
PETALUMA VALLEY GROUNDWATER CONDITIONS

Groundwater resources have long played a significant role in the development, growth and sustainability of the Petaluma Valley. These groundwater resources are relied upon to varying degrees by rural and urban residents, agricultural users, golf courses and other businesses and also support the rich ecosystems present in Petaluma Valley. Assuring sustainable groundwater supplies in the Petaluma Valley is critical to the environmental health and economic vitality of the Basin.

A comprehensive study of the Petaluma Valley Basin was last completed in 1982 by the Department of Water Resources. In recognition of the importance of local groundwater resources, in 2014, the Sonoma County Water Agency and City of Petaluma partnered with the U.S. Geological Survey to conduct a three-year groundwater study of the Petaluma Valley, which is currently nearing completion. The study will culminate in a report by 2018 consisting of the following major sections:

- Hydrogeologic characterization
- Data collection and interpretation (primarily water quality)
- Numerical groundwater flow model.

Groundwater is the primary source of supply for domestic and agricultural use by rural property owners in the Basin and while urban water supply to the City of Petaluma is primarily imported Russian River surface water, groundwater is a vital supplemental and backup source of water for the City of Petaluma. Estimates of total groundwater use in Petaluma Valley, along with the water budget are being developed as part of the USGS study.

The 46,000-acre Petaluma Valley Groundwater Basin is located within the larger 93,440-acre Petaluma Valley watershed. The main geologic units which form the primary aquifers in the Petaluma Valley are sedimentary deposits of the recent Alluvium, the Wilson Grove Formation, and the Petaluma Formation. Five faults or fault systems are documented within Petaluma Valley which may have an influence on groundwater movement and water quality. Aquifers are generally discontinuous vertically and horizontally, creating partitions of variable water quality and aquifer properties. In general, groundwater flows from recharge areas in the mountains surrounding the Petaluma valley toward the valley axis and in a generally southern direction towards San Pablo Bay. The Petaluma River traverses the axis of the basin with tidal influence extending from the San Pablo Bay to downtown Petaluma, roughly 14 miles.

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Important observations regarding groundwater conditions in the Petaluma Valley:

- The available groundwater elevation data suggest that groundwater elevations are relatively stable in areas of southern to the central Petaluma Valley, but in some areas in the northwest portion of the basin groundwater levels have exhibited long-term declines. While the majority of available data indicates relatively stable groundwater levels, groundwater level declines are occurring in several monitored wells in the Petaluma Valley, with one well in northern Petaluma Valley experiencing a decline of approximately 40 feet over the past decade.
- Historical occurrences of serious nitrate contamination have been documented in the western portion of the Basin (DWR, 1982) due to past land use practices. Though initial results from the USGS study indicate that concentrations have decreased, data gaps related to the current spatial distribution remain. Other areas of poor water quality are found in the southern end of the Petaluma Valley caused by connate waters of marine origin.
- DWR in 1982 found that saltwater intrusion from the tidally influenced portion of the Petaluma River affected shallow aquifers prior to 1962, but that there had been no further incursions after that time. They attributed the lack of further saltwater intrusion to substitution of groundwater with surface water. However, the risk of saltwater intrusion due to changes in land use and pumping patterns that have occurred since 1982, particularly from the tidally influenced portion of the Petaluma River into shallow aquifers in the Basin, is being evaluated through the ongoing USGS study.