San Luis Obispo Valley Groundwater Basin

- Groundwater Basin Number: 3-9
- County: San Luis Obispo
- Surface Area: 12,700 acres (19.9 square miles)

Basin Boundaries and Hydrology

The San Luis Obispo Valley Groundwater Basin underlies the San Luis and Edna Valleys and is bounded on the northeast by the Santa Lucia Range, on the southwest by the San Luis Range, and on all other sides by contact with impermeable Miocene and Franciscan Group rocks. The northwestern part of the valley is drained by San Luis Obispo, Prefumo, and Stenner Creeks. The southeastern part of the valley is drained by tributaries of Pismo and Davenport Creeks. Laguna Lake lies in the northwestern part of the valley. Average annual precipitation ranges across the valley from 19 to 23 inches with the mean of 21 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the San Luis Obispo Valley Groundwater Basin is found in Pleistocene to Holocene age terrestrial deposits. The average specific yield in the San Luis and Edna portions of the basin is 6 percent (DWR 1997). The specific yield of Holocene alluvium is estimated at 17 percent and the average specific yield of the basin at 13 percent (DWR 1997).

Holocene Deposits. Holocene age alluvium consists of unconsolidated gravel, sand, silt, and clay of fluvial origin that reaches a maximum thickness of about 50 feet (Boyle 1991). In the portion of the basin that underlies the San Luis Obispo Creek watershed, this alluvium covers the valley floor and is the main source of groundwater. Wells yield from 20 to 300 gpm (Boyle 1991).

Pleistocene Deposits. Pleistocene age alluvial terrace deposits as thick as 50 feet and wells completed in these deposits have yields of about 20 gpm (Boyle 1991). The Paso Robles Formation is composed of poorly sorted, unconsolidated to consolidated conglomerate, sand, silt, gravel, and clay (DWR 1979). Well yields are variable, ranging to more than 200 gpm (Boyle 1991).

Restrictive Structures

The Edna fault is the main geological structure in this basin; however, the fault does not appear to affect the movement or quality of groundwater (Boyle 1991).

Recharge Areas

Recharge of the basin is from infiltration of precipitation on the valley, applied irrigation water, and streamflow (Boyle 1991).

Groundwater Level Trends

In the San Luis Valley, water levels declined as much as 8 feet during the 1975 through 1977 drought (Boyle 1991). Water levels quickly recovered at the end of that drought, but declined again about 6.5 to 12 feet during the drought of 1986 through 1990 (Boyle 1991). In the Edna Valley portion of this basin, water levels declined 6.5 to 19.5 feet per year during the 1975 through 1977 drought (Boyle 1991). Water levels quickly recovered at the end of this drought, but declined from 5 to 11 feet per year during the drought of 1986 through 1990 (Boyle 1991).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity has been reported as 67,000 af (DWR 1975b) and 24,000 af (Boyle 1991). The total usable capacity has been estimated at 10,000 af (Bader 1969) and 22,000 af (DWR 1975a).

Groundwater in Storage. The sustained yield of the basin is estimated at 5,900 af/yr, where sustained yield is defined as the maximum quantity of water that is available from a groundwater basin on an annual basis (Boyle 1991). The groundwater in storage in the San Luis Valley portion of the basin was estimated to range from 15,000 to 18,000 af during the period from 1969 through 1993, with the average for the entire period at 16,300 af (DWR 1997). The groundwater in storage in the Edna Valley portion of the basin was estimated to range from 28,000 to 32,000 af during the period from 1969 through 1993, with the average for the entire period at 31,000 af (DWR 1997).

Groundwater Budget (Type A)

The average annual recharge to the basin from precipitation and agricultural return flow is estimated at 3,650 af/yr (Boyle 1991). DWR (1975a) estimated recharge to be 2,250 af/yr. Agricultural, municipal, and industrial extractions total 5,800 af/yr (Boyle 1991). The average annual subsurface outflow is estimated at 100 af/yr from underflow in the San Luis Obispo Creek channel deposits at Santa Fe Narrows (Boyle 1991). The City of San Luis Obispo extracts groundwater at a rate of approximately 2,000 af/yr (Boyle 1991). The average total surface inflow entering the San Luis Valley portion of the basin is 7,000 af (DWR 1997). The average total surface inflow entering the Edna Valley portion of the basin is about 2,400 af/yr (DWR 1997). Recharge into the San Luis Valley portion of the basin due to precipitation, agricultural return flow, and urban incidental recharge was estimated at 2,200 (DWR 1997).

Groundwater Quality

Characterization. Groundwater wells in the San Luis Obispo Valley Groundwater Basin typically yield water of magnesium bicarbonate character (Boyle 1991). Water stored in the Pleistocene alluvial terrace deposits is characterized by poor water quality, whereas water in the Holocene deposits is generally of excellent quality (Boyle 1991). Analyses of data from 7 public supply wells show an average TDS content of 583 mg/L in the basin with a range from 450 to 800 mg/L. Six wells in the basin yield sodium

chloride to magnesium chloride water having electrical conductivity ranging from 1,000 to 2,600 μmhos per centimeter (Boyle 1991).

Impairments. Water from six wells in the basin has excessive concentrations of nitrate and chloride (Boyle 1991).

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	5	0
Radiological	5	0
Nitrates	6	0
Pesticides	5	0
VOCs and SOCs	5	0
Inorganics – Secondary	5	2

[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: 600 gal/min	Average: 300 gal/min (DWR 1975a)
	Total depths (ft)	
Domestic	Range: NKD	Average: NKD
Municipal/Irrigation	Range: 210 ft	Average: 90 ft (DWR 1958)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
	Groundwater levels	
	Miscellaneous water quality	
Department of Health Services and cooperators	Title 22 water quality	11

Basin Management

Groundwater management:

Water agencies

Public	City of San Luis Obispo, San Luis Obispo County- Department of Public Works
Private	Southern California Water Company

References Cited

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Additional References

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_____. 1988. Groundwater Study: Survey of Resources and Constraints Analysis. San Luis Obispo, California.

Warner, J. W. 1971. Ground Water in Santa Barbara and Southern San Luis Obispo Counties, California Spring 1968 to Spring 1969. U. S. Geological Survey Open-File Report.

Errata

Changes made to the basin description will be noted here.