UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Albuquerque, New Mexico

SUMMARY RECORDS OF TEST AND SUPPLY WELLS IN RANGE AREAS, WHITE SANDS MISSILE RANGE, NEW MEXICO

By

James B. Cooper

Open-file report

Prepared by the U.S. Geological Survey in cooperation with White Sands Missile Range

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SUMMARY RECORDS OF TEST AND SUPPLY WELLS IN RANGE AREAS, WHITE SANDS MISSILE RANGE, NEW MEXICO

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INTRODUCTION

White Sands Missile Range and the U.S. Geological Survey, since 1953, have had a nearly continuous cooperative program for the investigation of the water resources of the Missile Range. Geological Survey personnel studied the geology and ground water at a number of locations on and near the range, observed the drilling and construction of several test and supply wells, and conducted aquifer tests on some wells. The results of these studies and observations are contained in a series of reports that have been released to the open file.

The purpose of this report is to summarize in one source the data that have been collected during the drilling, construction, testing, water sampling, and water-level measurement of test and supply wells in areas on the Missile Range, exclusive of the Post Headquarters area, and in the Bosque del Apache Grant. Data pertaining to wells in the Post Headquarters area are given in a separate report (Cooper, 1970).

SUMMARY OF DATA

The location of range areas where wells have been drilled is shown on figure 1. Summary records of these wells, diagrams showing the construction and lithology of wells drilled for water supply and test wells completed as observation wells, chemical analyses of water samples collected from the wells, and hydrographs of wells where periodic water-level measurements have been made, are contained in tables 1-60 and shown on figures 2-40.

Explanation of the various items of data listed in the tables of summary records is given below.

Location: Established from U.S. Geological Survey topographic maps.

USGS No: Wells are located and numbered according to the system of common subdivision of sectionized land used throughout the State by the U.S. Geological Survey. The number of each well consists of four segments separated by periods and locates the position to the nearest 10-acre tract of land. The segments denote, respectively, the township south of the New Mexico base line, the range east of the New Mexico principal meridian, the section, and the particular 10-acre tract within the section.

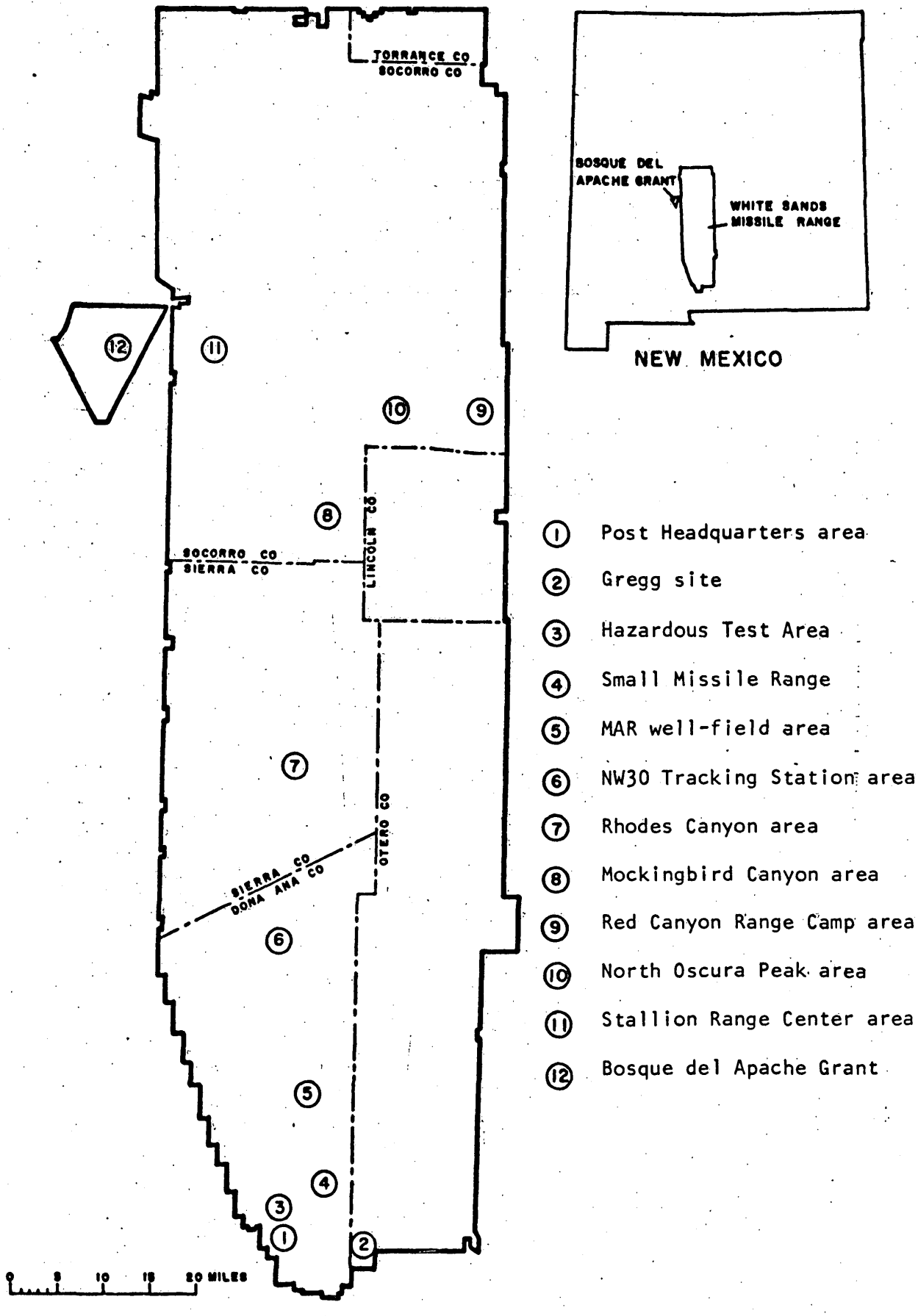
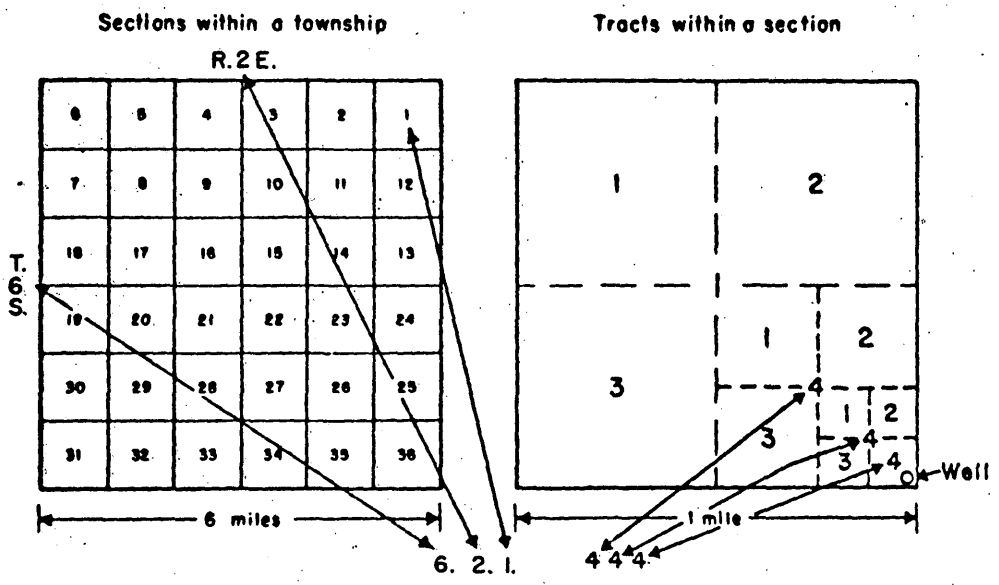


Figure 1.--Index map showing areas where test and supply wells have been drilled.

The fourth segment of the number consists of three digits denoting, respectively, the quarter section or approximate 160-acre tract, the quadrant (approximately 40 acres in size) of the quarter section, and the quadrant (approximately 10 acres in size) of the 40-acre tract in which the well is located. The system of numbering quarter sections and quadrants, which is done in reading order, as well as the usual numbering of sections within a township is shown below. The example given, 6.2.1.444, thus denotes a well in the SE¼SE¼SE¼ sec. 1, T. 6 S., R. 2 E. The letter "a" is added to the last segment of a well number to denote a second well located within the same 10-acre tract or quadrant. When a well can be located only within 40 or 160 acres, either the last or the last two digits of the fourth segment are zeros.



Latitude and longitude: Established from U.S. Geological Survey topographic maps.

Altitude: Altitude, in feet, of land surface at well. Altitudes interpolated from U.S. Geological Survey topographic maps are given to nearest foot. Altitudes established by Corps of Engineers Survey are given to nearest hundredths of a foot.

Depth: Depth is in feet below land surface.

Casing and hole record: Pipe diameters (unless otherwise noted) refer to nominal inside diameter up to 12 inches. Diameters greater than 12-inch refer to outside diameter of pipe. Hole diameters refer to outside diameter of bit used to drill the hole. All depths are in feet below land surface.

Yield: Data are for first pump test, or bailing test of record, usually upon completion of the well. Yields are in gpm (gallons per minute). Drawdown is the measured distance, in feet, between the nonpumping water level and the pumping water level.

Nonpumping water level: Figure given is for first measurement of record. Measured depths are given to nearest tenth of a foot. Reported depths are given to nearest foot. Depths are in feet below land surface.

Chemical quality: Data are for first analysis of record. Includes available data on samples collected during drilling of the well and when the well was first test pumped. Conductance refers to specific conductance, which is a measure of the ability of the water to conduct an electric current. Conductance increases as mineral constituents in the water increase. Conductance is reported in micromhos per centimeter at 25°C. Sulfate and Chloride are reported in mg/l (milligrams per liter). Date refers to date of field collection of the sample.

Formation logs: Various types of well logs made for the well. These logs are in the report reference for the well, or are in the open files of the Geological Survey, Albuquerque, N. Mex.

Geologic source: Formation that yields water to the well, or formation tested in unsuccessful wells.

Reference: Detailed information on the well is contained in the listed report reference. See "REFERENCES CITED" in text.

Gregg Site

Table 1.--Summary record of Gregg test well

Gregg Site
White Sands Missile Range
Otero County, New Mexico

LOCATION: SE¼NW¼SE¼ sec. 8, T. 22 S., R. 6 E. **USGS No.** 22.6.8.414

LATITUDE: 32°24'19" **LONGITUDE:** 106°20'48"

DEPTH: Drilled to 1,010 feet; finished at 500 feet **ALTITUDE:** 4,020 feet

DATE COMPLETED: September 1961 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Cemented 13¾-inch pipe in 18-inch hole from 0 to 38 feet; 8-inch casing 0 to 500 feet, torch-cut slots from 265-280, 290-360, 390-410, 425-465, and 480-500 feet; pipe set in 13-inch hole, removed upon completion of well.

YIELD: Well test pumped at 175 gpm for 8 hours with 12.8 feet of drawdown.

NONPUMPING WATER LEVEL: 213.2 feet on 9-7-61

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	281-300	8,890	4,910	350	8-18-61
	Total screen	14,900	8,730	708	9- 7-61

FORMATION LOGS: 1) Sample description; 2) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Hood, 1968

Table 2.--Chemical analyses of water samples from Gregg test well

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	8-8-61 1/	9-7-61 2/			
Silica (SiO_2)	35	40			
Iron (Fe)	-	-			
Calcium (Ca)	360	455			
Magnesium (Mg)	180	478			
Sodium (Na)	1,900	3,340			
Potassium (K)					
Bicarbonate (HCO_3)	194	317			
Carbonate (CO_3)	0	0			
Sulfate (SO_4)	4,910	8,730			
Chloride (Cl)	350	708			
Fluoride (F)	1.5	6.4			
Nitrate (NO_3)	4.1	.3			
Dissolved solids					
Calculated	7,840	13,900			
Residue on evaporation at 180°C	7,970	14,300			
Hardness as $CaCO_3$	1,640	3,100			
Noncarbonate hardness as $CaCO_3$	1,480	2,840			
Specific conductance (micromhos at 25°C)	8,890	14,900			
pH	8.2	7.4			
Color	-	-			
Temperature (°C)	-	-			

1/ Collected through packer from depths of 281-300 feet.

2/ Collected during pumping test on cased well.

Table 3.--Summary record of Gregg supply well

Gregg Site
White Sands Missile Range
Otero County, New Mexico

LOCATION: SE¼NW¼SE¼ sec. 8, T. 22 S., R. 6 E. **USGS No.** 22.6.8.414a

LATITUDE: 32°24'19" **LONGITUDE:** 106°20'48"

DEPTH: 478 feet **ALTITUDE:** 4,020 feet

DATE COMPLETED: October 1961 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Fourteen-inch pipe to 478 feet, torch-cut slots from 265-280, 290-360, 390-410, and 425-465 feet; gravel pack around pipe in 27 3/4-inch hole.

YIELD: Well test pumped at rates of 440 to 760 gpm for 11 hours with 60 feet of drawdown.

NONPUMPING WATER LEVEL: 218.0 feet on 10-30-61

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total screen	15,000	8,830	744	10-30-61

FORMATION LOGS: See Gregg test well

GEOLOGIC SOURCE: See Gregg test well

USE AND REMARKS: Experimental use for flooding land surface to obtain cooling effect to suppress heat waves around an optical tracking station. Gregg supply well drilled about 4 feet south of Gregg test well.

REFERENCE: Hood, 1968

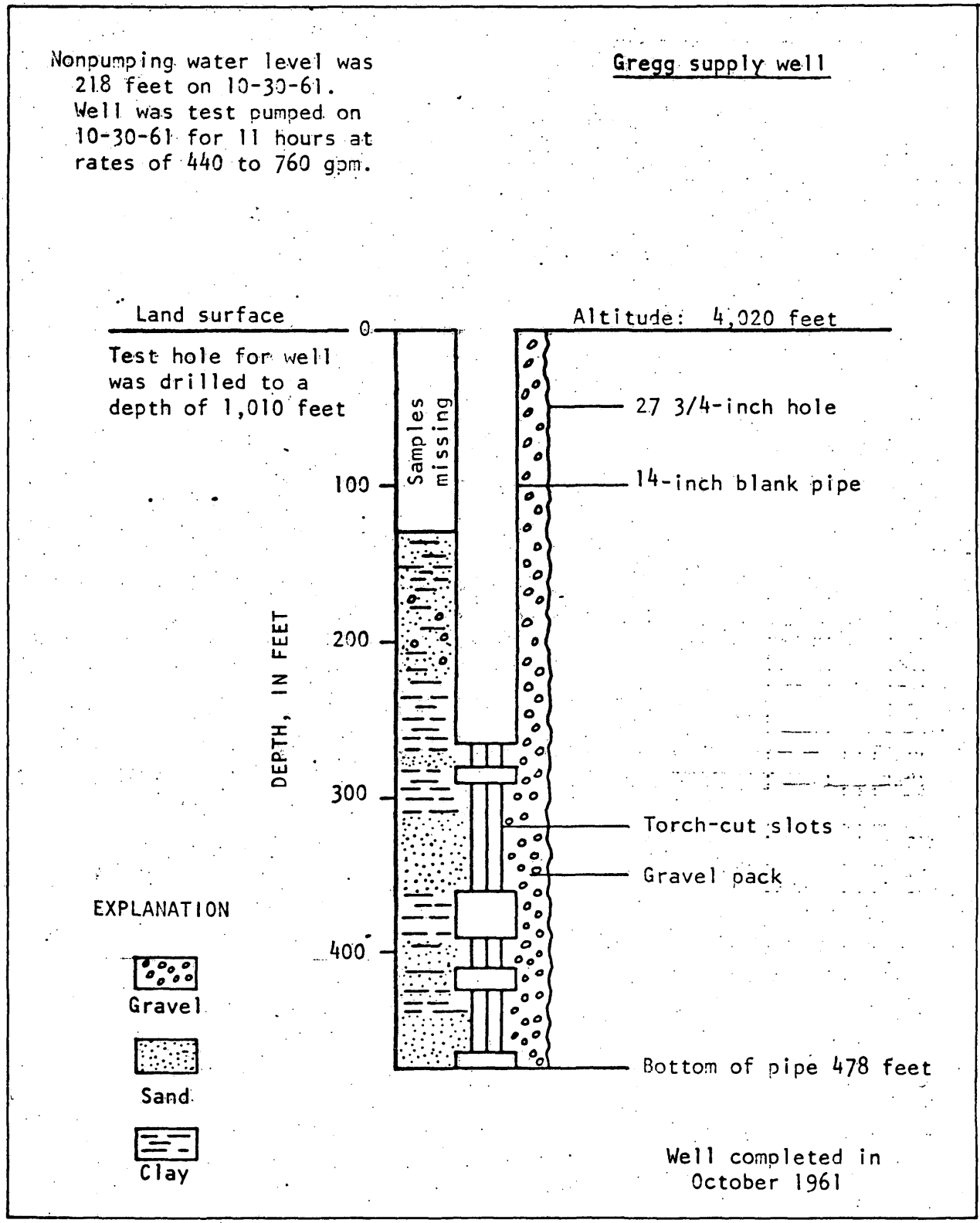


Figure 2.--Construction and lithology of Gregg supply well.

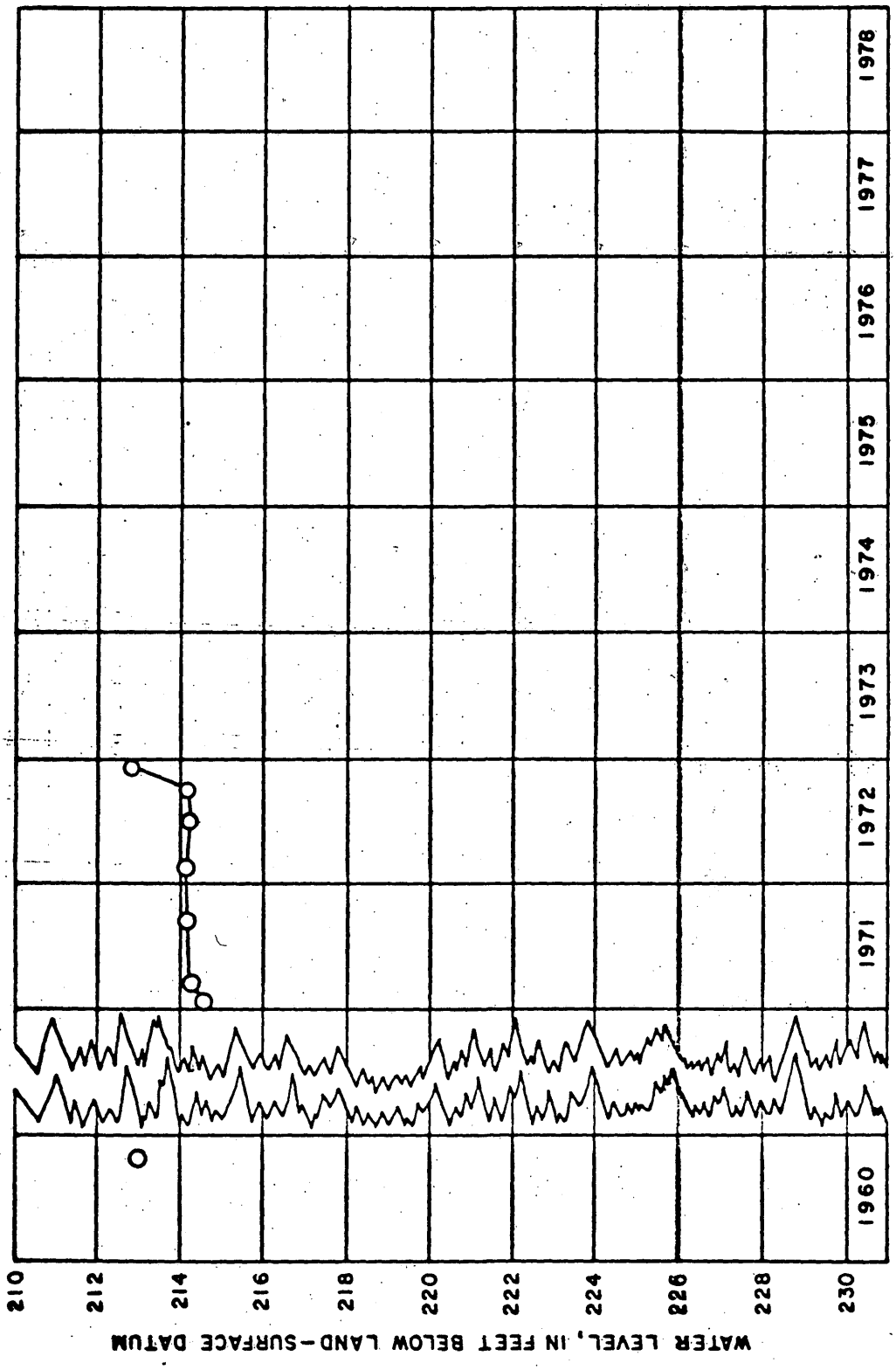


Figure 3.--Hydrograph of Gregg supply well.

Table 4.--Chemical analyses of water samples from Gregg supply well

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	10-30-61 1/				
Silica (SiO_2)	-				
Iron (Fe)	-				
Calcium (Ca)	-				
Magnesium (Mg)	-				
Sodium (Na)	-				
Potassium (K)	-				
Bicarbonate (HCO_3)	318				
Carbonate (CO_3)	0				
Sulfate (SO_4)	8,830				
Chloride (Cl)	744				
Fluoride (F)	-				
Nitrate (NO_3)	-				
Dissolved solids					
Calculated	-				
Residue on evaporation at 180°C	-				
Hardness as $CaCO_3$	3,170				
Noncarbonate hardness as $CaCO_3$	2,910				
Specific conductance (micromhos at 25°C)	15,000				
pH	7.4				
Color	-				
Temperature (°C)	26				

1/ Collected during pumping test on cased well.

Hazardous Test Area

Table 5.--Summary record of test well HTA-1

Hazardous Test Area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼SW¼NE¼ sec. 23, T. 21 S., R. 4 E. **USGS No.** 21.4.23.233

LATITUDE: 32°28'01" **LONGITUDE:** 106°30'08"

DEPTH: 250 feet **ALTITUDE:** 5,018.23 feet

DATE COMPLETED: October 1966 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Eight-inch blank pipe to 82 feet; open 8-inch hole from 82 to 250 feet.

YIELD: Well test pumped at 25 gpm for 8 hours with 18 feet of drawdown.

NONPUMPING WATER LEVEL: 78.40 feet on 10-3-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total depth	711	116	28	10-5-66

FORMATION LOGS: 1) Driller's; 2) Sample description; 3)

GEOLOGIC SOURCE: Fractured granitic rock

USE AND REMARKS: Observation well to monitor water-level changes. Depth-to-water measurements are made every 3 months. Well equipped with submersible pump in 1969.

REFERENCE: Doty, 1968f

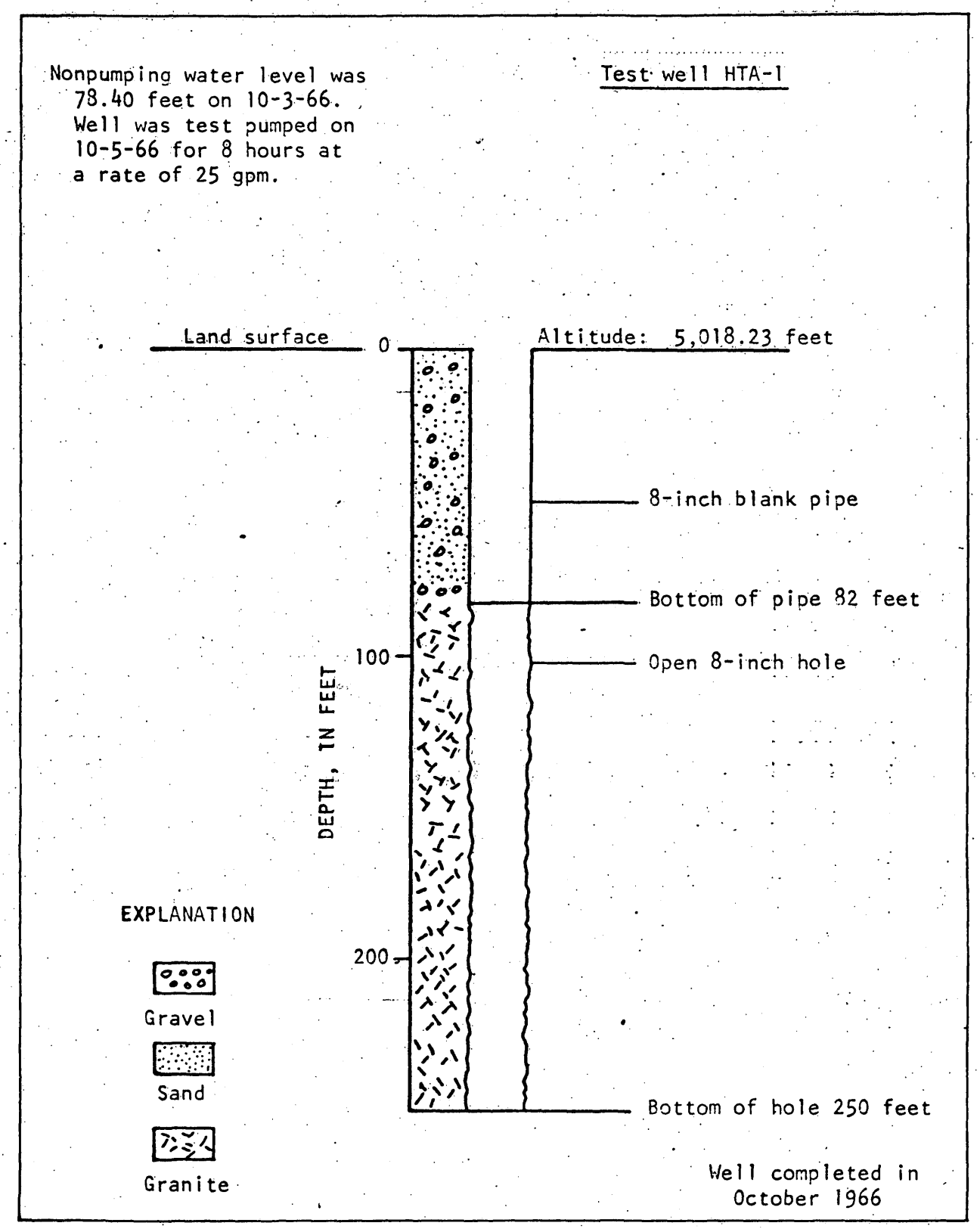


Figure 4.--Construction and lithology of test well HTA-1.

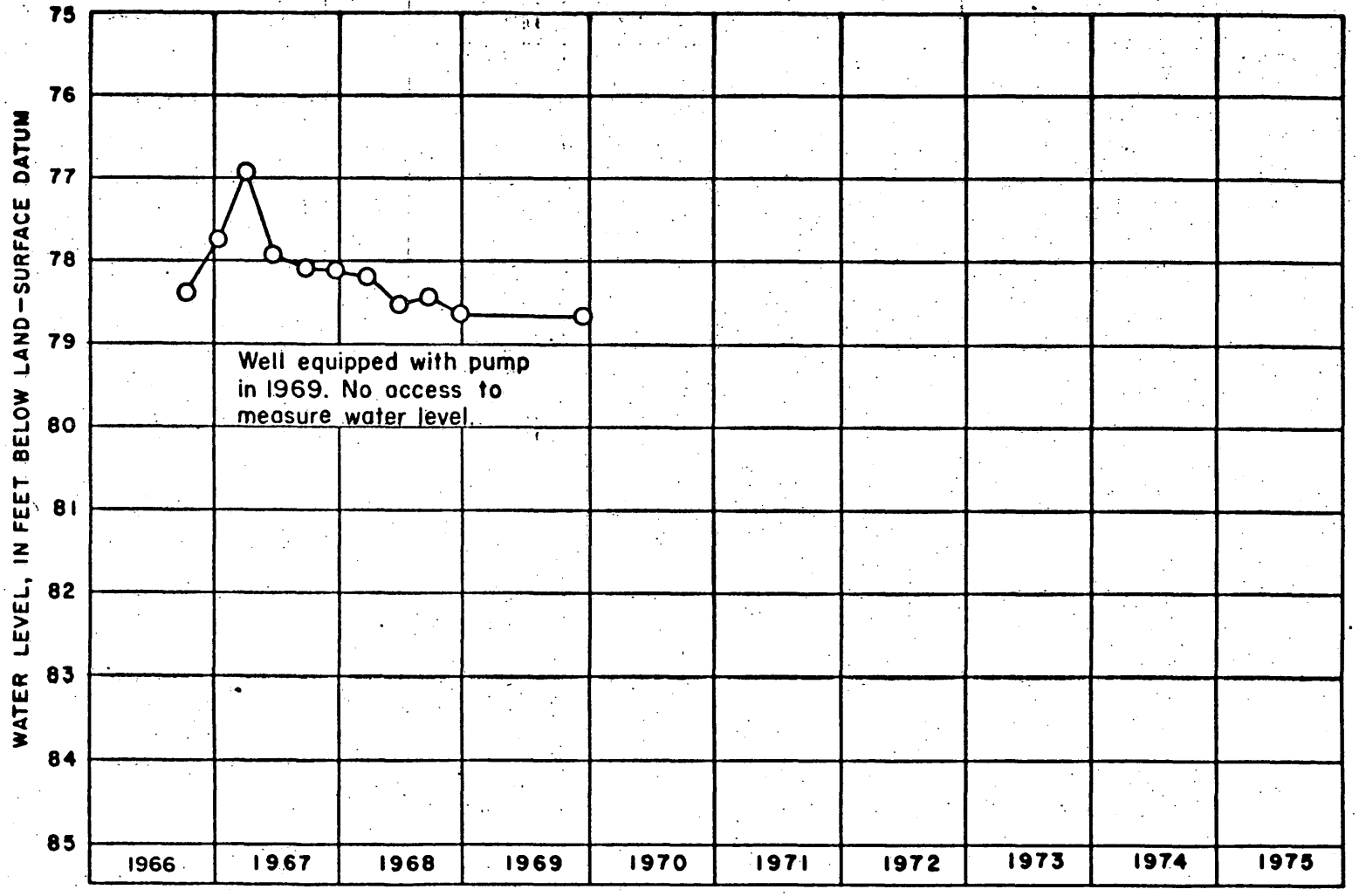


Figure 5.--Hydrograph of test well HTA-1.

Table 6.--Summary record of test well HTA-2

Hazardous Test Area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼SW¼SW¼ sec. 11, T. 21 S., R. 4 E. **USGS No.**21.4.11.333

LATITUDE: 32°29'28" **LONGITUDE:** 106°30'55"

DEPTH: Drilled to 189 feet **ALTITUDE:** 5,437.30 feet

DATE COMPLETED: November 1966 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Drilled with 10-inch bit

YIELD: Estimated 1/2 gpm

NONPUMPING WATER LEVEL: 77 feet on 11-30-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total depth	746	115	34	11-16-66

FORMATION LOGS: 1) Driller's; 2) Sample description; 3)

GEOLOGIC SOURCE: Fractured granitic rock

USE AND REMARKS: Plugged and abandoned

REFERENCE: Doty, 1968f

Table 7.--Chemical analyses of water samples from test wells HTA-1 and 2

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well	1	2			
Date of collection	10-5-66 1/	11-16-66 2/			
Silica (SiO_2)	34	24			
Iron (Fe)	.00	.02			
Calcium (Ca)	82	82			
Magnesium (Mg)	-	13			
Sodium (Na), Potassium (K)	53	60			
Bicarbonate (HCO_3)	221	238			
Carbonate (CO_3)	0	0			
Sulfate (SO_4)	116	115			
Chloride (Cl)	28	34			
Fluoride (F)	4.0	4.0			
Nitrate (NO_3)	29	22			
Dissolved solids					
Calculated	468	471			
Residue on evaporation at 180°C	-	476			
Hardness as $CaCO_3$	260	260			
Noncarbonate hardness as $CaCO_3$	79	65			
Specific conductance (micromhos at 25°C)	711	746			
pH	7.5	7.7			
Color	0	-			
Temperature (°C)	22	-			

1/ Collected during pumping test on cased well.
2/ Collected with bailer during drilling.

Small Missile Range

Table 8.--Summary record of supply well SMR-1

Small Missile Range
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: NE¼SW¼NW¼ sec. 16, T. 21 S., R. 5 E. **USGS No.** 21.5.16.132

LATITUDE: 32°28'56" **LONGITUDE:** 106 26'27"

DEPTH: Drilled to 600 feet; finished at 473 feet. **ALTITUDE:** 4,171 feet

DATE COMPLETED: June 1960 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Perry Brothers Drilling Co., Glencoe, N. Mex.

CASING AND HOLE RECORD: Six-inch pipe to 473 feet; 1/8-inch by 4-inch torch-cut slots from 286-310, 330-340, 352-372, 382-446, and 462-472 feet; pipe set in 8 3/4-inch hole.

YIELD: Well test pumped at an average rate of 124 gpm for 12 hours with 27.8 feet of drawdown.

NONPUMPING WATER LEVEL: 281.3 feet on 6-24-60

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total screen	785	142	24	6-25-60

FORMATION LOGS: 1) Sample description; 2) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Water-supply well for Small Missile Range

REFERENCE: Hood, 1968

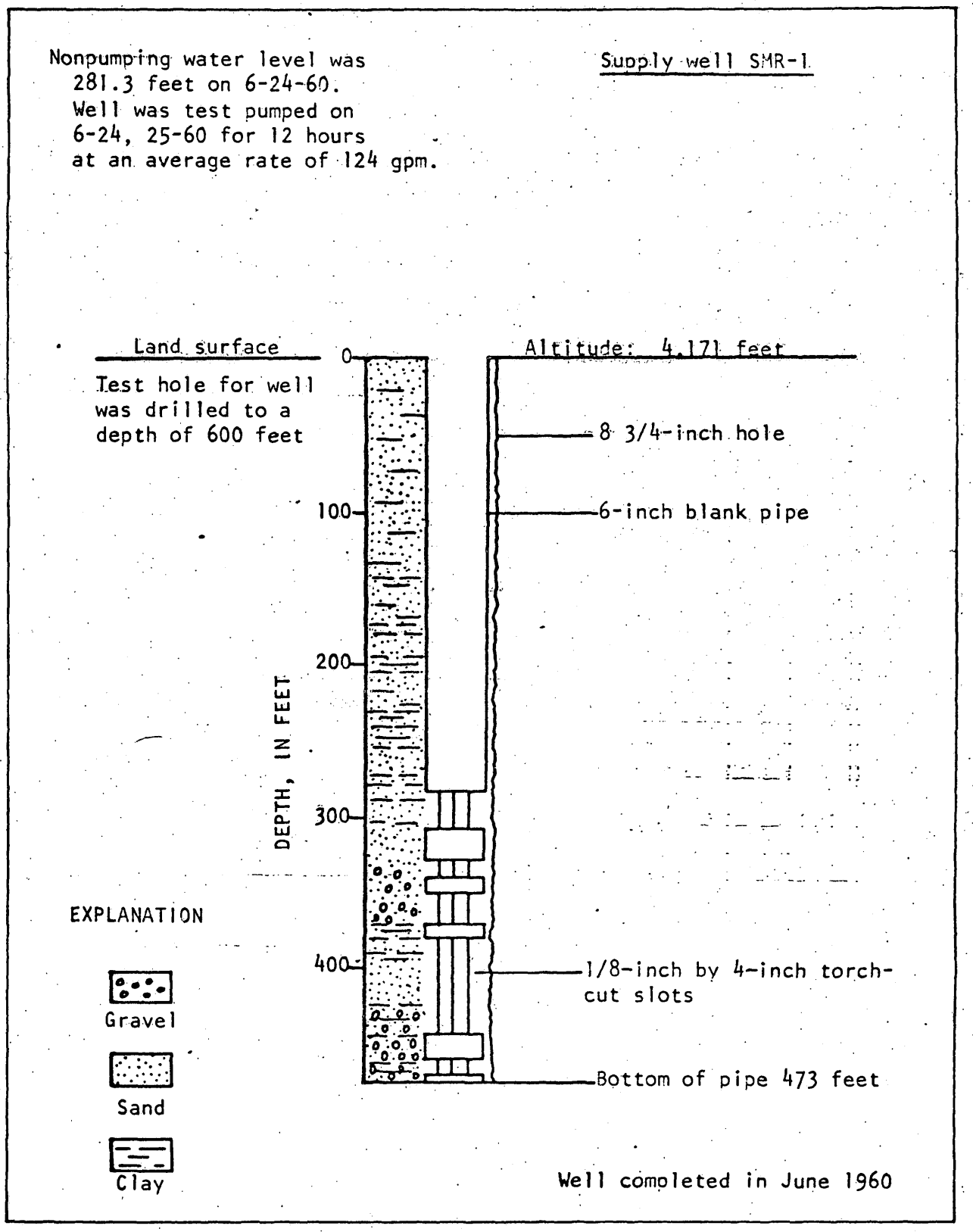


Figure 6.--Construction and lithology of supply well SMR-1.

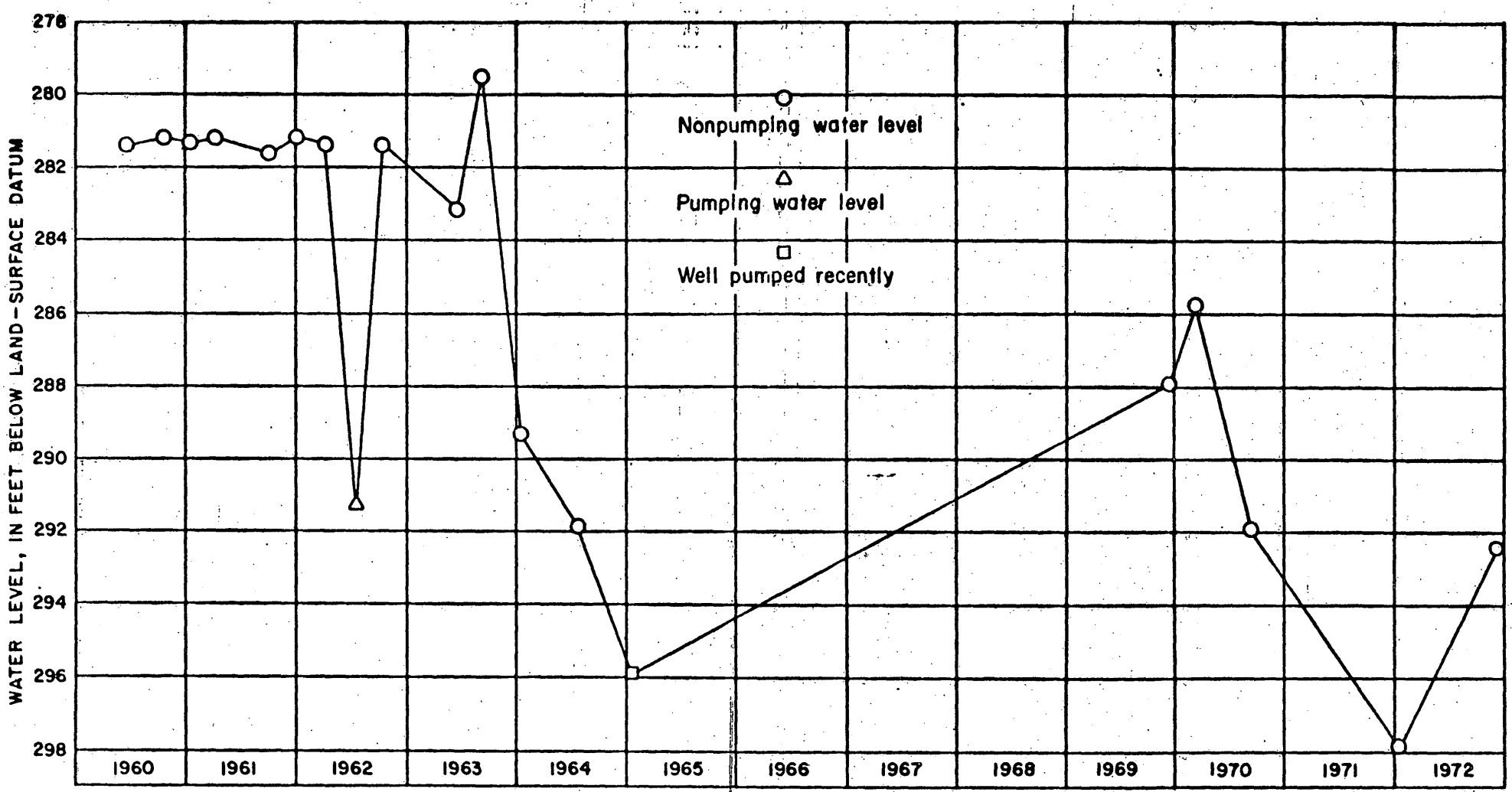


Figure 7.--Hydrograph of supply well SMR-1.

Table 9.--Chemical analyses of water samples from supply well SMR-1

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	6-10-60 1/	6-14-60 1/	6-25-60 2/		
Silica (SiO_2)	-	-	-		
Iron (Fe)	-	-	-		
Calcium (Ca)	-	-	74		
Magnesium (Mg)	-	-	51		
Sodium (Na)	-	-	-		
Potassium (K)					
Bicarbonate (HCO_3)	280	289	292		
Carbonate (CO_3)	0	0	0		
Sulfate (SO_4)	159	153	142		
Chloride (Cl)	27	26	24		
Fluoride (F)	-	-	1.0		
Nitrate (NO_3)	-	-	4.6		
Dissolved solids					
Calculated	-	-	484		
Residue on evaporation at 180°C	-	-	522		
Hardness as $CaCO_3$	364	374	396		
Noncarbonate hardness as $CaCO_3$	134	137	156		
Specific conductance (micromhos at 25°C)	775	800	785		
pH	8.0	7.5	7.8		
Color	-	-	-		
Temperature (°C)	27	27	27		

1/ Collected with bailer during drilling.

2/ Collected during pumping test on cased well.

Table 10.--Summary record of test well SMR-2

Small Missile Range
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SE¼NE¼SE¼ sec. 17, T. 21 S., R. 5 E. **USGS No.** 21.5.17.424

LATITUDE: 32°28'38" **LONGITUDE:** 106°26'44"

DEPTH: Drilled to 756 feet; finished at 747 feet. **ALTITUDE:** 4,198 feet

DATE COMPLETED: September 1960 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Perry Brothers Drilling Co., Glencoe, N. Mex.

CASING AND HOLE RECORD: Eight-inch pipe to 608 feet; 6-inch pipe from 598 to 747 feet; torch-cut slots from 295 to 588 and 608 to 715 feet. Pipe set in 10-inch hole from 0 to 612 feet and in 8-inch hole from 612 to 747 feet; 9 cubic yards of gravel around pipe.

YIELD: Well test pumped at rates as much as 172 gpm for 11 3/4 hours with 14 feet of drawdown.

NONPUMPING WATER LEVEL: 303.6 feet on 9-29-60

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total screen	781	162	29	9-29-60

FORMATION LOGS: 1) Sample description; 2) Gamma ray-neutron

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes near the Small Missile Range supply well. Depth-to-water measurements are made every 3 months.

REFERENCE: Hood, 1968

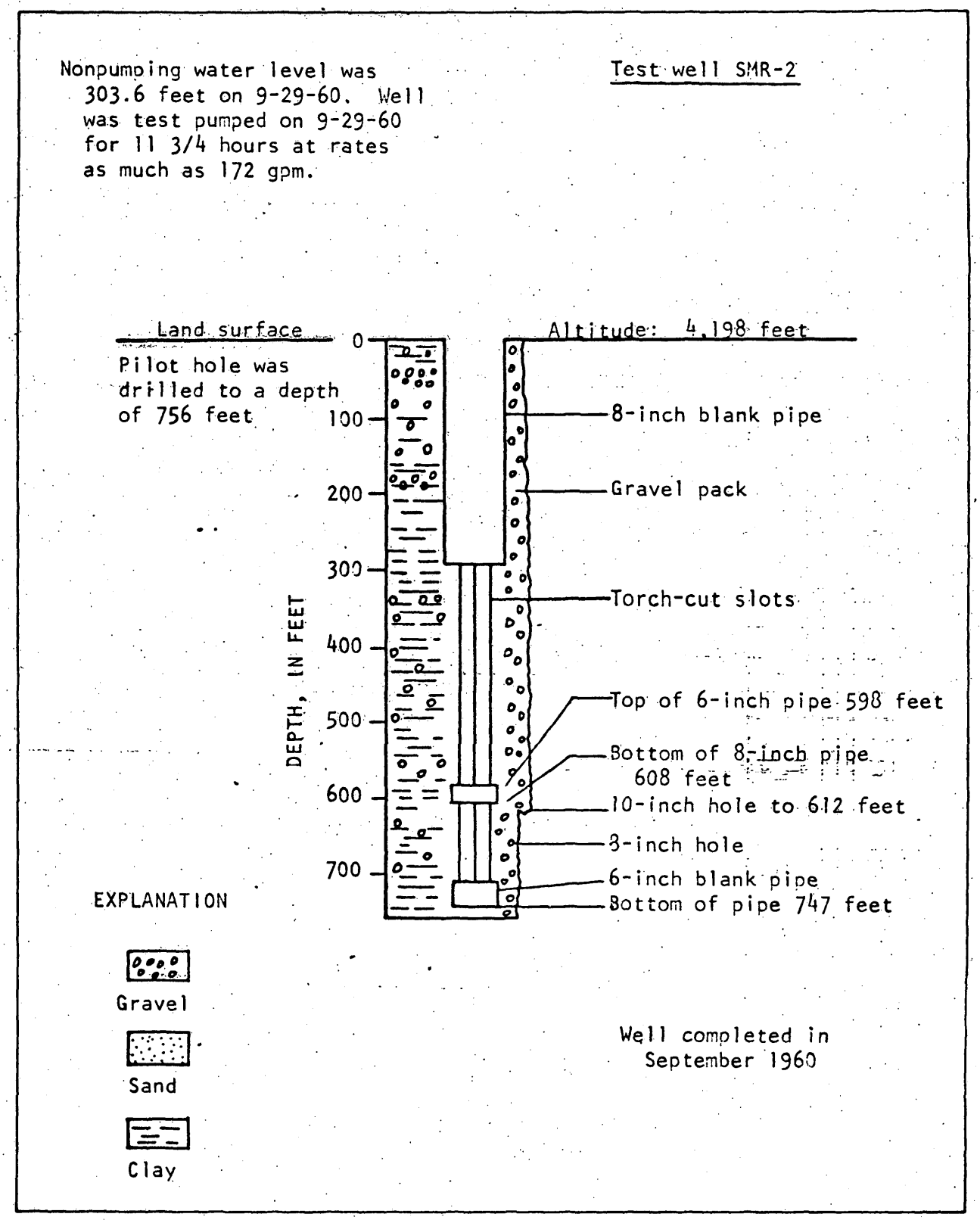


Figure 8.--Construction and lithology of test well SMR-2.

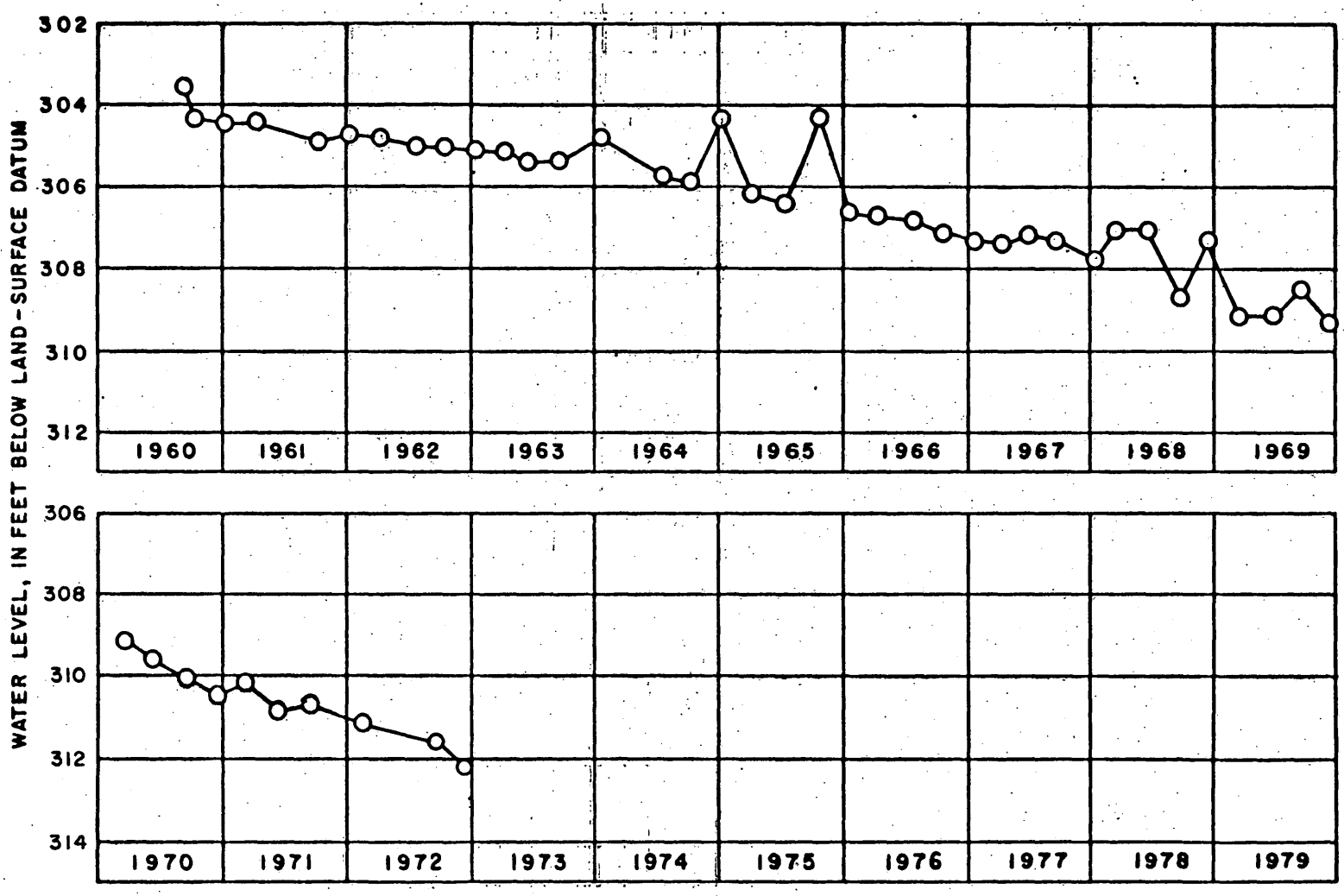


Figure 9.--Hydrograph of test well SMR-2.

Table 11.--Summary record of test well SMR-3

Small Missile Range
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼SW¼NW¼ sec. 34, T. 20 S., R. 5 E. **USGS No.** 20.5.34.133

LATITUDE: 32°31'04" **LONGITUDE:** 106°25'11"

DEPTH: Drilled to 1,010 feet; finished at 1,000 feet. **ALTITUDE:** 4,177.89 feet

DATE COMPLETED: January 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Eight-inch pipe to 1,000 feet; 1/8-inch by 2-inch mill-cut slots from 330-355, 380-410, 565-605, 710-730, 770-790, and 925-990 feet.

YIELD: Well test pumped at 212 gpm for 8 hours with 2.18 feet of drawdown.

NONPUMPING WATER LEVEL: 296.56 feet on 1-14-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	392	884	212	46	12-16-66
	707-742	886	215	34	12-21-66
	973-1,010	900	209	44	12-30-66
	Total screen	896	200	41	1-14-67

FORMATION LOGS: 1) Driller's; 2) Sample description; 3)

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes. Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1968f

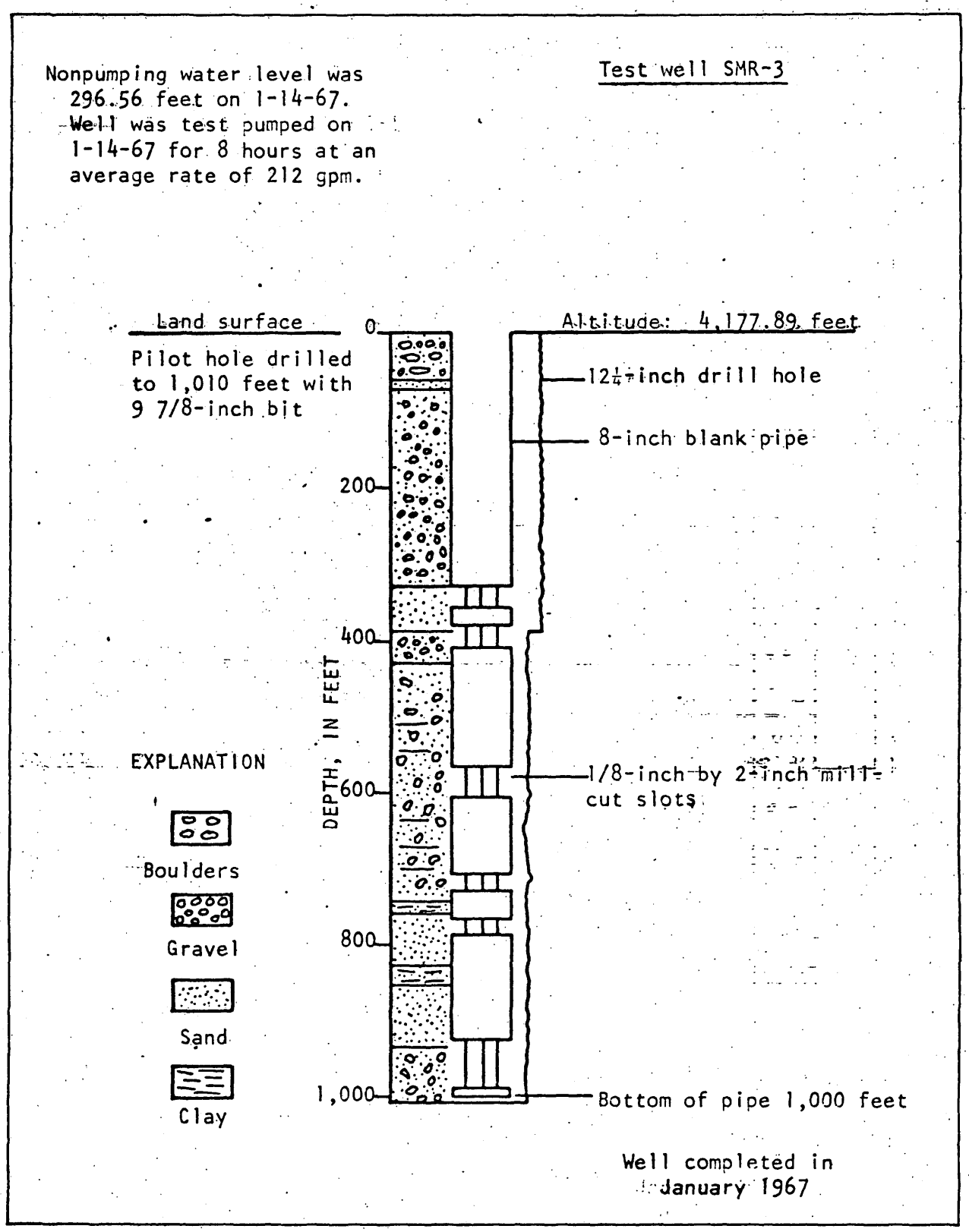


Figure 10.--Construction and lithology of test well SMR-3.

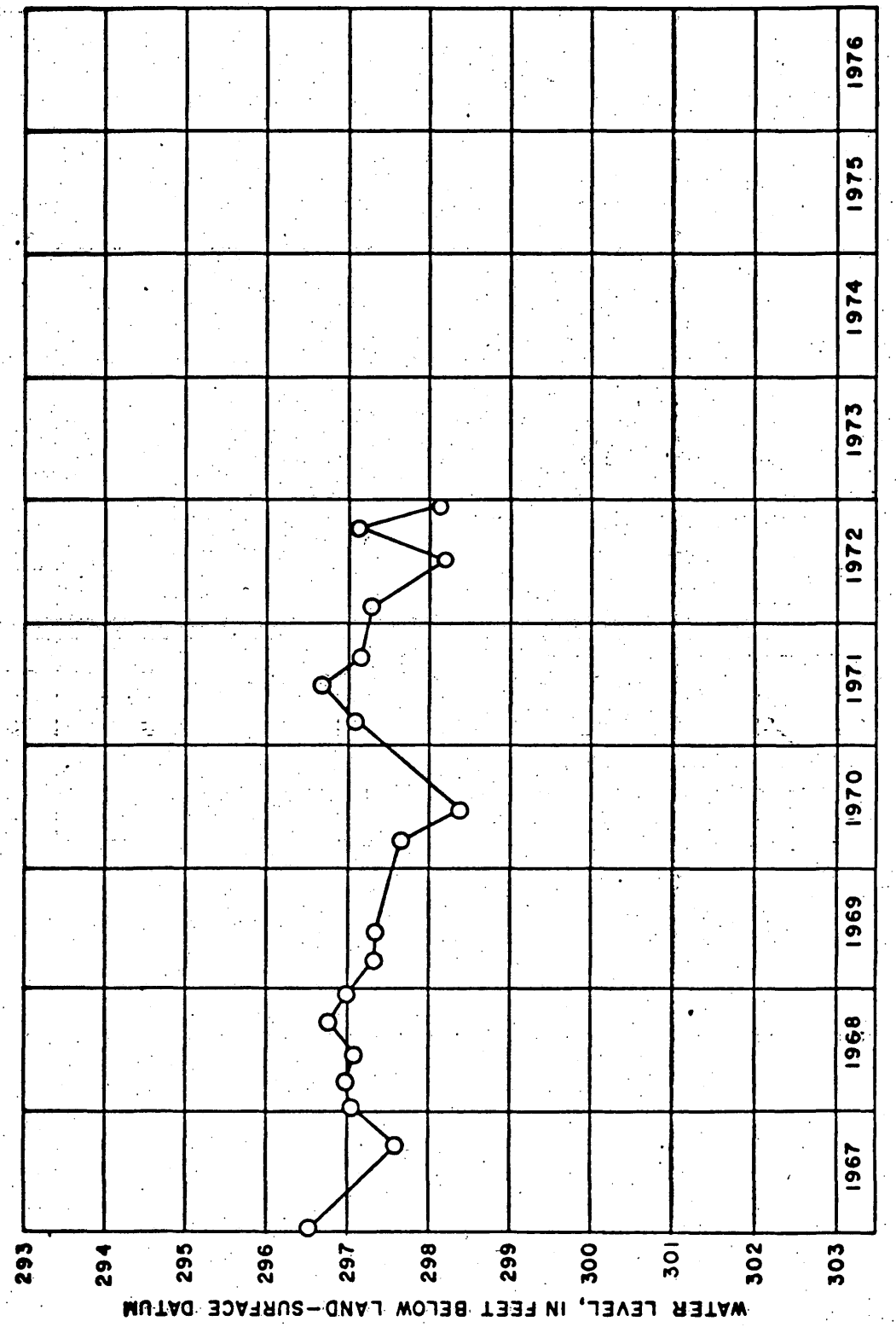


Figure 11.--Hydrograph of test well SMR-3.

Table 12.--Summary record of test well SMR-4

Small Missile Range
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SE¼SE¼SW¼ sec. 20, T. 21 S., R. 5 E. **USGS No.** 21.5.20.344

LATITUDE: 32°27'35" **LONGITUDE:** 106°27'13"

DEPTH: 1,016 feet **ALTITUDE:** 4,210 feet

DATE COMPLETED: December 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Drilled 12 1/4-inch hole to 450 feet and 7 7/8-inch hole to total depth; hole reamed to 12 1/4 inches from 450 to 580 feet and 8-inch pipe installed with 1/8 by 2-inch mill-cut slots, 36 slots per foot, in the interval 470 to 570 feet.

YIELD: Well test pumped at 152 gpm for 8 hours with 5.25 feet of drawdown.

NONPUMPING WATER LEVEL: 274.21 feet on 12-29-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	273-450	917	173	89	11-14-67
	670-703	684	110	62	11-16-67
	965-1,016	920	173	70	11-20-67
	470-570 (screen)	700	140	37	12-29-67

FORMATION LOGS: 1) Sample description; 2) Dual induction laterolog; 3) Proximity log microlog

GEOLOGIC SOURCE: Fan deposits or bolson fill

USE AND REMARKS: Observation well to monitor water-level changes. Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1969

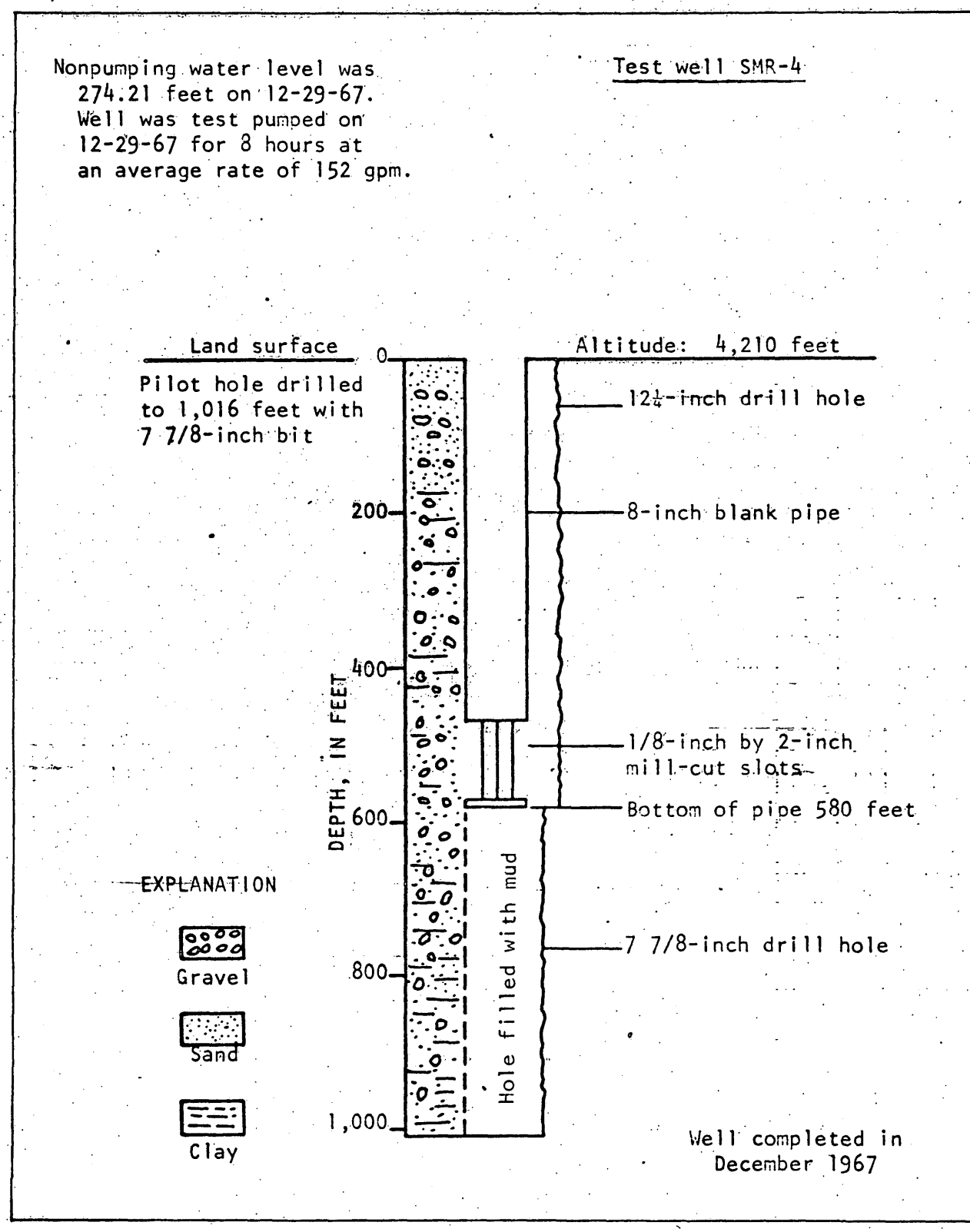


Figure 12.--Construction and lithology of test well SMR-4.

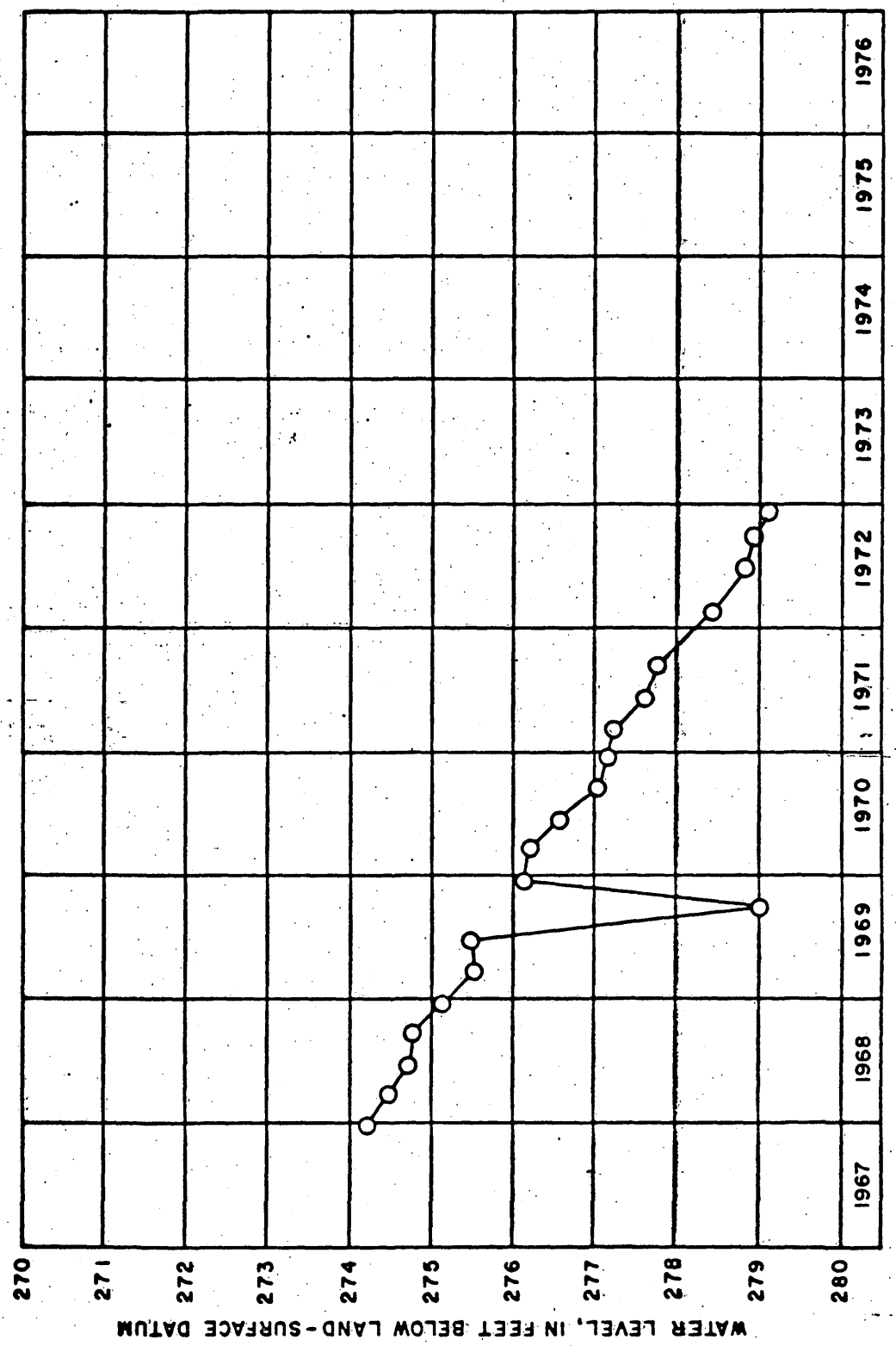


Figure 13.--Hydrograph of test well SMR-4.

Table 13.--Summary record of test well SMR-5

Small Missile Range
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SE¼SW¼SE¼ sec. 14, T. 21 S., R. 5 E. **USGS No.** 21.5.14.434

LATITUDE: 32°28'26" **LONGITUDE:** 106°23'50"

DEPTH: 666 feet **ALTITUDE:** 3,950 feet

DATE COMPLETED: December 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Drilled with 18-inch bit to 249 feet; 10 3/4-inch pipe installed. Drilled from 249 feet to total depth with 7 7/8-inch bit.

YIELD: Not test pumped; bailed at 20 gpm during collection of upper water sample.

NONPUMPING WATER LEVEL: 108.6 feet on 12-20-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	109-249	2,200	922	104	12-11-67
	615-666	13,900	6,450	1,930	12-18-67

FORMATION LOGS: 1) Sample description; 2) Dual induction laterolog; 3) Proximity log microlog

GEOLOGIC SOURCE: Bolson deposits

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1969

Table 14.—Chemical analyses of water samples from test wells SMR-2, 3, 4, and 5

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well SMR	2	2	2	3	3
Date of collection	7-7-60 1/	8-10-60 1/	9-29-60 2/	12-16-66 3/	12-21-66 4/
Silica (SiO_2)	-	-	30	-	-
Iron (Fe)	-	-	.31	-	-
Calcium (Ca)	-	-	75	-	-
Magnesium (Mg)	-	-	40	-	-
Sodium (Na)	-	-	39	-	-
Potassium (K)	-	-	2.2	-	-
Bicarbonate (HCO_3)	186	-	275	-	-
Carbonate (CO_3)	0	-	0	-	-
Sulfate (SO_4)	201	-	162	212	215
Chloride (Cl)	38	30	29	46	34
Fluoride (F)	-	-	1.5	-	-
Nitrate (NO_3)	-	-	4.3	-	-
Dissolved solids					
Calculated	-	-	531	-	-
Residue on evaporation at 180°C	-	-	532	-	-
Hardness as $CaCO_3$	334	-	352	-	-
Noncarbonate hardness as $CaCO_3$	182	-	126	-	-
Specific conductance (micromhos at 25°C)	781	817	781	884	886
pH	7.8	-	7.7	-	-
Color	-	-	-	-	-
Temperature (°C)	-	26	29	23	27

1/ Collected with bailer during drilling.
2/ Collected during pumping test on cased well.
3/ Collected with bailer from depth of 392 feet.
4/ Collected through packer from depths of 707-742 feet.

Table 14.--Chemical analyses of water samples from test wells SMR-2, 3, 4, and 5 - Continued

Test well SMR	3	3	4	4	4
Date of collection	12-30-66 5/	1-14-67 2/	11-14-67 6/	11-16-67 7/	11-20-67 8/
Silica (SiO_2)	-	24	39	-	36
Iron (Fe)	-	.00	.91	-	.01
Calcium (Ca)	-	86	54	37	64
Magnesium (Mg)	-	47	28	6.9	9.8
Sodium (Na)	-	38	149	98	126
Potassium (K)	-				
Bicarbonate (HCO_3)	-	262	188	158	222
Carbonate (CO_3)	-	0	0	0	0
Sulfate (SO_4)	209	200	173	110	173
Chloride (Cl)	44	41	89	62	70
Fluoride (F)	-	.5	3.1	-	1.3
Nitrate (NO_3)	-	7.2	6.8	4.6	12
Dissolved solids					
Calculated	-	573	591	-	601
Residue on evaporation at 180°C	-	568	610	-	597
Hardness as $CaCO_3$	-	406	146	121	200
Noncarbonate hardness as $CaCO_3$	-	192	0	0	18
Specific conductance (micromhos at 25°C)	900	896	917	684	920
pH	-	7.5	8.1	7.8	7.7
Color	-	-	7	-	4
Temperature (°C)	27	26	24	26	29

2/ Collected during pumping test on cased well.
5/ Collected through packer from depths of 973-1,010 feet.
6/ Collected through packer from depths of 273-450 feet.
7/ Collected through packer from depths of 670-703 feet.
8/ Collected through packer from depths of 965-1,016 feet.

Table 14.--Chemical analyses of water samples

from test wells SMR-2, 3, 4, and 5 - Concluded

Test well SMR	4	5	5		
Date of collection	12-29-67 2/	12-11-67 9/	12-18-67 10/		
Silica (SiO_2)	43	60	15		
Iron (Fe)	.03	.00	.02		
Calcium (Ca)	77	195	575		
Magnesium (Mg)	15	81	685		
Sodium (Na) / Potassium (K)	48	207	2,500		
Bicarbonate (HCO_3)	182	194	278		
Carbonate (CO_3)	0	0	0		
Sulfate (SO_4)	140	922	6,450		
Chloride (Cl)	37	104	1,930		
Fluoride (F)	2.5	1.8	3.3		
Nitrate (NO_3)	8.4	.2	.4		
Dissolved solids					
Calculated	460	1,670	12,300		
Residue on evaporation at 180°C	474	1,800	13,400		
Hardness as $CaCO_3$	255	820	4,250		
Noncarbonate hardness as $CaCO_3$	106	661	4,020		
Specific conductance (micromhos at 25°C)	700	2,200	13,900		
pH	7.8	7.5	7.5		
Color	3	3	3		
Temperature (°C)	28	21	22		

2/ Collected during pumping test on cased well.
9/ Collected through packer from depths of 109-249 feet.
10/ Collected through packer from depths of 615-666 feet.

MAR well-field area

Table 15.--Summary record of test well MAR-1

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼SW¼SW¼ sec. 17, T. 19 S., R. 5 E. **USGS No.** 19.5.17.333

LATITUDE: 32°38'54" **LONGITUDE:** 106°27'41"

DEPTH: Drilled to 1,000 feet; finished at 650 feet **ALTITUDE:** 4,135 feet

DATE COMPLETED: May 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Cass Drilling Co., El Paso, Tex.

CASING AND HOLE RECORD: Six-inch pipe to 650 feet, 1/8-inch by 4-inch torch-cut slots from 250-270, 285-300, 318-328, 336-368, 386-406, 452-462, 500-550, 588-598, and 617-632 feet; hole filled with gravel capped with cement from 1,000 to 650 feet; 15-inch diameter hole to 120 feet; 8 5/8-inch diameter hole from 120 to 650 feet.

YIELD: Well test pumped at 165 gpm for 12 hours with 39.4 feet of drawdown.

NONPUMPING WATER LEVEL: 225.52 feet on 5-3-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	250-350	950	234	42	3-20-63
	582-718	726	93	42	3-28-63
	827-1,000	68,700	2,460	27,200	4- 6-63
	Total screen	809	162	42	5- 9-63

FORMATION LOGS: 1) Sample description; 2) Contact caliper; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes near the MAR well field. Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1968a

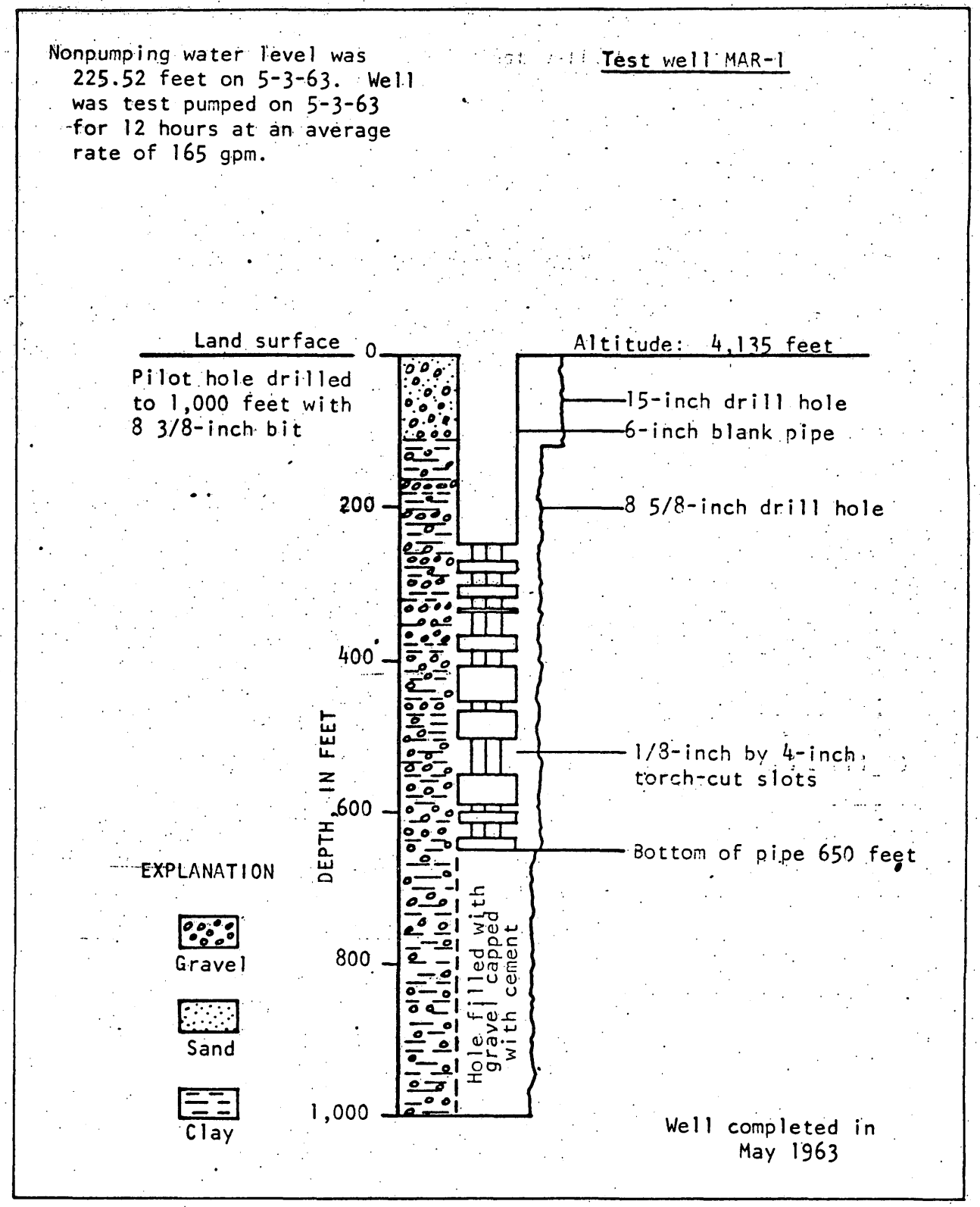


Figure 14.--Construction and lithology of test well MAR-1.

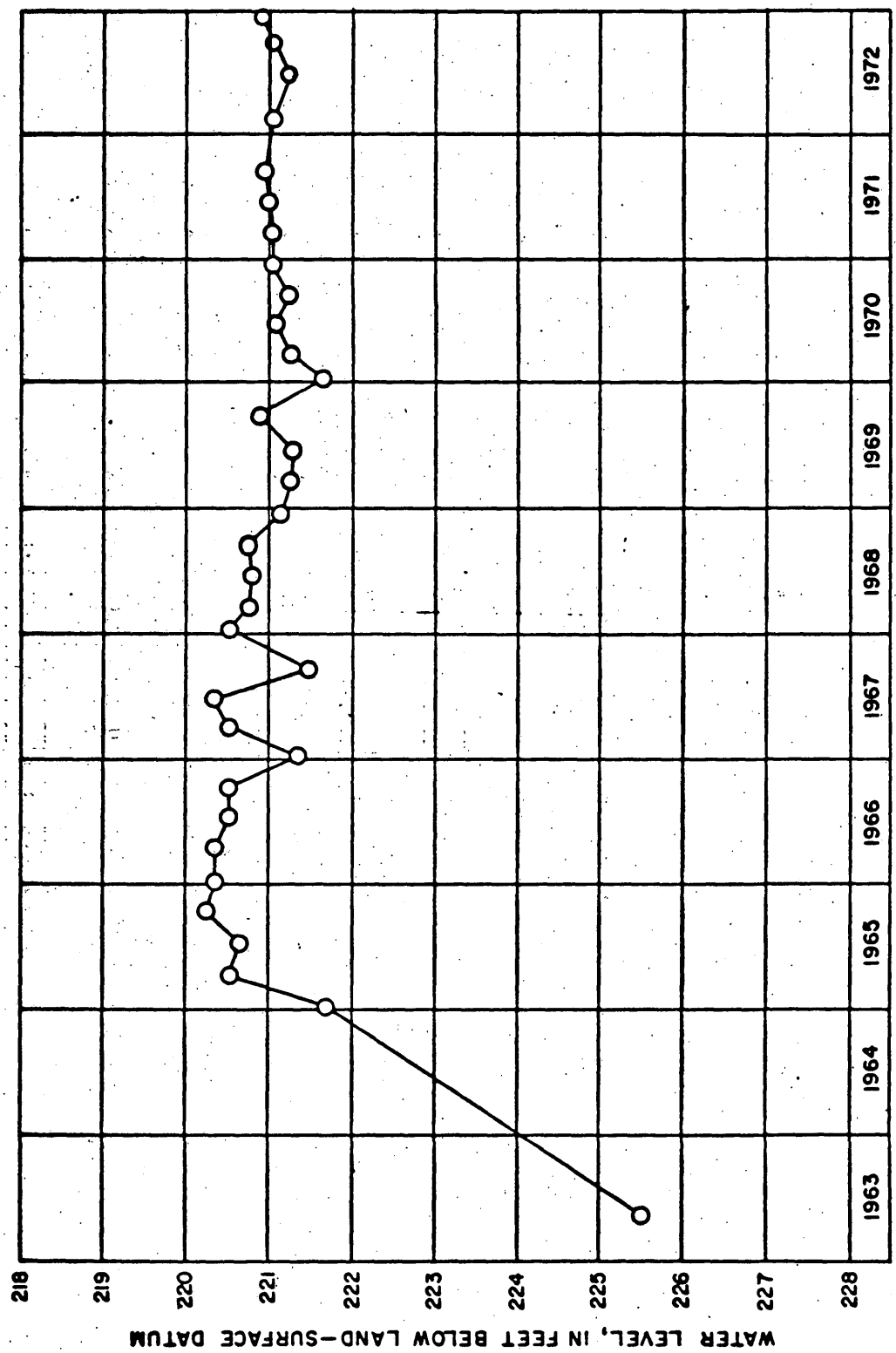


Figure 15.--Hydrograph of test well MAR-1.

Table 16.--Summary record of test well MAR-2

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼SE¼SE¼ sec. 28, T. 19 S., R. 5 E. **USGS No.** 19.5.28.443

LATITUDE: 32°37'12" **LONGITUDE:** 106°25'52"

DEPTH: 749 feet **ALTITUDE:** 4,135 feet

DATE COMPLETED: June 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Cass Drilling Co., El Paso, Tex.

CASING AND HOLE RECORD: Fifteen-inch hole to 117 feet; 8 3/4-inch hole from 117 to 749 feet; 10-inch temporary pipe installed to 117 feet; pipe removed upon completion of well.

YIELD: Not tested

NONPUMPING WATER LEVEL: 237 feet on 6-4-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	246-310	917	225	55	5-21-63
	670-749	56,200	2,640	20,500	5-24-63

FORMATION LOGS: 1) Sample description; 2) Contact caliper; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1968a

Table 17.--Summary record of test well MAR-3

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: NW¼NW¼NW¼ sec. 21, T. 19 S., R. 5 E. **USGS No.** 19.5.21.111

LATITUDE: 32°38'54" **LONGITUDE:** 106°26'41"

DEPTH: 750 feet **ALTITUDE:** 4,080 feet

DATE COMPLETED: July 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Cass Drilling Co., El Paso, Tex.

CASING AND HOLE RECORD: Fifteen-inch hole to 81 feet; 8 3/4-inch hole from 81 to 750 feet; 6-inch temporary pipe installed to 290 feet; pipe removed upon completion of well.

YIELD: Well bailed at 1.6 gpm

NONPUMPING WATER LEVEL: 179 feet on 6-27-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	178-290	930	258	45	6-27-63
	605-705	49,300	1,890	18,100	7- 3-63

FORMATION LOGS: 1) Sample description; 2) Contact caliper; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1968a

Table 18.--Summary record of test well MAR-4

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SW¼NW¼SE¼ sec. 19, T. 19 S., R. 5 E. **USGS No.** 19.5.19.413

LATITUDE: 32°38'42" **LONGITUDE:** 106°28'12"

DEPTH: Drilled to 1,016 feet; finished at 750 feet **ALTITUDE:** 4,223.39 feet

DATE COMPLETED: February 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Eight-inch pipe to 750 feet; 1/8-inch by 2-inch mill-cut slots from 436-456, 466-476, 550-570, 600-660, and 720-740 feet; open hole below pipe filled with cement from 750-770 feet.

YIELD: Well test pumped at 235 gpm for 8 hours with 4.27 feet of drawdown.

NONPUMPING WATER LEVEL: 303.16 feet on 2-1-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	430	778	177	34	1-21-67
	705-740	799	178	38	1-23-67
	985-1,016	2,150	164	480	1-26-67
	Total screen	794	166	34	2- 1-67

FORMATION LOGS: 1) Driller's; 2) Sample description; 3)

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes near the MAR well field. Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1968f

Nonpumping water level was 303.16 feet on 2-1-67. Well was test pumped on 2-1-67 for 8 hours at an average rate of 235 gpm.

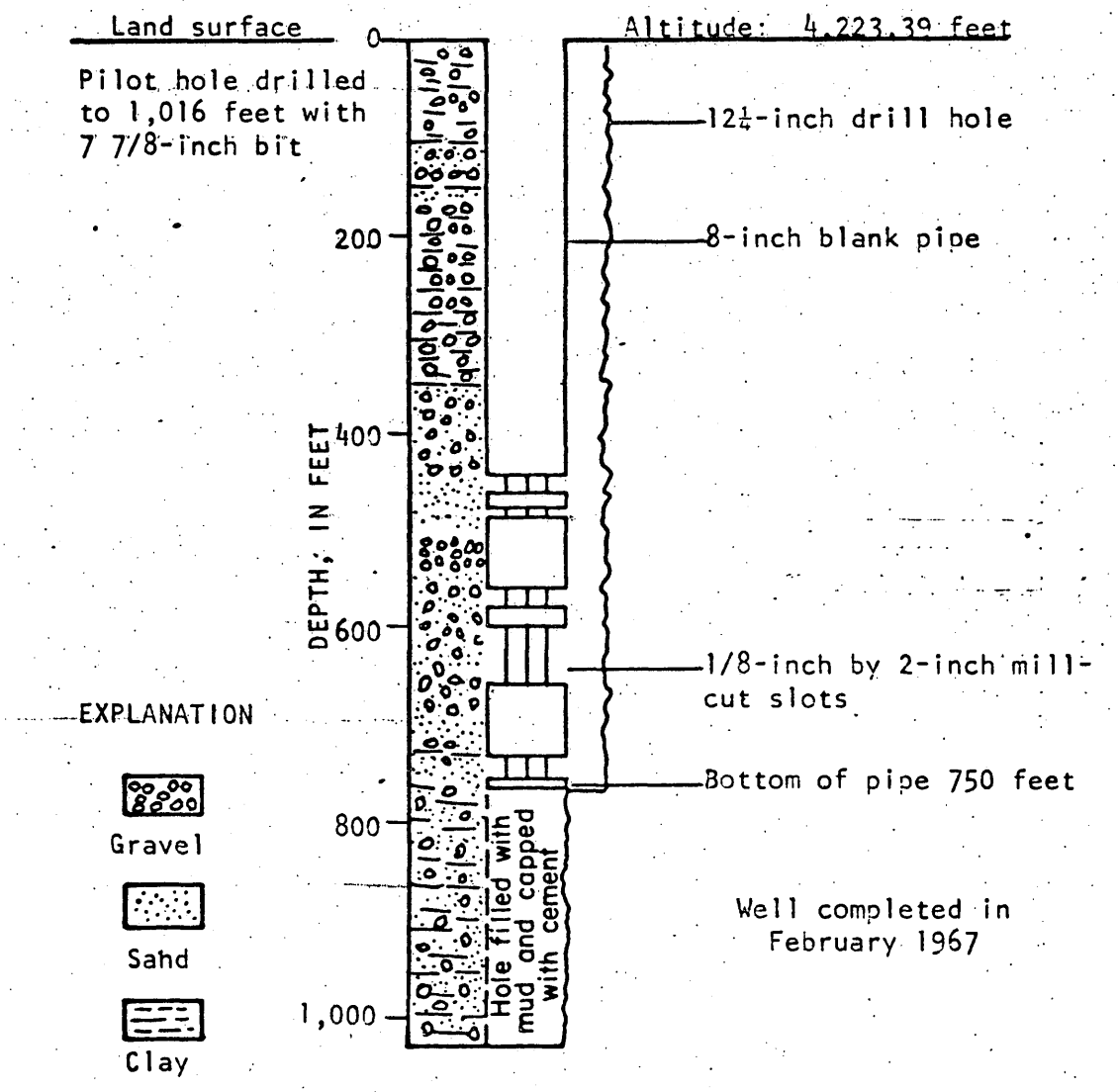


Figure 16.--Construction and lithology of test well MAR-4.

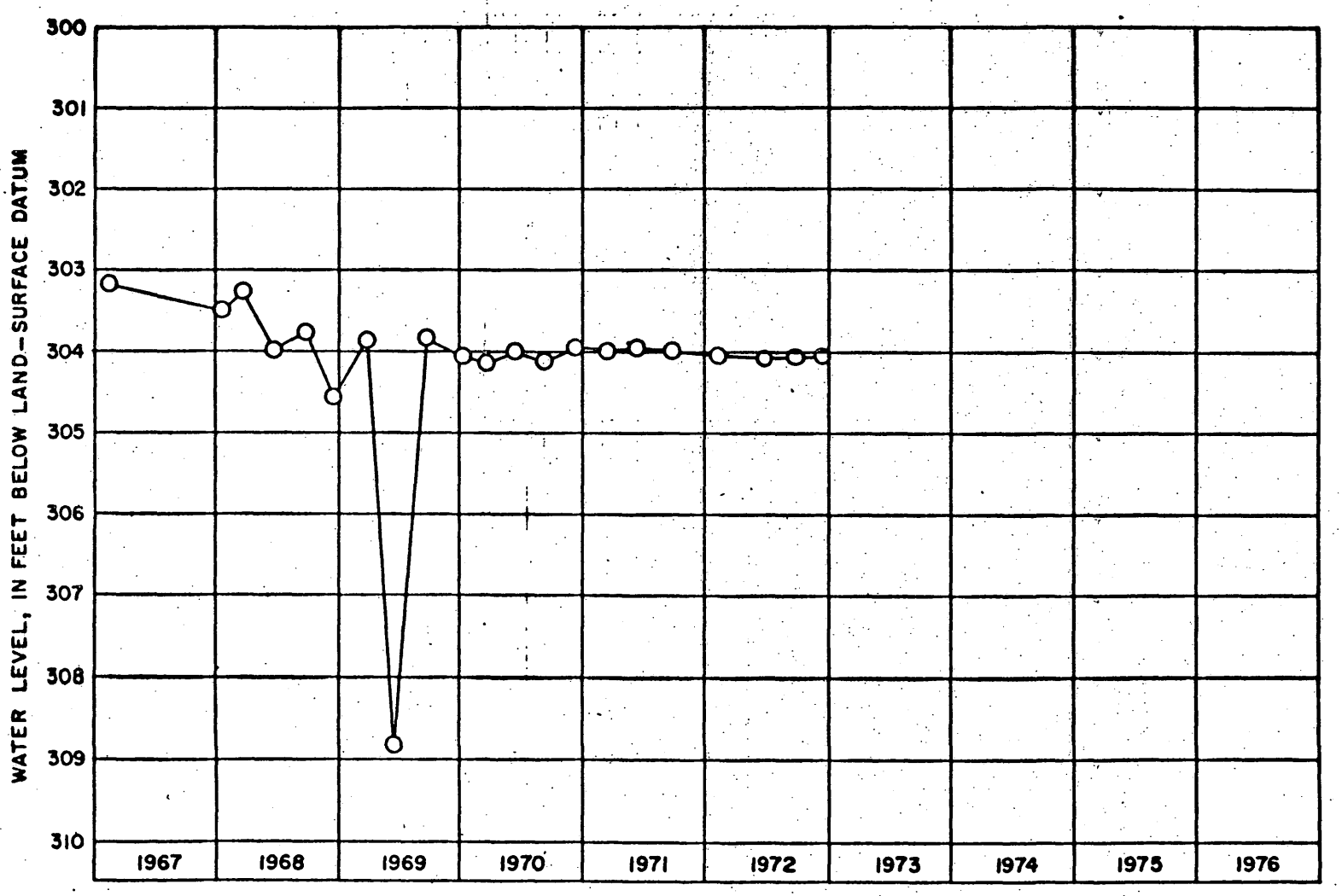


Figure 17.--Hydrograph of test well MAR-4.

Table 19.--Chemical analyses of water samples from test wells MAR-1, 2, 3, and 4

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well MAR	1	1	1	1	2
Date of collection	3-20-63 1/	3-28-63 2/	4-6-63 3/	5-9-63 4/	5-21-63 5/
Silica (SiO_2)	-	-	-	25	21
Iron (Fe)	-	-	-	.02	.02
Calcium (Ca)	-	-	-	81	53
Magnesium (Mg)	-	-	-	36	38
Sodium (Na) / Potassium (K)	-	-	-	42	94
Bicarbonate (HCO_3)	-	-	-	254	212
Carbonate (CO_3)	-	-	-	0	0
Sulfate (SO_4)	234	93	2,460	162	225
Chloride (Cl)	42	42	27,200	42	55
Fluoride (F)	-	-	-	.5	.7
Nitrate (NO_3)	-	-	-	6.9	8.6
Dissolved solids					
Calculated	-	-	-	520	599
Residue on evaporation at 180°C	-	-	-	-	612
Hardness as $CaCO_3$	-	-	-	352	290
Noncarbonate hardness as $CaCO_3$	-	-	-	144	116
Specific conductance (micromhos at 25°C)	950	726	68,700	809	917
pH	-	-	-	7.4	7.8
Color	-	-	-	1	4
Temperature (°C)	-	-	-	-	-

1/ Collected through packer from depths of 250-350 feet.
2/ Collected through packer from depths of 582-718 feet.
3/ Collected through packer from depths of 827-1,000 feet.
4/ Collected during pumping test on cased well.
5/ Collected through packer from depths of 246-310 feet.

Table 19.--Chemical analyses of water samples from test wells MAR-1, 2, 3, and 4 - Continued

Test well MAR	2	3	3	4	4
Date of collection	5-24-63 6/	6-27-63 7/	7-3-63 8/	1-21-67 9/	1-23-67 10/
Silica (SiO_2)	-	-	-	-	-
Iron (Fe)	-	-	-	-	-
Calcium (Ca)	-	-	-	-	-
Magnesium (Mg)	-	-	-	-	-
Sodium (Na)	-	-	-	-	-
Potassium (K)	-				
Bicarbonate (HCO_3)	-	-	182	-	-
Carbonate (CO_3)	-	-	0	-	-
Sulfate (SO_4)	2,640	258	1,890	177	178
Chloride (Cl)	20,500	45	18,100	34	38
Fluoride (F)	-	-	-	-	-
Nitrate (NO_3)	-	-	-	-	-
Dissolved solids					
Calculated	-	-	-	-	-
Residue on evaporation at 180°C	-	-	-	-	-
Hardness as $CaCO_3$	-	-	-	-	-
Noncarbonate hardness as $CaCO_3$	-	-	-	-	-
Specific conductance (micromhos at 25°C)	56,200	930	49,300	778	799
pH	-	-	-	-	-
Color	-	-	-	-	-
Temperature (°C)	-	-	-	23	28

6/ Collected through packer from depths of 670-749 feet.
7/ Collected through packer from depths of 178-290 feet.
8/ Collected through packer from depths of 605-705 feet.
9/ Collected with bailer from depth of 430 feet.
10/ Collected through packer from depths of 705-740 feet.

Table 19.--Chemical analyses of water samples from test wells MAR-1, 2, 3, and 4 - Concluded

Test well MAR	4	4			
Date of collection	1-26-67 11/	2-1-67 4/			
Silica (SiO_2)	-	24			
Iron (Fe)	-	.13			
Calcium (Ca)	-	82			
Magnesium (Mg)	-	40			
Sodium (Na) / Potassium (K)	-	32			
Bicarbonate (HCO_3)	-	258			
Carbonate (CO_3)	-	0			
Sulfate (SO_4)	164	166			
Chloride (Cl)	480	34			
Fluoride (F)	-	.4			
Nitrate (NO_3)	-	6.6			
Dissolved solids					
Calculated	-	512			
Residue on evaporation at 180°C	-	570			
Hardness as $CaCO_3$	-	370			
Noncarbonate hardness as $CaCO_3$	-	158			
Specific conductance (micromhos at 25°C)	2,150	794			
pH	-	7.6			
Color	-	-			
Temperature (°C)	28	25			

4/ Collected during pumping test on cased well.
11/ Collected through packer from depths of 985-1,016 feet.

Table 20.--Summary record of supply well MAR-1

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: NW¼SW¼SW¼ sec. 17, T. 19 S., R. 5 E. **USGS No.** 19.5.17.331

LATITUDE: 32°39'06" **LONGITUDE:** 106°27'43"

DEPTH: Drilled to 650 feet; finished at 550 feet **ALTITUDE:** 4,132 feet

DATE COMPLETED: October 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Harold P. Doty Drilling Co., Albuquerque, N. Mex.

CASING AND HOLE RECORD: Twenty-four-inch pipe cemented to 30 feet; 10-inch pipe 0 to 550 feet; 1/8-inch by 2 1/4-inch mill-cut slots from 230 to 550 feet; gravel pack around pipe in 20-inch hole.

YIELD: Well test pumped at 114 gpm for 24 hours with 37 feet of drawdown.

NONPUMPING WATER LEVEL: 213.65 feet on 10-22-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total screen	818	180	36	10-23-63

FORMATION LOGS: 1) Sample description; 2) Microlog; 3) Induction-electrical.

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Water-supply well for MAR facility

REFERENCE: Doty, 1968b

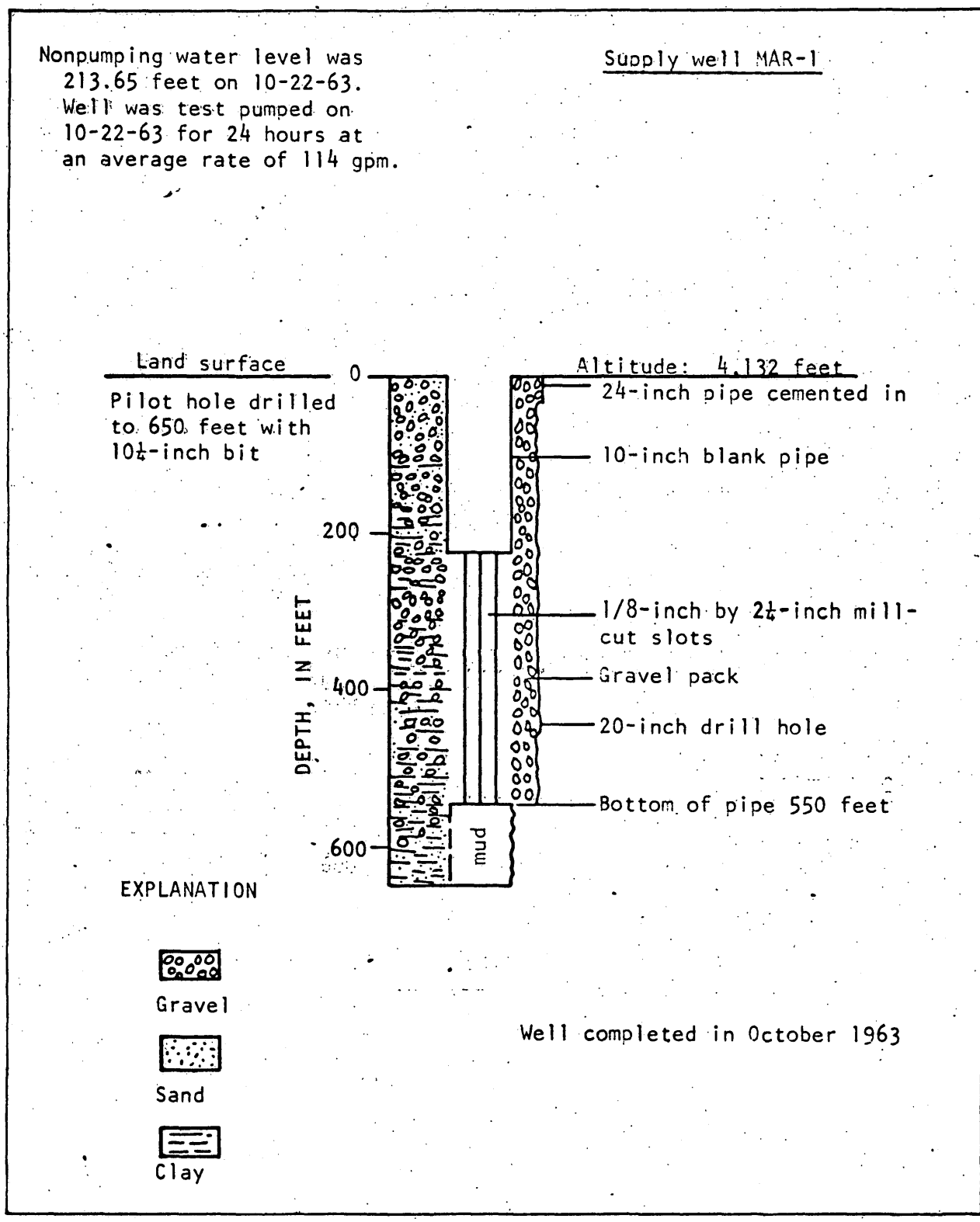


Figure 18.--Construction and lithology of supply well MAR-1.

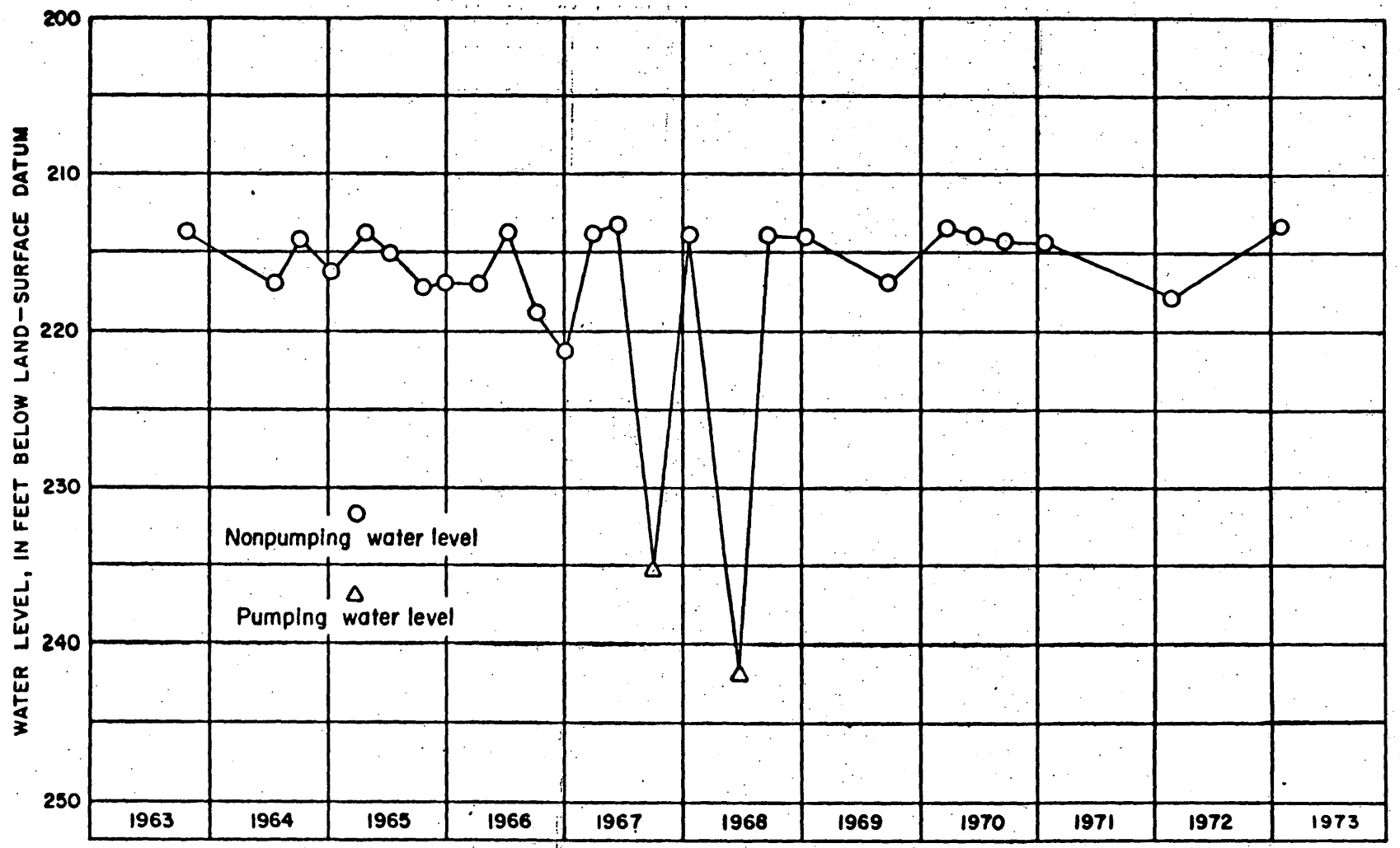


Figure 19.--Hydrograph of supply well MAR-1.

Table 21.--Summary record of supply well MAR-2

MAR well-field area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: SE¼SW¼SW¼ sec. 17, T. 19 S., R. 5 E. **USGS No.** 19.5.17.334

LATITUDE: 32°38'57" **LONGITUDE:** 106°27'32"

DEPTH: 650 feet **ALTITUDE:** 4,138 feet

DATE COMPLETED: November 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Harold P. Doty Drilling Co., Albuquerque, N. Mex.

CASING AND HOLE RECORD: Twenty-four-inch pipe cemented to 30 feet; 10-inch pipe 0 to 650 feet; 1/8-inch by 2 1/4-inch mill-cut slots from 227 to 650 feet; gravel pack around pipe in 20-inch hole.

YIELD: Well test pumped at 96 gpm for 24 hours with 116 feet of drawdown.

NONPUMPING WATER LEVEL: 216.79 feet on 11-27-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total screen	805	170	36	11-28-63

FORMATION LOGS: 1) Sample description; 2) Microlog; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Water-supply well for MAR facility

REFERENCE: Doty, 1968b

Nonpumping water level was 216.79 feet on 11-27-67. Well was test pumped on 11-27-67 for 24 hours at an average rate of 96 gpm.

Supply well MAR-2

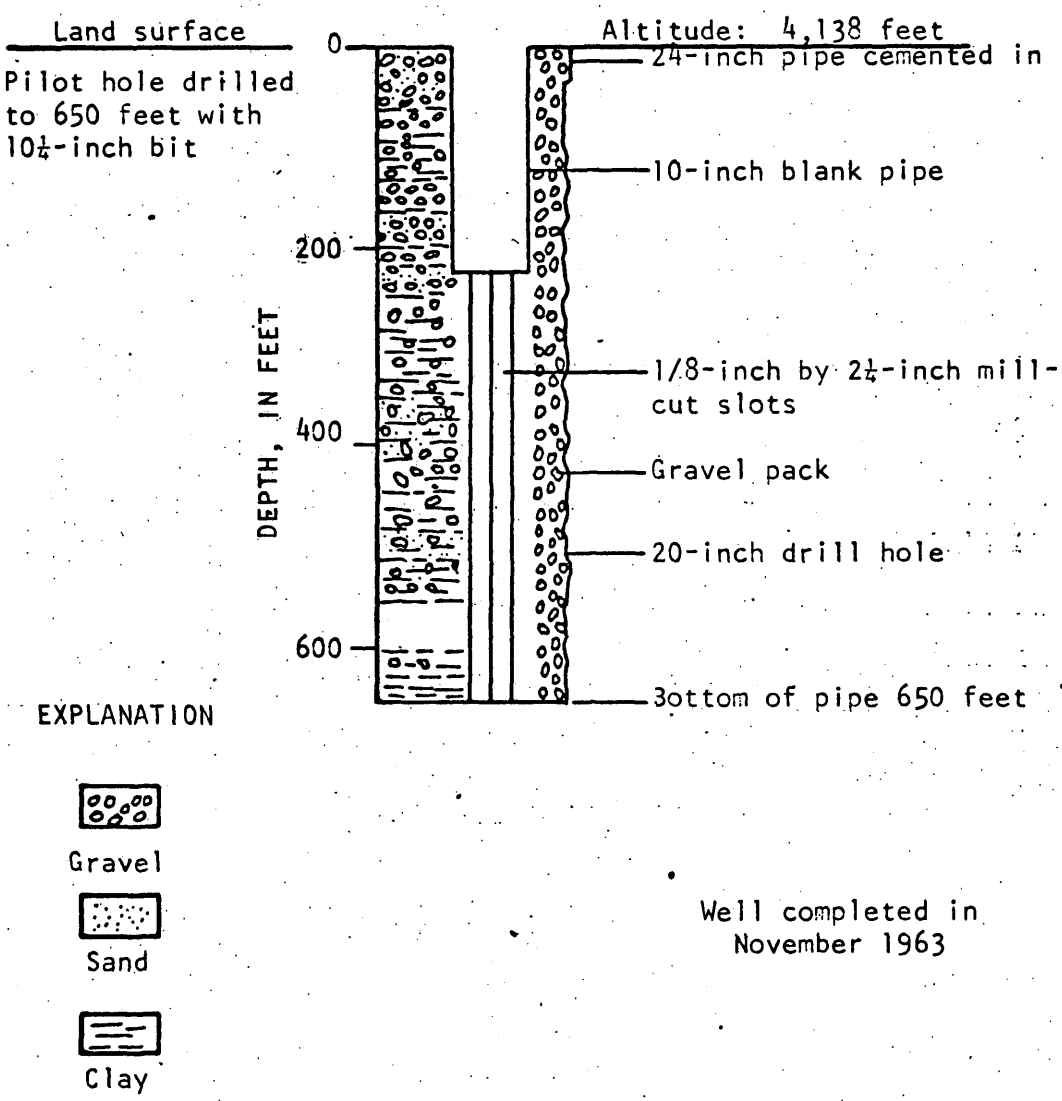


Figure 20.--Construction and lithology of supply well MAR-2.

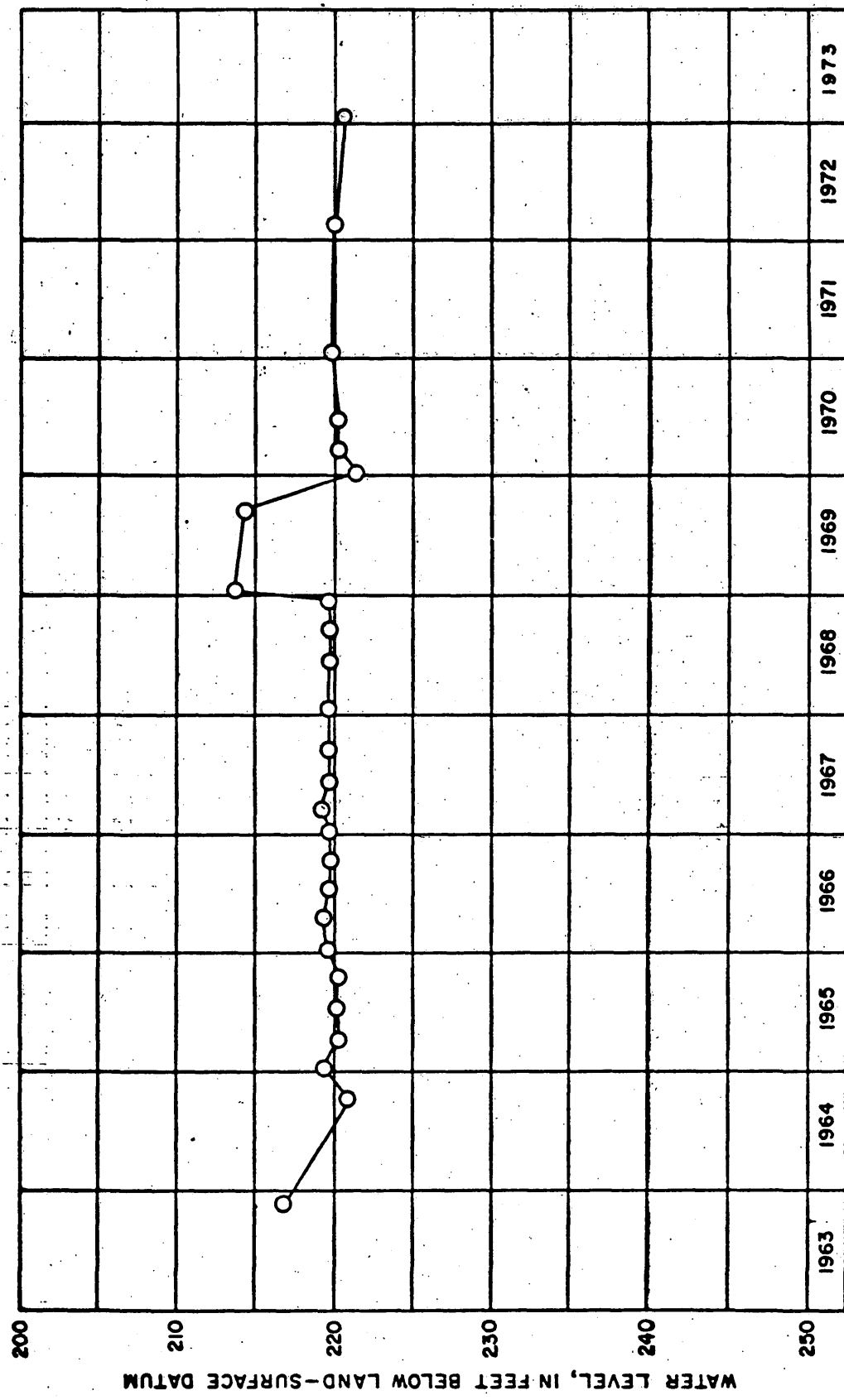


Figure 21.--Hydrograph of supply well MAR-2.

Table 22.--Chemical analyses of water samples from supply wells MAR-1 and 2

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Supply well MAR	1	2	2	2	
Date of collection	10-23-63 1/	10-29-63 2/	11-28-63 1/	4-22-64 3/	
Silica (SiO_2)	25	-	25	23	
Iron (Fe)	-	-	-	34	
Calcium (Ca)	78	-	68	79	
Magnesium (Mg)	41	-	40	42	
Sodium (Na) / Potassium (K)	43	-	52	39	
Bicarbonate (HCO_3)	256	-	259	254	
Carbonate (CO_3)	0	-	0	0	
Sulfate (SO_4)	180	174	170	176	
Chloride (Cl)	36	37	36	36	
Fluoride (F)	1.4	-	1.2	.6	
Nitrate (NO_3)	6.0	-	5.7	6.4	
Dissolved solids					
Calculated	536	-	525	528	
Residue on evaporation at 180°C	-	-	-	552	
Hardness as $CaCO_3$	364	-	336	368	
Noncarbonate hardness as $CaCO_3$	154	-	124	160	
Specific conductance (micromhos at 25°C)	818	807	805	817	
pH	7.5	-	7.7	7.5	
Color	-	-	-	-	
Temperature (°C)	-	-	-	-	

1/ Collected during pumping test on cased well.
2/ Collected by air jet from a depth of 650 feet.
3/ Collected after well placed in production.

NW30 Tracking Station area

Table 23.--Summary record of test well NW30-1

NW30 Tracking Station area
White Sands Missile Range
Dona Ana County, New Mexico

LOCATION: NW¼NW¼NE¼ sec. 2, T. 17 S., R. 4 E. **USGS No.** 17.4.2.211

LATITUDE: 32°52'05" **LONGITUDE:** 106°30'19"

DEPTH: Drilled to 1,010 feet; finished at 670 feet **ALTITUDE:** 4,139.87 feet

DATE COMPLETED: February 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Boyd and Son Drilling Co., Las Cruces, N. Mex.

CASING AND HOLE RECORD: Eight-inch pipe to 670 feet; 1/8-inch by 2-inch mill-cut slots from 260-281, 290-298, 374-390, 442-452, 485-500, 520-526, 562-582, and 630-654 feet; open hole below pipe filled with cement from 670-690 feet.

YIELD: Well test pumped at 248 gpm for 8 hours with 30.84 feet of drawdown.

NONPUMPING WATER LEVEL: 211.61 feet on 2-24-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	352	1,496	613	156	2-12-67
	620-735	61,600	2,330	24,200	2-15-67
	Total screen	16,700	744	5,520	2-24-67

FORMATION LOGS: 1) Driller's; 2) Sample description; 3) Induction-electrical; 4) Microlog

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes. Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1968f

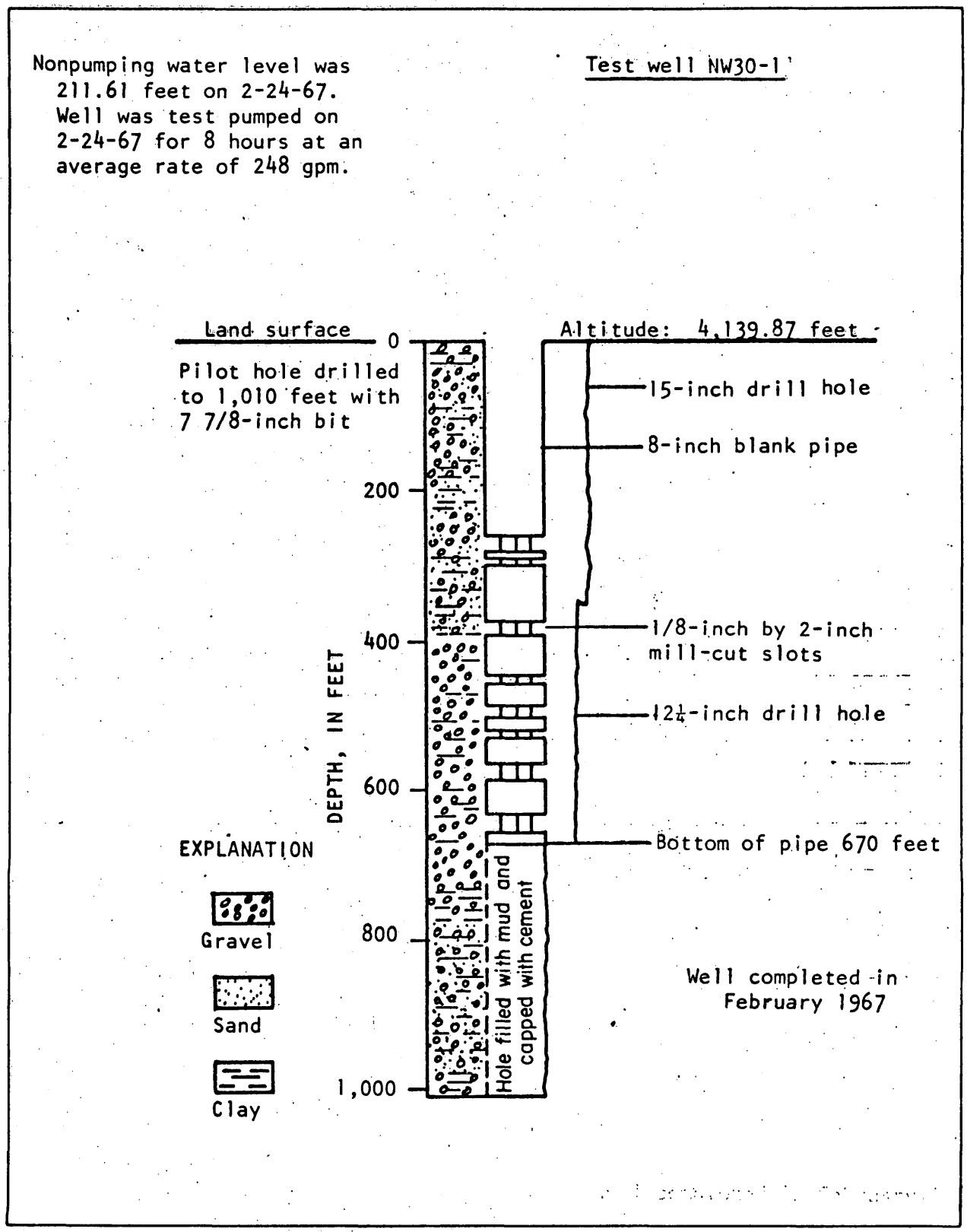


Figure 22.--Construction and lithology of test well NW30-1.

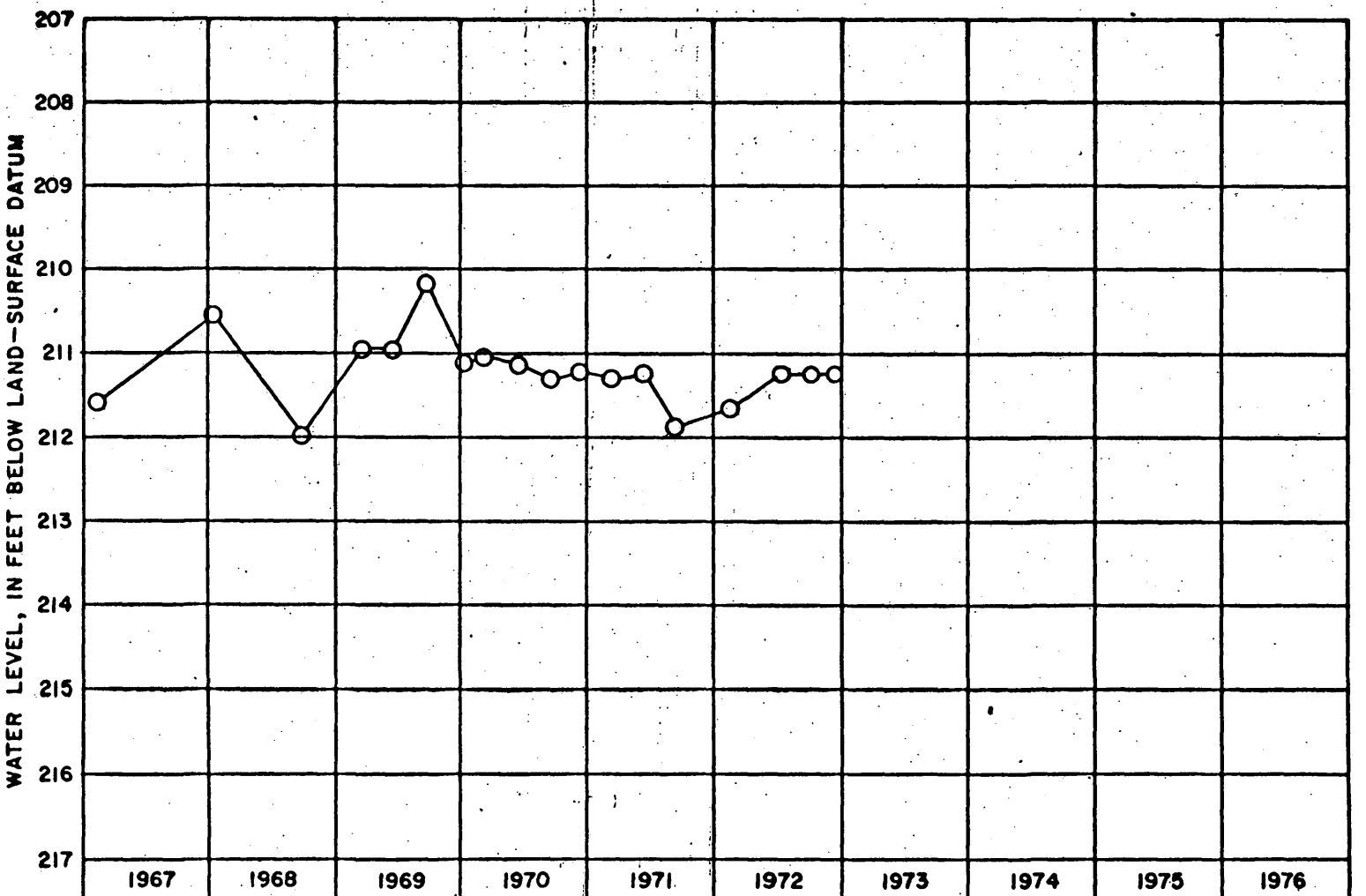


Figure 23.--Hydrograph of test well NW30-1.

Table 24.--Chemical analyses of water samples from test well NW30-1

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	2-12-67 1/	2-15-67 2/	2-24-67 3/		
Silica (SiO_2)	-	-	23		
Iron (Fe)	-	-	.01		
Calcium (Ca)	-	-	418		
Magnesium (Mg)	-	-	264		
Sodium (Na) / Potassium (K)	-	-	3,040		
Bicarbonate (HCO_3)	-	-	203		
Carbonate (CO_3)	-	-	0		
Sulfate (SO_4)	613	2,330	744		
Chloride (Cl)	156	24,200	5,520		
Fluoride (F)	-	-	.7		
Nitrate (NO_3)	-	-	6.1		
Dissolved solids					
Calculated	-	-	10,100		
Residue on evaporation at 180°C	-	-	10,500		
Hardness as $CaCO_3$	-	-	2,130		
Noncarbonate hardness as $CaCO_3$	-	-	1,966		
Specific conductance (micromhos at 25°C)	1,496	61,600	16,700		
pH	-	-	7.7		
Color	-	-	3		
Temperature (°C)	23	27	26		

1/ Collected with bailer from depth of 352 feet.
2/ Collected through packer from depths of 620-735 feet.
3/ Collected during pumping test on cased well.

Rhodes Canyon area

Table 25.--Summary record of test well RC-1

Rhodes Canyon area
White Sands Missile Range
Sierra County, New Mexico

LOCATION: SE¼SW¼SE¼ sec. 31, T. 12 S., R. 5 E. **USGS No.** 12.5.31.434

LATITUDE: 33°12'26" **LONGITUDE:** 106°30'18"

DEPTH: 942 feet **ALTITUDE:** 4,550 feet

DATE COMPLETED: January 1965 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Eight-inch hole to 750 feet; 6-inch hole from 750 to 942 feet; 6-inch temporary pipe installed to 746 feet; pipe removed upon completion of well.

YIELD: Well bailed at about 3 gpm

NONPUMPING WATER LEVEL: 471.5 feet on 12-11-64

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	530-540	967	232	62	12-11-64

FORMATION LOGS: 1) Sample description; 2) Gamma ray-neutron; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1968c

Table 26.--Summary record of test well RC-2

Rhodes Canyon area
White Sands Missile Range
Sierra County, New Mexico

LOCATION: NE¼SW¼SE¼ sec. 28, T. 12 S., R. 5 E. **USGS No.** 12.5.28.432

LATITUDE: 33°14'22" **LONGITUDE:** 106°32'24"

DEPTH: 358 feet **ALTITUDE:** 4,350 feet

DATE COMPLETED: May 1964 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Nine and seven eighths-inch hole to 40 feet; 7 7/8-inch hole from 40 to 358 feet; 4-inch temporary pipe installed to 358 feet; pipe removed upon completion of water sampling.

YIELD: Not tested

NONPUMPING WATER LEVEL: 234.2 feet on 5-12-64

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	358	5,150	1,010	1,040	5-6-64

FORMATION LOGS: 1) Sample description; 2) Microlog; 3) Induction-electrical

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1968c

Table 27.--Summary record of test well RC-3

Rhodes Canyon area
White Sands Missile Range
Sierra County, New Mexico

LOCATION: NW¼NE¼SE¼ sec. 27, T. 13 S., R. 5 E. **USGS No.** 13.5.27.421

LATITUDE: 33°09'19" **LONGITUDE:** 106°29'05"

DEPTH: 750 feet **ALTITUDE:** 4,014 feet

DATE COMPLETED: June 8, 1969 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Jerry Burgett Drilling Co., Carlsbad, N. Mex.

CASING AND HOLE RECORD: Drilled with 6 3/4-inch bit to 750 feet

YIELD: Water-sampling operation indicated 10 gpm in interval from 257-269 feet.

NONPUMPING WATER LEVEL: About 35 feet on 6-12-69

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	257-269	38,500	5,280	11,950	6-12-69
	390-412	181,000	5,940	103,000	6-12-69
	490-512	159,000	6,120	84,500	6-11-69

FORMATION LOGS: 1) Sample description; 2) Drilling time; 3) Dual induction-laterolog; 4) Proximity log microlog

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Plugged and abandoned

REFERENCE: Lyford, 1970a

Table 28.--Chemical analyses of water samples from test wells RC-1, RC-2, and RC-3

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well RC	1	2	3	3	3
Date of collection	12-11-64 1/	5-6-64 2/	6-11-69 3/	6-12-69 4/	6-12-69 5/
Silica (SiO_2)	15	21	19	17	10
Iron (Fe)	-	-	.06	.07	.03
Calcium (Ca)	85	134	2,000	1,950	950
Magnesium (Mg)	40	52	1,270	1,420	421
Sodium (Na), Potassium (K)	64	961	53,100	64,800	8,440
Bicarbonate (HCO_3)	204	140	66	54	98
Carbonate (CO_3)	0	0	0	0	0
Sulfate (SO_4)	232	1,010	6,120	5,940	5,280
Chloride (Cl)	62	1,040	84,500	103,000	11,950
Fluoride (F)	1.6	1.8	1.6	1.9	1.7
Nitrate (NO_3)	18	.5	.4	.0	.0
Dissolved solids					
Calculated	618	3,290	147,000	177,000	27,100
Residue on evaporation at 180°C	627	3,370	151,000	183,000	28,100
Hardness as $CaCO_3$	376	548	10,200	10,700	4,100
Noncarbonate hardness as $CaCO_3$	209	434	10,100	10,700	4,020
Specific conductance (micromhos at 25°C)	967	5,150	159,000	181,000	38,500
pH	8.2	7.6	7.1	7.1	7.6
Color	-	-	7	5	5
Temperature (°C)	-	-	25	25	23

1/ Collected from depths of 530-540 feet.
2/ Collected from depth of 358 feet.
3/ Collected through packer from depths of 490-512 feet.
4/ Collected through packer from depths of 390-412 feet.
5/ Collected through packer from depths of 257-269 feet.

Mockingbird Gap area

Table 29.--Summary record of test well MacDonald 2

Mockingbird Gap area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NW¼SE¼NE¼ sec. 5, T. 9 S., R. 5 E. **USGS No.** 9.5.5.241

LATITUDE: 33°33'45" **LONGITUDE:** 106°26'40"

DEPTH: 400 feet **ALTITUDE:** 5,130 feet

DATE COMPLETED: July 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: No record of hole diameter. No casing installed.

YIELD: Well reported to be dry.

NONPUMPING WATER LEVEL: -

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	-	-	-	-	-

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Undifferentiated siltstone, sandy clay, and sand

USE AND REMARKS: Well plugged and abandoned

REFERENCE: - Weir, 1965

Table 30.--Summary record of Murray test well 1

Mockingbird Gap area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼SW¼SW¼ sec. 32, T. 8 S., R. 5 E. **USGS No.** 8.5.32.334

LATITUDE: 33°34'08" **LONGITUDE:** 106°27'18"

DEPTH: Drilled to 310 feet; finished at 250 feet. **ALTITUDE:** 5,070 feet

DATE COMPLETED: July 1965 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Perry Drilling Co., Tularosa, N. Mex.

CASING AND HOLE RECORD: Six-inch pipe to 250 feet, 1/8-inch by 4-inch torch-cut slots from 225 to 250 feet; pipe set in 9 1/2-inch hole.

YIELD: Well bailed at 1.5 gpm with 51 feet of drawdown.

NONPUMPING WATER LEVEL: 180.8 feet on 7-2-65

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	225-250	974	278	28	7-2-65

FORMATION LOGS: 1) Sample description; 2) Gamma ray-neutron

GEOLOGIC SOURCE: Fan deposits or Bolson fill

USE AND REMARKS: Observation well to monitor water-level changes near the Murray Well (Stallion Range Center Supply). Depth-to-water measurements are made every 3 months.

REFERENCE: Doty, 1968d

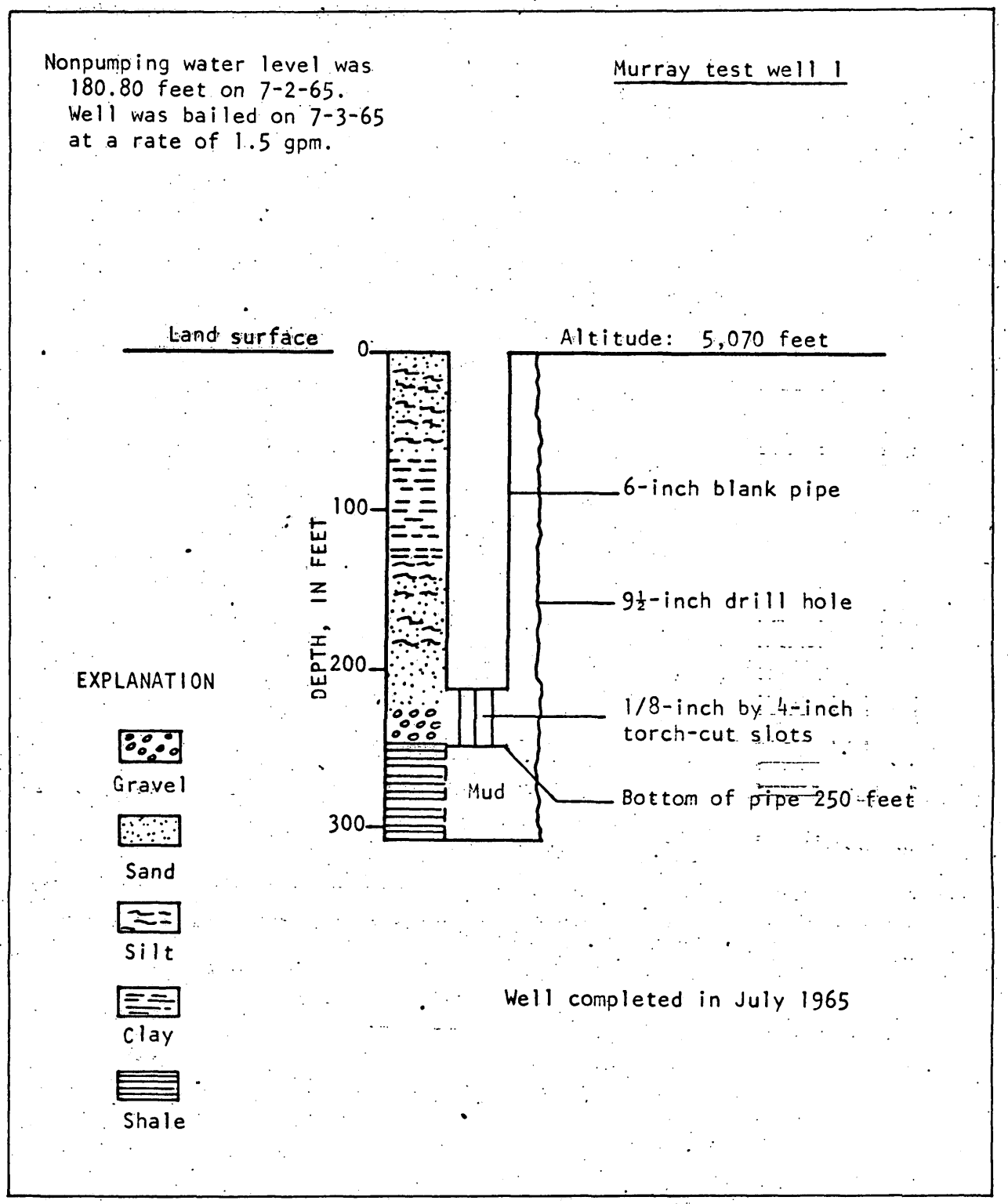


Figure 24.--Construction and lithology of Murray test well 1.

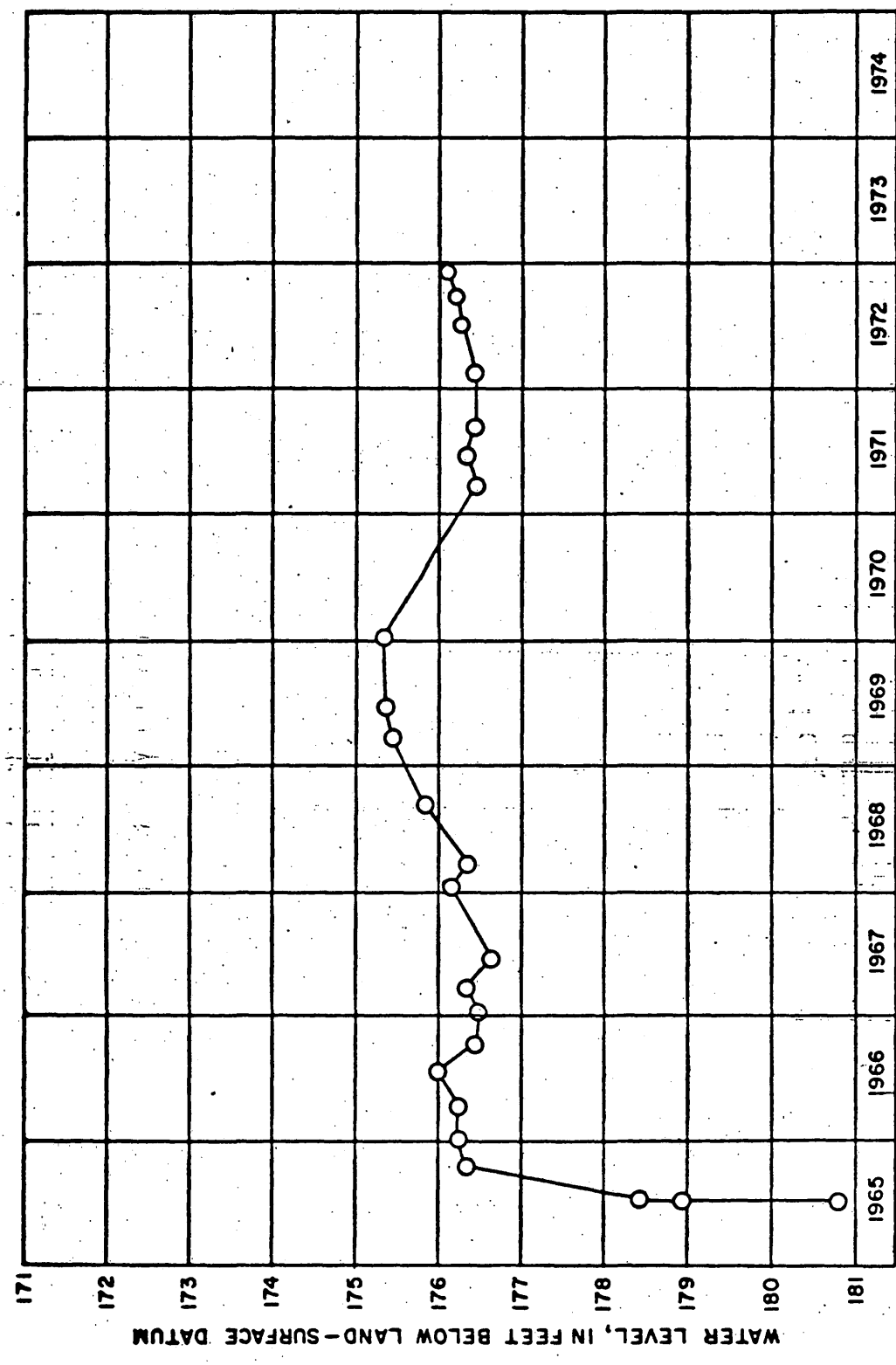


Figure 25.--Hydrograph of Murray test well 1.

Table 31.--Summary record of Murray test well 2

Mockingbird Gap area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼SE¼SW¼ sec. 32, T. 8 S., R. 5 E. **USGS No.** 8.5.32.344

LATITUDE: 33°34'08" **LONGITUDE:** 106°27'06"

DEPTH: 500 feet **ALTITUDE:** 5,090 feet

DATE COMPLETED: October 1965 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Perry Drilling Co., Tularosa, N. Mex.

CASING AND HOLE RECORD: Ten-inch hole to 475 feet; 6-inch hole from 475 to 500 feet. Six-inch temporary pipe installed to 475 feet; pipe removed upon completion of well.

YIELD: Well bailed at about 20 gpm.

NONPUMPING WATER LEVEL: 266.7 feet on 9-20-65

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	235-255	1,300	503	41	9-13-65
	385	1,560	510	100	9-16-65
	465-470	1,880	622	146	9-20-65

FORMATION LOGS: 1) Sample description; 2) Gamma ray-neutron

GEOLOGIC SOURCE: Clay and siltstone of undetermined age

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Doty, 1968d

Table 32.--Chemical analyses of water samples from Murray test wells 1 and 2

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well	1	2	2	2	
Date of collection	7-2-65 1/	9-13-65 2/	9-16-65 3/	9-20-65 4/	
Silica (SiO_2)	17	-	-	10	
Iron (Fe)	-	-	-	-	
Calcium (Ca)	80	-	-	41	
Magnesium (Mg)	22	-	-	13	
Sodium (Na) / Potassium (K)	107	-	-	370	
Bicarbonate (HCO_3)	236	-	-	129	
Carbonate (CO_3)	0	-	-	0	
Sulfate (SO_4)	278	503	510	622	
Chloride (Cl)	28	41	100	146	
Fluoride (F)	.7	-	-	1.2	
Nitrate (NO_3)	.5	-	-	.0	
Dissolved solids					
Calculated	649	-	-	1,270	
Residue on evaporation at 180°C	647	-	-	-	
Hardness as $CaCO_3$	292	-	-	158	
Noncarbonate hardness as $CaCO_3$	98	-	-	52	
Specific conductance (micromhos at 25°C)	974	1,300	1,560	1,880	
pH	8.0	-	-	8.2	
Color	-	-	-	-	
Temperature (°C)	-	-	-	-	

1/ Collected with bailer from depths of 225-250 feet.
2/ Collected with bailer from depths of 235-255 feet.
3/ Collected with bailer from depth of 385 feet.
4/ Collected with bailer from depths of 465-470 feet.

Table 33.--Summary record of Murray supply well

Mockingbird Gap area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NW¼SW¼SE¼ sec. 32, T. 8 S., R. 5 E. **USGS No.** 8.5.32.431

LATITUDE: 33°34'12" **LONGITUDE:** 106°26'56"

DEPTH: 290 feet (original depth 236 feet) **ALTITUDE:** 5,115 feet

DATE COMPLETED: April 1966[1/] **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: McClendon Drilling Co., Alamogordo, N. Mex.

CASING AND HOLE RECORD: Ten-inch pipe to 290 feet, 1/8-inch by 2-inch mill-cut slots from 205-245 and 272-287 feet; torch-cut slots from 255-260 feet (for cementing off lower portion of hole, if so desired).

YIELD: Well test pumped at 140 gpm for 8 hours with 18.5 feet of drawdown.

NONPUMPING WATER LEVEL: 201.63 feet (below concrete floor of pumphouse) on 4-28-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	236	949	302	48	5-31-55

FORMATION LOGS: 1) Sample description (236-290 feet); 2) Fluid conductivity; 3) Electric; 4) Gamma; 5) Caliper; 6) Neutron

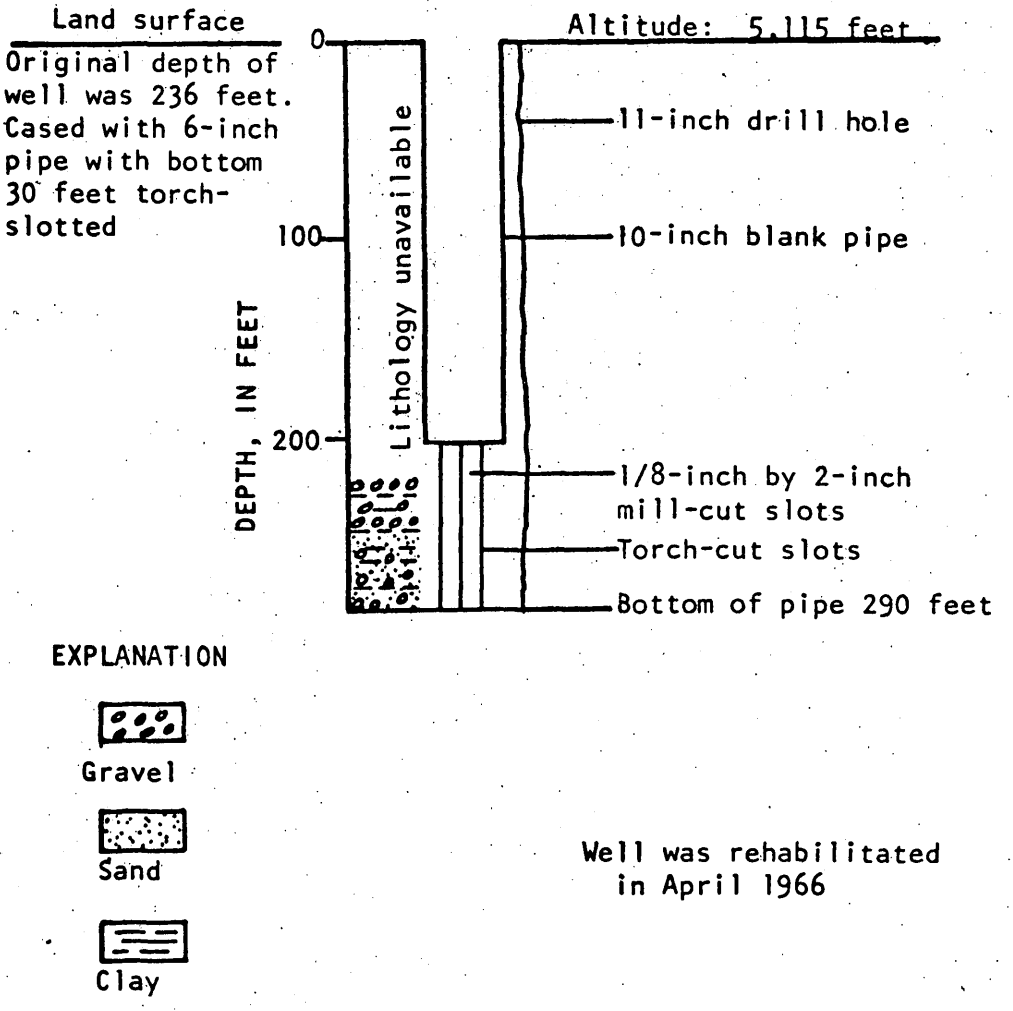
GEOLOGIC SOURCE: Fan deposits or Bolson fill

USE AND REMARKS: [1/]Date existing well rehabilitated. Water-supply well for Stallion Range Center and other up-range facilities. Not used since May 1967.

REFERENCE: Doty, 1968e

Nonpumping water level was 201.63 feet below pumphouse floor on 4-28-66. Well was test pumped on 4-28-66 for 8 hours at an average rate of 140 gpm.

Murray supply well



Well was rehabilitated in April 1966

Figure 26.--Construction and lithology of Murray supply well.

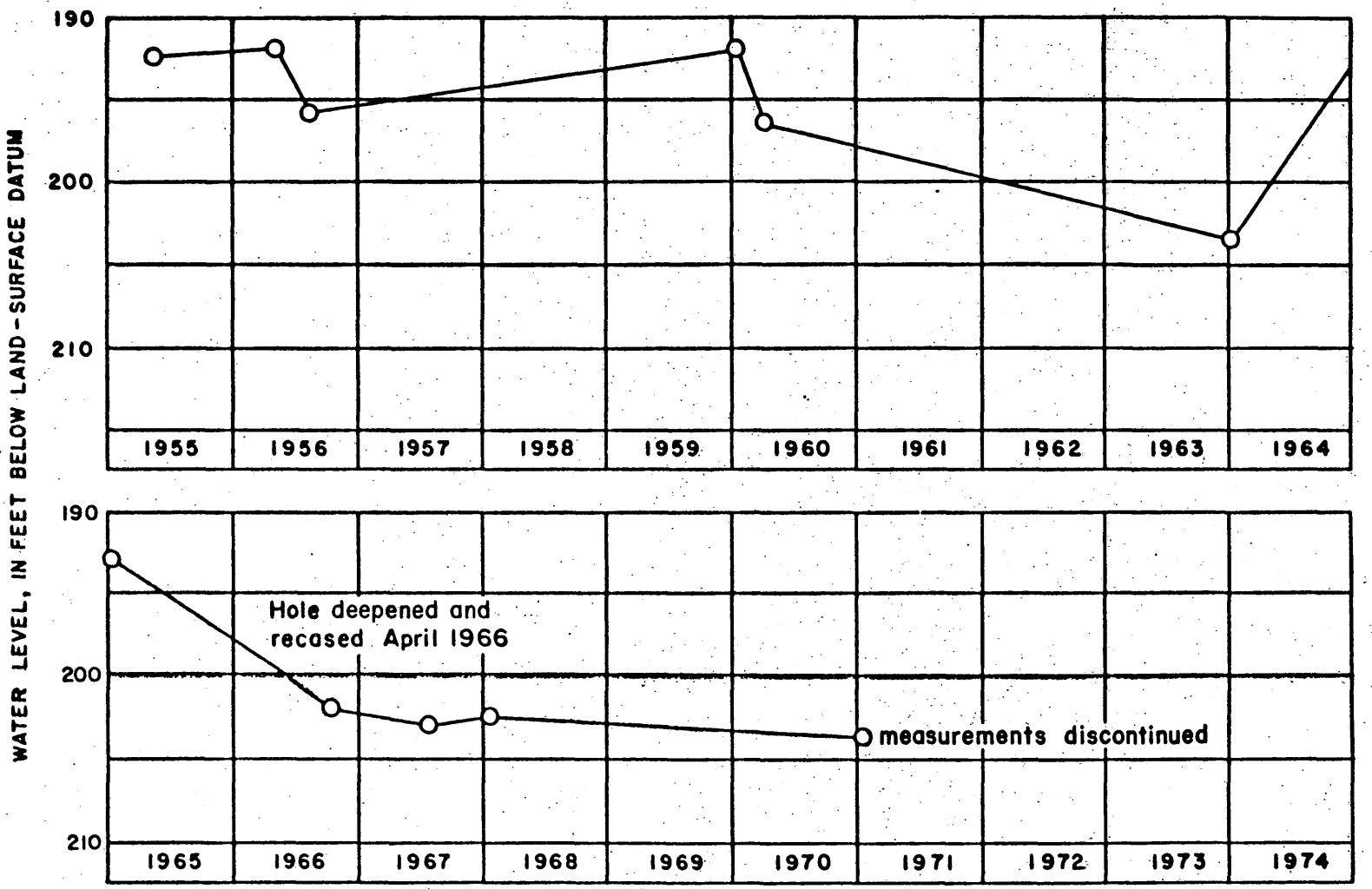


Figure 27.--Hydrograph of Murray supply well.

Table 34.--Chemical analyses of water samples from Murray supply well

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Well depth (feet)	236	236	236	236	290
Date of collection	5-31-55	5-11-56	5-9-57	2-10-66	4-28-66 1/
Silica (SiO_2)	31	31	28	27	29
Iron (Fe)	-	-	-	.12	.01
Calcium (Ca)	117	117	115	116	100
Magnesium (Mg)	37	38	38	31	36
Sodium (Na) / Potassium (K)	35	33	34	39	46
Bicarbonate (HCO_3)	162	159	159	161	175
Carbonate (CO_3)	0	0	0	0	0
Sulfate (SO_4)	302	302	299	286	277
Chloride (Cl)	48	47	48	46	40
Fluoride (F)	1.0	1.0	1.0	1.0	1.4
Nitrate (NO_3)	4.3	8.3	7.4	5.8	6.0
Dissolved solids					
Calculated	-	-	-	-	621
Residue on evaporation at 180°C	655	655	648	655	651
Hardness as $CaCO_3$	444	448	444	416	396
Noncarbonate hardness as $CaCO_3$	312	318	313	284	252
Specific conductance (micromhos at 25°C)	949	948	944	927	919
pH	7.6	7.4	7.5	7.6	7.5
Color	-	-	-	0	3
Temperature (°C)	22	21	21	22	-

1/ Collected during pumping test after well had been deepened.

Table 34.--Chemical analyses of water samples from Murray supply well - Concluded

Well depth (feet)	290	290	290	290	
Date of collection	10-7-66	1-11-67	7-18-67	7-20-67	
Silica (SiO_2)	-	-	28	28	
Iron (Fe)	-	-	-	-	
Calcium (Ca)	-	-	115	107	
Magnesium (Mg)	-	-	33	36	
Sodium (Na)	-	-	77	58	
Potassium (K)					
Bicarbonate (HCO_3)	-	-	168	165	
Carbonate (CO_3)	-	-	0	0	
Sulfate (SO_4)	306	-	373	331	
Chloride (Cl)	-	43	39	38	
Fluoride (F)	-	-	1.4	1.4	
Nitrate (NO_3)	-	-	8.9	7.9	
Dissolved solids					
Calculated	-	-	758	688	
Residue on evaporation at 180°C	674	713	-	733	
Hardness as $CaCO_3$	-	-	424	416	
Noncarbonate hardness as $CaCO_3$	-	-	286	281	
Specific conductance (micromhos at 25°C)	972	991	1,080	1,000	
pH	-	-	7.7	7.6	
Color	-	-	-	-	
Temperature (°C)	21	-	22	23	

Red Canyon Range Camp area

Table 35.--Summary record of supply well Red Canyon 1

Red Canyon Range Camp area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NE¼NW¼SE¼ sec. 8, T. 7 S., R. 8 E. **USGS No.** 7.8.8.412

LATITUDE: 33°42'50" **LONGITUDE:** 106°07'40"

DEPTH: 702 feet **ALTITUDE:** 5,495 feet

DATE COMPLETED: September 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: B. and W. Drilling Co., Borger, Tex.

CASING AND HOLE RECORD: Cased with 10-inch pipe with torch-cut slots from 602 to 702 feet.

YIELD: Well tested at about 35 gpm

NONPUMPING WATER LEVEL: 214.9 feet on 11-21-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	602-702	3,350	2,050	94	9-13-56

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Yeso Formation

USE AND REMARKS: Nonpotable water supply for Red Canyon Range Camp

REFERENCE: Weir, 1965

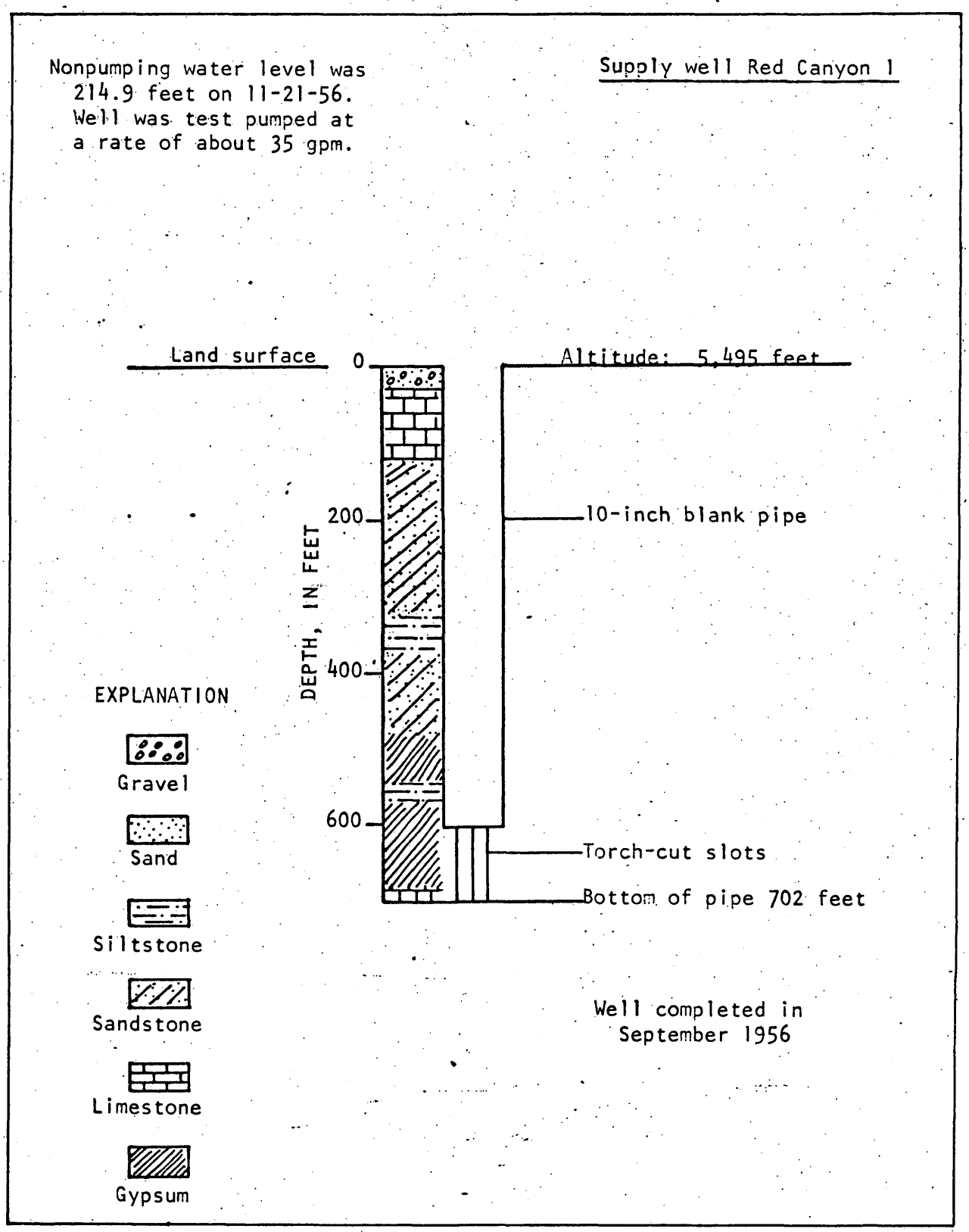


Figure 28.--Construction and lithology of supply well Red Canyon 1.

Table 36.--Summary record of supply well Red Canyon 2

Red Canyon Range Camp area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NE¼NE¼SW¼ sec. 8, T. 7 S., R. 8 E. **USGS No.** 7.8.8.322

LATITUDE: 33°42'50" **LONGITUDE:** 106°07'54"

DEPTH: 710 feet **ALTITUDE:** 5,520 feet

DATE COMPLETED: November 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: B. and W. Drilling Co., Borger, Tex.

CASING AND HOLE RECORD: Cased with 10-inch pipe with torch-cut slots from 270-300, 410-450, and 660-690 feet.

YIELD: Test pumped at 200 gpm for 48 hours with 2 feet of drawdown.

NONPUMPING WATER LEVEL: 242.8 feet on 11-21-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	270-690	3,160	1,910	92	11-23-56

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Yeso Formation

USE AND REMARKS: Nonpotable water supply for Red Canyon Range Camp

REFERENCE: Weir, 1965

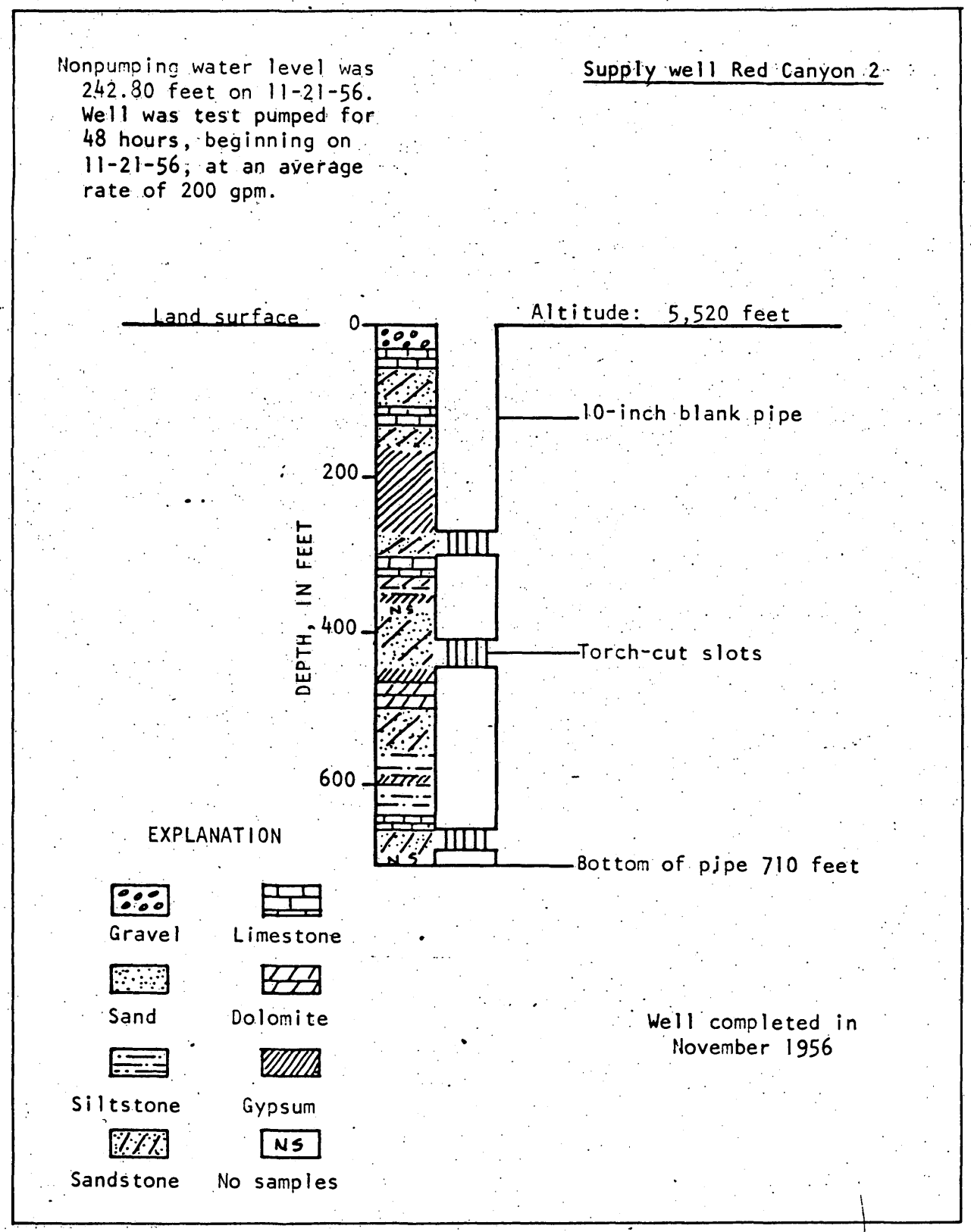


Figure 29.--Construction and lithology of supply well Red Canyon 2.

Table 37.--Chemical analyses of water samples from supply wells Red Canyon 1 and 2

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well	1	1	2	2	2
Date of collection	9-13-56	9-15-56	10-31-56	11-23-56	10-16-57
Silica (SiO_2)	16	-	-	19	16
Iron (Fe)	.00	-	-	-	.05
Calcium (Ca)	635	-	-	596	576
Magnesium (Mg)	209	-	-	183	172
Sodium (Na)	9.7	-	-	20	6.2
Potassium (K)					
Bicarbonate (HCO_3)	234	204	-	190	90
Carbonate (CO_3)	0	0	-	0	0
Sulfate (SO_4)	2,050	-	1,970	1,910	1,870
Chloride (Cl)	94	91	93	92	92
Fluoride (F)	1.8	-	1.4	1.6	1.8
Nitrate (NO_3)	2.4	-	5.0	5.4	4.5
Dissolved solids					
Calculated	-	-	-	-	-
Residue on evaporation at 180°C	3,130	-	-	2,920	2,780
Hardness as $CaCO_3$	2,440	2,360	-	2,240	2,140
Noncarbonate hardness as $CaCO_3$	2,250	2,190	-	2,080	2,070
Specific conductance (micromhos at 25°C)	3,350	3,200	3,220	3,160	3,150
pH	7.5	7.1	-	7.1	7.4
Color	-	-	-	-	-
Temperature (°C)	-	-	21	-	10

North Oscura Peak area

Table 38.--Summary record of test well A. F. Baca

North Oscura Peak area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SW¼SW¼SW¼ sec. 26, T. 6 S., R. 6 E. **USGS No.** 6.6.26.333

LATITUDE: 33°45'45" **LONGITUDE:** 106°18'05"

DEPTH: 220 feet **ALTITUDE:** 6,444 feet

DATE COMPLETED: December 1952 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: M. B. McClendon, Tularosa, N. Mex.

CASING AND HOLE RECORD: Cased with 6-inch pipe to 203 feet, perforated 0-84 and 190-203 feet.

YIELD: Test pumped at 20 gpm for 3 hours with 14 feet of drawdown.

NONPUMPING WATER LEVEL: 39.50 feet on 3-8-55

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	Total perforations	1,310	155	56	3-8-55

FORMATION LOGS: 1) Driller's

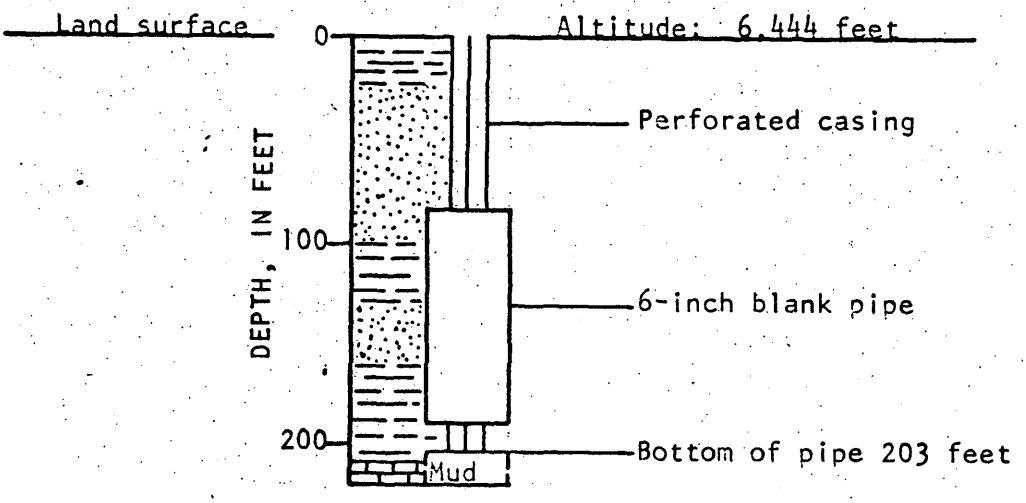
GEOLOGIC SOURCE: Bursum Formation

USE AND REMARKS: Well drilled for Holloman Air Force Base

REFERENCE: Weir, 1965

Nonpumping water level was 39.50 feet on 3-8-55. Well was test pumped on 12-10-55 for 3 hours at an average rate of 20 gpm.

Test well A. F. Baca



EXPLANATION

Shale

Sandstone

Limestone

Well was completed in December 1952

Figure 30.--Construction and lithology of test well A. F. Baca.

Table 39.--Summary record of Baca test well

North Oscura Peak area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼NE¼NE¼ sec. 34, T. 6 S., R. 6 E. **USGS No.** 6.6.34.224

LATITUDE: 33°45'32" **LONGITUDE:** 106°18'10"

DEPTH: 210 feet **ALTITUDE:** 6,500 feet

DATE COMPLETED: March 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: Eight-inch pipe to 70 feet cemented; 6-inch pipe 0 to 210 feet, perforated intervals not known.

YIELD: Well test pumped at 3 gpm for 3 hours with 116 feet of drawdown.

NONPUMPING WATER LEVEL: 28.60 feet on 3-16-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	210	1,410	124	52	5-7-57

FORMATION LOGS: 1) Sample description

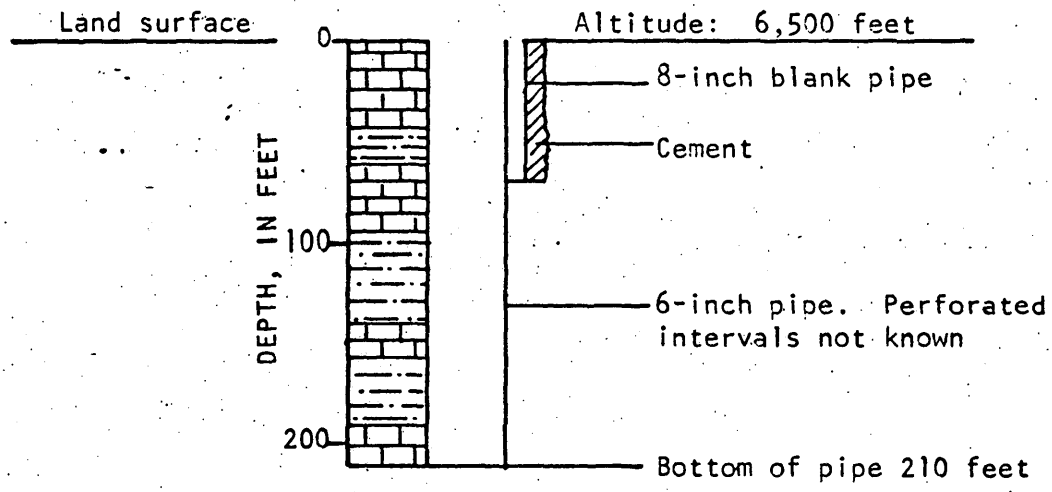
GEOLOGIC SOURCE: Bursum Formation

USE AND REMARKS: Equipped with pump on December 18, 1956

REFERENCE: Weir, 1965

Nonpumping water level was 28.60 feet on 3-16-56. Well was test pumped on 3-16-56 for 3 hours at an average rate of 3 gpm.

Baca test well



EXPLANATION

Siltstone

Limestone

Well was completed in March 1956

Figure 31.--Construction and lithology of Baca test well.

Table 40.--Chemical analyses of water samples from A. F. Baca and Baca test wells

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Test well	A. F. Baca		Baca		
Date of collection	3-8-55	12-11-55	2-23-56 1/	3-13-56 2/	5-7-57 2/
Silica (SiO_2)	11	10	-	-	7.2
Iron (Fe)	-	-	-	-	-
Calcium (Ca)	72	81	-	-	10
Magnesium (Mg)	74	71	-	-	7.6
Sodium (Na)	103	120	-	-	331
Potassium (K)					
Bicarbonate (HCO_3)	410	414	-	-	624
Carbonate (CO_3)	0	0	-	-	33
Sulfate (SO_4)	155	159	-	-	124
Chloride (Cl)	56	52	31	55	52
Fluoride (F)	.2	1.4	-	-	2.6
Nitrate (NO_3)	161	178	112	1.4	.2
Dissolved solids					
Calculated	-	-	-	-	-
Residue on evaporation at 180°C	834	862	-	-	875
Hardness as $CaCO_3$	484	494	-	-	56
Noncarbonate hardness as $CaCO_3$	148	154	-	-	0
Specific conductance (micromhos at 25°C)	1,310	1,320	1,180	1,490	1,410
pH	7.8	7.4	-	-	8.8
Color	-	-	-	-	-
Temperature (°C)	16	-	14	15	-

1/ Collected from depth of 53 feet.

2/ Collected from near bottom of well.

Table 41.--Summary record of Air Force test well

North Oscura Peak area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SW¼SE¼NE¼ sec. 6, T. 7 S., R. 6 E. **USGS No.** 7.6.6.243

LATITUDE: 33°44'25" **LONGITUDE:** 106°21'28"

DEPTH: 701 feet[1/] **ALTITUDE:** 7,775 feet

DATE COMPLETED: January 1956[1/] **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: Nine-inch hole; uncased

YIELD: Reported to be dry

NONPUMPING WATER LEVEL:

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	-	-	-	-	-

FORMATION LOGS: 1) Sample description (477-701 feet)

GEOLOGIC SOURCE: Madera Limestone

USE AND REMARKS: [1/]Drilled originally to 477 feet; plugged and abandoned in 1952. When deepened well was dry; plugged and abandoned.

REFERENCE: Weir, 1965

Stallion Range Center area

Table 42.--Summary record of test well Stallion 1

Stallion Range Center area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼SE¼SE¼ sec. 1, T. 6 S., R. 2 E. **USGS No.** 6.2.1.444

LATITUDE: 33°48'35" **LONGITUDE:** 106°40'55"

DEPTH: 600 feet **ALTITUDE:** 5,075 feet

DATE COMPLETED: April 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: Cased to 600 feet with 7-inch pipe; torch-cut slots from 309-330, 369-391, 434-453, 495-516, and 563-579 feet.

YIELD: Well test pumped at 20 gpm for 6 hours with 16 feet of drawdown.

NONPUMPING WATER LEVEL: 317.70 feet on 4-17-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	318-600	3,310	2,040	39	4- 4-56
	318-600	3,080	2,090	44	4-18-56

FORMATION LOGS: 1) Sample description

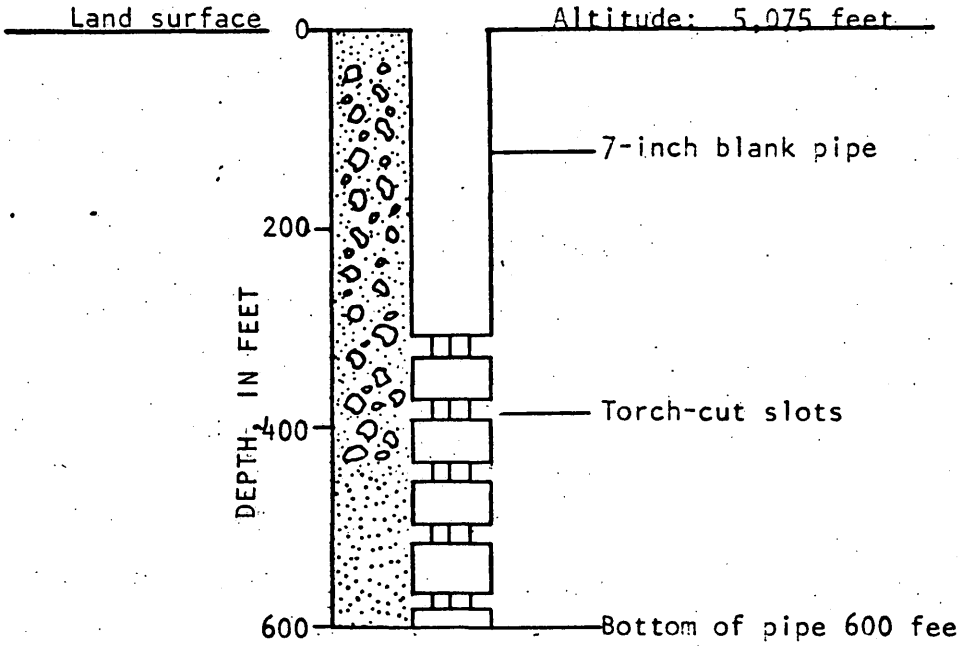
GEOLOGIC SOURCE: Baca and Datil Formations

USE AND REMARKS: Test well, cased and capped

REFERENCE: Weir, 1965

Nonpumping water level was 317.70 feet on 4-17-56. Well was test pumped for 6 hours on 4-13-56 at an average rate of 20 gpm.

Test well Stallion 1



EXPLANATION

Conglomerate

Sand

Well completed in April 1956

Figure 32.--Construction and lithology of test well Stallion 1.

Table 43.--Summary record of test well Stallion 2A

Stallion Range Center area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NW¼SE¼NW¼ sec. 10, T. 6 S., R. 2 E. **USGS No.** 6.2.10.141

LATITUDE: 33°48'16" **LONGITUDE:** 106°43'38"

DEPTH: 600 feet **ALTITUDE:** 5,050 feet

DATE COMPLETED: June 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: Eight-inch hole; uncased

YIELD: Well was bailed at a rate of 11 gpm

NONPUMPING WATER LEVEL: 405.0 feet on 5-31-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	405-600	2,010	904	39	5-21-56

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Baca and Datil Formations

USE AND REMARKS: Plugged and abandoned

REFERENCE: Weir, 1965

Table 44.--Summary record of test well Stallion 3

Stallion Range Center area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼SE¼NW¼ sec. 4, T. 6 S., R. 2 E. **USGS No.** 6.2.4.144

LATITUDE: 33°49'00" **LONGITUDE:** 106°44'32"

DEPTH: 720 feet **ALTITUDE:** 5,065 feet

DATE COMPLETED: September 1956 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: R. L. Newberry, Socorro, N. Mex.

CASING AND HOLE RECORD: Eight-inch hole; uncased

YIELD: Well was bailed at a rate of 3 gpm

NONPUMPING WATER LEVEL: 420.0 feet on 9-7-56

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	420-720	475	-	14	8-22-56
	420-720	771	218	24	9-14-56

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Santa Fe Group; Baca and Datil Formations

USE AND REMARKS: Plugged and abandoned

REFERENCE: Weir, 1965

Table 45.--Chemical analyses of water samples from test wells Stallion 1, 2A, and 3

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Stallion test well	1	1	2A	3	3
Date of collection	4-4-56	4-18-56	5-21-56	8-22-56	9-14-56
Silica (SiO_2)	-	37	-	-	-
Iron (Fe)	-	-	-	-	-
Calcium (Ca)	-	391	-	-	33
Magnesium (Mg)	-	177	-	-	8.8
Sodium (Na)	-	271	-	-	126
Potassium (K)					
Bicarbonate (HCO_3)	57	58	64	104	141
Carbonate (CO_3)	0	0	0	0	0
Sulfate (SO_4)	2,040	2,090	904	-	218
Chloride (Cl)	39	44	39	14	24
Fluoride (F)	-	1.0	-	-	1.6
Nitrate (NO_3)	-	7.3	-	-	16
Dissolved solids					
Calculated	-	3,050	-	-	-
Residue on evaporation at 180°C	-	-	-	-	496
Hardness as $CaCO_3$	1,630	1,700	416	107	118
Noncarbonate hardness as $CaCO_3$	1,580	1,660	364	22	3
Specific conductance (micromhos at 25°C)	3,310	3,080	2,010	475	771
pH	7.8	7.4	7.8	7.9	7.6
Color	-	-	-	-	-
Temperature (°C)	22	24	26	-	28

Table 46.--Summary record of supply well SRC-1

Stallion Range Center area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: NE¼SW¼NE¼ sec. 5, T. 6 N., R. 3 W. **USGS No.** 6.3.5.232

LATITUDE: 33°49'08" **LONGITUDE:** 106°39'08"

DEPTH: 750 feet **ALTITUDE:** 4,950 feet

DATE COMPLETED: August 1960 **DRILLING METHOD:** Cable tool

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Six-inch pipe to 750 feet; torch-cut slots from 400 to 750 feet; pipe set in 8-inch hole.

YIELD: Well test pumped at 200 gpm for 11 hours with 123 feet of drawdown.

NONPUMPING WATER LEVEL: 203.8 feet on 8-1-60

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	400-500	3,800	2,510	42	7-7-60
	Total screen	3,430	2,150	42	8-1-60

FORMATION LOGS: 1) Sample description

GEOLOGIC SOURCE: Bolson fill

USE AND REMARKS: Supplies water to desalting unit at Stallion Range Center

REFERENCE: Hood, 1968

Nonpumping water level was 203.80 feet on 8-1-60. Well was test pumped for 11 hours on 8-1-60 at an average rate of 200 gpm.

Supply well SRC-1

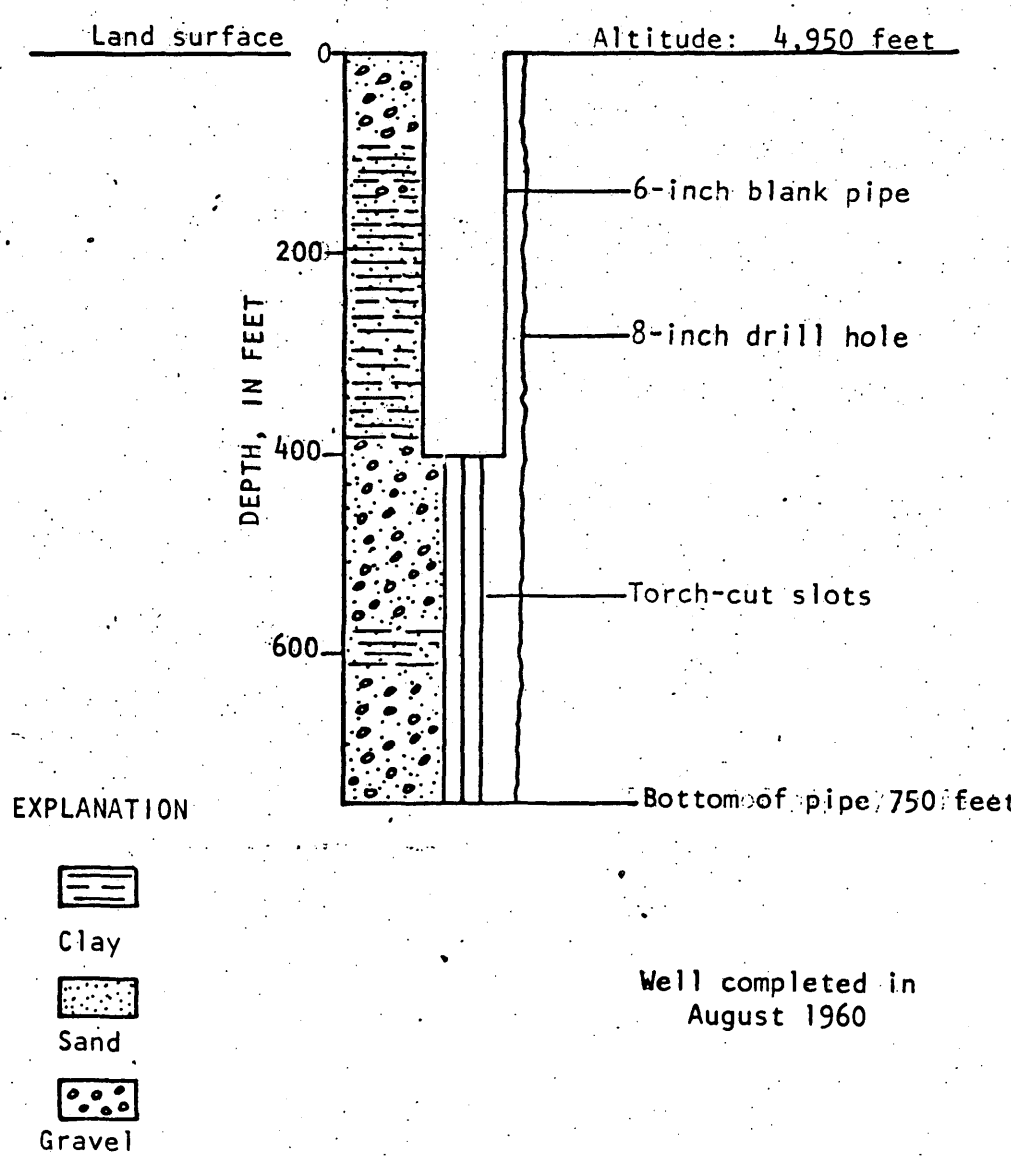


Figure 33.--Construction and lithology of supply well SRC-1.

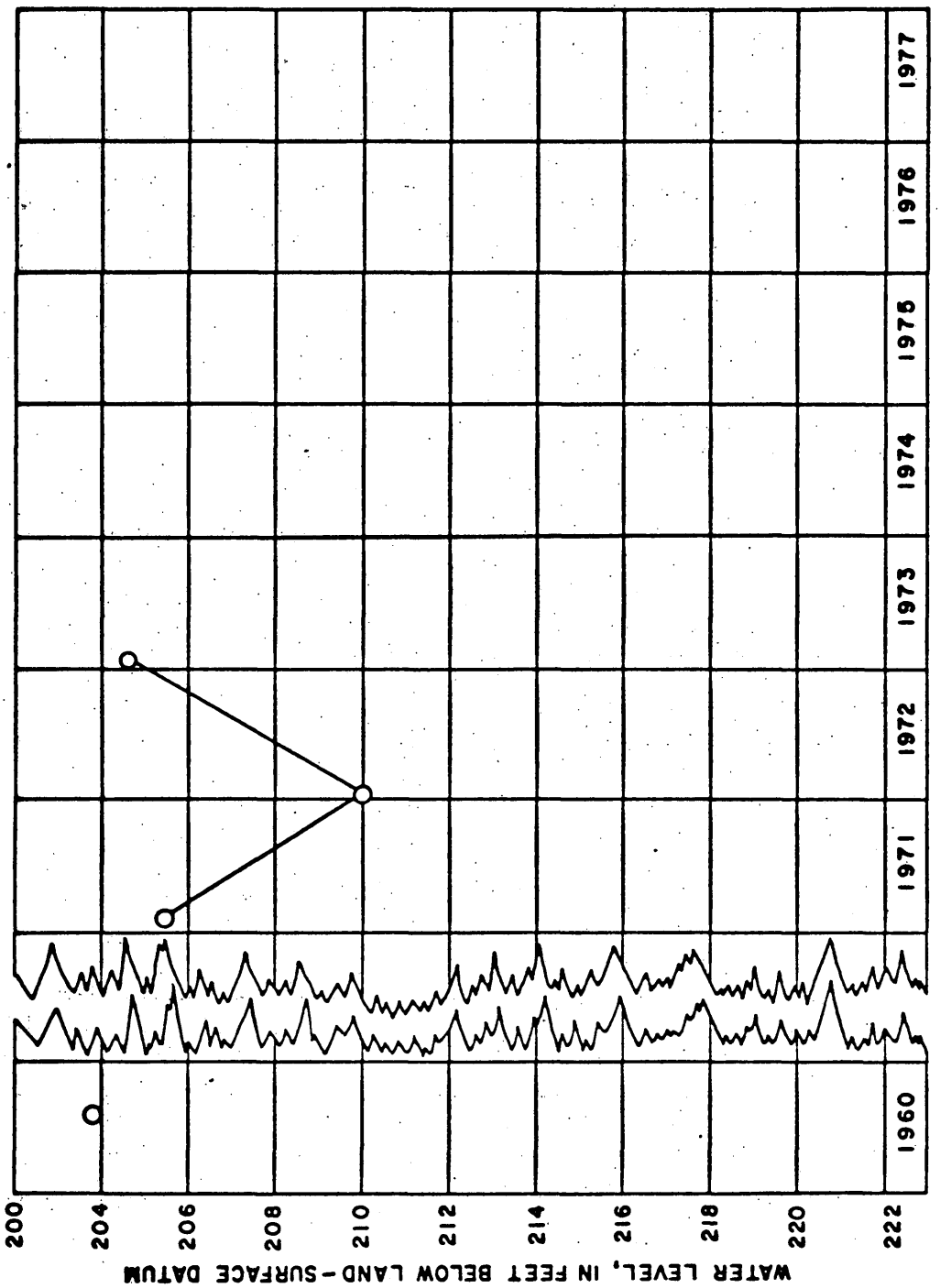


Figure 34.--Hydrograph of supply well SRC-1.

Table 47.--Chemical analyses of water samples from supply well SRC-1

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	7-7-60 1/	8-1-60 2/	5-17-63	6-18-64	10-7-66
Silica (SiO_2)	-	32	30	28	29
Iron (Fe)	-	-	.53	.32	-
Calcium (Ca)	-	410	409	406	408
Magnesium (Mg)	-	170	175	174	180
Sodium (Na)					
Potassium (K)	-	289	279	283	254
Bicarbonate (HCO_3)	46	51	49	52	52
Carbonate (CO_3)	0	0	0	0	0
Sulfate (SO_4)	2,510	2,150	2,150	2,150	2,120
Chloride (Cl)	42	42	43	41	42
Fluoride (F)	-	.9	.8	.8	-
Nitrate (NO_3)	-	8.3	6.5	6.7	5.7
Dissolved solids					
Calculated	-	3,130	3,120	3,120	3,070
Residue on evaporation at 180°C	-	3,380	3,420	3,470	-
Hardness as $CaCO_3$	2,080	1,720	1,740	1,730	1,760
Noncarbonate hardness as $CaCO_3$	2,040	1,680	1,700	1,690	1,720
Specific conductance (micromhos at 25°C)	3,800	3,430	3,460	3,420	3,500
pH	7.3	7.6	7.6	7.4	7.9
Color	-	-	2	2	-
Temperature (°C)	28	27	-	-	-

1/ Collected during pumping test when well was 500 feet deep.
2/ Collected during pumping test when well was completed at depth of 750 feet.

Table 47.--Chemical analyses of water samples from supply well SRC-1 - Concluded

Date of collection	11-9-66	6-18-67	6-7-68		
Silica (SiO_2)	29	28	29		
Iron (Fe)	-	.32	-		
Calcium (Ca)	414	406	408		
Magnesium (Mg)	172	174	163		
Sodium (Na)	275	283	274		
Potassium (K)					
Bicarbonate (HCO_3)	52	52	50		
Carbonate (CO_3)	0	0	0		
Sulfate (SO_4)	2,140	2,150	2,090		
Chloride (Cl)	43	41	42		
Fluoride (F)	.7	.8	.8		
Nitrate (NO_3)	7.7	6.7	9.2		
Dissolved solids					
Calculated	3,110	3,470	3,040		
Residue on evaporation at 180°C	-	-	-		
Hardness as $CaCO_3$	1,740	1,730	1,690		
Noncarbonate hardness as $CaCO_3$	1,700	1,690	1,650		
Specific conductance (micromhos at 25°C)	3,470	3,420	3,480		
pH	7.0	7.4	7.6		
Color	-	-	-		
Temperature (°C)	-	-	27		

Table 48.--Summary record of supply well SRC-2

Stallion Range Center area
White Sands Missile Range
Socorro County, New Mexico

LOCATION: SE¼SW¼NE¼ sec. 5, T. 6 S., R. 3 E. **USGS No.** 6.3.5.234

LATITUDE: 33°49'07" **LONGITUDE:** 106°39'12"

DEPTH: 800 feet; cased to 720 feet **ALTITUDE:** 4,953 feet

DATE COMPLETED: July 1969 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Jerry Burgett Drilling Co., Carlsbad, N. Mex.

CASING AND HOLE RECORD: Pilot hole drilled with 7 7/8-inch bit to 800 feet; 26-inch hole reamed to 30 feet and 20-inch pipe grouted in place; hole reamed with 19-inch bit to 720 feet; cased with 12 3/4-inch pipe to 720 feet with mill-cut slots 1/8 inch by 3 inches, 8 around and 3 rounds per foot between 500 and 700 feet; annulus filled with 1/8- to 3/8-inch gravel.

YIELD: Well test pumped at 141 gpm for 12 hours with 175 feet of drawdown.

NONPUMPING WATER LEVEL: 214.4 feet on 7-14-69

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	636-648	3,800	2,360	58	7- 3-69
	500-700	3,470	2,130	46	7-21-69

FORMATION LOGS: 1) Sample description; 2) Dual induction-laterolog; 3) Proximity log microlog

GEOLOGIC SOURCE: Sediments of Tertiary and Quaternary age

USE AND REMARKS: Supplies water to desalting unit at Stallion Range Center.

REFERENCE: Lyford, 1970b

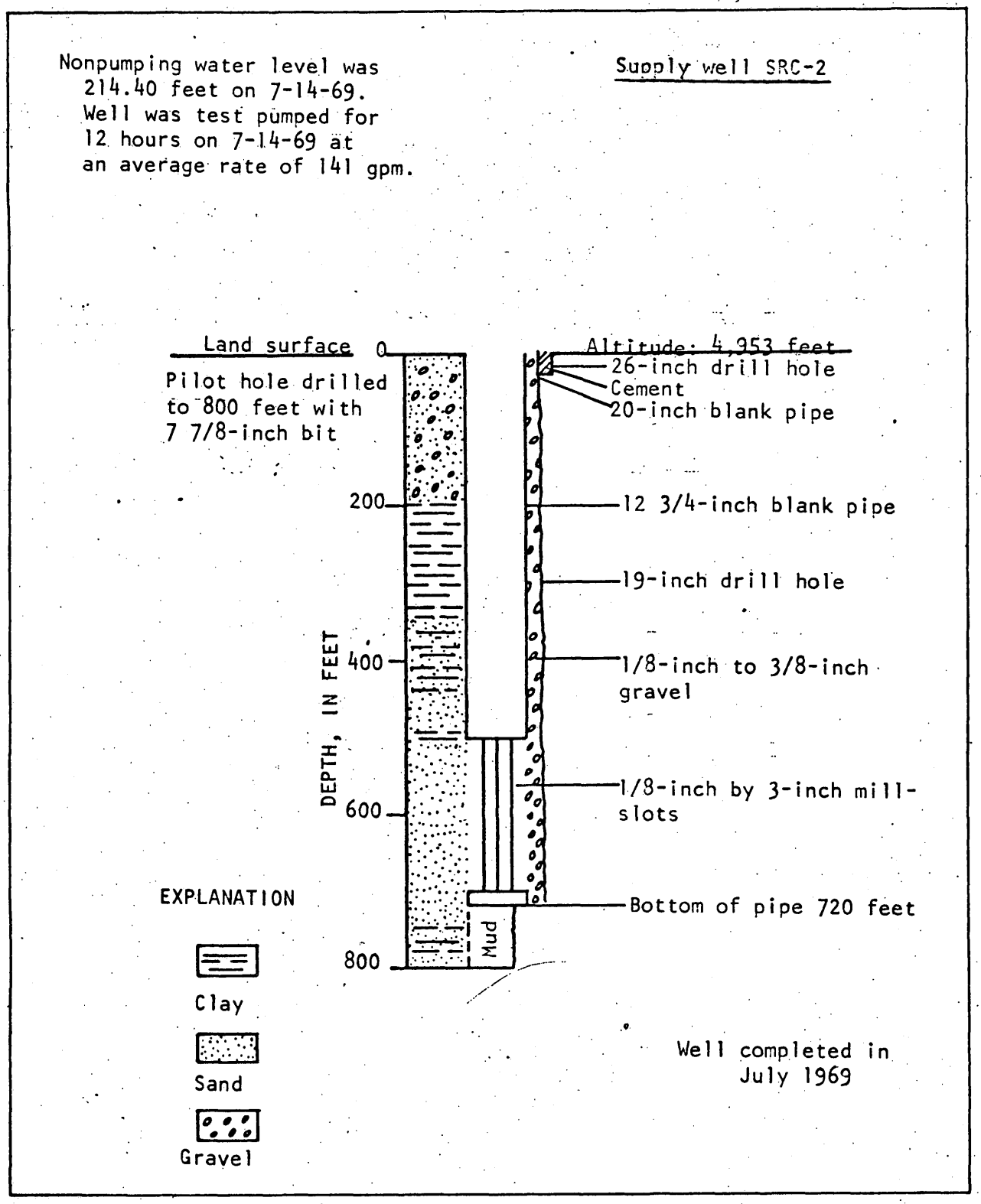


Figure 35.--Construction and lithology of supply well SRC-2.

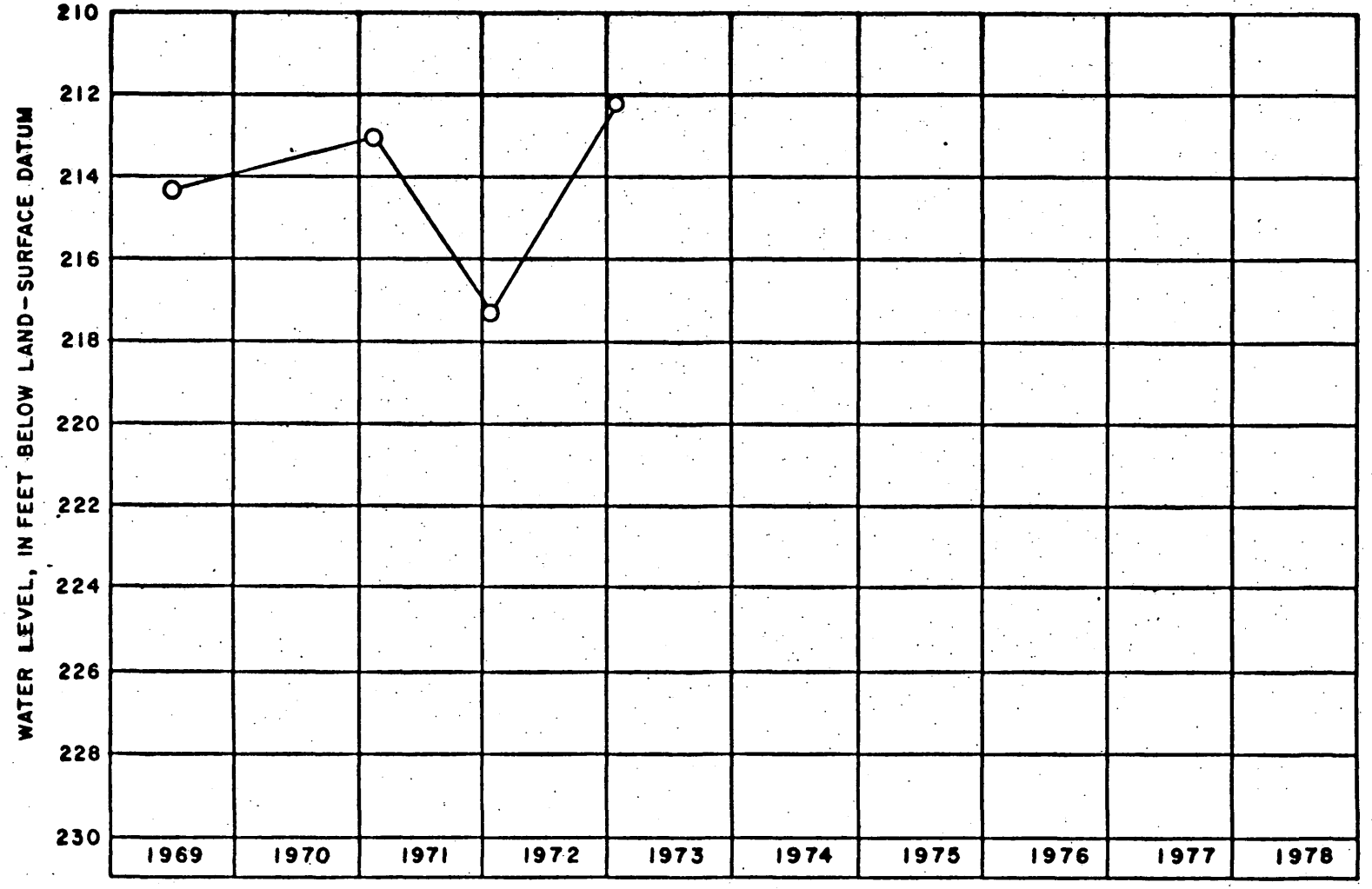


Figure 36.--Hydrograph of supply well SRC-2.

Table 49.--Chemical analyses of water samples from supply well SRC-2

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	7-3-69 1/	7-21-69 2/			
Silica (SiO_2)	20	32			
Iron (Fe)	.02	.01			
Calcium (Ca)	495	420			
Magnesium (Mg)	171	168			
Sodium (Na)	310	273			
Potassium (K)					
Bicarbonate (HCO_3)	82	50			
Carbonate (CO_3)	0	0			
Sulfate (SO_4)	2,360	2,130			
Chloride (Cl)	58	46			
Fluoride (F)	.8	.9			
Nitrate (NO_3)	7.5	8.5			
Dissolved solids					
Calculated	3,460	3,100			
Residue on evaporation at 180°C	3,800	3,440			
Hardness as $CaCO_3$	1,940	1,740			
Noncarbonate hardness as $CaCO_3$	1,870	1,700			
Specific conductance (micromhos at 25°C)	3,800	3,470			
pH	7.1	7.2			
Color	5	5			
Temperature (°C)	25	28			

1/ Collected through packer from depths of 636-648 feet.

2/ Collected during pumping test on cased well.

Bosque del Apache Grant

Table 50.--Summary record of test well B-1

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: NW¼NW¼NW¼ sec. 9, T. 6 S., R. 1 E. **USGS No.** 6.1.9.111

LATITUDE: 33°48'26" **LONGITUDE:** 106°51'00"

DEPTH: Drilled to 500 feet; finished at 167 feet **ALTITUDE:** 4,530 feet

DATE COMPLETED: November 1963 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Six-inch pipe to 500 feet, 1/8-inch by 4-inch mill-cut slots from 100-160, 320-340, and 440-460 feet; pipe filled with sand from 500 to 167 feet, and capped with cement; pipe set in 9-7/8 inch hole.

YIELD: Well test pumped at 150 gpm for 8 hours with 30 feet of drawdown.

NONPUMPING WATER LEVEL: 20.65 feet on 11-15-63

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	100-160	1,060	245	56	11-15-63
	320-340	1,620	258	236	11-13-63
	440-462	4,350	704	905	11-12-63

FORMATION LOGS: 1) Sample description; 2) Induction-electrical

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Observation well to monitor water-level and chemical-quality changes. In 1966 well was equipped with pump and windmill by local rancher.

REFERENCE: Doty, 1968c

Nonpumping water level was 20.65 feet on 11-15-63. Well was test pumped on 11-15-63 for 8 hours at an average rate of 150 gpm.

Test well B-1

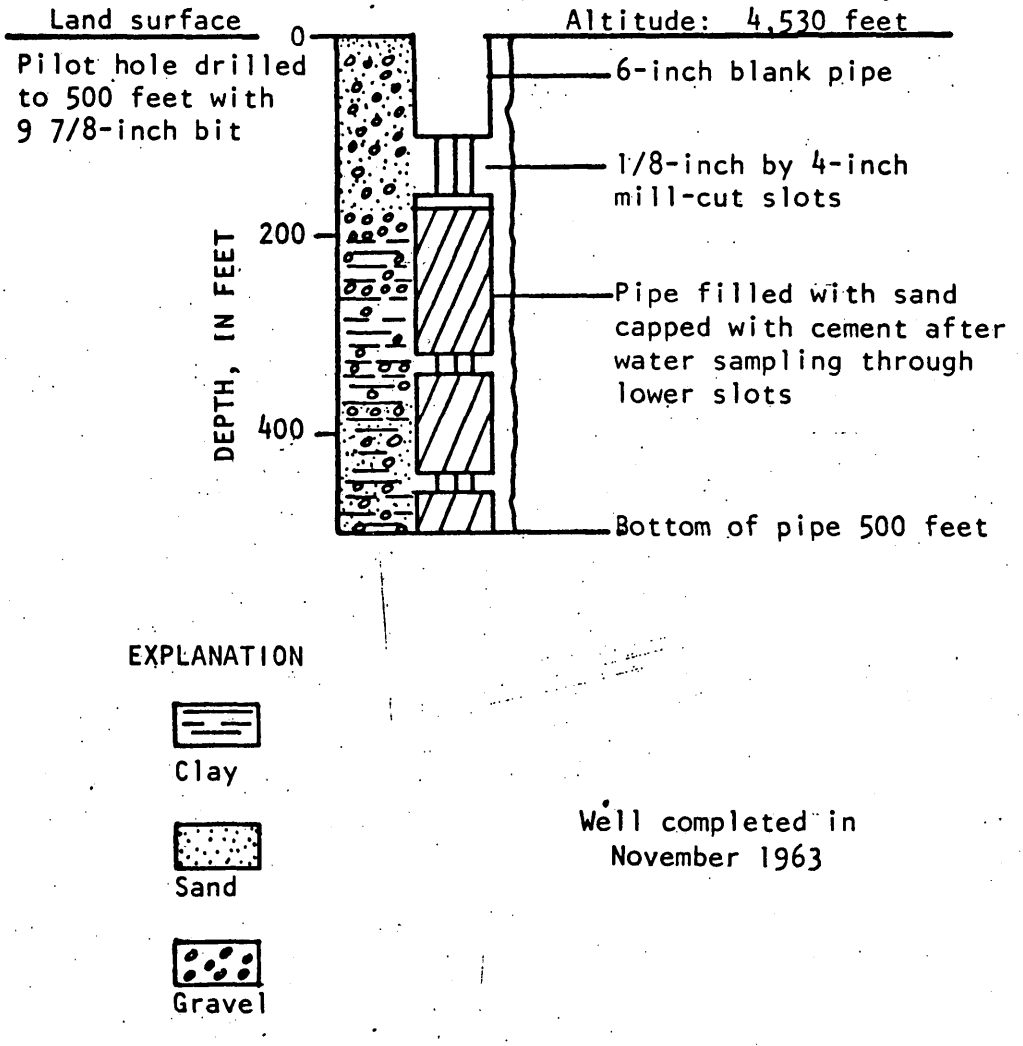


Figure 37.--Construction and lithology of test well B-1.

Table 51.--Chemical analyses of water samples from test well B-1

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	11-12-63 1/	11-13-63 2/	11-15-63 3/	6-17-66 4/	
Silica (SiO_2)	-	-	35	-	
Iron (Fe)	-	-	.11	-	
Calcium (Ca)	-	-	6.4	-	
Magnesium (Mg)	-	-	1.5	-	
Sodium (Na)	-	-	230	-	
Potassium (K)	-	-	8.3	-	
Bicarbonate (HCO_3)	-	-	230	-	
Carbonate (CO_3)	-	-	0	-	
Sulfate (SO_4)	704	258	245	240	
Chloride (Cl)	905	236	56	55	
Fluoride (F)	-	-	1.4	-	
Nitrate (NO_3)	-	-	.2	-	
Dissolved solids					
Calculated	-	-	697	-	
Residue on evaporation at 180°C	-	-	-	-	
Hardness as $CaCO_3$	-	-	22	-	
Noncarbonate hardness as $CaCO_3$	-	-	0	-	
Specific conductance (micromhos at 25°C)	4,350	1,620	1,060	1,050	
pH	-	-	8.1	-	
Color	-	-	-	-	
Temperature (°C)					

1/ Collected through packer from depths of 440-462 feet.
2/ Collected through packer from depths of 320-340 feet.
3/ Collected during pumping test on cased well.
4/ Collected from pump on well.

Table 52.--Summary record of test well B-2

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: SE¼NW¼SE¼ sec. 4, T. 6 S., R. 1 E. **USGS No.** 6.1.4.414

LATITUDE: 33°48'48" **LONGITUDE:** 106°50'28"

DEPTH: 255 feet **ALTITUDE:** 4,540 feet

DATE COMPLETED: June 1966 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 255 feet with 10½-inch bit; no pipe installed.

YIELD: Not tested

NONPUMPING WATER LEVEL: 25.57 feet on 6-17-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	119-130	6,350	1,250	1,150	6-11-66
	242-253	5,760	756	1,350	6-17-66

FORMATION LOGS: 1) Driller's

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Cooper and Doty, 1966

Table 53.--Summary record of test well B-3

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: NE¼NW¼NE¼ sec. 9, T. 6 S., R. 1 E. **USGS No.** 6.1.9.212

LATITUDE: 33°48'34" **LONGITUDE:** 106°50'18"

DEPTH: 255 feet **ALTITUDE:** 4,540 feet

DATE COMPLETED: June 1966 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 255 feet with 10½-inch bit; no pipe installed.

YIELD: Not tested

NONPUMPING WATER LEVEL: 41.20 feet on 6-28-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	86-97	5,060	1,060	905	6-23-66
	241-252	8,190	1,380	1,920	6-28-66

FORMATION LOGS: 1) Driller's

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Cooper and Doty, 1966

Table 54.--Summary record of test well B-4

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: SW¼SW¼SW¼ sec. 9, T. 6 S., R. 1 E. **USGS No.** 6.1.9.333

LATITUDE: 33°47'43" **LONGITUDE:** 106°51'16"

DEPTH: 256 feet **ALTITUDE:** 4,510 feet

DATE COMPLETED: July 1966 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 256 feet with 10½-inch bit; no pipe installed.

YIELD: Not tested

NONPUMPING WATER LEVEL: 10.8 feet on 7-12-66

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	91-102	6,560	1,230	1,540	7- 7-66
	237-252	9,660	1,500	2,380	7-12-66

FORMATION LOGS: 1) Driller's; 2) Microlaterolog; 3) Induction-electrical

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Cooper and Doty, 1966

Table 55.--Summary record of test well B-5

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: SW¼NE¼NE¼ sec. 8, T. 6 S., R. 1 E. **USGS No.** 6.1.8.332

LATITUDE: 33°48'27" **LONGITUDE:** 106°51'15"

DEPTH: 512 feet; completed at 185 feet **ALTITUDE:** 4,523 feet

DATE COMPLETED: May 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 455 feet with 12½-inch bit; drilled to 512 feet with 6 5/8-inch bit; cement plug set in hole from 185 to 205 feet; hole cased to 185 feet with 8 5/8-inch pipe with 1/8 by 2-inch mill-cut slots from 55 to 95 feet, 125 to 150 feet, and 160 to 170 feet.

YIELD: Well test pumped at 300 gpm for 8 hours with 19 feet of drawdown.

NONPUMPING WATER LEVEL: 13.65 feet on 5-26-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	77-100	719	160	33	4-21-67
	227-250	1,130	125	180	4-27-67
	489-512	6,100	955	1,300	5- 9-67
	Total screen	1,120	234	82	5-26-67

FORMATION LOGS: 1) Driller's; 2) Sample description; 3) Dual induction-laterolog; 4) Microlog

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Observation well to monitor water-level and chemical-quality changes.

REFERENCE: Cooper, 1968

Nonpumping water level was 13.65 feet on 5-26-67. Well was test pumped on 5-26-67 for 8 hours at an average rate of 300 gpm.

Test well B-5

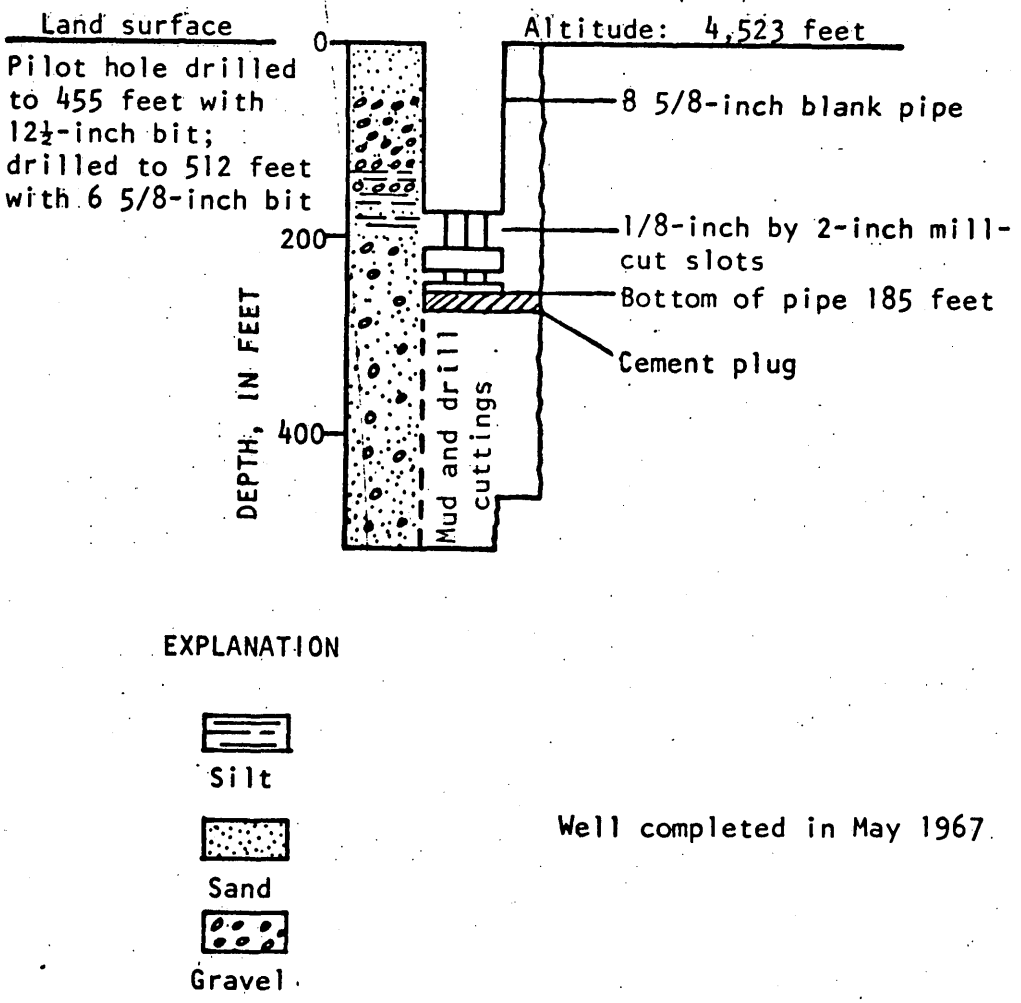


Figure 38.--Construction and lithology of test well B-5.

Table 56.--Chemical analyses of water samples from test well B-5

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	4-21-67 1/	4-27-67 2/	5-9-67 3/	5-19-67 4/	5-26-67 5/
Silica (SiO_2)	-	-	-	-	35
Iron (Fe)	-	-	-	-	.37
Calcium (Ca)	-	-	-	-	29
Magnesium (Mg)	-	-	-	-	9.1
Sodium (Na)	80	178	-	193	200
Potassium (K)	4.7	5.5	-	-	10
Bicarbonate (HCO_3)	-	168	-	238	242
Carbonate (CO_3)	-	4	-	-	0
Sulfate (SO_4)	160	125	955	232	234
Chloride (Cl)	33	180	1,300	79	82
Fluoride (F)	-	-	-	-	.7
Nitrate (NO_3)	-	-	-	-	.1
Dissolved solids					
Calculated	-	-	-	-	719
Residue on evaporation at 180°C	-	-	-	-	-
Hardness as $CaCO_3$	190	120	-	115	110
Noncarbonate hardness as $CaCO_3$	-	-	-	-	0
Specific conductance (micromhos at 25°C)	719	1,130	6,100	1,090	1,120
pH	-	8.3	-	8.2	8.0
Color	-	-	-	-	-
Temperature (°C)					

1/ Packer at 62 feet; screen from 77 to 100 feet.
2/ Packer at 212 feet; screen from 227 to 250 feet.
3/ Packer at 474 feet; screen from 489 to 512 feet.
4/ Collected during well development.
5/ Collected during pumping test on cased well.

Table 57.--Summary record of test well B-6

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: SW¼NW¼SE¼ sec. 8, T. 6 S., R. 1 E. **USGS No.** 6.1.8.413

LATITUDE: 33°48'07" **LONGITUDE:** 106°51'30"

DEPTH: 115 feet **ALTITUDE:** 4,525 feet

DATE COMPLETED: June 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 115 feet with 6 3/4-inch bit; reamed to 75 feet with 9 7/8-inch bit; no pipe installed.

YIELD: Not tested

NONPUMPING WATER LEVEL: 9.70 feet on 6-14-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	89-112	5,290	960	995	6-14-67

FORMATION LOGS: 1) Driller's

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Well plugged and abandoned

REFERENCE: Cooper, 1968

Table 58.--Chemical analyses of water samples from test wells B-2, B-3, B-4, and B-6

Analyses by Geological Survey, U.S. Dept. of the Interior (Chemical constituents in milligrams per liter)

Test well	B-2	B-2	B-3	B-3	B-4	B-4	B-6
Date of collection	6-11-66	6-17-66	6-23-66	6-28-66	7-7-66	7-12-66	6-14-67
Sample interval	1/	2/	3/	4/	5/	6/	7/
Sulfate (SO_4)	1,250	756	1,060	1,380	1,230	1,500	960
Chloride (Cl)	1,150	1,350	905	1,920	1,540	2,380	995
Specific conductance (micromhos at 25°C)	6,350	5,760	5,060	8,190	6,560	9,660	5,290

1/ Packer at 104 feet; screen from 119-130 feet.
2/ Packer at 227 feet; screen from 242-253 feet.
3/ Packer at 71 feet; screen from 86-97 feet.
4/ Packer at 225 feet; screen from 241-252 feet.
5/ Packer at 76 feet; screen from 91-102 feet.
6/ Packer at 227 feet; screen from 237-252 feet.
7/ Packer at 75 feet; screen from 89-112 feet.

Table 59.--Summary record of test well B-7

Bosque del Apache Grant
Socorro County, New Mexico

LOCATION: NW¼NW¼NE¼ sec. 8, T. 6 S., R. 1 E. **USGS No.** 6.1.8.211

LATITUDE: 33°48'38" **LONGITUDE:** 106°51'32"

DEPTH: 515 feet; completed at 255 feet **ALTITUDE:** 4,520 feet

DATE COMPLETED: September 1967 **DRILLING METHOD:** Hydraulic rotary

DRILLING CONTRACTOR: Layne Texas Co., Inc., El Paso, Tex.

CASING AND HOLE RECORD: Drilled to 464 feet with 12¼-inch bit; drilled to 515 feet with 6 5/8-inch bit; cement plug set in hole from 255 to 275 feet; hole cased to 255 feet with 8 5/8-inch pipe with 1/8- by 2-inch mill-cut slots from 175 to 215 feet and 235 to 250 feet.

YIELD: Well test pumped at 320 gpm for 8 hours with 30 feet of drawdown.

NONPUMPING WATER LEVEL: 8.20 feet on 9-22-67

CHEMICAL QUALITY	Depth interval (feet)	Conductance (micromhos)	Sulfate (mg/l)	Chloride (mg/l)	Date
	77-100	1,490	299	137	8-30-67
	227-251	944	127	130	9- 5-67
	481-502	6,530	1,064	1,410	9- 9-67
	Total screen	854	106	120	9-22-67

FORMATION LOGS: 1) Driller's; 2) Sample description; 3) Dual induction-laterolog; 4) Microlog

GEOLOGIC SOURCE: Alluvium

USE AND REMARKS: Observation well to monitor water-level and chemical-quality changes.

REFERENCE: Cooper, 1968

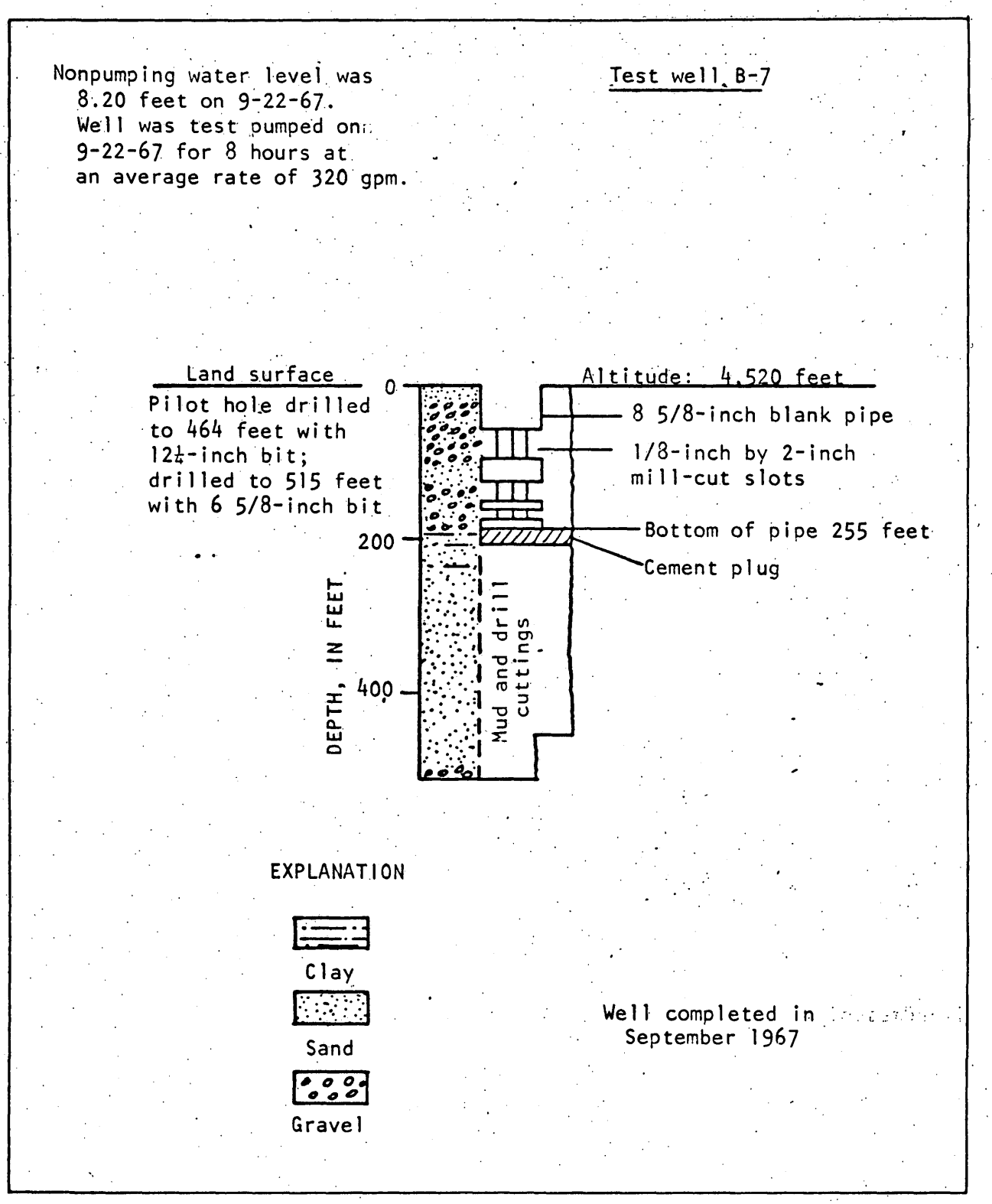


Figure 39.--Construction and lithology of test well B-7.

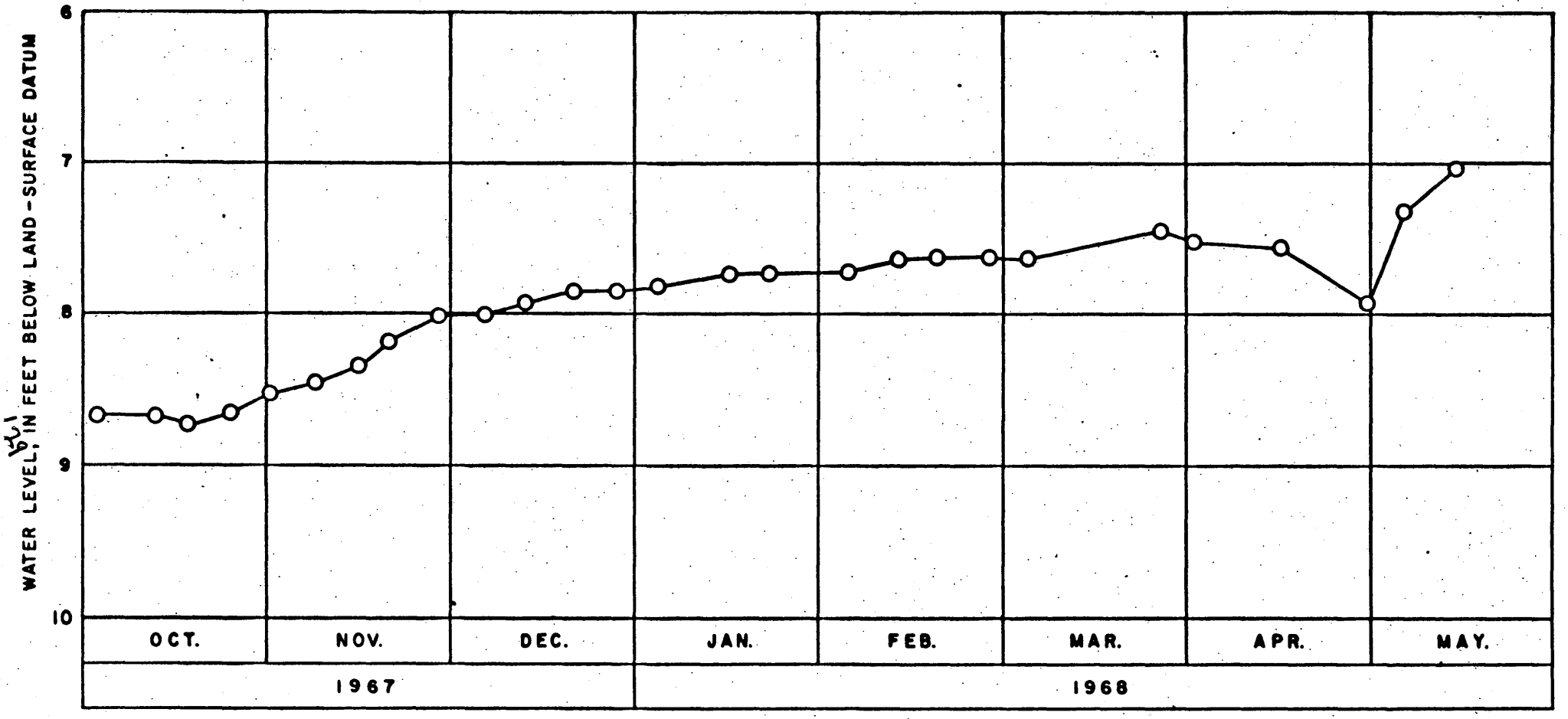


Figure 40.--Hydrograph of test well B-7.

Table 60.--Chemical analyses of water samples from test well B-7

Analyses by U.S. Geological Survey
[Constituents in milligrams per liter except pH, color, and as indicated]

Date of collection	8-30-67 1/	9-5-67 2/	9-9-67 3/	9-22-67 4/	
Silica (SiO_2)	-	-	-	56	
Iron (Fe)	-	-	-	.1	
Calcium (Ca)	-	-	-	34	
Magnesium (Mg)	-	-	-	9.5	
Sodium (Na) } Potassium (K)	-	-	-	134	
Bicarbonate (HCO_3)	-	-	-	163	
Carbonate (CO_3)	-	-	-	0	
Sulfate (SO_4)	299	127	1,064	106	
Chloride (Cl)	137	130	1,410	120	
Fluoride (F)	-	-	-	.5	
Nitrate (NO_3)	-	-	-	1.2	
Dissolved solids					
Calculated	-	-	-	541	
Residue on evaporation at 180°C	-	-	-	528	
Hardness as $CaCO_3$	-	-	-	124	
Noncarbonate hardness as $CaCO_3$	-	-	-	0	
Specific conductance (micromhos at 25°C)	1,490	944	6,530	854	
pH	-	-	-	7.9	
Color	-	-	-	-	
Temperature (°C)					

1/ Packer at 66 feet; screen from 77 to 100 feet.
2/ Packer at feet; screen from 227 to 251 feet.
3/ Packer at 464 feet; screen from 481 to 502 feet.
4/ Collected during a pumping test on cased well.

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