

Soda Lake Valley Groundwater Basin

- Groundwater Basin Number: 6-33
- County: San Bernardino
- Surface Area: 381,000 acres (595 square miles)

Basin Boundaries and Hydrology

Soda Lake Valley Groundwater Basin underlies a northeast-trending valley in northeast San Bernardino County. Elevation of the valley floor ranges from 923 to about 3,500 feet above mean sea level. The basin is bounded by nonwater-bearing rocks of the Marl and Kelso Mountains on the east, the Bristol and Cady Mountains on the south, and the Soda and Cave Mountains on the west. A low alluvial drainage divide that separates the Silver and Soda Lake Valleys defines the northern boundary. In the eastern part of the basin, several hills protrude from 600 to 2,000 feet above the surrounding valley. The mountains along the eastern margin reach elevations of about 5,000 feet (USGS 1955; DWR 1964).

Annual average precipitation ranges from about 3 to 5 inches. Runoff from the surrounding mountains drain towards Soda (dry) Lake in the westcentral part of the valley (Jennings and others 1962).

Hydrogeologic Information

Water Bearing Formations

Quaternary alluvium forms the major water-bearing unit within the basin and includes unconsolidated younger alluvial deposits and underlying unconsolidated to poorly consolidated older alluvial deposits. Maximum thickness of the alluvium is at least 400 feet (DWR 1964).

Recharge and Discharge Areas

Recharge to the basin is derived primarily from the percolation of flow in the Mojave River, and the percolation of runoff through alluvial fan deposits at the base of the surrounding mountains. Additional replenishment is derived through subsurface inflow from Cave Canyon, Kelso, and Broadwell Valley Groundwater Basins. Groundwater in the alluvium moves towards Soda Lake and discharges northwards into Silver Lake Valley Groundwater Basin (USGS 1955, DWR 1964, 1967).

Groundwater Level Trends

Groundwater levels in the basin have been generally stable over the period of record; however, declining water levels have been observed in some wells. Water levels in wells near the Mojave River Sink, in the southwest part of the basin, tend to fluctuate most. During 1954 through 1984, water levels dropped about 5 feet in one well. During this time, water levels typically declined about 2 to 3 feet in wells along the margins of Soda Lake, and 1 foot to 2 feet in wells in the north part of the basin, clustered near the town of Baker.

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is estimated at about 9,300,000 af (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (C)

Groundwater budget information is not available.

Groundwater Quality

Characterization. Groundwater character is typically sodium chloride or sodium bicarbonate, often in combination with sulfate. Sodium bicarbonate water is more often found in the vicinity of the Mojave River Sink; whereas, sodium chloride water is found primarily near Soda Lake. Groundwater with significant sulfate content tends to be found in the eastern parts of the basin.

Impairments. The quality of the groundwater is rated marginal to inferior for both domestic and irrigation purposes. This assessment is based on 66 analyses showing elevated concentrations of fluoride, boron, and TDS. Fluoride concentrations at or above 0.9 mg/L impair domestic consumption in 31 of 35 wells located throughout the basin. Average fluoride concentration in groundwater is about 3.5 mg/L, although levels as high as 33.3 mg/L have been reported. Boron concentration greater than 1.0 mg/L occur in 22 of 35 wells and preclude the use of groundwater for irrigation in many parts of the basin. Average concentration is about 1.3 mg/L. TDS content of 1,000 mg/L and above occurs in 20 of 35 wells, with the highest concentrations found in groundwater near Soda Lake, where reported levels have approached 8,300 mg/L. Average TDS content is about 1,500 mg/L.

Water Quality in Public Supply Wells

Constituent Group ¹	Number of wells sampled ²	Number of wells with a concentration above an MCL ³
Inorganics – Primary	0	0
Radiological	1	1
Nitrates	0	0
Pesticides	0	0
VOCs and SVOCs	0	0
Inorganics – Secondary	0	0

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: to 2,100	Average: 1,000
Total depths (ft)		
Domestic		
Municipal/Irrigation		

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	
	Miscellaneous water quality	
	Title 22 water quality	3 wells
Department of Health Services and cooperators		

Basin Management

Groundwater management:

Water agencies

Public

Private

References Cited

- California Department of Water Resources (DWR). 1964. *Ground Water Occurrence and Quality Lahontan Region*. Bulletin No.106-1. 439 p.
- _____. 1967. *Water Wells and Springs in Soda, Silver and Cronise Valleys*. Bulletin No. 91-13. 16 p.
- _____. 1975. *California's Ground Water*. Bulletin No. 118. 135 p.
- Jennings C. W. , J. L. Burnett, B. W. Troxel. 1962. *Geologic Map of California: Trona Sheet*. Olaf P. Jenkins Edition. California Department of Conservation, Division of Mines and Geology. Scale 1: 250,000.
- U.S. Geological Survey. 1955. *Data on Water Wells in Coyote, Cronise, Soda, and Silver Lake Valleys, San Bernardino County, California*. Open-file report. 16 p.

Errata

Substantive changes made to the basin description will be noted here.