_4$ glass.

In order to minimize the possible effects of excess or inherited Ar, ages were calculated by isochron analysis, i.e. regression of $^{36}Ar/^{40}Ar$ - $^{39}Ar/^{40}Ar$ isotope correlation data, following the algorithm of York (1969). Outlying data were excluded from regression using the approach of Deino and Potts (1990), with a threshold mean squared weighted deviation (MSWD) value of 2.0. This elimination procedure resulted in no deletions for two samples, one for another, and three for a fourth. Initial $^{40}Ar/^{36}Ar$ for all four samples determined by isochron analysis was indistinguishable from atmospheric Ar at the 2 σ level. Confidence limits on all data reported herein are at the 1 σ level. Complete analytical results follow the step-heating data.

I D number 1, sample II-15
unit Tma; subunit Los Heme
location: 30.2581° N, 114.6689° W
rock type: hornblende andesite (lava)

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
400	0.07	0.37	0.08	91.42	39.03	4.02	14.44	1.48
600	0.14	0.25	0.07	79.75	42.42	3.75	15.69	1.38
800	0.20	0.66	0.08	77.59	43.25	4.32	16.00	1.59
900	0.21	1.33	0.37	78.55	34.21	18.58	12.66	6.85
1000	0.22	2.09	0.57	46.92	47.98	25.35	17.73	10.06
1100	0.29	7.15	1.41	40.55	48.39	4.03	17.88	1.48
1200	0.91	8.33	0.02	28.21	42.93	0.44	15.87*	0.16
1400	0.99	11.89	0.17	16.04	49.31	3.21	18.22	1.18
1600	1.00	21.53	32.88	77.80	75.36	376.63	27.77	137.75
total		6.81	0.03		43.51	0.81	16.1	0.3

$(^{40}Ar^*/^{39}Ar_K)_{std}$ = 46.66 ± 0.12 ; J = 2.05875 × 10^{-4} ± 5.11343 × 10^{-7}
hornblende, mass 0.775 g, total $^{40}Ar_{atm}$ 2.080 × 10^{-11} cc STP/g, $^{39}Ar_K$ 3.208 × 10^{-13} cc STP/g
t_p =15.9 ± 0.2 Ma, 62 % ^{39} Ar

ID number 2, sample 21-III-6
unit Tma; subunit Los Heme
location: 30.2629° N, 114.7153° W
rock type: hornblende andesite

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
500	0.07	0.46	0.04	89.80	40.33	2.21	14.92	0.81
750	0.12	0.65	0.06	82.81	41.50	3.08	15.35	1.13
900	0.14	1.59	0.17	80.20	56.78	8.24	20.97	3.03
1000	0.15	4.16	0.72	77.14	85.76	29.11	31.57	10.62
1100	0.22	7.79	0.08	48.98	56.07	2.17	20.71	0.80
1150	0.76	7.94	0.13	30.12	44.12	0.30	16.31 *	0.11
1200	0.88	8.76	0.05	22.84	43.55	1.32	16.10 *	0.49
1600	1.00	10.26	0.06	27.80	47.55	1.28	17.57	0.47
total		7.25	0.02		45.42	0.45	16.8	0.2

$(^{40}Ar^*/^{39}Ar_K)_{std}$ = 46.66 ± 0.12; J = 2.05875 × 10^{-4} ± 5.11343 × 10^{-7}
hornblende, mass 1.082g, total $^{40}Ar_{atm}$ 2.321 × 10^{-11} cc STP/g, $^{39}Ar_K$ 3.878 × 10^{-13} cc STP/g,
t_p= 16.3 ± 0.1 Ma, 66 % ^{39} Ar

ID number 3, sample 22-III-1
unit Tmr; subunit Tmru, Valle Curbina
location: 30.3675° N, 114.6702° W
rock type: rhyolite lava dome

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
300	0.003	0.21	0.13	99.71	62.11	19.65	25.07	7.87
450	0.03	0.11	0.01	96.86	20.46	0.98	8.30	0.39
600	0.19	0.13	0.002	87.08	15.19	0.16	6.16	0.06
750	0.52	0.06	0.001	31.70	14.32	0.06	5.81 *	0.03
900	0.69	0.05	0.002	51.78	14.29	0.2	5.80 *	0.05
1050	0.87	0.06	0.002	76.63	14.28	0.13	5.80 *	0.05
1200	0.98	0.06	0.003	78.79	14.94	0.19	6.06	0.08
1600	1.00	0.15	0.002	94.44	15.98	1.21	6.48	0.05
total		0.07	0.001		14.84	0.08	6.02	0.04

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 42.64 \pm 0.14$; $J = 2.25304 \times 10^{-4} \pm 7.29483 \times 10^{-7}$
whole rock, mass 1.135 g, total $^{40}Ar_{atm}$ 3.259×10^{-10} cc STP/g, $^{39}Ar_K$ 2.744×10^{-12} cc STP/g,
$t_p = 5.80 \pm 0.03$ Ma, 68 % ^{39}Ar

ID number 4, sample 30-IV-4
unit Tba; subunit Valle Curbina
location: 30.3577° N, 114.6689° W
rock type:andesite dike (fairly aphyric)

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
300	0.10	0.85	0.10	98.30	6.74	7.37	2.78	3.04
600	0.46	3.78	0.04	91.53	9.73	2.11	4.01	0.87
1000	0.75	6.09	0.07	93.66	12.09	2.57	4.98	1.06
1600	1.00	13.31	0.17	91.27	15.20	2.97	6.26	1.22
total		6.57	0.04		11.50	1.50	4.74	0.62

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 41.98 \pm 0.13$; $J = 2.28879 \times 10^{-4} \pm 6.93641 \times 10^{-7}$
whole rock, 1st run, mass 0.265 g, total $^{40}Ar_{atm}$ 5.660×10^{-11} cc STP/g, $^{39}Ar_K$ 3.346×10^{-12} cc STP/g,

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
250	0.04	1.10	0.08	97.30	13.04	5.32	5.38	2.19
500	0.35	2.16	0.01	93.12	10.80	0.75	4.46	0.31
750	0.55	6.54	0.03	89.29	12.08	1.13	4.98 *	0.46
1000	0.75	6.17	0.03	94.21	12.55	1.14	5.17 *	0.47
1600	1.00	13.60	0.05	91.99	15.00	0.93	6.18	0.38
total		6.64	0.02		12.55	0.51	5.2	0.21

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 41.98 \pm 0.13$; $J = 2.28879 \times 10^{-4} \pm 6.93641 \times 10^{-7}$
whole rock, 2nd run, mass 0.859 g, total $^{40}Ar_{atm}$ 5.647×10^{-11} cc STP/g, $^{39}Ar_K$ 3.337×10^{-13} cc STP/g,
$t_p = 5.1 \pm 0.3$ Ma, 40 % ^{39}Ar

ID number 5, sample I-16
unit Tph; subunit Tph 28 (?)
location: 30.2825° N, 114.7694° W
rock type: welded ash flow tuff vitrophyre

temp	$\%^{39}Ar$	$^{37}Ar/^{39}Ar$	±	atm	$^{40}Ar^{*}/^{39}Ar_K$	±	age (Ma)	±
300	0.0003	0.59	1.48	99.09	65.66	69.41	25.28	26.50
450	0.003	0.20	0.16	98.80	26.29	7.44	10.15	2.86
600	0.02	0.25	0.04	97.18	9.93	1.67	3.84	0.65
750	0.04	0.19	0.02	94.24	10.85	1.09	4.20	0.42
900	0.09	0.15	0.01	94.52	8.88	0.49	3.43	0.19
1200	0.52	0.16	0.001	99.15	3.10	0.31	1.20	0.12
1600	0.93	0.18	0.001	99.10	4.23	0.40	1.64	0.16
1601	1.00	0.17	0.007	95.99	18.34	0.51	7.09	0.20
total		0.17	0.001		5.27	0.22	2	0.1

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 44.76 \pm 0.11$; $J = 2.14642 \times 10^{-4} \pm 8.85210 \times 10^{-7}$
whole rock, mass 1.445 g, total $^{40}Ar_{atm}$ 7.847×10^{-10} cc STP/g, $^{39}Ar_K$ 1.950×10^{-12} cc STP/g,

temp	$\%^{39}Ar$	$^{37}Ar/^{39}Ar$	±	atm	$^{40}Ar^{*}/^{39}Ar_K$	±	age (Ma)	±
400	0.01	0.98	0.85	103	-15.28	44.49	-5.78	16.58
600	0.07	3.46	0.18	69.16	7.95	7.75	2.95	2.87
800	0.16	3.80	0.14	73.31	1.50	5.52	0.56	2.05
1000	0.46	4.00	0.04	79.21	7.44	1.68	2.76 *	0.62
1300	0.90	4.17	0.03	74.56	7.04	1.11	2.61 *	0.41
1600	0.98	4.44	0.22	92.19	14.46	8.54	5.36	3.16
1700	0.99	3.01	0.74	104	-18.55	3.27	-6.90	12.19
1714	1.00	4.11	0.36	99.31	-142.99	1645	-53.91	629
total		4.01	0.04		6.75	1.48	2.5	0.6

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 46.66 \pm 0.12$; $J = 2.05875 \times 10^{-4} \pm 5.11343 \times 10^{-7}$
plagioclase,,mass 0.416 g, total $^{40}Ar_{atm}$ 1.728×10^{-11} cc STP/g, $^{39}Ar_K$ 3.163×10^{-13} cc STP/g
$t_p = 2.7 \pm 0.4$ Ma, 78 % ^{39}Ar

ID number 6, sample II-13,
unit Tph; subunit Tph 28 (?), Los Heme, (unit beneath the uppermost unit of Tpr on this site)
location: 30.2483° N, 114.7040° W
rock type: welded ash flow tuff vitrophyre

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
300	0.006	0.38	0.12	97.05	5.69	5.65	2.20	2.18
450	0.05	0.33	0.02	97.28	3.77	0.79	1.46	0.30
600	0.16	0.25	0.07	73.76	8.76	0.33	3.39 *	0.13
750	0.63	0.14	0.002	17.77	8.88	0.08	3.43 *	0.03
900	0.89	0.15	0.003	29.69	8.33	0.14	3.22 *	0.05
1100	0.96	0.61	0.01	75.92	8.67	0.48	3.36 *	0.19
1300	0.99	1.46	0.03	85.71	10.02	1.21	3.88	0.47
1600	1.00	1.72	0.15	89.52	11.06	6.67	4.27	2.58
total		0.25	0.002		8.49	0.10	3.29	0.04

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 44.76 \pm 0.11$; $J = 2.14642 \times 10^{-4} \pm 8.85210 \times 10^{-7}$
whole rock, mass 0.991 g, total $^{40}Ar_{atm}$ 2.983×10^{-11} cc STP/g, $^{39}Ar_K$ 1.812×10^{-12} cc STP/g,
$t_p = 3.36 \pm 0.03$ Ma, 91 % ^{39}Ar

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
400	0.007	1.47	0.36	97.51	46.64	18.12	17.24	6.67
600	0.04	1.41	0.08	85.28	70.20	4.03	25.89	1.48
800	0.27	1.15	0.01	57.68	18.28	0.55	6.78	0.20
1000	0.58	2.27	0.009	55.66	12.75	0.42	4.73	0.16
1200	0.89	2.64	0.009	72.78	10.55	0.41	3.92	0.15
1450	0.97	5.21	0.05	85.29	9.73	1.61	3.61	0.60
1700	1.00	4.05	0.09	94.90	7.86	3.70	2.92	1.37
total		2.38	0.007		15.07	0.34	5.6	0.1

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 46.66 \pm 0.12$; $J = 2.05875 \times 10^{-4} \pm 5.11343 \times 10^{-7}$
plagioclase, mass 0.977 g, total $^{40}Ar_{atm}$ 2.951×10^{-11} cc STP/g, $^{39}Ar_K$ 5.327×10^{-13} cc STP/g

ID number 7, sample III-6
unit Tpr; subunit Tpt-b, Valle Curbina
location: 30.3637° N, 114.6599° W
rock type: ash flow tuff

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
300	0.07	0.24	0.02	97.38	22.15	1.78	9.12	0.73
1600	1.00	0.35	0.002	94.85	8.39	0.18	3.46 *	0.08
total		0.34	0.002		9.40	0.21	3.9	0.1

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 41.98 \pm 0.13$; $J = 2.28879 \times 10^{-4} \pm 6.93641 \times 10^{-7}$
whole rock, 1st run, mass 0.317 g, total $^{40}Ar_{atm}$ 3.506×10^{-10} cc STP/g, $^{39}Ar_K$ 1.723×10^{-12} cc STP/g,
t_p= 3.5 ± 0.1 Ma, 93 % ^{39}Ar

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
250	0.02	0.34	0.02	97.59	58.91	2.63	24.16	1.11
450	0.30	0.23	0.002	95.91	6.51	0.19	2.69	0.08
650	0.86	0.25	0.001	93.89	8.70	0.13	3.59 *	0.06
850	0.96	0.38	0.006	95.06	13.03	0.46	5.37	0.19
1200	0.98	3.94	0.05	96.94	10.57	2.18	4.36	0.90
1600	1.00	1.70	0.03	96.43	10.13	1.96	4.18	0.81
total		0.36	0.001		9.67	0.13	3.99	0.06

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 41.98 \pm 0.13$; $J = 2.28879 \times 10^{-4} \pm 6.93641 \times 10^{-7}$
whole rock, 2nd run, mass 0.992 g, total $^{40}Ar_{atm}$ 3.481×10^{-10} cc STP/g, $^{39}Ar_K$ 1.688×10^{-12} cc STP/g
t_p= 3.59 ± 0.06 Ma, 56 % ^{39}Ar

ID number 8, sample VP-1
unit Tpa; subunit Volcan Prieto
location: 30.2356° N, 114.6489° W
rock type: andesite lava

temp	%^{39}Ar	^{37}Ar/^{39}Ar	±	atm	^{40}Ar*/^{39}Ar$_K$	±	age (Ma)	±
300	0.05	0.95	0.04	96.72	3.06	2.36	1.24	0.96
450	0.13	2.13	0.03	75.42	4.39	1.33	1.78	0.54
600	0.43	2.07	0.007	25.44	6.56	0.35	2.66 *	0.14
800	0.76	3.13	0.008	33.49	6.26	0.33	2.54 *	0.13
1000	0.88	1.54	0.02	53.59	6.71	0.88	2.72 *	0.36
1200	0.93	4.92	0.05	72.51	7.12	2.01	2.89 *	0.81
1600	1.00	1.42	0.10	74.20	8.01	1.58	3.25	0.64
total		3.28	0.006		6.27	0.28	2.6	0.1

$(^{40}Ar^{*}/^{39}Ar_K)_{std} = 42.64 \pm 0.14$; $J = 2.25304 \times 10^{-4} \pm 7.29483 \times 10^{-7}$
whole rock, mass 1.155 g, total $^{40}Ar_{atm}$ 5.452×10^{-12} cc STP/g, $^{39}Ar_K$ 5.236×10^{-13} cc STP/g
t_p= 2.6 ± 0.1 Ma, 81 % ^{39}Ar

ID number 9, sample EST-55
unit Tmc , subunit Tmc1
location: 30.3636° N, 114.7170° W
rock type: crystal rich ash-flow tuff.
Sanidine

Lab#	^{40}Ar (moles) $\times 10^{-15}$	^{40}Ar/^{39}Ar	^{38}Ar/^{39}Ar	^{37}Ar/^{39}Ar	^{36}Ar/^{39}Ar	^{40}Ar*/^{39}ArK	%^{40}Ar*	Age(Ma)	± (1σ)
5582-01	1.33E-14	10.7285	0.0122	0.0218	0.0019	10.1629	94.7	6.35	0.05
5582-02	1.75E-14	11.6802	0.0121	0.0514	0.0051	10.1856	87.2	6.36	0.05
5582-03	2.29E-15	11.3313	0.0139	0.0257	0.0031	10.4269	92.0	6.51	0.38
5582-04	1.69E-14	10.7686	0.0117	0.0279	0.0018	10.2326	95.0	6.39	0.05
5582-05	2.11E-14	11.8878	0.0122	0.0273	0.0053	10.3230	86.8	6.45	0.04
5582-06	1.11E-14	10.8349	0.0120	0.0236	0.0018	10.2987	95.0	6.43	0.11
5582-07A	6.84E-15	13.8933	0.0131	0.0264	0.0124	10.2153	73.5	6.38	0.11
5582-07B	2.68E-14	10.8125	0.0114	0.0275	0.0017	10.2985	95.2	6.43	0.03
5582-08A	8.41E-15	12.7068	0.0128	0.0307	0.0077	10.4204	82.0	6.51	0.09
5582-08B	2.49E-14	10.8107	0.0116	0.0279	0.0018	10.2682	95.0	6.41	0.03
5582-09A	1.14E-14	13.0155	0.0124	0.0274	0.0093	10.2546	78.8	6.40	0.05
5582-09B	3.78E-14	11.1298	0.0121	0.0248	0.0027	10.3328	92.8	6.45	0.03
5582-10A	1.43E-14	12.3648	0.0124	0.0338	0.0071	10.2671	83.0	6.41	0.05
5582-10B	1.57E-14	10.9562	0.0117	0.0339	0.0024	10.2422	93.5	6.40	0.05
5582-11A	1.24E-14	12.3554	0.0126	0.0310	0.0071	10.2517	83.0	6.40	0.07
5582-11B	6.64E-14	10.7833	0.0115	0.0307	0.0016	10.3200	95.7	6.45	0.02
5582-12A	1.35E-14	12.9962	0.0132	0.0323	0.0090	10.3355	79.5	6.45	0.05
5582-12B	6.82E-14	11.0945	0.0120	0.0296	0.0026	10.3202	93.0	6.45	0.02
5582-13A	1.17E-14	12.3077	0.0134	0.0269	0.0070	10.2514	83.3	6.40	0.05
5582-13B	6.25E-14	10.8406	0.0118	0.0249	0.0017	10.3477	95.4	6.46	0.02

ID number 10, sample 12-I-91
unit Tpr, subunit Tpvc
location: 30.3793° N, 114.6614° W
rock type: pumice lapilli ash-flow tuff.
Plagioclase

Lab#	^{40}Ar(moles) $\times 10^{-15}$	^{40}Ar/^{39}Ar	^{38}Ar/^{39}Ar	^{37}Ar/^{39}Ar	^{36}Ar/^{39}Ar	^{40}Ar*/^{39}ArK	%^{40}Ar*	Age(Ma)	± (1σ)
5580-01	5.29E-15	6.7249	0.0119	1.4673	0.0045	5.5005	81.7	3.44	0.14
5580-02	5.50E-15	5.8192	0.0130	1.4660	0.0025	5.2025	89.3	3.25	0.11
5580-03	3.96E-15	5.9756	0.0117	1.3823	0.0029	5.2322	87.5	3.27	0.16
5580-04	4.21E-15	6.3778	0.0137	1.8913	0.0055	4.9023	76.8	3.06	0.13
5580-05	4.30E-15	5.9524	0.0116	1.1828	0.0024	5.3296	89.5	3.33	0.10
5580-06	2.10E-15	6.0023	0.0107	1.1874	0.0020	5.5038	91.6	3.44	0.18
5580-07B	6.74E-15	5.7520	0.0126	1.3901	0.0024	5.1473	89.4	3.22	0.05
5580-08A	5.06E-16	12.9906	0.0292	1.1091	0.0316	3.7317	28.7	2.33	1.41
5580-08B	6.44E-15	5.9275	0.0131	1.2037	0.0029	5.1666	87.1	3.23	0.11
5580-09B	5.35E-15	7.5072	0.0130	1.0921	0.0079	5.2718	70.2	3.30	0.07
5580-10A	5.08E-16	15.8129	0.0334	1.2168	0.0403	4.0046	25.3	2.50	1.36
5580-10B	6.20E-15	5.9528	0.0124	1.2708	0.0026	5.2964	88.9	3.31	0.08
5580-11A	6.22E-16	19.0819	0.0021	1.0405	0.0477	5.0573	26.5	3.16	1.51
5580-11B	2.58E-15	6.8749	0.0138	1.1633	0.0051	5.4631	79.4	3.41	0.22
5580-12A	2.78E-16	10.1670	0.0270	1.0095	0.0212	3.9937	39.3	2.50	1.96
5580-12B	3.04E-15	5.8169	0.0133	1.0938	0.0014	5.4760	94.1	3.42	0.12
5580-13B	1.57E-15	6.2708	0.0154	1.2030	0.0046	5.0111	79.8	3.13	0.16

ID number 11, sample MT-91-41
unit Tph, subunit Tph 28
location: 30.2646° N, 114.6695° W
rock type: welded ash flow tuff.
Plagioclase

Lab#	^{40}Ar(moles) $\times 10^{-15}$	^{40}Ar/^{39}Ar	^{38}Ar/^{39}Ar	^{37}Ar/^{39}Ar	^{36}Ar/^{39}Ar	^{40}Ar*/^{39}ArK	%^{40}Ar*	Age(Ma)	± (1σ)
5578-01	7.50E-16	4.3249	0.0086	3.3143	0.0019	4.0321	93.0	2.52	0.57
5578-02	1.25E-15	4.9179	0.0144	3.5231	0.0038	4.0775	82.7	2.55	0.28
5578-03	7.69E-16	4.6714	0.0190	3.4289	0.0062	3.1033	66.3	1.94	1.08
5578-04	7.33E-16	5.1733	0.0212	3.4979	0.0029	4.5909	88.5	2.87	0.41
5578-05	6.43E-16	4.0261	0.0190	3.3601	0.0016	3.8026	94.2	2.38	0.72
5578-06	9.03E-16	5.4033	0.0165	3.3877	0.0058	3.9555	73.0	2.47	0.44
5578-07A	1.46E-15	7.8712	0.0193	2.7652	0.0132	4.1756	53.0	2.61	0.37
5578-07B	2.43E-15	7.5172	0.0118	3.7269	0.0127	4.0622	53.9	2.54	0.17
5578-08A	1.29E-15	7.8080	0.0121	2.6697	0.0141	3.8562	49.3	2.41	0.41
5578-08B	1.63E-15	5.6226	0.0121	3.4703	0.0049	4.4343	78.7	2.77	0.13
5578-09A	5.14E-15	24.7489	0.0280	2.5113	0.0693	4.4648	18.0	2.79	0.33
5578-09B	8.36E-15	22.8214	0.0247	3.5051	0.0632	4.4345	19.4	2.77	0.24
5578-10A	2.88E-15	7.8741	0.0130	2.6328	0.0126	4.3583	55.3	2.72	0.23
5578-10B	3.81E-15	8.3994	0.0147	3.4810	0.0146	4.3726	51.9	2.73	0.11
5578-11A	3.94E-15	6.8462	0.0138	2.6703	0.0097	4.1838	61.0	2.62	0.13
5578-11B	3.76E-15	6.9562	0.0137	3.5945	0.0095	4.4285	63.5	2.77	0.08
5578-12A	2.20E-15	8.2121	0.0126	2.6336	0.0159	3.7108	45.1	2.32	0.56
5578-12B	3.54E-15	5.8636	0.0135	3.6106	0.0065	4.2377	72.1	2.65	0.15
5578-13A	2.08E-15	9.3508	0.0156	2.5814	0.0183	4.1402	44.2	2.59	0.30
5578-13B	2.22E-15	7.9619	0.0156	3.5501	0.0138	4.1598	52.1	2.60	0.15

ID number 12, sample EST-65-1
unit Tpr, subunit Ptg (Tpt-unit b)
location: 30.4881° N, 114.6978° W
rock type: water lain vitric tuff.
Plagioclase

Lab#	^{40}Ar(moles) $\times 10^{-15}$	$^{40}Ar/^{39}Ar$	$^{38}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{40}Ar^*/^{39}Ar_K$	%$^{40}Ar^*$	Age(Ma)	± (1σ)
5584-01	1.34E-15	8.0772	0.0169	10.6875	0.0124	5.2533	64.6	3.28	0.47
5584-02	2.05E-15	6.3785	0.0179	9.2058	0.0084	4.6150	71.9	2.89	0.41
5584-03	2.10E-15	6.2705	0.0169	9.4923	0.0068	5.0287	79.7	3.14	0.24
5584-04	1.62E-15	6.3324	0.0147	10.5180	0.0061	5.3767	84.3	3.36	0.31
5584-05	1.10E-15	5.8495	0.0137	10.9560	0.0070	4.6353	78.7	2.90	0.30
5584-06	1.62E-15	6.4139	0.0179	11.3188	0.0085	4.7934	74.2	3.00	0.37
5584-07A	2.46E-15	13.8798	0.0240	6.1958	0.0311	5.1775	37.1	3.24	0.56
5584-07B	1.43E-15	5.8951	0.0096	10.8505	0.0059	5.0002	84.2	3.13	0.18
5584-08A	2.06E-15	11.7133	0.0243	6.9659	0.0248	4.9398	42.0	3.09	0.49
5584-08B	1.72E-15	6.1676	0.0123	10.9793	0.0066	5.0776	81.7	3.17	0.16
5584-09A	1.70E-15	8.0839	0.0200	6.8178	0.0127	4.8668	59.9	3.04	0.27
5584-09B	1.93E-15	6.0896	0.0130	11.3700	0.0068	4.9771	81.1	3.11	0.19
5584-10A	3.10E-15	9.4827	0.0207	7.5722	0.0161	5.3391	56.0	3.34	0.21
5584-10B	1.71E-15	6.4619	0.0153	11.1351	0.0096	4.5065	69.2	2.82	0.22
5584-11A	2.77E-15	11.5006	0.0167	7.5826	0.0221	5.5888	48.3	3.49	0.31
5584-11B	2.61E-15	6.2360	0.0122	11.4095	0.0066	5.1787	82.4	3.24	0.15
5584-12A	3.61E-15	13.2084	0.0170	7.3315	0.0283	5.4337	40.9	3.40	0.38
5584-12B	2.38E-15	6.2076	0.0167	11.2741	0.0077	4.8353	77.3	3.02	0.14
5584-13A	4.08E-15	8.8060	0.0160	7.1416	0.0145	5.0842	57.5	3.18	0.16
5584-13B	5.32E-15	6.3442	0.0147	11.1716	0.0085	4.7115	73.7	2.95	0.10

APPENDIX 2. SAMPLE DESCRIPTION

Sample code	Unit or subunit	Rock description
VC87-10	Mb1*	Lava flow. Basalt or basaltic andesite with 15%–40% phenocrysts (Ol, Cpx, Pl), in a microcrystalline matrix (Pl, Px, Fex). K-Ar ages range from 20.5 ± 0.36 Ma to 15.2 ± 0.42 Ma.
VC87-54	Mb3*	Flows of smooth- to blocky weathering lava layers, 3–5 m thick, separated by flows and scoria deposit of basaltic autobreccia. One sample of this unit gave an age of 17.03 ± 0.26 Ma.
VC86-99	Mb4*	Sill of a massive black to gray weathering olivine basalt. About 40% phenocrysts (Fex > Ol > Cpx). Intergranular groundmass of microcrystalline feldspar. The sill passes laterally into a flow. Sill dated at ca. 14.5 ± 0.2 Ma (K-Ar, wr).
P38-1	Tma	Sill overlying and dike cutting a cinder cone deposit in Arroyo Los Heme. Gray-greenish phyric andesite. Underlies heterolithologic debris flows. Microporphyritic lava, 50% phenocrysts (Hb ~ Pl + Ksp(?) > Fex). Some hornblende phenocrysts oxidized.
30IV-4	Tba	Dike cutting the upper rhyolite flow in Valle Curbina. Gray-greenish, aphanitic to microporphyritic andesite. Microlithic flow texture, 5% to 10% phenocrysts (Pl > Cpx > Opx). Microcrystalline groundmass (Pl, Px, Fex, and glass). Part of the dike is brecciated and hydrothermally altered.
2V-2	Tba	Small lava flow and breccia overlying the younger rhyolite flows (Tmru) crop out in locality 18 (Fig. 3). Dark gray, aphanitic to microporphyritic andesite, with 5% to 15% microphenocrysts (Pl > Cpx > Opx ≥ Fex) in a microcrystalline groundmass (Pl, Px, Fex). This unit is equivalent to sample 30IV-4 and unit Tba from Arroyo Los Heme (Fig. 3).
VP-1	Tpa	Lava flow in the northern flank of Volcán Prieto. Overlies the youngest tuff of the Tuff of Los Heme. Dark gray, sparsely phyric, vesicular andesite. Trachytic to microlithic flow texture, with 5–15 phenocrysts (Pl, Opx, Cpx) and microcrystalline groundmass (Pl, Px, Fex). Dated at 2.6 ± 0.1 Ma (wr) (sample 8, Table 1).
VP-2	Tpa	Lava flow in the northern flank of Volcán Prieto. Overlies the youngest tuff of the Tuff of Los Heme. Black porphyritic and

		vesicular andesite 30%–40% phenocrysts (Pl, Opx, Cpx) and a microcrystalline groundmass.
MT91-67	Tpa	Lava flow along a north-northeast–trending normal fault west of Cerro Canelo (site 20 in Fig. 2). Gray, fairly phyric andesite, 15%–20% phenocrysts (Pl > Cpx > Opx). Microcrystalline groundmass with a microlithic flow texture. Dated at 0.91 ± 0.67 Ma ($^{40}Ar/^{39}Ar$, wr).
VC86-208	Ma2*	Lava flow from a series of flows and breccia forming original constructional vents (domes, cones) in Valle Chico. Gray, fairly phyric dacite, <15% phenocrysts (Ksp, Pl, Hb, Fex). One sample was dated at 6.47 ± 0.28 (K/Ar, wr).*
VC86-223	Ma2*	Same as sample VC86-208.
LC92-53	Tmrl	Obsidian glass flow from the dome in Arroyo La Cantera. This unit underlies the Tuff of El Canelo and airfall deposits along the arroyo. Glassy flows and breccias, partially perlitized. <5% phenocrysts (Pl, Cpx, Opx, Fex). Plagioclase phenocryst (2–3 mm) with resorption textures.
MT90-21	f4† (Tmru)§	Glassy rhyolite flow overlying the Tuff of El Canelo along the Arroyo Matomí.
VC89-73	f3† (Tmrl)§	Obsidian rhyolite glass flow.
VP93-9	Tph	Obsidian glass ballistic fragment (~1 m long) in a black pumice-lapilli airfall deposit west of Volcán Prieto. May correspond with one of the upper units of the Tuff of Los Heme. <5% phenocrysts (Pl).
EH93-21-1	Tph29	Densely welded ash-flow tuff. Abundant fiamme and lithophysae. Two partial cooling brake at the base (sample).
MT90-71	Tpd† (Tpt-c)§	Densely welded ash-flow tuff. This unit correlates with one of the Tuff of Mesa El Tábano. Light brownish gray tuff with a devitrified matrix, and a small lithophysae with secondary minerals. ~8% phenocrysts (Pl > Cpx > Ol ~ Hb). Contains <10% lithics.
MT91-23	t3 (Tpt)§	Crystal-rich welded tuff, with devitrified, light purple matrix. ~14% phenocrysts (Pl >> Cpx ~ Opx > Fex). <10% lithics.
EH93-21-10	Tph2	Partially welded ash-flow tuff, basal vitrophyre (sample) with 15 % phenocrysts (Pl ≥ Opx ~ Cpx > Ol, Fex). This unit overlies Tph1 7 km southwest of Volcán Prieto, along Arroyo El Huerfanito. Located in the southernmost part of Figure 3.

MT90-72	Tpt-a	Moderately crystal-rich welded tuff. Eutaxitic foliation with some glass shard still present. ~12% phenocrysts (Pl >> Fex), with relict olivines (altered to Fex). Correlates with unit Tpt-a of the Tuff of Mesa El Tábano.

*Samples described in Stock (1989).
†Samples described in Stock et al.(1991).
§Equivalent unit in the studied area.