

Upper Santa Ana Valley Groundwater Basin, San Timoteo Subbasin

- Groundwater Basin Number: 8-2.08
- County: Riverside, San Bernardino
- Surface Area: 73,100 acres (114 square miles)

Basin Boundaries and Hydrology

The San Timoteo Subbasin underlies Cherry Valley and the City of Beaumont in southwestern San Bernardino and northwestern Riverside Counties. The subbasin is bounded to the north and northeast by the Banning fault and impermeable rocks of the San Bernardino Mountains, Crafton Hills, and Yucaipa Hills, on the south by the San Jacinto fault, on the west by the San Jacinto Mountains, and on the east by a topographic drainage divide with the Colorado River Hydrologic Region. The surface is drained by Little San Geronio Creek and San Timoteo Canyon to the Santa Ana River. Average annual precipitation ranges from 12 to 14 inches in the western part to 16 to 18 inches in the eastern part of the subbasin.

Hydrogeologic Information

Water Bearing Formations

Groundwater is found in alluvium and San Timoteo Formation. Estimated specific yields in the subbasin range from 3 percent for fine materials to 35 percent for coarser materials (DWR 1970) with an average of about 11 percent (DWR 1967b).

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Alluvium. Holocene age alluvium, which consists of unconsolidated clay, silt, sand, and gravel, is the principal water-bearing unit in this subbasin. The alluvium, which is probably thickest near the City of Beaumont (DPW 1934), thins toward the southwest and is not present in the central part of the subbasin.

San Timoteo Formation. The Pliocene-Pleistocene age San Timoteo Formation consists of alluvial deposits that have been folded and eroded. These deposits are widely distributed and principally composed of gravel, silt, and clay, with comparatively small amounts of calcite-cemented conglomerate. The clasts are chiefly granitic, with lesser amounts of volcanic and metamorphic pebbles and cobbles (DPW 1934). The total thickness of the San Timoteo Formation is estimated to be between 1,500 and 2,000 feet, but logs of deep wells near the central part of the subbasin indicate water-bearing gravels to depths of only 700 to 1,000 feet (DPW 1934).

Restrictive Structures

The Banning and Cherry Valley faults and two unnamed faults in the northeast part of the subbasin offset impermeable basement rocks, stepping down to the south (DWR 1965a; 1967b). Water levels change across the Banning fault, dropping 100 to 200 feet to the south (DWR 1967b, Dutcher and Fenzel 1972). In the western part of the subbasin, water levels drop to

the south about 75 feet across the Loma Linda fault and about 50 feet across the San Timoteo barrier (Dutcher and Fenzel 1972). In the northeastern part of the subbasin, water levels drop to the south across two unnamed faults (DWR 1965a; 1967b). Each of these faults appears to disrupt groundwater movement in the subbasin.

Recharge Areas

Groundwater is replenished by subsurface inflow and percolation of precipitation, runoff, and imported water. Runoff and imported water are delivered to streambeds and spreading grounds for percolation (DWR 1967a; 1970).

Groundwater Level Trends

Groundwater flows towards San Timoteo Canyon, then northwesterly along the canyon to Bunker Hill Subbasin (DPW 1934; Dutcher and Fenzel 1972). Water levels in one well in San Timoteo Canyon declined about 7 feet from 1921 to 1932, but in another well levels dropped only 1 foot from December 1926 to January 1933 (DPW 1934).

A study of change in water levels during 1933 through 1960 revealed distinctive hydrograph character for wells in alluvial deposits in this subbasin (DWR 1965b). Hydrographs from wells in San Timoteo Canyon showed a flat character with low yearly fluctuations, those from the northeastern part of the subbasin near Oak Glen showed a flat character with high yearly fluctuations, and those from Cherry Valley showed a continual downward trend (DWR 1965b).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity of alluvial deposits is estimated to be about 2,010,000 af (DWR 1967b).

Groundwater in Storage. The amount of groundwater in storage in 1960 in alluvial deposits is estimated to have been about 1,570,000 af (DWR 1967b).

Groundwater Budget (Type A)

Deep percolation from irrigation is estimated to be 38,000 af and deep percolation from wastewater is estimated to be 14,000 af (DWR 1970). Deep percolation from precipitation is estimated to be 16,000 af (DWR 1970). The total subsurface inflow averages about 23,400 af/yr. Of this, 21,900 af/yr is estimated to come from the San Bernardino and San Gabriel Mountains (DWR 1970). Subsurface outflow to the Bunker Hill Subbasin during 1927 through 1967 is estimated to have ranged from 8,150 af/yr to 5,350 af/yr (Dutcher and Fenzel 1972) and averaged about 6,400 af/yr.

Groundwater Quality

Characterization. The character of groundwater beneath San Timoteo Canyon is sodium bicarbonate, in the alluvium of Little San Gorgonio Creek is calcium bicarbonate, and near Beaumont is calcium bicarbonate in younger alluvium and sodium bicarbonate in older deposits (DWR 1966). Water sampled from 24 public supply wells have an average TDS content of approximately 253 mg/L with a range of 170 to 340 mg/L.

Impairments. Water sampled from some wells in the subbasin contained high nitrate and salinity levels (DPW 1933).

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	27	0
Radiological	26	0
Nitrates	28	0
Pesticides	27	0
VOCs and SVOCs	27	0
Inorganics – Secondary	27	1

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 Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range:	Average:
Total depths (ft)		
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
USGS	Groundwater levels	67
USGS	Miscellaneous water quality	12
Department of Health Services and cooperators	Title 22 water quality	36

Basin Management

Groundwater management:

Water agencies

Public	San Bernardino Valley Municipal Water District, San Bernardino Valley Water Conservation District, City of San Bernardino Water Department, and San Bernardino County Flood Control District
Private	

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Errata

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