Tahoe Valley Groundwater Basin, Tahoe West Subbasin

- Groundwater Basin Number: 6-5.02
- County: El Dorado, Placer
- Surface Area: 6,000 acres (9 square miles)

Basin Boundaries and Hydrology

The Tahoe Valley West Subbasin of the Tahoe Valley Groundwater Basin is located about 150 miles east of the San Francisco Bay area, and about 90 miles east of the Sacramento Valley. The Tahoe Valley Groundwater Basin is located within the larger structural feature commonly referred to as the Lake Tahoe Basin. The basin is surrounded by the mountain peaks of the Sierra Nevada to the west and the Carson Range to the east. The groundwater basin consists of three alluvial areas surrounding the California side of the lake on the south, west, and north. The subbasin occupies an elongated, approximately 10 mile long structural basin, in which basin-fill deposits have accumulated (Thodal 1997). It is bounded on the east by the western shore of the Lake, and on the west by the Sierra Nevada, with an approximate north-south boundary that lies about ½ mile west of Dollar Point and 2 miles west of Meeks Bay. Elevations within the subbasin range from 6,225 feet at lake level rising to above 6,400 feet in the west.

Several creeks flow through the subbasin and into the Lake including, from north to south: Burton, Ward, Blackwood, Mckinney, and General creeks. The Truckee River, the only outlet from the Lake, flows through the northern region of the subbasin, near Tahoe City. Average annual precipitation in the subbasin ranges from 24 inches to 36 inches, increasing from east to west.

Hydrogeologic Information

Water Bearing Formations

The principal source of groundwater in the Tahoe Valley West subbasin is from Tertiary and Quaternary age glacial, fluvial, and lacustrine sediments, collectively referred to as basin-fill deposits (Burnett 1971). Each of the three depositional processes gives rise to distinct sediment types with variable hydraulic properties (Scott et al 1978). Granitic (Cretaceous-age), volcanic (Quaternary-age), and metamorphic rocks (pre-Cretaceous), collectively referred to as bedrock underlie the basin-fill deposits (Thodal 1997). While specific-yield estimates for deposits in the subbasin could not be identified from a review of previous studies, the range for similar deposits in the Tahoe Valley, South Subbasin range from 6 to 20 percent and average about 10 percent (Thodal 1997).

Basin-fill deposits. Glacial outwash sediments, deposited on prograding deltas, are the predominant sediments within the basin, and are typically composed of rock ranging from fine silt to large boulders that have been sorted and stratified by the action of water flowing from the glacier (Freeze and Cherry 1979). Permeability of these deposits can be moderate to high. Glacial sediments consisting of moraine deposits also occur within the basin

and mark the extent of glacial advance. These deposits are generally unsorted, have high clay content, and are produced by the grinding glacial action. They typically have moderate permeability.

Lacustrine deposits. These deposits are widespread and discontinuous, and are a result of fluctuating lake levels. They occur as high as 600 feet above the current lake level (about 6,225 feet). Deposits containing well-sorted beach sand have relatively high permeability, but those with high silt and clay content have lower permeability (Thodal 1997).

Fluvial Deposits. Recent fluvial deposits consisting of decomposed granite and glacial sediments that have been reworked by stream water typically are restricted to stream margins and floodplains within the subbasin. These deposits are generally very permeable. (Thodal 1997).

Basin-fill Deposits. These deposits partly fill the drainage basins of Meeks, General, McKinney, Homewood Canyon, Madden, Blackwood, and Ward Creeks permeability (SWRCB 1979). Driller's logs within the subbasin report well yields ranging from 8 to 650 gpm (DWR unpublished data).

Recharge Areas

Groundwater recharge in the study area is primarily from infiltration of precipitation into faults and fractures in bedrock, into the soil and decomposed granite that overlies much of the bedrock, and into unconsolidated basin-fill deposits. Groundwater is recharged over the entire extent of the flow path, except where the land surface in impermeable or where the groundwater table coincides with land surface. Stream flow also recharges ground water when the water-table altitude is lower than the water-surface altitude of the stream (Thodal 1997).

Groundwater Level Trends

Groundwater elevation changes are directly related to changes in groundwater storage. As reported by Thodal (1997), changes in groundwater storage have been minimal. Decreases in groundwater storage have resulted locally in areas of pumping.

Groundwater Storage

Changes in ground-water storage have been minimal. Decreases in ground-water storage have resulted in areas of pumping, whereas increases in storage have resulted in areas where storm runoff is temporarily ponded in small basins.

Groundwater Storage Capacity. No published groundwater storage capacity data was found.

Groundwater in Storage. No published groundwater in storage data was found.

Groundwater Budget (Type C)

Due to lack of groundwater budget data, inflows, including natural, applied, and artificial recharge and outflows including urban and agricultural extraction have not been included.

Groundwater Quality

Characterization. Analysis of 32 samples collected from various wells located throughout the Lake Tahoe basin (9 wells located within the Tahoe Valley, West subbasin) indicates that the sampled waters are generally of a mixed-cation bicarbonate (Thodal 1997). Tahoe City Public Utility District monitored the 9 wells in the subbasin for water quality. In 1999, total dissolved solids ranged from 68 –128 mg/L and averaged 103mg/L and electrical conductivity averaged 137 mg/L and ranged 89 – 190 mg/L for the 9 wells.

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	8	0
Radiological	5	0
Nitrates	8	0
Pesticides	7	0
VOCs and VSOCs	7	0
Inorganics – Secondary	8	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 Production Characteristics

	Well yields (gal/min)	
Municipal/Irrigation:	Range: unknown	
	Total depths (ft)	
Domestic:	Range: 65–210	Average: 126 (based on 17 wells)
Municipal/Irrigation	Range: 72–805	Average: 335 (based on 8 wells)

Active Monitoring Data

Agency	Parameter	Number of wells /Measurement frequency
	Groundwater levels	No wells are monitored at this time
	Miscellaneous water quality	No wells are monitored at this time
Dept. of Health Services and cooperators	Title 22 water quality	9 wells (Tahoe City PUD)

Basin Management

Groundwater Management: Water Agencies	None identified
Public	Tahoe City PUD
Private	Tahoe Park Water Co., Talmont Resort Improvement District, Ward Well Water Co., Timberland Water District, Skyland Water Co., Tahoe Pines Water Co., Tahoe Swiss Village Water Co., Earl Marr, Madden Creek Water Co., Tahoe Cedars Water Co., Tahoma Meadows Mutual Water Co., Neilsen Subdivision Water Co., McKinney Water District, Lake View Water Co., Meeks Bay Mutual Water Co., West Lake Tahoe Water Co., Tamarack Mutual, Fulton Water Co., Agate Bay Water Co.

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Additional References

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Errata

Changes made to the basin description will be noted here.