UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Ground Water Branch

DATA ON WATER WELLS IN THE WILLOW SPRINGS, GLOSTER, AND CHAFFEE AREAS, KERN COUNTY, CALIFORNIA

By
Fred Kunkel and others

Prepared in cooperation with the
California Department of Water Resources

Open-file report. Not reviewed for conformance with stratigraphic nomenclature and editorial standards of the Geological Survey.

Long Beach, California
1957

CONTENTS

TABLES

DATA ON WATER WELLS IN THE WILLOW SPRINGS, GLOSTER, AND CHAFFEE AREAS, KERN COUNTY, CALIFORNIA

By Fred Kunkel and others

PURPOSE AND SCOPE OF THE WORK

The data presented in this report were collected by the U. S. Geological Survey as a part of a reconnaissance ground-water investigation throughout much of the desert region of southern California. The study has been financed in part by Federal funds for Arid Regions studies, and in part by cooperation with the California Department of Water Resources.

The desert regions of California are characterized by barren mountain ranges and isolated hills surrounding broad valleys or basins. These valleys are underlain by unconsolidated alluvial debris derived from the surrounding highlands. These deposits generally contain ground water with a wide range in chemical quality, which in some areas can be developed for beneficial use.

The general objective of the overall cooperative investigation is to collect and to tabulate by areas all available hydrologic data for the desert basins to provide public agencies and the general public with a basis for planning water utilization and development, and to furnish background data for subsequent ground-water investigations.

The work carried on by the Geological Survey in each area includes: (1) A brief reconnaissance mapping of major geologic formations to define the extent and general character of the deposits; (2) a study of all water wells in the area, to determine and record their locations, depths and sizes, types and capacities of installed pumping equipment, uses of the water, and other pertinent information about the well; (3) measurement of the depth to water below land surface; (4) selection of representative wells to be measured periodically to observe and record changes of water levels; and (5) collection and assembly of well records, including well logs, water-level measurements, and chemical analyses.

Work for the Willow Springs, Gloster, and Chaffee areas was carried on by the U. S. Geological Survey, under the general supervision of G. F. Worts, Jr., district geologist, Sacramento, California. The field work was carried on intermittently between April 1951 and October 1956 from the Ground Water Branch southern California area office at Long Beach by L. C. Dutcher, W. J. Hiltgen, R. S. Brown, F. S. Riley, M. A. Pistrang, G. H. Chase, and the writer.

PREVIOUS INVESTIGATIONS AND ACKNOWLEDGMENTS

Data on ground water in the Willow Springs, Gloster, and Chaffee areas are contained in two previous reports. U. S. Geological Survey Water-Supply Paper 578, "The Mojave Desert region, California," 1929, by D. G. Thompson, includes data obtained in 1918 on 10 wells in the area of the present investigation. A private report by a consulting engineer, Cyril Williams, Jr., contains information collected in 1929 and 1930 on 49 wells in the area. These data on wells are included in this report.

The geology shown on plate 1 for townships 10 through 13 west was compiled and modified from unpublished mapping of L. C. Dutcher, of the Ground Water Branch, and for townships 14 and 15 west from unpublished mapping of T. W. Dibblee of the ~~Fuels~~ Mineral Deposits Branch, U. S. Geological Survey.

LOCATION AND GENERAL FEATURES OF THE AREA

The Willow Springs, Gloster, and Chaffee areas cover about 500 square miles (20 by 25 miles) in the western part of the Mojave Desert, between 34°52' and 35°10' north latitude and 117°57' and 180°30' west longitude (pl.1). The area is shown on parts of the Tehachapi, Mojave, Castle Butte, Willow Springs, Rosamond, and Rogers Lake quadrangle maps at a scale of 1:62,500. Approximately 95 square miles of the southeastern part of the area of this report lies within Edwards Air Force Base, and is closed to civilian development. Data on wells within the military reservation are not included in this report.

Topographically the area consists principally of steep alluvial fans and gently sloping alluvial plains built out from the southeastern slopes of the Tehachapi Mountains. In the central and southern part of the area isolated buttes and mountains rise above the alluvial plain. Low gently rolling hills of granitic rocks limit the eastern extent of the alluvial plain. The northern boundary of the area is the Muroc fault and the southern boundary is the Rosamond fault, both are well-defined geologic features.

Two principal drainage systems, Cache Creek and Oak Creek, carry occasional surface runoff from the Tehachapi Mountains onto the alluvial slopes of the desert floor.

The principal town in the area is Mojave, at the intersection of U. S. Highways 6 and 466 and the junction of the Southern Pacific and Santa Fe railroads.

Except for several small fields of alfalfa northeast of Rosamond and in the Gloster area, the only significant irrigation during the period 1954-56 was in the vicinity of Willow Springs. In this area 10 wells supplied irrigation water to about 2,500 acres of alfalfa.

GEOLOGIC AND HYDROLOGIC FEATURES OF THE AREA

The geologic units in the area can be grouped in two broad categories: consolidated rocks and unconsolidated deposits. The consolidated rocks as mapped (pl. 1) include crystalline and metamorphic rocks of pre-Tertiary age that form the basement complex (map symbol bc), and intrusive and extrusive volcanic rocks (Ty) of Tertiary age, and a series of nonmarine sedimentary rocks (Tc). For the most part the consolidated rocks are relatively hard and impervious, and except for minor amounts of water contained in cracks and weathered zones, they are essentially non-water-bearing.

Unconsolidated alluvial deposits of Quaternary age underlie most of the desert floor in the lowland areas. The unconsolidated deposits are porous and some beds are permeable, and capable of storing, transmitting, and yielding significant quantities of ground water.

The older alluvium of Pleistocene age (Qoal) consists of compact arkosic coarse sand and fine gravel. The deposits are weathered and locally the feldspars have been altered to clay. These deposits do not yield water to wells as freely as the central-valley alluvium, however they are thick, occur beneath the water table and constitute the main aquifer in the area.

The central-valley alluvium (Qal) deposited during late Pleistocene and Recent time by streams draining the Tehachapi Mountains mantles most of the desert floor. These deposits are generally more coarse and least well sorted in the upper fan areas. They become progressively finer grained and better sorted toward the central valley. Where saturated these deposits generally yield water freely to wells.

Small areas of locally derived alluvial-fan deposits and slope-wash debris fringe the desert hills and buttes (Qf). These deposits generally are very poorly sorted, poorly permeable, and are usually above the water table. These beds are believed to be poor sources of water.

Both the Muroc fault and the Rosamond fault are well defined and are barriers to the movement of ground water. The altitude of the water surface on the south side of the Muroc fault is as much as 300 feet higher than it is on the north side. The altitude of the water surface on the north side of the Rosamond fault is as much as 100 feet higher than the altitude of the water surface on the south side of the fault.

A total of 166 wells were inventoried in the area and are shown on plate 1 and described in table 1A. In 1955-56 the depth to water in wells ranged from about land surface or a few feet below in the Willow Springs area to more than 300 feet below land surface in some wells in the higher alluvial slopes.

Probably a considerable part of the ground-water recharge from Cache Creek moves generally eastward and discharges across the Muroc fault into another ground-water basin to the north. The remainder of the ground-water flow from Cache Creek moves easterly and southeasterly into the central part of the Chaffee area, where the movement is northeasterly toward the Muroc fault.

Recharge from the Oak Creek drainage system moves generally southeastward toward Soledad Mountain. Part of this water moves east along the north side of Soledad Mountain into the Chaffee area, and part moves south along the west side of the mountain. Of the water that moves south along the west side of Soledad Mountain, most eventually moves east along the south edge of the mountain into the Gloster area and thence into the Chaffee area. Some of the water may move south and southwest into the Willow Springs area and eventually discharge across the Rosamond fault into another ground-water basin to the south.

Table 2A gives results of determinations of chloride, hardness, and specific conductance in water from 10 wells. Table 3A lists 19 chemical analyses of water from 18 wells. Table 4A lists 41 drillers' logs of wells. Table 5A lists depth-to-water measurements for 8 representative wells measured periodically by the Geological Survey.

WELL-NUMBERING SYSTEM

The well-numbering system used in the Willow Springs, Gloster, and Chaffee areas conforms to that used in essentially all ground-water investigations made by the Geological Survey in California since 1940. It has been adopted as official by the California Department of Water Resources and by the California Water Pollution Control Board for use throughout the state.

Wells are assigned numbers according to their locations in the rectangular system for the subdivision of public land. For example, in the number 11/12-18B2, assigned to a well shown on plate 1, the part of the number preceding the bar indicates the township (T. 11 N.), the part between the bar and the hyphen indicates the range (R. 12 W.), the number between the hyphen and the letter indicates the section (sec. 18), and the letter indicates the 40-acre subdivision of the section as shown in the accompanying diagram.

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

18

Within the 40-acre tract the wells are numbered serially as indicated by the final digit. Thus, well 11/12-18B2 is the second well to be listed in the NW¼NE¼ sec. 18 (San Bernardino base and meridian).

Similarly, well 32/36-20M1 is in the NW¼SW¼ sec. 20, T. 32 S., R. 36 E., Mt. Diablo base and meridian. Because all of the wells in the Willow Springs, Gloster, and Chaffee areas are either in the northwest quadrant of the San Bernardino base and meridian lines or in the southeast quadrant of the Mt. Diablo base and meridian lines, the foregoing abbreviations of the township and range are sufficient.

For well numbers where a dash has been substituted for the letter designating the 40-acre tract, the dash indicates that the well is plotted from unverified location descriptions; the indicated sites of such wells were visited but no evidence of a well could be found.

REFERENCES CITED

Thompson, D. G., 1929, The Mojave Desert region, California: U. S. Geological Survey Water-Supply Paper 578, p. 348-371

Williams, Cyril, Jr., Consulting Engineer, San Francisco, California, 1930, Supply investigation in the vicinity of Mojave, California: Prepared for Pacific Portland Cement Company, typewritten report.

Table 1A.- Description of wells

Source of data: The source of the data on each line is indicated by the following symbols: GS observations and measurements made by the Geological Survey on the dates indicated; CW unpublished report by Cyril Williams, Jr. (1930); 578 U. S. Geological Survey Water-Supply Paper 578 by D. G. Thompson (1929). Numbers following CW and 578 are the well numbers used in the respective source reports.

Date of observation: Data for each well are presented in reverse chronological order, with the most recent information summarized on the top line.

Altitude: The altitude given is the land-surface altitude at the well. Altitudes given to the nearest 5 feet were interpolated from U. S. Geological Survey topographic maps having 25- or 100-foot contour intervals. Altitudes given to the nearest foot were determined by hand-leveling. Altitudes given to the nearest tenth of a foot were determined by spirit-leveling during the present investigation or were taken from Williams (1930).

Depth: Depths of wells given in whole feet were reported by owners, drillers, or others; depths given in feet and tenths were measured below land surface by the Geological Survey.

Type well and diameter: Type of well construction is indicated by the following symbols: C cable-tool, D dug, G gravel packed, R rotary. Well diameter is given in inches.

Pump data: The type of pump is indicated first, as follows: B bucket, J jet, L lift or cylinder, N none, T turbine. The type of power is indicated second, as follows: E electric motor of undetermined horsepower, G gasoline engine, H hand operated, N none, W windmill; where a number appears in this column it indicates the rated horsepower of an electric motor. Yield is given in gallons per minute.

Use of well: Dm domestic, Ds destroyed or dry, I irrigation, P poultry raising, Ps public supply, S stock, T test hole, Un unused, Id industrial, Cs highway construction.

Table 1A.- Description of wells--Continued

Measuring point: The point from which water-level measurements are made is described as follows: Bhc bottom of hole in casing, Bpb bottom of pump base, Hcc hole in casing cover, Hpb hole in pump base, Ls land surface, Tap top of access pipe, Tbc top of board cover at crack or hole, Tc top of casing, Tcc top of casing cover, Tcr top of curbing, Tdp top of discharge pipe, Tnc top of nipple in casing cover, Tt top of timber or steel beam under pump. The suffix letters N, S, E, or W indicate the side, north, south, east, or west, from which the measurement is made. The distance of the measuring point above or below (-) land-surface datum is given in feet and tenths.

Water level: The water level is given in feet below land-surface datum; reported or approximate depths to water are given in whole feet, and measured depths to water are given in feet, tenths, and usually hundredths.

Other data: C chemical analysis (table 2A or 3A), L driller's log (table 4A), B well reported to have penetrated bedrock (basement complex) at bottom, W periodic water-level records (table 5A).

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 12 W.												
9/12-16D1	GS	3-29-51	R. E. Payne	1949	2390	85	G	6	L 2	30	Dm	Tcr	1.2	26.75	B
16E1	GS	5-24-56	Clara Koch	1950	2404	-	-	-	- -	-	Ds	-	-	-	-
	GS	3-29-51	-Gettys	-	-	150			N N		Un	Ls	0	48.4	
16E2	GS	5-24-56	Clara Koch	1951	2375	-	-	8	T -	-	Dm	Tap	1.65	94.15	-
	GS	3-13-53	-Gettys						L W		S	TcE	1.0	89.20	-
	GS	11- 6-52												92.24	
	GS	9-21-51				182.4								92.94	
16J1	GS	5-24-56	A. C. Scruggs	1951	2340	200	G	12	T 25	-	I	TcS	0.4	65.75	C,L,B
	GS	11- 5-52												74.94	
	GS	4-17-51												60.86	
	GS	3-28-51												62	
16K1		4-17-51	R. J. Rubees	1945	2360	204	G	12	T 20	-	I	-	-	-	L
16L1	GS	5-24-56	Frank Miske	1917	2365	-	-	14	T 15	-	I	Tc	0	89.72	L
	GS	2- 9-51												79.5	
	GS	2- 9-51								281				a111.3	
		4-18-50								522				66.5	
		2- 1-47	Mitchell, Erickson, Johnson		2335									70	
	578-22	6-13-17				254				450				35	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	Diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 12 W.--Continued												
)/12-16Q1	GS	4-17-51	Peter Thomas	-	2335	250	-	14	T 25	-	I	-	-	-	-
16Q2	GS	4-17-51	Peter Thomas	-	2353	-	-	10?	T 10	-	I	-	-	-	-
17M1	GS	4- 9-51	C. G. Spencer	1936	2367	160	-	8	L W	-	Dm	-	-	-	-
17M2	GS	5-22-56	C. G. Spencer	-	2367	-	-	8	J 1	-	Dm	Tc	0.4	93.15	-
18C1	GS	5-21-56	-	-	2422	10.0	D	-	- -	-	Ds	-	-	dry	-
	GS	4-12-51				45.0			N N		Un	Ls	0	19.9	
18E1	GS	5-22-56	Dale Randleman	1949	2423	354	D	12	L W	-	Un	Tc	1.0	17.25	L,B
	GS	3- 2-52									Dm			b61.58	
	GS	11-15-51												b61.74	
	GS	4- 9-51												a55.60	
	GS	10----50												17	
18E2	GS	5-22-56	-	-	2425	27.0	-	-	N N	-	Ds	-	-	dry	-
	CW-18A	10- 8-29			2408.7				L W		Dm		0.65	35.95	

a. Pumping.
b. Pumped recently.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 12 W.--Continued												
)/12-18E3	GS	5-22-56	-	-	2415	19.5	-	12	N N	-	Ds	-	-	dry	-
	CW-18B	12- 7-29			2396.0						Un	Tc	0.17	26.13	
18F1	GS	5-22-56	Dale Randleman	1955	2415	233	C	8	L W	-	Dm	TcE	1.0	63.74	-
			T. 9 N., R. 13 W.												
)/13-1M1	GS	4-18-51	-	-	2480	93.5	G	8	N N	-	Un	TcS	0.5	59.16	-
1N1	GS	5-22-56	-	-	-	67.2	-	8	N N	-	Un	Tc	1.0	63.45	-
	GS	2- 9-54												61.85	
	GS	3- 4-52												62.24	
	GS	11-15-51												62.10	
	GS	4-18-51												61.56	
	CW-1A	10-10-29	R. Kirk		2486.6	400			L W			Tbc	1.3	69.62	
1Q1	GS	5-23-56	E. Starr	1950	2463	242	-	6	N N	-	S	Ls	0	flowing	L
	GS	2-10-54												flowing	
	GS	4-18-51												flowing	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
T. 9 N., R. 13 W.--Continued														
/13- 4A1	GS	2-10-54	O. S. Hatcher	-	-	282	- 12	T G	-	Dm	Tc	0	71.39	W
	CW-4A	11-15-29	B. L. Neiswinder		2636.8			N N		Un			69.70	
5M1	GS	5-21-56	Curtis	-	2645	-	- 16	T 125	-	I	Tc	0	102.82	-
	-	11-19-54											90	
	GS	2- 8-54											76.03	
	GS	1-20-53											71.65	
5-1	CW-5A	11-10-29	B. Bellows	-	2643.0	-	- 7	- -	-	-	Tc	0.8	59.85	
7A1	GS	5-23-56		-	-	10.0	D 60	N N	-	Ds	-	-	dry	
	CW-7H	11-10-29	G. Frye		2622.3	100					Ls	0	37.60	
7Q1	GS	2-10-53	Willow Springs Co.	-	-	38.1	- -	- -	-	Dm	Tc	0	2.86	W
	CW-7F	11-14-29	F. M. Hamilton		2566.0						Tap	0.7	3.10	
7Q2	GS	2- 8-54	Willow Springs Co.	-	2560	50.6	- 12	C 2	-	Dm	Tc	0	a5.60	C
	GS	2-10-53											a0.83	
7Q3	GS	5-23-56	Willow Springs Co.	-	-	185	- 8	T -	-	Dm	Tap	0	c20.90	
	CW-7G	11-14-29	F. M. Hamilton		2564.3								0.31	

a. Pumping.
c. Nearby well pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 9 N., R. 13 W.--Continued											
/13- 7Q4	GS	5-23-56	Willow Springs Co.	-	-	1.0	D -	N N	-	Ds	-	-	dry	-
	CW-7D	11-14-29	F. M. Hamilton		2561.0								2.01	
7Q5	GS	5-23-56	Willow Springs Co.	-	-	3.0	D -	N N	-	Ds	-	-	dry	
	CW-7E	11-14-29	F. M. Hamilton		2564.0								20.26	
7R1	GS	5-23-56	Willow Springs Co.	-	-	-	- -	L N	-	Un	Tc	0.4	18.80	
	CW-7C	11-14-29	F. M. Hamilton		2564.0			L W		Dm			9.45	
7R2	GS	5-23-56	Willow Springs Co.	-	-	37.1	- 12	N N	-	Un	Tc	0	23.20	
	GS	2- 8-54											16.32	
	GS	2-10-53											15.19	
	CW-7B	11-14-29	F. M. Hamilton	-	2567.7			? G			Tc	3.0	13.08	
7R3	GS	5-23-56	Willow Springs Co.	-	-	-	- -	N N	-	Un	Bhc	-0.3	26.71	-
	CW-7A1	11-14-29	F. M. Hamilton		2568.2	100		L W		Dm	Tc	0.5	24.94	B,L
8D1	GS	2-10-53	-	-	-	4.0	- -	- -	-	Ds	Ls	0	dry	-
	CW-8A	11-16-29	J. Maquin		2618.0			N N		Un	Tc	0.3	44.06	
	578-16	-	Naquin				- 12				-	-	47	
10A1	GS	5-23-56	-	-	-	38.0	D 60	- -	-	Ds	Ls	0	dry	
	CW-10A	12- 8-29	W. S. Webb		2540.5					Un			54.3	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 13 W.--Continued											
/13-12B1	GS	5-22-56	Wm. Fousek	1954	2460	266	R 6	L W	-	Dm	Tc	0.5	18.14	-
12B2	GS	5-22-56	-Stemwedel	1947	2475	178	- 12	T ½	-	Dm	Bhc	1.0	71.36	-
12D1	GS	5-22-56	-	-	2495	-	- 13	N N	_	Un	TcE	0.8	77.8	-
	GS	2- 9-54				102.7							76.94	
	GS	4-18-51											76.75	
13D1	GS	5-23-56	R. William	-	2475	-	- -	T 30	-	I	Hcc	0.3	88.74	-
	GS	5-22-56											a127.5	
14A1	GS	5-23-56	C. W. Norton	-	-	37.1	- -	N N	-	Ds	Ls	0	dry	-
	CW-14B	10-10-29	C. Graves		2447.0			L N		Un	Bpb	0.1	70.10	
14E1	GS	5-23-56	C. W. Norton	-	-	43.0	D 48	N N	-	Ds	Ls	0	dry	-
	CW-14C	12- 8-29	C. Graves		2415.5					Un			54.67	
14E2	GS	5-23-56	A. G. Burton	-	2435	139	- -	T 10	-	I	-	-	-	-
	GS	1950											55	
14F1	GS	5-23-56	C. Burton	-	2455	108.4	- 12	L 5	-	Ps	TcN	-5.6	87.45	-
14F2	GS	5-23-56	C. Burton	-	2450	-	- -	T 20	-	Ps	-	-	-	-
	GS	1955											62	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	Diameter (in)	Pump data: Type	Pump data: power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 13 W.--Continued													
)/13-14H1	GS	5-23-56	J. Jones	1953	2470	190	G	8	L	W	-	Dm	Hcc	0.5	82.14	-
	GS	1953													70	
14H2	GS	5-23-56	C. O. McLennan	1936	2455	200	-	12	L	W	-	Dm	Hcc	0	73.30	-
			T. 9 N., R. 14 W.													
)/14- 1H1	GS	5-23-56	Jess Butler	1950	2700	945	G	18	N	N	-	Un	Tc	0	115.00	L
1P1	GS	5-21-56	E. Jordan	1946	2680	221	C	8	L	G	-	Dm	Tc	0.8	81.80	-
	-	1946													74	
1Q1	GS	5-21-56	Miss Ball	1950	2675	170	-	8	L	W	-	Un	TcN	1.5	69.86	-
		2-10-54													68.46	
		1-30-53													68.79	
1R1	GS	1-30-53	Wagon Wheel Ranch	1936	2670	210	-	7	J	1	-	Dm	-	-	-	-
1R2	GS	5-23-56	Fred Hamilton	1912	2670	170	-	12	L	W	-	Dm	Tc	1.0	63.46	
	GS	2-10-54													60.15	
	GS	1-30-53													59.14	
	578-15		F. M. Hamilton			186									57	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 9 N., R. 14 W.--Continued										
/14- 2J1	GS	1-30-53	S. L. Henson	1926	2735	250	- 12	T E	-	Dm	Tc 2.0	124.63	W
2-1	CW-2A 578-14	11- 4-29	-	-	2746.3	164 155	- 7 7	- -	-	-	Tc 2.1	148.70 -	-
4B1	GS 578-13	5-21-56 -	- John Lane	-	2925	242.5 550	- 12	N N	-	Ds	Ls 0	dry 250	-

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diam eter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 11 W.											
10/11- 7A1	GS	9-11-52	-	1910	2515	59.9	- 12	N N	-	Ds	-	-	dry	-
8E1	GS	11- 2-55	R. Fetters	1952	2497.5	200	- 10	L G	90	Dm,S	TcE	0.5	55.24	C,L,B
	GS	12- 2-52											54.36	
	GS	9-18-52											46.86	
8M1	GS	11- 4-55	-	1910	2505.1	65.2	- 12	N N	-	Un	TcNE	0.0	62.29	-
	GS	9-11-52											62.56	
	CW-8A	2-18-30			2504.0			T -	-	I	Bpb	0.3	62.3	
	CW-8A	10- 4-29											62.6	
			T. 10 N., R. 12 W.											
10/12- 2B1	GS	10-27-55	C. W. Roberts	-	2575.1	215	C 14	L G	-	Dm,S	Tcc	0.4	134.87	-
4B1	GS	9-21-51	Southern Pacific	-	2630	-	- -	N N	-	Un	-	-	-	C
4B2	GS	11- 3-55	Southern Pacific	1952	2626.0	200	- -	L E	-	Dm	Tcc	0.4	182.98	C
9A1	GS	2- 9-53	D. McAllister	1951	2594	208	- 8	J E	8	Dm	Tnc	1.28	150.17	L,B
	GS	12- 5-52						N N		Un	Tc	1.0	150.17	
10N1	GS	9-12-52	-	-	2565	74.5	- 10	N N	-	Ds	TcE	2.2	dry	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued											
0/12-10P1	GS	11- 3-55	Seay	-	2559.3	225	C 6?	L 1	-	Dm	Hcc	0.5	101.59	-
10R1	GS	10-27-55	Dr. L. Schultz	-	-	300	- 12	T 7½	150±	Un	Hpb	0.1	94.27	C
	GS	1-19-53	Golden Queen Mine							Dm				
	CW-10B	2-18-30	M. Hirschoen		2552.3	253		N N		Un	Tcc	0.0	93.91	
	CW-10B	10-29-29											94.00	
10-1	CW-10A	2-18-30	J. A. Jungquist	-	2560.5	166	- 12	N N	-	Un	Tc	0.0	104.77	-
	CW-10A	10-29-29											104.90	
12H1	GS	11-25-52	-	-		73.8	- 7	N N	-	Ds	Tc	-	dry	-
	CW-12C	2-18-30	H. M. Callecod		2520.8					Un	Tc	0.3	70.62	
	CW-12C	9-25-29											69.72	
12K1	GS	9-18-52	-	-		249.4	- 14	N N	-	Un	TcW	0.0	72.67	-
	CW-12A	2-18-30	J. Kearman		2523.6	294		L G	270	Dm	Bpb	0.0	73.14	
	CW-12A	9-25-29											73.22	
12L1	GS	10-27-55	Pasadena Rocket Soc.	-	2520	78.5	- 7	B H	-	Ds	TcNW	1.5	dry	-
	GS	9-18-52				107.3				Dm			78.26	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued												
0/12-15C1	GS	5-22-56	George Cox	1955	2556.8	260	G	6	J 1	6	Dm	Tc	0.3	61.10	-
	GS	11- 3-55												61.28	
15C2	GS	5-22-56	W. D. McMillan	1955	2251.1	260	R	6	N N	-	Un	TcS	0.8	55.30	-
		11- 4-55												55.33	
15E1	GS	3- 5-56	Fred Mushler	1952	2560	-	-	-	J E	-	Dm	-	-	-	-
15M1	GS	9-11-52	J. Actis	1932	2563	175	-	10	N N	-	Un	TcE	0	49.93	-
	GS	3- 4-52												49.39	
	GS	11-16-51												49.80	
	GS	9-21-51							L W					50.00	
15M2	GS	9-11-52	J. Actis	-	-	-	-	12	J 3	-	Dm			-	C
	CW-16A				2562.0	275			L W			Ls	0	65	
15M3	GS	3- 5-56	J. Actis	1955	2560	175.0	C	7½	N N	-	Un	Tc	1.0	63.64	-
16J1	GS	3- 5-56	James Kempu	-	2570	175	C	8	N N	-	Un	TcW	1.0	58.31	-
16N1	GS	9-26-51	Norma Moody	1949	2611	154	-	6	J 1	-	Dm	-	-	68	
16N2	GS	3- 5-56	Mrs. Killain	1955		178	R	8	J 1½	-	Un	-	-	65	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued											
0/12-16P1	GS	11-24-52	Charles Halcomb	1950	2605	200	- 6	L H	-	Dm	-	-	70	-
16Q1	GS	3- 5-56	Brown	-	2680	-	- 8	J E	-	Dm	TcW	1.0	-	-
16R1	GS	5-22-56	M. White	-	2577	-	- 8	J 1	-	Dm	Hpb	0.5	65.63	-
	GS	9-11-52											66.05	
	GS	11-27-51											65.62	
19D1	GS	3- 5-56	Collender	1954	2777	300	- 12	T 45	400	I				
20B1	GS	9-21-51	O. J. Backus	1912?	-	117.6	- 16	N N	-	Un	TcW	1.0	89.92	W
	CW-20A	2-19-30	R. M. Sopp										90.19	L
	CW-20A	9-27-29			2638.6	135							90.60	
20C1	GS	11-13-52	O. J. Backus	1917	-	d107.8	D 12	T 5	-	Dm	-	-	-	L
	CW-20D	2-19-30			2650.5	161		T G		I	Tcr	0	99.28	C
	CW-20D	12-13-29							75				a128	
	CW-20D	12-13-29											98.89	
	CW-20D	12- 8-29											98.30	
20C2	GS	11-24-52	O. J. Backus	1918?	2650	d107.8	D -	- -	-	Un	-	-	-	

a. Pumping.
d. Drilled well at bottom of pit.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued											
10/12-20C3	GS	11-13-52	O. J. Backus	1914	2645	128	- 8	J E	35	Dm	Bpb	0	93.32	-
20C4	GS	3- 5-56	O. J. Backus	1954	-	625	G 12	T 30	90	I	-	-	-	-
20N1	GS	11-13-52	-	-	2660	82.6	- 10	N N	-	Ds	TcN	0	dry	-
	CW-20C												-	
20P1	GS	11-13-52	-	-	-	82.0	- 10	N N	-	Ds	Tc	0.7	dry	-
	CW-20B	2-18-30	G. H. Buckley		2632.2	97			-	Un			84.72	L
	CW-20B	10- 5-29											84.80	
21R1	GS	9-11-52	L. Wiggenton	1951	2570	150	- 6	L G	-	Dm	-	-	-	C,L
21R2	GS	5-22-56	Cole Investment Co.	-	2575	125	R 8	J 3	-	Un	TcE	1.0	47.4	
	GS	3- 2-56											45.41	
22C1	GS	11-24-52	Dittman and Kemper	-	-	4.3	- 8	N N	-	Ds	-	-	dry	-
	CW-22E	2-18-30	E. E. Warren		2539.0					Un	Tc	0.4	37.12	
	CW-22E	9-27-29											37.05	
22D1	GS	5-24-56	-	-	2550	57.7	- 7	N N	-	Un	TcW	1.0	36.70	
	GS	9-12-52											36.29	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued										
10/12-22E1	GS	5-24-56	-	-	-	41.0	- 10	N N	-	Un	Tc	0	38.15	
	GS	11-24-52											38.86	
	CW-22A	2-18-30	A. L. Kemper		2552.3	41.0				Un	Tc	1.0	40.20	L
	CW-22A	-				240		? ?	270	Cs			38.90	
22F1	GS	3- 2-56	Cole Investment Co.	1953	2540	125	R 6	J 1	-	Dm	-	-	40	
	GS	3- 2-56							1.6				a69	
22F2	GS	3- 2-56	Cole Investment Co.	1924	2540	125	- 6	N N	-	Un	Tc	0.5	38.95	-
	GS	-							1.5				a64	
22F3	GS	3- 2-56	Cole Investment Co.	1924	2540	500	- 12	T 15	-	I	Bpb	0.5	38.13	-
	GS	3- 2-56							390				a98	
22N1	GS	5-12-56	Mrs. Leitch	1919?	2563	60.8	- 10	L W	-	Un	TcN	0.5	48.96	
	GS	5- 5-54											50.56	
	GS	9-11-52				125							49.66	. C
22N2	GS	5-22-56	Mrs. Leitch	1919?	-	125	- 12?	T 5	-	Dm	Bpb	0.8	49.31	-
	GS	9-11-52											50.62	
	GS	11-21-51											54.01	
	CW-22B	9-27-29	J. Kawall		2561.0			T G		I	Tc	0	49.43	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued											
10/12-27L1	GS	11-24-52	-	-	-	42.2	D 48	N N	-	Ds	Ls	0	dry	
	CW-27A	2-19-30	W. Fusek		2540.5	66					Tcr	0.2	57.20	L,B
	CW-27A	11- 4-29											57.20	
28C1	GS	5-24-56	-	-	-	79.6	- 10	N N	-	Un	TcS	0	58.61	-
	GS	1-20-53											58.25	
	GS	11-13-52											58.32	
	CW-28A	2-18-30	W. D. Miller		2585.0						-	1.7	61.69	B
	CW-28A	10- 5-29											61.90	
28J1	GS	5-22-56	E. Faires	-	-	-	- 9	L W	-	Un	TcS	1.0	63.34	-
	GS	11- 2-52											61.64	
	GS	3- 3-52											60.68	
	GS	11-16-51											64.09	
	GS	9-21-51											65.80	
	CW-28B	2-19-30	J. D. Faires		2549.2	120							b63.32	B
	CW-28B	10-31-29											62.10	
28-1	CW-28C	2-18-30	F. A. Jungquist	-	2560.0	-	- 12	- -	-	-	Tc	0	54.55	-
	CW-28C	12-19-29											54.76	

b. Pumped recently.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 10 N., R. 12 W.--Continued											
D/12-30A1	GS	11-13-52	-	-	-	94.3	- 10	- -	-	Ds	Ls	0	dry	
	CW-30A	2-18-30	R. M. Freeman	-	2664.1						Tc	0.7	99.70	L,B
	CW-30A	11- 2-29											98.70	
			T. 10 N., R. 13 W.											
D/13- 4D1	GS	11-13-52	-	-	3140	285.5	- 8	N N	-	Ds	Tc	1.5	dry	-
	CW-14A	10-19-29	M. D. Schmidt					L W		Un			290.5	
14Q1	GS	11-24-52	Seaton	1952	2840	463	- 12	T E	-	Dm	-	-	253	C,L
	GS	11-24-52							360				a340	
18P1	GS	1-20-53	Cactus Mine	-	2960	-	- -	T E	-	Ps	-	-	306	-
19M1	GS	1-20-53	Dewey Butler	1952	2905	770	G 16	N N	450	Un	Bhc	1.0	291.61	L,W
22D1	GS	1-20-53	Marsh	1953	2875	-	C 6	- -	-	Dm	-	-	282	L
24B1	GS	11-13-52	-	-	-	171.4	- 7	N N	-	-	-	-	dry	-
	CW-24B	2-19-30	R. Livingstone		2762.6			? G		Dm	Tap	0.9	185.65	
	CW-24B	2- 8-29											186.20	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 13 W.--Continued											
0/13-24C1	GS	3- 4-52	Mrs. DeBoard	-	2775	252	- 6	L 1	-	Dm	TcW	0.7	184.23	C
	GS	11-16-51											184.14	
	GS	9-26-51											184.17	
24F1	GS	9-26-51	Montmorency	-	-	-	- 12	T E	-	Dm	Tc	1.1	184.7	-
	CW-24A	2-19-30	C. E. Patterson		2757.6	600		L W		S	Tc	2.5	b180.90	C
	CW-24A	11- 2-29											179.40	
29M1	GS	2- 8-54	Paul Adler	1953	2800	1250	G 16	T 200	2200	I	TcW	0	218.34	-
30B1	GS	2- 8-54	M and P Ranch	1952	2860	750	G 16	T 150	-	I	TcW	0.5	255.65	-
	GS	1-20-53											247.78	
30D1	GS	11-29-54	M and P Ranch	1952	2880	834	G 16	T 200	-	I	TcE	0.5	282.74	L
	GS	2- 8-54											282.74	
	GS	1-20-53											275.26	
30K1	GS	1-20-53	M and P Ranch	1952	2825	407	G 16	T 200	-	I	-	-	-	L
31E1	GS	2-10-54	CCC Ranch	1952	2795	1000	G 16	T 150	-	I	TcE	0	186.34	-
		1-30-53											181.49	
31M1	GS	1-30-53	CCC Ranch	-	2780	-	- -	T 50	-	I	-	-	-	

b. Pumped recently.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 10 N., R. 13 W.--Continued											
0/13-32D1	GS	1-20-53	Lombardi and Frew	1949	2775	1345	- 16	T 200	-	I	-	-	-	L
32M1	GS	5-21-56	Lombardi and Frew	1951	2740	805	- 16	T E	-	I	Tc	0.5	162.30	L,B
	GS	11-14-55											156.19	
	GS	3- 1-54											148.32	
	GS	1-20-53											131.95	
			T. 10 N., R. 14 W.											
0/14-36A1	GS	2-10-54	CCC Ranch	1950	2855	986	G 16	T 150	1500	I	TcS	0.5	241.92	C,L
	GS	1-30-53											237.29	
	-	7- 5-50											a336	
	-	6-21-50											a336	
	-	5-31-50											a332	
	-	5- 2-50											a330	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 11 N., R. 11 W.											
1/11- 1Q1	GS	11- 1-55	A. H. Kent	-	2450	761.5	R 6	N N	-	T	Tc	1.5	33.25	C
	GS	9-29-55											32.10	
	GS	12-11-52											31.88	
2N1	GS	11- 1-55	H. L. Miller	-	-	-	- 12	N N	-	Un	TcSE	0.7	89.92	C
	GS	10-21-55				e303.5							89.97	
	GS	9-10-52				f81.1							dry	
	CW-2A	2-27-30			2512.0			N N		Un			91.29	
	CW-2A	10-15-29											91.30	
	578-51	1918											92	
6D1	GS	9-30-55	G. Ward	-	-	257.1	- 12	N N	-	Un	TcW	1.7	254.28	-
	GS	3-15-54											254.42	
	GS	1-21-53				256.3							255.0	
	GS	12- 3-52											254.97	
	CW-6A	2-27-30	F. Ward		2681.0			N N		Un			258.40	
	CW-6A												258.20	
6M1	GS	3- 2-55	-	-	2680	245.8	- 12	N N	-	Ds	-	-	dry	-

e. Well cleaned to bottom.
f. Depth of obstruction in casing.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Date (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 11 N., R. 11 W.--Continued											
1/11- 8D1	GS	10-21-55	Z. Thorning	-	-	e275.0	- 12	N N	-	Un	Bhc	1.0	198.43	C,W
	GS	9-29-55				f204.0							198.32	
	CW-8A	2-27-30	A. T. Thorning		2624.5			N N		Un	Tc	1.5	218.30	
	CW-8A	9-28-29											218.60	
	578-49	1918						- -	450				205	
18D1	GS	12- 2-52	B. Hammett	-	-	220	- 12	N N	-	Un	TcN	0.5	213.02	-
	CW-18A	2-28-30	Natl. Bank of Italy Co.		2639.5			- G		Un	Bpb	1.3	220.6	
	CW-18A	9-28-29											217.9	
20Q1	GS	12- 5-52	-	-	-	76.2	- 12	N N	-	Ds	Tc	2.8	dry	-
	CW-20A	2-19-30	A. E. Morse		2561.0								131.10	
	CW-20A	9-27-29											131.29	
23J1	GS	12- 5-52	-	-	-	-	- -	- -	-	Ds	-	-	-	L
	CW-23A	12-15-29	S. P. Land Co.	1929	2763.0					T	Ls	0	310.60	
		10-15-29											314.50	
30C1	GS	12- 2-52			2585	21.2	- 7	N N	-	Ds	-	--	dry	

e. Well cleaned to bottom.
f. Depth of obstruction in casing.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 11 N., R. 11 W.--Continued											
11/11-30K1	GS	9-27-55	-	-	-	146.2	- 8	L W	-	Un	Tbc	0.5	124.20	-
	GS	9-15-52											124.34	
	CW-30A	2-19-30	F. H. Forbes		2560.0			N N			Tc	0.3	124.9	
	CW-30A	9-25-29											125.2	
32N1	GS	9-27-55	-	-	--	112.0	D 60	N N	-	Ds	-	-	dry	-
	GS	12- 2-52											dry	
	CW-32A	2-19-30	B. N. Peterson		2550.5					Un	Tcr	0.2	113.52	
	CW-32A	11-26-29											113.58	
33P1	GS	11- 4-55	-	-	2501.4	-	- -	- -	-	Ds	-	-	dry	-
	GS	9-28-51								Un	Tc	0.0	69.60	
	CW-33A	2-19-30	Mission Sisters of Sacred Heart		2501.7	190					Tc	2.5	70.8	
	CW-33A	11-26-29											70.8	
	578-8	-	Rathbun			200				Dm			70	
34M1	GS	11-11-52	-	-	2531.7	282.3	- 10	L G	-	Un	TcW	0.5	78.25	-
	GS	9-15-52											78.15	
	GS	3- 4-52											78.32	
	GS	11-16-51											78.44	
	GS	9-26-51											78.30	
	578-7	-	Rathbun			300		L H		Dm			70	

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 11 N., R. 12 W.											
11/12-12D1	GS	9-10-52	-	1912	-	261.0	D 48	N N	-	Ds	-	-	dry	-
	CW-12A	11-12-29	G. Arper		2718.0			L -		Dm,P	Tdp	2.2	291.30	
	578-53	1918	G. Arper										400?	
12M1	GS	11- 1-55	-	-	2694.4		- 8	N N	-	Un	TcN	1.5	267.57	C
	GS	10-20-55				e318.5							267.39	
	GS	12- 2-52				f39.5							dry	
	CW-12B	2-27-30	J. W. Johnson		2695.0			N N		Un	Tc	1.5	270.00	
	CW-12B	1929											270.30	
14D1	GS	9-17-52	-	-	-	262.8	- 12	L N	-	Ds	-	-	dry	L
	CW-14A	2-28-30	H. S. Knowles		2705.4			N N		Un	Tc	2.0	268.20	
	CW-14A	12-12-29											267.50	
14N1	GS	9-17-52	J. Carr	-	2665	185.8	- 8	N N	-	Ds	-	-	dry	-
14N2	GS	9-17-52	-	-	2670	109.1	- 12	N N	-	Ds	-	-	dry	-
18B1	GS	9-17-52	A. Capello	-	2835	300	- 6	L 1	-	Dm	-	-	-	C
18B2	GS	9-28-55	E. A. Koch	-	2825	300±	- 12	N N	-	Un	TcN	1.0	241.82	

e. Well cleaned to bottom.
f. Depth of obstruction in casing.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point: (feet)		Depth to water below lsd (feet)	Other data
			T. 11 N., R. 12 W.--Continued											
11/12-22D1	GS	9-15-52	Mojave Public Utility District	1914	2689.0	g206.3	- 14	N N	-	Ds	-	-	dry	L
	CW-22A	2-19-30	M. Cuthbert		2687.7					Un	Tc	4.1	249.9	
	CW-22A	12-10-29											250.00	
24D1	GS	12-16-55	-	-	2650	199.8	- 14	N N	-	Ds	-	-	dry	-
26J1	GS	9-27-55	V. Phillips	-	2594.0	225.0	- 14	N N	-	Un	TcS	1.0	156.37	C,L,W
	GS	3- 2-55											156.46	
	GS	11-29-54											156.49	
	GS	3-15-54											156.60	
	GS	12- 4-52											156.40	
	GS	9-15-52											156.46	
	CW-26A	3- 1-30	I. M. Jameson		2594.6			L W	200±	S	Tt	0.6	158.2	
	CW-26A	9-26-29											161.2	
	578-50	1918	F. H. Forbes			250		- -	270	S			155	
26J2	GS	12- 4-52	Monolith Cement Co.	1948	2595	321	RG 14	T -	800±	Un	TcS	1.0	156.97	L
29D1	GS	11-25-52	-	1952	2765	283.0	G 12	- -	-	Un	TcSW	1.0	176.95	

g. Well drilled to 348 feet.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point (feet)		Depth to water below lsd (feet)	Other data
			T. 11 N., R. 12 W.--Continued											
1/12-32E1	GS	11-25-52	Dr. L. Schultz	-	2770	300	- 10	T 15	40	Ps	-	-	-	-
32E2	GS	12- 4-52	G. Knight	1922	2765	265	- 10	T 7½	40	Dm	Hpb	0.5	179.95	C
32E3	GS	10- 4-55	Miehl	1955	2765	-	C 5	J 1	-	Dm	Tcc	1.0	176.43	
32R1	GS	10- 4-55	Verdi Development Co.	1955	2690	245.0	C 5	N N	-	Un	TcS	1.0	187.76	B
			T. 11 N., R. 13 W.											
1/13-19C1	GS	5-24-56	California Portland Cement Co., well 1	1953	3610	430	C 16	N N	58	Un	Tcc	1.0	279.65	L
	-	3-19-56											275.77	
	GS	10- 6-55											268.19	
	-	12-10-53											a327	
	-	12-10-53											217	
19C2	-	3----54	California Portland Cement Co.,well 4	1954	3600	375	C 16	- -	65	Un	-	-	a277	L
	-	3----54											147	
19C3	-	3----54	California Portland Cement Co., well 3	1954	3600	388	C 16	- -	90	Un	-	-	a337	C,L
	-	3----54											145	

a. Pumping.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 11 N., R. 13 W.--Continued												
1/13-19-1	-	1956 11----53	California Portland Cement Co.	1953	-	430	C	-	N N	-	Ds	-	-	- 246	L
24A1	GS	9-17-52	Spicer and Silvestro	1948	2840	h357	-	8	T G	-	Dm	-	-	-	C,B
29M1	-	3-19-56 3- 5-56 2- 1-56	California Portland Cement Co.,well 2	1954	3350	749	C	16	N N	-	Un	Tcc	1.0	322.27 324 317	L
	GS	10- 6-55 2- 6-55 2- 4-54 2- 4-54								73				321.24 322 a517 300	
31A1	GS	10- 6-55	Tull	1954?	3300	600	RG	16	N N	J500	Ds	-	-	-	L
31A2	GS	10- 6-55	Tull	1954?	3300	600	RG	16	N N	J500	Ds	-	-	-	-

a. Pumping.
h. Well drilled to 491 feet. Bedrock encountered at 406 feet.
j. Reported yield during development test.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	Measuring point (feet)	Depth to water below lsd (feet)	Other data
			T. 11 N., R. 13 W.--Continued											
11/13-36B1	GS	9-28-55	Dr. J. Gillis	1953	2900	580	RG 16	N N	-	Un	Tcc	1.3	295.03	L
36C1	GS	9-28-55	Dr. J. Gillis	1953	2910	611	RG 14	N N	-	Un	Tcc	0.4	301.80	L
36K1	GS	9-28-55	Dr. J. Gillis	1954	2888	630	RG 16	N N	J900	Un	Tcc	0.5	281.79	L
36L1	GS	9-28-55	Dr. J. Gillis	1954	2913	585	RG 14	T N	J900	Un	Hpb	0.2	302.70	-
			T. 11 N., R. 14 W.											
11/14-14B1	-	3-19-56	California Portland Cement Co., well 5	1954	4000	84	C 16	- -	-	Id	Tc	0.8	24.97	L,B
	-	1954							350				a50	
	-	1954											25	
14B2	-	1954	California Portland Cement Co., well 6	1954	3990	64	C 16	- -	500	Id	-	-	a28	L
		1954											12	
			T. 12 N., R. 11 W.											
12/11-34L1	GS	9-10-52	-	-	2550	95.4	- 8	N N	-	Ds	-	-	dry	

a. Pumping.

1 Reported yield during development test.

Table 1A.- Description of wells--Continued

USGS well No.	Source of data	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	Diameter (in)	Pump data: Type and power	Pump data: Yield (gpm)	Use of well	Measuring point	(feet)	Depth to water below lsd (feet)	Other data
			T. 32 S., R. 36 E.												
32/36-20M1	GS	9-30-55	-	-	2930	-	-	12	N N	-	T	Tc	0.0	485.70	-
21Q1	GS	11- 3-55	J. J. Wonders	1949	2798.9	k805	RG	10	T G	263	Dm	TapW	1.0	372.88	C,L,W,B
	GS	3- 2-55												370.88	
	GS	12- 3-50												371.20	
22N1	GS	9-18-52	W. M. Kinlade	1947	2760	370	-	6	L G	16	Dm	-	-	-	C
28-1	CW-28A	1929	R. Gannt	-	2833	407	-	-	N N	-	T	Ls	0	dry	-
34E1	GS	12- 2-52	Maddock	-	2760	-	-	-	N N	-	Ds	-	-	-	-

k. Well drilled to 1,356 feet. Cemented off at 805 feet.

Table 2A.- Chloride, hardness, and specific conductance in 10 well waters

Well number	Date	Chloride (ppm)	Hardness as $CaCO_3$ (ppm)	Specific conductance (micromhos at 77°F)	Depth of well (feet)
10/12-4B1	11-7-51	25	215	668	-
10/12-4B2	12-4-52	24	200	643	200
10/12-16R1	12-4-52	13	160	529	300
10/12-15M2	12-5-52	28	89	389	275
10/12-22N1	12-4-52	18	131	423	125
10/13-11Q1	12-4-52	17	79	366	463
10/13-24C1	11-7-51	17	90	382	252
10/13-24F1	12-4-52	21	79	365	600
11/12-18B1	12-4-52	26	123	482	300
11/12-32E2	12-4-52	12	212	622	265

Table 3A.- Chemical analyses of well waters

Constituents: Constituents shown in parentheses are calculated. Where the value of sodium is preceded by the letter a, it indicates sodium and potassium expressed as sodium. The sum of determined constituents, in parts per million (ppm) is the arithmetic total of tabulated constituents minus approximately one half (50.8 percent) of the bicarbonate. All values have been rounded, where necessary, to conform to the standards of the Geological Survey Quality of Water Branch.

Analyzing laboratory: CT, Curtis and Tompkins, San Francisco, California; DWR, California Division of Water Resources; GS, Geological Survey, Quality of Water Branch.

Well number	9/12-16J1	9/13-7Q2	10/11-8E1
Constituents in parts per million			
Silica (SiO_2)	-	-	-
Iron (Fe)	-	-	-
Calcium (Ca)	49	32	13
Magnesium (Mg)	16	7.1	3
Sodium (Na)	80	52	94
Potassium (K)	3.1	2	2.5
Bicarbonate (HCO_3)	188	150	120
Carbonate (CO_3)	0	0	-
Sulfate (SO_4)	116	65	99
Chloride (Cl)	58	18	52
Fluoride (F)	1.2	.1	-
Nitrate (NO_3)	2.0	-	1.2
Boron (B)	.52	.1	.5
Constituents (Sum)	420	254	325
Hardness as $CaCO_3$	-	-	45
Percent Sodium (%Na)	47	50	81
Specific conductance (Sp C) (micromhos at 77°F)	730	412	548
pH	7.2	8.0	7.7
Water temperature (°F)	-	-	66
Date collected (Date)	8-15-53	6-4-53	12-2-52
Depth of well in feet (Depth)	200	50.6	200
Analyzing laboratory (Lab.)	DWR	DWR	GS
Laboratory number (No.)	3351	2934	5866

Table 3A.—Continued

	10/12-15M2	10/12-20C1	10/12-20C1	10/12-21R1	10/13-24F1
Constituents in parts per million					
SiO_2	30	25	-	-	17
Fe	-	-	-	-	-
Ca	34	32	36	33	22
Mg	6	5	3.3	6	4
Na	a54	a49	44	41	a53
K	-	-	3.1	1.7	-
HCO_3	142	130	131	115	103
CO_3	6	0	-	-	0
SO_4	70	69	72	75	66
Cl	20	21	19	16	21
F	-	-	-	-	-
NO_3	0	-	2.5	2.9	0
B	-	-	.03	.04	-
Sum	288	266	245	233	234
Hardness	97	100	103	107	-
%Na	55	55	47	45	64
Sp C	-	-	413	387	-
pH	-	-	7.2	8.1	-
°F	-	-	69	66	-
Date	3-6-30	3-6-30	2-4-52	12-5-52	3-6-30
Depth	275	161	-	150	600
Lab.	CT	CT	GS	GS	CT
No.	107780	107781	5871	5880	107782

Table 3A.—Continued

	10/14-36A1	11/11-1Q1	11/11-2N1	11/11-8D1
Constituents in parts per million				
SiO_2	-	-	-	-
Fe	-	-	-	-
Ca	66	1.6	37	30
Mg	8.1	.5	8.3	8.1
Na	82	140	47	56
K	3	5.8	3.5	3.7
HCO_3	99	185	192	235
CO_3	0	75	0	5
SO_4	240	(26)	(47)	(16)
Cl	29	38	15	11
F	11	5.6	.4	.4
NO_3	.2	.7	6.2	.7
B	0	1.2	.15	.29
Sum	489	(385)	(245)	(247)
Hardress	-	6	127	108
%Na	47	96	44	52
Sp C	735	691	459	444
pH	7.7	9.6	7.7	8.5
°F	-	-	-	-
Date	6-4-53	10-21-55	10-21-55	10-21-55
Depth	986	761.5	303.5	275.0
Lab.	DWR	GS	GS	GS
No.	2935	17237	17236	17235

Table 3A.—Continued

	11/12-12M1	11/12-18B1	11/12-26J1	11/13-19C3
Constituents in parts per million				
SiO_2	-	-	23	-
Fe	-	-	-	-
Ca	17	40	28	72
Mg	2.4	8.1	5	42
Na	86	61	a38	60
K	8.9	1.5	-	1.8
HCO_3	225	213	124	471
CO_3	0	0	0	0
SO_4	(6.7)	37	49	70
Cl	35	29	15	17
F	.8	.4	-	1.0
NO_3	97	13	0	8.4
B	.61	.2	-	.28
Sum	(365)	297	220	509
Hardness	53	-	90	-
%Na	75	-	52	27
Sp C	547	485	-	902
pH	8.2	-	-	7.3
°F	-	-	-	59
Date	10-20-55	6-4-53	6-3-30	3-2-55
Depth	318.5	300	225.0	388
Lab.	GS	DWR	CT	DWR
No.	17234	P-678	107783	1872

Table 3A.—Continued

	11/13-24A1	32/36-21Q1	32/36-22N1
Constituents in parts per million			
SiO_2	-	-	-
Fe	-	-	-
Ca	46	20	87
Mg	4.9	63	27
Na	74	196	158
K	2.6	7	9.8
HCO_3	177	342	276
CO_3	-	0	-
SO_4	42	371	392
Cl	45	49	46
F	-	.2	-
NO_3	52	12	2.2
B	.16	2.0	1.2
Sum	356	705	861
Hardness	135	-	328
%Na	54	-	50
Sp C	588	1,280	1,290
pH	7.4	8.0	7.2
°F	76	-	75
Date	12-5-52	6-4-53	12-2-52
Depth	357	805	370
Lab.	GS	D:R	GS
No.	5878	P-677	5867

Table 4A.- Drillers' logs of wells

9/12-16J1. A. C. Scruggs. Drilled by Frank Rottman. 12-inch casing. Altitude about 2,340 feet.

Material	Thickness (feet)	Depth (feet)
Sand	50	50
Gravel and sand	20	70
Clay and gravel	20	90
Clay	20	110
Rock and gravel	40	150
Boulders	20	170
Gravel	10	180
Rock	20	200

9/12-16K1. R. J. Rubees. Drilled by Frank Rottman. 12-inch casing, perforated from 72 to 204 feet. Altitude about 2,360 feet.

Clay	10	10
Clay and boulders	20	30
Sand	10	40
Clay and boulders	20	60
Sand and gravel	5	65
Hard sand, boulders and clay	25	90
Rock and clay	20	110
Boulders and clay	20	130
Sand and boulders	28	158
Clay and rock	12	170
Sand	5	175
Clay	29	204

9/12-16L1. Frank Miske. Drilled by R. H. Orr. 14-inch casing, perforated 71-251 feet. Altitude about 2,365 feet. Estimated yield when drilled: 450 gpm.

Soil	32	32
Sand	1	33
Clay	27	60
Sand	1	61
Clay	17	78
Sand	2	80
Clay	10	90
Sand	3	93
Clay	47	140
Sand	3	143
Clay	17	160

Table 4A.--Continued

9/12-16L1.--Continued

Material	Thickness (feet)	Depth (feet)
Sand	3	163
Clay	7	170
Sand	3	173
Clay	7	180
Sand	2	182
Clay	38	220
Sand	2	222
Clay	10	232
Sand	2	234
Clay	20	254

9/12-18E1. Dale Randleman. Drilled by Frank Rottman. 12-inch casing, perforated from 140 to 354 feet. Altitude about 2,423 feet.

Surface	10	10
Gravel	130	140
Sand and gravel	150	290
Hard sand and gravel with some clay	64	354
Rock	-	354+

9/13-1Q1. E. Starr. Drilled by Pengilley. 6-inch casing. Altitude about 2,463 feet.

Alluvium	69	69
"Rock"	135	204
"Ore" red sample	5	209
"Rock"	33	242

9/13-7R3. Willow Springs Co., old Willow Springs school. Altitude 2,568.2 feet.

Alternate sand and clay	76	76
Water sand	14	90
Clay	10	100
Hard limestone	-	100
(Heavy clay just above water sand. Water rose to 30 feet)		

Table 4A.--Continued

9/14-1H1. J. Butler. Drilled by Frank Rottman. 18-inch casing. Altitude about 2,700 feet.

Material	Thickness (feet)	Depth (feet)
Surface soil	20	20
Fine sand and gravel	30	50
Gravel	32	82
Clay with sand	38	120
Clay	47	167
Fine sand and gravel	28	195
Clay and gravel	20	215
Gravel	20	235
Clay	43	278
Clay and gravel	22	300
Clay, sand and gravel	40	340
Gravel, few boulders	20	360
Sand, clay streaks	10	370
Clay, sand, boulders	10	380
Clay streaks and boulders	20	400
Sand and gravel	25	425
Sand, clay and gravel	25	450
Sand, boulders, gravel	20	470
Clay	25	495
Gravel	12	507
Gravel, streaks of clay	16	523
Hard sand and boulders	42	565
Hard sand	15	580
Hard sand and bentonite	20	600
Sand and rock	32	632
Hard sand	23	655
Hard sand and gravel	22	677
Hard sand and clay	23	700
Sand and clay streaks	22	722
Rock and boulders	18	740
Sand and boulders	25	765
Sand and rock	45	810
Fine gravel	92	902
No entry	43	945

Table 4A.--Continued

10/11-8E1. Robert Fetters. Drilled by AV Pump and Drilling Co. 10-inch casing. Altitude 2,497.5 feet. Reported yield when drilled: 90 gpm.

Material	Thickness (feet)	Depth (feet)
Sand	112	112
Rock	5	117
Gravel	70	187
Bottomed in rock (red)	-	200

10/12-9A1. Mrs. Dorothy McAllister. Drilled by Pengilley Bros. 8-inch casing, perforated from 158 to 208 feet. Altitude 2,594 feet.

Clay, sand, etc.	198	198
Sand and gravel, coarse	10	208
Solid rock	-	208+

10/12-20B1. O. J. Backus. 16-inch casing. Altitude 2,638.6 feet.

Alternate clay and sand	125	125
Gravel	5	130
Clay	2	132
Quicksand	3	135

10/12-20C1. O. J. Backus Ranch. Drilled by O. J. Backus. 12-inch casing. Altitude 2,650.5 feet.

Shaft (no data)	--	93
Stiff blue clay	62	155
Water gravel	6	161

10/12-20P1. G. H. Buckley. 10-inch casing. Altitude 2,632.2 feet.

Alternate clay and sand	50	50
Red sandstone	7	57
Alternate clay and sand	40	97

Table 4A.--Continued

10/12-21R1. Wiggenton. Drilled by Pengilley Bros. 6-inch casing. Altitude about 2,570 feet.

Material	Thickness (feet)	Depth (feet)
Coarse sand, rather tight, one slightly harder streak	150	150

10/12-22E1. A. L. Kemper. 10-inch casing. Altitude 2,552.3 feet. Uncased hole below 241 feet.

Alternate streaks of sand and clay	169	169
Fine gravel	19	188
Clay and some sand streaks	53	241
Igneous boulders, rounded, and sand	59	300

10/12-27L1. W. Fusek. 48-inch dug well. Altitude 2,540.5 feet.

Sand	61	61
Rotten granite	5	66
(Water at 61 feet)		

10/12-30A1. Freeman. 10-inch casing. Altitude 2,664.1 feet.

Gravelly soil	60	60
Rotten granite	34	94
(Water at 88 feet)		
Granite	?	?

Table 4A.--Continued

10/13-14Q1. Seaton. Drilled by Frank Rottman. 12-inch casing. Altitude about 2,840 feet.

Material	Thickness (feet)	Depth (feet)
Sand, hard	50	50
Sand and boulders	50	100
Sand, hard	50	150
Boulders and clay	50	200
Sand, coarse little	20	220
Boulders and sand	30	250
Boulders	30	280
Sand and clay	20	300
Boulders and clay	50	350
Sand	20	370
Boulders and sand	30	400
Sand and clay	30	430
Boulders and clay	20	450
Clay "squeeze"	13	463

10/13-19M1. Dewey Butler. Drilled by Frank Rottman. 16-inch casing. Altitude about 2,905 feet.

Sand and boulders	90	90
Boulders and hard sand	22	112
Boulders and sand	22	134
Fine gravel and sand	23	157
Hard sand and boulders	22	179
Sandy rock	23	202
Sandy clay	22	224
Clay streaks, sand, some boulders	23	247
Clay and fine gravel	22	269
Hard sandy clay	23	292
Clay and gravel	23	315
Clay, fine sand	21	336
Clay and boulders	24	360
Clay and gravel	44	404
Clay, coarse rock	23	427
Clay, fine sand	22	449
Gravel with clay	45	494
Clay, fine sand	23	517
Gravel and clay	67	584
Red clay and rock	23	607
Clay and gravel	22	629
Clay and boulders	45	674
Clay and shale	23	697
Red clay and rocks	23	720
Clay and gravel	22	742
No entry	28	770

Table 4A.--Continued

10/13-22D1. Marsh. Drilled by G. Montmorency. 6-inch casing. Altitude about 2,875 feet.

Material	Thickness (feet)	Depth (feet)
Sand	70	70
Clay	50	120
Sand	10	130
Clay	157	287
Sand, water	13	300
Clay	-	?

10/13-3CD1. M and P Ranch. Drilled by Frank Rottman. 16-inch casing. Altitude about 2,880 feet.

Surface sand and gravel	73	73
No entry	23	96
Hard sand and gravel	43	139
Sand and small gravel	22	161
Clay and fine sand	22	183
Hard sand and clay	22	205
Gravel and clay	68	273
Sand and gravel	23	296
Hard sand, clay	44	340
Hard sand	23	363
Sand clay, small gravel	22	385
Sand and gravel with clay streaks	23	408
Hard sand streaks and clay streaks	22	430
Clay and sand	22	452
Clay, fine sand	23	475
Clay	22	497
Clay sand	22	519
Clay and sand streaks	68	587
Clay and gravel	22	609
Sand, gravel, few boulders	22	631
Sand and gravel	22	653
Red clay, streaks of sand	23	676
Clay, sand	22	698
Hard sand and red clay streaks	23	721
Hard blue shale	23	744
Blue shale clay	22	766
Shale, red clay	22	788
No entry	46	834

Table 4A.--Continued

10/13-30K1. M and P Ranch. Drilled by Frank Rottman. 16-inch casing, perforated from 200 to 400 feet. Altitude about 2,825 feet.

Material	Thickness (feet)	Depth (feet)
Surface	50	50
Clay	28	78
Gravel	24	102
Clay and gravel	16	118
Clay and sand	22	140
Clay and gravel	23	163
Sand and gravel	22	185
Clay and boulders	22	207
Clay and gravel	23	230
No entry	22	252
Gravel	15	267
Clay	14	281
Gravel and boulders	24	305
Clay and boulders	27	332
Gravel	25	357
Clay	15	372
Gravel and boulders	23	395
Gravel and clay	12	407

10/13-32D1. Lombardi and Frew. Drilled by Frank Rottman. 16-inch casing. Altitude about 2,775 feet.

Surface soil	30	30
Clay	65	95
Clay with sand	61	156
Fine sand	22	178
Fine sand and gravel	23	201
Clay and boulders	21	222
Clay and gravel	23	245
Clay and sand and gravel	23	268
Clay, sand, gravel and boulders	22	290
Clay, sand and boulders	38	328
Fine sand	23	351
Fine gravel	135	486
Gravel and clay	20	506
Tufa with some gravel	23	529
Clay and gravel	112	641
Fine gravel	23	664
Clay and gravel	67	731

Table 4A.--Continued

10/13-32D1.--Continued

Material	Thickness (feet)	Depth (feet)
Gravel	66	797
Gravel, red	23	820
Boulders and clay	45	865
Clay and gravel	23	888
Clay and gravel, some boulders	22	910
Sand and clay	46	956
Very hard	44	1,000
Fine gravel and boulders	22	1,022
Clay and fine sand and boulders	24	1,046
Clay, gravel and boulders	22	1,068
Rock cuttings	112	1,180
Clay and gravel	142	1,322
Fine gravel	23	1,345

10/13-32M1. Lombardi and Frew. Drilled by Frank Rottman. 16-inch casing. Altitude about 2,740 feet.

Surface	89	89
Clay	23	112
Boulders and clay	22	134
Clay and fine sand	23	157
Hard shale	43	200
Boulders and clay	44	244
Gravel and boulders	23	267
Clay and boulders	44	311
Clay and gravel	23	334
Fine gravel	23	357
Gravel	44	401
Boulders and clay	23	424
Rock	44	468
Hard packed sand	112	580
Clay, boulders and fine sand	23	603
Gravel	22	625
Gravel and fine sand	23	648
Gravel	22	670
Hard packed sand	135	805
Rock bottom	-	805+

Table 4A.--Continued

10/14-36A1. CCC Ranch. Drilled by Frank Rottman. Altitude about 2,855 feet. 16-inch casing.

Material	Thickness (feet)	Depth (feet)
Sand and gravel	64	64
Clay and streaks of fine sand	88	152
Clay with streaks of sand and boulders	148	300
Clay with streaks of sand and shale	50	350
Fine sand with streaks of clay and gravel	117	467
Sand, gravel with shale streaks	44	511
Clay, gravel, sand and few boulders	45	556
Sand, gravel, few boulders	44	600
Coarse gravel and sand	45	645
Gumbo clay, fine sand	67	712
Clay with heavy streaks of gravel and sand	202	914
Fine sand, small gravel	72	986

11/11-23J1. Oil-well test. Altitude 2,763.0 feet.

Surface sands, gravel, lime shells	570	570
Buff sand	20	590
Brown sandy shale	20	610
No entry	710	1,320
Brown sand	10	1,330
No entry	129	1,459
Hard gray-blue lime	8	1,467
Gray-blue sand and shale	45	1,512

Table 4A.--Continued

11/12-14D1(?). Oil-well test. 12-inch casing. Altitude 2,705.4 feet.

Material	Thickness (feet)	Depth (feet)
Gravel and clay	270	270
Water gravel	80	350
Sand and gravel	5	355
Yellow clay	45	400
Conglomerate	150	550
Blue lime	220	770
No entry	100	870
Brown shale	10	880
Conglomerate, medium hard	10	890
Dark shale	5	895
Hard capping	5	900
Dark shale	5	905
Brown shale	40	945
Dark shale	5	950
Blue shale and hard shells	25	975
Brown shale and hard shells	20	995
Hard shells and water	15	1,010
Hard shell	30	1,040

11/12-22D1. Mojave Public Utility District, well 1. 14-inch casing. Altitude 2,689.0 feet.

Gravel and adobe	3	3
Gravel, decomposed	42	45
Adobe, sandy	20	65
Sand and gravel	25	90
Adobe, sandy	15	105
Gravel, fine	55	160
Adobe, fine sandy, and hardpan	57	217
Sand, loose, coarse	13	230
Hardpan	30	260
Sand, soft, fine	10	270
Sand, fine, water	7	277
Sand, coarse, or gravel, fine	3	280
Hardpan	31	311
Sand, fine	14	325
Gravel, coarse	10	335
Hardpan, sandy	13	348

Table 4A.--Continued

11/12-26J1. V. Phillips. 14-inch casing. Altitude 2,594.0 feet.

Material	Thickness (feet)	Depth (feet)
Clay and sand streaks	125	125
Water sand	10	135
Heavy clay and packed sand	15	150
Water sand and fine gravel	10	160
Clay and packed sand	70	230
Water gravel, up to 2 inches in diameter	20	250

11/12-26J2. Monolith Cement Co. Drilled by Frank Rottman. 14-inch casing. Altitude about 2,595 feet. Reported yield when drilled: 800 gpm.

Surface soil and clay	20	20
Hard shale and boulders	15	35
Hard sand and clay and boulders	55	90
Hard clay	20	110
Clay and boulders	55	165
Clay, gravel and boulders	35	200
Clay and gravel	40	240
Gravel	5	245
Clay and sand	25	270
Clay	30	300
Clay, sand and boulders	21	321

11/13-19C1. California Portland Cement Co., well 1. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 230 to 358 and from 376 to 430 feet. Altitude about 3,610 feet. Reported yield when drilled: 58 gpm.

Sand and gravel, 3-inch	6	6
Clay and boulders	42	48
Sand and gravel, 4-inch	2	50
Granite boulders	70	120
Clay with gravel, 1-inch	44	164
Clay with boulders	36	200
Clay and gravel, 1-inch	10	210
Clay and coarse sand, 1/4-inch	145	355
Decomposed granite	13	368
Red clay	12	380
Granite	50	430

Table 4A.--Continued

11/13-19C2. California Portland Cement Co., well 4. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 160 to 354 feet. Altitude about 3,600 feet. Reported yield when drilled: 65 gpm.

Material	Thickness (feet)	Depth (feet)
Sand and boulders	105	105
Clay and gravel, 2-inch	70	175
Clay and gravel, 1/4-inch	23	198
Clay and boulders	82	280
Red clay and gravel	70	350
Quartz	25	375

11/13-19C3. California Portland Cement Co., well 3. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 150 to 366 feet. Altitude about 3,600 feet. Reported yield when drilled: 90 gpm.

Sand	48	48
Clay and boulders	102	150
Gravel, 2-inch	18	168
Clay and boulders	24	192
Clay and gravel, 1-inch	91	283
Clay and boulders	57	340
Clay and gravel, 1/4-inch	40	380
Sharp quartz	8	388

11/13-19-1. California Portland Cement Co. Drilled by Roscoe Moss Co. Bailed dry, casing pulled.

Sand	40	40
Sand and clay	45	85
Sand and granite boulders	40	125
Clay and boulders	55	180
Clay	55	235
Sandy clay with small gravel	13	248
Gravel, 1-inch	2	250
Sandy clay and gravel, 1/4-inch	130	380
Sand and gravel, 1/4-inch	4	384
Hard sandy clay	6	390
Quartzite	40	430

Table 4A.--Continued

11/13-29M1. California Portland Cement Co., well 2. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 520 to 724 feet. Altitude about 3,350 feet. Reported yield when drilled: 73 gpm.

Material	Thickness (feet)	Depth (feet)
Top soil	5	5
Cemented sand	20	25
Clay and boulders	73	98
Clay and gravel, 2-inch	60	158
Granite boulders	120	278
Clay and gravel, 1-inch	242	520
Water-bearing gravel, 2-inch	5	525
Clay and gravel, 1-inch	45	570
Sticky clay	20	590
Clean gravel, 5-inch	14	604
Clay and gravel, 1/4-inch	24	628
Cemented sand and gravel, 3-inch	4	632
Decomposed granite	76	708
"Hill top"	27	735
Quartzite	14	749

11/13-31A1. Tull. Drilled by J. M. Scoggin.. Log reported by George Marsh. 16-inch casing. Altitude about 3,300 feet. Reported yield during development test: 500 gpm.

Shale	40	40
Dirty sand and gravel	350	390
Shale	10	400
Water sand	100	500
White "beach" sand	40	540
Red and white sand	60	600
Bottomed in sandstone	-	600+

Table 4A.—Continued

11/13-36B1. Dr. J. Gillis. Drilled by J. M. Scoggin. Log reported by George Marsh. 16-inch casing, perforated from 400 to 580 feet. Altitude about 2,900 feet.

Material	Thickness (feet)	Depth (feet)
No data	395	395
Water sand	85	480
Shale	10	490
Water sand	40	530
Lime	10	540
Water sand	40	580
Bottomed in green shale	-	580+

11/13-36C1. Dr. J. Gillis. Drilled by J. M. Scoggin. Log reported by George Marsh. 14-inch casing. Altitude about 2,910 feet.

No data	400	400
Water sand	100	500
Conglomerate	10	510
Water sand	50	560
Shale	10	570
Water sand	40	610
Lime	1	611
Bottomed in green shale	-	611+

11/13-36K1. Dr. J. Gillis. Drilled by J. M. Scoggin. Log reported by George Marsh. 16-inch casing, perforated from 380 to 630 feet. Altitude about 2,888 feet. Reported yield during development test: 900 gpm.

Gravel	20	20
Shale	180	200
Sand and pea-gravel	125	325
Black "loam"	55	380
Good water sand	120	500
Gray shale	10	510
Water sand	50	560
Lime	10	570
Water sand	60	630
Bottomed in green shale	-	630+

Table 4A.--Continued

11/14-14B1. California Portland Cement Co., well 5. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 30-60 feet. Altitude about 4,000 feet. Reported yield when drilled: 350 gpm.

Material	Thickness (feet)	Depth (feet)
Top soil	8	8
Sand and gravel	54	62
Blue clay	18	80
Granite	4	84

11/14-14B2. California Portland Cement Co., well 6. Drilled by Roscoe Moss Co. 16-inch casing, perforated from 20 to 46 feet. Altitude about 3,990 feet. Reported yield when drilled: 500 gpm.

Sand	5	5
Sand and boulders	20	25
Sand and gravel, 6-inch	25	50
Limestone	14	64

Table 4A.--Continued

32/36-21Q1. J. J. Wonders. Drilled by Frank Rottman. 10-inch casing to 805 feet, uncased and cemented off below 805 feet. Altitude 2,798.9 feet. Reported yield: 263 gpm.

Material	Thickness (feet)	Depth (feet)
No data	340	-
Gravel and coarse sand	-	340
No data	200	540
Gravel, very fine, well sorted	21	561
Sand, medium to coarse, unweathered	22	583
Sand, fine to coarse, very silty	23	606
Sand, fine to coarse, some fine gravel	20	626
Sand, fine to coarse, considerable fine gravel	23	649
No data	44	693
Sand, coarse, and fine gravel; silty	22	715
Sand, fine to medium, and silt; tight	22	737
No data	73	-
Silt and clay, tight	-	810
No data	35	845
Gravel, fine, silty	71	916
Sand, coarse, and fine gravel	55	971
No data	271	-
Sand, fine to medium	-	1,242
No data	22	-
Sand, fine to medium	-	1,264
No data	21	-
Silt, sandy	-	1,285
No data	5	-
Silt, sandy	-	1,290
No data	33	1,323
Granitic rock, somewhat decomposed	33	1,356

Material below 800 feet reported to be poorly water bearing, and may be Tertiary continental deposits.

Table 5A.- Records of water levels in wells

Water levels in feet below land-surface datum

9/13-4A1. O. S. Hatcher. Depth 282 feet. Altitude 2,636.8 feet.

Date	Water level	Date	Water level	Date	Water level
Nov. 15, 1929	71.39	Mar. 1, 1955	72.90	Oct. 15, 1956	75.90
Feb. 10, 1954	69.70	Nov. 14	74.49		
Nov. 29	75.50	Mar. 21, 1956	74.75		

9/13-7Q1. Willow Springs Company. Depth 38.1 feet. Altitude 2,566.0 feet.

Nov. 14, 1929	3.10	Nov. 29, 1954	13.76	Mar. 21, 1956	12.39
Feb. 10, 1953	2.86	Mar. 1, 1955	8.72	May 23	17.95
Feb. 8, 1954	4.86	Nov. 14	12.24	Sept. 26	21.52

9/14-2J1. S. L. Henson. Depth 250 feet. Altitude about 2,735 feet.

Jan. 30, 1953	124.63	Mar. 1, 1955	127.09	May 21, 1956	130.76
Feb. 10, 1954	119.12	Nov. 14	128.78	Sept. 26	130.62
Nov. 29	127.11	Mar. 21, 1956	132.31		

10/12-20B1. O. J. Backus. Depth 117.6 feet. Altitude 2,638.6 feet.

Sept. 27, 1929	90.60	Mar. 4, 1952	89.69	May 22, 1956	89.98
Feb. 19, 1930	90.19	Nov. 13	89.63	Sept. 26	91.17
Sept. 21, 1951	89.92	Jan. 20, 1953	89.82		
Nov. 16	89.95	May 5, 1954	89.63		

10/13-19M1. Dewey Butler. Depth 770 feet. Altitude about 2,905 feet.

Jan. 20, 1953	291.61	Mar. 1, 1955	299.12	Sept. 26, 1956	304.12
Feb. 8, 1954	295.76	Mar. 21, 1956	302.34		
Nov. 29	299.20	May 21	304.10		

Table 5A.- Continued.

11/11-8D1. Z. Thorning. Depth 204.0 feet, well cleaned to 275.0 feet on October 21, 1955. Altitude 2,624.5 feet.

Date	Water level	Date	Water level	Date	Water level
1918	205	Mar. 15, 1954	198.50	Mar. 21, 1956	198.11
Sept. 28, 1929	218.60	Mar. 2, 1955	198.47	Oct. 19	199.95
Feb. 27, 1930	218.30	Sept. 29	198.32		
Sept. 10, 1952	198.79	Oct. 21	198.43		

11/12-26J1. V. Phillips. Depth 225.0 feet. Altitude 2,594.0 feet.

1918	155	Dec. 4, 1952	156.40	Sept. 27, 1955	156.37
Sept. 26, 1929	161.2	Mar. 15, 1954	156.60	Mar. 21, 1956	156.24
Mar. 1, 1930	158.2	Nov. 29	156.49	Oct. 19	156.22
Sept. 15, 1952	156.46	Mar. 2, 1955	156.46		

32/36-21Q1. J. J. Wonders. Depth 805 feet. Altitude 2,798.9 feet. Dec. 3, 1950, 371.20; Mar. 2, 1955, 370.88; Nov. 3, 372.88; Mar. 21, 1956, 370.89.