Temecula Valley Groundwater Basin

- Groundwater Basin Number: 9-05
- County: Riverside, San Diego
- Surface Area: 87,800 acres (137 square miles)

Basin Boundaries and Hydrology

The Temecula Valley Groundwater Basin underlies several valleys in southwestern Riverside County and a portion of northern San Diego County. Murrieta, Temecula, Pauba, Long, and Lancaster Valleys are largest of the valleys overlying this basin. The basin is bounded by nonwater-bearing crystalline rocks of the Penninsular Ranges. The overlying valleys are drained mainly by Wilson, Temecula, Murrieta, Warm Springs, and Pechanga Creeks to the Santa Margarita River, which flows west out of Temecula Valley. The Pechanga Indian Reservation overlies some of the southwestern part of the basin. Average annual precipitation ranges from 7 to 15 inches.

Hydrogeologic Information

Water Bearing Formations

Quaternary alluvium, which is estimated to reach more than 2,500 feet thick, is the water-bearing material of this basin. Well yields generally range to 300 gpm in the northwestern part of the basin, but reach 1,750 gpm for wells in Pauba Valley (DWR 1956). Groundwater is generally unconfined, but is confined in the Pauba Valley and near some faults that cut the basin (DWR 1956).

Holocene alluvial deposits consist of unconsolidated gravel, sand, silt, and clay that are generally about 100 to 125 feet thick (DWR 1956), but reach 200 feet thick (DWR 1967). The Pleistocene age Temecula Arkose, an alluvial deposit composed of arkosic sand with some marl, tuff, and silt, is at least 1,400 feet thick (DWR 1967). Groundwater is also extracted from residuum and from fractured rocks beneath the basin.

Restrictive Structures

The Lancaster, Aguanga, and Agua Caliente faults and several strands of the Elsinore fault zone cross the basin and may affect groundwater movement. The Wildomar fault is a groundwater barrier that produces differences in water level and pressure in the northwestern part of the basin (DWR 1956). Murrieta Hot Springs lie along an unnamed fault indicating that the fault affects subsurface flow.

Recharge Areas

Natural recharge of the alluvium is from direct precipitation and percolation in the Warm Springs, Tucalota, Santa Gertrudis, Murrieta, and Pechanga Creeks and the Temecula River.

Groundwater Level Trends

Groundwater flows southeastward under Murrieta and Temecula Valleys and southwestward beneath Pauba Valley to the southwestern part of the basin.

In the central part of the basin, the water level in one well rose about 12 feet during 1990 through 1993. In the southwestern part of the basin, the water level in one well declined about 60 feet during 1980 through 1993, recovered about 50 feet during 1993, then declined about 15 feet during 1994 through 2000. The hydrograph of another well in the southwestern part of the basin indicates large seasonal variations in water levels.

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity is estimated to be 253,000 af (DWR 1975).

Groundwater in Storage. Unknown.

Groundwater Budget (Type C)

Groundwater extraction was about 13,000 af in 1953 (DWR 1956).

Groundwater Quality

Characterization. The groundwater in this basin is largely sodium bicarbonate in character (DWR 1967). Sodium-calcium bicarbonate, sodium-calcium sulfate, calcium bicarbonate, and sodium chloride waters also are present in the basin (DWR 1956; 1967). TDS concentration ranged from 220 to 984 mg/L in 1956 (DWR 1956); however, water from 50 public supply wells ranges from 240 to 1,500 mg/L, and averages 476 mg/L. Groundwater in this basin is largely suitable for domestic and irrigation uses (DWR 1967).

Impairments. Groundwater is rated inferior for domestic use locally near Murrieta and Murrieta Hot Springs because of high nitrate or fluoride content (DWR 1967). Groundwater is rated marginal to inferior for irrigation use locally in Pauba and Wilson Creek Valleys and near Murrieta Hot Springs, because of chloride content and percent sodium (DWR 1967). Sulfate, chloride, magnesium, and nitrate concentrations are locally high for domestic use; TDS content is locally high for domestic and irrigation use (DWR 1975).

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	56	4
Radiological	57	1
Nitrates	56	2
Pesticides	58	0
VOCs and SVOCs	56	2
Inorganics – Secondary	56	16

[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: to 1,750 gal/min	Average: (DWR 1956)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
Rancho California WD	Groundwater levels	115/monthly
USGS	Groundwater levels	17/monthly
Murrieta County WD	Groundwater levels	5/monthly
Eastern MWD	Groundwater levels	3/monthly
USGS	Water Quality	4
Department of Health Services and collaborators	Title 22 Water Quality	67

Basin Management

Groundwater management:	Murrieta County Water District is developing a Watershed Management Plan under AB303.
Water agencies	
Public	Eastern Municipal Water District, Elsinore Valley Municipal Water District, Rancho California Water District
Private	

References Cited

California Department of Water Resources (DWR). 1956. *Santa Margarita River Investigation*. Bulletin 57. 273 p.

_____. 1967. *Ground Water Occurrence and Quality: San Diego Region.* Bulletin No. 106-2. 235 p.

_____. 1975. *California's Ground Water*. Bulletin 118. 135 p.

Errata

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