

## South Lahontan Hydrologic Region

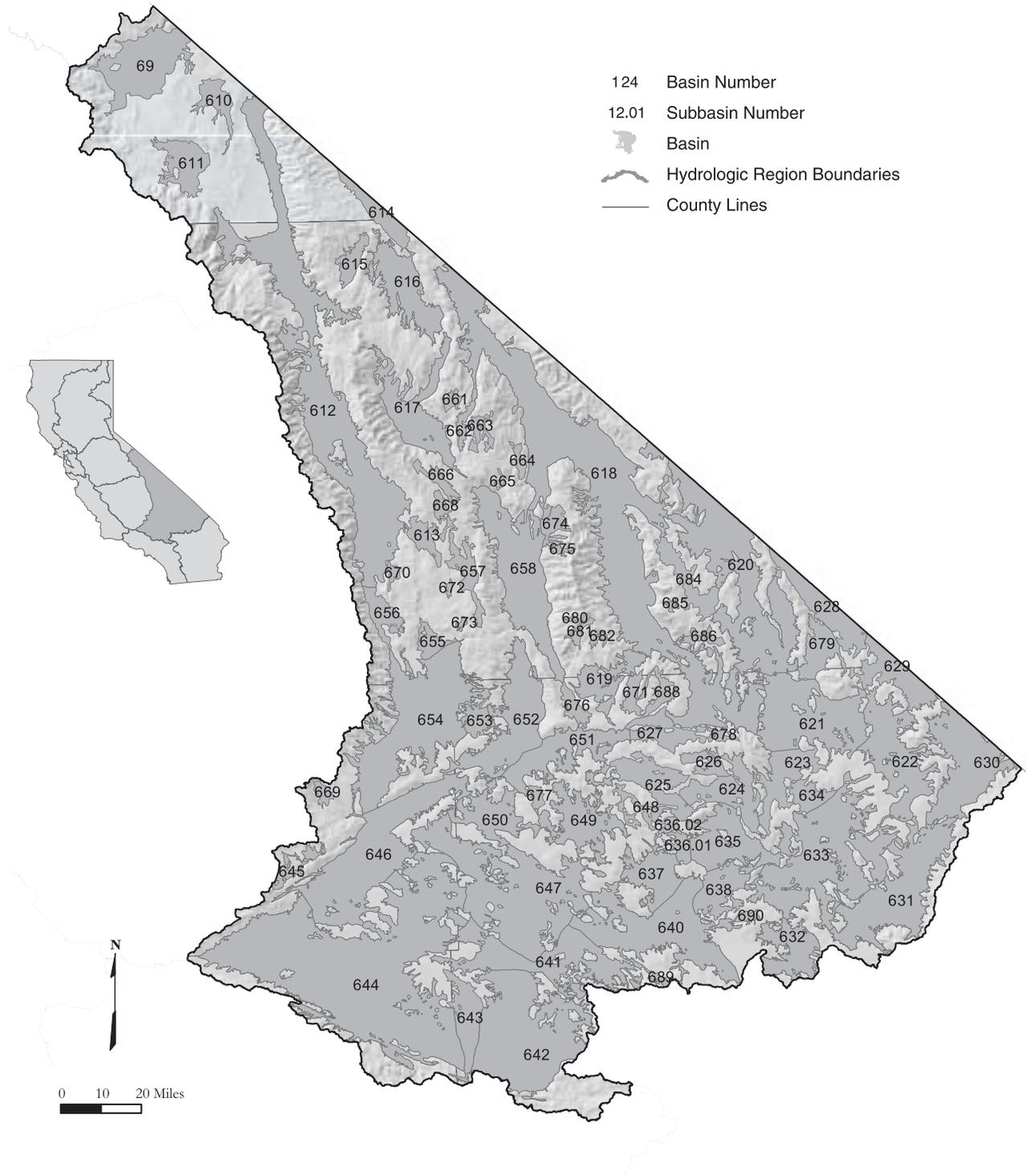


Figure 41 South Lahontan Hydrologic Region

## Basins and Subbasins of the South Lahontan Hydrologic Region

Basin/subbasin	Basin name	Basin/subbasin	Basin name
6-9	Mono Valley	6-51	Pilot Knob Valley
6-10	Adobe Lake Valley	6-52	Searles Valley
6-11	Long Valley	6-53	Salt Wells Valley
6-12	Owens Valley	6-54	Indian Wells Valley
6-13	Black Springs Valley	6-55	Coso Valley
6-14	Fish Lake Valley	6-56	Rose Valley
6-15	Deep Springs Valley	6-57	Darwin Valley
6-16	Eureka Valley	6-58	Panamint Valley
6-17	Saline Valley	6-61	Cameo Area
6-18	Death Valley	6-62	Race Track Valley
6-19	Wingate Valley	6-63	Hidden Valley
6-20	Middle Amargosa Valley	6-64	Marble Canyon Area
6-21	Lower Kingston Valley	6-65	Cottonwood Spring Area
6-22	Upper Kingston Valley	6-66	Lee Flat
6-23	Riggs Valley	6-68	Santa Rosa Flat
6-24	Red Pass Valley	6-69	Kelso Lander Valley
6-25	Bicycle Valley	6-70	Cactus Flat
6-26	Avawatz Valley	6-71	Lost Lake Valley
6-27	Leach Valley	6-72	Coles Flat
6-28	Pahrump Valley	6-73	Wild Horse Mesa Area
6-29	Mesquite Valley	6-74	Harrisburg Flats
6-30	Ivanpah Valley	6-75	Wildrose Canyon
6-31	Kelso Valley	6-76	Brown Mountain Valley
6-32	Broadwell Valley	6-77	Grass Valley
6-33	Soda Lake Valley	6-78	Denning Spring Valley
6-34	Silver Lake Valley	6-79	California Valley
6-35	Cronise Valley	6-80	Middle Park Canyon
6-36	Langford Valley	6-81	Butte Valley
6-36.01	Langford Well Lake	6-82	Spring Canyon Valley
6-36.02	Irwin	6-84	Greenwater Valley
6-37	Coyote Lake Valley	6-85	Gold Valley
6-38	Caves Canyon Valley	6-86	Rhodes Hill Area
6-40	Lower Mojave River Valley	6-88	Owl Lake Valley
6-41	Middle Mojave River Valley	6-89	Kane Wash Area
6-42	Upper Mojave River Valley	6-90	Cady Fault Area
6-43	El Mirage Valley		
6-44	Antelope Valley		
6-45	Tehachapi Valley East		
6-46	Fremont Valley		
6-47	Harper Valley		
6-48	Goldstone Valley		
6-49	Superior Valley		
6-50	Cuddeback Valley		

## Description of the Region

The South Lahontan HR covers approximately 21.2 million acres (33,100 square miles) in eastern California. This region includes about 21 percent of the surface area of California and both the highest (Mount Whitney) and lowest (Death Valley) surface elevations of the contiguous United States. The HR is bounded on the west by the crest of the Sierra Nevada and on the north by the watershed divide between Mono Lake and East Walker River drainages; on the east by Nevada and the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. This HR includes the Owens, Mojave, and Amargosa River systems, the Mono Lake drainage system, and many other internally drained basins. Average annual precipitation is about 7.9 inches, and runoff is about 1.3 maf per year (DWR 1994).

The South Lahontan HR includes Inyo County, much of Mono and San Bernardino counties, and parts of Kern and Los Angeles counties (Figure 41). National forests, national and state parks, military bases and other public lands comprise most of the land in this region. The Los Angeles Department of Water and Power is also a major landowner in the northern part of the HR and controls rights to much of the water draining the eastern Sierra Nevada.

According to 2000 census data, the South Lahontan HR is home to about 530,000 people, or 1.6 percent of the state's population. The major population centers are in the southern part of the HR and include Palmdale, Lancaster, Victorville, Apple Valley, and Hesperia.

## Groundwater Development

In this report, 76 groundwater basins are delineated in the South Lahontan HR, and the Langford Valley Groundwater Basin (6-36) is divided into two subbasins. The groundwater basins underlie about 11.60 million acres (18,100 square miles) or about 55 percent of the HR.

Most of the groundwater production is concentrated, along with the population, in basins in the southern part of this region. Groundwater provides 41 percent of water supply for agriculture and urban uses (DWR 1998). Much of this HR is public land with very low population density, within these areas there has been little groundwater development and little is known about the basins.

In most smaller basins, groundwater is found in unconfined alluvial aquifers; however, in some of the larger basins, or near dry lakes, aquifers may be separated by aquitards that cause confined groundwater conditions. Depths of the basins range from tens or hundreds of feet in smaller basins to thousands of feet in larger basins. The thickness of aquifers varies from tens to hundreds of feet. Well yields vary in this region depending on aquifer characteristics and well location, size, and use.

Conjunctive use of surface water and groundwater is practiced in the more heavily pumped basins. Some water used in the southern part of the HR is imported from Northern California by the State Water Project. Some of this imported water is used to recharge groundwater in the Mojave River Valley basins (6-40, 6-41, and 6-42). Surface water and groundwater are exported from the South Lahontan HR to the South Coast HR by the Los Angeles Department of Water and Power.

## Groundwater Quality

The chemical character of the groundwater varies throughout the region, but most often is calcium or sodium bicarbonate. Near and beneath dry lakes, sodium chloride and sodium sulfate-chloride water is common. In general, groundwater near the edges of valleys contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

Drinking water standards are most often exceeded for TDS, fluoride, and boron content. The EPA lists 13 sites of contamination in this HR. Of these, three military installations in the Antelope Valley and Mojave River Valley groundwater basins are federal Superfund sites because of VOCs and other hazardous contaminants.

*Water Quality in Public Supply Wells*

From 1994 through 2000, 605 public supply water wells were sampled in 19 of the 77 basins and subbasins in the South Lahontan HR. Analyzed samples indicate that 506 wells, or 84 percent, met the state primary MCLs for drinking water. Ninety-nine wells, or 16 percent, have constituents that exceed one or more MCL. Figure 42 shows the percentages of each contaminant group that exceeded MCLs in the 99 wells.

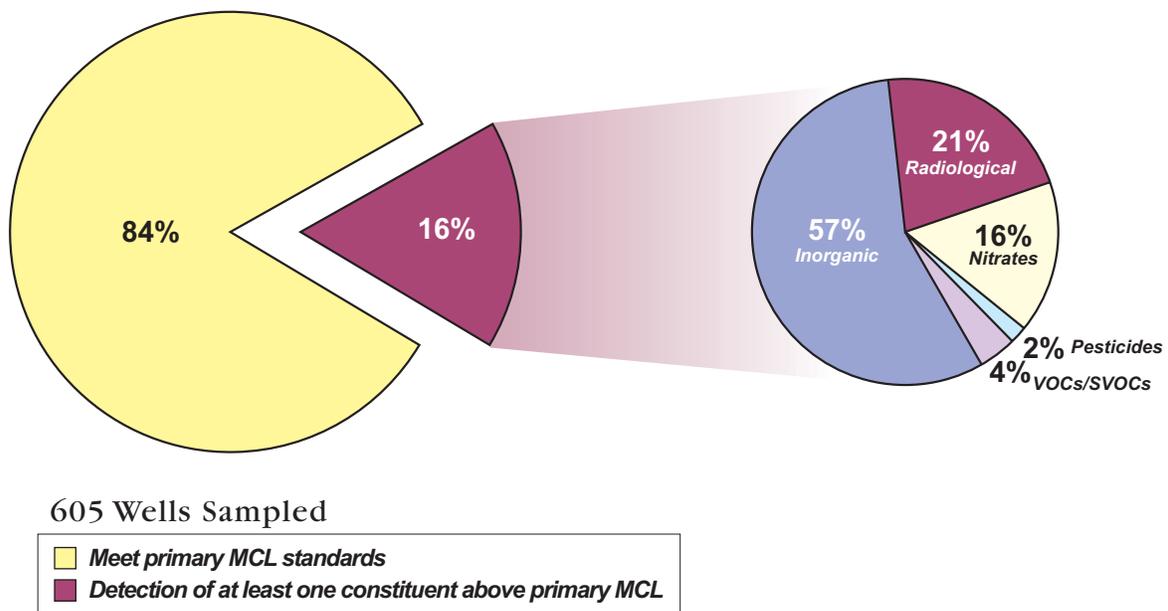


Figure 42 MCL exceedances in public supply wells in the South Lahontan Hydrologic Region

Table 36 lists the three most frequently occurring contaminants in each of the six contaminant groups and shows the number of wells in the HR that exceeded the MCL for those contaminants.

**Table 36 Most frequently occurring contaminants by contaminant group in the South Lahontan Hydrologic Region**

Contaminant group	Contaminant - # of wells	Contaminant - # of wells	Contaminant - # of wells
Inorganics – Primary	Fluoride – 30	Arsenic – 19	Antimony – 5
Inorganics – Secondary	Iron – 82	Manganese – 36	Specific Conductance – 5 TDS – 5
Radiological	Gross Alpha – 18	Uranium – 7	Radium 228 – 2
Dissolved Nitrogen	Nitrate (as NO <sub>3</sub> ) – 12	Nitrate + Nitrite–6	Nitrite (as N) – 4
Pesticides	Di(2-Ethylhexyl)phthalate) – 2		
VOCs/SVOCs	MTBE – 2	TCE – 2	Carbon Tetrachloride – 2

TCE = Trichloroethylene  
 MTBE = Methyltertiarybutylether  
 VOC = Volatile Organic Compound  
 SVOC = Semivolatile Organic Compound

**Changes from Bulletin 118-80**

Several modifications from the groundwater basins presented in Bulletin 118-80 are incorporated in this report (Table 37). Langford Valley Groundwater Basin (6-36) has been divided into two subbasins. Granite Mountain Area (6-59) and Fish Slough Valley (6-60) groundwater basins have been deleted because no information was found concerning wells or groundwater in these basins or because well completion reports indicate that groundwater production is derived from fractured rocks beneath the basin. Furnace Creek Area Groundwater Basin (6-83) has been incorporated into Death Valley Groundwater Basin (6-18), and Butterbread Canyon Valley Groundwater Basin (6-87) has been incorporated into Lost Lake Valley Groundwater Basin (6-71).

**Table 37 Modifications since Bulletin 118-80 of groundwater basins and subbasins in South Lahontan Hydrologic Region**

Basin/subbasin name	New number	Old number
Langford Well Lake	6-36.01	6-36
Irwin	6-36.02	6-36
Troy Valley	Incorporated into 6-40 and 7-14.	6-39
Granite Mountain Area	Deleted	6-59
Fish Slough Valley	Deleted	6-60
Furnace Creek Area	Deleted – incorporated into 6-18	6-83
Butterbread Canyon Valley	Deleted – incorporated into 6-71	6-87

Troy Valley Groundwater Basin (6-39) has been split at the Pisgah fault, which is a groundwater barrier, and has been incorporated into Lower Mojave River Valley (6-40) and Lavié Valley (7-14) groundwater basins. This change incorporates part of the South Lahontan HR into a basin in the Colorado River HR<sup>1</sup>. The Middle Mojave River Valley Groundwater Basin (6-41) has changed boundaries along the north (Harper Valley; 6-47) and east sides (Lower Mojave River Valley; 6-40). The new boundaries are along the Camp Rock-Harper Lake fault zone, Waterman fault, and Helendale fault. Groundwater level elevations indicate that these faults are likely strong barriers to groundwater movement.

The boundary between the Upper Mojave River Valley Groundwater Basin (6-42) and the Lucerne Valley Groundwater Basin (7-19) was changed from the regional surface divide to the southern part of the Helendale fault, which is a groundwater barrier. This change incorporates part of the Colorado Desert HR into a basin in the South Lahontan HR<sup>2</sup>.

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<sup>1</sup> The boundaries of the hydrologic regions are defined by surface drainage patterns. In this case, faults impede groundwater flow causing it to flow beneath the surface drainage divide into the adjacent hydrologic region.

<sup>2</sup> See previous note.

Table 38 South Lahontan Hydrologic Region groundwater data

Basin/Subbasin	Basin Name	Area (acres)	Groundwater Budget Type	Well Yields (gpm)		Types of Monitoring			TDS (mg/L)	
				Maximum	Average	Levels	Quality	Title 22	Average	Range
6-09	MONO VALLEY	173,000	A	800	480	-	-	-	-	2060
6-10	ADOBE LAKE VALLEY	39,800	C	-	-	-	-	-	-	-
6-11	LONG VALLEY	71,800	A	250	90	20	-	5	-	-
6-12	OWENS VALLEY	661,000	A	8,100	1,870	700	7	89	-	300-450,000
6-13	BLACK SPRINGS VALLEY	30,800	C	-	-	-	-	-	-	-
6-14	FISH LAKE VALLEY	48,100	C	-	-	-	-	-	-	-
6-15	DEEP SPRINGS VALLEY	29,900	C	700	390	-	-	-	-	-
6-16	EUREKA VALLEY	129,000	C	-	-	-	-	1	-	-
6-17	SALINE VALLEY	146,000	C	-	-	-	-	-	-	-
6-18	DEATH VALLEY	921,000	C	-	-	28	-	6	-	-
6-19	WINGATE VALLEY	71,400	C	-	-	-	-	-	-	-
6-20	MIDDLE AMARGOSA VALLEY	390,000	C	3,000	2,500	2	-	4	-	-
6-21	LOWER KINGSTON VALLEY	240,000	C	-	-	-	-	-	-	-
6-22	UPPER KINGSTON VALLEY	177,000	C	24	-	-	-	5	-	-
6-23	RIGGS VALLEY	87,700	C	-	-	-	-	-	-	-
6-24	RED PASS VALLEY	96,500	C	-	-	-	-	-	-	-
6-25	BICYCLE VALLEY	89,600	C	710	-	-	12	6	618	508-810
6-26	AVAWATZ VALLEY	27,700	C	-	-	-	-	-	-	-
6-27	LEACH VALLEY	61,300	C	-	-	-	-	-	-	-
6-28	PAHRUMP VALLEY	93,100	C	300	150	-	-	-	-	-
6-29	MESQUITE VALLEY	88,400	C	1,500	1,020	-	-	-	-	-
6-30	IVANPAH VALLEY	199,000	C	600	400	-	-	9	-	-
6-31	KELSO VALLEY	255,000	C	370	290	-	-	-	-	-
6-32	BROADWELL VALLEY	92,100	C	-	-	-	-	1	-	-
6-33	SODA LAKE VALLEY	381,000	C	2,100	1,100	-	-	3	-	-
6-34	SILVER LAKE VALLEY	35,300	C	-	-	-	-	-	-	-
6-35	CRONISE VALLEY	127,000	C	600	340	-	-	-	-	-
6-36	LANGFORD VALLEY	-	-	-	-	-	-	-	-	-
6-36.01	LANGFORD WELL LAKE	19,300	C	1,700	410	11	7	3	498	440-568
6-36.02	IRWIN	10,500	C	550	-	40	-	3	528	496-598
6-37	COYOTE LAKE VALLEY	88,200	A	1,740	660	5	-	-	-	300-1000
6-38	CAVES CANYON VALLEY	73,100	A	300	-	4	1	4	-	300-1000
6-40	LOWER MOJAVE RIVER VALLEY	286,000	A	2,700	770	70	21	52	300	-
6-41	MIDDLE MOJAVE RIVER VALLEY	211,000	A	4,000	1,000	74	3	14	500	-
6-42	UPPER MOJAVE RIVER VALLEY	413,000	A	5,500	1,030	120	22	153	500	1105
6-43	EL MIRAGE VALLEY	75,900	A	1,000	230	50	3	21	-	-
6-44	ANTELOPE VALLEY	1,110,000	A	7,500	286	262	10	248	300	200-800
6-45	TEHACHAPI VALLEY EAST	24,000	C	150	31	31	-	9	361	298-405
6-46	FREMONT VALLEY	2,370,000	C	4,000	500	23	-	13	596	350-100,000
6-47	HARPER VALLEY	410,000	A	3,000	725	11	3	19	-	179-2391
6-48	GOLDSTONE VALLEY	28,100	C	-	-	-	-	-	-	-
6-49	SUPERIOR VALLEY	120,000	C	450	100	-	-	-	-	-

Table 38 South Lahontan Hydrologic Region groundwater data (continued)

Basin/Subbasin	Basin Name	Area (acres)	Groundwater Budget Type	Well Yields (gpm)			Types of Monitoring			TDS (mg/L)	
				Maximum	Average	Levels	Quality	Title 22	Average	Range	
6-50	CUDEBACK VALLEY	94,900	C	500	300	-	-	-	-	-	
6-51	PILOT KNOB VALLEY	139,000	C	-	-	-	-	I	-	-	
6-52	SEARLES VALLEY	197,000	C	1,000	300	-	-	-	-	-	
6-53	SALT WELLS VALLEY	29,500	C	-	-	-	-	-	-	-	
6-54	INDIAN WELLS VALLEY	382,000	A	3,800	815	116	20	63	312	110-1620	
6-55	COSO VALLEY	25,600	C	-	-	-	-	-	-	-	
6-56	ROSE VALLEY	42,500	C	-	-	-	-	I	-	-	
6-57	DARWIN VALLEY	44,200	C	130	43	-	-	-	-	-	
6-58	PANAMINT VALLEY	259,000	C	35	30	-	-	-	-	-	
6-61	CAMEO AREA	9,310	C	-	-	-	-	-	-	-	
6-62	RACE TRACK VALLEY	14,100	C	-	-	-	-	-	-	-	
6-63	HIDDEN VALLEY	18,000	C	-	-	-	-	-	-	-	
6-64	MARBLE CANYON AREA	10,400	C	-	-	-	-	-	-	-	
6-65	COTTONWOOD SPRING AREA	3,900	C	-	-	-	-	-	-	-	
6-66	LEE FLAT	20,300	C	-	-	-	-	-	-	-	
6-68	SANTA ROSA FLAT	312	C	-	-	-	-	-	-	-	
6-69	KELSO LANDER VALLEY	11,200	C	-	-	-	-	-	-	-	
6-70	CACTUS FLAT	7,030	C	-	-	-	-	-	-	-	
6-71	LOST LAKE VALLEY	23,300	C	-	-	-	-	-	-	-	
6-72	COLES FLAT	2,950	C	-	-	-	-	-	-	-	
6-73	WILD HORSE MESA AREA	3,320	C	-	-	-	-	-	-	-	
6-74	HARRISBURG FLATS	24,900	C	-	-	-	-	I	-	-	
6-75	WILDROSE CANYON	5,160	C	-	-	-	-	-	-	-	
6-76	BROWN MOUNTAIN VALLEY	21,700	C	-	-	-	-	-	-	-	
6-77	GRASS VALLEY	9,980	C	-	-	-	-	-	-	-	
6-78	DENNING SPRING VALLEY	7,240	C	-	-	-	-	-	-	-	
6-79	CALIFORNIA VALLEY	58,300	C	-	-	-	-	-	-	-	
6-80	MIDDLE PARK CANYON	1,740	C	-	-	-	-	-	-	-	
6-81	BUTTE VALLEY	8,810	C	-	-	-	-	-	-	-	
6-82	ANVIL SPRING CANYON VALLEY	4,810	C	-	-	-	-	-	-	-	
6-84	GREENWATER VALLEY	59,900	C	-	-	-	-	-	-	-	
6-85	GOLD VALLEY	3,220	C	-	-	-	-	-	-	-	
6-86	RHODES HILL AREA	15,600	C	-	-	-	-	-	-	-	
6-88	OWL LAKE VALLEY	22,300	C	-	-	-	-	-	-	-	
6-89	KANE WASH AREA	5,960	C	60	-	-	-	-	-	-	
6-90	CADY FAULT AREA	7,960	C	-	-	-	-	-	-	-	

gpm - gallons per minute  
mg/L - milligram per liter  
TDS -total dissolved solids