

Gilroy-Hollister Valley Groundwater Basin, San Juan Bautista Area Subbasin

- Groundwater Basin Number: 3-3.04
- County: San Benito
- Surface Area: 74,300 acres (116 square miles)

Basin Boundaries and Hydrology

Gilroy-Hollister Valley Groundwater Basin lies between the Diablo Range on the east and the Gabilan Range and the Santa Cruz Mountains to the west. It is bounded on the southwest by the San Andreas Rift Zone. The northern portion is drained toward Monterey Bay by the Pajaro River and its tributaries. The southern portion is drained by the San Benito River and its tributaries.

The San Juan Bautista Area subbasin lies within the southwest portion of the Gilroy-Hollister Valley Groundwater Basin, is bounded on the north by Sargent Fault and Sargent anticline and abuts the Bolsa Area subbasin. The San Andreas Fault and the Gabilan Range form the southwest boundary. The eastern boundary is the Calaveras Fault and the Hollister Area subbasin. These subbasin boundaries are primarily derived from geologic and hydrologic conditions. Groundwater occurs in the alluvium of Holocene age, and the Purisima Formation of Pliocene age. The subbasin is drained primarily by the San Benito River and its tributary creeks. The Pajaro River drains the northern boundary of the subbasin. Average precipitation values range from 13 inches at the center of the subbasin to 17-19 inches at the north and south ends.

Hydrogeologic Information

The Gilroy-Hollister basin is comprised of a sedimentary sequence that contains the principal aquifers underlying the Hollister and San Juan Valleys. It consists mainly of clay, silt, sand, and gravel ranging in age from Tertiary to Holocene. The oldest of these deposits lie unconformably on consolidated bedrock of Jurassic, Cretaceous and early Tertiary age (Kilburn 1972).

Water Bearing Formations

Geologic units comprising the San Juan Bautista Area subbasin include Holocene age alluvium and the Purisima Formation of Pliocene age (Luhdorff and Scalmanini 1991).

Holocene Alluvium. The alluvium consists of unconsolidated lenticular beds of gravel, sand, silt, and clay deposited by streams as flood plain, alluvial-fan, slope-wash, and terrace deposits (Kilburn 1972). Saturated deposits are moderately to extremely permeable. The thickness generally ranges from 0 to 300 feet (JSA 1998.)

Purisima Formation. The Purisima Formation while lithologically similar to the overlying alluvium is generally more consolidated and less permeable (JSA 1998). It ranges from the surface in some areas to several thousand feet deep and in the San Juan Bautista Area subbasin is believed to lie directly upon consolidated basement rocks of Jurassic age (Kilburn 1972).

Restrictive Structures

The Calaveras and Sargent faults that bound the subbasin are considered to represent relatively impermeable barriers to groundwater flow. These fault zones may contain large numbers of crumpled slivers of rock fragments and clay that can form a nearly impervious vertical barrier to groundwater movement (Kilburn 1972). Recent evaluation of groundwater level data has shown that the effect on groundwater levels is pronounced in some areas, such as along the segment of the Calaveras fault near Hollister (JSA 1998). The subbasin generally exhibits an unconfined nature and thus there are no restrictive structures to vertical flow.

Recharge Areas

The most significant recharge to the subbasin occurs from infiltration losses along the San Benito River. Historically the river was a gaining stream over several reaches in the San Juan Bautista subbasin but with groundwater development water levels have fallen and the river is now, over most reaches, a losing stream (Kilburn 1972). Hernandez Reservoir located about 50 miles southeast of Hollister is operated by the San Benito County Water District for the primary purpose of supplying groundwater recharge along the San Benito River (SBCWD 2001).

Groundwater Level Trends

Groundwater level measurements have been made periodically since 1913. Water levels throughout most of the subbasin show significant declines from early in the century to the early 1970's. A hydrograph of average water level elevations in the subbasin presented in San Benito County Water District Annual Groundwater Report (JSA 200) shows that on average water levels within the basin have risen over 100 feet from 1976 to 2000. This groundwater rise is likely attributable to two factors, construction of Hernandez Reservoir in 1961 and the delivery of imported surface water beginning in 1987.

Groundwater Storage

Groundwater Storage Capacity. No information is available on the total volume of water in storage in the subbasin. The storage capacity of the larger Gilroy-Hollister Valley Groundwater basin is estimated at 932,000 af. (Bader 1969).

Groundwater in Storage. Groundwater storage is discussed in the Groundwater Management Plan for the San Benito County Part of the Gilroy-Hollister Groundwater Basin (JSA 1998) in general terms. However, no specific information is available for the San Juan Bautista Area subbasin.

Groundwater Budget (Type A)

Information in "San Benito County Ground-Water Investigation" (Luhdorff and Scalmanini 1991) describes the groundwater budget of the San Juan Bautista Area subbasin. It indicates that based on a groundwater flow model of the basin, pre-development recharge to the subbasin averaged approximately 6,700 af per year and occurred as subsurface flow into the eastern part of the subbasin and from infiltration of rain, direct runoff and

minor streamflow. Pre-development discharge was also approximately 6,700 af and occurred as discharge from the aquifer to the San Benito River. Groundwater development occurred in the area after 1945, and caused water levels to decline. Depletion of aquifer storage changed the San Benito River from a gaining stream to a losing stream. Based on the model, average discharge from 1945 to 1968 was approximately 13,100 af. Of this, approximately 12,900 af per year occurred as pumpage from wells, and approximately 200 af occurred as discharge to the San Benito River. Recharge during the same period averaged 9,800 af per year. Since the late 1960's and early 1970's water levels have risen. The San Benito County Water Districts' Annual Groundwater Report for the 1999-2000 Water Year (JSA 2000) calculates a change in storage for the subbasin. The San Juan portion of the subbasin is reported to have a decrease change in storage of 731 af and the Tres Pinos portion is reported to have an increase in storage of 88 af over the period from October 1999 to October 2000. These calculations were done using an area-weighted average storage coefficient for the subbasin.

Groundwater Quality

Characterization. No complete characterization of groundwater quality was found in the published data, however incomplete water quality analysis (Kilburn 1972, JSA 1998, JSA 2000, and Bader 1969) indicate the groundwater in the subbasin to be somewhat hard and contains significant concentrations of sulfate and chloride. Data specific to the subbasin indicate electrical conductivity ranges from 655umhos to 2,380umhos in samples collected from wells in 1997 (JSA 1998).

Impairments. The Groundwater Management Plan for the San Benito County Part of the Gilroy-Hollister Groundwater Basin (JSA 1998) states that groundwater quality in the larger basin is marginally acceptable for potable and irrigation use. The water quality constituents of greatest concern are salinity, nitrate, boron, hardness, and trace elements that occasionally exceed drinking water standards.

Water Quality in Public Supply Wells

Constituent Group¹	Number of wells sampled²	Number of wells with a concentration above an MCL³
Inorganics – Primary	33	5
Radiological	23	4
Nitrates	37	8
Pesticides	29	0
VOCs and SOCs	30	0
Inorganics – Secondary	33	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 Production characteristics

Well yields (gal/min)	
Municipal/Irrigation	Average: 400 (Bader 1969)
Total depths (ft)	
Domestic	
Municipal/Irrigation	

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
San Benito CWD	Groundwater levels	37 Wells quarterly
San Benito CWD	Miscellaneous water quality	<37 Wells varies
Department of Health Services and cooperators	Title 22 water quality	40 Wells varies

Basin Management

Groundwater management:	Groundwater Management Plan for the San Benito County Part of the Gilroy-Hollister Groundwater Basin finalized April 1998. Prepared for Aromas WD, City of Hollister, City of San Juan Bautista, San Benito CWD, Sunnyslope CWD, and Tres Pinos CWD.
Water agencies	
Public	San Benito CWD, Tres Pinos CWD, City of San Juan Bautista, City of Hollister
Private	

References Cited

- Bader J., United States Geological Survey. 1969. Ground-Water Data as of 1967, Central Coastal Subregion, California. Menlo Park. 16 p.
- Jones & Stokes Associates (JSA). 1998. Groundwater Management Plan for the San Benito County Part of the Gilroy-Hollister Groundwater Basin.
- Jones & Stokes Associates (JSA). 2000. Annual Groundwater Report for the 1999-2000 Water Year.
- Kilburn C., United States Geological Survey. Water Resources Division. 1972. Ground-water hydrology of the Hollister and San Juan Valleys, San Benito County, California : 1913-68. Menlo Park: U. S. Geological Survey. iv,44 p.
- Luhdorff & Scalmanini. 1991. San Benito County Ground-Water Investigation.
- San Benito County Water District (SBCWD). 2001. The Water Line 3(2):4.

Additional References

California Department of Water Resources San Joaquin District. 1964. Waste Water Disposal Investigation, Hollister Gas Field, San Benito County, Code 4103-044. 13 p.

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Farrar CD, San Benito County Water Conservation and Flood Control District, United States Geological Survey. 1981. Ground-water-level monitoring network, Hollister and San Juan Valleys, San Benito County, California. Menlo Park, Calif.: U.S. Geological Survey. 9 p.

Faye RE, United States Geological Survey, San Benito County Water Conservation and Flood Control District. 1974. Mathematical model of San Juan Valley ground-water basin, San Benito County, California. Menlo Park, Calif.: Water Resources Division U.S. Geological Survey. iv, 39 p.

Errata

Changes made to the basin description will be noted here.