Lower Lake Basin

- Groundwater Basin Number: 5-30
- County: Lake
- Surface Area: 2,400 acres (4 square miles)

Basin Boundaries and Hydrology

Lower Lake Basin is located at the southeast end of Clear Lake and includes the alluvial plains of Cache, Herndon, and Seigler Canyon Creeks. Copsey Creek also drains to Cache Creek from Excelsior Valley located to the south. The basin is bounded on the south by Plio-Pleistocene Cache Formation, Tertiary bedrock, and rocks of the Great Valley Sequence; on the north by the Cache Formation and Quaternary volcanics; and on the east by Tertiary rock of the Martinez and Tejon formations. Surficial Cache Formation and Martinez Formation deposits are located within the middle third of the basin north and northeast of the city of Lower Lake. Annual precipitation in the basin is approximately 27 inches.

Hydrogeologic Information

Water-Bearing Formations

The aquifer system of Lower Lake Basin is primarily composed of deposits of Quaternary alluvium and the Plio-Pleistocene Cache Formation (Upson 1955).

Quaternary Alluvium. Alluvial deposits in the basin are approximately 50- to 75-feet thick and consists of clay, silt, and sand, with some gravel (DWR 1976). Irrigation wells constructed in the vicinity of alluvial deposits yield between 400- and 600-gpm with little drawdowns (Upson 1955). The alluvial plain of Herndon Creek likely consists of clay, clay and gravel, and some interbedded gravel stringers or layers. Wells installed to depths of approximately 75 feet yield up to 250 gpm with about 40 feet of drawdown (Upson 1955).

Plio-Pleistocene Cache Formation. The Cache Formation is primarily composed of gravel, silt, and sand with the upper most sediments consisting of water-laid tuffs and tuffaceous sands intercalated with clay, marl, pebbly limestone, and diatomite (DOM 1953). The formation underlies younger alluvial deposits over a region of approximately two-thirds of the basin. The permeability in the formation is variable but generally low. Most of the strata are too high in clay or silt. Depth of the formation is unknown. Well yields are reported to range between 150 and 240 gallons per minute (Upson 1955).

Recharge Areas

Groundwater recharge is derived from precipitation and from seepage from Herndon Creek and Clear Lake (Upson 1955). Recharge also likely occurs from Copsey and Seigler Canyon creeks. Recharge of groundwater in the Cache formation is likely derived from the infiltration of rain that falls on the outcrop area (Upson 1955).

Groundwater Level Trends

Analysis Incomplete.

Groundwater Storage

Storage capacity is estimated to range from 3,000 to 4,000 acre-feet (Upson 1955). Additional storage capacity is available as part of the Cache Formation; however, thickness and specific yield of that formation is unknown.

Groundwater Budget (Type B)

Estimates of groundwater extraction for Lower Lake Basin are based on a survey conducted by the California Department of Water Resources in 1995. The survey included landuse and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 78 and 210 acre-feet respectively. Deep percolation from applied water is estimated to be 33 acre-feet.

Groundwater Quality

Characterization. Bicarbonate type waters with mixed cationic character are found in the basin. Total dissolved solids (TDS) concentrations range from 290- to-1,230 mg/L, averaging 568 mg/L (DWR unpublished data).

Impairments. Groundwater in the basin has localized high iron, manganese, calcium, sodium, ASAR, sulfate, and TDS. High boron concentrations may be an issue for irrigation.

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	3	0
Radiological	1	0
Nitrates	5	0
Pesticides	1	0
VOCs and SVOCs	0	0
Inorganics – Secondary	3	2

[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: 3 – 100	Average: 37 (9 Well Completion Reports)
	Total depths (ft)	
Domestic	Range: 22 - 230	Average: 78 (86 Well Completion Reports)
Municipal/Irrigation	Range: 26 - 340	Average: 113 (17 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Miscellaneous water quality	3 wells semiannually
Department of Health Services	Miscellaneous water quality	5 wells biennially

Basin Management

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

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Errata

Changes made to the basin description will be noted here.