UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Ground Water Branch

DATA ON WATER WELLS AND SPRINGS IN MORONGO VALLEY AND VICINITY, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA

By

J. S. Bader and W. R. Moyle, Jr.

Prepared in cooperation with the
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DATA ON WATER WELLS AND SPRINGS IN MORONGO VALLEY AND VICINITY SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA

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PURPOSE AND SCOPE OF THE WORK AND REPORT

The data presented in this tabulation were collected by the U. S. Geological Survey in connection with an investigation of water wells and general hydrologic conditions 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 characteristically regions of barren mountain ranges and isolated hills surrounding broad valleys or basins which are underlain by alluvial debris derived from the surrounding mountains and hills. These basins generally contain ground water, having a wide range of chemical quality, which can be and in some areas has been developed for beneficial use.

The general objective of the cooperative investigation is to collect and to tabulate all available hydrologic data for the desert basins in order to provide public agencies and the general public with data for use in planning water utilization and development works, and for use in subsequent ground-water investigations.

Accordingly, the scope of the work carried out by the Geological Survey in each area has included: (1) Very brief reconnaissance mapping of major geologic features to define the extent and general character of the deposits that contain the ground-water bodies; (2) visiting and examining virtually all the water wells in the area, determining and recording their locations in relation to geographic and cultural features and the public land net, wherever possible, and recording well depths and sizes, types and capacities of installed equipment, uses of the water, and other pertinent information available at the well; (3) measurement of the depth to the water surface below an established and described measuring point at or near the land surface; (4) selection of representative wells to be measured periodically in order to detect and record changes of water levels and ground water in storage; and (5) collection and assembly of well records, including well logs, water-level measurements, chemical analyses, and other data.

The work has been carried on by the U. S. Geological Survey under the general supervision of G. F. Worts, Jr., district geologist in charge of ground-water investigations in California, and under the immediate supervision of Fred Kunkel, geologist in charge of the Long Beach subdistrict office. The field work was carried on, by the authors, in the spring of 1958 from the southern California sub-district office of the Ground Water Branch at Long Beach.

LOCATION AND GENERAL FEATURES OF THE AREA

Morongo Valley and vicinity covers about 180 square miles. It lies between the southeast end of the San Bernardino Mountains and the east end of the Little San Bernardino Mountains between 116°30' and 116°45' west longitude and 34°00' and 34°15' north latitude. The north boundary adjoins the south edge of Lucerne, Johnson, Fry, and Means Valleys (Riley, 1956).

Access to the area is provided by the Twentynine Palms Highway and several unpaved roads.

Geographically the area is chiefly mountainous, but it contains two relatively flat areas in the eastern part. Bowden flat is in the northeast corner of the area between the mountains and a series of black lava-capped buttes, and Morongo Valley is a northeast-trending valley in the southeastern part of the area. Most of the wells are in this valley.

GEOLOGIC AND HYDROLOGIC FEATURES OF THE AREA

The geologic units in the Morongo Valley area can be grouped in two broad categories: Consolidated rocks and unconsolidated deposits. The consolidated rocks (pl. 1) include old metamorphic and crystalline rocks of pre-Tertiary age that form the basement complex (map symbol bc). For the most part these rocks are impermeable and, except for minor amounts of water contained in cracks and weathered zones, virtually non-water-bearing.

Moderately indurated alluvial deposits of Quaternary age occur in the southwestern part of the Morongo Valley area. These deposits (map symbol Qco) were called the Coachella fanglomerate by Vaughan (1922) and are mostly coarse dark-red conglomerate. The hydrologic character of these deposits is not known because they are not tapped by wells. Their appearance suggests that where saturated they probably would yield small quantities of water to wells.

Another alluvial deposit is exposed along the south edge of the area. This deposit (map symbol Qc) was called the Cabezon fanglomerate by Vaughan (1922) and consists of poorly sorted and poorly indurated boulders, gravel, sand, silt, and clay. It is generally brown but locally where weathered near the surface it is red. These deposits where saturated probably would yield water freely to wells.

The volcanic rocks of Quaternary age (Qv) exposed in the area consist mainly of basalt flows which cap some of the hills in the northeastern part of the area. The basalt is unsaturated, is probably poorly permeable, and is not penetrated by wells. In the south-central part of the area some volcanic mudflows and agglomerate crop out. The thickness and subsurface extent of these rocks are unknown, but their appearance suggests that they probably are virtually non-water-bearing.

The older fan alluvium of late Pleistocene age (Qofa) consists of compact arkosic gravel, sand, and silt. The deposits are weathered and locally the feldspars have been altered to clay. Near the mountains the unit contains large, angular boulders, but beneath the valleys it is finer grained and better sorted. The deposit, where saturated, contains the main aquifers in the area and is tapped by many wells.

The younger fan alluvium of Recent age (Qyfa) is mostly boulders, gravel, sand, silt, and clay beneath fans and stream channels. Locally it overlies the older units. It is poorly sorted and moderately permeable but is largely unsaturated. However, the younger fan alluvium supplies a small amount of water to a few wells in the southern part of Morongo Valley.

PREVIOUS WORK AND ACKNOWLEDGMENTS

Data on ground water in Morongo Valley and vicinity are contained in reports by Thompson (1929, p. 638-642) and the San Bernardino County Flood Control District (1951, p. 177; 1954, p. 146).

The writers wish to express their appreciation for the cooperation given by the many ranchers, well owners, well drillers, and other persons visited during the investigation.

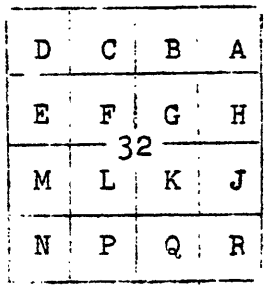
The California Department of Water Resources and the San Bernardino County Flood Control District provided access to all the pertinent information in their files, including numerous well logs, water-level records, and chemical analyses.

The cooperation and assistance given by these people and agencies contributed materially to the completeness of this report and are most gratefully acknowledged.

WELL-NUMBERING SYSTEM

The well-numbering system used in the area covered by this report conforms to that used 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 1S/4-32A1, which was assigned to the domestic well of S. R. Lee, the part of the number preceding the bar indicates the township (T. 1 south), the part between the bar and the hyphen is the range (R. 4 east), the number between the hyphen and the letter indicates the section (sec. 32), and the letter indicates the 40-acre subdivision of the section as shown in the accompanying diagram.



Within the 40-acre tract the wells are numbered serially as indicated by the final digit. Thus, well 1S/4-32A2 is the second well to be listed in the NE¼NE¼ sec. 32. Because the area is traversed by the San Bernardino base line, the letters N and S indicate whether the well lies north or south of the line. However, the letters E and W are omitted, because the area lies entirely east of the San Bernardino meridian line.

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.

Springs are numbered in the same way as the wells, except that the number following the letter designating the 40-acre subdivision has been replaced by the letter s.

REFERENCES

Riley, F. S., 1956, Data on water wells in Lucerne, Johnson, Fry, and Means Valleys, San Bernardino County, California: U. S. Geol. Survey open-file rept., 150 p. (mimeographed).

San Bernardino County Flood Control District, 1951, Hydrologic and climatic data 1947-1950: V. 2 (mimeographed).

_____ 1954, Hydrologic and climatic data 1950-51 and 1951-52: V. 3 (mimeographed).

Thompson, D. G., 1929, The Mohave Desert region, California: U. S. Geol. Survey Water-Supply Paper 578.

Vaughan, F. E., 1922, Geology of the San Bernardino Mountains north of San Gorgonio pass: California Univ., Dept. Geol. Sci. Bull., v. 13, p. 319-411.

Table 1.- Data on water wells and springs in Morongo Valley and vicinity, California

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

Year completed: For wells the year drilled was obtained from the driller's log or reported by the owner or others.

Altitude: The altitude given is the altitude of land-surface datum, the plane of reference at the well or spring. The altitudes were interpolated from the Geological Survey topographic map of the area having a contour interval of 80 feet.

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

Type well and diameter: Type of well construction is indicated by the following symbols: C cable tool, D dug, Da auger hole drilled in bottom of a dug pit, R rotary. The number following the letter is the diameter of the casing or pit in inches. The letter g indicates that the well is gravel packed.

Pump data: The type of pump or method of lift is indicated as follows: B bucket, C centrifugal, J jet, L lift, N none, S suction, Si siphon, T turbine, Ts turbine submersible. The type of power is indicated 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.

Well yield: The yield or output of the well or spring was reported by the owner or driller, or estimated by the Geological Survey and is not necessarily the maximum capacity.

Use of well or spring: Dm domestic, Ds destroyed or dry, Ps public supply, S stock, Un unused.

Measuring point: The point from which water-level measurements are made is described as follows: Hcc hole in casing cover, Hpb hole in pump base, Hsc hole in side of casing, Ls land surface, Na no access into well, Tap top of access pipe, Tbc top of board cover, Tc top of casing, Tcl top of clamp. The distance of the measuring point above land-surface datum is given in feet and tenths and sometimes hundredths.

Depth to water: Measured depths to water level are given in feet, tenths, and hundredths, or feet and tenths; reported or approximate depths to water level are given in whole feet. The water-level measurements are below land-surface datum. For these measurements the difference in altitudes between land-surface datum and the measuring point has been subtracted from the measured water level below the measuring point.

Other data: C chemical analysis of water is given in table 5, L driller's log of well is given in table 4, W records of water levels are given in table 3.

Table 1.- Data on water wells and springs in Morongo Valley and vicinity, California

USGS well number	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in.)	Pump data: Type	Pump data: Power	Well yield (gpm)	Use of well	Water level: Measuring point (feet)	Water level: Depth below land-surface datum (feet)	Other data
		T. 1 N., R. 4 E.											
1N/4- 1J1	1-16-58 2- 6-53	Oelke do.		4,120		C 9				Dm	Hcc 0		(a) 70.12
2M1	1-22-58			4,400	102.0	C 10	N	N		Ds			dry
3M1	1-16-58 2- 6-53	William Murphy do.		4,600	71.6	C 8	N	N		Un	Tc .5 Tc .5		68.83 68.43
11J1	1-22-58	Robert Wires	1948	4,290		R 8	L	N		Un	Tc 1.0		41.80
12E1	1-17-58	John Hamilton		4,160	18	D 48	N	N		Un	Tbc 0		4.24
12E2	1-17-58 4-29-53 2- 6-53	do. do. do.	1951	4,180	17.0	D 72	L	G	12.5	Un	Tbc 2.0 Tbc 2.0 Tbc 2.0		dry 10.99 11.35
12M1	1-17-58			4,200	15.0	C 8	N	W		Ds			dry
14P1	1-22-58	J. L. Kee	1952	4,320		Cg 12	L	W		Dm	Tc 1.0		b113.40
14P2	1-22-58	J. L. Kee	1949	4,330	108	C 12	N	N		Un	Tc 0		97.48

14Q1	1-22-58	R. T. Best	1950	4,280	90	C	12	L	W	15	Dm	Tap	1.0	b48.67
14Q2	1-22-58	F. E. Smith	1955	4,300	137	C	6	L	W	3	Dm	Na		
25Bs	3- 4-58			4,200		spring		N	N		Un			(c)
		T. 1 N., R. 5 E.												
1N/5- 6K1	1-22-58			4,080	26.0	D		L	H		Ds			dry
		T. 2 N., R. 4 E.												
2N/4-32R1	1-16-58			5,000	15.0	D	24	N	N		Ds			dry
32Rs	3-24-58	Burns Spring		5,040		spring		N	N	1½	Dm			C
		T. 1 S., R. 3 E.												
1S/3-12Cs	3- 4-58			4,520		spring		N	N	25+	Un			flowing
12Hs	3- 4-58			4,240		spring		N	N	25+	Un			flowing
		T. 1 S., R. 4 E.												
1S/4- 2Gs	3- 4-58	Tom Pierce		3,300		spring		N	N	10+	Dm			flowing
10Rs	3- 5-58	Leopard Spring		3,150		spring		N	N		Un			(c)

a. Pumphouse locked or well inaccessible.
b. Pumping.
c. No flow, dense growth of cottonwood trees.

USGS well number	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in.)	Pump data: Type	Pump data: Power	Well yield (gpm)	Use of well	Water level: Measuring point	Water level: Depth below land-surface datum (feet)	Other data
		T. 1 S., R. 4 E.--Continued											
1S/4-12Q1	3-14-58	F. A. Hicks	1957	2,740	220	C 8	N	N		Un	Tap 3.2	156.00	
13B1	3-14-58	Emil Flament	1955	2,710	280	Rg 6	Ts	3/4		Dm	Tc .75	151.93	L
13B2	3-14-58	Richardson		2,690		8	N	N		Un	Na		
13E1	3-13-58			2,690		8	J	3		Dm	Na		
13F1	3-14-58	Ralph Martine	(d)	2,680	65	D 48	N	N		Un		(d)	
13G1	3-14-58	Clyde Hartman	1954	2,670	140	C 8	J	1		Dm	Tc 1.3	86.84	
13H1	3-14-58	Mrs. Samel	1949	2,720	182	C	L	1		Dm		(a)	
13H2	3-14-58	Allie Derrig		2,680	190	C 8	L	1		Dm	Tap 1.2	126.53	
13J1	3-14-58	May Skipwith		2,760	208					Dm		(a)	
13L1	3-12-58	Townsend and Obrym	1956	2,660		6	J	1½		Dm	Tc 1.1	131.00	
13L2	3-12-58	George Cernich		2,640	110+	6	L	1		Dm	Na		
13L3	3-12-58	George Cernich		2,640	110					Un		(a)	
13N1	3-12-58	John Hamilton		2,640		8	L	1		Dm		(a)	

13P1	3-12-58	Minnie Heidt	1950	2,640	82	C	12	Ts	1	60	Dm	Hcc	1.2	49.65	C,L
13P2	3-12-58	Allen Bobo	1952	2,680	22						Dm			8	
13P3	3- 6-58	Hodges		2,680		D	40	J	½		Dm	Tc	0	29.38	
13P4	3-12-58	John Pelka	1957	2,630	68	C	8	J	1	600	Dm	Tc	1.0	b 51.62	L
13P5	3-25-58	Neilson	(d)	2,680	d15	D	48	N	N		Un	Ls	0	13.57	
13Q1	3- 6-58	Ruby Deutsh	1946	2,640	90	C	8	L	1		Dm	Hpb	2.2	35.82	
14A1	3-19-58	Warren Martin		2,760		C	6	Ts	1½		Dm	Tc	1.9	177.03	
14L1	3-12-58	Pacific Water Co.	1954	2,720	167		8	T	15	100	Ps	Tap	.85	136.97	L
14N1	3- 5-58	Axel Rosevahl		2,750		C		Ts	1		Dm	Tap	.13	181.84	C,W
14N2	3- 5-58	Grimes(?)		2,750		C	8	L	W		Dm	Na			
14Q1	3-12-58	B. Hatcher		2,680		D	30	N	N		Ds				
14R1	3-12-58	Extrom		2,600				J	1		Un	Na			
15N1	3- 4-58	Robinson	1956	2,930	205	R	6	J	1		Un	Hcc	1.0	169.63	
15N2	3- 4-58		(d)	2,980		C	12	N	N		Un			(d)	
15R1	3- 5-58	Orvil LaFrance	1946	2,810	290	C	6	L	1		Dm	Na			
15R2	3-13-58	Ralston		2,830				L	1		Dm			(a)	
18B1	3- 4-58	Gillispie		3,880	9.0	D	30	B	H		Un			dry	

a. Pumphouse locked or well inaccessible.
b. Pumping.
d. Still drilling or digging well.

USGS well number	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in.)	Pump data: Type	Pump data: Power	Well yield (gpm)	Use of well	Water level: Measuring point (feet)	Water level: Depth below land-surface datum (feet)	Other data
		T. 1 S., R. 4 E.--Continued											
15/4-18Bs	3- 4-58	Gillispie		3,840		spring	N	N		Un		(c)	
18K1	3- 4-58	C. T. Grotsenburg	1933	3,670	9.4	D 36	B			Un	Tbc 0	8.9	
18K2	3- 4-58	W. E. Turner		3,680	8.0	D 36	N	N		Un		dry	
18K3	3- 4-58	W. E. Turner	1957	3,680	75	R 8	S	G		Dm	Hcc 1.0	20.64	
18R1	3- 4-58	C. T. Grotsenburg	1933	3,550	17.5	D 36	J	½		Dr	Tbc 0	10.82	
18Rs	3- 4-58	C. T. Grotsenburg		3,550		spring	N	N	25+	Ps		flowing	
20Ds	3- 5-58	Sherman Shady Spring		3,360		spring	N	N		Un		(c)	
22C1	3-14-58	R. T. Tiedje		2,870	285	6	Ts	1		Dr	Tc 1.0	200	
22J1	3-13-58	Clara V. Livingstone	1935	2,750	235	C 8	L	1	25	Dm	Tc .85	163.77	C,W
23A1	3-12-58	Fred May	1950	2,630	75	R	L	W		Dm	Na		
23A2	3-12-58	William Bobo	1936	2,690	38.0	D 48	N	N		Ds		dry	
23B1	3-12-58	J. F. Compton	1940	2,680	125	R 12	L	1	8	Dm		(c)	
23B2	3-12-58	William Runyan		2,680	155	6	L	W		Dm	Na	90	

23C1	3-12-58	Walters and Dow	1949	2,710	164	C	8	L	W		Un	Na			
23C2	3-12-58	Walters and Dow	1949	2,710	150	C	6	N	N		Ds				
23C3	3-12-58	Dean Floyd	1950	2,700	160	C	6	J	1		Dm	Tcl	1.0	131.87	W
23C4	3-20-58	Francis L. Ward		2,710	169.7		8	N	N		Un	Tc	2.0	142.40	
23D1	3-13-58	Cubit		2,730	161.3		8	N	N		Un	Tc	1.0	159.6	W
23D2	3-20-58	Tom Hobgood	1947	2,725	161.2	C	8	N	N		Ds			dry	
23E1	3-12-58	Pacific Water Co.	1957	2,730	272	Rg	14	T	15	450	Ps	Tap	1.0	147.84	L
23E2	3-12-58	Kenneth Fobes	1945	2,730	215	C	8	L	W		Dm	Tcl	.6	177.12	
23M1	3-13-58			2,720	176.4		8	N	N		Un	Tc	1.0	137.74	
24C1	3- 6-58	B. E. Duncan		2,580	9.0	D	40	N	N		Ds			dry	
24C2	3- 8-58	B. E. Duncan		2,560	0			N	N		Ds				
24C3	3- 8-58	B. E. Duncan	1957	2,560	14	D	34	B	H		Dm	Tc	1.7	8.43	
28C1	3- 5-58	K. M. Myers		2,630	130+	C	8	L	G		Un	Tc	1.0	71.8	
28C2	3- 5-58	K. M. Myers		2,630	39.0	D	40	N	N		Ds			dry	
28G1	3-13-58	Woodard and Tinch	1951	2,570	100	C	10	J	3	23	Dm	Na		29	
28J1	3- 8-58	Brad Seely		2,530		spring		N	N		Un			flowing	
28K1	3- 8-58	Brad Seely	1943	2,560	300+	C	10	N	N		Un	Tc	1.5	34.80	
28L1	3- 6-58	Pacific Water Co.		2,570		R	12	T	15	250	Ps	Tap	.5	26.22	W

c. No flow, dense growth of cottonwood trees.
e. Tape smears.

USGS well number	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well	Diameter (in.)	Pump data: Type	Pump data: Power	Well yield (gpm)	Use of well	Water level: Measuring point	Water level: (feet)	Water level: Depth below land-surface datum (feet)	Other data
		T. 1 S., R. 4 E.--Continued													
1S/4-28L2	3- 6-58	E. G. Hilt		2,570		C		N	N		Ds				
28L3	3- 6-58	E. G. Hilt		2,570				N	N		Ds				
28L4	3- 6-58	E. G. Hilt		2,570				N	N		Ds				W
28M1	3-19-58	George Killman	1936	2,630	81.5	Da	7	N	N		Ds			dry	W
28N1	3- 8-58	H. M. Hess		2,570			6	J	1		Dm	Na			
28N2	3-13-58	Turp		2,570							Dm			(a)	
28N3	3-13-58	John Barton		2,570	61.0		8	N	N		Un	Tc	0.7	35.90	
28P1	3- 8-58			2,565			12	N	N		Un	Hsc	1.9	21.30	
28Q1	3- 6-58	Brad Seely	1900	2,520	6.0	C	4	N	N		Ds			dry	
29C1	3- 5-58	Terrance Neunvebel		2,850	26.3	C	8	N	N		Ds			dry	
29F1	3-13-58	F. N. Archer	1949	2,800	151	C	8	J	3/4		Dm	Tc	1.5	124.64	
29J1	3-13-58	C. D. Crawford	1918	2,640	115		10	L	W	1	Dm	Tcl	1.0	83.60	C,W
29R1	3-13-58	Pacific Water Co.		2,630	207			T	15		Ps	Tap	.4	83.51	C

32A1	3-13-58	S. R. Lee		2,600			12	J	3		Dm	Hsc	1.0	40.52	
32A2	3-19-58	Mrs. Ellen Finney	1946	2,600	92.3	C	10	N	N		Un	Tc	1.0	51.85	C
32C1	3-13-58	P. E. Goakes		2,650	125		8	N	N		Un	Tc	1.6	119.86	W
32G1	3-13-58	E. F. Geils		2,600	100		8	C	G		Dm	Tbc	2.08	51.26	C,W
32H1	3-13-58	Lewis Bomer	1947	2,560	250		10	L	W	70	Dm	Tc	0	49.98	C
33C1	3- 8-58	H. M. Hess	1955	2,600	275	Rg	8	J	5		Un	Tc	.8	3.07	L
33E1	3-19-58			2,560	38.5		8	N	N		Ds			dry	
		T. 1 S., R. 5 E.													
1S/5- 7G1	3- 5-58	B. F. Simons	1948	3,000	370	C	8	L	2		Dm	Na		305	C,W
18D1	3-14-58	M. M. Samel	1957	2,760	310	Rg	8	Ts	1	16	Dm			(e)	
		T. 2 S., R. 3 E.													
2S/3-12C1	3-20-58	Indian Reservation		2,460		D	72	N	N		Ds				
		T. 2 S., R. 4 E.													
2S/4- 5R1	3-19-58	Raymond Cree	1947	2,160	50	C	12	Si	G		Dm	Tc	1.0	19.7	
8K1	3-20-58	Roland Bates	1934	1,880	502			N	N		Ds			(f)	
8K2	3-20-58	Roland Bates	1937	1,880	325			N	N		Ds			(f)	

a. Pumphouse locked or well inaccessible.
e. Tape smears.
f. Reportedly dry when drilled.

USGS well number	Date of observation	Owner or user	Year completed	Altitude (feet)	Depth (feet)	Type well and diameter (in.)	Pump data: Type	Pump data: Power	Well yield (gpm)	Use of well	Water level: Measuring point (feet)	Water level: Depth below land-surface datum (feet)	Other data
		T. 2 S., R. 4 E.--Continued											
2S/4- 8M1	3-20-58	R. F. Kolbe	1951	2,040	201		N	N		Ds			(f)
8-1	3-20-58	R. F. Kolbe	1948	2,080	185		N	N		Ds			(f)
18D1	3-20-58	A. K. Burnam	1920?	2,160	238.3	6	N	N		Un	Tc 2.3	148.28	
18D2	3-20-58	A. K. Burnam	1920?	2,160	170.4	11	N	N		Un	Tc .5	148.10	
18D3	3-20-58	A. K. Burnam	1956	2,170	312	8	Ts	E		Dm	Hcc 1.5	150.17	

f. Reportedly dry when drilled.

Table 2.- Records of water levels for 11 wells in Morongo Valley and vicinity, California

Measurements prior to 1958 are by the San Bernardino County Flood Control District (1951 and 1954). The number in parentheses following the Geological Survey number is the number assigned to the well by the San Bernardino County Flood Control District. The measurements for March 1958 are by the Geological Survey.

Below is a list of numbers asssigned to wells by the San Bernardino County Flood Control District and the number assigned to the same well by the Geological Survey.

San Bernardino County numbers	Geological Survey numbers
1S/4E-14-3a	1S/4-14N1
22-4a	22J1
23-E1	23C3
23-2a	23D1
28-K1	28L1
1S/4E-28-3a	1S/4-28L4
28-3b	28M1
29-4a	29J1
32-2a	32C1
32-1a	32G1
1S/5E- 7-2a	1S/5- 7G1

Altitudes given are in feet above mean sea level for the land-surface datum at the well. Land-surface datum is a plane of reference which approximates land surface. Altitudes are interpolated from the topographic map.

Water levels are in feet below land-surface datum. The distance from the measuring point to land-surface datum has been subtracted from all measurements.

1S/4-14N1 (1S/4E-14-3a). Axel Rosevahl. Altitude about 2,750 feet.

Date	Water level	Date	Water level	Date	Water level
Nov. 6, 1950	173.04	Apr. 20, 1954	178.00	Jan. 16, 1957	180.80
Mar. 12, 1951	173.82	Dec. 13	184.00	Apr. 23	181.10
Apr. 14, 1952	174.52	Apr. 19, 1955	179.25	Mar. 5, 1958	181.84
Nov. 17	176.05	Dec. 19	182.45		
Nov. 23, 1953	183.8	Apr. 24, 1956	180.25		

1S/4-22J1 (1S/4E-22-4a). Clara V. Livingstone. Depth 235 feet. Altitude about 2,750 feet.

Date	Water level	Date	Water level	Date	Water level
Nov. 13, 1947	155.45	May 22, 1953	161.30	Apr. 24, 1956	166.99
Nov. 17, 1948	156.04	Nov. 23	171.6	Jan. 17, 1957	164.66
Nov. 15, 1949	157.33	Apr. 20, 1954	154.10	Apr. 23	166.92
Nov. 6, 1950	158.57	Dec. 13	161.70	Mar. 13, 1958	163.77
Nov. 12, 1951	160.47	Apr. 19, 1955	163.62		
Nov. 17, 1952	161.40	Dec. 19	164.70		

1S/4-23C3 (1S/4E-23E1). Dean Floyd. Depth 160 feet. Altitude about 2,700 feet.

Apr. 10, 1950	122.37	May 22, 1953	128.47	Apr. 24, 1956	130.30
Nov. 16	123.50	Nov. 23	127.38	Jan. 16, 1957	130.93
Mar. 12, 1951	123.96	Apr. 20, 1954	127.88	Apr. 23	131.13
Nov. 12	125.21	Dec. 13	131.88	Mar. 12, 1958	131.87
Apr. 14, 1952	125.61	Apr. 19, 1955	129.53		
Nov. 17	126.0	Dec. 19	131.90		

1S/4-23D1 (1S/4E-23-2a). Cubit, formerly Habgood. Depth, March 13, 1958, 161.3 feet. Altitude about 2,730 feet.

Nov. 16, 1946	164.82	Apr. 26, 1949	dry	May 22, 1953	dry
Apr. 14, 1947	165.28	Nov. 15	dry	Apr. 20, 1954	dry
Nov. 13	166.30	Apr. 10, 1950	170.16	Dec. 20	dry
Apr. 5, 1948	169.28	Mar. 12, 1951	dry	Mar. 13, 1958	159.6
Nov. 17	167.80	Nov. 12	dry		

1S/4-28L1 (1S/4E-28K1). Pacific Water Co., formerly E. G. Hilt. Altitude about 2,570 feet.

Apr. 5, 1948	a10.83	Nov. 12, 1951	15.59	Dec. 19, 1955	19.85
Nov. 17	11.74	Nov. 18, 1952	18.18	Apr. 24, 1956	21.80
Nov. 15, 1949	13.00	May 22, 1953	17.20	Jan. 16, 1957	20.23
Apr. 10, 1950	12.98	Apr. 20, 1954	17.90	Apr. 23	20.37
Nov. 6	14.13	Dec. 13	17.70	Mar. 6, 1958	26.22
Mar. 12, 1951	14.33	Apr. 19, 1955	18.80		

1S/4-28L4 (1S/4E-28-3a). E. G. Hilt. Well destroyed in 1958. Apr. 14, 1947, 18.18; Nov. 13, 20.15.

a. Pumped recently.

1S/4-28M1 (1S/4E-28-3b). George Killman, formerly Wier. Well dry at 81.5 feet on March 19, 1958. Altitude about 2,630 feet.

Date	Water level	Date	Water level	Date	Water level
Nov. 16, 1946	69.39	Nov. 6, 1950	75.38	Dec. 13, 1954	86?
Apr. 14, 1947	70.12	Nov. 12, 1951	76.32	Apr. 19, 1955	84.45
Nov. 13	71.35	Nov. 17, 1952	77.90	Dec. 19	81.90
Nov. 17, 1948	72.75	Nov. 23, 1953	81.90	Apr. 21, 1956	84.90
Nov. 15, 1949	73.95	Apr. 20, 1954	82.30	Mar. 19, 1958	dry

1S/4-29J1 (1S/4E-29-4a). Mrs. Crawford. Depth 115 feet. Altitude about 2,640 feet.

Nov. 16, 1946	69.13	May 22, 1953	70.05	Apr. 24, 1956	82.07
Nov. 17, 1948	72.95	Nov. 23,	80.45	Jan. 16, 1957	83.15
Nov. 15, 1949	74.90	Apr. 20, 1954	80.25	Apr. 23	83.34
Nov. 6, 1950	76.06	Dec. 13	81.25	Mar. 13, 1958	83.60
Nov. 12, 1951	73.13	Apr. 19, 1955	81.43		
Nov. 17, 1952	79.20	Dec. 19	82.08		

1S/4-32C1 (1S/4E-32-2a). P. E. Goakes, formerly Minter. Depth 125 feet. Altitude about 2,650 feet.

Apr. 14, 1947	99.02	May 22, 1953	98.71	Apr. 24, 1956	112.07
Nov. 17, 1948	102.08	Nov. 23	103.35	Jan. 16, 1957	113.82
Nov. 15, 1949	104.30	Apr. 20, 1954	109.80	Apr. 23	114.32
Nov. 6, 1950	105.31	Dec. 13	110.3	Mar. 13, 1958	119.86
Nov. 12, 1951	106.89	Apr. 19, 1955	111.67		
Nov. 17, 1952	98.30	Dec. 19	112.20		

1S/4-32G1 (1S/4E-32-1a). D. F. Geils. Depth 100 feet. Altitude about 2,600 feet.

Nov. 16, 1946	42.20	Mar. 12, 1951	63.00	Dec. 13, 1954	52.20
Nov. 13, 1947	48.50	Nov. 12	52.44	Apr. 14, 1955	52.58
Apr. 5, 1948	44.10	Apr. 14, 1952	49.49	Dec. 19	53.42
Nov. 17	45.82	Nov. 17,	50.34	Apr. 24, 1956	53.65
Apr. 26, 1949	46.76	May 22, 1953	51.71	Jan. 16, 1957	54.53
Nov. 15	55.02	Nov. 23	51.50	Apr. 23	54.78
Nov. 6, 1950	47.72	Apr. 20, 1954	51.70	Mar. 13, 1958	51.26

1S/5-7G1 (1S/5E-7-2a). B. F. Simons. Depth about 370 feet. Altitude about 3,000 feet.

Nov. 16, 1946	315.5	Apr. 10, 1950	317.14	Mar. 12, 1951	314.98
Apr. 5, 1948	298.5	Nov. 6	317.44		

Table 3.- Drillers' logs of water wells

1S/4-13B1. Emil Flament. Altitude about 2,710 feet. Drilled by C. K. S. Drilling Co. in November 1955. 6-inch casing.

Material	Thickness (feet)	Depth (feet)
Top soil and sand	20	20
Brown and red gravel	44	64
Brown and gray coarse gravel	31	95
Blue clay	1	96
Coarse brown and red gravel	14	110
Rock and white sand	10	120
Coarse gravel and rock	12	132
Red and brown rock	5	137
Red and white decomposed granite	8	145
Gray boulders	5	150
Brown gravel and yellow clay	9	159
Yellow clay and red gravel	15	174
Blue clay and red gravel	5	179
Reddish brown gravel and clay	41	220
Brown and white decomposed granite	20	240
Coarse gravel, brown	40	280

1S/4-13P1. Minnie Heidt. Altitude about 2,640 feet. Drilled by S. F. Webb in April 1950. 12-inch casing. Perforated from 30 to 82 feet.

Sand and silt	20	20
Decomposed granite	20	40
Sand, boulders	28	68
Water-sand, gravel	14	82

1S/4-13P4. John Pelka. Altitude about 2,630 feet. Drilled by F. D. McDougall in 1957. 8-inch casing.

Coarse sand, large boulders	6	6
Red sandy clay	5	11
Sand and boulders	15	26
Coarse sand and large boulders	31	57
Coarse water-sand with assorted small gravel	11	68

1S/4-14L1. Pacific Water Co. Altitude about 2,720 feet. Drilled in July 1954. 8-inch casing.

Material	Thickness (feet)	Depth (feet)
Boulders	40	40
Decomposed granite	94	134
Water, sand, and gravel	33	167

1S/4-23E1. Pacific Water Co. Altitude about 2,730 feet. Drilled by Jack Myers Drilling Co. in 1957. 14-inch casing from 0 to 215 feet, uncased from 215 to 272 feet.

Sand and boulders	36	36
Boulders	2	38
Sand	1	39
Brown clay	1	40
Sand	6	46
Brown clay	2	48
Sand, clay breaks	7	55
Coarse sand, clay breaks	5	60
Packed sand, sandy clay	16	76
Boulders	1	77
Clay	11	88
Sand	9	97
Boulders	2	99
Clay	3	102
Boulders	1	103
Gravel in sandy clay	11	114
Hard packed sand	11	125
Clay	5	130
Gravel, boulders	75	205
Sand, gravel	6	211
Clay	2	213
Hard sandstone	59	272

1S/4-33C1. H. M. Hess. Altitude about 2,600 feet. Drilled by C. K. S. Drilling Co. in September 1955. 8-inch casing.

Material	Thickness (feet)	Depth (feet)
Topsoil, black	15	15
Fine sand, brown	5	20
Coarse sand	20	40
Fine rock	30	70
Sand and brown clay	21	91
Gray rock	20	111
Clay and brown sand	44	155
White granite and clay	45	200
Granite and little clay	14	214
Gravel, coarse, brown	36	250
Gravel, pea, and clay at bottom	25	275
Gray rock	-	275

Table 4.- Chemical analyses of waters from wells and springs

Constituents: The sum of determined constituents is the sum of the tabulated constituents minus approximately half (50.8 percent) of the bicarbonate. Because all of the commonly occurring major constituents (except silica in some of the analyses) were analytically determined, the values for dissolved solids and sum of determined constituents should be approximately the same. All values have been rounded where necessary to conform to the standards of the Geological Survey. Numbers in parentheses are values calculated by the Geological Survey, Ground Water Branch.

Analyzing laboratory: DWR State of California, Department of Water Resources, SBC San Bernardino County Flood Control District.

Well or spring number	2N/4-32Rs	1S/4-13P1		1S/4-14N1
Constituents in parts per million				
Silica (SiO_2)	-	-	30	-
Iron (Fe)	-	-	-	-
Calcium (Ca)	64	83	78	72
Magnesium (Mg)	22	17	20	19
Sodium (Na)	47	73	75	72
Potassium (K)	3.4	5.5	6.2	7.2
Bicarbonate (HCO_3)	295	315	320	271
Carbonate (CO_3)	0	0	0	10
Sulfate (SO_4)	70	143	132	145
Chloride (Cl)	32	27	28	27
Fluoride (F)	.4	.7	.8	.8
Nitrate (NO_3)	3.2	2.0	2.0	3.0
Boron (B)	.04	.06	.06	.10
Dissolved solids (Dis. S.)	391	507	535	518
Sum of determined constituents (Sum)	(390)	(508)	(532)	(492)
Hardness as $CaCO_3$	(250)	(277)	(277)	258
Percent sodium (% Na)	29	(36)	(36)	37
Specific conductance (micromhos at 77°F)	649	840	819	784
pH	8.0	7.8	7.8	8.3
Temperature (°F)	-	-	-	-
Date collected (Date)	4-5-55	2-25-54	12-28-56	4-27-56
Depth of well in feet (Depth)		82	-	-
Analyzing laboratory (Lab.)	DWR	DWR	DWR	SBC
Laboratory number (No.)	R-621	4029	7540	3857

Well or spring number	1S/4-22J1		1S/4-29J1		1S/4-29R1
Constituents in parts per million					
SiO_2	-	30	-	-	-
Fe	-	-	-	-	-
Ca	55	53	61	61	67
Mg	13	13	11	14	13
Na	70	75	105	108	125
K	5.2	5.9	5.5	6.4	5.2
HCO_3	283	283	134	140	112
CO_3	0	0	0	-	0
SO_4	89	88	267	277	334
Cl	20	22	34	34	35
F	.6	.8	1.4	1.2	3.8
NO_3	0	1.0	0	2.8	.5
B	0	.06	.12	.15	.22
Dis. S	388	415	555	585	658
Sum	(394)	(430)	(552)	(574)	(640)
Hardness	(190)	(186)	(197)	(210)	219
% Na	(44)	(46)	(53)	52	54
Micromhos at 77°F	662	662	872	763	1,000
pH	8.1	8.1	7.7	8.1	7.8
°F	66	-	72	65	-
Date	2-25-54	12-28-56	2-25-54	2-24-55	11-23-53
Depth	235	-	115	-	207
Lab.	DWR	DWR	DWR	DWR	SBC
No.	4031	7539	4032	R-542	2905

Well or spring number	1S/4-32A2	1S/4-32G1		1S/4-32H1	1S/5-7G1	
Constituents in parts per million						
SiO_2	-	-	30	-	-	20
Fe	-	-	-	-	-	-
Ca	31	29	30	93	76	65
Mg	4	5	8	41	12	14
Na	a125	41	45	62	130	129
K	-	4.5	5.0	7.7	3.9	3.8
HCO_3	122	137	186	320	198	179
CO_3	-	-	0	0	0	0
SO_4	211	33	25	228	263	267
Cl	25	21	25	22	56	58
F	1.8	1.3	1.2	-	.9	1.4
NO_3	2.4	2.2	.5	0	3.5	1.5
B	.22	.19	.02	.04	.06	.10
Dis. S.	483	212	265	665	650	670
Sum	(461)	(206)	(263)	(614)	(644)	(649)
Hardness	(93)	(93)	(108)	(401)	(239)	(220)
% Na	75	47	(46)	(25)	(54)	(55)
Micromhos at 77°F	730	340	390	862	1,012	892
pH	7.8	8.2	8.1	8.0	7.9	7.8
°F	72	-	66	60	-	66
Date	10-24-52	2-24-55	12-28-56	3-27-52	2-25-54	12-28-56
Depth	108	100	-	250	370	-
Lab.	DWR	DWR	DWR	DWR	DWR	DWR
No.	2438	R-543	7538	1661	4028	7516

a. Includes potassium.