

**U.S. DEPARTMENT OF THE INTERIOR
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**Laboratory data for calcic soils in Central New Mexico:
Background information for mapping Quaternary deposits
in the Albuquerque basin**

By

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INTRODUCTION

Soils enriched in calcium carbonate are common throughout lower elevation (<1,830 m; <6,000 ft.) sites in the Southwestern United States, especially where the climate is currently arid or semiarid. These soils, variously known as pedocals (old USDA nomenclature) and calcic soils (Machette, 1985), provide a means to determine the relative age of Quaternary deposits on a reconnaissance basis (see Birkeland, 1984; Birkeland and others 1991). If one could calibrate their rates of formation, then the development of calcic soils would provide a useful reconnaissance tool for mapping and deciphering the Quaternary history of regions, including tectonic and climatic events. This strategy has played an important part in regional analysis of Quaternary stratigraphy in the Southwest and specifically in the Rio Grande rift of New Mexico (Machette, 1985, Table 2 and fig. 8).

During the mid to late 1970's, the U.S. Geological Survey conducted geologic mapping in the central part of the Rio Grande rift of New Mexico (fig. 1). As part of this effort, we described, sampled and analyzed more than 50 soils on Quaternary deposits in order to establish criteria for mapping different ages of deposits and for using calcic soils as a relative-age tool (see figs. 2 and 3). These data were used in two papers summarizing regional aspects of calcic soils (Bachman and Machette, 1977; Machette, 1985), as part of detailed 1:24,000-scale mapping of the San Acacia 7.5-minute quadrangle in the southern part of the Albuquerque basin (Machette, 1978a) and regional 1:250,000-scale mapping of the Socorro 1°x2° quadrangle (Machette, 1978b). In addition, detailed soil analyses were made for dating movement on specific Quaternary faults (Machette, 1978c, 1978d; Machette, 1986, 1988) and as a tool for deciphering timing of faulting on a regional basis (Machette and McGimsey, 1983). Although the soil data was fundamental to each of these studies, it was never archived nor released as a public document.

With the renewed interest in the Quaternary geologic and tectonic history of the middle Rio Grande drainage basin (current USGS cooperative project between Water Resources and Geologic Divisions) it seems appropriate to publish this data as reference materials for future stratigraphic work. This report includes basic geologic and geographic information, and laboratory and chemical data used to calculate the amount of secondary (pedogenic) calcium carbonate in 52 soil profiles (Appendix) from central New Mexico. Hopefully, these data will serve as reference for additional sampling and characterization of soil development as a relative dating tool for geologic studies.

METHODS

The basic strategy for assessing the content of secondary calcium content in a soil uses four fundamental measurements: 1) sampling thickness, 2) grain-size distribution, 3) calcium carbonate content of the sample, and 4) bulk density of the sample. Using these data, one can calculate the concentration of calcium carbonate content (g/cm^3) in a sample, in a sampled interval, and then sum all the sampled intervals for a total content in the soil. Then, by using data from the soil's parent material (Cu horizon), one can assess the primary (depositional) carbonate content. The secondary (pedogenic) component of the calcium carbonate is the difference between the total and primary contents. In our studies, we typically chose to describe and sample soils on noncalcareous parent materials, thereby minimizing the primary carbonate content. The procedure for calculating carbonate content is described in detail in Machette (1978c) and in general in Machette (1985).

Sampling thickness comes from the physical description of the soil. Most soil profiles were measured in hand-excavated pits in natural exposures or temporary excavations using the criteria described in Harden (1986). However, our soil profile descriptions were relatively brief and focused primarily on horizonation and carbonate morphology. Calcium carbonate content was determined by a Chittick apparatus by measuring the volume of CO_2 evolved from acid digestion of the carbonate minerals as described by Machette (1986). By maximizing the volume of CO_2 evolved, the method will yield an optimum error of $\pm 3\%$ of the reported value (*i.e.*, $50\% \pm 1.5\%$) (Bachman and Machette, 1977). The >2 mm versus <2 mm contents (both measured and estimated in the field) were used to calculate the measured and estimated carbonate content (<2 mm fraction) on a whole sample basis, since the samples contained negligible secondary calcium carbonate in the gravel (>2 mm) fraction. Bulk density of soil peds were determined by the paraffin-clod method (Singer, 1986), or estimated from the grain-size distribution and sediment type where peds were not developed (*i.e.*, parent material of weakly calcareous horizons).

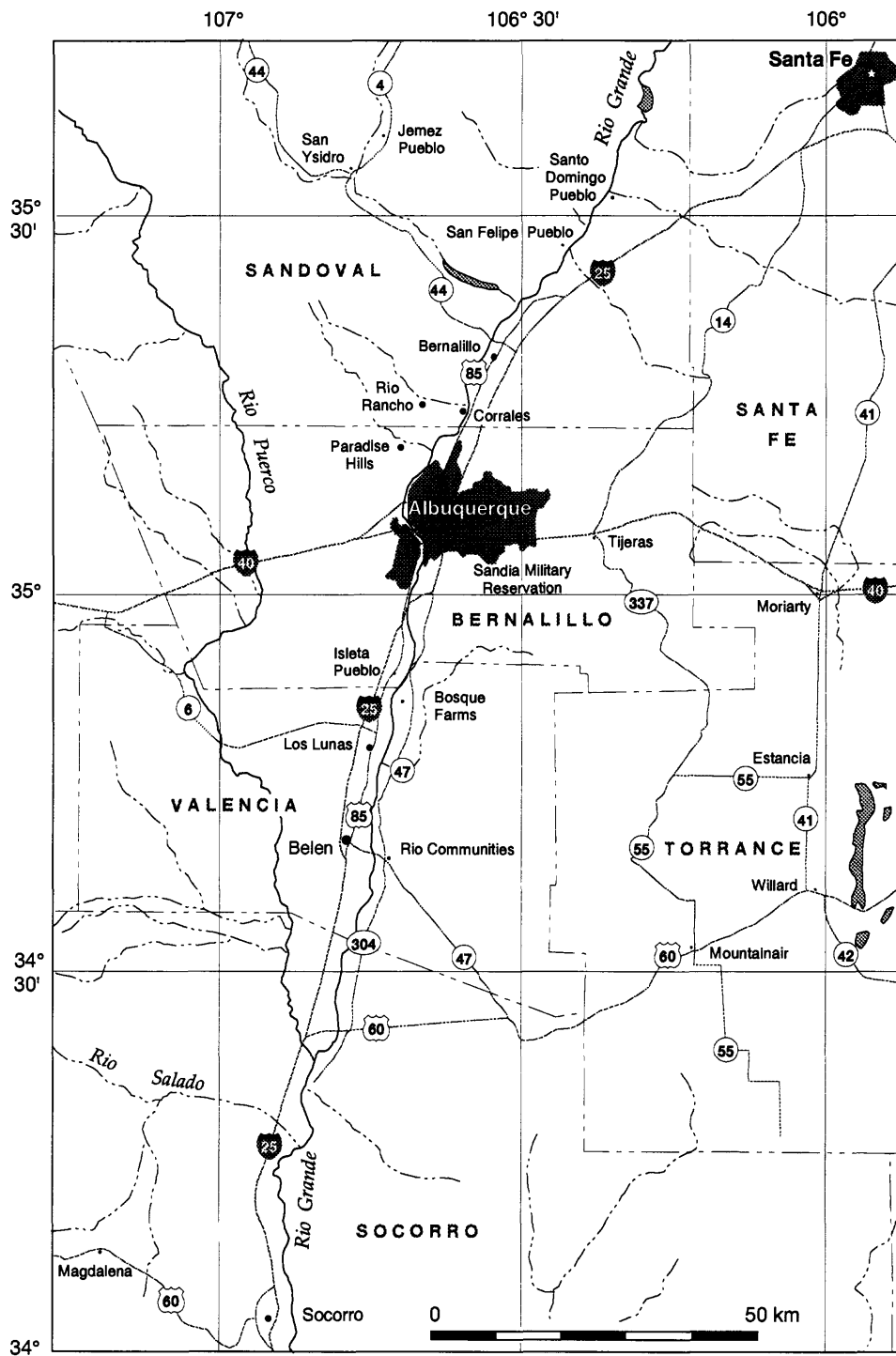
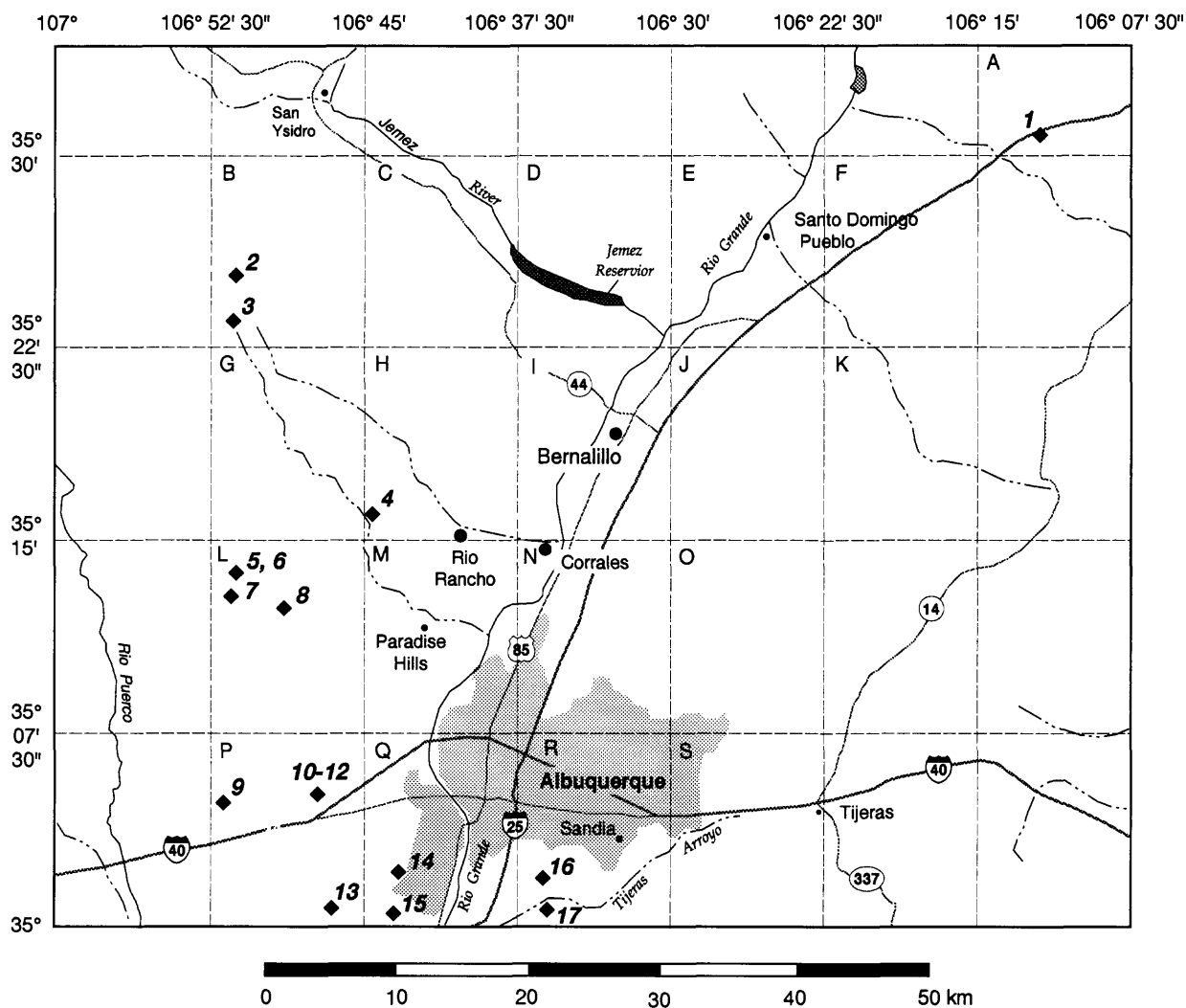


Figure 1. Index map of central New Mexico showing streams, roads, towns, and counties. Figures 2 and 3 show location of soil sampling sites.



Index to USGS 7.5-minute topographic quadrangles

A. Tetilla Peak	H. Loma Machette	N. Alameda
B. Sky Village NE	I. Bernalillo	O. Sandia Crest
C. Bernalillo NW	J. Placitas	P. La Mesita Negra SE
D. Santa Ana Pueblo	K. Hagan	Q. Albuquerque West
E. San Felipe Pueblo	L. Volcano Ranch	R. Albuquerque East
F. San Felipe Pueblo NE	M. Los Griegos	S. Tijeras
G. Sky Village SE		

Figure 2. Index map to soil sampling sites in the northern part of the Albuquerque basin and adjacent areas. Sample localities (site nos.) are shown by diamonds and are keyed (by number) to descriptive information in the Appendix. Topographic map names are keyed by letter.

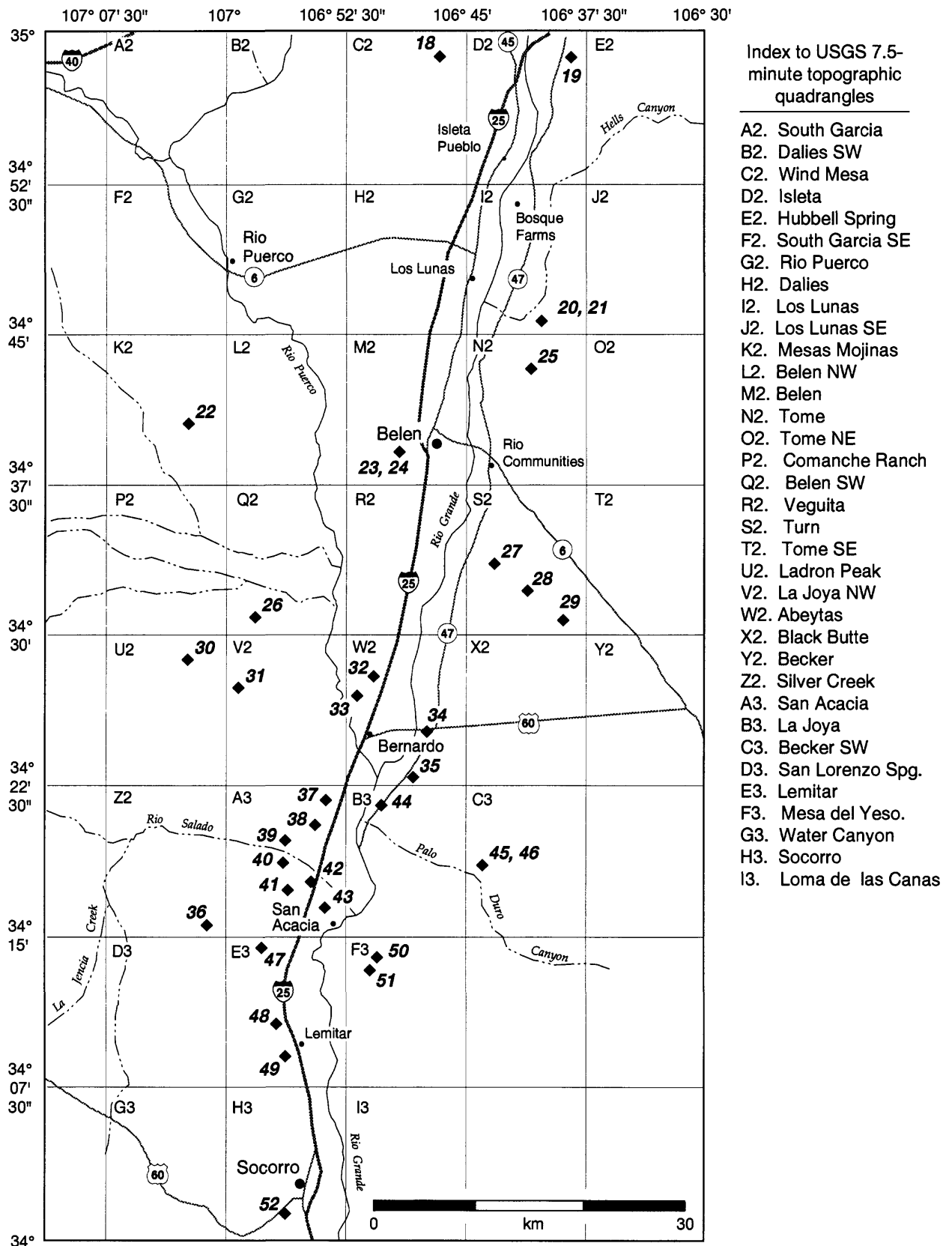


Figure 3. Index map to soil sampling sites in the central and southern parts of the Albuquerque basin and adjacent areas. Sample localities (site nos.) are shown by diamonds and are keyed by number to descriptive information in the Appendix. Topographic map names are keyed by letter.

Table 1. Format of spreadsheet showing columns and headings

A	B	C	D	E	F	G	H
Sample number	Horizon nomenclature		Depth (cm)		Thick-ness	Grain size (percent)	
	Old system	New system	top	bottom	(cm)	>2mm	<2mm

Table 1.—Continued

I	J	K	L	M	N	O	P	Q	R
CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
(<2 mm)	Present	Primary	Present	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	

Table 2. Explanation of columns in spreadsheet and embedded calculations
(Values calculated by spreadsheet are rounded to accomodate format.)

Column A	Sample number (typically a number and letter for each sampled subhorizon).
Column B	Horizon (or subhorizon) nomenclature used in the field (mid-1970's).
Column C	Horizon (or subhorizon) nomenclature now used for geologic studies (Birkeland, 1984).
Column D	Depth to top of sampled interval.
Column E	Depth to bottom of sampled interval.
Column F	Thickness of sampled interval. Cell calculation is E-D (cm).
Column G	Percent of sample in >2-mm size fraction (gravel). Reported in cell as percent/100.
Column H	Percent of sample in <2-mm size fraction (sand, silt and clay). Reported in cell as percent/100.
Column I	Percent calcium carbonate in present-day <2-mm size fraction (sand, silt and clay). Reported in cell as percent/100.
Column J	Percent calcium carbonate in present-day whole-soil fraction. Cell calculation is I x H. Reported in cell as percent/100.
Column K	Percent primary (initial) calcium carbonate in whole soil. Value based on parent material in Cu horizon and on typical values obtained on similar materials from same lithologic and geologic environment. Because noncalcareous parent materials were commonly sought out, the primary carbonate content is commonly <2 percent, and does not exceed 5 percent. Cell is derived value from Cu horizon, reported as percent/100.
Column L	Bulk density of present-day whole soil (ped or clod representative of subhorizon). Reported in cell as g/cm ³ .
Column M	Bulk density of primary (initial) parent material (whole soil). Value based on parent material in Cu horizon and on typical values obtained on similar materials from same lithologic and geologic environment. Reported in cell as g/cm ³ .
Column N	Present (present-day) concentration of calcium carbonate in sampled interval. Cell calculation is J x L. Reported in cell as g/cm ³ .
Column O	Primary (initial) concentration of calcium carbonate in sampled interval. Cell calculation is K x M. Reported in cell as g/cm ³ .
Column P	Secondary (pedogenic) concentration of calcium carbonate in sampled interval. Cell calculation is N-O. Reported in cell as g/cm ³ .
Column Q	Secondary (pedogenic) total accumulation of calcium carbonate in sampled interval. Cell calculation is F x P. Reported in cell as g/cm ² -column through soil horizon or subhorizon. Sum of all secondary calcium carbonate in soil profile shown at bottom of column (marked "Total").
Column R	Comments on calcium carbonate stage of morphology (see Machette, 1985). Base of column shows sum of all cells in Column Q. Reported as g/cm ² -column through soil profile. This value is commonly referred to as the total secondary calcium carbonate content of the soil (cS, Machette, 1985, p. 8).

The descriptive and laboratory data are reported in tabular form in the Appendix. The calculations of total, primary and secondary carbonate concentrations (gm/cm³) and the amount of secondary carbonate (gm/cm²-column) in sampled intervals (typically subhorizons) and the whole profile were performed using an Excel spreadsheet with formulas embedded in cells, rows, and columns. These formulas are keyed to the example spreadsheet in Table 1 and explained in Table 2.

RESULTS

The data tabulated in the Appendix are for soils that range from Holocene to Pliocene age. No attempt is made here with to ascribe numerical ages to these soils, as I did in 1985, because of significant, but still unresolved, questions about the age of the Llano de Albuquerque, a regionally extensive geomorphic surface that was previously considered to be about 0.5 Ma (see Machette, 1985). It is becoming commonly accepted that the Llano de Albuquerque is older, perhaps 1 Ma or more. Also, its association with volcanic ashes of known age, or dated basalt flows is still subject to debate, and no compelling paleomagnetic signatures have been obtained from deposits underlying the Llano. In fact, the Llano may have a considerable age range owing to local faulting and regional changes to the position of the Rio Grande and its major tributary streams. Once the age(s) of the Llano de Albuquerque is better defined, these soil data can be used to refine rates of carbonate accumulation published by Machette (1985) and to better estimate the relative ages of soils on Quaternary deposits in the Albuquerque basin.

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APPENDIX

The following tables (p. A1-A53) include geographic, geologic, and topographic information for soil sampling sites in the Albuquerque basin and adjacent areas. Site numbers (1-52) are labeled according to location, generally from north to south and west to east in the Albuquerque basin (see figures 2 and 3). Soil profile numbers are generally correlated to sampling date (month, day, year), although numerous sites may have been sampled in a single day, hence the use of hyphenated numbers (*i.e.*, 8/02/75-1). The names of the units (geologic) or surfaces (physiographic) are largely informal. Landform is the type of physiographic surface; *i.e.*, alluvial fan or piedmont slope.

Location information is given by USGS quadrangle (7.5- minute, 1:24,000 scale), by latitude and longitude, in the standard Township and Range system, and by UTM (Universal Transverse Mercator) system, which records a points location north and east of an established origin for individual zones (UTM zone 13 for this study). The latter type of location data is especially useful for entry of sampling sites in a Geographic Information System (GIS). In addition, we record the County and elevation of the site as determined from USGS 7.5-minute topographic quadrangle maps. The name of the person describing and sampling the soil profile is given, along with the sampling date. Finally, brief additional comments are made (where appropriate) about the geology, specific sampling location, and references.

The descriptive and laboratory data reported below include calculations of present-day, primary and secondary carbonate concentrations (g/cm^3) and the total amount of secondary carbonate (g/cm^2 -column) in sampled intervals (typically soil subhorizons) and the whole soil profile as previously described in Tables 1 and Table 2. Measured values are shown in regular type, whereas values estimated from the soils physical appearance or modeled from values determined from adjacent samples are shown in italic type. These estimates introduce additional error in the analysis, but are needed to calculate the total amount of secondary carbonate in a soil.

Site No. 1

Profile No. 8/02/75-1

Unit or Surface: La Bajada

Landform: Mesa (basalt covered)

Quadrangle: Tetilla Peak 7.5' (A)

Lat. 35° 31' 15" N., Long. 106° 12' 10" W.

NW¹/₄, NW¹/₄, NE¹/₄, Sec. 21, T. 15 N., R. 7 E.,
La Majada Grant

County: Santa Fe

UTM: 3,931,460 N; 390,905 E.; Zone 13

Elevation: 6000 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: August 2, 1975

Comments: Buried late Pliocene soil beneath 2.8 Ma basalt of the Cerros del Rio field (see Bachman and Mehnert, 1978). Sampled in north-facing roadcut along U.S. Interstate Highway 25. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
A	Bt					F												R
8/02/75	Old system	New system	top	bottom	(cm)		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	Bt	Bt	0	15	15		0.0	100.0	1.0	1.0	1.0	1.30	1.6	0.013	0.016	-0.003	-0.05	
-1a	Km	Km	15	110	95		3.0	97.0	33.4	32.4	1.0	1.24	1.6	0.402	0.016	0.386	36.64	Stg. III+
N.S.	Cca1	Bk1	110	150	40		0.0	100.0	20.0	20.0	1.0	1.50	1.6	0.300	0.016	0.284	11.36	Stg. III-
-1b	Cca2	Bk2	150	230	80		21.0	79.0	3.6	2.84	1.0	1.67	1.6	0.047	0.016	0.031	2.52	Stg. II
-1c	Cca3	Bk3	230	325	95		9.0	91.0	1.8	1.64	1.0	1.58	1.6	0.026	0.016	0.010	0.94	Stg. II
N.S.	Cn	Cu	325	N.E.	N.A.					0.0	1.0	1.60	1.6	0.00	0.016	0.00	0.00	
Total																		51.41

Site No. 2

Profile No. 8/18/75-2

Unit or Surface: Unmapped

Landform: Piedmont slope

Quadrangle: Sky Village NE 7.5' (B)

Lat. 35° 24' 32" N., Long. 106° 51' 10" W.

SE¹/₄, SE¹/₄, Sec. 29, T. 14 N., R. 1 E.

County: Sandoval

UTM: 3,916,450 N.; 331,650 E.; Zone 13

Elevation: 6665 ft.

Described by George Bachman

Sampled by George Bachman

Sampling date: August 18, 1975

Comments: Sampling along road intersection on dissected portion of the Llano de Albuquerque. Parent material and geologic context unknown. N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		G	H	I	J	K	L	M	N	O	P	Q	
8/18/75	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	Cn	Cu	0	23	23	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.00	0.00	
-2a	IIB	2B	23	53	30	1.0	99.0	1.0	1.0	1.5	1.68	1.6	0.016	0.024	-0.004	-0.24	
-2b	IICca	2Bk	53	73	20	0.8	99.2	6.0	6.0	1.5	1.67	1.6	0.096	0.024	0.08	1.44	Sig. II-
N.S.	IICn	2Cu	73	120	47	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.00	0.00	
-2c	IIICca	3Bk	120	164	44	0.2	99.8	18.8	18.8	1.5	1.63	1.6	0.306	0.024	0.28	12.41	Sig. II+
N.S.	IIICn	3Cu	164	N.E.	N.A.	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.00	0.00	
																13.61	Total

Site No. 3

Profile No. 8/18/75-1

Unit or Surface: Unnamed alluvium of Jemez Creek(?)

Landform: Piedmont slope

Quadrangle: Sky Village NE 7.5' (B)

Lat. 35° 22' 42" N., Long. 106° 51' 13" W.

SE¹/₄, SE¹/₄, Sec. 5, T. 13 N., R. 1 E.

County: Sandoval

UTM: 3,916,450 N.; 331,650 E.; Zone 13

Elevation: 6560 ft.

Described by George Bachman

Sampled by George Bachman

Sampling date: August 18, 1975

Comments: Sampling locality along La Ceja (the eyebrow, or edge). Parent material is reported as ancient alluvium of Jemez Creek by George Bachman, which is inset into the Llano de Albuquerque surface. Shown as dissected remnants of the Llano de Albuquerque by Bachman and Mehnert (1978). N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		G	H	I	J	K	L	M	N	O	P	Q	
8/18/75	Old system	New system	top	bottom	F	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	R
N.S.	Spoil	Spoil	0	10	10	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.000	0.00	
-1a	Bt	Bt	10	27	17	60	94.0	42	40	15	1.67	1.65	0.067	0.0248	0.042	0.72	
-1b	Bca	Bk1	27	41	14	60	94.0	74	70	15	1.67	1.65	0.117	0.0248	0.092	1.29	N.R.
-1c	K2m	K2m	41	66	25	50	95.0	53.0	50.4	15	1.70	1.65	0.857	0.0248	0.832	20.80	N.R.
-1d	K3	K3	66	93	27	40	96.0	34.8	33.4	15	1.74	1.65	0.581	0.0248	0.556	15.02	N.R.
-1e	Cca	Bk2	93	113	20	20	98.0	14.1	13.8	15	1.84	1.65	0.254	0.0248	0.229	4.58	N.R.
N.S.	Cn	Cu	113	N.E.	N.A.	00	100.0	15	15	15	1.65	1.65	0.025	0.0248	0.000	0.00	
Total																	42.41

Site No. 4

Profile No. 7/18/75-2

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Loma Machete 7.5' (H)

Lat. 35° 15' 38" N., Long. 106° 44' 40" S.

Unsurveyed, Town of Alameda Grant

County: Sandoval

UTM: 1,555,160 N.; 341,313 E.; Zone 13

Elevation: 5560 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 18, 1975

Comments: Downdropped remnant of the Llano de Albuquerque surface (Machette, 1985). Location on west bank of south-trending tributary to Arroyo de las Calabacillas. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
7/18/75	Old system	New system	top	bottom			>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	K1m	K1m	0	15	15		0.0	100.0	50.0	50.0	1.80	1.75	1.6	0.875	0.0288	0.846	12.69	Stg. III+
N.S.	K21m	K2m	15	20	5		0.0	100.0	75.0	75.0	1.80	1.80	1.6	1.350	0.0288	1.321	6.61	Stg. IV-
-2a	K2m	K3m	20	50	30		1.0	99.0	69.6	68.9	1.80	1.76	1.6	1.213	0.0288	1.184	35.52	Stg. III+
-2b	K31m	K4m	50	69	19		0.1	99.9	55.7	55.6	1.80	1.56	1.6	0.867	0.0288	0.839	15.93	Stg. III+
-2c	K32m	K5m	69	88	19		0.6	99.4	41.3	41.1	1.80	1.59	1.6	0.653	0.0288	0.625	11.87	Stg. III
-2d	K33	Bk1	88	143	55		1.0	99.0	14.6	14.5	1.80	1.60	1.6	0.232	0.0288	0.203	11.12	Stg. II+
-2e	Cca1	Bk2	143	193	50		1.0	99.0	10.8	10.7	1.80	1.60	1.6	0.171	0.0288	0.142	7.12	Stg. II
-2f	Cca2	Bk3	193	259	66		9.0	91.0	6.8	6.2	1.80	1.70	1.6	0.105	0.0288	0.077	5.06	Stg. II-
N.S.	Cn	Cu	259	N.E.	N.A.		10.0	90.0	2.0	1.8	1.80	1.60	1.6	0.029	0.0288	0.000	0.00	
Total																	105.92	Total

Site No. 5

Profile No. 7/21/75A

Unit or Surface: Llano de Albuquerque, faulted

Landform: Mesa

Quadrangle: Volcano Ranch 7.5' (L)

Lat. 35° 14' 20" N., Long. 106° 51' 41" W.

NE¹/₄, NE¹/₄, SW¹/₄, Sec. 29, T. 12 N., R. 1 E.

County: Sandoval

UTM: 3,900,950 N.; 330,680 E.; Zone 13

Elevation: 6180 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 21, 1975

Comments: Sampled near Sandoval Microwave Station at north edge of west-facing reentrant on the western edge of the Llano de Albuquerque. Site is on east side of unnamed fault. Thick section of buried calcic soils on downdropped fault block may represent similar tectonic setting as at the Bernalillo County Dump (see Machette, 1978c). Used values from 9Cu horizon as model for parent material for soils above. N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I (<2mm)	J	K	L	M	N	O	P	Q	R	
A	7/21/75A	Old system	top	bottom			>2mm	<2mm	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²			
-1	Cn	Cn			0		0.0	100.0	1.2	1.2	0.5	1.65	1.65	0.020	0.008	0.012	0.00		
-2	IIC1ca	2Bk1	0	30	30		0.0	100.0	1.7	1.7	1.0	1.65	1.65	0.028	0.017	0.011	0.33	N.R.	
-3	IIC2ca	2Bk2	30	95	65		0.0	100.0	11.9	11.9	1.0	1.70	1.65	0.202	0.017	0.185	12.04	N.R.	
-4	IIC3ca	2Bk3	95	210	115		0.0	100.0	0.8	0.8	1.0	1.65	1.65	0.013	0.017	-0.004	-0.44		
-5	IIK11	3K1	210	235	25		1.0	99.0	18.2	18.0	1.0	1.75	1.65	0.315	0.017	0.298	7.45	N.R.	
-6	IIK12	3K2m	235	270	35		3.0	97.0	30.5	29.6	1.0	1.92	1.65	0.568	0.017	0.551	19.30	N.R.	
-7	IIK2	3K3	270	300	30		2.0	98.0	21.7	21.3	1.0	1.60	1.65	0.341	0.017	0.324	9.71	N.R.	
-8	IIK3	3K4	300	320	20		2.0	98.0	26.0	25.5	1.0	1.81	1.65	0.462	0.017	0.445	8.89	N.R.	
-9	IVBs	4Bs	500	537	37		2.0	98.0	0.6	0.6	1.0	1.74	1.65	0.010	0.017	-0.007	-0.24		
-10	IVBca	4Bk1	537	587	50		0.0	100.0	10.6	10.6	1.0	1.69	1.65	0.179	0.017	0.162	8.11	N.R.	
-11	IVCca	4Bk2	587	647	60		4.0	96.0	23.2	22.3	1.0	1.84	1.65	0.410	0.017	0.393	23.60	N.R.	
-12	IVK	4K	647	707	60		4.0	96.0	8.8	8.5	1.0	1.92	1.65	0.163	0.017	0.146	8.77	N.R.	
-13	VBca	5Bk1	707	820	113		4.0	96.0	0.8	0.8	1.0	1.90	1.65	0.015	0.017	-0.002	-0.20		
-14	VK22m	5K1	820	840	20		1.0	99.0	13.6	13.5	1.0	1.97	1.65	0.266	0.017	0.249	4.98	N.R.	
-15	VK23m	5K2m	840	865	25		2.0	98.0	35.2	34.5	1.0	1.90	1.65	0.656	0.017	0.639	15.96	N.R.	
-16	VK32m	5K3	865	885	20		1.0	99.0	23.2	23.0	1.0	1.58	1.65	0.363	0.017	0.346	6.93	N.R.	
-17	VK33m	5K4	885	910	25		2.0	98.0	11.5	11.3	1.0	1.81	1.65	0.205	0.017	0.188	4.69	N.R.	

Site No. 5-Continued

Profile No. 7/21/75A

Unit or Surface: Llano de Albuquerque, faulted

Landform: Mesa

Quadrangle: Volcano Ranch 7.5' (L)

Lat. 35° 14' 20" N., Long. 106° 51' 41" W.

NE¹/₄, NE¹/₄, SW¹/₄, Sec. 29, T. 12 N., R. 1 E.

County: Sandoval

UTM: 3,900,950 N.; 330,680 E.; Zone 13

Elevation: 6180 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 21, 1975

Comments: Sampled near Sandoval Microwave Station at north edge of west-facing reentrant on the western edge of the Llano de Albuquerque. Site is on east side of unnamed fault. Thick section of buried calcic soils on downdropped fault block may represent similar tectonic setting as at the Bernalillo County Dump (see Machette, 1978c). Used values from 9Cu horizon as model for parent material for soils above. N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/21/75 A	Old system		New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-18	VCca	5Bk2		910	1040	130	2.0	98.0	2.5	2.5	1.0	1.78	1.65	0.045	0.017	0.028	3.58	N.R.	
-19	VIBca	6Bk1		1040	1115	75	4.0	96.0	1.3	1.3	1.0	1.86	1.65	0.024	0.017	0.007	0.53		
-20	VICca	6Bk2		1115	1135	20	3.0	97.0	3.4	3.3	1.0	1.85	1.65	0.061	0.017	0.044	0.88	N.R.	
-21	VIK1m	6K1		1135	1155	20	5.0	95.0	10.5	10.0	1.0	1.90	1.65	0.190	0.017	0.173	3.46	N.R.	
-22	VIK2m	6K2		1155	1195	40	1.0	99.0	16.3	16.1	1.0	1.92	1.65	0.309	0.017	0.292	11.68	N.R.	
-23	VIK3	6K3		1195	1220	25	3.0	97.0	7.8	7.6	1.0	1.85	1.65	0.141	0.017	0.124	3.09	N.R.	
-24	VIIIBca	7Bk1		1390	1450	60	3.0	97.0	23.5	22.8	1.0	1.74	1.65	0.397	0.017	0.380	22.78	N.R.	
-25	VIIIC2ca	7Bk2		1450	1495	45	2.0	98.0	12.1	11.9	1.0	1.85	1.65	0.220	0.017	0.203	9.14	N.R.	
-26	VIIIC3ca	7Bk3		1495	1535	40	4.0	96.0	14.8	14.2	1.0	1.89	1.65	0.268	0.017	0.251	10.06	N.R.	
-27	VIIIC1ca	8Bk1		1855	1920	65	0.0	100.0	13.0	13.0	1.0	1.74	1.65	0.226	0.017	0.209	13.60	N.R.	
-28	VIIIC2ca	8Bk2		1920	1995	75	3.0	97.0	8.8	8.5	1.0	1.80	1.65	0.153	0.017	0.136	10.20	N.R.	
-29	VIIIC3ca	8Bk3		1995	2170	175	4.0	96.0	12.3	11.8	1.0	1.79	1.65	0.211	0.017	0.194	34.00	N.R.	
-30	IXCca	9Bk1		2390	2460	70	2.0	98.0	10.5	10.3	1.0	1.92	1.65	0.198	0.017	0.181	12.65	N.R.	
-31	IXC2ca	9Bk2		2705	2815	110	1.0	99.0	9.2	9.1	1.0	1.83	1.65	0.167	0.017	0.150	16.45	N.R.	
-31	IXC3ca	9Bk3		3225	3380	155	4.0	96.0	1.4	1.0	1.0	1.92	1.65	0.019	0.017	0.002	1.34	N.R.	
-31	IXCn	9Cu		3380	N.E.	N.A.	4.0	96.0	1.0	1.0	1.0	1.65	1.65	0.017	0.017	0.000	0.00		
Total																		283.26	Total

Site No. 6

Profile No. 7/22/75A

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Volcano Ranch 7.5' (L)

Lat. 35° 13' 55" N., Long. 106° 51' 43" W.

NW¹/₄, NE¹/₄, NW¹/₄, Sec. 32, T. 12 N., R. 1 E.

County: Sandoval

UTM: 3,900,175 N.; 330,620 E.; Zone 13

Elevation: 6180 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 22, 1975

Comments: Sampled near Sandoval Microwave Station on east side of fault. Weak to moderately developed soil beneath young eolian sand. Physiographic surface from Machette (1985). N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
7/22/75A	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²			
-1	IIA/Cca	2A/Bk	0	65	65	0.0	100.0	3.8	3.8	0.4	1.62	1.6	0.062	0.0064	0.055	3.59	N.R.		
-2	IIC1ca	2Bk1	65	100	35	0.0	100.0	4.3	4.3	0.4	1.70	1.6	0.073	0.0064	0.067	2.33	N.R.		
-3	IIC2ca	2Bk2	100	215	115	0.0	100.0	3.3	3.3	0.4	1.74	1.6	0.057	0.0064	0.051	5.87	N.R.		
-4	IIC2ca	2Cu	215	285	70	0.0	100.0	0.6	0.6	0.4	1.85	1.6	0.011	0.0064	0.005	0.33			
Total																	12.12	Total	

Site No. 7

Profile No. 7/22/75B

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Volcano Ranch 7.5' (L)

Lat. 35° 13' 53" N., Long. 106° 51' 48" W.

NW¹/₄, NE¹/₄, NW¹/₄, Sec. 32, T. 12 N., R. 1 E.

County: Sandoval

UTM: 3,900,150 N.; 330,475 E.; Zone 13

Elevation: 6200 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 22, 1975

Comments: Sampled near Sandoval Microwave Station at south edge of west-facing reentrant on the western edge of the Llano de Albuquerque. Site is on west (upthrown) side of unnamed fault. Section comprised of late Pleistocene eolian sand and two buried soils. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		>2mm	G	H	I (<2mm)	Present day	Primary	Present day	Primary	N	O	Primary	Second.	
A			top	bottom	F									Total g/cm ³		Second.	g/cm ²	R
7/22/75B	Old system	New system																
N.S.	Cn	Cu	0	20	20		0.0	100.0	1.5	1.5	0.4	1.60	1.6	0.02	0.006	0.02	0.35	.
-5	IIC1ca	2Bk1	20	35	15		0.0	100.0	3.1	3.1	1.0	1.61	1.6	0.05	0.016	0.03	0.51	Stg. I
-6	IIC2ca	2Bk2	35	85	50		0.4	99.6	6.2	6.2	1.0	1.71	1.6	0.11	0.016	0.09	4.50	Stg. II-
-7	IIC3ca	2Bk3	85	130	45		2.1	98.0	1.4	1.4	1.0	1.75	1.6	0.02	0.016	0.00	0.38	Stg. I
N.S.	IICn	2Cu	130	185	55		0.0	100.0	1.0	1.0	1.0	1.65	1.6	0.02	0.016	0.00	0.03	
-8	IIIC2ca	3Bk1	185	260	75		5.4	95.0	7.9	7.5	1.0	1.83	1.6	0.14	0.016	0.12	9.09	Stg. II
-9	IIIC3ca	3Bk2	260	310	50		1.7	98.0	7.0	6.9	1.0	1.69	1.6	0.12	0.016	0.10	5.03	Stg. II-
N.S.	IIICn	3Cu	310	N.E.	N.A.		0.0	100.0	1.0	1.0	1.0	1.65	1.6	0.02	0.016	0.00	0.00	
														19.89		Total		

Site No. 8

Profile No. 7/22/75C

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Volcano Ranch 7.5' (L)

Lat. 35° 13' 30" N., Long. 106° 48' 57" W.

Unsurveyed, Town of Alameda Grant

County: Sandoval

UTM: 3,899,400 N.; 334,890 E.; Zone 13

Elevation: 5950 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 22, 1975

Comments: Sampling locality at southern tip of eroded Llano de Albuquerque surface, from eastern side of road cut. Surface is south-sloping, but backtitled to the west (*i.e.*, reversing original southeasterly slope). Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/22/75C		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second g/cm ³	Second g/cm ²			
N.S.	K1m, eroded			0	30	30	00	100.0	30.0	30.0	1.0	1.60	1.6	0.480	0.016	0.464	13.92	Stg. III		
-10	K21m			30	40	10	3.0	97.0	39.2	38.0	1.0	1.58	1.6	0.600	0.016	0.584	5.84	Stg. III		
-11	K22m			40	50	10	2.0	98.0	48.1	47.1	1.0	1.60	1.6	0.754	0.016	0.738	7.38	Stg. III+		
-12	K3			50	90	40	3.0	97.0	45.6	44.2	1.0	1.52	1.6	0.672	0.016	0.656	26.23	Stg. III+		
-13	K3			90	133	43	2.0	98.0	35.2	34.5	1.0	1.60	1.6	0.552	0.016	0.536	23.05	Stg. III		
-14	C1ca			133	165	32	4.0	96.0	29.7	28.5	1.0	1.75	1.6	0.499	0.016	0.483	15.45	Stg. II		
-15	C2ca			165	197	32	2.0	98.0	24.6	24.1	1.0	1.77	1.6	0.427	0.016	0.411	13.14	Stg. II		
N.S.	C3ca			197	230	33	2.0	98.0	10.2	10.0	1.0	1.60	1.6	0.160	0.016	0.144	4.75	Stg. II-		
N.S.	Cn			230	N.E.	N.A.	00	100.0	20	20	1.0	1.60	1.6	0.032	0.016	0.016	0.00	Total		

Site No. 9

Profile No. 6/03/74-3

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: La Mesita Negra SE 7.5' (P)

Lat. 35° 04' 17" N., Long. 106° 52' 10" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,882,400 N.; 329,400 E.; Zone 13

Elevation: 5940 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 3, 1974

Comments: On western edge of the Llano de Albuquerque, just west of the West Mesa Radar Station (BM 5974). Relict soil, buried by eolian sand (sample -3a). Stable sampling site. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
6/03/74	Old system	New system	top	bottom			>2mm	<2mm		Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-3a	Cca	Bk			0	0.0	100.0	3.4	3.4	1.3	1.60	1.6	0.054	0.021	0.033	0.00		
-3b	IIAca	2Ak	0	30	30	0.0	100.0	2.8	2.8	1.3	1.70	1.6	0.048	0.021	0.027	0.80	Stg. I	
-3c	IIIBsca	2Bsk	30	70	40	0.0	100.0	2.2	2.2	1.3	1.70	1.6	0.037	0.021	0.016	0.66	Stg. I	
-3d	IICca	2Bk	70	160	90	0.0	100.0	5.3	5.3	1.3	1.70	1.6	0.090	0.021	0.069	6.22	Stg. II-	
-3e	IIIK1m	3K1m	160	175	15	3.0	97.0	51.2	49.7	1.3	1.50	1.6	0.746	0.021	0.725	10.87	Stg. III	
-3f	IIIK22m	3K2m	175	195	20	1.5	98.5	49.1	48.4	1.3	1.49	1.6	0.721	0.021	0.700	14.00	Stg. III	
-3g	IIIK22m	3K3m	195	240	45	1.0	99.0	52.5	52.0	1.3	1.57	1.6	0.816	0.021	0.795	35.79	Stg. III	
-3h	IIIK3m	3K4	240	350	110	1.0	99.0	24.2	24.0	1.3	1.58	1.6	0.379	0.021	0.358	39.40	Stg. III-	
-3i	IIICca	3BK2	350	450	100	5.0	95.0	12.0	11.4	1.3	1.60	1.6	0.182	0.021	0.161	16.14	Stg. II+	
N.S.	IIICn	3Cu	450	N.E.	N.A.	10.0	90.0	1.4	1.3	1.3	1.60	1.6	0.021	0.021	0.000	0.00	Stg. II	
Total																	123.88	

Site No. 10

Profile No. 5/30/74-2

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: La Mesita Negra SE 7.5' (P)

Lat. 35° 04' 38" N., Long. 106° 46' 42" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,882,800 N.; 337,600 E.; Zone 13

Elevation: 5680 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: May 30, 1974.

Comments: Soil X, east of Bernalillo County Dump fault (see Machette, 1978c). Thick aggradational profile buries soil Y. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)	Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C			G	H	I (<2mm)	J	K	L	M	N	O	P	Q	
5/30/74	Old system	New system	top	bottom	>2mm	<2mm		Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	K21m	K1m	0	30	50	95.0	20.0	18.0	2.0	1.70	1.6	0.306	0.032	0.274	8.22	Stg. III
-2a	K22m	K2m	30	88	7.0	93.0	19.6	18.2	2.0	1.73	1.6	0.315	0.032	0.283	16.41	Stg. III
-2b	K23m	K3m	88	118	1.0	99.0	46.3	45.8	2.0	1.96	1.6	0.898	0.032	0.866	25.97	Stg. III+
-2c	K3m	K4	118	170	2.0	98.0	24.4	23.9	2.0	1.85	1.6	0.442	0.032	0.410	21.33	Stg. III-
-2d	Cca1	Bk1	170	200	1.0	99.0	6.2	6.1	2.0	1.70	1.6	0.104	0.032	0.072	2.15	Stg. II-
-2e	Cca2	Bk2	200	250	4.0	96.0	8.7	8.4	2.0	1.70	1.6	0.143	0.032	0.111	5.54	Stg. II-
-2f	Cca3	Bk3	250	410	3.0	97.0	4.1	4.0	2.0	1.65	1.6	0.066	0.032	0.034	5.44	Stg. I
N.S.	Ch	Cu	410	N.E.	0.0	100.0	2.0	2.0	2.0	1.60	1.6	0.032	0.032	0.000	0.00	
Total																85.06

Site No. 11

Profile No. 6/04/74-3

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: La Mesita Negra SE 7.5' (P)

Lat. 35° 04' 40" N., Long. 106° 46' 45" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,882,875 N.; 337,880 E.; Zone 13

Elevation: 5680 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 4, 1974.

Comments: Relict soil from E. end of Llano de Albuquerque surface at the Bernalillo County Dump. Sampled at K&P triangulation station (Ed. 1973), which is Machette's (1978c) plane table station A. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P		Q
A																		
6/04/84		Old system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	K21m	K1m	0	15	15	0.0	100.0	45.0	45.0	1.8	1.70	1.65	0.765	0.030	0.735	11.03	Stg. III+	
-3a	K22m	K2m	15	35	20	2.5	97.5	53.3	52.0	1.8	1.77	1.65	0.920	0.030	0.890	17.81	Stg. III+	
-3b	K31m	K3m	35	75	40	1.0	99.0	47.1	46.6	1.8	1.53	1.65	0.713	0.030	0.683	27.32	Stg. III+	
-3c	K32m	K4	75	150	75	3.0	97.0	29.1	28.2	1.8	1.71	1.65	0.482	0.030	0.452	33.92	Stg. III- to II+	
-3d	Cca	Bk	150	200	50	4.0	96.0	14.6	14.0	1.8	1.70	1.65	0.238	0.030	0.208	10.40	Stg. II	
N.S.	Cn	Cu	200	N.E.	N.A.	5.0	95.0	1.9	1.8	1.8	1.65	1.65	0.030	0.030	0.000	0.00		
Total																	100.48	Total

Site No. 12

Profile No. 78M-6

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: La Mesita Negra SE 7.5' (P)

Lat. 35° 04' 43" N., Long. 106° 46' 19" W.

Unsurveyed Town of Alameda Grant

County: Bernalillo

UTM: 3,837,940 N.; 338,555 E.; Zone 13

Elevation: 5660 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: December 14, 1978

Comments: Location approximate; sampling for U-Th analysis, bulk densities, and CaCO₃ contents; field notes unavailable. Comprises soils VXYZ of Machette (1978c). Soil U is 123 cm above top of sampled section. See also Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q		
A																			R
78M	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second g/cm ³	Second g/cm ²			
-6g	K	K	63	0	63	3.4	96.6	30.0	29.0	1.5	1.75	1.7	0.508	0.026	0.482	30.33		Soil V	
-6a	K11m	2K2m	0	35	35	1.3	98.7	38.1	37.6	1.5	1.75	1.7	0.658	0.026	0.632	22.12		Stg. III	
-6b	K12m	2K3m	35	50	15	2.1	97.9	45.5	44.5	1.5	1.80	1.7	0.801	0.026	0.775	11.63		Stg. III	
-6c	K22m	2K4m	50	75	25	0.6	99.4	51.0	50.7	1.5	1.72	1.7	0.872	0.026	0.846	21.15		Stg. III+	
-6d	K23m	2K5m	75	92	17	0.3	99.7	37.3	37.2	1.5	1.70	1.7	0.632	0.026	0.606	10.31		Stg. III	
-6e	K3	2K6	92	122	30	6.2	93.8	18.7	17.5	1.5	1.70	1.7	0.298	0.026	0.272	8.15		Stg. III-	
-6f	Cca	2Bk	122	160	38	5.4	94.6	11.2	10.6	1.5	1.75	1.7	0.186	0.026	0.160	6.06		Stg. II	
N.S.	Cn	2Cu	160	N.E.	N.A.	5.4	94.6	1.6	1.5	1.5	1.75	1.7	0.030	0.026	0.000	0.00			
Soil XYZ																		79.52	Subtotal
Soil VXYZ																		109.85	Total

Site No. 13

Profile No. 6/03/74-2

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: La Mesita Negra SE 7.5' (P)

Lat. 35° 00' 45" N., Long. 106° 46' 18" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,875,640 N.; 338,300 E.; Zone 13

Elevation: 5480 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 3, 1974

Comments: Location about 0.9 km (0.55 mi.) N. of Good triangulation station (USCGS, #1071, 1969) on eastern margin of the Llano de Albuquerque. Natural exposure of eolian sand over slightly pebbly alluvium (upper Santa Fe Group sediment). Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C		D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
A				top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
6/03/74	Old system	New system																	
N.S.	Cca	Bk1	0	20	20	20	0.0	100.0	2.5	2.5	1.5	1.60	1.6	0.040	0.024	0.016	0.32	N.R.	
-2a	IIK1m	2K1	20	43	23	23	7.0	93.0	15.3	14.2	1.5	1.90	1.6	0.270	0.024	0.246	5.66	Stg. II+	
-2b	IIK2m	2K2m	43	86	43	43	4.0	96.0	45.9	44.1	1.5	1.88	1.6	0.830	0.024	0.806	34.62	Stg. III+	
-2c	IIK3m	2K3m	86	126	40	40	0.0	100.0	34.4	34.4	1.5	1.74	1.6	0.599	0.024	0.575	22.98	Stg. III-	
-2d	IIC2ca	2Bk2	126	160	34	34	1.0	99.0	19.2	19.0	1.5	1.70	1.6	0.332	0.024	0.299	10.17	Stg. III to II	
-2e	IIICca	3Bk1	160	175	15	15	3.0	97.0	20.0	19.4	1.5	1.70	1.6	0.330	0.024	0.306	4.59	Stg. II	
-2f	IIIK2m	3K2m	175	205	30	30	1.0	99.0	36.9	36.5	1.5	1.86	1.6	0.679	0.024	0.655	19.65	Stg. III	
-2g	IIIK3m	3K3m	205	245	40	40	1.0	99.0	24.6	24.4	1.5	1.75	1.6	0.427	0.024	0.403	16.12	Stg. III- to II	
-2h	IIIC2ca	3Bk2	245	315	70	70	2.0	98.0	5.2	5.1	1.5	1.70	1.6	0.087	0.024	0.063	4.39	Stg. II	
N.S.	IIICn	3Cu	315	N.E.	N.A.	N.A.	2.0	98.0	1.5	1.5	1.5	1.60	1.6	0.000	0.024	0.000	0.00		
Total																		118.50	Total

Site No. 14

Profile No. 7/23/75-1

Unit or Surface: Primero Alto

Landform: Terrace

Quadrangle: Albuquerque West 7.5' (Q)

Lat. 35° 03' 16" N., Long. 106° 42' 25" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,880,300 N.; 344,250 E.; Zone 13

Elevation: 4990 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 23, 1975

Comments: Sampled in north end of gravel pit west of Coors Road and east of the San Jose cemetery in Arenal.. Location from Machette's notes for soil profile no. 8/10/74. Terrace is about 14 m (45 ft.) above the Rio Grande. Physiographic surface named by Lambert (1968); see also Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/23/75		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	A/Bs	A/Bs		0	35	35	0.0	100.0	0.0	0.5	1.0	1.65	1.7	0.008	0.017	-0.009	-0.32		
-1a	C1ca	Bk1		35	53	18	2.0	98.0	6.9	6.8	1.0	1.65	1.7	0.112	0.017	0.095	1.71	Stg. II-	
-1b	C21ca	Bk2		53	90	37	14.0	86.0	12.2	10.5	1.0	1.77	1.7	0.186	0.017	0.169	6.25	Stg. II	
-1c	C22ca	Bk3		90	123	33	35.0	65.0	16.8	10.9	1.0	1.90	1.7	0.207	0.017	0.190	6.27	Stg. II+	
-1d	C3ca	Bk4		123	143	20	17.0	83.0	3.6	3.0	1.0	1.75	1.7	0.053	0.017	0.036	0.71	Stg. II-	
N.S.	Cn	Cu		143	NE.	N.A.				1.0	1.0	1.70	1.7	0.017	0.017	0.000	0.00		
																		14.62	Total

Site No. 15

Profile No. 7/23/75-2

Unit or Surface: Primero Alto

Landform: Terrace

Quadrangle: Albuquerque West 7.5' (Q)

Lat. 35° 00' 58" N., Long. 106° 43' 18" W.

Unsurveyed, Town of Atrisco Grant

County: Bernalillo

UTM: 3,875,910 N.; 342,930 E.; Zone 13

Elevation: 4980 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 23, 1975

Comments: Sampled about 580 m (1900 ft.) W of Coors Road and 1.6 km (1.0 mi.) south of Barcelona Road. Older alluvium (Qao) of Lambert (1968) forms Primero Alto terrace, which is about 15 m (50 ft.) above the Rio Grande. See also Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage		
	A	B	C	D		E	F	G	H	I	J	K	L	M	N	O		P	Q
7/23/75																			
N.S.	A/Bs	A/Bs	0	43	43	43	0.0	100.0	1.0	1.0	1.0	1.70	1.7	0.017	0.017	0.000	0.00		
-2a	C1ca	Bk1	43	65	22	22	22.0	78.0	13.5	10.5	1.0	1.72	1.7	0.181	0.017	0.164	3.60	N.R.	
-2b	C2ca	Bk2	65	90	25	25	16.0	84.0	18.5	15.5	1.0	1.78	1.7	0.276	0.017	0.259	6.47	N.R.	
-2c	C3ca	Bk3	90	115	25	25	43.0	57.0	47	2.7	1.0	1.75	1.7	0.047	0.017	0.030	0.76	N.R.	
N.S.	Cn	Cu	115	N.E.	N.A.	N.A.	25.0	75.0	2.0	1.5	1.0	1.70	1.7	0.034	0.017	0.007	0.00		
																	10.83	Total	

Site No. 16

Profile No. 7/10/74-3

Unit or Surface: Sunport (Albuquerque Airport)

Landform: Distal piedmont slope

Quadrangle: Albuquerque East 7.5' (R)

Lat. 35° 01' 52" N., Long. 106° 36' 40" W.

SW¹/₄, SW¹/₄, SE¹/₄, Sec. 3, T.9 N., R. 3 W.

County: Bernalillo

UTM: 3,877,500 N.; 352,975 E.; Zone 13

Elevation: 5300 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 10, 1974

Comments: Sampled on north side of Tijeras Arroyo at south end of N-S runway for Albuquerque International airport. Surface probably equivalent to Llano de Manzano of Machette (1985). Total secondary CaCO₃ does not include sample 7/10/74-3a in calculation. Physiographic surface projects to about 114 m (375 ft.) above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I (<2mm)	J Present day	K Primary	L Present day	M Primary	N Total g/cm ³	O Primary g/cm ³	P Second. g/cm ³	Q Second. g/cm ²		
7/10/74	Old system	New system	top	bottom			>2mm	<2mm		Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-3a	Cn	Cu	0	0	0	0.0	100.0	1.0	1.0	1.0	1.60	1.6	0.016	0.016	0.000	0.00			
-3b	IICca	2Bk	0	20	20	2.0	98.0	6.6	6.5	1.0	1.60	1.6	0.104	0.016	0.088	1.76		Stg. II-	
-3c	IIK1m	2K1m	0	45	45	3.0	97.0	42.8	41.5	1.0	1.73	1.6	0.718	0.016	0.702	31.59		Stg. III	
-3d	IIK2m	2K2m	45	65	20	2.0	98.0	54.1	53.0	1.0	1.66	1.6	0.880	0.016	0.864	17.28		Stg. III+	
-3e	IIK3m	2K3	65	105	40	1.5	98.5	27.7	27.3	1.0	1.65	1.6	0.450	0.016	0.434	17.38		Stg. III-	
-3f	IICca	2Bk	105	170	65	2.0	98.0	10.1	9.9	1.0	1.60	1.6	0.158	0.016	0.142	9.26		Stg. II	
N.S.	IICn	2Cu	170	N.E.	N.A.	2.0	98.0	1.0	1.0	1.0	1.60	1.6	0.016	0.016	0.000	0.00		Total	

Site No. 17

Profile No. 8/07/76-1

Unit or Surface: Llano de Manzano

Landform: Distal piedmont slope

Quadrangle: Albuquerque East 7.5' (R)

Lat. 35° 00' 29" N., Long. 106° 36' 40" S.

Approx. SW¹/₄, NE¹/₄, Sec. 15, T. 9 N., R. 3 E.

County: Bernalillo

UTM: 3,874,950 N.; 352,950 E.; Zone 13

Elevation: 5295 ft.

Described by George Bachman

Sampled by George Bachman

Sampling date: August 7, 1976

Comments: Location approximate at head of south-trending swale, south margin of Tijeras Canyon north of E-W landing strip. Soil is probably overthickened and overdeveloped owing to landscape position (*i.e.*, some surface groundwater component to secondary CaCO₃). Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
8/07/76	Old system	New system	top	bottom			>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	Cca	Bk	0	80	80		0.0	100.0	8.0	8.0	2.50	1.60	1.65	0.128	0.041	0.087	6.96	Stg. II
-1a	IIK21m	2K1m	80	155	75		0.0	100.0	16.2	16.2	2.50	1.77	1.65	0.289	0.041	0.246	18.41	Stg. III-
-1b	IIK22m	2K2m	155	255	100		0.0	100.0	47.6	47.6	2.50	1.69	1.65	0.804	0.041	0.763	76.34	Stg. III+
-1e	IIK23m	2K3m	255	305	50		0.0	100.0	43.1	43.1	2.50	1.62	1.65	0.698	0.041	0.657	32.85	Stg. III+
-1c	IIK3	2K4	305	370	65		0.0	100.0	15.6	15.6	2.50	1.83	1.65	0.285	0.041	0.244	15.89	Stg. III-
-1d	IICca	2Bk	370	380	10		0.0	100.0	10.2	10.2	2.50	1.67	1.65	0.170	0.041	0.129	1.29	Stg. II
N.S.	IICn	2Cu	380	N.E.	N.A.		0.0	100.0	2.5	2.5	2.50	1.65	1.65	0.041	0.041	0.000	0.00	
																	151.76	Total

Site No. 18

Profile No. 6/03/74-1

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Wind Mesa 7.5' (C2)

Lat. 34° 59' 50" N., Long. 106° 46' 03" W.

Unsurveyed, Parajito Grant

County: Bernalillo

UTM: 3,873,950 N.; 338,700 E.; Zone 13

Elevation: 5390 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 3, 1974

Comments: West of Interstate Highway 25, opposite Isleta Pueblo. Sampling locality along eastern edge of the Llano de Albuquerque in natural exposure. Base covered, so total secondary CaCO₃ is an estimate. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)	Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C			G	H	I	J	K	L	M	N	O	P	Q	R	
6/03/74	Old system	New system	top	bottom	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-1a	Cca	Bk	0	33	0.0	100.0	3.2	3.2	1.5	1.65	1.65	0.053	0.025	0.028	0.92	N.R.	
N.S.	IICca	2Bk1	33	53	5.0	95.0	25.0	23.8	1.5	1.70	1.65	0.405	0.025	0.380	7.59	N.R.	
-1b	IIK2m	2K1m	53	83	5.0	95.0	39.2	37.2	1.5	1.66	1.65	0.618	0.025	0.593	17.78	N.R.	
-1c	IIK3m	2K2m	83	128	7.0	93.0	25.0	23.2	1.5	1.80	1.65	0.418	0.025	0.393	17.67	N.R.	
-1d	IICca	2Bk2	128	178	5.0	95.0	18.9	18.0	1.5	1.70	1.65	0.306	0.025	0.281	14.05	N.R.	
N.S.	IICca	2Bk3	178	250	5.0	95.0	10.0	9.5	1.5	1.70	1.65	0.162	0.025	0.137	19.83	N.R.	
N.S.	IICn	2Cu	250	N.E.	5.0	95.0	1.60	1.5	1.5	1.65	1.65	0.025	0.025	0.000	0.00		
67.84																Total	

Site No. 19

Profile No. 7/10/74-1

Quadrangle: Isleta 7.5' (D2)

County: Bernalillo

Described by Michael Machette

Unit or Surface: Llano de Manzano

Lat. 34° 59' 35" N., Long. 106° 37' 54" W.

UTM: 3,873,280 N.; 351,100 E.; Zone 13

Sampled by Michael Machette

Landform: Distal piedmont slope

NW¹/₄, NE¹/₄, SW¹/₄, Sec. 21, T.9 N., R. 3 W.

Elevation: 5300 ft.

Sampling date: July 10, 1974

Comments: Sampled on south side of Tijeras Arroyo along northern margin of the Llano de Manzano. Surface probably equivalent to Sunport surface according to Machette (1985) (see soil profile 7/10/74-3). Physiographic surface is about 117 m (385 ft.) above the Rio Grande. N.S., not sampled; N.A., not applicable.

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	B	C		D	E		F	G	H	I	J	K	L	M	N	O	P		Q
A																			
7/10/74		Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	C1ca	Bk1		0	25	25	5.0	95.0	5.1	48	1.5	1.60	1.6	0.077	0.024	0.053	1.32	Stg. I	
-1f	C2ca	Bk2		25	50	25	9.0	91.0	5.2	10.0	1.5	1.60	1.6	0.160	0.024	0.136	3.40	Stg. II	
-1a	IIK1m	2K1		50	62	12	2.0	98.0	23.4	22.9	1.5	1.58	1.6	0.362	0.024	0.338	4.05	Stg. III-	
-1b	IIK2m	2K2m		62	82	20	1.0	99.0	54.9	54.4	1.5	1.61	1.6	0.876	0.024	0.852	17.04	Stg. III+	
-1c	IIK32	2K3		82	102	20	4.0	96.0	31.6	30.3	1.5	1.60	1.6	0.485	0.024	0.461	9.22	Stg. III-	
-1d	IIK33	2K4		102	145	43	3.0	97.0	25.8	25.0	1.5	1.52	1.6	0.380	0.024	0.356	15.31	Stg. III-	
-1e	IICca	2Bk		145	210	65	2.0	98.0	9.5	9.3	1.5	1.60	1.6	0.149	0.024	0.125	8.11	Stg. II	
N.S.	IICn	2Cu		210	N.E.	N.A.	2.0	98.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00		
																		58.45	Total

Site No. 20

Profile No. 7/16/74-2

Quadrangle: Los Lunas 7.5' (12)

County: Valencia

Described by Michael Machette

Comments: Same sampling location as soil profile no. 6/05/74-2. Thick cover of recent eolian sand over a well-preserved soil on late(?) or middle Pleistocene terrace cut into Llano de Manzano. Terrace forms broad south-sloping surface graded to a position about 55 m (180 ft) above the Rio Grande. N.S., not sampled; N.A., not applicable.

Unit or Surface: Unmapped Quaternary alluvium

Lat. 34° 46' 07" N., Long. 106° 39' 57" W.

UTM: 3,848,375 N.; 347,480 E.; Zone 13

Sampled by Michael Machette

Landform: Terrace

SW¹/₄, SW¹/₄, SE¹/₄, Sec. 6, T. 6 N., R. 3 E.

Elevation: 5010 ft.

Sampling date: July 16, 1974

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)				Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/16/74	Old system	New system	top	bottom			>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-2a	Cn	Cu	100+	0	0	50	95.0		2.4	2.3	2.0	1.65	1.65	0.038	0.033	0.005	0.00		
-2b	IICca	2Bk1	0	18	18	60	94.0		19.3	18.1	1.0	1.76	1.65	0.319	0.017	0.302	5.43	Stg. II-	
-2c	IIK1m	2K1m	18	36	18	40	96.0		25.1	24.1	1.0	1.64	1.65	0.398	0.017	0.378	6.85	Stg. III-	
-2d	IIK2m	2K2m	36	64	28	30	97.0		27.1	26.3	1.0	1.63	1.65	0.429	0.017	0.412	11.53	Stg. III-	
-2e	IIK3m	2K3m	64	100	36	40	96.0		16.2	15.6	1.0	1.74	1.65	0.271	0.017	0.254	9.16	Stg. II+	
-2f	IICca	2Bk2	100	150	50	10.0	90.0		8.8	7.9	1.0	1.70	1.65	0.134	0.017	0.117	5.87	Stg. II	
-2g	IIC2ca _{ox}	2Bsk	150	190	40	1.0	99.0		1.6	1.6	1.0	1.65	1.65	0.026	0.017	0.009	0.38	Stg. II to I	
N.S.	IICn	2Cu	190	N.E.	N.A.	1.0	99.0		1.0	1.0	1.0	1.65	1.65	0.017	0.017	0.000	0.00		
																	39.22	Total	

stop forming

Site No. 21

Profile No. 6/05/74-2

Unit or Surface: Unmapped Quaternary alluvium

Landform: Terrace

Quadrangle: Los Lunas 7.5' (12)

Lat. 34° 46' 07" N., Long. 106° 39' 57" W.

SW¹/₄, SW¹/₄, SE¹/₄, Sec. 6, T. 6 N., R. 3 E.

County: Valencia

UTM: 3,848,375 N.; 347,480 E.; Zone 13

Elevation: 5010 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 16, 1974

Comments: Same sampling location as soil profile no. 7/16/74-2. Thick cover of recent eolian sand over a well-preserved soil on late(?) or middle Pleistocene terrace cut into Llano de Manzano. Terrace forms broad south-sloping surface graded to a position about 55 m (180 ft) above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
6/05/74	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-2a	Cn	Cu	100+	0	0	5.0	95.0	2.4	2.3	2.0	1.65	1.65	0.038	0.033	0.005	0.00		
-2b	IICca	2Bk1	0	18	18	6.0	94.0	19.3	18.1	1.0	1.76	1.65	0.319	0.017	0.302	5.44	Sig. II-	
-2c	IIC1m	2K1m	18	36	18	4.0	96.0	25.1	24.1	1.0	1.64	1.65	0.395	0.017	0.378	6.81	Sig. III-	
-2d	IIC2m	2K2m	36	64	28	3.0	97.0	27.1	26.3	1.0	1.63	1.65	0.428	0.017	0.412	11.53	Sig. III-	
-2e	IIC3m	2K3m	64	100	36	4.0	96.0	16.2	15.6	1.0	1.74	1.65	0.271	0.017	0.254	9.16	Sig. II+	
-2f	IICca	2Bk2	100	150	50	10.0	90.0	8.8	7.9	1.0	1.70	1.65	0.134	0.017	0.117	5.87	Sig. II	
-2g	IIC2ca _{ox}	2Boxk	150	190	40	1.0	99.0	1.6	1.6	1.0	1.65	1.65	0.026	0.017	0.009	0.38	Sig. II to I	
N.S.	IICn	2Cu	190	N.E.	N.A.	1.0	99.0	1.0	1.0	1.0	1.65	1.65	0.017	0.017	0.000	0.00		
Total																	39.21	

Site No. 22

Profile No. 7/24/75

Quadrangle: Mesas Mojinas 7.5' (K2)

County: Valencia

Described by Michael Machette

Sampled by Michael Machette

Unit or Surface: Frost Ranch

Lat. 34° 40' 34" N., Long. 107° 01' 35" W.

UTM: 3,836,800 N.; 314,500 E.; Zone 13

Landform: Piedmont slope

Boundary of Sec. 10/11, T. 5 N., R. 2 W.

Elevation: 5600 ft.

Sampling date: July 24, 1975

Comments: On boundary of two sections, ca. 0.4 km (0.25 mi.) S. of north edge of sections. Uplifted post-Llano de Albuquerque surface on southwest margin of the Gabaladon badlands (source is unpublished mapping by Machette, ca. 1975.). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
7/24/75																			
N.S.		Bsca	Bsk	0	30	30	00	100.0	50	50	2.0	1.60	1.65	0.080	0.033	0.047	1.41	Stg. I+	
-1		K1m	K1m	30	48	18	11.0	89.0	32.7	29.1	2.0	1.80	1.65	0.521	0.033	0.491	8.83	Stg. III	
-2		K2m	K2m	48	80	32	23.0	77.0	23.2	17.9	2.0	1.91	1.65	0.309	0.033	0.309	9.88	Stg. III	
-3		K31m	K3m	80	110	30	30	97.0	14.9	14.5	2.0	1.65	1.65	0.204	0.033	0.206	6.19	Stg. III- to II	
-4		K32m	K4m	110	170	60	40	94.0	18.8	17.7	2.0	1.71	1.65	0.303	0.033	0.270	16.18	Stg. III-	
-5		Cca	Bk	170	190	20	20	98.0	12.0	11.8	2.0	1.66	1.65	0.196	0.033	0.163	3.26	Stg. II-	
N.S.		Cn	Cu	190	N.E.	N.A.	50	95.0	2.1	2.0	2.0	1.65	1.65	0.033	0.033	0.000	0.00		
Total																		45.75	Total

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Site No. 23

Profile No. 5/30/74-1

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Belen 7.5' (M2)

Lat. 34° 39' 02" N., Long. 106° 48' 38" W.

Unsurveyed, Belen Grant

County: Valencia

UTM: 3,835,475 N.; 334,025 E.; Zone 13

Elevation: 5175 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: May 30, 1974.

Comments: Resampled on January 13, 1976 (soil profile no. 1/13/76-4). Location on eastern margin of the Llano de Albuquerque on N. side of Camino del Llano road, west of Belen dump (now abandoned). Surface is about 116 m (380 ft.) above the Rio Grande. Physiographic surface from Machette (1985). N.S., not sampled; N.A., not applicable.

Sample number	Horizon nomenclature			Depth (cm)		Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
5/30/74		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-1a		Cca	Bk	0	38	38	1.0	99.0	99	98	1.5	1.70	1.6	0.167	0.024	0.143	5.42	Stg. II	
-1b		IIAca	2Ak	38	60	22	3.0	97.0	32	3.1	1.5	1.70	1.6	0.053	0.024	0.029	0.63	Stg. I	
-1c		IICca	2Bk	60	75	15	5.0	95.0	16.1	15.3	1.5	1.70	1.6	0.260	0.024	0.236	3.54	Stg. II	
-1d		IIK21m	2K1m	75	85	10	2.0	98.0	35.8	35.1	1.5	1.75	1.6	0.614	0.024	0.590	5.90	Stg. III	
-1e		IIK22m	2K2m	85	110	25	0.5	99.5	50.7	50.5	1.5	1.80	1.6	0.909	0.024	0.885	22.13	Stg. III+	
-1f		IIK23m	2K3m	110	130	20	1.0	99.0	45.6	45.1	1.5	1.75	1.6	0.798	0.024	0.765	15.31	Stg. III+	
-1g		IIK3	2K4	130	180	50	2.0	98.0	23.1	22.6	1.5	1.70	1.6	0.384	0.024	0.360	18.01	Stg. II+	
N.S.		IIICca	3Bk	180	285	105	0.0	100.0	14.0	14.0	1.5	1.65	1.6	0.231	0.024	0.207	21.74	Stg. II+ to II	
N.S.		IVCca	4Bk	285	350	65	75.0	25.0	20.0	5.0	1.5	1.60	1.6	0.080	0.024	0.056	3.64	Stg. II	
N.S.		VCn	5Cu	350	N.E.	N.A.	75.0	25.0	6.0	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00		
																	96.32	Total	

Site No. 24

Profile No. 1/13/76-4

Unit or Surface: Llano de Albuquerque

Landform: Mesa

Quadrangle: Belen 7.5' (M2)

Lat. 34° 39' 02" N., Long. 106° 48' 38" W.

Unsurveyed, Belen Grant

County: Valencia

UTM: 3,835,475 N.; 334,025 E.; Zone 13

Elevation: 5175 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: January 13, 1976.

Comments: Resampling of soil profile no. 5/30/74-1. Location on eastern margin of the Llano de Albuquerque on N. side of Camino del Llano road, west of Belen dump (now abandoned). Surface is about 116 m (380 ft.) above the Rio Grande. Physiographic surface from Machette (1985). N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1/13/76-4	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-4a	Cca	Bk	0	75	75	0.0	100.0	7.1	7.1	1.5	1.53	1.6	0.109	0.024	0.085	6.35	N.R.	
-4b	IIK21m	2K1m	75	85	10	2.0	98.0	56.1	55.0	1.5	1.41	1.6	0.776	0.024	0.752	7.52	N.R.	
-4c	IIK21m	2K2m	85	110	25	1.0	99.0	42.8	42.4	1.5	1.40	1.6	0.594	0.024	0.570	14.25	N.R.	
-4d	IIK23m	2K3m	110	130	20	1.0	99.0	35.8	35.4	1.5	1.42	1.6	0.503	0.024	0.478	9.59	N.R.	
-4e	IIK31	2K4	130	155	25	0.0	100.0	35.8	35.8	1.5	1.62	1.6	0.580	0.024	0.556	13.90	N.R.	
-4f	IIK32	2K5	155	180	25	1.0	99.0	20.4	20.2	1.5	1.52	1.6	0.307	0.024	0.283	7.08	N.R.	
-4g	IIICca	3Bk1	180	230	50	0.0	100.0	9.0	9.0	1.5	1.60	1.6	0.144	0.024	0.120	6.00	N.R.	
-4h	IICca2	3Bk2	230	285	55	0.0	100.0	9.0	9.0	1.5	1.60	1.6	0.144	0.024	0.120	6.60	N.R.	
-4i	IVCca	4Bk	285	317	32	0.0	100.0	4.5	4.5	1.6	1.60	1.6	0.072	0.026	0.048	1.47	N.R.	
-4j	VCn	5Cu	317	350	33	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00		
Total																	72.76	Total

Site No. 25

Profile No. 7/03/74-3

Unit or Surface: Llano de Manzano

Landform: Distal piedmont slope

Quadrangle: Tome 7.5' (N2)

Lat. 34° 43' 28" N., Long. 106° 40' 52" W.

Unsurveyed, Tome Grant

County: Valencia

UTM: Not shown on map.

Elevation: 4990 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 3, 1974

Comments: About 2.4 km (1.5 mi.) E. of El Cerro and Tome cemetery. May represent distal portion of piedmont slope (Llano de Manzano) or fluvial terrace (?) that is about 54 m (180 ft) above the Rio Grande. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
7/03/74-3	Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	Cca	Bk	50+	0	50	0.0	100.0	3.0	3.0	1.5	1.70	1.6	0.051	0.024	0.027	1.35	N.R.	
-3a	IIK1m	2K1m	0	20	20	1.0	99.0	27.6	27.3	1.5	1.71	1.6	0.467	0.024	0.443	8.86	N.R.	
-3b	IIK2m	2K2m	20	42	22	1.0	99.0	24.0	23.8	1.5	1.74	1.6	0.414	0.024	0.390	8.58	N.R.	
-3c	IIK3	2K3	42	112	70	4.0	96.0	15.9	14.3	1.5	1.70	1.6	0.243	0.024	0.219	15.34	N.R.	
N.S..	IICca	2Bk	112	162	50	5.0	95.0	8.4	8.0	1.5	1.60	1.6	0.128	0.024	0.104	5.20	N.R.	
N.S.	IICn	2Cu	162	N.E.	N.A.	5.0	95.0	1.6	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00	Total	
39.33																	Total	

Site No. 26

Profile No. 6/09/76-1

Quadrangle: Belen SW 7.5' (Q2)

County: Socorro

Described by Michael Machette

Unit or Surface: Canada Mariana pediment

Lat. 34° 31' 00" N., Long. 106° 58' 08" W.

UTM: Not shown on map.

Sampled by Michael Machette

Landform: Piedmont slope

SW¹/₄, SE¹/₄, NW¹/₄, Sec. 5, T. 3 N., R. 1 W.

Elevation: 5120 ft.

Sampling date: June 9, 1976

Comments: Sampling locality is on the north bank of Mariano Draw in thin piedmont-slope alluvium that is unconformable across axial river gravels of the upper Santa Fe Group.. Denny (1940) mapped this piedmont slope surface as part of the Canada Mariana pediment, which is graded to a position about 15 m (50 ft.) above the Rio Grande. As this site, the soil is about 13 m (45 ft.) above Mariano Draw (local base level). The soil is formed on an anomalously slope that may be an ancient highly eroded fault scarp, but this relation has not been proven. Another second soil located 1.5-1.8 m below sample -1f may represent burial from scarp erosion processes. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation			CaCO ₃ Stage	
	A	B	C	D		E	F	G	H	I	J	K	L	M	N	O		P
6/09/76		Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a		Aca	Ak	0	15	15	60	94.0	13.6	12.8	1.5	1.51	1.65	0.193	0.025	0.168	2.52	
-1b		IICca	2Bk1	15	30	15	90	91.0	27.2	24.8	1.5	1.60	1.65	0.397	0.025	0.372	5.58	Stg. III
-1c		IIK2m	2K1m	30	52	22	40	96.0	52.9	50.8	1.5	1.70	1.65	0.864	0.025	0.839	18.45	Stg. III+
-1d		IIK31	2K2	52	70	18	24.0	76.0	32.5	24.7	1.5	1.70	1.65	0.420	0.025	0.395	7.11	Stg. III
-1e		IIK32	2K3	70	83	13	60	94.0	24.5	23.0	1.5	1.70	1.65	0.391	0.025	0.366	4.76	Stg. III-
-1f		IICca	2Bk2	83	105	22	10.0	90.0	18.1	16.3	1.5	1.76	1.65	0.287	0.025	0.262	5.76	Stg. III-
N.S.		IICn	2Cu	105	N.E.	N.A.	10.0	90.0	1.7	1.5	1.5	1.65	1.65	0.025	0.025	0.000	0.00	
																	44.18	Total

Site No. 27

Profile No. 1/13/76-6

Unit or Surface: Unmapped

Landform: Distal piedmont slope or terrace

Quadrangle: Turn 7.5' (S2)

Lat. 34° 34' 35" N., Long. 106° 42' 12" W.

Unsurveyed, Tome Grant

County: Valencia

UTM: Not shown on map.

Elevation: 4950 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: January 13, 1976

Comments: Location ca. 750 m (2,500 ft.) SE of Turn triangulation station, elev. 4953 ft.) in railroad cut south of switch box, ca. one-third the way NW through railroad cut. Soil is formed on Quaternary deposit that is either a downdropped element of the Lland de Manzano or a younger inset alluvial terrace of the Rio Grande. Surface is about 52 m (170 ft.) above the Rio Grande. If downfaulted, the soil may be equivalent to soil profiles at sites 7/03/74-1 and 7/03/74-2 to the southeast. N.S., not sampled; N.E., not exposed; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)	Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
1/13/76		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	Bs	Bs		0	20	20	0.0	100.0	2.0	2.0	2.0	1.65	1.6	0.033	0.032	0.001	0.02	
N.S.	Bsca	Bsk		20	40	20	0.0	100.0	4.0	4.0	2.0	1.65	1.6	0.066	0.032	0.034	0.68	Stg. I
-6a	C1ca	Bk1		40	75	35	2.0	98.0	7.9	7.7	2.0	1.78	1.6	0.137	0.032	0.105	3.70	Stg. II
-6b	C2ca	Bk2		75	113	38	3.0	97.0	8.6	8.3	2.0	1.85	1.6	0.154	0.032	0.122	4.65	Stg. II
-6c	K1m	K1m		113	125	12	3.0	97.0	28.5	27.7	2.0	1.72	1.6	0.476	0.032	0.444	5.33	Stg. III-
-6d	K22m	K2m		125	143	18	2.0	98.0	28.6	28.0	2.0	1.77	1.6	0.496	0.032	0.464	8.34	Stg. III-
-6e	K23m	K3m		143	158	15	5.0	95.0	37.0	35.2	2.0	1.65	1.6	0.581	0.032	0.549	8.23	Stg. III
-6f	K31m	K4m		158	176	18	1.0	99.0	35.2	34.9	2.0	1.63	1.6	0.569	0.032	0.537	9.66	Stg. III
-6g	K32m	K5m		176	210	34	1.0	99.0	29.4	29.1	2.0	1.78	1.6	0.518	0.032	0.486	16.52	Stg. III-
-6h	K33	K6		210	256	46	1.0	99.0	14.3	14.2	2.0	1.69	1.6	0.240	0.032	0.208	9.57	Stg. II
-6i	Cca	Bk3		256	276	20	0.0	100.0	5.0	5.0	2.0	1.60	1.6	0.080	0.032	0.048	0.96	Stg. II-
N.S.	Cn	Cu		276	N.E.	N.A.		100.0	2.0	2.0	2.0	1.60	1.6	0.032	0.032	0.000	0.00	
																		Total
																		67.60

Site No. 28

Profile No. 7/03/74-2

Quadrangle: Turn 7.5' (S2)

County: Valencia

Described by Michael Machette

Comments: In railroad cut, ca. 1.5 km SW of Bogeda siding. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Unit or Surface: Llano de Manzano

Lat. 34° 32' 29" N., Long. 106° 39' 57" W.

UTM: Not shown on map.

Sampled by Michael Machette

Comments: In railroad cut, ca. 1.5 km SW of Bogeda siding. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Landform: Distal piedmont slope

Unsurveyed, Casa Colorado (Belen) Grant

Elevation: 5050 ft.

Sampling date: July 3, 1974

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P		Q
7/03/74		Old system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	Cca	Bk	0	25	25	5.0	95.0	15.7	15.0	1.5	1.65	1.65	0.248	0.025	0.222	5.56	Stg. II	
-2a	IIK11	2K1	25	43	18	5.0	95.0	32.5	30.9	1.5	1.65	1.65	0.510	0.025	0.485	8.73	Stg. III-	
-2b	IIK12m	2K2m	43	63	20	9.0	91.0	42.5	38.7	1.5	1.66	1.65	0.642	0.025	0.617	12.35	Stg. III	
-2c	IIK2m	2K3m	63	93	30	9.0	91.0	43.1	39.2	1.5	1.62	1.65	0.635	0.025	0.610	18.30	Stg. III	
-2d	IIK32m	2K4m	93	103	10	3.0	97.0	35.9	34.8	1.5	1.74	1.65	0.606	0.025	0.581	5.81	Stg. III-	
-2e	IIK33	2K5	103	170	67	5.0	95.0	18.0	17.1	1.5	1.68	1.65	0.287	0.025	0.262	17.57	Stg. III- to II+	
-2f	IICca	2Bk	170	200	30	12.0	88.0	5.1	4.5	1.5	1.65	1.65	0.074	0.025	0.049	1.48	Stg. II	
N.S.	IICn	2Cu	200	N.E.	N.A.	10.0	90.0	1.7	1.5	1.05	1.65	1.65	0.025	0.025	0.000	0.00		
Total																	69.80	Total

Site No. 29

Profile No. 7/03/74-1

Unit or Surface: Llano de Manzano

Landform: Distal piedmont slope

Quadrangle: Turn 7.5' (S2)

Lat. 34° 30' 43" N., Long. 106° 38' 05" W.

Unsurveyed, Casa Colorado (Belen) Grant

County: Valencia

UTM: Not shown on map

Elevation: 5140 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 3, 1974

Comments: 2.4 km (1.5 mi.) NW of Becker railroad siding on SW side of tracks in cut. Physiographic surface from Machette (1985). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation			CaCO ₃ Stage		
	A	B	C	D		E	F	G	H	I	J	K	L	M	N		O	P
7/03/74		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	A/C	A/C		0	20	20	10.0	90.0	1.1	1.0	2.0	1.60	1.6	0.016	0.032	-0.016	-0.32	
-1a	Bs	Bs		20	30	10	14.0	86.0	1.2	1.0	2.0	1.70	1.6	0.017	0.032	-0.005	-0.15	
-1b	IICca	2Bk1		30	90	60	40	96.0	9.3	8.9	2.0	1.71	1.6	0.152	0.032	0.120	7.21	Stg. I+
-1c	IIK1m	2K1m		90	125	35	30	97.0	27.9	27.1	2.0	1.72	1.6	0.466	0.032	0.434	15.19	Stg. III-
-1d	IIK2m	2K2m		125	167	42	50	95.0	23.7	22.5	2.0	1.68	1.6	0.378	0.032	0.346	14.53	Stg. III-
-1e	IIK3m	2K3m		167	197	30	40	96.0	20.7	19.9	2.0	1.72	1.6	0.342	0.032	0.310	9.31	Stg. III-
-1f	IICca2	2Bk2		197	257	60	50	95.0	14.5	13.8	2.0	1.72	1.6	0.237	0.032	0.205	12.32	Stg. II
N.S.	IICca3	2Bk3		257	287	30	0.0	100.0	5.0	5.0	2.0	1.60	1.6	0.080	0.032	0.048	1.44	Stg. II-
N.S.	IICn	2Cu		287	N.E.	N.A.	5.0	95.0	2.1	2.0	2.0	1.60	1.6	0.032	0.032	0.000	0.00	
																	59.53	Total

Site No. 30

Profile No. 6/02/77-2

Quadrangle: Ladrón Peak 7.5' (U2)

County: Socorro

Described by Michael Machette

Comments: Sampled in SCS (now NRCS) soil pit, ca. 12 m N. of dirt road to old fire-watch station (BLM) and ca. 80 m E. of boundary between Sec. 16 and Sec. 17. Mapped as Valle de Paríada pediment by Denny (1940), but may be equivalent to piedmont unit E (Qpe) of Machette (1978a). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Unit or Surface: Valle de Paríada pediment

Lat. 34° 28' 39" N., Long. 107° 03' 38" W.

UTM: 1,268,700 N.; 310,810 E.; Zone 13

Sampled by Michael Machette

Landform: Proximal piedmont slope

SE^{1/4}, SW^{1/4}, SW^{1/4}, Sec. 16, T. 3 N., R. 2 W.

Elevation: 5705 ft.

Sampling date: June 2, 1977

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
6/02/77		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	R
N.S.	A, B21t	A, Bt1		0	20	20	0.0	100.0	3.5	3.5	3.5	1.75	1.6	0.061	0.056	0.005	0.10	
-2a	B22t	Bt2		20	28	8	0.0	100.0	4.2	4.2	3.5	1.75	1.6	0.074	0.056	0.018	0.14	
-2b	B3tca	Bt3k		28	40	12	7.5	92.5	13.3	12.3	3.50	1.70	1.6	0.209	0.056	0.153	1.84	Stg. II
-2c	K21m	Bk1m		40	54	14	9.1	90.9	35.4	32.2	3.5	1.70	1.6	0.547	0.056	0.491	6.88	Stg. III
-2d	K22m	Bk2m		54	68	14	14.4	85.6	48.4	41.4	3.5	1.75	1.6	0.725	0.056	0.669	9.37	Stg. III
-2e	K31m	Bk3m		68	88	20	22.4	77.6	36.5	28.3	3.5	1.70	1.6	0.481	0.056	0.425	8.50	Stg. III
-2f	Cca2	Bk4		88	108	20	32.4	67.6	14.0	9.5	3.5	1.65	1.6	0.157	0.056	0.101	2.02	Stg. II
-2g	Cca3	Bk5		108	115	7	29.9	70.1	7.9	5.5	3.5	1.60	1.6	0.088	0.056	0.032	0.22	Stg. I
N.S.	Cn	Cn		115	N.E.	N.A.	30.0	70.0	5.0	3.5	3.5	1.60	1.6	0.056	0.056	0.000	0.00	
Total																		29.06

Site No. 31

Profile No. 6/02/77-1

Quadrangle: La Joya NW 7.5' (V2)

County: Socorro

Described by Michael Machette

Comments: Weakly developed soil exposed in road cut 75 m (250 ft.) W. of boundary between R. 1 W. and R. 2 W. Road leads SW to Armijo Ranch.

Denny (1940) mapped this surface as the Canada Mariana piedmont; in this area there are several distinct alluvial surfaces within his Canada Mariana. N.S., not sampled; N.A., not applicable.

Unit or Surface: Ladron Mountains piedmont

Lat. 34° 27' 28" N., Long. 106° 59' 30" W.

UTM: 3,814,520 N.; 317,150 E.; Zone 13

Sampled by Michael Machette

Landform: Proximal piedmont slope

SE¹/₄, SE¹/₄, NE¹/₄, Sec. 25, T. 3 N., R. 2 W.
Elevation: 5345 ft.
Sampling date: June 2, 1977

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	
6/02/77		Old system	New system	top	bottom		>2mm	<2mm	<2mm	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a	A	A		0	7	7	19.7	80.3	0.9	0.7	3.5	1.61	1.5	0.011	0.053	-0.402	-0.29	
-1b	Bs/Bt	Bs/Bt		7	21	14	10.8	89.2	0.8	0.7	3.5	1.41	1.5	0.01-	0.053	0.043	-0.60	
-1c	C22ca	Bk1		21	40	19	0.0	100.0	16.1	16.1	3.5	1.50	1.5	0.242	0.053	0.189	3.58	Stg. II
-1d	C23ca	Bk2		40	61	21	14.2	85.8	11.3	9.7	3.5	1.45	1.5	0.141	0.053	0.088	1.84	Stg. II
-1e	C3ca	Bk3		61	76	15	12.7	87.3	5.6	4.9	3.5	1.50	1.5	0.074	0.053	0.021	0.31	Stg. II-
-1f	C4n	Cu		76	90	14	10.4	89.6	4.1	3.7	3.5	1.51	1.5	0.056	0.053	0.003	0.04	
N.S.	C5n	2Cu		90	108	18	0.0	100.0	3.5	3.5	3.5	1.50	1.5	0.053	0.053	0.000	0.00	
																	4.88	Total

Site No. 32

Profile No. 7/01/74-2

Quadrangle: Abeytas 7.5' (W2)

County: Socorro

Described by Michael Machette

Unit or Surface: Llano de Albuquerque

Lat. 34° 28' 43" N., Long. 106° 50' 10" W.

UTM: 3,816,600 N.; 331,400 E.; Zone 13

Sampled by Michael Machette

Landform: Mesa

Unsurveyed, Belen Grant

Elevation: 5075 ft.

Sampling date: July 1, 1974

Comments: Location near southeastern end of east edge of Llano de Albuquerque, ca. 0.9 km (0.55 mi.) N. of powerlines. Upper part of profile probably eroded before burial by parent material 1. Physiographic surface is about 102 m (335 ft.) above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	A	B	C	D		E	F	G	H	I	J	K	L	M	N	O		P
7/01/74		Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-2a		Cca	Bk	0	50	50	0.0	100.0	11.8	11.8	1.5	1.53	1.6	0.181	0.024	0.157	7.83	Stg. I+
-2b		IK1	2K1	50	75	25	4.0	96.0	36.3	34.9	1.5	1.56	1.6	0.544	0.024	0.520	13.01	Stg. III
-2c		IK21m	2K2m	75	95	20	3.0	97.0	51.6	50.1	1.5	1.67	1.6	0.837	0.024	0.813	16.25	Stg. III+
-2d		IK22m	2K3m	95	115	20	8.0	92.0	43.5	40.0	1.5	1.61	1.6	0.644	0.024	0.620	12.40	Stg. III+
-2e		IK3m	2K4	115	140	25	6.0	94.0	27.7	26.0	1.5	1.60	1.6	0.416	0.024	0.392	9.80	Stg. III-
N.S.		IIC1ca	2Bk1	140	185	45	5.0	95.0	13.6	12.9	1.5	1.60	1.6	0.206	0.024	0.182	8.21	Stg. II+
-2f		IIC2ca	2Bk2	185	230	45	11.0	89.0	32	29	1.5	1.60	1.6	0.046	0.024	0.022	1.01	Stg. II
N.S.		IICn	2Cu	230	N.E.	N.A.	10.0	90.0	1.7	1.5	1.5	1.60	1.6	0.027	0.024	0.003	0.00	.
																	68.51	Total

Site No. 33

Profile No. 7/01/74-1

Quadrangle: Abeytas 7.5' (W2)

County: Socorro

Described by Michael Machette

Unit or Surface: Llano de Albuquerque

Lat. 34° 27' 43" N., Long. 106° 50' 46" W.

UTM: 3,814,780 N.; 330,490 E.; Zone 13

Sampled by Michael Machette

Landform: Mesa

Unsurveyed, Belen Grant

Elevation: 5095 ft.

Sampling date: July 1, 1974

Comments: Location at southern end of west edge of the Llano de Albuquerque, just west of powerlines. Soil on parent material 2 may be eroded, sampling incomplete. Physiographic surface is about 110 m (360 ft.) above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
7/01/74		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a		Cca	Bk1	0	45	45	0.0	100.0	10.0	10.0	1.5	1.60	1.6	0.160	0.024	0.136	6.12	Stg. II
-1b		C2ca	Bk2	45	70	25	3.0	97.0	6.4	6.2	1.5	1.60	1.6	0.099	0.024	0.075	1.88	Stg. II-
N.S.		Cox	Bs	70	100	30	3.0	97.0	2.1	2.0	1.5	1.60	1.6	0.032	0.024	0.008	0.24	
-1c		IIK1	2K1	100	118	18	3.4	96.0	33.0	31.7	1.5	1.70	1.6	0.539	0.024	0.515	9.27	Stg. III
-1d		IIK2m	2K2m	118	155	37	4.0	96.0	42.6	40.9	1.5	1.70	1.6	0.695	0.024	0.671	24.84	Stg. III+
N.S.		IICca	2Bk	155	205	50	4.0	96.0	20.8	20.0	1.5	1.60	1.6	0.320	0.024	0.296	14.80	Stg. II+
N.S.		IIICca	3Bk	205	265	60	4.0	96.0	10.4	10.0	1.5	1.60	1.6	0.160	0.024	0.136	8.16	Stg. II
N.S.		IIICn	3Cu	265	N.E.	N.A.	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00	
																	65.31	Total

Site No. 34

Profile No. 6/27/74-1

Quadrangle: Abeytas 7.5' (W2)

County: Socorro

Described by Michael Machette

Unit or Surface: Canada Mariana pediment

Lat. 34° 25' 04" N., Long. 106° 47' 18" W.

UTM: 3,809,700 N.; 335,750 E.; Zone 13

Sampled by Michael Machette

Landform: Terrace of Rio Grande

Unsurveyed, Sevilleta Grant

Elevation: 4800 ft.

Sampling date: June 27, 1974

Comments: Location in gravel pit about 0.6 km (0.4 mi.) east of E. end of bridge over Rio Grande; 0.8 km (0.5 mi.) W. of junction of U.S Highway 60 and New Mexico Highway 47. Soil on late Pleistocene terrace about 23 m (75) ft above the Rio Grande. This is part of the Canada Mariana pediment of Denny (1940), which to the south is graded to a position about 15 m (50 ft.) above the Rio Grande. Higher terrace(?) to east forms surface about 34 m (110 ft.) above Rio Grande. See also soil profile no. 6/06/74-2 (site 35) from low alluvial fan south of this site. N.S., not sampled; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
6/27/74			Old system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
N.S.	Cn		Cu	0	8	8	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00	
-1a	IIK2		2K	8	34	26	40	96.0	25.9	24.9	1.5	1.70	1.6	0.423	0.024	0.399	10.38	N.R.
-1b	IIK3		2Bk1	34	54	20	0.0	100.0	8.5	8.5	1.5	1.60	1.6	0.136	0.024	0.112	2.24	N.R.
N.S.	IICca		2Bk2	54	90	36	0.0	100.0	4.0	4.0	1.5	1.60	1.6	0.064	0.024	0.040	1.44	N.R.
N.S.	IICn		2Cu	90	N.E.	N.A.	0.0	100.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00	
Total																		14.06

Site No. 35

Profile No. 6/06/74-2

Unit or Surface: Canada Mariana pediment

Landform: Distal alluvial fan

Quadrangle: Abeytas 7.5' (W2)

Lat. 34° 23' 09" N., Long. 106° 48' 08" W.

Unsurveyed, Sevilleta Grant

County: Socorro

UTM: 3,806,150 N.; 334,200 E.; Zone 13

Elevation: 4785 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 6, 1974

Comments: Late(?) Pleistocene alluvial fan about 20 m (65) ft above the Rio Grande. Sampling location about 0.5 km NE of Conteras on south bank of arroyo. See also soil profile no. 6/27/74-1 (site 34) from low terrace north of this site. This site is part of the Canada Mariana pediment of Denny (1940), which is graded to a position about 15 m (50 ft.) above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not application.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P		Q
6/06/74	Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	C1ca	Bk1	0	15	15	10.0	90.0	9.0	8.1	1.0	1.65	1.6	0.134	0.016	0.118	1.76	Stg. I	
-2a	C21ca	Bk2	15	25	10	22.0	78.0	14.5	11.3	1.0	1.65	1.6	0.187	0.016	0.170	1.70	Stg. II-	
-2b	C22ca	Bk3	25	75	50	18.0	82.0	10.9	8.9	1.0	1.65	1.6	0.147	0.016	0.131	6.54	Stg. II	
-2c	C3caox	Bk4	75	100	25	55.0	45.0	10.7	4.8	1.0	1.60	1.6	0.077	0.016	0.061	1.52	Stg. I	
N.S.	Cox	Bs	100	N.E.	N.A.	50.0	50.0	2.0	1.0	1.0	1.60	1.6	0.016	0.016	0.000	0.00		
Total																	11.52	Total

Site No. 36

Profile No. 7/04/74.4

Unit or Surface: Unnamed alluvial fan

Landform: Proximal piedmont slope

Quadrangle: Silver Creek 7.5' (Z2)

Lat. 34° 15' 35" N., Long. 107° 01' 37" W.

Unsurveyed, projected on boundary of Secs. 34/35, T. 1 N., R. 2 W.

County: Socorro

UTM: 3,792,625 N.; 313,313 E.; Zone 13

Elevation: 5680 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 4, 1976

Comments: Sampled about 100 m S. of road along drainage divide between Silver Creek (to the north) and San Lorenzo Arroyo (to the south). Location is ca. 800 m (2625 ft.) WNW of VABM 5934. Unit may be equivalent to piemont unit E (Qpe) of Machette (1978a). N.S., not sampled; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/04/74		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	A	A	A	0	5	5	0.0	100.0	0.0	0.0	1.5	1.60	1.65	0.000	0.025	-0.025	-0.13		
-4a	Btca	Btk		5	25	20	8.0	92.0	10.0	8.0	1.5	1.66	1.65	0.133	0.025	0.108	2.16	Stg. II-	
-4b	Bca	Bk1		25	35	10	7.0	93.0	18.4	17.1	1.5	1.44	1.65	0.246	0.025	0.22	2.21	Stg. II+	
-4c	K2	K1		35	75	40	7.0	93.0	32.4	30.1	1.5	1.70	1.65	0.512	0.025	0.491	19.47	Stg. III-	
-4d	K3	K2		75	105	30	15.0	85.0	33.1	28.1	1.5	1.83	1.65	0.514	0.025	0.489	14.68	Stg. III-	
N.S.	Cca	Bk2		105	120	15	25.0	75.0	15.0	11.3	1.5	1.70	1.65	0.192	0.025	0.167	2.51	Stg. II	
N.S.	Cn	Cu		120	N.E.	N.A.	35.0	65.0	2.3	1.5	1.5	1.65	1.65	0.025	0.025	0.000	0.00		
Total																		40.90	Total

Site No. 37

Profile No. 5/31/74-1

Unit or Surface: Cliff surface

Landform: Eroded fault scarp/piedmont slope

Quadrangle: San Acacia 7.5' (A3)

Lat. 34° 21' 54" N., Long. 106° 53' 46" W.

Unsurveyed, Servilleta Grant

County: Socorro

UTM: 3,804,050 N.; 325,6400 E.; Zone 13

Elevation: 5000 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: May 31, 1974

Comments: Soil formed on Cliff surface, an eroded fault scarp that grades west into a piedmont slope. Upper soil postdates movement on Cliff fault, lower soil predates movement on Cliff fault. Also see description and figures by Machette (1978d, 1982). Earlier basis for fault timing was based on 500 k.y. of soil formation, with 35 gm of secondary CaCO₃ in the upper soil and 110 gm of secondary CaCO₃ in the lower soil. These analyses suggest a slightly different timing, with 28 percent of the soil formation (30 gm of 109gm) occurring after faulting and 72 percent of the soil formation (79 gm of 109 gm) occurring before faulting. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage			
	A	B	C	D		E	F	G	H	I	J	K	L	M	N	O	P		Q	R	
5/31/74																					
N.S.	K1	K1	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²				
-1a	K2m	K2m		17	60	43	70	97.0	26.3	25.5	15	1.75	1.65	0.446	0.025	0.421	18.11	Stg. III-	Stg. II+		
N.S.	K3	K3		60	80	20	2.0	98.0	20.4	20.0	15	1.70	1.65	0.340	0.025	0.315	6.30	Stg. II			
Upper soil																		29.94	Subtotal		
-1b	IIK22m	2K1m		80	110	30	1.0	99.0	32.5	32.2	15	1.76	1.65	0.567	0.025	0.542	16.25	Stg. III			
-1c	IIK23m	2K2m		110	130	20	4.0	96.0	29.4	28.2	15	1.84	1.65	0.519	0.025	0.494	9.88	Stg. III			
-1d	IIK24m	2K3		130	160	30	3.0	97.0	24.1	23.4	15	1.79	1.65	0.419	0.025	0.394	11.82	Stg. III-			
-1e	IIC1ca	2BK1		160	190	30	8.0	92.0	8.9	8.2	15	1.70	1.65	0.139	0.025	0.114	3.43	Stg. II			
-1f	IIC2ca	2BK2		190	315	125	0.0	100.0	8.0	8.0	15	1.70	1.65	0.136	0.025	0.111	13.88	Stg. II			
-1g	IIC3ca	2BK3		315	390	75	0.0	100.0	17.6	17.6	15	1.70	1.65	0.299	0.025	0.274	20.57	Stg. II+			
N.S.	IIICca	3BK		390	450	60	0.0	100.0	5.0	5.0	15	1.65	1.65	0.083	0.025	0.058	3.45	Stg. II			
N.S.	IIICn	3Cu		450	N.E.	N.A.	0.0	100.0	1.5	1.5	15	1.65	1.65	0.025	0.025	0.000	0.00	Stg. II			
Lower soil																		79.28	Subtotal		
																		109.22	Total		

Site No. 38

Profile No. 10/02/75-1

Unit or Surface: Alluvial unit G (Qag)

Landform: Terrace of Rio Salado

Quadrangle: San Acacia 7.5' (A3)

Lat. 34° 20' 23" N., Long. 106° 54' 08" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,801,265 N.; 325,095 E.; Zone 13

Elevation: 5008 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: October 2, 1975

Comments: Sampled at northern edge of southern of two gravel pits (abandoned) west of old U.S. Highway 85 (abandoned). Surface ca. 63 m (200 ft.) above Rio Salado. Part of Denny's (1940) dissected Quaternary surfaces (undifferentiated). See geologic map of Machette (1978a) for Quaternary geologic units. N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	A	B	C	D		E	F	G	H	I	J	K	L	M	N	O		P
10/02/75		Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a		K11m	K1m	0	11	11	20.0	80.0	34.7	27.8	4.6	2.00	1.7	0.556	0.032	0.524	5.76	Stg. III
-1b		K12m	K2m	11	21	10	9.0	91.0	38.0	34.6	4.6	2.04	1.7	0.706	0.032	0.674	6.74	Stg. III+
-1c		K22m	K3m	21	37	16	15.0	85.0	33.3	28.3	4.6	1.68	1.7	0.475	0.032	0.443	7.10	Stg. III
-1d		K23m	K4m	37	53	16	13.0	87.0	29.6	25.8	4.6	1.68	1.7	0.433	0.032	0.401	6.42	Stg. III
-1e		K31m	K5m	53	65	12	15.0	85.0	25.2	21.4	4.6	1.73	1.7	0.370	0.032	0.338	4.06	Stg. III
-1f		K32m	K6m	65	78	13	13.0	87.0	30.9	26.9	4.6	1.70	1.7	0.457	0.032	0.425	5.53	Stg. III
-1g		Cca1	K7	78	107	29	27.0	73.0	30.8	22.5	4.6	1.70	1.7	0.383	0.032	0.351	10.16	Stg. III
-1h		Cca2	K8	107	136	29	16.0	84.0	42.3	35.5	4.6	1.70	1.7	0.604	0.032	0.572	16.57	Stg. III+
-1i		IICn	2Cu	136	NE.	N.A.	62.0	38.0	12.2	4.6	4.6	1.70	1.7	0.032	0.032	0.000	0.00	
																	62.34	Total

Site No. 39

Profile No. 10/02/75-3

Quadrangle: San Acacia 7.5' (A3)

County: Socorro

Unit or Surface: Alluvial unit E (Qae)

Lat. 34° 19' 04" N., Long. 106° 55' 21" W.

UTM: 3,796,240 N.; 322,980 E.; Zone 13

Landform: Terrace of Rio Salado

Unsurveyed Sevilleta Land Grant

Elevation: 4945 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: October 2, 1975

Comments: Described from auger hole under powerline, ca. 30 m (100 ft.) N. of southern edge of terrace. See geologic map of Machette (1978a) for Quaternary geologic units. Surface ca. 38 m (125 ft.) above the Rio Salado. Denny (1940) mapped this terrace as part of the Canada Mariana surface, which is graded to a position about 15 m (50 ft.) above the Rio Grande, but it seems to relate better to the Valle de Parida surface. Soil horizonation not applicable (N.A.) because of a lack of exposure. Sample -3p is a resampling of -3k. N.E. not exposed; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
10/02/75	Old system	New system	top	bottom	(cm)	>2mm	<2mm	($<2\text{mm}$)	Present day	Primary	Present day	Primary	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-3a	N.A.	N.A.	0	5	5	3.0	97.0	1.7	1.7	1.7	2.0	1.50	1.6	0.026	0.032	-0.006	-0.03	N.R	
-3b	N.A.	N.A.	5	16	11	0.0	100.0	8.8	8.8	8.8	2.0	1.50	1.6	0.132	0.032	0.100	1.10	N.R	
-3c	N.A.	N.A.	16	27	11	0.0	100.0	11.7	11.7	11.7	2.0	1.50	1.6	0.176	0.032	0.144	1.58	N.R	
-3d	N.A.	N.A.	27	38	11	1.0	99.0	12.0	11.9	11.9	2.0	1.52	1.6	0.181	0.032	0.149	1.64	N.R	
-3e	N.A.	N.A.	38	45	7	1.0	99.0	11.0	10.9	10.9	2.0	1.67	1.6	0.182	0.032	0.150	1.05	N.R	
-3f	N.A.	N.A.	45	53	8	3.0	97.0	10.1	9.8	9.8	2.0	1.61	1.6	0.158	0.032	0.126	1.08	N.R	
-3g	N.A.	N.A.	53	78	25	40.0	60.0	15.7	9.4	9.4	2.0	1.65	1.6	0.155	0.032	0.123	3.08	N.R	
-3h	N.A.	N.A.	78	98	20	7.0	93.0	7.5	7.0	7.0	2.0	1.80	1.6	0.126	0.032	0.099	1.88	N.R	
-3i	N.A.	N.A.	98	123	25	10.0	90.0	8.6	7.7	7.7	2.0	1.90	1.6	0.146	0.032	0.114	2.86	N.R	
-3j	N.A.	N.A.	123	144	21	30.0	70.0	12.5	8.8	8.8	2.0	1.84	1.6	0.162	0.032	0.130	2.73	N.R	
-3p (3k)	N.A.	N.A.	144	154	10	7.0	93.0	22.9	21.3	21.3	2.0	1.78	1.6	0.379	0.032	0.347	3.47	N.R	
-3l	N.A.	N.A.	154	162	8	46.0	54.0	9.0	4.9	4.9	2.0	1.60	1.6	0.078	0.032	0.046	0.37	N.R	
-3m	N.A.	N.A.	162	170	8	36.0	64.0	9.5	6.1	6.1	2.0	1.60	1.6	0.098	0.032	0.066	0.52	N.R	
-3n	N.A.	N.A.	170	185	15	60.0	40.0	11.2	4.5	4.5	2.0	1.60	1.6	0.072	0.032	0.040	0.60	N.R	
-3o	N.A.	N.A.	185	N.E.	N.A.	41.0	59.0	3.6	2.1	2.1	2.0	1.60	1.6	0.034	0.032	0.000	0.00	N.R	
Total																		21.86	Total

Site No. 40

Profile No. 6/06/74-4

Unit or Surface: Piedmont unit D (Qpd)

Landform: Piedmont slope

Quadrangle: San Acacia 7.5' (A3)

Lat. 34° 17' 46" N., Long. 106° 55' 09" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,797,602 N.; 323,265 E.; Zone 13

Elevation: 4915 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 6, 1974

Comments: Location 1.05 km (0.65 mi.) SSE of windmill at 4827 ft. elevation. Top of piedmont-slope deposits graded to position about 100-110 ft. (30-33 m) above Rio Salado. See geologic map of Machette (1978a) for Quaternary geologic units. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage	
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P		Q
6/06/74	Old system	New system	top	bottom	(cm)	>2mm	<2mm	($<2\text{mm}$)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	Cca	Bk	0	30	30	5.0	95.0	1.0	1.0	1.5	1.70	1.6	0.017	0.024	-0.007	-0.21	Stg. II	
-4a	IIK1m	2K1m	30	40	10	5.0	95.0	18.7	17.8	1.5	1.70	1.6	0.303	0.024	0.279	2.79	Stg. III-	
-4b	IIK2m	2K2m	40	65	25	5.0	95.0	24.0	22.8	1.5	1.75	1.6	0.399	0.024	0.375	9.38	Stg. III	
-4c	IIK3	2K3	65	88	23	2.0	98.0	14.4	14.1	1.5	1.70	1.6	0.240	0.024	0.216	4.96	Stg. III- to II	
N.S.	IICca	2Bk	88	118	30	2.0	98.0	6.1	6.0	1.5	1.70	1.6	0.102	0.024	0.078	2.34	Stg. II-	
N.S.	IICn	2Cu	118	N.E.	N.A.	2.0	98.0	1.5	1.5	1.5	1.60	1.6	0.024	0.024	0.000	0.00		
Total																	19.26	Total

Site No. 41

Profile No. 10/03/75-1

Quadrangle: San Acacia 7.5'

County: Socorro

Described by Michael Machette

Unit or Surface: Piedmont unit D (Qpd)

Lat. 34° 17' 04" N., Long 106° 55' 00" W.

UTM: 3,795,960 N.; 323,495 E.; Zone 13

Sampled by Michael Machette

Landform: Eolian dunes on piedmont slope

Unsurveyed Sevilleta Land Grant

Elevation: 4855 ft.

Sampling date: October 3, 1975

Comments: Sampled beneath thin eolian sand (Qss) using hand auger. Remnants of piedmont graded to position about 100 (30 m) above Rio Salado. See geologic map of Machette (1978a) for Quaternary geologic units. N.S., not sampled; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
10/03/75		Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
N.S.	Cn	Cn		0	26	26	0.0	100.0	2.0	2.0	1.6	1.50	1.6	0.030	0.0256	0.004	0.10		
-1a	IICca1	2Bk1		26	39	13	9.0	91.0	19.8	18.0	1.6	1.60	1.6	0.288	0.0256	0.262	3.41	Stg. II+	
-1b	IICca2	2Bk2		39	52	13	8.0	92.0	16.6	15.3	1.6	1.60	1.6	0.245	0.0256	0.219	2.84	Stg. II	
-1c	IIK21	2K1		52	65	13	2.0	98.0	27.4	26.9	1.6	1.70	1.6	0.457	0.0256	0.431	5.61	Stg. III	
-1d	IIK22	2K2		65	78	13	1.0	99.0	24.8	24.6	1.6	1.70	1.6	0.418	0.0256	0.392	5.10	Stg. III	
-1e	IIK32	2K3		78	91	13	2.0	98.0	20.6	20.2	1.6	1.70	1.6	0.343	0.0256	0.317	4.13	Stg. III-	
-1f	IIK33	2K4		91	104	13	2.0	98.0	17.9	17.5	1.6	1.75	1.6	0.306	0.0256	0.280	3.64	Stg. III-	
-1g	IIICca1	3Bk1		104	117	13	14.0	86.0	11.0	9.5	1.6	1.60	1.6	0.152	0.0256	0.126	1.64	Stg. II	
-1h	IIICca2	3Bk2		117	130	13	21.0	79.0	7.9	6.2	1.6	1.60	1.6	0.099	0.0256	0.073	0.95	Stg. II-	
N.S.	IIICn	3Cn		130	N.E.	N.A.	20.0	80.0	2.0	1.6	1.6	1.60	1.6	0.026	0.0256	0.000	0.00		
Total																		27.42	Total

Site No. 42

Profile No. 6/06/74-3

Unit or Surface: Alluvial unit C (Qac)

Landform: Piedmont slope/terrace transition

Quadrangle: San Acacia 7.5' (A3)

Lat. 34° 17' 13" N., Long. 106° 53' 47" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,795,265 N.; 325,265 E.; Zone 13

Elevation: 4775 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: June 6, 1974

Comments: Sampled in west road cut of Interstate Highway 25, ca. 1800 ft. (550 m) south of the incised channel of the Rio Salado. Surface is about 11 m (35 ft.) above the Rio Salado. See geologic map of Machette (1978a) for Quaternary geologic units. Compare to soil profile no. 10/17/76-2 (site 43). N.S., not sampled; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
6/06/74	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-3a	Bca	Bk1	0	22	22	14.0	86.0	11.2	96	15	1.65	1.65	0.158	0.025	0.133	2.93	Stg. I to II+	
-3b	C2ca	Bk2	22	52	30	90	91.0	12.3	11.2	15	1.70	1.65	0.190	0.025	0.165	4.96	Stg. II	
-3c	C3ca	Bk3	52	112	60	50	95.0	7.7	73	15	1.65	1.65	0.120	0.025	0.095	5.73	Stg. II- to I-	
N.S.	Cn	Cn	112	N.E.	N.A.	00	100.0	15	15	15	1.65	1.65	0.025	0.025	0.000	0.00	Total	

Site No. 43

Profile No. 10/17/76-2

Unit or Surface: Alluvial unit C (Qac)

Landform: Terrace of Rio Salado

Quadrangle: San Acacia 7.5' (A3)

Lat. 34° 16' 02" N., Long. 106° 53' 27" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,793,190 N.; 325,900 E.; Zone 13

Elevation: 4730 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: October 17, 1976

Comments: Sampled from arroyo cut, 40 m N. of N/NW jog in arroyo that parallels dirt road from Interstate Highway 25 southeast to the northern basalt-covered butte at San Acacia dam. See geologic map of Machette (1978a) for Quaternary geologic units. Alluvium forms terrace surface about 8 m (25 ft.) above the Rio Salado. Thick soil profile suggests aggradation during development. Compare to soil profile no. 6/06/74-3 (site 42).

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation			CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
A																		
7/16/74	Old system	New system	top	bottom			>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-2a	Cn	Cu	150	0	150	0	0	100.0	2.6	2.6	2.6	1.50	1.5	0.039	0.039	0.000	0.00	
-2b	IIA	2A	0	6	6	6	0.6	99.4	3.0	3.0	2.6	1.50	1.6	0.045	0.042	0.003	0.02	
-2c	IIBs	2Bs	6	16	10	10	0.6	99.4	4.8	4.8	2.6	1.56	1.6	0.075	0.042	0.033	0.33	
-2d	IIBsca	2Bsk	16	28	12	12	0.0	100.0	6.1	6.1	2.6	1.69	1.6	0.103	0.042	0.061	0.73	Stg. II
-2e	IIC1ca	2Bk1	28	42	14	14	0.0	100.0	8.7	8.7	2.6	1.54	1.6	0.134	0.042	0.092	1.29	Stg. II
-2f	IIC2ca	2Bk2	42	56	14	14	5.6	94.4	8.1	7.7	2.6	1.60	1.6	0.123	0.042	0.081	1.14	Stg. II
-2g	IIIAca	3Ak	56	64	8	8	22.5	77.5	9.6	7.4	3.5	1.60	1.7	0.118	0.060	0.062	0.50	Stg. II+
-2h	IIIC11ca	3Bk1	64	86	22	22	3.9	96.1	6.4	6.2	3.5	1.70	1.7	0.105	0.060	0.049	1.09	Stg. II
-2i	IIIC12ca	3Bk2	86	108	22	22	3.4	96.6	7.1	6.9	3.5	1.70	1.7	0.117	0.060	0.061	1.35	Stg. II
-2j	IIIC21ca	3Bk3	108	125	17	17	9.3	90.7	11.4	10.3	3.5	1.70	1.7	0.175	0.060	0.119	2.02	Stg. II
-2k	IIIC22ca	3Bk4	125	142	17	17	16.2	83.8	13.5	11.3	3.5	1.70	1.7	0.192	0.060	0.136	2.31	Stg. II+
-2l	IIIC23cam	3Bk5m	142	157	15	15	30.5	69.5	18.4	12.8	3.5	1.75	1.7	0.224	0.060	0.168	2.52	Stg. III-
-2m	IIIC3n	3Cu	157	200	43	43	22.0	78.0	4.5	3.5	3.5	1.70	1.7	0.060	0.060	0.000	0.00	
Total																		13.30

Site No. 44

Profile No. 7/16/74-1

Quadrangle: La Joya 7.5' (B3)

County: Socorro

Described by Michael Machette

Unit or Surface: Low terrace (unmapped)

Lat. 34° 23' 23" N., Long. 106°48' 32" W.

UTM: 3,808,525 N.; 333,700 E.; Zone 13

Sampled by Michael Machette

Landform: Terrace of the Rio Grande

Unsurveyed, Servilleta Grant

Elevation: 4740 ft.

Sampling date: July 16, 1974

Comments: Sampled just W. of New Mexico Highway 47 on S. side of Conteras Arroyo. Terrace is about 3.5 m (10ft.) above arroyo bottom. Sampling is coarse and may not adequately represent secondary CaCO₃ accumulation. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)	Thickness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
7/16/74	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a	Cca	Bk	0	75	75	2.0	98.0	11.5	11.3	2.0	1.39	1.6	0.157	0.032	0.125	9.38	Stg. II-
-1b	IICca	2Bk1	75	150	75	20.0	80.0	11.5	9.2	2.0	1.75	1.6	0.161	0.032	0.129	9.68	Stg. II-
-1c	IIC2ca	2Bk2	150	190	40	19.0	81.0	2.5	2.0	2.0	1.84	1.6	0.037	0.032	0.005	0.20	Stg. I
N.S.	IICn	2Cu	190	N.E.	N.A.	20.0	80.0	2.5	2.0	2.0	1.60	1.6	0.032	0.032	0.000	0.00	
Total																	19.26

Site No. 45

Profile No. 8/14/75

Unit or Surface: Unmapped

Landform: Piedmont slope

Quadrangle: Becker SW 7.5' (C3)

Lat. 34° 19' 50" N., Long. 106° 43' 36" W.

Unsurveyed, Servilleta Grant

County: Socorro

UTM: Not shown on map.

Elevation: 5275 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: August 14, 1975

Comments: Sampled on north side of Palo Duro Canyon. This surface is clearly older than the Llano de Manzano surface (to the north) and may be older than the Llano de Albuquerque based on the advanced stage of calcium carbonate morphology and large amount of total secondary CaCO₃. It may represent the an erosional surface that formed in upper Santa Fe time (late Pliocene or early Quaternary). The soils is extremely well developed (best in the Albuquerque basin), and is clearly better developed than those on the Llano de Albuquerque. See also soil profile no. 5/04/761 (site 46). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation			CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
8/14/75		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1	K2m	K1m		+30	0	30	0.0	100.0	50.0	50.0	2.5	1.75	1.65	0.875	0.042	0.834	25.02	Sig. III+
-2	K2lm	K2m		0	60	60	0.0	100.0	70.2	70.2	2.5	1.77	1.65	1.243	0.042	1.202	72.09	Sig. IV+
-3	K3	K3		60	120	60	0.0	100.0	55.6	55.6	2.5	1.86	1.65	1.034	0.042	0.993	59.59	Sig. IV-
-4	Cca	Bk		120	180	60	8.0	92.0	27.6	25.4	2.5	1.69	1.65	0.429	0.042	0.388	23.30	Sig. III- to II
N.S.	Cn	Cu		180	N.E.	N.A.	0.0	100.0	2.5	2.5	2.5	1.65	1.65	0.041	0.042	0.000	0.00	
															180.00			Total

Site No. 46

Profile No. 5/04/76-1

Unit or Surface: Unnamed

Landform: Piedmont slope

Quadrangle: Becker SW 7.5' (C3)

Lat. 34° 19' 51" N., Long. 106° 43' 35" W.

Unsurveyed, Servilleta Grant

County: Socorro

UTM: Not shown on map.

Elevation: 5280 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: May 4, 1976

Comments: Sampled on north side of Palo Duro Canyon. This surface is clearly older than the Llano de Manzano surface (to the north) and may be older than the Llano de Albuquerque based on the advanced stage of calcium carbonate morphology and large amount of total secondary CaCO₃. It is probably an early erosional surface that was cut across the Permian Yeso Formation in upper Santa Fe time (late Pliocene or early Quaternary). The soil is well developed and is clearly better developed than most of those on the Llano de Albuquerque. See also soil profile no. 8/14/75-1 (site 45). N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)		CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	
5/04/76	Old system	New system	top	bottom	(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a	K21lm	K1m	0	5	5	0.0	100.0	75.0	75.0	2.5	2.00	1.65	1.500	0.041	1.459	7.30	Stg. IV+
-1b	K22m	K2m	5	15	10	0.0	100.0	79.0	79.0	2.5	1.95	1.65	1.541	0.041	1.500	15.00	Stg. IV+
-1c	K23m	K3m	15	25	10	0.0	100.0	81.3	70.0	2.5	2.01	1.65	1.407	0.041	1.366	13.66	Stg. IV+
-1d	K32m	K4m	25	50	25	0.0	100.0	65.4	65.4	2.5	1.90	1.65	1.243	0.041	1.202	30.04	Stg. IV-
-1e	K33	K5	50	87	37	0.0	100.0	47.3	47.3	2.5	1.82	1.65	0.861	0.041	0.820	30.33	Stg. III+
N.S.	Csca	Bsk	87	117	30	0.0	100.0	25.0	25.0	2.5	1.75	1.65	0.438	0.041	0.397	>11.90	Stg. II+
N.S.	Cn	Cu	N.E.	N.E.	N.A.	0.0	100.0	2.5	2.5	2.5	1.65	1.65	0.041	0.041	0.000	0.00	Stg. II+
Total																	>108.23

Site No. 47

Profile No. 7/26/74-M

Quadrangle: Lemitar 7.5' (E3)

Unit or Surface: Piedmont unit E (Qpe)

Lat. 34° 14' 42" N., Long. 106° 59' 28" W.

Landform: Piedmont slope

Unsurveyed, Sevilleta Grant. NW¹/₄, NE¹/₄, NE¹/₄, Sec. 7, T. 1 S., R. 1 W. (projected)

County: Socorro

UTM: 3,789,952 N.; 318,178 E.; Zone 13

Elevation: 5200 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: July 26, 1974

Comments: Sampled ca. 30 m (100 ft.) N. of abandoned jeep trail at head of tributary to Arroyo Vivarosa, 793 m (2600 ft.) N. of elevation 5083 (Lemitar 7.5' quadrangle) on Sevilleta grant boundary (fence). Contiguous with surficial unit mapped as Qpe by Machette (1978a). N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)		Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	R	
7/26/74	Old system	New system	top	bottom			>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-M3a	Cca	Bk	0	30	30		32.0	68.0	9.7	6.6	1.0	1.43	1.7	0.094	0.017	0.077	2.32		Sig. II
-M3b	IIK1m	2K1m	30	50	20		19.0	81.0	34.9	28.3	1.0	1.72	1.7	0.488	0.017	0.470	9.40		Sig. III
-M3c	IIK2m	2K2m	50	85	35		30.0	70.0	26.8	18.8	1.0	1.79	1.7	0.337	0.017	0.320	11.18		Sig. III-
-M3d	IICca	2K3	85	140	55		70.0	30.0	6.5	2.0	1.0	1.70	1.7	0.034	0.017	0.017	0.94		Sig. II
-M3e	IICn	2Cu	140	N.E.	N.A.		75.0	25.0	4.0	1.0	1.0	1.70	1.7	0.017	0.017	0.000	0.00		
Total																			23.84

Site No. 48

Profile No. 10/16/76-1

Quadrangle: Lemitar 7.5' (E3)

County: Socorro

Described by Michael Machette

Comments: Sampled from north side of small arroyo, 640 m (2100 ft.) W. of frontage road on W. side of U.S. Highway 85. Location ca. 213 m (700 ft.) E. of double powerlines on N. side of road to microwave station. Information from unpublished mapping of Machette, ca. 1976. N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Unit or Surface: Unmapped alluvium

Lat. 34° 10' 49" N., Long. 106° 55' 50" W.

UTM: 3,783,575 N.; 322,030 E.; Zone 13

Sampled by Michael Machette

Landform: Distal piedmont slope

SW¹/₄, SW¹/₄, NE¹/₄, Sec. 34, T. 1 S., R. 1 W.

Elevation: 4730 ft.

Sampling date: October 16, 1976

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	
10/16/76		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-1a		Cca	Bk	0	35	35	27.0	73.0	4.9	3.6	2.0	1.70	1.6	0.061	0.032	0.029	1.02	N.R.	
-1b		Cn	Cu	35	67	32	57.0	43.0	3.2	1.4	2.0	1.60	1.6	0.022	0.032	-0.010	-0.32	N.R.	
-1c		IIBsca	2Bsk	67	79	12	6.0	94.0	3.7	3.5	2.0	1.40	1.6	0.049	0.032	0.017	0.20	N.R.	
-1d		IIC1ca	2Bk1	79	84	5	3.0	97.0	7.7	7.5	2.0	1.40	1.6	0.105	0.032	0.073	0.37	N.R.	
-1e		IIC2ca	2Bk2	84	103	19	0.0	100.0	11.6	11.6	2.0	1.38	1.6	0.160	0.032	0.128	2.43	N.R.	
-1f		IIC3ca	2Bk3	103	116	13	11.0	89.0	16.0	14.2	2.0	1.50	1.6	0.213	0.032	0.181	2.35	N.R.	
-1g		IIK	3Bk	116	123	7	67.0	33.0	16.2	5.4	2.0	1.65	1.6	0.089	0.032	0.057	0.40	N.R.	
-1h		IVC2ca	4Bk	123	167	44	4.0	96.0	6.3	6.1	2.0	1.60	1.6	0.098	0.032	0.066	2.89	N.R.	
N.S.		IVC3ca	5Bk	167	180	13	10.0	90.0	4.2	3.8	2.0	1.60	1.6	0.061	0.032	0.029	0.37	N.R.	
N.S.		IVCn	5Cu	180	N.E.	N.A.	10.0	90.0	2.2	2.0	2.0	1.60	1.6	0.032	0.032	0.000	0.00	N.R.	
																		9.71	Total

Site No. 49

Profile No. 10/17/76-1

Unit or Surface: Unmapped

Landform: Distal alluvial fan

Quadrangle: Lemitar 7.5' (E3)

Lat. 34° 09' 10" N., Long. 106° 55' 09" W.

SE¹/₄, SW¹/₄, NW¹/₄, Sec. 11, T. 2 S., R. 1 W.

County: Socorro

UTM: 3,785,952 N.; 323,000 E.; Zone 13

Elevation: 4736 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: October 17, 1976

Comments: Sampled from north side of alluvial channel ca. 350 m (1150 ft.) W. of U.S. Interstate Highway 25. Alluvial sequence forms surface 3 m (10 ft.) above floor of intermittent stream channel. Inset terrace to south is lower (1 m [3 ft.] above stream channel) and younger. Sampled soil is on fan alluvium that buried older, strongly developed soil (not sampled). Physiographic surface from unpublished mapping of Machette, ca. 1976. N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
10/17/76		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²		
-1a		Aca	Ak	0	8	8	8.0	92.0	6.2	5.7	2.0	1.60	1.5	0.091	0.030	0.061	0.49	N.R.	
-1b		C22ca	Bk1	8	23	15	30.0	70.0	6.8	4.8	2.0	1.50	1.5	0.072	0.030	0.042	0.63	N.R.	
-1c		C23ca	Bk2	23	36	13	21.0	79.0	9.3	7.4	2.0	1.50	1.5	0.111	0.030	0.081	1.05	N.R.	
-1d		C3ca	Bk3	36	40	13	38.0	62.0	13.5	8.4	2.0	1.50	1.5	0.126	0.030	0.096	1.25	N.R.	
-1e		C4ca	Bk4	40	59	10	73.0	27.0	11.2	3.0	2.0	1.50	1.5	0.045	0.030	0.015	0.15	N.R.	
-1f		C5n	Cu	59	220	161	63.0	37.0	5.4	2.0	2.0	1.50	1.5	0.030	0.030	0.000	0.00	N.R.	
Upper soil																			Total
N.S.		IIBtb	2Btl	220	233	13													
N.S.		IIBtcab	2Btk2	233	248	15													
N.S.		IIKm	2Kcm	248	306	58													

Site No. 50

Profile No. 8/13/75

Unit or Surface: Valle de Parida pediment

Landform: Distal piedmont slope

Quadrangle: Mesa del Yeso 7.5' (F3)

Lat. 34° 14' 29" N., Long. 106° 51' 17" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,790,195 N.; 329,222 E.; Zone 13

Elevation: 4940 ft.

Described by Michael Machette

Sampled by Michael Machette

Sampling date: August 13, 1975

Comments: Site similar to that of soil profile no. 5/11/76-1 (site 51), but this is from natural exposure, is deeper and contains two discrete soils. Sampled along west margin of eroded piedmont slope, ca. 0.8 km (0.5 mi.) N. of BM 4962. Piedmont slope (pediment of Denny) is formed along western margin of La Joyita Hills, a small series of elongate N-S hills east of the Rio Grande. At this site, the surface is ca. 82 m (270 ft) above the Rio Grande. Denny (1940) mapped this as the Valle de Parida pediment, which is graded to a position about 46 m (150 ft.) above the Rio Grande. However, this site is probably on Denny's (1940) Tio Bartolo surface, which is graded to a position 76 m (250) ft above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature			Depth (cm)		Thick-ness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E		F	G	H	I	J	K	L	M	N	O	P	Q	R	
8/13/75		Old system	New system	top	bottom		>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²			
N.S.	K1		K1m	0	41	41	15.0	85.0	41.2	35.0	2.5	1.50	1.6	0.525	0.040	0.485	19.89	Stg. III+		
	eroded																			
-3	K21		K2m	41	66	25	7.0	93.0	50.3	46.8	2.5	1.60	1.6	0.749	0.040	0.709	17.72	Stg. IV		
-4	K22		K3m	66	106	40	0.9	99.1	65.4	64.8	2.5	1.48	1.6	0.959	0.040	0.919	36.76	Stg. IV		
-5	K23		K4	106	143	37	0.8	99.2	20.8	20.6	2.5	1.54	1.6	0.317	0.040	0.277	10.26	Stg. III-		
-6	Cca		Bk	143	153	10	25.0	75.0	15.7	11.8	2.5	1.50	1.6	0.177	0.040	0.137	1.37	Stg. II		
Upper soil																			86.00	
-7	IIK2		2K	153	190	37	1.0	99.0	23.2	23.0	2.5	1.78	1.6	0.409	0.040	0.369	13.67	Stg. III		
N.S.	IICca		2Bk	190	218	28	0.0	100.0	15.0	15.0	2.5	1.60	1.6	0.240	0.040	0.200	5.60	Stg. II		
N.S.	IICn		2Cu	218	N.E.	N.A.	0.0	100.0	2.5	2.5	2.5	1.60	1.6	0.040	0.040	0.000	0.00			
Lower soil																			19.27	
Both soils																			105.27	Total

Site No. 51

Profile No. 5/11/76-1

Unit or Surface: Tio Bartolo pediment

Landform: Medial piedmont slope

Quadrangle: Mesa del Yeso 7.5' (F3)

Lat. 34° 14' 17" N., Long. 106° 51' 23" W.

Unsurveyed Sevilleta Land Grant

County: Socorro

UTM: 3,789,925 N.; 329,060 E.; Zone 13

Elevation: 4945 ft

Described by Michael Machette

Sampled by Michael Machette

Sampling date: May 11, 1976

Comments: Site similar to that of soil profile no. 8/13/72-2 (site 50), but this is from a hand-dug pit and thus is shallower. Piedmont slope (pediment of Denny) is formed along western margin of La Joyita Hills, a small series of elongate N-S hills east of the Rio Grande. At this site, the surface is ca. 84 m (275 ft) above the Rio Grande. Denny (1940) mapped this as the Valle de Parida pediment, which is graded to a position about 46 m (150 ft.) above the Rio Grande. However, this site is probably on Denny's (1940) Tio Bartolo surface, which is graded to a position 76 m (250) ft above the Rio Grande. N.S., not sampled; N.E., not exposed; N.A., not applicable.

Sample number	Horizon nomenclature		Depth (cm)	Thickness (cm)	Grain size (percent)			CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
5/11/76	Old system	New system	top	bottom		(cm)	>2mm	<2mm	(<2mm)	Present day	Primary	Present day	Primary	Total g/cm ³	Primary g/cm ³	Second. g/cm ³	Second. g/cm ²	
-1a	K2m	K1m	0	18		18	3.0	97.0	49.9	48.4	1.50	1.50	1.6	0.726	0.024	0.702	12.64	Stg. IV-
-1b	K31m	K2m	18	35		17	3.0	97.0	35.8	34.7	1.50	1.57	1.6	0.545	0.024	0.521	8.85	Stg. III+
-1c	K32m	K3m	33	49		16	3.0	97.0	35.7	34.6	1.50	1.50	1.6	0.519	0.024	0.495	7.92	Stg. III+
-1d	K33	K4	49	66		17	0.0	100.0	27.5	27.5	1.50	1.58	1.6	0.435	0.024	0.411	6.98	Stg. III
-1e	Cca1	Bk1	66	86		20	6.0	94.0	19.7	18.5	1.50	1.69	1.6	0.313	0.024	0.289	5.77	Stg. II+
-1f	Cca2	Bk2	86	106		20	35.0	65.0	18.8	12.2	1.50	1.60	1.6	0.301	0.024	0.277	5.54	Stg. II+
-1g	Cca3	Bk3	106	125		19	43.0	57.0	3.5	2.0	1.50	1.60	1.6	0.032	0.024	0.008	0.15	Stg. I
N.S.	Cn	Cu	125	N.E.		N.A.	40.0	60.0	2.5	1.5	1.50	1.60	1.6	0.024	0.024	0.000	0.00	
Total																		47.85

Site No. 52

Profile No. 6/06/74-6

Quadrangle: Socorro 7.5' (H3)

County: Socorro

Described by Michael Machette

Unit or Surface: Socorro High School (informal)

Lat. 34° 02' 35" N., Long. 106° 54' 28" W.

UTM: 3,767,500 N.; 323,820 E.; Zone 13

Sampled by Michael Machette

Landform: Distal piedmont slope

Unsurveyed, Town of Socorro Grant

Elevation: 4780 ft.

Sampling date: June 6, 1974

Comments: Sampled in SE road cut on U.S. Highway 60 near Socorro High School. Physiographic surface based on unpublished mapping by Machette, ca. 1974. N.S., not sampled; N.E., not exposed; N.A., not applicable; N.R., not recorded.

Sample number	Horizon nomenclature		Depth (cm)		Thick-ness (cm)	Grain size (percent)		CaCO ₃ (percent)			Bulk Density (g/cm ³)			CaCO ₃ accumulation				CaCO ₃ Stage
	B	C	D	E		F	G	H	I (<2mm)	J Present day	K Primary	L Present day	M Primary	N Total g/cm ³	O Primary g/cm ³	P Second. g/cm ³	Q Second. g/cm ²	
6/06/74																		
N.S.	Cca	Bk1	0	25	25	25	5.0	95.0	21.1	20.0	0.02	1.65	1.65	0.330	0.033	0.297	7.43	N.R.
-6a	K2m	K2m	25	50	25	25	5.0	95.0	55.6x	52.8	0.02	1.75	1.65	0.924	0.033	0.891	22.28	N.R.
-6b	K3m	K3m	50	65	15	15	2.0	98.0	63.1	61.8	0.02	1.80	1.65	1.112	0.033	1.079	16.19	N.R.
N.S.	Cca	Bk2	65	140	75	75	2.0	98.0	20.4	20.0	0.02	1.70	1.65	0.340	0.033	0.307	23.03	N.R.
N.S.	Ccacs	Bky	140	165	25	25	2.0	98.0	5.1	5.0	0.02	1.65	1.65	0.083	0.033	0.050	1.24	N.R.
N.S.	Cn	Cu	165	N.E.	N.A.	N.A.	2.0	98.0	2.0	2.0	0.02	1.65	1.65	0.033	0.033	0.000	0.00	N.R.
																	70.17	Total