APPENDIX G. LITHOLOGIC DATA AND GROUND-WATER DATA FOR THE MORONGO GROUND-WATER BASIN—WARREN SUBBASIN

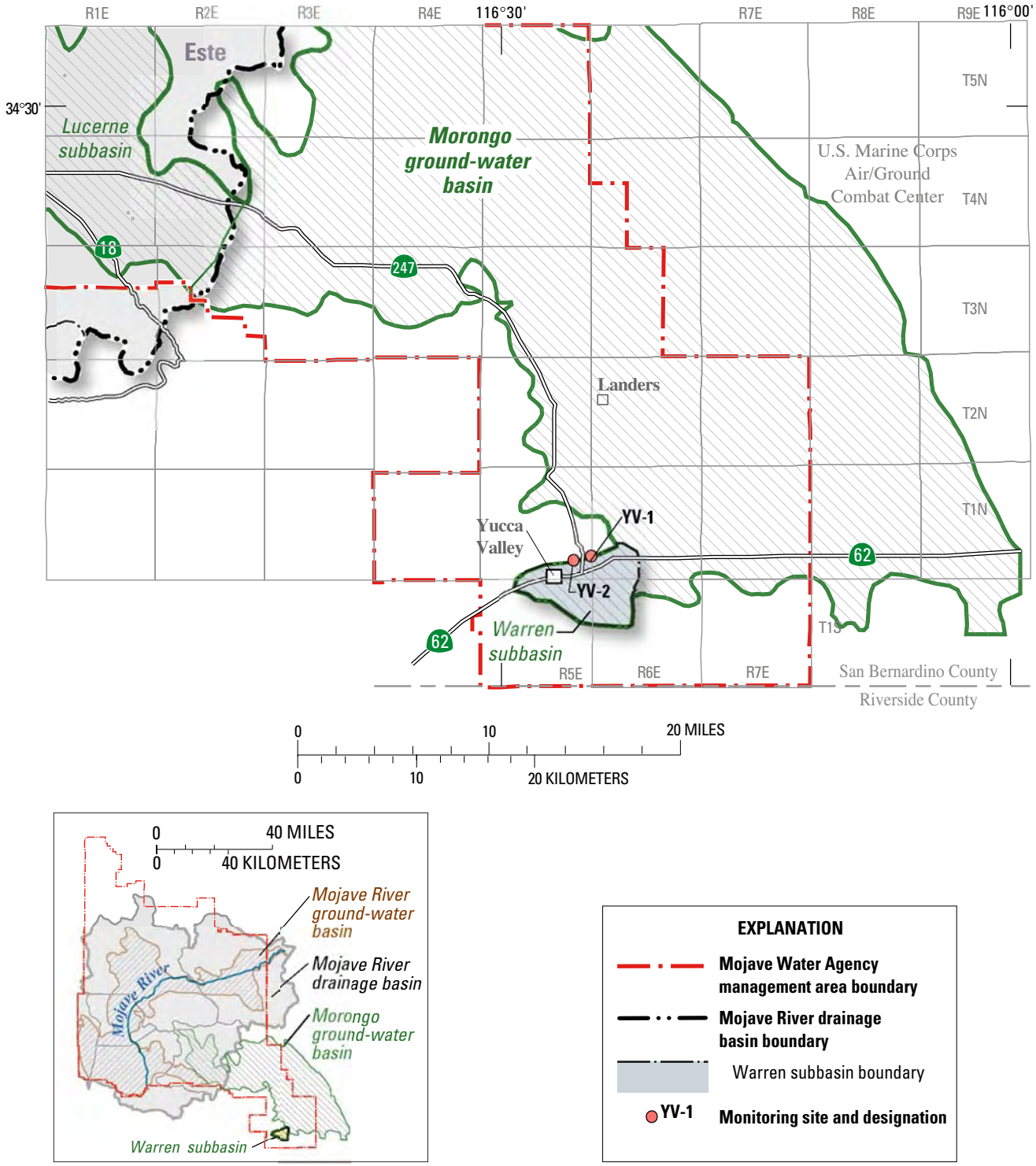


Figure G1. Location of monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table G1. Well-construction data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California

[Depth of well, sand-pack interval, seal interval, and perforated interval in feet below land surface. Altitude of land-surface datum in feet above sea level]

Common name	State well No.	Type of well	Depth of well	Sand-pack interval	Seal interval	Type of seal	Perforated interval	Altitude of land-surface datum	Date drilled
					Site YV-1				
YV-1					0–80	Cement grout			
YV-1 @ 230	1N/5E-36G4	Multiple	230	189–254	80–189	Bentonite	210–230	3,221.5	08-01-93
YV-1 @ 305	1N/5E-36G3	Multiple	305	270–320	254–270	Bentonite	285–305	3,221.5	08-01-93
YV-1 @ 400	1N/5E-36G2	Multiple	400	327–418	320–327	Bentonite	380–400	3,221.5	08-01-93
YV-1 @ 570	1N/5E-36G1	Multiple	570	524–580	418–524	Bentonite	550–570	3,221.5	08-01-93
					Site YV-2				
YV-2					0–50	Cement grout			
YV-2 @ 300	1N/5E-36M3	Multiple	300	260–320	50–260	Bentonite	280–300	3,240.4	10-20-93
YV-2 @ 390	1N/5E-36M2	Multiple	390	350–410	320–350	Bentonite	370–390	3,240.4	10-20-93
YV-2 @ 570	1N/5E-36M1	Multiple	570	520–600	410–520	Bentonite	550–570	3,240.4	10-20-93

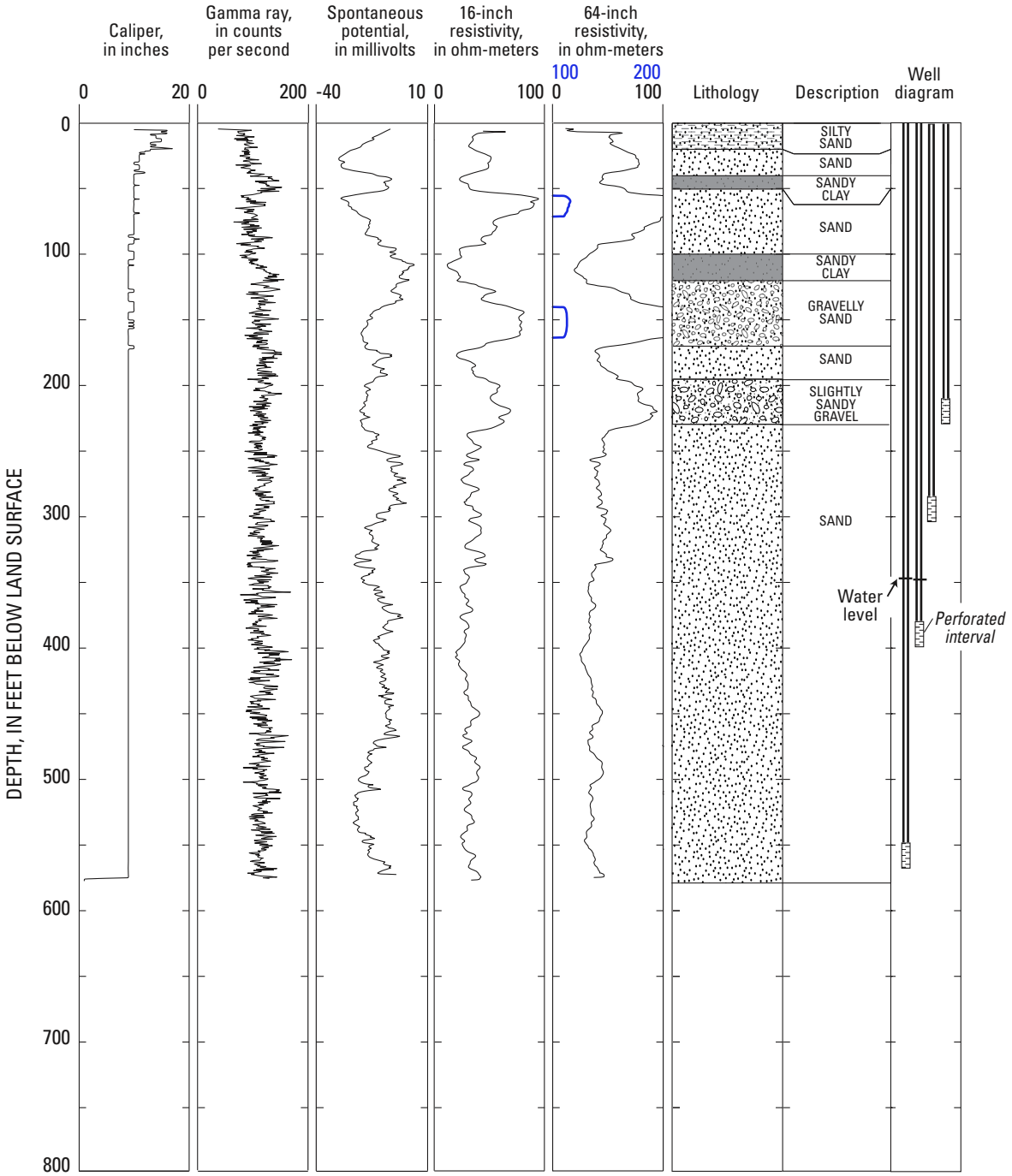
Table G2. Lithologic log for multiple-well monitoring site YV-1 (wells 1N/5E-36G1–4) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 3,222 ft. Depth is in feet below land surface. Soil and rock color notation from Munsell Color (1994). Drilled by U.S. Geological Survey using mud rotary, August 1993. Total depth drilled 580 ft. Screened intervals: 550–570, 380–400, 285–305, and 210–230 ft]

Depth (ft)		Description
From	To	
0	10	Silty sand, fine to coarse; subrounded; poorly sorted; abundant biotite; dark yellowish brown (10YR 4/2)
10	20	Silty sand, fine to coarse; subrounded, moderately well sorted; biotite; dark yellowish brown (10YR 4/2)
20	30	Sand, medium to coarse; subrounded; poorly sorted; moderate yellowish brown (10YR 5/4)
30	40	Sand, fine to coarse; subrounded; poorly sorted; biotite; moderate yellowish brown (10YR 5/4)
40	50	Sandy clay, fine to medium; grayish brown (5YR 3/2)
50	60	Sand, medium to coarse; subrounded; moderately well sorted; dark yellowish brown (10YR 4/2)
60	70	Sand, medium to coarse; subrounded; moderately well sorted; biotite; dark yellowish brown (10YR 4/2)
70	80	Sand, fine to coarse; subrounded; poorly sorted; dark yellowish brown (10YR 4/2)
80	90	Sand, fine to coarse; subrounded; moderately well sorted; dark yellowish brown (10YR 4/2)
90	95	Sand, fine to coarse; subangular; poorly sorted; significant amount of biotite; dark yellowish brown (10YR 4/2)
95	110	Clayey sand, fine to coarse; subangular (larger grains) to angular (smaller grains); moderately well sorted; dark yellowish brown (10YR 4/2)
110	120	Sandy clay, fine to medium; subangular; well-sorted; dusky yellowish brown (10YR 2/2)
120	130	Sand, fine to medium, with some gravel; subangular to angular; well-sorted; moderate yellowish brown (10YR 5/4)
130	140	Sand, fine to coarse, with some gravel; angular; well-sorted; pale yellowish brown (10YR 6/2)
140	150	Sand, fine to medium, with some gravel; angular; well-sorted; pale yellowish brown (10YR 6/2)
150	170	Sand, fine to medium, with some gravel; subangular; well-sorted; pale yellowish brown (10YR 6/2)
170	180	Sand, fine to medium; subangular; well-sorted; pale yellowish brown (10YR 6/2)
180	190	Sand, fine to coarse; subangular; poorly sorted; pale yellowish brown (10YR 6/2)
190	195	Sand, fine to medium; subangular; moderately well sorted; pale yellowish brown (10YR 6/2)
195	210	Sand, medium, with some fine; subangular, well-sorted; pale yellowish brown (10YR 6/2)
210	220	Sand, medium, with some fine, occasional gravel; subangular; well-sorted; pale yellowish brown (10YR 6/2)
220	230	Sand, fine to coarse, with some gravel; subangular; poorly sorted; pale yellowish brown (10YR 6/2)
230	240	Sand, fine to medium; subangular; well-sorted; grayish orange (10YR 7/4)
240	250	Sand, medium to coarse; subangular; moderately well sorted; moderate yellowish brown (10YR 5/4)
250	260	Sand, medium to coarse, with some fine; subangular; moderately well sorted; moderate yellowish brown (10YR 5/4)
260	350	Sand, fine to coarse; subangular; poorly sorted; moderate yellowish brown (10YR 5/4)
350	370	Sand, medium to coarse, with some fine; subrounded; poorly sorted; moderate yellowish brown (10YR 5/4)
370	380	Sand, medium to coarse, subrounded; poorly sorted; moderate yellowish brown (10YR 5/4)
380	420	Sand, fine to coarse; subrounded; poorly sorted; moderate yellowish brown (10YR 5/4)
420	430	Sand, medium to coarse; subangular; well-sorted; pale yellowish brown (10YR 6/2)
430	440	Sand, medium to coarse; subangular; moderately well sorted; pale yellowish brown (10YR 6/2)
440	450	No sieve sample—fines only off cones
450	460	Sand, fine to medium; subangular; poorly sorted; pale yellowish brown (10YR 6/2)
460	470	Sand, fine; angular; well-sorted; some biotite flakes present; grayish orange (10YR 7/4)
470	490	Sand, fine; angular; well-sorted; grayish orange (10YR 7/4)

Table G2. Lithologic log for multiple-well monitoring site YV-1 (wells 1N/5E-36G1–4) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Depth (ft)		Description
From	To	
490	500	No sample collected
500	520	Sand, fine, with occasional coarse grains; angular; well-sorted; grayish orange (10YR 7/4)
520	540	Sand, fine, with medium to coarse grains; angular; well-sorted; grayish orange (10YR 7/4)
540	560	Sand, fine, with some coarse grains; angular; well-sorted; grayish orange (10YR 7/4)
560	580	Sand, fine; angular; well-sorted; grayish orange (10YR 7/4)



Note: Some lithologic units may have been combined for presentation in this figure and the lithologic description may not correspond exactly to the description in the lithologic log shown in table.

Figure G2. Geophysical logs, lithology, and well diagram for multiple-well monitoring site YV-1 (wells 1N/5E-36G1–4) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California.

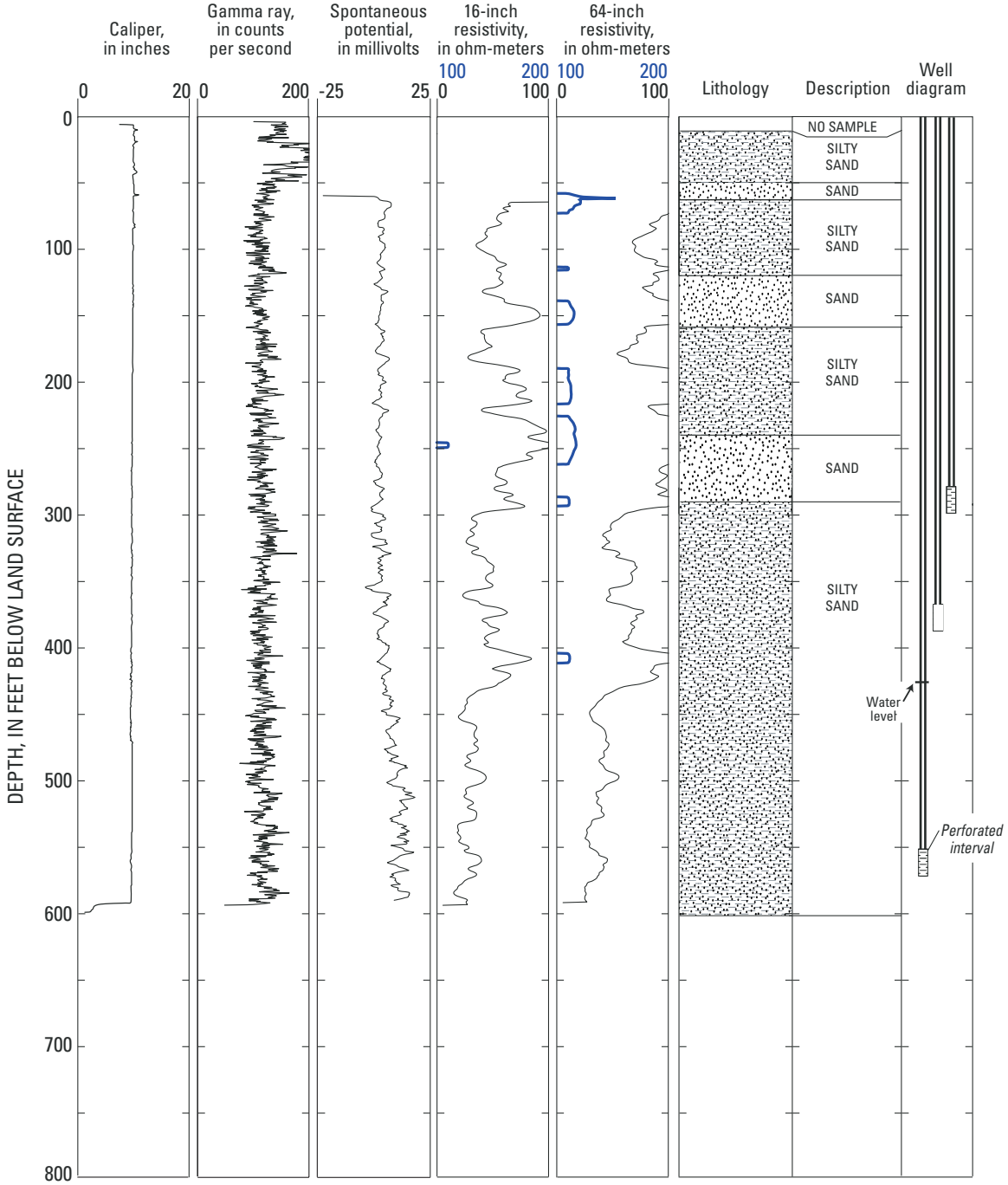
Table G3. Lithologic log for multiple-well monitoring site YV-2 (wells 1N/5E-36M1–3) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 3,240 ft. Depth is in feet below land surface. Soil and rock color notation from Munsell Color (1994). Drilled by U.S. Geological Survey using mud rotary, October 1993. Total depth drilled 600 ft. Screened intervals: 550–570, 370–390, and 280–300 ft)

Depth (ft)		Description
From	To	
0	10	No sample collected
10	20	Silty sand, very fine to very coarse; very poorly sorted; angular to subangular; pale yellowish brown (10YR 6/2)
20	30	Silty sand, very fine to very coarse, skewed toward fine; poorly sorted; angular to subrounded; grayish olive (10Y 4/2)
30	40	Silty sand, fine to very coarse, skewed toward coarse; poorly sorted; subangular to subrounded; grayish olive (10Y 4/2)
40	50	Silty sand, very fine to very coarse, skewed toward fine, trace clay; poorly sorted; angular to subrounded; dark yellowish brown (10YR 4/2)
50	60	Sand, fine to very coarse, skewed toward coarse; poorly sorted; angular biotite to subrounded quartz; dark yellowish orange (10YR 6/6)
60	70	Silty sand, very fine to very coarse, skewed toward fine, trace clay; poorly sorted; subrounded; dark yellowish brown (10YR 4/2)
70	80	Sand, fine to very coarse, with some silt and gravel granules; poorly sorted; angular to subrounded; grayish brown (5YR 3/2)
80	90	Silty sand, fine to very coarse; poorly sorted; angular to subrounded; dark yellowish brown (10YR 4/2)
90	100	Silty sand, fine to coarse; poorly sorted; angular to subrounded; dark yellowish brown (10YR 4/2)
100	110	Silty sand, very fine to very coarse, minor pebbles; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
110	120	Silty sand, very fine to very coarse, minor clay; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
120	130	Sand, medium to very coarse, some silt; moderately sorted; subangular to subrounded; moderate yellowish brown (10YR 5/4)
130	150	Sand, fine to medium, clean; well-sorted; subangular; grayish orange (10YR 7/4)
150	160	Sand, fine to very coarse, some silt, minor gravel granules; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
160	180	Silty sand, very fine to very coarse; poorly sorted; angular to subangular; moderate yellowish brown (10YR 5/4)
180	190	Silty sand, very fine to coarse; poorly sorted; subangular; moderate yellowish brown (10YR 5/4)
190	200	Silty sand, fine to coarse; well-graded; poorly sorted; subangular to subrounded; moderate yellowish brown (10YR 5/4)
200	210	Silty sand, very fine to coarse, skewed toward fine; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
210	220	Silty sand, very fine to coarse, well-graded; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
220	230	Silty sand, fine to coarse, well-graded; poorly sorted; subangular to subrounded; moderate yellowish brown (10YR 5/4)
230	240	Silty sand, very fine to very coarse, skewed toward fine, some clay; poorly sorted; subangular to subrounded; moderate yellowish brown (10YR 5/4)
240	250	Sand, medium to coarse, some silt; moderately sorted; subrounded; moderate yellowish brown (10YR 5/4)
250	260	Sand, fine to medium, minor silt; moderately sorted; angular muscovite to subrounded quartz; moderate yellowish brown (10YR 5/4)

Table G3. Lithologic log for multiple-well monitoring site YV-2 (wells 1N/5E-36M1–3) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Depth (ft)		Description
From	To	
260	270	Silty sand, very fine to coarse, well-graded; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
270	280	Silty sand, very fine to coarse; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
280	290	Silty sand, very fine to coarse; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
290	300	Silty sand, very fine to coarse, skewed toward fine; minor clay; angular to subrounded; moderate yellowish brown (10YR 5/4)
300	310	Sand, fine to coarse, some silt; moderately sorted; subangular to rounded; moderate yellowish brown (10YR 5/4)
310	320	Silty sand, very fine to coarse; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
320	340	Sand, very fine to medium, minor silt; moderately sorted; subrounded; moderate yellowish brown (10YR 5/4)
340	360	Sand, very fine to medium, some silt; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
360	380	Silty sand, very fine to medium; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
380	400	Sand, very fine to medium, some silt; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
400	420	Silty sand, very fine to medium, minor clay; moderately sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
420	440	Silty sand, very fine to coarse, skewed toward fine, minor clay; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
440	480	Sand, fine to medium, some silt; moderately sorted; subrounded; moderate yellowish brown (10YR 5/4)
480	500	Sand, fine to medium, some silt; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
500	520	Silty sand, fine to medium; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
520	540	Silty sand, very fine to medium; moderately sorted; angular to subangular; moderate yellowish brown (10YR 5/4)
540	560	Silty sand, very fine to very coarse; well-graded; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
560	580	Silty sand, very fine to coarse, skewed toward fine; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
580	600	Silty sand, very fine to coarse, skewed toward fine; poorly sorted; subangular to subrounded; moderate yellowish brown (10YR 5/4)



Note: Some lithologic units may have been combined for presentation in this figure and the lithologic description may not correspond exactly to the description in the lithologic log shown in table.

Figure G3. Geophysical logs, lithology, and well diagram for multiple-well monitoring site YV-2 (wells 1N/5E-36M1–3) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table G4. Water-level data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California

[Measurement method (column M): S, steel tape; V, calibrated electric tape. Site status (column S): D, dry; O, obstruction]

State well number 001N005E36G001S
Site identification number 340746116244201
Common name YV-1 NO 1
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 570 feet, perforated 210–230, 285–305, 380–400, 550–570 feet. Altitude of land-surface datum 3,221.5 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Oct 08, 1993	346.50	V	Jan 04, 1995	352.74	V	Mar 26, 1996	267.55	V	Aug 26, 1997	182.58	V
Dec 27	344.22	V	Jan 12	352.55	V	Jun 18	265.88	V	Sep 03	180.37	V
Jan 05, 1994	343.01	S	Mar 13	353.17	V	Dec 16	251.72	V	Jan 22, 1998	158.39	V
Jan 25	345.49	V	Jun 29	342.33	V	Mar 24, 1997	186.95	V	Mar 25	155.30	V
Feb 01	342.08	V	Aug 17	337.38	V	May 12	190.37	V	Jun 10	168.06	V
May 23	343.69	V	Mar 15, 1996	272.96	V	May 30	188.81	V			

HIGHEST	155.30	Mar 25, 1998
LOWEST	353.17	Mar 13, 1995

State well number 001N005E36G002S
Site identification number 340746116244202
Common name YV-1 NO 2
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 400 feet, perforated 380–400 feet. Altitude of land-surface datum 3,221.5 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Oct 08, 1993	346.66	V	Jan 04, 1995	353.10	V	Mar 26, 1996	236.79	V	Aug 26, 1997	174.46	V
Dec 27	343.50	V	Jan 13	353.10	S	Dec 16	244.94	V	Sep 03	172.34	V
Jan 05, 1994	344.54	S	Mar 13	354.03	V	Mar 24, 1997	178.36	V	Jan 22, 1998	153.60	V
Jan 25	348.05	V	Jun 29	282.31	V	May 12	183.19	V	Mar 25	151.31	V
Feb 01	342.84	V	Aug 17	294.82	V	May 30	182.19	V	Jun 10	167.59	V
May 23	343.26	V	Mar 15, 1996	239.22	V						

HIGHEST	151.31	Mar 25, 1998
LOWEST	354.03	Mar 13, 1995

State well number 001N005E36G003S
Site identification number 340746116244203
Common name YV-1 NO 3
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 305 feet, perforated 285–305 feet. Altitude of land-surface datum 3,221.5 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Oct 08, 1993		VD	Jun 29, 1995	279.02	V	Dec 16, 1996	243.85	V	Sep 03, 1997	171.73	V
Dec 27		VD	Aug 17		VD	Mar 24, 1997	177.75	V	Jan 22, 1998	153.22	V
Jan 05, 1994		SD	Mar 15, 1996	232.92	V	May 12	182.63	V	Mar 25	150.91	V
May 23		VD	Mar 26	211.70	V	May 30	181.72	V	Jun 10	157.89	V
Jan 04, 1995		VD	Jun 18	259.31	V	Aug 26	173.89	V			

HIGHEST	150.91	Mar 25, 1998
LOWEST	279.02	Jun 29, 1995

Table G3. Lithologic log for multiple-well monitoring site YV-2 (wells 1N/5E-36M1–3) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 001N005E36G004S
Site identification number 340746116244204
Common name YV-1 NO 4
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 230 feet, perforated 210–230 feet. Altitude of land-surface datum 3,221.5 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Oct 08, 1993		VD	Aug 17, 1995	227.59	V	Mar 24, 1997	164.06	V	Sep 03, 1997	160.02	V
Dec 27		VD	Mar 15, 1996	212.36	V	May 12	168.66	V	Jan 22, 1998	144.24	V
Jan 05, 1994		SD	Mar 26		VO	May 30	168.75	V	Mar 25	142.23	V
May 23		VD	Jun 18	214.41	V	Aug 26	161.76	V	Jun 10	172.04	V
Jan 04, 1995		VD	Dec 16	209.96	V						

HIGHEST	142.23	Mar 25, 1998
LOWEST	227.59	Aug 17, 1995

State well number 001N005E36M001S
Site identification number 340737116250801
Common name YV2-570
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 570 feet, perforated 550–570 feet. Altitude of land-surface datum 3,240.4 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Dec 01, 1993	426.42	S	Mar 27, 1995	459.25	V	Mar 12, 1996	386.77	V	May 30, 1997	280.43	V
Jan 25, 1994	428.62	V	Jun 07	280.09	V	Mar 15	385.36	V	Aug 27	275.24	V
Feb 01	420.30	V	Jun 20	418.10	V	Mar 26	379.51	V	Sep 03	275.15	V
May 23	359.26	V	Jun 28	418.33	V	Dec 16	312.98	V	Jan 22, 1998	235.10	V
Jul 28	364.61	V	Aug 16	418.35	V	Mar 24, 1997	294.80	V	Mar 24	229.21	V
Jan 04, 1995	366.00	V	Sep 07	417.82	V	May 12	284.17	V	Jun 10	228.74	V
Mar 13	367.40	V	Sep 19	417.82	V						

HIGHEST	228.74	Jun 10, 1998
LOWEST	459.25	Mar 27, 1995

State well number 001N005E36M002S
Site identification number 340737116250802
Common name YV2-390
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 390 feet, perforated 370–390 feet. Altitude of land-surface datum 3,240.4 feet. Water-level records available since 1993.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Dec 01, 1993		SD	Aug 16, 1995	347.96	V	Mar 26, 1996	288.61	V	Aug 27, 1997	258.10	V
May 23, 1994		VD	Sep 07	355.80	V	Dec 16	287.89	V	Sep 03	257.83	V
Mar 13, 1995		VD	Sep 19	359.36	V	Mar 24, 1997	277.46	V	Jan 22, 1998	231.96	V
Mar 27		VD	Mar 12, 1996	290.76	V	May 12	267.62	V	Mar 24	228.54	V
Jun 20	311.71	V	Mar 15	290.81	V	May 30	264.42	V	Jun 10	230.73	V
Jun 28	324.89	V									

HIGHEST	228.54	Mar 24, 1998
LOWEST	359.36	Sep 19, 1995

Table G3. Lithologic log for multiple-well monitoring site YV-2 (wells 1N/5E-36M1–3) in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 001N005E36M003S
Site identification number 340737116250803
Common name YV2-300
In Yucca Valley. Drilled observation well. Diameter 2 inches, depth 300 feet, perforated 280–300 feet. Altitude of land-surface datum 3,240.4 feet. Water-level records available since 1994.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
May 23, 1994		VD	Sep 19, 1995	290.79	V	Mar 24, 1997	273.78	V	Sep 03, 1997	255.49	V
Jun 07, 1995	262.71	V	Mar 12, 1996	280.17	V	May 12	265.13	V	Jan 22, 1998	231.62	V
Jun 20	288.82	V	Mar 15	280.34	V	May 30	262.13	V	Mar 24	228.36	V
Aug 16		VD	Mar 26	279.47	V	Aug 27	256.18	V	Jun 10	230.00	V
Sep 07	291.72	V	Dec 16	286.07	V						

HIGHEST	228.36	Mar 24, 1998
LOWEST	291.72	Sep 07, 1995

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California

[All data were analyzed at U.S. Geological Survey laboratories. Location of sites shown in figure G1. Numbering systems for sites are explained in text; µS/cm, microsiemens per centimeter; °C, degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter. —, no data; <, actual value is less than value shown]

Common name	State well No.	Site identification No.	Date	Time	Temperature water (°C)	Temperature air (°C)	Depth below land surface (water level) (feet)
YV-1 NO 1	001N005E36G001S	340746116244201	09-09-93	1130	24.5	36.5	—
			01-25-94	1145	20.5	10.8	345.49
			01-12-95	1530	21.0	10.0	352.55
			12-17-96	1245	21.3	11.0	—
			03-25-98	1420	18.5	9.0	155.30
			06-10-98	1410	21.9	24.0	168.06
YV-1 NO 2	001N005E36G002S	340746116244202	09-09-93	0900	—	—	—
			01-25-94	1442	19.5	10.1	348.05
			01-13-95	1000	19.5	21.5	358.48
			12-17-96	1630	—	9.5	—
			03-25-98	1020	17.4	—	—
			06-10-98	1800	20.8	24.5	167.59
YV-1 NO 3	001N005E36G003S	340746116244203	12-17-96	0940	18.3	10.5	—
			03-25-98	1600	17.5	8.5	150.91
			06-12-98	1115	20.8	19.0	157.79
YV-1 NO 4	001N005E36G004S	340746116244204	06-18-96	1445	28.6	—	214.41
			12-18-96	1200	—	—	—
			08-26-97	1900	22.2	31.0	161.76
			03-25-98	1200	19.5	—	142.23
			06-12-98	1215	20.2	19.5	172.04
YV-2 AT 570	001N005E36M001S	340737116250801	01-25-94	1730	18.5	3.0	428.62
			12-18-96	1145	—	—	—
			03-24-98	1830	19.3	—	229.21
			06-12-98	1430	19.4	19.5	228.74
YV-2 AT 390	001N005E36M002S	340737116250802	12-19-96	1030	16.5	—	—
			03-24-98	1900	16.3	—	—
			06-11-98	1230	20.3	20.5	230.73
YV-2 AT 300	001N005E36M003S	340737116250803	12-17-96	1600	—	—	—
			08-27-97	1645	21.5	35.0	256.18
			03-24-98	1800	17.9	—	228.36
			06-11-98	1400	19.9	—	—

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH water whole field (standard units)	Alkalinity wat dis fix end field $CaCO_3$ (mg/L)	Alkalinity wat dis tot it field (mg/L as $CaCO_3$)	Bicarbonate water dis it field (mg/L as HCO_3)
YV-1 @ 570	09-09-93	1130	259	—	7.5	98	97	119
	01-25-94	1145	259	7.4	7.2	97	94	115
	01-12-95	1530	238	14.4	7.6	96	97	118
	12-17-96	1245	239	8.0	7.6	94	97	118
	03-25-98	1420	240	7.6	7.7	76	75	93
	06-10-98	1410	237	6.4	7.6	90	90	—
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	889	—	7.1	—	—	—
	01-13-95	1000	334	7.2	7.4	100	101	123
	12-17-96	1630	665	12.4	7.4	91	89	109
	03-25-98	1020	677	14.8	7.9	71	—	—
	06-10-98	1800	604	—	7.6	87	86	—
YV-1 @ 305	12-17-96	0940	662	—	7.5	88	88	107
	03-25-98	1600	741	12.2	7.5	66	66	—
	06-12-98	1115	733	12.0	7.6	81	81	—
YV-1 @ 230	06-18-96	1445	1,760	—	6.6	—	—	—
	12-18-96	1200	—	—	—	—	—	—
	08-26-97	1900	812	10.0	6.8	79	79	96
	03-25-98	1200	682	17.6	7.3	64	65	—
	06-12-98	1215	742	—	7.5	66	66	—
YV-2 @ 570	01-25-94	1730	270	—	7.6	100	101	124
	12-18-96	1145	307	—	7.2	—	—	—
	03-24-98	1830	461	8.0	7.7	66	66	—
	06-12-98	1430	359	8.0	7.6	83	82	—
YV-2 @ 390	12-19-96	1030	506	—	7.2	77	78	95
	03-24-98	1900	418	20.4	8.0	62	62	—
	06-11-98	1230	—	10.6	7.5	72	71	—
YV-2 @ 300	12-17-96	1600	—	—	—	—	—	—
	08-27-97	1645	477	8.8	7.7	61	61	74
	03-24-98	1800	413	13.0	7.8	65	65	—
	06-11-98	1400	440	11.8	7.7	78	78	—

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, ammonia + organic dissolved (mg/L as N)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus dissolved (mg/L as P)	Phosphorus ortho, dissolved (mg/L as P)
YV-1 @ 570	09-09-93	1130	—	—	—	—	—	—
	01-25-94	1145	0.020	0.020	<0.20	2.10	0.800	0.800
	01-12-95	1530	<.015	<.010	<.20	2.10	.300	.280
	12-17-96	1245	.150	<.010	.80	2.20	.200	.180
	03-25-98	1420	<.020	.023	<.10	2.36	.112	.115
	06-10-98	1410	.027	<.010	<.10	2.28	.098	.116
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	—	—	—	—	—	—
	01-13-95	1000	<.015	<.010	<.20	2.40	113	14.0
	12-17-96	1630	<.015	<.010	<.20	30.0	1.90	1.70
	03-25-98	1020	<.020	.023	<.10	23.4	.636	.622
	06-10-98	1800	<.020	<.010	<.10	19.1	.378	—
YV-1 @ 305	12-17-96	0940	<.015	<.010	<.20	30.0	.220	.230
	03-25-98	1600	<.037	.041	<.10	20.7	3.67	3.47
	06-12-98	1115	.029	<.010	.10	28.0	.054	.072
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—
	12-18-96	1200	.030	.020	<.20	29.0	2.30	2.00
	08-26-97	1900	.032	.010	.38	30.3	.878	.837
	03-25-98	1200	<.020	.022	<.10	24.8	.132	.132
	06-12-98	1215	.029	<.010	<.10	24.0	.298	.276
YV-2 @ 570	01-25-94	1730	.010	.020	<.20	2.00	.140	.140
	12-18-96	1145	—	—	—	—	—	—
	03-24-98	1830	<.020	.018	<.10	1.09	.906	.904
	06-12-98	1430	<.020	.010	<.10	11.2	2.03	2.07
YV-2 @ 390	12-19-96	1030	<.015	<.010	<.20	5.30	7.00	5.80
	03-24-98	1900	<.020	.016	<.10	1.62	4.73	4.61
	06-11-98	1230	.020	<.010	<.10	2.32	.930	.962
YV-2 @ 300	12-17-96	1600	<.015	<.010	<.20	1.90	5.10	5.20
	08-27-97	1645	.032	.014	.26	1.95	1.68	1.56
	03-24-98	1800	<.020	.020	<.10	8.60	.124	.123
	06-11-98	1400	<.020	<.010	<.10	4.53	.403	.417

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Calcium dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate dissolved (mg/L as SO_4)
YV-1 @ 570	09-09-93	1130	17	3.2	34	1.8	9.0	12
	01-25-94	1145	15	2.7	34	1.8	8.9	11
	01-12-95	1530	19	3.1	26	1.5	9.2	8.3
	12-17-96	1245	20	3.1	26	1.2	8.5	8.7
	03-25-98	1420	21	3.3	26	1.1	8.3	7.9
	06-10-98	1410	20	3.2	24	1.2	8.5	8.3
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	—	—	—	—	—	—
	01-13-95	1000	6.2	1.6	58	1.8	9.7	14
	12-17-96	1630	64	9.7	52	2.2	56	36
	03-25-98	1020	65	9.7	52	1.9	66	49
	06-10-98	1800	57	8.5	46	1.9	58	44
YV-1 @ 305	12-17-96	0940	64	9.3	51	1.7	58	35
	03-25-98	1600	—	—	—	—	—	—
	06-12-98	1115	70	10	52	1.9	72	53
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—
	12-18-96	1200	59	9.1	59	1.9	68	40
	08-26-97	1900	72	11	63	2.4	82	68
	03-25-98	1200	67	9.6	54	1.6	69	58
	06-12-98	1215	71	10	53	1.9	75	69
YV-2 @ 570	01-25-94	1730	13	2.5	41	2.3	10	13
	12-18-96	1145	16	3.5	41	1.7	8.3	10
	03-24-98	1830	38	7.9	39	2.2	29	19
	06-12-98	1430	30	5.9	30	1.8	19	13
YV-2 @ 390	12-19-96	1030	27	6.2	67	2.2	52	56
	03-24-98	1900	29	5.9	44	1.7	44	33
	06-11-98	1230	35	6.1	31	1.5	43	36
YV-2 @ 300	12-17-96	1600	30	6.5	44	2.0	46	36
	08-27-97	1645	37	6.3	42	2.5	52	38
	03-24-98	1800	32	5.2	42	1.4	47	34
	06-11-98	1400	37	5.6	38	1.4	50	34

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Solids, residue at 180 °C dissolved (mg/L)	Iodide, dissolved (mg/L as I)	Bromide dissolved (mg/L as Br)	Arsenic dissolved (µg/L as As)
YV-1 @ 570	09-09-93	1130	0.62	35	180	<0.001	0.091	6
	01-25-94	1145	.50	36	180	.002	.080	7
	01-12-95	1530	.50	34	165	.001	.070	3
	12-17-96	1245	.50	34	162	.002	.050	2
	03-25-98	1420	.56	33	158	—	.062	2
	06-10-98	1410	.61	31	172	—	.067	2
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	—	—	—	—	—	—
	01-13-95	1000	.60	35	221	.003	.070	23
	12-17-96	1630	.70	30	426	.003	.40	1
	03-25-98	1020	.63	28	427	—	.39	1
	06-10-98	1800	.78	28	422	—	.34	<1
YV-1 @ 305	12-17-96	0940	.70	30	429	.003	.40	1
	03-25-98	1600	—	—	—	—	—	—
	06-12-98	1115	.76	27	501	—	.42	<1
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—
	12-18-96	1200	.80	30	436	.005	.41	<1
	08-26-97	1900	.72	28	594	.006	.49	1
	03-25-98	1200	.73	29	437	—	.37	<1
	06-12-98	1215	.70	28	502	—	.41	<1
YV-2 @ 570	01-25-94	1730	.50	33	179	.003	.080	3
	12-18-96	1145	.40	34	193	.002	.060	4
	03-24-98	1830	.22	32	309	—	.18	2
	06-12-98	1430	.26	30	251	—	.13	2
YV-2 @ 390	12-19-96	1030	.20	32	319	.014	.14	2
	03-24-98	1900	.20	30	238	—	.14	2
	06-11-98	1230	.19	28	235	—	.15	<1
YV-2 @ 300	12-17-96	1600	.80	27	261	.015	.13	1
	08-27-97	1645	.63	23	298	.011	.16	1
	03-24-98	1800	.73	24	244	—	.15	<1
	06-11-98	1400	.56	24	282	—	.17	<1

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Barium, dissolved (µg/L as Ba)	Beryllium, dissolved (µg/L as Be)	Boron, dissolved (µg/L as B)	Cadmium, dissolved (µg/L as Cd)	Chromium, dissolved (µg/L as Cr)	Cobalt, dissolved (µg/L as Co)
YV-1 @ 570	09-09-93	1130	14	<0.50	49	<1.0	<5.0	<3.0
	01-25-94	1145	12	—	50	—	—	—
	01-12-95	1530	13	—	50	—	—	—
	12-17-96	1245	<100	—	44	—	—	—
	03-25-98	1420	—	—	54	—	—	—
	06-10-98	1410	—	—	40	—	—	—
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	—	—	—	—	—	—
	01-13-95	1000	2.0	—	50	—	—	—
	12-17-96	1630	<100	—	51	—	—	—
	03-25-98	1020	—	—	52	—	—	—
	06-10-98	1800	—	—	54	—	—	—
YV-1 @ 305	12-17-96	0940	<100	—	53	—	—	—
	03-25-98	1600	—	—	—	—	—	—
	06-12-98	1115	—	—	59	—	—	—
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—
	12-18-96	1200	<100	—	55	—	—	—
	08-26-97	1900	67	—	85	—	—	—
	03-25-98	1200	—	—	47	—	—	—
	06-12-98	1215	—	—	54	—	—	—
YV-2 @ 570	01-25-94	1730	12	—	60	—	—	—
	12-18-96	1145	<100	—	48	—	—	—
	03-24-98	1830	—	—	47	—	—	—
	06-12-98	1430	—	—	55	—	—	—
YV-2 @ 390	12-19-96	1030	<100	—	71	—	—	—
	03-24-98	1900	—	—	76	—	—	—
	06-11-98	1230	—	—	69	—	—	—
YV-2 @ 300	12-17-96	1600	<100	—	194	—	—	—
	08-27-97	1645	20	—	118	—	—	—
	03-24-98	1800	—	—	131	—	—	—
	06-11-98	1400	—	—	119	—	—	—

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Copper, dissolved (µg/L as Cu)	Iron, dissolved (µg/L as Fe)	Lead, dissolved (µg/L as Pb)	Manganese, dissolved (µg/L as Mn)	Molybdenum, dissolved (µg/L as Mo)	Nickel, dissolved (µg/L as Ni)
YV-1 @ 570	09-09-93	1130	<10	300	<10	34	<10	<10
	01-25-94	1145	—	9.0	—	<1.0	—	—
	01-12-95	1530	—	<3.0	—	<1.0	—	—
	12-17-96	1245	—	<3.0	—	<1.0	—	—
	03-25-98	1420	—	<10	—	<4.0	—	—
	06-10-98	1410	—	<10	—	<4.0	—	—
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—
	01-25-94	1442	—	—	—	—	—	—
	01-13-95	1000	—	120	—	67	—	—
	12-17-96	1630	—	16	—	<1.0	—	—
	03-25-98	1020	—	<10	—	<4.0	—	—
	06-10-98	1800	—	<10	—	<4.0	—	—
YV-1 @ 305	12-17-96	0940	—	35	—	8.0	—	—
	03-25-98	1600	—	—	—	—	—	—
	06-12-98	1115	—	<10	—	7.8	—	—
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—
	12-18-96	1200	—	<3.0	—	34	—	—
	08-26-97	1900	—	<3.0	—	12	—	—
	03-25-98	1200	—	<10	—	<4.0	—	—
	06-12-98	1215	—	12	—	<4.0	—	—
YV-2 @ 570	01-25-94	1730	—	54	—	7.0	—	—
	12-18-96	1145	—	49	—	<1.0	—	—
	03-24-98	1830	—	—	—	51	—	—
	06-12-98	1430	—	<10	—	42	—	—
YV-2 @ 390	12-19-96	1030	—	<3.0	—	18	—	—
	03-24-98	1900	—	<10	—	7.2	—	—
	06-11-98	1230	—	<10	—	<4.0	—	—
YV-2 @ 300	12-17-96	1600	—	<3.0	—	33	—	—
	08-27-97	1645	—	<3.0	—	8.5	—	—
	03-24-98	1800	—	<10	—	<4.0	—	—
	06-11-98	1400	—	<10	—	<4.0	—	—

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Silver, dissolved (µg/L as Ag)	Strontium, dissolved (µg/L as Sr)	Vanadium, dissolved (µg/L as V)	Zinc, dissolved (µg/L as Zn)	Lithium, dissolved (µg/L as Li)	$^{2}H/^{1}H$ stable isotope (ratio per mil)	$^{18}O/^{16}O$ stable isotope ratio per mil
YV-1 @ 570	09-09-93	1130	<1.0	184	7	<20	20	–78.9	–11.25
	01-25-94	1145	—	140	—	—	20	–77.0	–11.09
	01-12-95	1530	—	170	—	—	17	–77.8	–11.11
	12-17-96	1245	—	180	—	—	20	–78.9	–11.13
	03-25-98	1420	—	—	—	—	—	–78.2	–11.12
	06-10-98	1410	—	—	—	—	—	–77.1	–11.14
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	–74.3	–10.58
	01-25-94	1442	—	—	—	—	—	–76.3	–11.01
	01-13-95	1000	—	89	—	—	15	–77.3	–11.10
	12-17-96	1630	—	840	—	—	28	–75.6	–10.73
	03-25-98	1020	—	—	—	—	—	–74.5	–10.23
	06-10-98	1800	—	—	—	—	—	–73.0	–10.14
YV-1 @ 305	12-17-96	0940	—	620	—	—	29	–77.6	–10.71
	03-25-98	1600	—	—	—	—	—	–74.2	–10.35
	06-12-98	1115	—	—	—	—	—	–75.2	–10.29
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	–75.8	–10.75
	12-18-96	1200	—	640	—	—	28	–74.9	–10.62
	08-26-97	1900	—	715	—	—	37	–75.6	–10.19
	03-25-98	1200	—	—	—	—	—	–73.6	–10.16
	06-12-98	1215	—	—	—	—	—	–72.7	–9.79
YV-2 @ 570	01-25-94	1730	—	110	—	—	18	–77.8	–11.08
	12-18-96	1145	—	280	—	—	21	–77.2	–11.07
	03-24-98	1830	—	—	—	—	—	–77.9	–10.90
	06-12-98	1430	—	—	—	—	—	–77.8	–11.00
YV-2 @ 390	12-19-96	1030	—	480	—	—	25	–70.4	–9.44
	03-24-98	1900	—	—	—	—	—	–67.6	–9.07
	06-11-98	1230	—	—	—	—	—	–69.3	–9.11
YV-2 @ 300	12-17-96	1600	—	580	—	—	14	–69.2	–9.19
	08-27-97	1645	—	575	—	—	17	–71.1	–9.36
	03-24-98	1800	—	—	—	—	—	–68.9	–9.22
	06-11-98	1400	—	—	—	—	—	–70.3	–9.36

Table G5. Water-quality data for monitoring sites in the Warren subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Tritium in water molecules (TU)	Tritium water molecules count error (TU)	$^{13}C/^{12}C$ stable isotope (ratio per mil)	Carbon-14 water fltrd (percent)	Carbon-14 cnt err water fltrd (percent)	Carbon-14 (percent modern)	$^{15}N/^{14}N$ NO_3 frac water fltrd (0.45 U per mil)
YV-1 @ 570	09-09-93	1130	—	—	—	—	—		
	01-25-94	1145	—	—	–12.50	—	—	—	—
	01-12-95	1530	—	—	—	—	—	—	—
	12-17-96	1245	—	—	–12.90	79.50	0.550	—	—
	03-25-98	1420	—	—	—	—	—	—	—
	06-10-98	1410	—	—	—	—	—	—	—
YV-1 @ 400	09-09-93	0900	—	—	—	—	—	—	3.9
	01-25-94	1442	<0.1	0.2	—	—	—	—	—
	01-13-95	1000	—	—	—	—	—	—	—
	12-17-96	1630	—	—	—	—	—	—	—
	03-25-98	1020	—	—	—	—	—	—	—
	06-10-98	1800	—	—	—	—	—	—	7.2
YV-1 @ 305	12-17-96	0940	—	—	—	—	—	—	7.1
	03-25-98	1600	—	—	—	—	—	—	—
	06-12-98	1115	—	—	—	—	—	—	—
YV-1 @ 230	06-18-96	1445	—	—	—	—	—	—	7.1
	12-18-96	1200	—	—	—	—	—	—	—
	08-26-97	1900	—	—	—	—	—	—	—
	03-25-98	1200	—	—	—	—	—	—	—
	06-12-98	1215	—	—	—	—	—	—	7.0
YV-2 @ 570	01-25-94	1730	<.1	.2	–12.80	—	—	—	7.1
	12-18-96	1145	—	—	–12.40	69.30	.510	75.2	—
	03-24-98	1830	—	—	—	—	—	—	—
	06-12-98	1430	—	—	—	—	—	—	—
YV-2 @ 390	12-19-96	1030	—	—	—	—	—	—	6.3
	03-24-98	1900	—	—	—	—	—	—	—
	06-11-98	1230	—	—	—	—	—	—	—
YV-2 @ 300	12-17-96	1600	—	—	—	—	—	—	6.9
	08-27-97	1645	—	—	—	—	—	—	—
	03-24-98	1800	—	—	—	—	—	—	—
	06-11-98	1400	—	—	—	—	—	—	8.2

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