Coyote Valley Basin

- Groundwater Basin Number: 5-18
- County: Lake
- Surface Area: 6,530 acres (10 square miles)

Basin Boundaries and Hydrology

Coyote Valley is a northwest-southeast trending valley located within the southeastern portion of Lake County along Putah Creek about 4 miles northeast of Middletown. The valley is approximately 5 miles long and a maximum of 2.5 miles in width. The alluvial plain of the valley is bounded by sediments of the Jurassic-Cretaceous Franciscan-Knoxville groups and undifferentiated Cretaceous rocks on the west and northwest. The south and southeastern part of the valley is nearly isolated by low hills of basalt of Upper Jurassic age. The Plio-Pleistocene Cache Formation outcrops along the northern edge of the valley and Plio-Pleistocene basalt outcrops are observed at the northeastern valley edge valley (Koenig 1963). Annual precipitation in the valley ranges from 37- to 41-inches, increasing to the north.

Hydrogeologic Information

Water-Bearing Formations

The aquifer system of Coyote Valley Basin is primarily comprised of Quaternary Holocene alluvial deposits and, to a much lesser extent, Plio-Pleistocene Cache Formation deposits.

Holocene Alluvium. Holocene alluvium within the valley overlies the Cache Formation and is the primary water-bearing unit in the basin. The alluvium is made up of floodplain and channel deposits of Putah Creek and gently sloping alluvial fan deposits in the southwestern lobe of the valley and at the valley margins. The deposits consist of poorly stratified sand, gravel, and fine-grained material. The most productive strata are gravels that occur in sheets and stringers between beds of silty and sandy clay. The alluvial fill may range in thickness from 100- to 300-feet (Upson 1955) (DWR 1976).

Plio-Pleistocene Volcanics and Cache Formation. Volcanic rocks and underlying tuffaceous deposits (Upper Cache Formation) exist along the north edge and in the southeastern part of the valley and may be water-bearing. The tuffaceous deposits are poorly consolidated and apparently lie at considerable depth beneath the hills to the northeast, where they are overlain by, and possibly interbedded with, basaltic flows. The lithology of the sediments associated with lava flows along the north edge of Coyote Valley is like that of the Upper Cache near Clear Lake, except for the composition of the cobble gravels, which are composed largely of rounded cobbles of white rhyolite (DOM 1953). The Cache Formation outcrops on the northeast edge of Coyote Valley and probably underlies much of the Holocene alluvium. It is composed of gravel, silt, and sand, and near the top of the section, water–laid tuffs and tuffaceous sands become dominant (DOM 1953). The permeability in the Cache formation is variable, but generally low. Most of the strata are too high in clay or silt for water movement to be great. Groundwater flow through a few coarse sedimentary strata and volcanic deposits may be appreciable (DWR 1957).

Recharge Areas

The major source of groundwater recharge is from Putah Creek. Lesser amounts of recharge occur from precipitation upon the alluvial plain and from side-stream runoff (DWR 1976).

Groundwater Level Trends

Analysis Incomplete.

Groundwater Storage

Groundwater Storage Capacity. The USGS Water Supply Paper 1297 estimates the storage capacity of the basin to be 27,000 acre-feet. This estimate is based on the areal extent of alluvium within the basin (approximately 3000 acres) for a saturated depth interval of 10 to 100-feet having a specific yield of 10 percent (Upson 1955). DWR (1960) estimates the storage capacity to be 29,000 acre-feet with a useable storage capacity of 7,000 acre-feet.

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources in 1995. The survey included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 1,400 and 290 acre-feet respectively. Deep percolation from applied water is estimated to be 1,100 acre-feet.

Groundwater Quality

Characterization. Groundwater in the basin consists of magnesium bicarbonate type waters. Total dissolved solids (TDS) range from 175- to 390-mg/L, averaging 288 mg/L (DWR unpublished data).
Impairments. Water quality impairments include locally high magnesium.

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	5	0
Radiological	3	0
Nitrates	5	0
Pesticides	2	0
VOCs and SVOCs	2	0
Inorganics – Secondary	5	0

[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 Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 75 – 800	Average: 446 (6 Well Completion Reports)
	Total depths (ft)	
Domestic	Range: 15 – 485	Average: 183 (98 Well Completion Reports)
Municipal/Irrigation	Range: 20 – 240	Average: 123 (16 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	1 well semi-annually
Lake County	Groundwater levels	6 wells semi-annually
DWR	Miscellaneous water quality	3 wells biennially
Department of Health Services and cooperators	Title 22 water quality	3

Basin Management

Groundwater management:	Lake County adopted a groundwater management ordinance in 1999.
Water agencies	
Public	
Private	

Selected References

California Department of Water Resources (DWR). July 1957. Lake County Investigation. California Department of Water Resources. Bulletin 14.

California Department of Water Resources (DWR). 1960. Northeastern Counties Investigation. California Department of Water Resources. Bulletin 58.

California Department of Water Resources (DWR). September 1976. Southwestern Sacramento Valley Ground Water Investigation. California Department of Water Resources, Northern District. Draft Memorandum Report.

California Division of Mines (DOM). 1953. Geology of Lower Lake Quadrangle, California. Bulletin 166.

Hearn BC, Donnelly JM, Goff FE. 1975. Geology and Geochronology of the Clear Lake Volcanics, California. USGS. 75-296.

Koenig JB. 1963. Geologic Map of California [Santa Rosa Sheet] Scale 1:250,000, California Division of Mines and Geology.

McLaughlin RJ, Ohlin HN, Blome CD. 1983. Tectonostratigraphic Framework of the Franciscan Assemblage and Lower Part of the Great Valley Sequence in the Geysers-Clear Lake Region, California. American Geophysical Union, Eos, Transactions.

Ott Water Engineers Inc. 1987. Lake County Resource Management Plan Update. Lake County Flood Control and Water Conservation District.

Upson JE, Kunkel F. 1955. Ground Water of the Lower Lake-Middletown Area, Lake County, CA. USGS. Water-Supply Paper 1297.

Rymer MJ. 1978. Stratigraphy of the Cache Formation (Pliocene-Pleistocene) in Clear Lake basin, Lake County, California. USGS.

Rymer MJ. 1981. Stratigraphic Revision of the Cache Formation (Pliocene and Pliestocene), Lake County, California. USGS.

Rymer MJ, Roth B, Bradbury JP, Forester RM. 1988. Depositional Environments of the Cache, Lower Lake, and Kelseyville Formations, Lake County, California. Geological Society of America.

Bibliography

Bailey EH. 1966. Geology of Northern California. California Division of Mines and Geology. Bulletin 190.

California Department of Water Resources (1962). Reconnaissance Report on Upper Putah Creek Basin Investigation. Bulletin 99.

California Department of Water Resources. 1975. California's Ground Water. California Department of Water Resources. Bulletin 118.

California Department of Water Resources. 1980. Ground Water Basins in California. California Department of Water Resources. Bulletin 118-80.

California Department of Water Resources. 1998. California Water Plan Update. California Department of Water Resources. Bulletin 160-98,Volumes 1 and 2.

Dickinson WR, Ingersoll RV, Grahm SA. 1979. Paleogene Sediment Dispersal and Paleotectonics in Northern California. Geological Society of America Bulletin 90:1458-1528.

McNitt JR. 1968. Geology of the Kelseyville Quadrangle, Sonoma, Lake and Mendocino Counties. California Divisions of Mines and Geology. Map Sheet 9.

Planert M, Williams JS. 1995. Ground Water Atlas of the United States, Segment 1, California, Nevada. USGS. HA-730-B.

Sims JD. 1988. Late Quaternary Climate, Tectonism, and Sedimentation in Clear Lake, Northern California Coast Ranges. Geological Society of America.

United States Army Corps of Engineers San Francisco District. 1954. Hydrology and Hydrolic Analysis: Russian River Reservoir (Coyote Valley), California. U.S. Army Corps of Engineers, San Francisco District.

Errata

Changes made to the basin description will be noted here.