

OFR: 76-688

U.S. GEOLOGICAL SURVEY  
Reston, VA 22092

Memorandum

Date 8/31/76

To: Branch of Plans and Program Management,  
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From: Chief, Office of Scientific Publications

Subject: New USGS open-file report

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**TITLE:** Logs of drill holes, San Acacia 7½' quadrangle, Socorro  
County, New Mexico

**AUTHOR(S):** Michael N. Machette

**CONTENTS:** 20 p.,        pls., 1 figs.,        tables.

**map scale:**                                 

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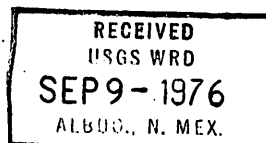
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Report No. 76-688

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UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Logs of Drill Holes,

San Acacia 7 1/2' quadrangle,

Socorro County, New Mexico

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1976

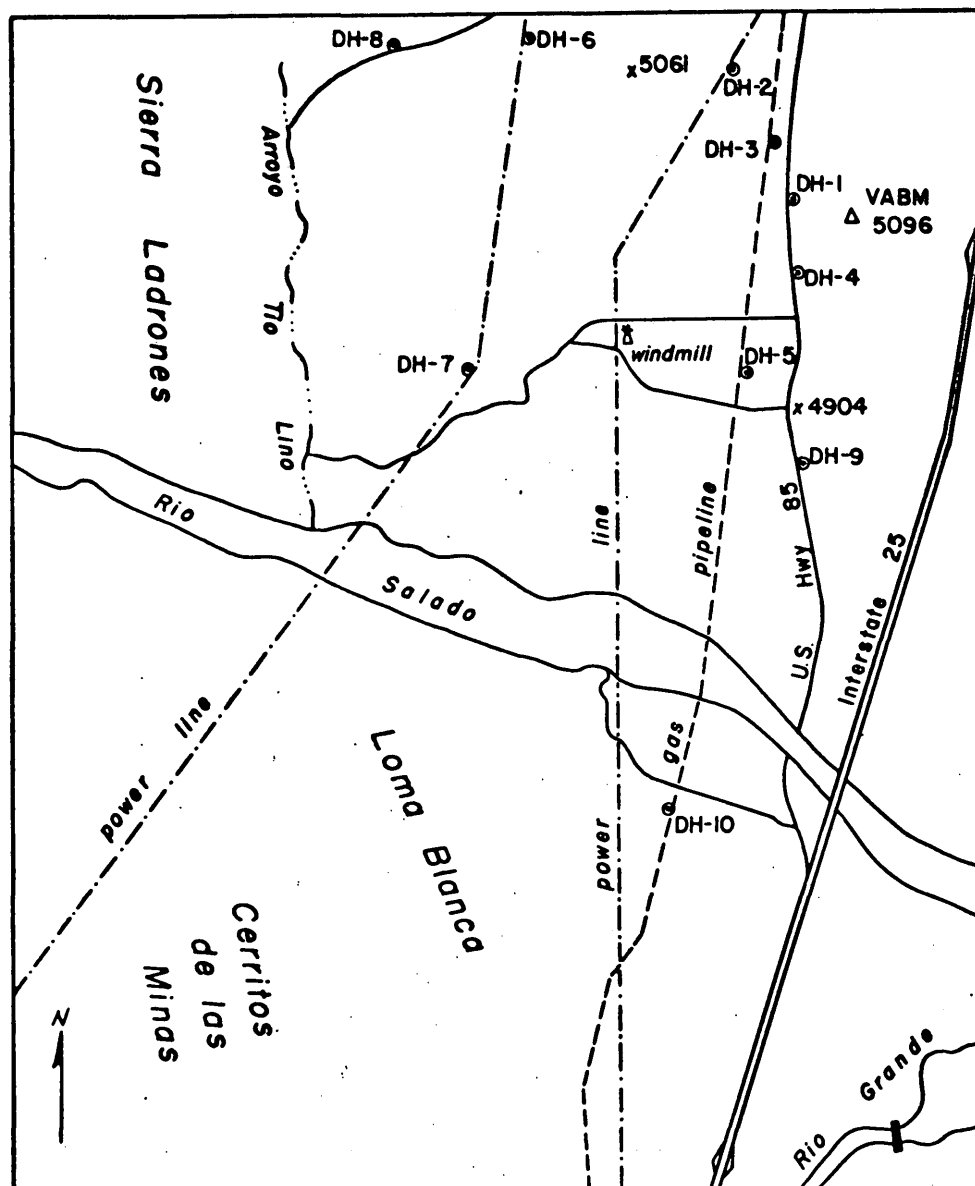
This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards and nomenclature.

9.1.1967

This report presents, in preliminary form, the results of a shallow auger-drilling program conducted in the San Acacia 7 1/2° quadrangle, New Mexico, during early August 1975. The San Acacia quadrangle is located about 32 km (20 mi) north of Socorro, in central New Mexico.

The drilling was undertaken to obtain basic information on the nature and subsurface distribution of Quaternary surficial deposits and the depth to bedrock. This report is limited to a lithologic description of materials encountered during drilling. A more complete and comprehensive study of the geology of the San Acacia quadrangle is now in progress.

Ten holes (fig. 1) were drilled by the U.S. Geological Survey, using a truck-mounted power-flight auger having 15.9-cm (6 1/4-in) outside-diameter and 5.7-cm (2 1/4-in) inside diameter hollow-stem augers in 1.5-m (5-ft) lengths. James Scott was the main drill operator, and G. O. Bachman, N. R. Timbel, and the author collected and described samples. Hole depths ranged from 7.1 m to 22 m, and a total of 175 m of drill hole was logged. The nomenclature used for soil (and rock) color consists of two complementary systems: 1) color names, and 2) Munsell notation of color (Munsell Color, Macbeth Division of Kollmorgen Corporation, Baltimore, Md., 21218). The symbol d is for dry rock or soil colors.



SAN ACACIA 7 1/2' QUADRANGLE

Figure 1.--Index map of the San Acacia 7 1/2' quadrangle, New Mexico, showing drill-hole localities and reference points mentioned in the text.

We gratefully acknowledge the U.S. Fish and Wildlife Service which granted permission to conduct the research and drilling program in the San Acacia quadrangle. This area lies within the Sevilleta Grant, now administered as a National Wildlife Refuge. This work was sponsored by Nuclear Regulatory Commission Agreement AT (49-25) 1000.

## Drill Logs

### San Acacia drill hole DH-1

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta

Land Grant, lat.  $34^{\circ}21'19''$  N., long.  $106^{\circ}54'00''$  W., 700 m

N.  $76^{\circ}$  W. of VABM 5096, in small north-south trending swale, about  
15 m east of old U.S. Highway 85 (abandoned).

ELEVATION AT TOP OF HOLE: 1,524.4 m (5,000 ft).

ELEVATION AT BASE OF HOLE: 1,517.3 m (4,976.8 ft).

TOTAL DEPTH: 7.1 m (23.2 ft).

DATE OF DRILLING: August 4, 1975.

Depth (m)	Unit thick- ness (m)	Description
4.1	4.1	Brown (7.5YR5.5/5d), very fine-grained, loose sand with some silt and clay. Fairly well sorted with rare granules. Thin pebbly layer at 2.1 m, 1-cm pebbles in brown (7.5YR5/5d) fine sand at 3.6 m.
5.1	1.0	Light-brown (7.5YR6/4d) fine-grained sand with granules. Calcium carbonate-enriched (Cca) horizon of buried soil.
6.2	1.1	Light-brown (7.5YR6.5/4d) calcium carbonate ( $\text{CaCO}_3$ )-engulfed (K) horizon in a fine-grained pebbly sand. Pebbles coated with $\text{CaCO}_3$ .
7.0	0.8	Same as at 5.1-m depth; gravelly at base.

8.2      1.2      Light-brown (7.5YR6/4d) fine- to medium-grained  
sand with granule and pebbles. At 7.3 m,  
layer of dark-brown (7.5YR4/2d) clay. At 8.1 m,  
loose, poorly sorted, subangular sandy gravel  
to gravelly sand.



San Acacia drill hole DH-2

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat.  $34^{\circ}22'10''$  N., long.  $106^{\circ}54'29''$  W., 2,245 m N.  $39^{\circ}$  W. of VABM 5096, about 15 m east of powerline on crest of small rise.

ELEVATION AT TOP OF HOLE: 1,540.3 m (5,050 ft).

ELEVATION AT BASE OF HOLE: 1,518.9 m (4,980 ft)

TOTAL DEPTH: 21.4 m (70 ft).

DATE OF DRILLING: August 4, 1975.

SAMPLES: Horizons sampled are denoted by asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
0.6	0.6	Light-brown fine-grained sand, slightly calcareous, and thin veneer of lag gravel.
1.2	.6	Pink (7.5YR7.5/3d) calcareous pebbly sand*, probably Cca horizon.
2.1	.9	Light-brown, slightly to moderately calcareous pebbly sand to sandy gravel. Lower part of Cca horizon (1.2-m depth).
4.3	2.2	Pale-brown (10YR6/3d), slightly to noncalcareous fine- to medium-grained pebbly sand, clean and loose.
5.2	.9	Dark-brown (10YR3/3d) clay.
7.2	2.0	Pale-brown (10YR6/3d), well sorted, loose, medium-grained sand with rare granules.

Depth (m)	Unit thick- ness (m)	Description
7.7	0.5	Pinkish-white (7.5YR8/2d), calcareous, pebbly sand, probably buried Cca horizon.
8.8	1.1	Pebbly sand, loose.
13.1	4.3	Sandy gravel, subangular to subrounded, clasts commonly 4-6 cm in diameter, maximum of 8 cm. Poorly sorted, loose, to poorly indurated.
16.5	3.4	Sandy gravel, loose but cleaner than above.
18.0	1.5	Light-brown, poorly sorted and indurate sand and gravel.
21.4	3.4	Light-brown, poorly sorted and indurated pebbly sand.

San Acacia drill hole DH-3

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat.  $34^{\circ}21'42''$  N., long.  $34^{\circ}54'10''$  W., 1,260 m N.  $47^{\circ}$  W. of VABM 5096, about 245 m west of old U.S. Highway 85 (abandoned), 17 m east of gas pipeline.

ELEVATION AT TOP OF HOLE: 1,531.1 m (5,020 ft).

ELEVATION AT BASE OF HOLE: 1,509.7 m (4,950 ft).

TOTAL DEPTH: 21.4 m (70 ft).

DATE OF DRILLING: August 4-5, 1975.

Depth (m)	Unit thick- ness (m)	Description
0.3	0.3	Lag gravel with sandy matrix.
1.7	1.4	Light-brown, calcareous, sandy gravel to pebbly sand; pebbles with thin continuous coating of $\text{CaCO}_3$ . Cca horizon.
2.2	.5	Same as above, less calcareous, lower part of Cca. Gravel clast subangular; maximum size about 4-5 cm.
3.4	1.2	Light-brown pebbly sand with small pieces of dark-brown clay.
4.1	.7	Light-brown, fine- to medium-grained sand, soft and friable.
15.4	11.3	Alternating layers of sand, sandy gravel, and gravel, all subangular, loose, and poorly sorted. Rare (<1 m thick) layers of silty sand to clay; tight.

Depth (m)	Unit thick- ness (m)	Description
18.0	2.6	Brown (7.5YR5/2 to 5/4) sand and gravel, subangular to angular and poorly sorted. Maximum clast size about 3 cm, commonly 0.5 cm.
21.4	3.4	Fine- to medium-grained pebbly sand to gravelly sand, compact, moderately indurated, in alternating layers.

San Acacia drill hole DH-4

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat. 34°20'50" N., long. 106°54'00" W., 990 m S. 44° W. of VABM 5096, about 4 m west of old U.S. Highway 85 (abandoned).

ELEVATION AT TOP OF HOLE: 1,526.5 m (5,005 ft).

ELEVATION AT BASE OF HOLE: 1,516.7 m (4,973 ft).

TOTAL DEPTH: 9.8 m (32 ft)

DATE OF DRILLING: August 5, 1975.

SAMPLES: Horizons collected are denoted by asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
1.9	1.9	Very fine-grained sand with scattered coarse-grained sand and granules; fairly well sorted. Probably eolian sand.
2.9	1.0	Sandy gravel containing clasts up to 1.5 cm in diameter, loose, poorly sorted.
3.9	1.0	Light-brown (7.5YR6.5/3d) pebbly sand*, calcareous, with $\text{CaCO}_3$ nodules and coatings on pebbles. Strongly calcareous at top, weak at base. Cca horizon.
4.6	.7	Light-brown sand with scattered pebbles.
5.3	.7	Light-brown (7.5YR6.5/4d) sand*, calcareous, with scattered $\text{CaCO}_3$ nodules. Cca(?) horizon.
9.8	4.5	Sandy gravel to coarse pebbly sand, subangular clasts up to 10 cm in diameter.

San Acacia drill hole DH-5

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat. 34°20'13" N., long. 106°54'26" W., 2,260 m, S. 34° W., of VABM 5096, on south edge of high-level river terrace, 10 m east of gas pipeline.

ELEVATION AT TOP OF HOLE: 1,519.0 m (4,980 ft).

ELEVATION AT BASE OF HOLE: 1,497.0 m (4,908 ft).

TOTAL DEPTH: 22.0 m (72 ft).

DATE OF DRILLING: August 5, 1975.

SAMPLES: Horizons sampled are denoted by asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
0.7	0.7	Light-brown, very fine-grained sand, loose and very slightly calcareous.
2.7	2.0	Pinkish-white to pink (7.5YR7.5/2d to 8/4d), calcareous, pebbly sand* (Cca horizon) grading down into weakly calcareous sandy gravel.
4.3	1.6	Sandy gravel, slightly calcareous, loose.
7.6	3.3	Pebbly sand, noncalcareous, with subangular clasts up to 5 cm in diameter.
22.0	14.4	Alternating layers of sand, pebbly sand, and gravel, with subangular, subround, and occasional rounded clasts up to 10 cm in diameter. Becomes finer-grained below 17 m. Loose, poorly indurated. Clasts are of mixed lithology and include the travertine exposed in La Jencia Basin about 10 km to the west.

San Acacia drill hole DH-6

LOCATION: San Acacia 7 1/2' quadrangle, unsurveyed Sevilleta Land Grant, lat.  $34^{\circ}22'21''$  N., long.  $106^{\circ}56'03''$  W., 1,240 m N.  $71^{\circ}$  W., of elevation X5061 in north-central part of quadrangle, 15 m east of powerline.

ELEVATION AT TOP OF HOLE: 1,554.0 m (5,095 ft).

ELEVATION AT BASE OF HOLE: 1,532.0 m (5,023 ft).

TOTAL DEPTH: 220 m (72 ft).

DATE OF DRILLING: August 6, 1975.

SAMPLES: Horizons sampled are denoted by an asterisk (\*).

Depth (m)	Unit thickness (m)	Description
1.7	1.7	Light-brown, noncalcareous, very fine to fine-grained sand, moderately well-sorted, loose. Eolian sand.
2.7	1.0	Brown (7.5YR5/4d) pebbly sand, clasts up to 1.5 cm in diameter.
4.3	1.6	Pinkish-white (5YR8/2d) calcareous pebbly sand*. Pebbles subangular, up to 5 cm in diameter. Sampled at 3.0-m and 3.2-m depths. Cca horizon.
6.2	1.9	Light-brown, fine- to medium-grained sand containing scattered pebbles. $\text{CaCO}_3$ nodules in the upper part.

Depth (m)	Unit thick- ness (m)	Description
7.8	1.6	Interbedded layers of light-gray (7.5YR7/0d) to light-brown (7.5YR6/4d), fine- to medium-grained sand, pebbly sand, and sandy gravel. Poorly sorted, loose to friable. Pebbles up to 2 cm in diameter, subangular and angular.
13.1	5.3	Light-gray to light-brown pebbly sand and gravel; similar to above unit except coarser grained. Coarse gravel layer at 10 m, about 0.7 m thick.
22.0	8.9	Sandy gravel grading down into light-brown pebbly sand, loose, moderately sorted. Lense of loose, clean sand 0.4 m thick at 19.8-m depth. Clasts up to 3 cm in diameter, subangular.



# San Acacia drill hole DH-7

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat. 34°20'18" N., long. 106°56'27" W., 1,800 m S. 77° W. of windmill in north-central part of quadrangle, about 45 m west of powerline.

ELEVATION AT TOP OF HOLE: 1,550.6 m (5,084 ft).

ELEVATION AT BASE OF HOLE: 1,528.7 m (5,012 ft).

TOTAL DEPTH: 22.0 m (72 ft).

DATE OF DRILLING: August 6, 1974.

Depth (m)	Unit thick- ness (m)	Description
2.1	2.1	Light-brown, coarse-grained sand and gravel, poorly sorted, slightly calcareous in upper 0.7 m. Rare clasts up to 15 cm.
4.6	2.5	Very pale brown (10YR7/3d) pebbly sand, loose, noncalcareous.
6.4	1.8	Very pale brown sandy gravel, loose, noncalcareous. Maximum clasts size about 15 cm.
7.5	1.1	Light-brown pebbly sand; maximum clast size about 2 cm.
7.7	.2	Coarse sand and gravel lense.
11.9	4.2	Alternating layers of pebbly sand to sandy gravel, loose. Gravel layers usually less than 15 cm thick.
12.5	.6	Pebbly sand, loose, clean.

Depth (m)	Unit thick- ness (m)	Description
14.3	1.8	Pebbly sand to sandy gravel, poorly sorted, poorly indurated.
22.0	7.7	Gravel and alternating layers of sandy gravel to gravelly sand. Finer grained layers are pinkish gray (7.5YR7/3d) to light-brown (7.5YR6/4d), poorly sorted, and with clasts up to 1.5 cm in diameter.

San Acacia drill hole DH-8

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat. 34°22'16" N., long. 106°55'29" W., 2,720 m N. 85° W. of elevation X5061 in the north-central part of the quadrangle, about 10 m northwest of dirt road to Arroyo Tio Lino.

ELEVATION AT TOP OF HOLE: 1,578.4 m (5,175 ft).

ELEVATION AT BASE OF HOLE: 1,563.8 m (5,127 ft).

TOTAL DEPTH: 14.6 m (48.9 ft).

DATE OF DRILLING: August 6, 1975.

SAMPLES: Horizons sampled are denoted by an asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
1.5	1.5	Pink (7.5YR7/3.5d) to light-brown (7.5YR6/4d), noncalcareous to slightly calcareous, fine-grained sand with scattered pebbles.
4.0	2.5	Brown (7.5YR5.5/5d), slightly clayey to silty sand with scattered subangular pebbles up to 2 cm in diameter. Slightly calcareous near base.
4.9	.9	Light-brown (7.5YR6.5/4d) pebbly sand*, calcareous with CaCO <sub>3</sub> nodules. Subangular pebbles up to 4 cm in diameter. Cca horizon.
8.2	3.3	Light-brown pebbly sand, slightly calcareous grading down into noncalcareous.
10.7	2.5	Sandy gravel*, angular, with clasts up to 5.5 cm in diameter.

Depth (m)	Unit thick- ness (m)	Description
14.5	3.8	Light-brown pebbly sand, poorly sorted; subangular clasts up to 1.5 cm. Noncalcareous to slightly calcareous.
14.6	.1	Well-consolidated, light-brown sandstone. Hard. Stopped in this unit (bedrock), unable to drill deeper.

San Acacia drill hole DH-9

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat.  $34^{\circ}19'37''$  N., long.  $105^{\circ}53'55''$  W., about 330 m south of elevation 4,909 and 55 m east of old U.S. Highway 85, on wide terrace north of the Rio Salado.

ELEVATION OF TOP OF HOLE: 1,498.0 m (4,911 ft).

ELEVATION OF BASE OF HOLE: 1,476.0 m (4,839 ft).

TOTAL DEPTH: 22.0 m (72 ft).

DATE OF DRILLING: August 7, 1975.

SAMPLES: Horizons sampled are denoted by an asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
1.5	1.5	Pale-brown to light-yellowish-brown (10YR6/3.5d), very fine-grained silty sand, well sorted, friable, slightly calcareous.
3.0	1.5	Gravelly sand. Poorly sorted fine- to medium-grained sand containing pebbles up to 12 cm in diameter. Noncalcareous.
3.7	.7	Light-brown (7.5YR6.5/4d) gravelly sand, calcareous. Moderate grading down into weakly calcareous, with $\text{CaCO}_3$ nodules near base.
6.4	2.7	Alternating layers of coarse sand to sandy gravel. Maximum clast size about 2 cm. Clean, loose.
9.2	2.8	Light-brown, pebbly, medium-grained sand, moderately sorted, loose.

Depth (m)	Unit thick- ness (m)	Description
17.7	8.5	Strong-brown (7.5YR5.5/6d), medium-grained sand* containing pebbles (subangular to subrounded) up to 1.5 cm in diameter. Well sorted, loose.
22.0	4.3	Gravel and sandy gravel, angular to subrounded, loose. Clasts up to 6 cm in drill cutting.

San Acacia drill hole DH-10

LOCATION: San Acacia 7 1/2' quadrangle, N. M., unsurveyed Sevilleta Land Grant, lat.  $34^{\circ}17'31''$  N., long.  $105^{\circ}54'55''$  W., on wide fan surface south of the Rio Salado, 25 m west of gas pipeline and 200 m south of east-west dirt road.

ELEVATION AT TOP OF HOLE: 1,492.0 m (4,892 ft).

ELEVATION AT BASE OF HOLE: 1,479.2 m (4,850 ft).

TOTAL DEPTH: 12.8 m (42 ft).

DATE OF DRILLING: August 7, 1975.

SAMPLES: Horizons sampled are denoted by an asterisk (\*).

Depth (m)	Unit thick- ness (m)	Description
0.6	0.6	Brown (7.5YR5/4d), very fine-grained sand, well sorted. Forms coppice dunes.
1.5	.9	Pinkish-white (7.5YR7/3d) to pink (7.5YR7/4d), calcareous gravelly sand* with $\text{CaCO}_3$ nodules. Cca horizon.
7.3	5.8	Light-brown (7.5YR6/4d), fine- to medium-grained pebbly sand, moderately sorted with clasts up to 1.5 cm in diameter. Gravel lense at base 0.8 m thick.
12.8	5.5	Very pale brown (10YR7/4d) sand and pebbly sand with some silty layers. Rare pebbly layers. Loose to poorly indurated. Bedrock unit-- Tertiary alluvium.