San Antonio Creek Valley Groundwater Basin

- Groundwater Basin Number: 3-14
- County: Santa Barbara
- Surface Area: 81,800 acres (128 square miles)

Basin Boundaries and Hydrology

The San Antonio Creek Valley Groundwater Basin is bounded on the north by the Casmalia Hills and the Solomon Hills, on the south by the Purisma Hills and Burton Mesa, and on the west by the Pacific Ocean. The valley is drained by San Antonio Creek. Average annual precipitation ranges from 15 to 19 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater is found in alluvium, dune sand, terrace deposits, and the Orcutt, Paso Robles, and Careaga Formations. The alluvium, Paso Robles Formation, and Careaga Formation yield significant amounts of groundwater. Dune sand, terrace deposits, and Orcutt Formation, which are generally unsaturated and locally perched, are potential sources of groundwater. Groundwater is unconfined.

The specific yield of the basin tends to increase from east to west and ranges from 9.75 to 11.75 percent (DWR 1998).

Holocene Deposits. Alluvium consists of unconsolidated sand, clay, silt, and gravel of primarily fluvial origin. The alluvium has a maximum thickness of about 100 feet and an average thickness of about 80 feet (Muir 1964). Dune sand consists of unconsolidated, fine- to coarse-grained, well-rounded sand. The thickness of the dune sand is unknown, but it is probably no more than 100 feet (Muir 1964).

Pleistocene Deposits. Terrace deposits consist of unconsolidated sand, gravel, and clay of fluvial and marine origin. Their maximum thickness does not exceed 75 feet (Muir 1964). The Orcutt Formation, which is primarily of fluvial origin, consists of unconsolidated sand and clay interbedded with gravel. The Orcutt Formation has a maximum thickness of about 150 feet (Muir 1964). The Paso Robles Formation consists of unconsolidated gravel, sand, silt, and clay of nonmarine origin. This formation reaches a thickness of about 2,000 feet beneath the central part of the valley (Muir 1964). The Paso Robles Formation is the main water-bearing unit.

Careaga Formation. The Careaga Formation of Pliocene age is a loosely consolidated, massive, fine- to medium-grained sand with some silt and gravel of marine origin (Muir 1964). Careaga Formation reaches a maximum of thickness of 1,425 feet in the Purisima Hills and thins to 700 feet under the Solomon and Casmalia Hills (Muir 1964).

Restrictive Structures

A subsurface groundwater barrier is located about five miles east of the Pacific Ocean. The barrier creates the wetland area known as Barka Slough (SBCWA 1996).

Recharge Areas

Recharge is derived from infiltration of rain falling on the valley floor (Hutchinson 1980) and seepage from streams (Muir 1964). Groundwater level contours for December 1943 show the main area of recharge is in the Solomon Hills (Muir 1964).

Groundwater Level Trends

Water levels rose an average of about 3 feet between spring 1968 and spring 1969 (Warner 1971). However, data indicate an average decline in water levels of 3 feet from 1958 through 1977 (Hutchinson 1980). Hydrographs indicate a decline in groundwater levels during the 1986 through 1991 drought period (SBCWA 1996). Analyses conducted by the USGS in the 1980s confirm that groundwater levels declined in several parts of the basin as much as 30 feet since the 1950s (SBCWA 1996). Groundwater moves westward, toward the ocean.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated at 2,100,000 af (Bader 1969; DWR 1975a).

Groundwater in Storage. The available dry storage within the basin is estimated at 800,000 af (SBCWA 2001). This implies about 1,300,000 af of groundwater in storage.

Groundwater Budget (Type A)

The average annual subsurface inflow for 1979 was estimated at 700 af/yr (Jones and Stokes 1979). Recharge from stream seepage was estimated at 2,000 af/yr, and recharge from rainfall infiltration was estimated at 5,800 af/yr (Jones and Stokes 1979). However, the average recharge from rainfall for 1943 through 1958 was estimated at 2,600 af/yr (Muir 1964).

Total loss from the basin from consumptive use by phreatophytes and subsurface outflow was estimated at 1,100 af/yr (Jones and Stokes 1979). The average annual agricultural consumptive use was estimated at 7,600 af/yr, and the average annual municipal and industrial consumptive use was estimated at 2,810 af/yr (Jones and Stokes 1979). Pumpage during 1968 was estimated at 11,500 af (Warner 1971).

The net consumptive use of groundwater is estimated to be 15,931 af/yr (SBCWA 2001).

Groundwater Quality

Characterization. Analyses of data for 3 public supply wells show an average TDS content of 415 mg/L in the basin and a range of 335 to 570 mg/L. Water quality data indicate an average TDS content of 710 mg/L, with concentrations generally increasing westward toward the ocean

(Hutchinson 1980). The highest TDS concentration (3,780 mg/L) is from the western part of the basin, and the lowest TDS concentration (263 mg/L) is from the eastern part of the basin (SBCWA 2001). Data during 1987 through 1990 show TDS content ranging from 309 to 1,030 mg/L (SBCPDD 1994).

Impairments. Elevated TDS content reaching 3,780 mg/L (SBCWA 2001) exceeds the MCL.

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	7	0
Radiological	7	0
Nitrates	7	0
Pesticides	6	0
VOCs and SVOCs	6	0
Inorganics – Secondary	7	5

[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	NKD
	Total depths (ft)
Domestic	NKD
Municipal/Irrigation	NKD

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
USGS	Groundwater levels	30
	Miscellaneous water quality	
Department of Health Services and cooperators	Title 22 water quality	9

Basin Management

Groundwater management:

Water agencies

Public	Los Alamos CSD
Private	

References Cited

Bader, J. S. 1969. Ground-Water Data as of 1967, Central Coastal Subregion, California. U. S. Geological Survey Open-File Report.

California Department of Water Resources (DWR). 1975a. California's Groundwater. Bulletin No. 118. 135 p.

______. 1975b. Sea-Water Intrusion in California: Inventory of Coastal Ground Water Basins. Bulletin 63-5.

______, Southern District. 1998. Evaluation of Groundwater Overdraft in the Southern Central Coast Region. Technical Information Record SD-98-1.

Hutchinson, C.B. 1980. Appraisal of Ground Water Resources in the San Antonio Creek Valley, Santa Barbara County, California. U.S. Geological Survey Open-File Report 80-750.

Jones and Stokes Associates. 1979. Final Environmental and Water Resources Reconnaissance Study for State Water Project and Alternatives.

Muir, K.S. 1964. Geology and Ground Water of San Antonio Creek Valley, Santa Barbara County, California. U.S. Geological Survey Water-Supply Paper 1664.

Santa Barbara County Water Agency (SBCWA). 1996. Santa Barbara County 1996 Groundwater Resources Report. 42 p.

______. 2001. 2000 Santa Barbara Groundwater Report. 53 p.

Santa Barbara County Planning and Development Department (SBCPDD). 1994. Santa Barbara County Comprehensive Plan, Conservation Element. 77 p.

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.

Additional References

California Department of Water Resources, Southern District. 1971. *Ground Water Quality and Hydrology Data, San Antonio Creek Basin*. Memorandum Report.

Koehler, J.H. 1970. *Ground-Water conditions During 1968, Vandenberg Air Force Base Area, California*. U. S. Geological Survey Open File Report.

LaRocque, G. A., Jr., and others. 1950. *Wells and Water Levels in Principal Ground-Water Basins in Santa Barbara County, California*. U. S. Geological Survey Water-Supply Paper 1068.

Mallory, M.J. 1980. *Potential Effects of Increased Ground-Water Pumpage on Barka Slough, San Antonio Creek Valley, Santa Barbara County, California.* U.S. Geological Survey Water-Resources Investigations Report 80-95.

Martin, P. 1985. *Development and Calibration of a Two-Dimensional Digital Model for the Analysis of the Ground-Water Flow System in the San Antonio Creek Valley, Santa Barbara County, California.* U.S. Geological Survey Water-Resources Investigations Report 84-4340.

Toups Corporation. 1974. *Water Resources Management Study: South Coast – Santa Barbara County, a report prepared for the ad hoc committee on water supply*: Santa Ana, California, Toups Corporation, 219 p.

United States Department of Air Force. 1997. *Draft Environmental Assessment for the San Antonio Creek Short-Term Flood Control Program at Vandenberg Air Force Base, California.* Los Angeles, CA: Department of Air Force.

Errata

Changes made to the basin description will be noted here.