APPENDIX F. LITHOLOGIC DATA AND GROUND-WATER DATA FOR THE MORONGO GROUND-WATER BASIN—LUCERNE SUBBASIN

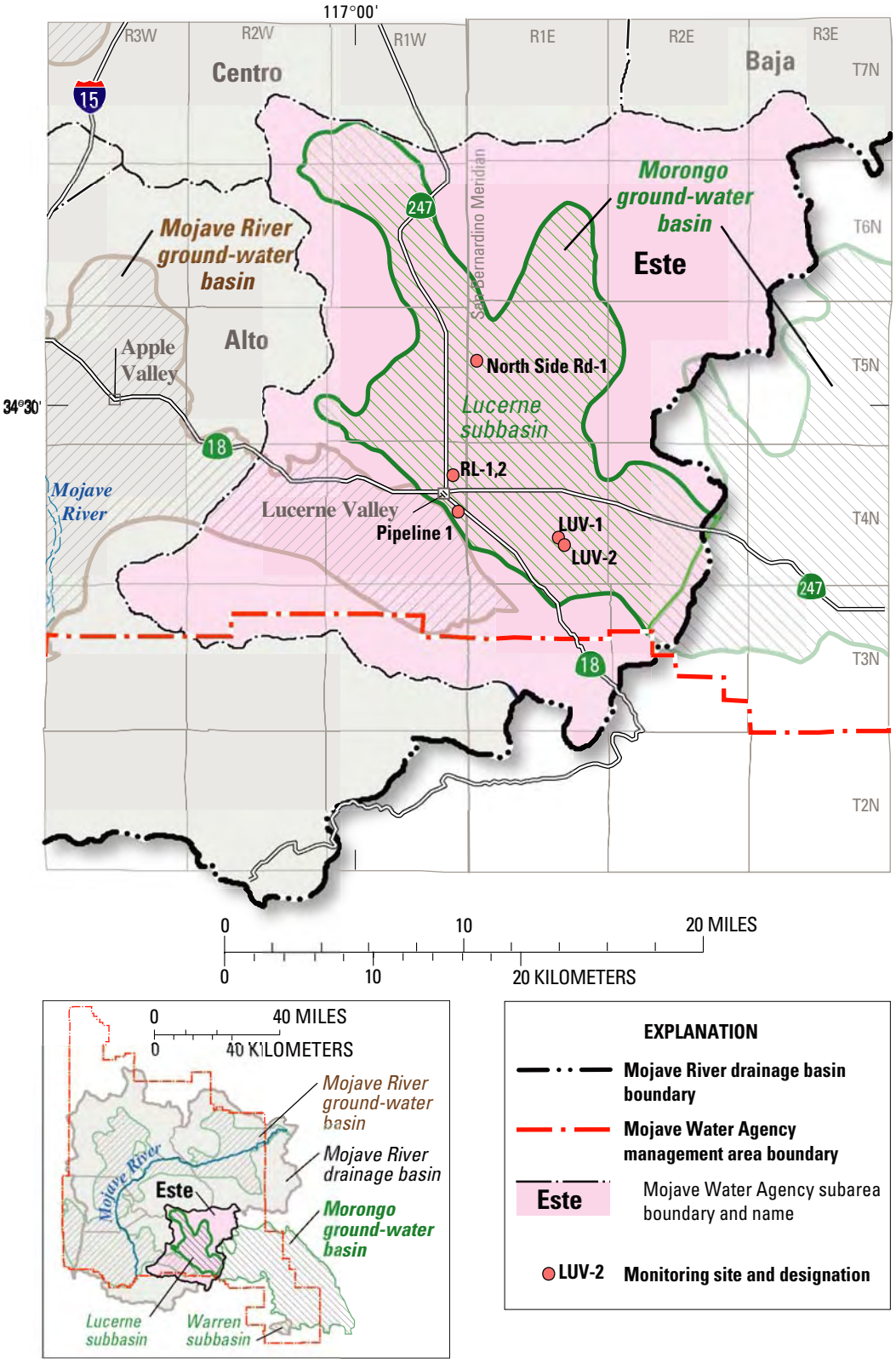


Figure F1. Location of monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table F1. Well-construction data for monitoring sites in the Lucerne 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 LUV-1									
LUV-1					0–50	Cement grout			
LUV-1 NO 1	4N/1E-23K2	Multiple	381	341–415	50–341	Bentonite	360–380	3,110	09-06-94
LUV-1 NO 2	4N/1E-23K1	Multiple	660	590–700	415–590	Bentonite	640–660	3,110	09-06-94
Site LUV-2									
LUV-2					0–25	Cement grout			
LUV-2 NO 1	4N/1E-23R2	Multiple	210	160–230	25–160	Bentonite	190–210	3,145	09-11-94
LUV-2 NO 2	4N/1E-23R1	Multiple	436	325–436	230–325	Bentonite	396–436	3,145	09-11-94
Site RL1									
RL-1					0–25	Cement grout			
RL-1 at 150	4N/1W-1R7	Multiple	150	72–160	25–72	Bentonite	130–150	2,878	01-21-97
RL-1 at 340	4N/1W-1R6	Multiple	340	281–347	160–281	Bentonite	320–340	2,878	01-21-97
RL-1 at 560	4N/1W-1R5	Multiple	560	518–565	347–518	Bentonite	540–560	2,878	01-21-97
RL-1 at 760	4N/1W-1R4	Multiple	760	705–800	565–705	Bentonite	740–760	2,878	01-21-97
Site RL2									
RL-2					0–25	Cement grout			
RL-2 at 140	4N/1W-1R9	Multiple	140	120–160	25–120	Bentonite	120–140	2,875	02-23-97
RL-2 at 348	4N/1W-1R8	Multiple	348	308–350	160–308	Bentonite	328–348	2,875	02-23-97
Site Pipeline 1									
Pipeline 1					0–25	Cement grout			
Pipeline 1 at 130	4N/1W-13R4	Multiple	130	88–138	25–88	Bentonite	110–130	3,075	01-23-95
Pipeline 1 at 260	4N/1W-13R3	Multiple	260	220–282	138–220	Bentonite	240–260	3,075	01-23-95
Pipeline 1 at 380	4N/1W-13R2	Multiple	380	328–405	282–328	Bentonite	360–380	3,075	01-23-95
Pipeline 1 at 490	4N/1W-13R1	Multiple	490	440–520	405–440	Bentonite	470–490	3,075	01-23-95
Site North Side Rd-1									
North Side Rd-1					0–22	Cement grout			
North Side Rd-1 at 200	5N/1E-8N4	Multiple	200	153–211	22–153	Bentonite	180–200	2,875	01-28-97
North Side Rd-1 at 280	5N/1E-8N3	Multiple	280	229–280	211–229	Bentonite	260–280	2,875	01-28-97

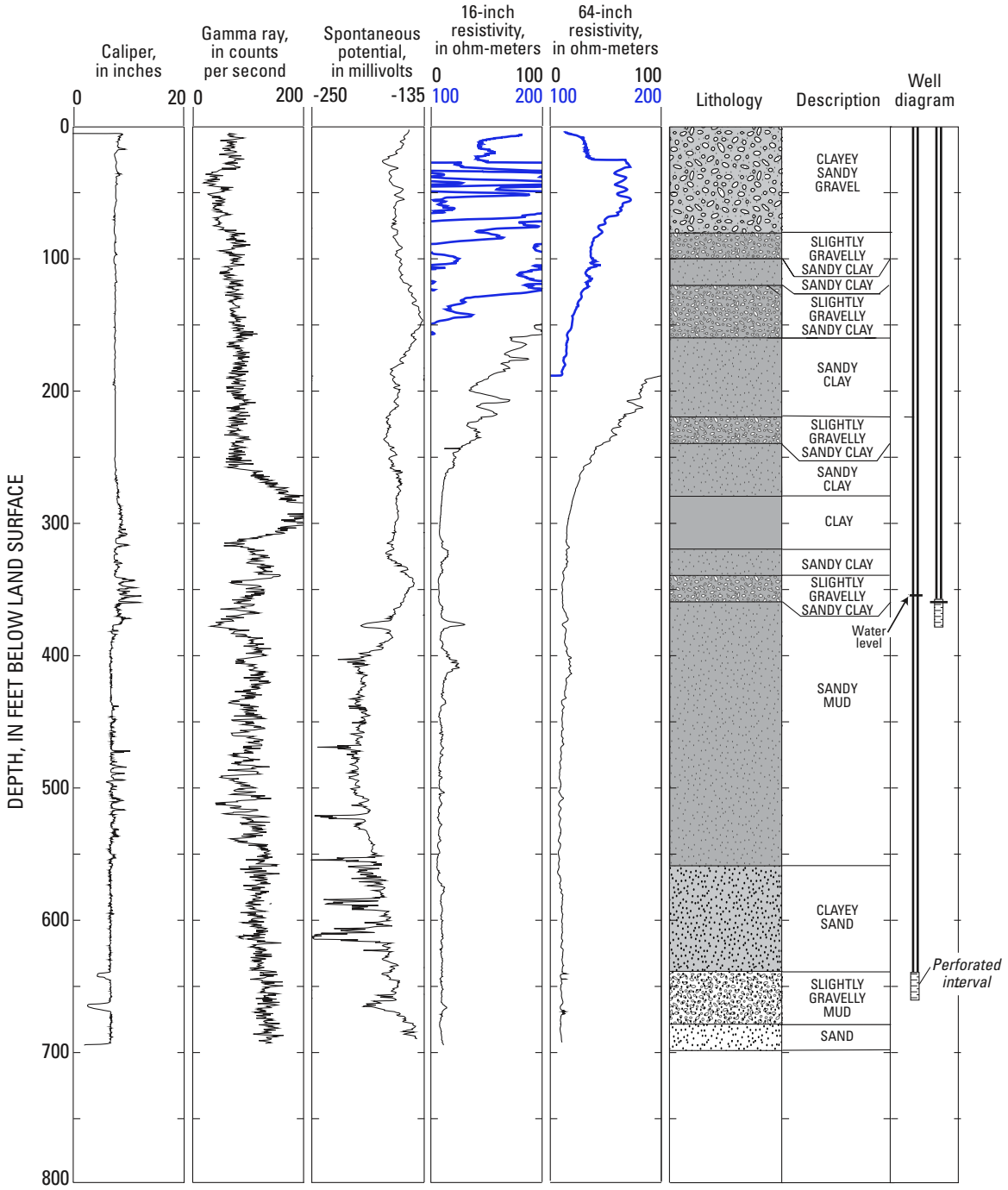
Table F2. Lithologic log for multiple-well monitoring site LUV-1 (wells 4N/1E-23K1 and 2) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 3,110 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, September 1994. Total depth drilled 700 ft. Screened intervals: 640–660 and 360–380 ft]

Depth (ft)		Description
From	To	
0	20	Sandy gravel, some clay, very fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
20	60	Sandy gravel, minor clay, very fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
60	80	Sandy gravel, some clay, very fine to very coarse; poorly sorted; angular to rounded; very pale orange (10YR 8/2)
80	100	Sandy clay, very fine to medium, minor gravel; moderately well sorted; angular to subrounded; grayish orange (10YR 7/4)
100	120	Sandy clay, very fine to coarse; moderately well sorted; angular to subrounded; grayish orange (10YR 7/4)
120	140	Sandy clay, very fine to coarse but skewed toward fine, trace gravel; moderately sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
140	160	Sandy clay, very fine to coarse, trace gravel; well-sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
160	200	Sandy clay, very fine to coarse; well-sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
200	220	Sandy clay, very fine to coarse; well-sorted; angular to rounded; pale yellowish brown (10YR 6/2)
220	240	Sandy clay, very fine to very coarse, some gravel; moderately well sorted; angular to subrounded; light olive gray (5Y 5/2)
240	260	Sandy clay, very fine to medium; well-sorted; angular to subangular; light olive gray (5Y 5/2)
260	280	Sandy clay, very fine to fine; very well sorted; angular to subangular; light olive brown (5Y 5/6)
280	300	Clay, some very fine sand, high plasticity; light olive brown (5Y 5/6)
300	320	Clay, some caliche, very good cohesion, high plasticity; grayish orange (10YR 7/4)
320	340	Sandy clay, very fine to medium; well-sorted; angular to subrounded; pale yellowish brown (10YR 6/2)
340	360	Clay, some caliche, minor gravel granules, high plasticity; subangular; moderate yellowish brown (10YR 5/4)
360	380	Clay, some sand, very fine to very coarse, some caliche; well-sorted; subangular; moderate yellowish brown (10YR 5/4)
380	400	Clay, some caliche, some sand, very fine to medium; well-sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
400	420	Clayey sand, very fine to medium; well-sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
420	460	Clay, some sand, very fine to fine; very well sorted; angular to subrounded; dark yellowish orange (10YR 6/6)
460	480	Clay, some sand, very fine to fine, some caliche; very well sorted; angular to subrounded; dark yellowish orange (10YR 6/6)
480	500	Clay, some sand, very fine to fine; very well sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
500	520	Clay, some sand, very fine to medium; well-sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
520	540	Clay, some sand, very fine to medium, some caliche; well-sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
540	560	Clay, some sand, very fine to coarse skewed toward fine, minor gravel granules, minor caliche; well-sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
560	580	Clayey sand, very fine to very coarse but skewed toward fine; moderately well sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)

Table F2. Lithologic log for multiple-well monitoring site LUV-1 (wells 4N/1E-23K1 and 2) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Depth (ft)		Description
From	To	
580	620	Clayey sand, very fine to very coarse; poorly sorted; well-graded; angular to subrounded; moderate yellowish brown (10YR 5/4)
620	640	Clayey sand, very fine to coarse, some caliche; moderately well sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
640	660	Sand, fine to medium, trace gravel granules; very well sorted; angular to rounded; grayish orange (10YR 7/4)
660	680	Sand, fine to coarse, trace gravel granules; poorly sorted; moderately well graded; subangular to subrounded; grayish orange (10YR 7/4)
680	700	Sand, fine to very coarse; poorly sorted; subangular to subrounded; grayish orange (10YR 7/4)



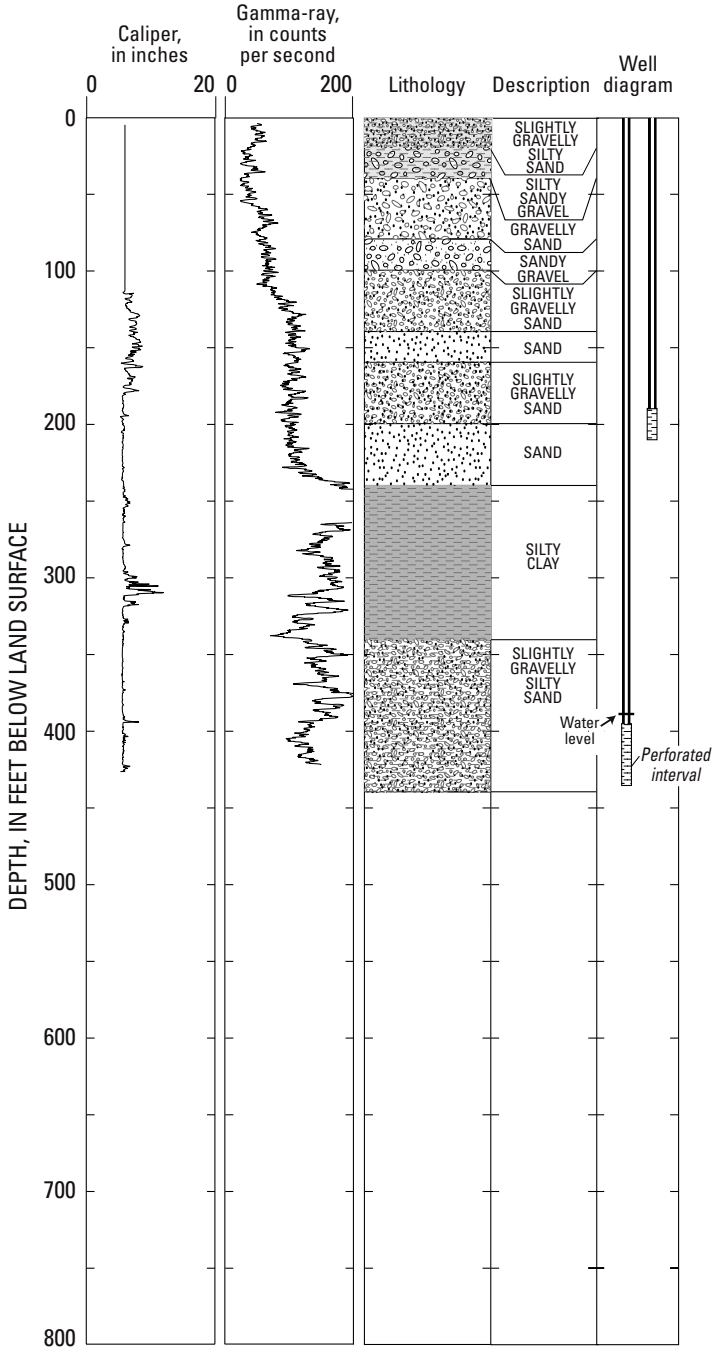
Note: Some lithologic units may have been combined for presentation in this figure and the lithologic description may not correspond exactly to the description in the lithologic log shown in table.

Figure F2. Geophysical logs, lithology, and well diagram for multiple-well monitoring site LUV-1 (wells 4N/1E-23K1 and 2) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table F3. Lithologic log for multiple-well monitoring site LUV-2 (wells 4N/1E-23R1 and 2) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 3,145 ft. Depth is in feet below land surface. Soil and rock color notation from Munsell Color (1994). Drilled by U.S. Geological Survey using under-reamer method, September 1994. Total depth drilled 440 ft. Screened intervals: 396–436 and 190–210 ft]

Depth (ft)		Description
From	To	
0	20	Silty sand, very fine to coarse, some gravel granules; well-graded; angular to subrounded; very pale orange (10YR 8/2)
20	40	Sandy gravel, very fine to very coarse, some silt and clay, rock chips; well-graded; angular to subrounded; very pale orange (10YR 8/2)
40	60	Gravelly sand, very fine to very coarse; poorly sorted; angular to subrounded; grayish orange (10YR 7/4)
60	80	Gravelly sand, very fine to very coarse; poorly sorted; angular to subrounded; light olive gray (5Y 5/2)
80	100	Sandy gravel, very fine to very coarse; poorly sorted; angular to rounded; light olive gray (5Y 5/2)
100	120	Sand, some gravel, very fine to very coarse; poorly sorted; angular to rounded; dusky yellow (5Y 6/4)
120	140	Sand, fine to coarse, minor gravel; poorly sorted; angular to rounded; light olive gray (5Y 5/2)
140	160	Sand, medium to coarse; well-sorted; angular to subrounded; dusky yellow (5Y 6/4)
160	180	Sand, medium to coarse, some gravel pebbles; well-sorted; angular to rounded; light olive brown (5Y 5/6)
180	200	Sand, medium to coarse, minor gravel granules; well-sorted; angular to subrounded; light olive brown (5Y 5/6)
200	220	Sand, medium to coarse; well-sorted; angular to subrounded; light olive brown (5Y 5/6)
220	240	Sand, medium; well-sorted; angular to subrounded; light olive brown (5Y 5/6)
240	280	Silty clay; low plasticity; fair cohesion; light olive gray (5Y 5/2)
280	300	No sample
300	320	Silty clay, trace gravel granules; low plasticity; fair cohesion; moderate yellowish brown (10YR 5/4)
320	340	Silty clay; moderate plasticity; good cohesion; moderate yellowish brown (10YR 5/4)
340	360	Silty clay, trace gravel granules; subangular; moderate plasticity; good cohesion; moderate yellowish brown (10YR 5/4)
360	380	Silty sand, very fine to very coarse, some clay, some gravel granules; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
380	400	Silty sand, very fine to very coarse, some clay; poorly sorted; angular to subrounded; moderate yellowish brown (10YR 5/4)
400	420	Silty sand, very fine to very coarse, some gravel granules, minor clay; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
420	440	Clayey sand, very fine to very coarse, some gravel granules; poorly sorted; angular 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 F3. Geophysical logs, lithology, and well diagram for multiple-well monitoring site LUV-2 (wells 4N/1E-23R1 and 2) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

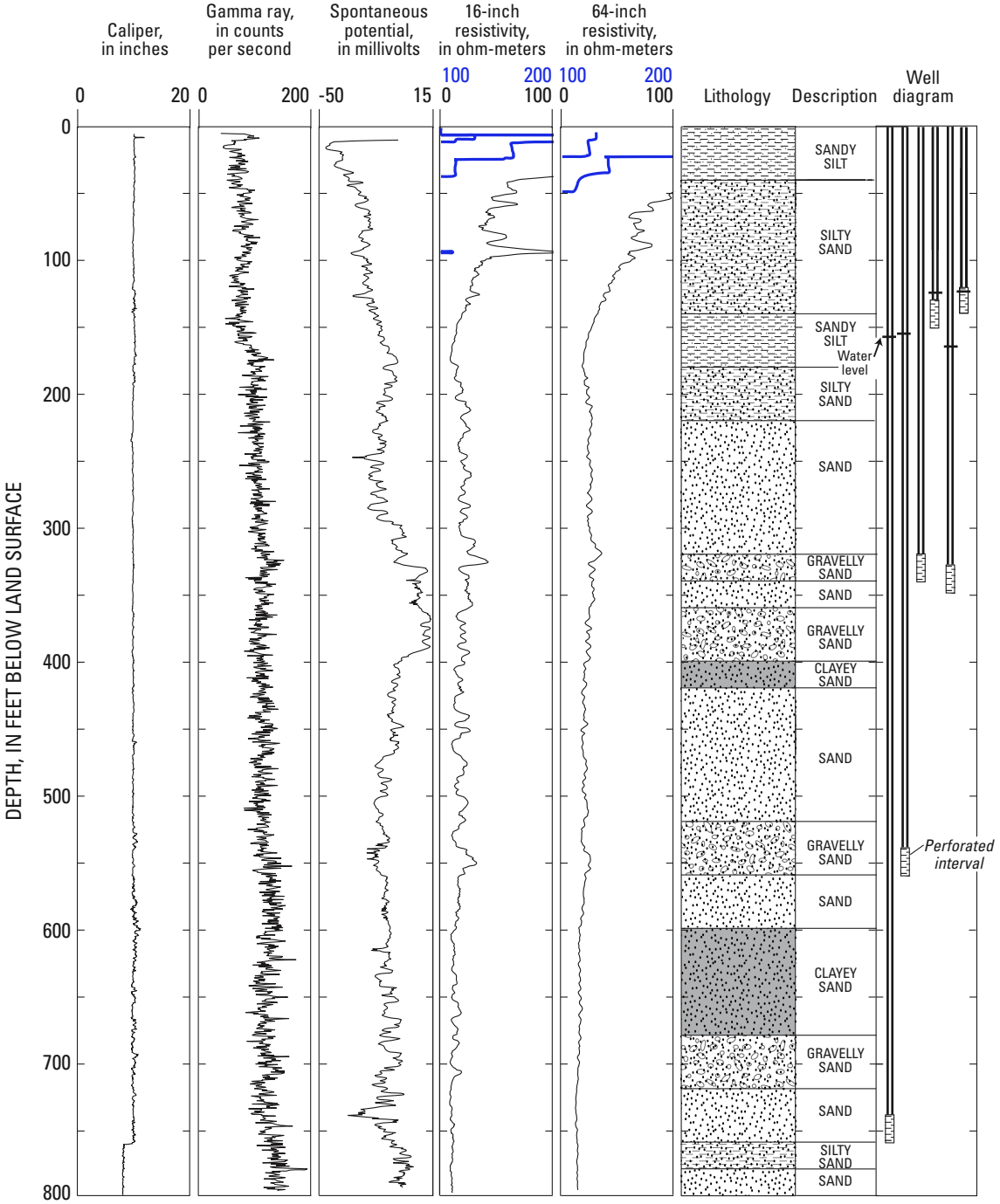
Table F4. Lithologic log for multiple-well monitoring sites RL-1 and RL-2 (wells 4N/1W-1R4–9) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

[Because of proximity, two sites were used to compile this log. Depth is in feet below land surface. Soil and rock color notation from Munsell Color (1994). RL1: Altitude of land surface, approximately 2,878 ft. Drilled by U.S. Geological Survey using mud rotary, January 1997. Total depth drilled 800 ft. Screened intervals: 740–760, 540–560, 320–340, and 130–150 ft. RL2: Altitude of land surface, approximately 2,875 ft. Drilled by U.S. Geological Survey using mud rotary, March 1997. Total depth drilled 350 ft. Screened intervals: 328–348 and 120–140 ft]

Depth (ft)		Description
From	To	
0	20	Silt, clay and fine sand, with occasional medium grains; poorly sorted; subrounded; quartz, biotite; very pale brown (10YR 8/2)
20	40	Clay, silt, and very fine sand, with occasional medium-coarse grains; poorly sorted; subrounded; clay, quartz, biotite; light gray (10YR 7/2)
40	60	Sand, fine to coarse, silt, and clay; poorly sorted; subrounded to angular; quartz, biotite; very pale brown (10YR 8/3)
60	80	Sand, fine to coarse, and silt with clay; poorly sorted; subangular; quartz, biotite; very pale brown (10YR 8/3)
80	100	Sand, coarse to fine, and silt, with occasional clay; poorly sorted; subrounded; quartz, biotite; light brownish gray (10YR 6/2)
100	120	Sand, fine to medium; and silt, with clay, occasional coarse grains; poorly sorted; subrounded; quartz, biotite; light brownish gray (10YR 6/2)
120	140	Sand, coarse to fine, and silt; poorly sorted; subrounded to subangular; quartz, biotite; light gray (10YR 7/2)
140	160	Clay, silt, and sand, very fine to fine, with occasional coarse grains; poorly sorted; subrounded; quartz, biotite; light yellowish brown (10YR 6/4)
160	180	Clay, silt, and very fine sand, with occasional medium grains; poorly sorted; subrounded to angular; quartz, biotite; light yellowish brown (10YR 6/4)
180	200	Sand, coarse to very coarse, and silt, with some medium to fine grains; poorly sorted; subangular to subrounded; quartz, biotite; yellow (10YR 7/6)
200	220	Sand, coarse to medium, and silt, with gravel; poorly sorted; angular to subrounded; quartz, biotite; yellowish brown (10YR 5/4)
220	240	Sand, coarse to medium, and gravel granules, with some silt, clay; poorly sorted; subrounded; quartz, biotite; yellow (10YR 7/6)
240	260	Sand, coarse to medium, with some silt; moderately sorted; subrounded; quartz, biotite; brownish yellow (10YR 6/6)
260	280	Sand, coarse to medium, with some gravel, clay; poorly sorted; angular to subrounded; quartz, biotite; light yellowish brown (10YR 6/4)
280	300	Sand, coarse to very coarse, with some fine grains; poorly sorted; subrounded; quartz, biotite; light yellowish brown (10YR 6/4)
300	320	Sand, coarse to medium, with very coarse grains, some clay; poorly sorted; subrounded to angular; quartz, biotite; light yellowish brown (10YR 6/4)
320	340	Sand, very coarse to medium, and gravel, with some fine sand, silt; poorly sorted; subrounded to angular; quartz, biotite; light yellowish brown (10YR 6/4)
340	360	Sand, very coarse to medium, with fine sand, silt; poorly sorted; subrounded to angular; quartz, biotite; yellowish brown (10YR 5/6)
360	380	Sand, fine to very coarse, and gravel, with some clay, silt; poorly sorted; subrounded to angular; quartz; yellow (10YR 7/6)
380	400	Sand, medium to very coarse, and gravel, with clay balls; poorly sorted; subrounded to subangular; quartz, biotite; yellowish brown (10YR 5/6)
400	420	Sand, fine to medium, and clay, with occasional very coarse sand, gravel; poorly sorted; subrounded to subangular; quartz, biotite; brownish yellow (10YR 6/6)

Table F4. Lithologic log for multiple-well monitoring sites RL-1 and RL-2 (wells 4N/1W-1R4–9) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Depth (ft)		Description
From	To	
420	440	Sand, medium to fine, with some very coarse sand; moderately poorly sorted, subrounded; yellowish brown (10YR 5/4)
440	460	Sand, medium to coarse, with some gravel, clay; poorly sorted; subrounded to angular; quartz, minor biotite; light yellowish brown (10YR 6/4)
460	480	Sand, fine to medium, with clay, occasional gravel; poorly sorted; subrounded to subangular; quartz, minor biotite; yellowish brown (10YR 5/4)
480	500	Sand, medium to fine, with coarse sand, some gravel, minor clay; poorly sorted; subrounded; quartz; brownish yellow (10YR 6/6)
500	520	Sand, fine to coarse, with some clay, silt; poorly sorted; subrounded; quartz, minor biotite; yellowish brown (10YR 5/4)
520	540	Sand, medium to very coarse, and gravel, with some clay; poorly sorted; subrounded to angular; quartz; yellowish brown (10YR 5/4)
540	560	Sand, very coarse to medium, and gravel, with some clay; poorly sorted; subrounded to angular; quartz, minor biotite; yellowish brown (10YR 5/4)
560	580	Sand, medium to coarse, with gravel, clay; poorly sorted; subrounded to subangular; quartz; yellowish brown (10YR 5/6)
580	600	Sand, medium to very coarse, and gravel; poorly sorted; subrounded to subangular; quartz, minor biotite; yellowish brown (10YR 5/6)
600	640	Sand, medium to coarse, and clay, with gravel; poorly sorted, subrounded to subangular; quartz; light yellowish brown (10YR 6/4)
640	660	Sand, medium to very coarse, and clay, with some gravel; poorlysorted; subrounded to subangular; quartz; yellowish brown (10YR 5/4)
660	680	Sand, medium to very coarse, and clay; poorly sorted; subrounded; quartz; yellowish brown (10YR 5/4)
680	700	Sand, fine to coarse, with silt, moderately sorted; subrounded; quartz; very pale brown (10YR 7/4)
700	720	Sand, coarse to medium, and gravel, with silt; poorly sorted; subrounded to angular; quartz, minor biotite; yellowish brown (10YR 5/4)
720	740	Sand, coarse to fine, and silt, with clay; poorly sorted; subrounded; quartz; yellowish brown (10YR 5/4)
740	760	Sand, very coarse to medium, with clay, some gravel; poorly sorted; subrounded to angular; quartz; pale brown (10YR 6/3)
760	780	Sand, medium to very coarse, and silt, with clay, gravel; poorly sorted; subrounded to subangular; quartz; pale brown (10YR 6/3)
780	800	Sand, very coarse, with gravel, clay; poorly sorted; subangular to angular; quartz; pale brown (10YR 6/3)



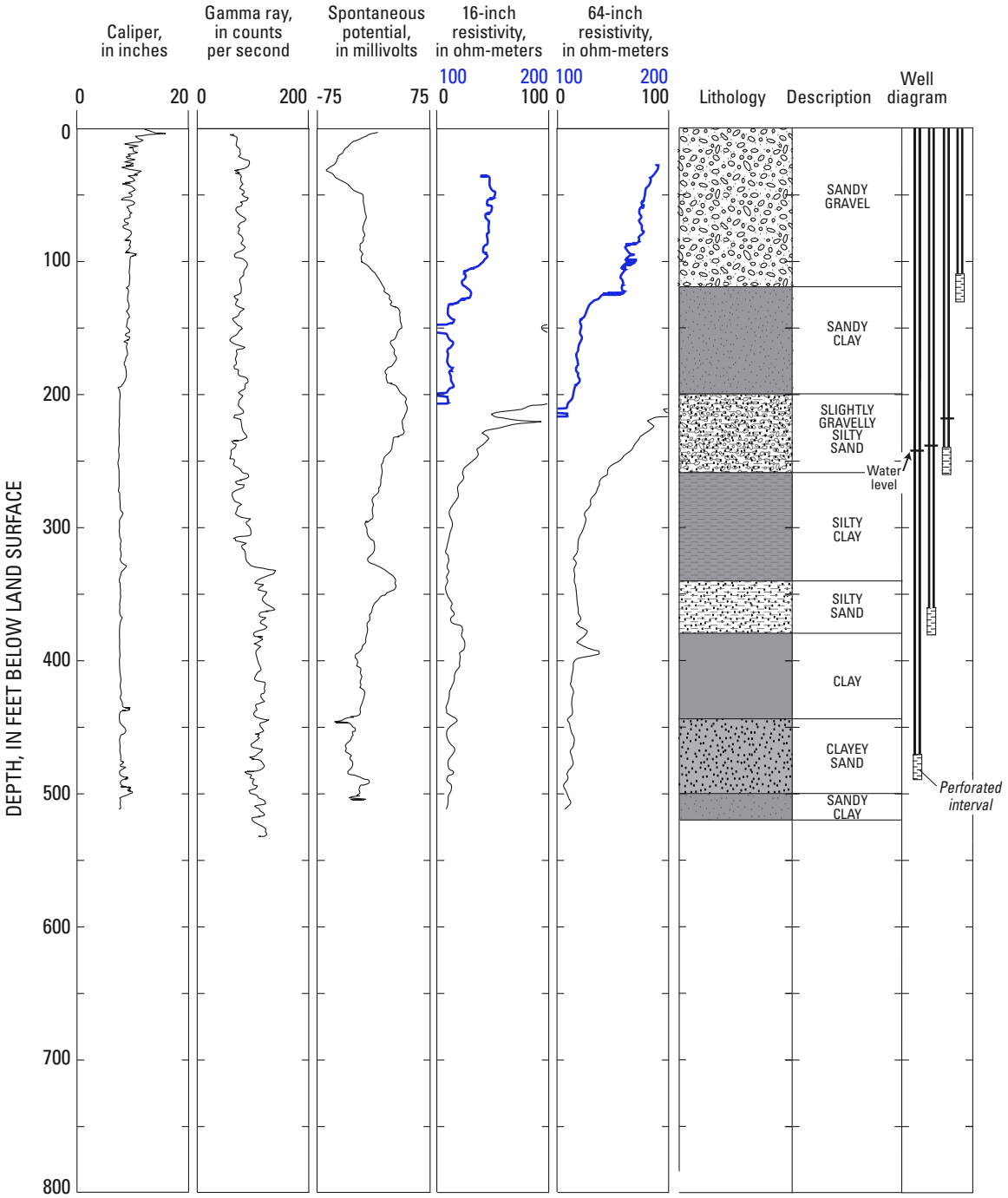
Note: Some lithologic units may have been combined for presentation in this figure and the lithologic description may not correspond exactly to the description in the lithologic log shown in table.

Figure F4. Geophysical logs, lithology, and well diagram for multiple-well monitoring sites RL-1 and RL-2 (wells 4N/1W-1R4–9) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table F5. Lithologic log for multiple-well monitoring site Pipeline 1 (wells 4N/1W-13R1–4) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 3,075 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, January 1995. Total depth drilled 520 ft. Screened intervals: 470–490, 360–380, 240–260, and 110–130 ft]

Depth (ft)		Description
From	To	
0	80	Sandy gravel, fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
80	100	Silty gravel, some sand, very fine to very coarse; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
100	120	Sandy gravel, some silt, very fine to very coarse; poorly sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
120	140	Silty gravel, some sand, very fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
140	160	Sandy clay, some gravel and silt, very fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
160	200	Sandy clay, some gravel, very fine to very coarse; poorly sorted; angular to rounded; grayish orange (10YR 7/4)
200	220	Clayey sand, very fine to very coarse, some silt, minor gravel; moderately well sorted; angular to rounded; grayish orange (10YR 7/4)
220	260	Clayey sand, very fine to medium, some silt; well-sorted; angular to subrounded; grayish orange (10YR 7/4)
260	280	Sandy clay, very fine to fine, some silt; very well sorted; angular to rounded; grayish orange (10YR 7/4)
280	300	Silty clay, minor sand, very fine to coarse; well-sorted; angular to rounded; grayish orange (10YR 7/4)
300	320	Silty clay, minor sand, very fine to coarse, skewed toward fine; well-sorted; angular to subrounded; grayish orange (10YR 7/4)
320	340	Silty clay, minor sand, very fine to medium; very well sorted; angular to subrounded; grayish orange (10YR 7/4)
340	360	Clayey sand, very fine to medium; well-sorted; angular to rounded; moderate yellowish brown (10YR 5/4)
360	380	Silty sand, some clay, very fine to coarse; well-sorted, angular to subrounded; grayish orange (10YR 7/4)
380	400	Sandy clay, some silt, very fine to very coarse, skewed toward fine; well-sorted; angular to rounded; grayish orange (10YR 7/4)
400	420	Clayey sand, some silt, very fine to coarse; well-sorted; angular to subrounded; grayish orange (10YR 7/4)
420	440	Sandy clay, some silt, very fine to coarse; well-sorted; angular to subrounded; grayish orange (10YR 7/4)
440	460	Clayey sand, very fine to very coarse; poorly sorted; angular to subrounded; grayish orange (10YR 7/4)
460	480	Clayey sand, very fine to very coarse; poorly sorted; angular to subrounded; grayish orange (10YR 7/4)
480	500	Clayey sand, very fine to very coarse, minor gravel and silt; poorly sorted; well-graded; angular to subrounded; grayish orange (10YR 7/4)
500	520	Sandy clay, some gravel granules, very fine to very coarse sand; poorly sorted; moderately well graded; angular to subrounded; grayish orange (10YR 7/4)



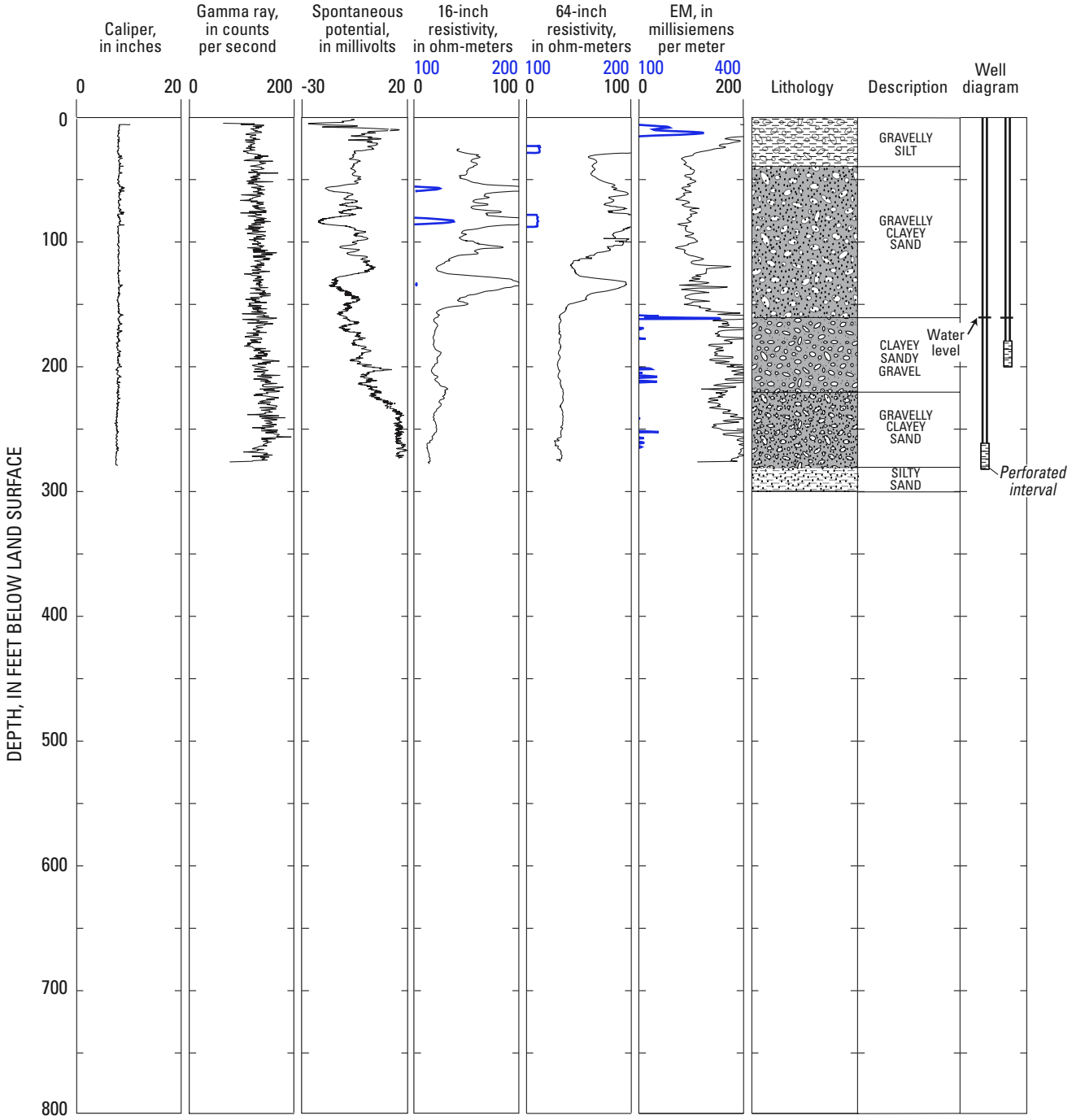
Note: Some lithologic units may have been combined for presentation in this figure and the lithologic description may not correspond exactly to the description in the lithologic log shown in table.

Figure F5. Geophysical logs, lithology, and well diagram for multiple-well monitoring site Pipeline 1 (wells 4N/1W-13R1–4) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table F6. Lithologic log for multiple-well monitoring site North Side Rd-1 (wells 5N/1E-8N3 and 4) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

[Altitude of land surface, approximately 2,875 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, January 1997. Total depth drilled 300 ft. Screened intervals: 260–280 and 180–200 ft]

Depth (ft)		Description
From	To	
0	20	Clay, silt, and gravel, with fine sand; poorly sorted; angular to subrounded; granitic rock fragments; light yellowish brown (10YR 6/4)
20	40	Sand, fine to coarse, silt and gravel, granules to pebbles, with clay; poorly sorted; angular to subrounded; metavolcanic rock fragments; light yellowish brown (10YR 6/4)
40	60	Sand, coarse to fine, silt, and gravel, granules to pebbles, with some clay; poorly sorted; subrounded to angular; granitic rock fragments; light yellowish brown (10YR 6/4)
60	80	Sand, fine to medium, clay, and pebbles; poorly sorted, subrounded to angular; metavolcanic and granitic fragments; light yellowish brown (10YR 6/4)
80	100	Sand, medium to fine, and silt with clay, some gravel; poorly sorted; subrounded to angular; granitic fragments; light yellowish brown (10YR 6/4)
100	120	Sand, fine to very coarse, and silt, with gravel, granules to pebbles, some clay; poorly sorted; subrounded to angular; granitic fragments; light yellowish brown (10YR 6/4)
120	140	Sand, medium to very coarse, and clay, with gravel, granules to pebbles, silt; poorly sorted; subrounded to subangular; granitic fragments; light yellowish brown (10YR 6/4)
140	160	Sand, very coarse to medium, and gravel, granules to pebbles, with some clay; poorly sorted; subrounded to angular; yellowish brown (10YR 5/6)
160	180	Gravel, granules to pebbles, with clay, some sand; moderately sorted; angular to subrounded; metavolcanic and granitic fragments; yellowish brown (10YR 5/4)
180	200	Gravel, granules to pebbles, with some medium to very coarse sand, occasional clay; moderately sorted; angular to subrounded; metavolcanic and granitic fragments; brown (10YR 5/3)
200	220	Gravel, granules to pebbles, and sand, very coarse to coarse, occasional clay; poorly sorted; angular; granitic and metavolcanic fragments; yellowish brown (10YR 5/4)
220	240	Sand, medium to fine, and clay, with gravel; poorly sorted; subrounded to angular; light yellowish brown (10YR 6/4)
240	260	Sand, coarse to fine, and clay, with gravel; poorly sorted; subrounded to subangular; quartz; light yellowish brown (10YR 6/4)
260	280	Sand, medium to fine, and clay, with coarse sand, some gravel; poorly sorted; subrounded to angular; quartz, muscovite, metavolcanic fragments; yellowish brown (10YR 5/4)
280	300	Sand, medium to fine, and silt, with some coarse sand, poorly sorted; subrounded to subangular; quartz; 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 F6. Geophysical log, lithology, and well diagram for multiple-well monitoring site North Side Rd-1 (wells 5N/1E-8N3 and 4) in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California.

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California

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

State well number 004N001E23K001S
Site identification number 342518116505401
Common name LUV-1 NO.1
Southeast of town of Lucerne Valley. Drilled observation well. Diameter 2 inches, depth 660 feet, perforated 640–660 feet. Altitude of land-surface datum 3,110 feet. Reported measurements provided by Mojave Water Agency. 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
Oct 05, 1994	354.27	V	Aug 29, 1995	355.07	V	Sep 27, 1996	354.61	R	Nov 07, 1997	355.30	R
Oct 25	354.20	R	Sep 25	355.34	V	Oct 22	354.66	R	Nov 26	354.75	R
Nov 29	353.58	R	Oct 30	355.12	V	Nov 27	354.25	R	Jan 05, 1998	353.87	R
Dec 20	353.06	R	Nov 27	355.19	V	Jan 03, 1997	353.20	R	Jan 30	353.54	R
Jan 24, 1995	351.89	V	Dec 18	353.81	V	Jan 31	352.82	R	Mar 02	352.85	R
Jan 25	351.89	R	Jan 31, 1996	352.58	V	Feb 28	352.38	R	Mar 27	352.36	R
Feb 28	351.34	R	Feb 29	352.31	V	Mar 28	352.43	R	Apr 23	352.56	R
Mar 30	351.14	R	Mar 29	351.91	V	Apr 30	352.84	R	May 26	352.83	R
Apr 25	351.32	V	Apr 29	351.97	R	May 29	353.56	R	Jun 16	352.84	V
May 25	351.93	V	May 29	352.00	R	Jul 01	354.41	R	Jun 25	355.68	R
Jun 06	353.46	V	Jul 03	352.73	R	Jul 31	354.63	R	Jul 28	354.35	R
Jun 27	352.93	V	Jul 31	353.53	R	Sep 02	355.76	R	Aug 24	355.10	R
Jul 25	353.86	V	Aug 22	353.99	R	Sep 25	355.70	R	Sep 26	355.39	R

HIGHEST	351.14	Mar 30, 1995
LOWEST	355.76	Sep 02, 1997

State well number 004N001E23K002S
Site identification number 342518116505402
Common name LUV-1 NO.2
Southeast of town of Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 381.2 feet in 1996, perforated 360–380 feet. Altitude of land-surface datum 3,110 feet. Reported measurements provided by Mojave Water Agency. 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
Oct 05, 1994	359.70	V	Sep 25, 1995	354.06	V	Oct 22, 1996	355.25	R	Nov 26, 1997	358.62	R
Oct 25	364.04	R	Oct 30	354.11	V	Nov 27	354.43	R	Jan 05, 1998	358.31	R
Nov 29	359.63	R	Nov 27	353.81	V	Jan 03, 1997	351.01	R	Jan 30	358.31	R
Dec 20	358.25	R	Dec 18	354.07	V	Jan 31	356.06	R	Mar 02	357.81	R
Jan 24, 1995	355.72	V	Jan 31, 1996	354.39	V	Feb 28	356.31	R	Mar 27	357.48	R
Jan 25	355.72	R	Feb 29	354.45	V	Mar 28	357.25	R	Apr 23	357.68	R
Feb 28	354.13	R	Mar 29	354.27	V	Apr 30	357.57	R	May 26	357.80	R
Mar 30	353.65	R	Apr 29	354.26	R	May 29	358.03	R	Jun 16	357.54	V
Apr 25	353.46	V	May 29	352.26	R	Jul 01	358.53	R	Jun 25	358.29	R
May 25	353.45	V	Jul 03	353.42	R	Jul 31	358.72	R	Jul 28	358.70	R
Jun 27	353.59	V	Jul 31	354.65	R	Sep 02	359.05	R	Aug 24	359.10	R
Jul 25	353.76	V	Aug 22	354.98	R	Sep 25	358.92	R	Sep 26	359.25	R
Aug 29	354.03	V	Sep 27	355.29	R	Nov 07	358.30	R			

HIGHEST	359.10	Aug 24, 1998
LOWEST	364.04	Oct 25, 1994

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001E23R001S
Site identification number 342504116503801
Common name LUV-2 NO.1
Southeast of town of Lucerne Valley. Drilled observation well. Diameter 2 inches, depth 436 feet, perforated 396–436 feet. Altitude of land-surface datum 3,145 feet. Reported measurements provided by Mojave Water Agency. Water-level records available 1994–95. Well obstructed by wedged sample pump since 1995.

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 05, 1994	389.24	V	Apr 25, 1995	389.66	V	Oct 30, 1995		VO	Jul 03, 1996		RO
Oct 25	389.55	R	May 25	389.69	V	Nov 27		VO	Jul 31		RO
Nov 29	389.93	R	Jun 13	389.96	S	Dec 18		VO	Aug 22		RO
Dec 20	389.81	R	Jun 27		VO	Jan 31, 1996		VO	Sep 27		RO
Jan 24, 1995	389.56	V	Jul 25		VO	Feb 29		VO	Oct 22		RO
Jan 25	389.56	R	Aug 29		VO	Apr 29		RO	Nov 27		RO
Feb 28	389.72	R	Sep 25		VO	May 29		RO	Jun 16, 1998		O
Mar 30	389.78	V									

HIGHEST	389.24	Oct 05, 1994
LOWEST	389.96	Jun 13, 1995

State well number 004N001E23R002S
Site identification number 342504116503802
Common name LUV-2 NO.2
Southeast of town of Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 207 feet in 1996, perforated 190–210 feet. Dry hole since drilled in 1994. Altitude of land-surface datum 3,145 feet. Periodic monitoring by Mojave Water Agency.

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 05, 1994		VD	Nov 27, 1995		VD	Jul 03, 1996		VD	Jan 03, 1997		RD
Oct 25		VD	Dec 18		VD	Jul 31		VD	Jan 31		RD
Nov 29		VD	Jan 31, 1996		VD	Aug 22		RD	Feb 28		RD
May 25, 1995		VD	Mar 29		VD	Sep 27		RD	Mar 28		RD
Jun 27		VD	Apr 29		RD	Oct 22		RD	Apr 30		RD
Aug 29		VD	May 29		VD	Nov 27		RD	Jun 16, 1998		VD
Oct 30		VD									

HIGHEST	—
LOWEST	—

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001W01R004S
Site identification number 342738116553901
Common name RL-1 at 760
In Lucerne Valley north of Rabbit Springs Road. Drilled observation well. Diameter 2 inches, depth 760 feet, perforated 740–760 feet. Altitude of land-surface datum 2,878 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 03, 1997	156.57	V	Apr 07, 1997	157.09	V	May 26, 1998	155.85	R	Jul 28, 1998	158.00	R
Feb 21	153.85	V	Mar 10, 1998	153.63	V	Jun 17	155.85	V	Aug 24	158.77	R
Mar 23	155.82	V	Mar 27	154.11	R	Jun 25	156.90	R	Sep 26	159.06	R
Apr 01	156.40	V	Apr 23	155.64	R						

HIGHEST	153.63	Mar 10, 1998
LOWEST	159.06	Sep 26, 1998

State well number 004N001W01R005S
Site identification number 342738116553902
Common name RL-1 at 560
In Lucerne Valley north of Rabbit Springs Road. Drilled observation well. Diameter 2 inches, depth 560 feet, perforated 540–560 feet. Altitude of land-surface datum 2,878 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 03, 1997	173.70	V	Apr 07, 1997	155.91	V	May 26, 1998	154.10	R	Jul 28, 1998	156.35	R
Feb 21	154.47	V	Mar 10, 1998	151.67	V	Jun 17	154.15	V	Aug 24	157.52	R
Mar 23	155.25	V	Mar 27	151.82	R	Jun 25	154.89	R	Sep 26	157.27	R
Apr 01	154.90	V	Apr 23	154.26	R						

HIGHEST	151.67	Mar 10, 1998
LOWEST	173.70	Feb 03, 1997

State well number 004N001W01R006S
Site identification number 342738116553903
Common name RL-1 at 340
In Lucerne Valley north of Rabbit Springs Road. Drilled observation well. Diameter 2 inches, depth drilled 340 feet. Altitude of land-surface datum 2,878 feet. Well destroyed.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Mar 27, 1998		RD	Apr 23, 1998		RW

HIGHEST	—
LOWEST	—

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001W01R007S
Site identification number 342738116553904
Common name RL-1 at 150
In Lucerne Valley north of Rabbit Springs Road. Drilled observation well. Diameter 2 inches, depth 150 feet, perforated 130–150 feet. Altitude of land-surface datum 2,878 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Mar 10, 1998	123.77	V	May 26, 1998	124.30	R	Jun 25, 1998	124.45	R	Aug 24, 1998	127.97	R
Mar 27	124.83	R	Jun 17	124.21	V	Jul 28	124.90	R	Sep 26	124.81	R
Apr 23	122.97	R									

HIGHEST	122.97	Apr 23, 1998
LOWEST	124.97	Aug 24, 1998

State well number 004N001W01R008S
Site identification number 342738116553905
Common name RL-2 at 348
In Lucerne Valley north of Rabbit Springs Road. Drilled observation well. Diameter 2 inches, depth measured 345.5 feet in 1997, perforated 328–348 feet. Altitude of land-surface datum 2,878 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Apr 01, 1997	163.56	V	Mar 27, 1998	150.78	R	Jun 17, 1998	153.58	V	Aug 24, 1998	157.10	R
Apr 07	155.27	V	Apr 23	153.76	R	Jun 25	154.07	R	Sep 26	156.41	R
Mar 10, 1998	150.83	V	May 26	153.55	R	Jul 28	155.85	R			

HIGHEST	150.78	Mar 27, 1998
LOWEST	163.56	Apr 01, 1997

State well number 004N001W01R009S
Site identification number 342738116553906
Common name RL-2 at 140
In Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 136.5 feet in 1997, perforated 120–140 feet. Altitude of land-surface datum 2,875 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Apr 01, 1997	123.20	V	Mar 27, 1998	123.98	R	Jun 17, 1998	124.30	V	Aug 24, 1998	125.04	R
Apr 07	122.08	V	Apr 23	124.11	R	Jun 25	124.55	R	Sep 26	125.28	R
Mar 10, 1998	123.77	V	May 26	124.35	R	Jul 28	124.85	R			

HIGHEST	122.08	Apr 07, 1997
LOWEST	125.28	Sep, 26, 1998

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001W13R001S
Site identification number 342544116555001
Common name PIPELINE-1 at 490
In Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 489.7 feet in 1996, perforated 470–490 feet. Altitude of land-surface datum 3,075 feet. Reported measurements provided by Mojave Water Agency. Water-level records available since 1995.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 23, 1995	284.72	V	Jul 26, 1995	286.1	V	Jul 03, 1996	285.76	R	Sep 25, 1997	286.25	R
Mar 30	284.46	V	Jul 27	286.1	V	Jul 30	286.72	R	Nov 07	286.05	R
Apr 25	284.47	V	Jul 31	286.2	V	Aug 22	287.20	R	Nov 26	285.80	R
May 25	284.77	V	Aug 01	286.2	V	Sep 27	287.82	R	Jan 05, 1998	285.08	R
Jun 21	285.07	V	Aug 29	286.91	V	Oct 22	287.52	R	Jan 30	285.48	R
Jun 27	285.31	V	Sep 07	287.17	V	Nov 27	286.92	R	Mar 02	285.24	R
Jul 14	285.7	V	Sep 25	287.02	V	Jan 03, 1997	285.87	R	Mar 06	288.50	V
Jul 15	285.8	V	Oct 30	286.70	V	Jan 31	285.61	R	Mar 27	285.02	R
Jul 16	285.8	V	Nov 27	286.28	V	Feb 28	285.27	R	Apr 23	285.25	R
Jul 17	285.8	V	Dec 18	285.79	V	Mar 28	285.28	R	May 26	285.35	R
Jul 18	285.9	V	Jan 31, 1996	285.10	V	Apr 30	285.35	R	Jun 17	285.20	V
Jul 19	285.9	V	Feb 29	285.04	V	May 29	285.53	R	Jun 25	285.86	R
Jul 20	286.0	V	Mar 29	284.62	V	Jul 01	285.99	R	Jul 28	286.22	R
Jul 21	286.0	V	Apr 29	284.97	R	Jul 31	286.12	R	Aug 24	286.92	R
Jul 23	285.9	V	May 27	284.75	R	Sep 02	286.59	R	Sep 26	287.70	R
Jul 25	286.02	V									

HIGHEST	284.46	Mar 30, 1995
LOWEST	288.50	Mar 06, 1998

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001W13R002S
Site identification number 342544116555002
Common name PIPELINE-1 at 380
In Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 370.6 feet in 1996, perforated 360–380 feet. Altitude of land-surface datum 3,075 feet. Reported measurements provided by Mojave Water Agency. Water-level records available since 1995.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 23, 1995	276.81	V	Jul 26, 1995	285.8	V	Jul 03, 1996	285.31	R	Sep 25, 1997	279.28	R
Mar 30	276.01	V	Jul 27	286.0	V	Jul 30	286.39	R	Nov 07	278.29	R
Apr 25	276.60	V	Jul 31	285.8	V	Aug 22	288.05	R	Nov 26	277.19	R
May 25	278.62	V	Aug 01	285.7	V	Sep 27	287.38	R	Jan 05, 1998	276.40	R
Jun 21	282.01	V	Aug 29	287.52	V	Oct 22	285.38	R	Jan 30	275.18	R
Jun 27	282.00	V	Sep 07	287.63	V	Nov 27	290.30	R	Mar 02	274.45	R
Jul 14	284.8	V	Sep 25	287.12	V	Jan 03, 1997	287.24	R	Mar 06	277.68	V
Jul 15	284.9	V	Oct 30	283.28	V	Jan 31	276.57	R	Mar 27	274.31	R
Jul 16	285.1	V	Nov 27	280.46	V	Feb 28	275.98	R	Apr 23	274.75	R
Jul 17	285.1	V	Dec 18	278.88	V	Mar 28	276.30	R	May 26	276.01	R
Jul 18	285.1	V	Jan 31, 1996	276.52	V	Apr 30	276.81	R	Jun 17	277.1	V
Jul 19	285.2	V	Feb 29	275.05	V	May 29	277.85	R	Jun 25	277.84	R
Jul 20	285.2	V	Mar 29	274.45	V	Jul 01	279.65	R	Jul 28	281.45	R
Jul 21	285.3	V	Apr 29	277.22	R	Jul 31	279.94	R	Aug 24	284.47	R
Jul 23	285.4	V	May 27	276.77	R	Sep 02	280.58	R	Sep 26	284.20	R
Jul 25	285.64	V									

HIGHEST	274.31	Mar 27, 1998
LOWEST	290.30	Nov 27, 1996

State well number 004N001W13R003S
Site identification number 342544116555003
Common name PIPELINE-1 at 260
In Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 237.1 feet in 1996, perforated 240–260 feet. Altitude of land-surface datum 3,075 feet. Reported measurements provided by Mojave Water Agency. Water-level records available since 1995.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 23, 1995	236.63	V	Jul 26, 1995	236.9	V	May 29, 1996	225.05	R	Sep 02, 1997	232.02	R
Mar 30		VO	Jul 27	236.9	V	Jul 03	225.91	R	Sep 25	232.19	R
Apr 25		VO	Jul 31	236.9	V	Jul 30	226.53	R	Nov 07	232.43	R
May 25		VO	Aug 01	236.8	V	Aug 22	226.98	R	Nov 26	232.41	R
Jun 27	236.80	V	Aug 01	236.8	V	Sep 27	227.88	R	Jan 05, 1998	232.16	R
Jul 14	236.89	V	Aug 29	236.64	V	Oct 22	228.13	R	Jan 30	233.23	R
Jul 15	236.90	V	Sep 07	230.66	V	Nov 27	228.75	R	Mar 02	233.35	R
Jul 16	236.90	V	Sep 25	232.15	V	Jan 03, 1997	229.26	R	Mar 27	233.52	R
Jul 17	236.91	V	Oct 30	221.43	V	Jan 31	229.53	R	Apr 23	233.81	R
Jul 18	236.88	V	Nov 27	217.20	V	Feb 28	230.07	R	May 26	233.98	R
Jul 19	236.90	V	Dec 18	218.00	V	Mar 28	230.23	R	Jun 17	233.9	V
Jul 20	236.90	V	Jan 31, 1996	220.57	V	Apr 30	230.66	R	Jun 25	234.25	R
Jul 21	236.90	V	Feb 29	222.25	V	May 29	230.90	R	Jul 28	234.44	R
Jul 23	236.90	V	Mar 29	223.34	V	Jul 01	231.35	R	Aug 24	234.44	R
Jul 25	236.90	V	Apr 29	224.39	R	Jul 31	231.57	R	Sep 26	234.91	R

HIGHEST	217.20	Nov 27, 1995
LOWEST	236.91	Jul 17, 1995

Table F7. Water-level data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

State well number 004N001W13R004S
Site identification number 342544116555004
Common name PIPELINE-1 at 130
In Lucerne Valley. Drilled observation well. Diameter 2 inches, depth measured 126.9 feet in 1996, perforated 110–130 feet. Altitude of land-surface datum 3,075 feet. Reported measurements provided by Mojave Water Agency.Water-level records available since 1995.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Mar 30, 1995		VD	Jan 31, 1996		VD	Aug 22, 1996		RD	Mar 28, 1997		RD
Apr 25		VD	Feb 29		D	Sep 27		RD	Apr 30		RD
May 25		VD	Mar 29		VD	Oct 22		RD	Mar 06, 1998		VD
Jun 27		VD	Apr 29		RD	Nov 27		RD	Jun 17		VD
Oct 30		VD	May 29		RD	Jan 03, 1997		RD			
Nov 27		VD	Jul 03		RD	Jan 31		RD			
Dec 18		VD	Jul 30		RD	Feb 28		RD			

HIGHEST	—	
LOWEST	—	

State well number 005N001E08N003S
Site identification number 343155116543401
Common name NORTH SIDE RD-1 at 280
In Lucerne Valley east of Highway 247. Drilled observation well. Diameter 2 inches, depth 280 feet, perforated 260–280 feet. Altitude of land-surface datum 2,875 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 20, 1997	153.64	V	Mar 27, 1998	153.67	R	Jun 17, 1998	153.45	V	Aug 24, 1998	153.83	R
Mar 31	153.36	V	Apr 23	153.59	R	Jun 25	153.62	R	Sep 26	153.86	R
Mar 18, 1998	153.58	S	May 26	153.60	R	Jul 28	153.90	R			

HIGHEST	153.36	Mar 31, 1997
LOWEST	153.90	Jul 28, 1998

State well number 005N001E08N004S
Site identification number 343155116543402
Common name NORTH SIDE RD-1 at 200
In Lucerne Valley east of Highway 247. Drilled observation well. Diameter 2 inches, depth 200 feet, perforated 180–200 feet. Altitude of land-surface datum 2,875 feet. Water-level records available since 1997.

WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS	DATE	WATER LEVEL	MS
Feb 20, 1997	153.78	V	Mar 27, 1998	153.86	R	Jun 17, 1998	153.6	V	Aug 24, 1998	153.79	R
Mar 31	153.45	V	Apr 23	153.71	R	Jun 25	153.65	R	Sep 26	153.91	R
Mar 18, 1998	153.82	S	May 26	153.69	R	Jul 28	153.70	R			

HIGHEST	153.45	Mar 31, 1997
LOWEST	153.91	Sep 26, 1998

Table F8. Water-quality data for monitoring sites in the Lucerne 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 F1. 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)
LUV-1 NO 2	004N001E23K001S	342518116505401	10-06-94	1500	25.7	—
			06-06-95	1930	20.0	24.0
LUV-2 NO 2	004N001E23R001S	342504116503801	10-05-94	1600	24.3	—
RL1 at 760	004N001W01R004S	342738116553901	03-23-97	1400	22.4	21.9
RL1 at 560	004N001W01R005S	342738116553902	03-23-97	1800	22.3	17.8
RL2 at 348	004N001W01R008S	342738116553905	04-18-97	1015	21.9	23.9
Pipeline 1 at 490	004N001W13R001S	342544116555001	03-01-95	1630	21.6	13.9
Pipeline 1 at 380	004N001W13R002S	342544116555002	03-01-95	1130	21.1	14.6
Pipeline 1 at 260	004N001W13R003S	342544116555003	10-12-95	1200	23.9	30.0
North Side Rd-1 at 280	005N001E08N003S	343155116543401	03-31-97	0910	21.3	14.2
North Side Rd-1 at 200	005N001E08N004S	343155116543402	03-31-97	1045	21.2	16.5

Common name	Date	Time	Depth below land surface (water level) (feet)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH water whole field (standard units)	Alkalinity wat dis fix end field $CaC0_3$ (mg/L)	Alkalinity wat dis tot it field (mg/L as $CaCO_3$)
LUV-1 NO 2	10-06-94	1500	—	510	—	9.2	74	73
	06-06-95	1930	353.46	530	—	9.1	82	82
LUV-2 NO 2	10-05-94	1600	398.24	582	—	7.8	190	192
RL1 at 760	03-23-97	1400	155.80	8,390	0.6	8.0	26	—
RL1 at 560	03-23-97	1800	155.25	1,050	1.2	8.2	80	80
RL2 at 348	04-18-97	1015	157.46	552	—	7.8	150	150
Pipeline 1 at 490	03-01-95	1630	284.19	365	13.0	7.9	160	158
Pipeline 1 at 380	03-01-95	1130	—	420	3.2	7.7	180	187
Pipeline 1 at 260	10-12-95	1200	230.23	1,360	—	7.4	210	211
North Side Rd-1 at 280	03-31-97	0910	153.40	5,110	3.0	7.3		
North Side Rd-1 at 200	03-31-97	1045	153.40	4,470	9.0	7.5		

Common name	Date	Time	Carbonate water dis it field (mg/L as CO_3)	Bicarbonate water dis it field (mg/L as HCO_3)	Nitrogen, ammonia dissolved (mg/L as N)	Nitrogen, nitrite dissolved (mg/L as N)	Nitrogen, ammonia + organic dissolved (mg/L as N)
LUV-1 NO 2	10-06-94	1500	10	60	0.020	0.390	0.20
	06-06-95	1930	7	85	.040	.080	<.20
LUV-2 NO 2	10-05-94	1600	—	234	.070	.190	<.20
RL1 at 760	03-23-97	1400	—	—	.180	<.010	<.20
RL1 at 560	03-23-97	1800	—	97	<.015	<.010	<.20
RL2 at 348	04-18-97	1015	—	183	<.015	<.010	<.20
Pipeline 1 at 490	03-01-95	1630	—	193	<.015	<.010	<.20
Pipeline 1 at 380	03-01-95	1130	—	228	<.015	<.010	<.20
Pipeline 1 at 260	10-12-95	1200	—	258	.120	<.010	.50
North Side Rd-1 at 280	03-31-97	0910	—	90	.050	<.010	<.20
North Side Rd-1 at 200	03-31-97	1045	—	76	<.015	<.010	<.20

Table F8. Water-quality data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Alkalinity wat dis fix end field $CaC0_3$ (mg/L)	Alkalinity wat dis tot it field (mg/L as $CaCO_3$)	Nitrogen, NO_2+NO_3 dissolved (mg/L as N)	Phosphorus dissolved (mg/L as P)	Phosphorus ortho, dissolved (mg/L as P)
LUV-1 NO 2	10-06-94	1500	74	73	1.50	0.050	0.070
	06-06-95	1930	82	82	1.20	.030	.080
LUV-2 NO 2	10-05-94	1600	190	192	2.20	.010	.020
RL1 at 760	03-23-97	1400	26	—	<.050	<.010	<.010
RL1 at 560	03-23-97	1800	80	80	.340	.670	.570
RL2 at 348	04-18-97	1015	150	150	.630	.040	.040
Pipeline 1 at 490	03-01-95	1630	160	158	1.02	.452	.239
Pipeline 1 at 380	03-01-95	1130	180	187	1.10	1.10	.700
Pipeline 1 at 260	10-12-95	1200	210	211	.150	29.0	28.0
North Side Rd-1 at 280	03-31-97	0910	74	74	.150	.040	.050
North Side Rd-1 at 200	03-31-97	1045	62	61	.110	.140	.140

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)
LUV-1 NO 2	10-06-94	1500	3.3	0.23	99	2.1	39
	06-06-95	1930	3.1	.30	100	1.5	34
LUV-2 NO 2	10-05-94	1600	11	5.7	110	3.6	27
RL1 at 760	03-23-97	1400	540	20	1,300	8.8	2,400
RL1 at 560	03-23-97	1800	24	3.9	190	2.5	62
RL2 at 348	04-18-97	1015	34	14	61	3.0	23
Pipeline 1 at 490	03-01-95	1630	21	8.5	47	2.4	9.1
Pipeline 1 at 380	03-01-95	1130	28	23	26	3.0	8.1
Pipeline 1 at 260	10-12-95	1200	49	21	180	6.1	200
North Side Rd-1 at 280	03-31-97	0910	350	120	540	9.3	1,400
North Side Rd-1 at 200	03-31-97	1045	220	60	650	7.2	1,100

Common name	Date	Time	Sulfate dissolved (mg/L as SO_4)	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)
LUV-1 NO 2	10-06-94	1500	88	1.4	16	305	0.016
	06-06-95	1930	91	1.3	15	308	.029
LUV-2 NO 2	10-05-94	1600	48	2.1	73	405	.120
RL1 at 760	03-23-97	1400	960	2.2	14	5,700	.046
RL1 at 560	03-23-97	1800	310	7.1	14	680	.012
RL2 at 348	04-18-97	1015	90	.46	21	349	.002
Pipeline 1 at 490	03-01-95	1630	18	.38	26	225	.008
Pipeline 1 at 380	03-01-95	1130	22	.90	68	288	.002
Pipeline 1 at 260	10-12-95	1200	79	.20	29	756	.019
North Side Rd-1 at 280	03-31-97	0910	600	.60	32	3,290	.016
North Side Rd-1 at 200	03-31-97	1045	630	2.0	25	2,800	.021

Table F8. Water-quality data for monitoring sites in the Lucerne subbasin of the Morongo ground-water basin, San Bernardino County, California—Continued

Common name	Date	Time	Bromide dissolved (mg/L as Br)	Arsenic dissolved (µg/L as As)	Barium, dissolved (µg/L as Ba)	Boron, dissolved (µg/L as B)	Iron, dissolved (µg/L as Fe)	Manganese, dissolved (µg/L as Mn)
LUV-1 NO 2	10-06-94	1500	0.13	8	10	220	<3.0	<1.0
	06-06-95	1930	.11	8	12	230	8.0	4.0
LUV-2 NO 2	10-05-94	1600	.16	9	42	390	<3.0	38
RL1 at 760	03-23-97	1400	2.6	1	—	3,940	<15	590
RL1 at 560	03-23-97	1800	.14	8	—	1,960	4.0	41
RL2 at 348	04-18-97	1015	.12	3	—	106	6.0	4.4
Pipeline 1 at 490	03-01-95	1630	.056	6	38	79	<3.0	8.2
Pipeline 1 at 380	03-01-95	1130	.070	6	130	80	12	22
Pipeline 1 at 260	10-12-95	1200	.69	19	<100	90	97	210
North Side Rd-1 at 280	03-31-97	0910	1.5	2	—	1,300	<9.0	10
North Side Rd-1 at 200	03-31-97	1045	1.2	2	—	2,040	<9.0	43

Common name	Date	Time	Strontium, dissolved (µg/L as Sr)	Zinc, dissolved (µg/L as Zn)	Lithium, dissolved (µg/L as Li)	H^2/H^1 stable isotope (ratio per mil)	O^{18}/O^{16} stable isotope (ratio per mil)	S-34 /S-32 stable isotope (ratio per mil)
LUV-1 NO 2	10-06-94	1500	73	—	—	–98.7	–12.45	73.00
	06-06-95	1930	65	—	<4	–101.0	–15.44	—
LUV-2 NO 2	10-05-94	1600	340	—	—	–100.0	–12.54	—
RL1 at 760	03-23-97	1400	8,000	<15	—	–93.8	–11.36	—
RL1 at 560	03-23-97	1800	520	6.0	—	–97.7	–12.37	—
RL2 at 348	04-18-97	1015	694	22	—	–89.0	–12.20	—
Pipeline 1 at 490	03-01-95	1630	234	—	—	–91.1	–12.18	—
Pipeline 1 at 380	03-01-95	1130	400	—	—	–86.9	–12.06	—
Pipeline 1 at 260	10-12-95	1200	710	—	20	–82.0	–10.96	—
North Side Rd-1 at 280	03-31-97	0910	6,300	<9.0	—	–94.2	–10.50	—
North Side Rd-1 at 200	03-31-97	1045	3,400	12	—	–95.0	–10.99	—

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 (percent modern)	Carbon-14 water fltrd (percent)	Carbon-14 cnt err water fltrd (percent)
LUV-1 NO 2	10-06-94	1500	—	—	—	—	—	—
	06-06-95	1930	0.3	0.2	–10.00	13.3	—	—
LUV-2 NO 2	10-05-94	1600	—	—	—	—	—	—
RL1 at 760	03-23-97	1400	—	—	—	—	—	—
RL1 at 560	03-23-97	1800	—	—	—	—	—	—
RL2 at 348	04-18-97	1015	—	—	—	—	—	—
Pipeline 1 at 490	03-01-95	1630	.1	.2	–11.30	6.3	6.30	.100
Pipeline 1 at 380	03-01-95	1130	<.1	.2	–10.50	6.9	—	—
Pipeline 1 at 260	10-12-95	1200	4.1	.3	–9.89	33.8	—	—
North Side Rd-1 at 280	03-31-97	0910	—	—	—	—	—	—
North Side Rd-1 at 200	03-31-97	1045	—	—	—	—	—	—