

Half Moon Bay Terrace Groundwater Basin

- Groundwater Basin Number: 2-22
- County: San Mateo
- Surface Area: 9,189 acres (14 square miles)

Basin Boundaries and Hydrology

The Half Moon Bay Terrace Groundwater Basin is located along the northern San Mateo coast about 20 miles south of San Francisco and 90 miles southwest of the Sacramento Valley. The Terrace is bounded by Martini Creek on the north, by the Pacific Ocean on the west, by Tunitas Creek on the south, and by the Montara Mountains on the east. Elevations within the basin range from sea level at the ocean to nearly 300 feet along the eastern boundary. Many creeks flow through the basin toward the Pacific Ocean, including Montara, San Vicente, Denniston, Pilarcitos, Purisima, and Lobitos Creeks. The region has a Mediterranean climate with most of the precipitation in the region occurring as rain during the winter and spring. Although the summer is generally dry, regional fog helps moderate the average temperature, reduces evapotranspiration, and meets some moisture demands from plants (MWSD 2012).

Hydrogeologic Information

Water-Bearing Formations

The basin is filled by sedimentary materials and underlain by Montara Mountain granite. Montara Mountain granite is part of a much larger Cretaceous-age magmatic arc complex known as the Salinian Block. The basin occupies a structural trough which has been filled with sediments transported from the adjacent hills (DWR 1999).

Holocene Alluvium. The alluvium consists of unconsolidated, moderately sorted sand and gravel. In the basin, coarse-grained alluvium is present in stream floodplains and as a fan deposit east of Half Moon Bay Airport (DWR 1999).

Pleistocene Marine Terrace Deposits. Marine terrace deposits are found along the coastline of the basin. The deposits consist of poorly to moderately consolidated marine, eolian, and alluvial sand, silt, gravel, and clay. The formation lies unconformably on top of the Purisima Formation (Brabb 1980).

Pliocene Purisima Formation. The Purisima Formation is a highly fractured, well-indurated, soft- to medium-hard, fossiliferous mudstone, siltstone, and sandstone. The formation rests nonconformably on top of Montara Mountain granitics and is believed to be hundreds of feet thick. The Purisima Formation crops out in the study area just west of Half Moon Bay Airport, and underlies most of the Upper Pleistocene marine terrace deposits (DWR 1999).

Cretaceous Montara Mountain Granitic Rock. The granite of Montara Mountain is a highly fractured medium to coarsely-crystalline rock. Exposures of the granite are commonly fractured and weathered to a depth of

100 feet. The granitic rock forms the mountains directly east of the coastline and underlies all of the younger geologic formations (DWR 1999).

Recharge Areas

A study of the watersheds of several creeks in and around the Half Moon Bay Terrace Groundwater Basin found that for areas of higher elevation, direct precipitation is largely responsible for groundwater recharge, whereas for the lower elevation areas most recharge occurs locally from streams (Balance Hydrologics 2010).

Groundwater Level Trends

Hydrographs from DWR monitoring wells in the north part of the basin indicate that the overall groundwater level trend during the period of record has been stable. The depths to groundwater fluctuate annually with the depth to groundwater generally greatest in summer months and shallowest in winter months.

Groundwater Storage

Groundwater in Storage. A 1987 study by Earth Sciences Associates and Luhdorff and Scalmanini Consulting Engineers estimated the usable groundwater in storage for the Half Moon Bay Airport and Pillar Point Marsh area to be about 1,300 acre-feet. This area is bounded by San Vicente Creek on the north, the community of El Granada on the south, the Seal Cove Fault on the west, and Montara Mountain on the east.

Groundwater Budget (Type C)

Due to lack of groundwater budget data for Half Moon Bay Terrace Groundwater Basin, a groundwater budget estimate has not been prepared. However, the Midcoast Groundwater Study Phase II identifies a sub-area of the Half Moon Bay Terrace Groundwater Basin, referred to as the Airport Subbasin, in which budget information was estimated. Groundwater pumping in the Airport Subbasin was estimated at 513 AFY. Average inflow was estimated at approximately 2,780 AFY which was found to equal average outflow (Kleinfelder 2009). Therefore, the Phase II Study finds that the Airport Subbasin is in long-term hydrologic balance.

Groundwater Quality

Characterization. Water quality information for the Half Moon Bay Terrace Groundwater Basin is limited. However, much of the groundwater in the northern part of the Basin is high in iron and manganese (Montgomery Watson 1996). Total dissolved solids data from 12 wells indicate a range of 160 to 460 milligrams per liter (mg/l) and an average of 283 mg/l. Additionally, according to the Midcoast Groundwater Study Phase III, conditions for sea water intrusion have not developed (Balance Hydrologics 2010).

Well Characteristics

| Well yields (gal/min) | | |
|-----------------------|-----------------|--|
| Municipal/Irrigation | Range: 3 – 220 | Average: 39 (based on 117 well completion reports [WCRs]) |
| Total depths (ft) | | |
| Domestic | Range: 30 – 910 | Average: 160 (based on 915 WCRs) |
| Municipal/Irrigation | Range: 40 – 305 | Average: 124 (based on 74 WCRs) |

Active Monitoring Data

| Agency | Parameter | Number of wells /measurement frequency |
|---|-----------------------------|--|
| DWR | Groundwater levels | 3 wells/semi-annually |
| Department of Health Services and cooperators | Groundwater levels | 9 wells/biennially |
| DWR | Miscellaneous water quality | None |
| Department of Health Services and cooperators | Title 22 water quality | 14 wells/annually |

Basin Management

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|-------------------------|---|
| Groundwater management: | Montara Water and Sanitary District: Informally adopted findings from Montara-Moss Beach Water Well Environmental Impact Report |
| Water agencies | |
| Public | Coastside County Water District, Montara Water and Sanitary District |
| Private | Unknown |

References Cited

- Balance Hydrologics Inc. 2010. Midcoast Groundwater Study Phase III, San Mateo County, California.
- Brabb EE. 1980. Preliminary geologic map of the La Honda and San Grgorio quadrangles, San Mateo County, California, Open-File Report OF-80-245, scale 1:24,000.
- California Department of Water Resources (DWR). 1999. Montara Water Supply Study for Montara Sanitary District San Mateo County, California.
- Kleinfelder. 2009. Midcoast Groundwater Study Phase II, San Mateo County, California, 2007. Summary and Errata dated April 2009.
- Montara Water and Sanitary District (MWSD). 2010. CASGEM Monitoring Plan.

Errata

Changes made to the basin description will be noted here.