

Little Lake Valley Groundwater Basin

- Groundwater Basin Number: 1-13
- County: Mendocino
- Surface Area: 10,020 acres (16 square miles)

Basin Boundaries and Hydrology

Little Lake Valley Groundwater Basin is an irregular shaped basin located in the Coast Ranges within central Mendocino County. The basin is approximately 7 miles in length and up to 3 miles wide near the middle of the valley. The town of Willits is situated in the west-central portion of the valley.

The basin was likely formed by faulting along the Maacama Fault Zone on the southwest and northeast margins of the valley. The attitude of beds in the southern part of the basin suggests the presence of a broad anticline plunging to the north. The contact between alluvium/continental deposits and bedrock of the Jurassic-Cretaceous Franciscan Complex constitutes the basin boundary.

The valley drains to the north by several streams including: Baechtel, Broaddus, Davis, Haehl, and Willits Creeks. The marsh area at the north end of the valley drains to the northwest through Outlet Creek. Annual precipitation is approximately 49 inches.

Hydrogeologic Information

Water-Bearing Formations

Water-bearing formations in the basin consist of the Quaternary alluvial deposits and older Pliocene to Pleistocene continental basin deposits. The following summary on water-bearing formations and groundwater conditions was taken primarily from Farrar (1986) and Cardwell (1965). Groundwater is locally available in fractures in the underlying and surrounding consolidated bedrock; however, little data is available and a discussion of groundwater from bedrock is not included in this summary.

Holocene Alluvial Deposits. The alluvial deposits are Holocene in age and cover most of the flat portions of the valley - an area of approximately 12 square miles. The alluvium consists of uncemented gravel, sand, silt, and clay. Thickness of the formation may be as much as 250 feet in parts of the valley. The alluvium is the most productive aquifer in the valley and properly constructed wells in favorable areas can yield up to several hundred gallons per minute. Groundwater in the alluvium is mostly confined to semiconfined beneath extensive sheets of fine-grained sediments. Water occurs unconfined along the valley margins and in shallow alluvium along creeks. Specific yield for the alluvium is estimated at about 8 percent.

Pliocene to Pleistocene Continental Basin Deposits. These deposits consist of poorly sorted gravel, sand, silt, and clay interbedded with beds of clay. Outcrops occur along the southeastern, southern, and southwestern portions of the valley over an area of approximately 5 square miles. The

beds are generally compact to semi-consolidated and have been warped into an anticlinal structure plunging northward beneath the alluvium. The thickness of these deposits range from a thin veneer along the valley margins up to 1500 feet in the southwest part of the basin. Yields from this unit are generally low ranging from less than 1- to 45-gpm based on short-term pumping tests. Groundwater in these deposits is under confined to semiconfined conditions.

Recharge Areas

Most of recharge to alluvium occurs at the southern margin of the alluvial plain.

Groundwater Level Trends

Hydrographs of groundwater levels from the period of the late 1950's to present show typical seasonal water level fluctuations with no significant long-term trends (Farrar 1986; DWR unpublished data).

Groundwater Storage

Groundwater Storage Capacity. Cardwell (1965) estimates storage capacity to be 50,000 acre-feet based on the areal extent of alluvial deposits of 12 square miles for a depth interval of 10- to 100-feet below ground surface and an estimated specific yield of 10 percent. DWR (1965) estimates the storage capacity to be 91,600 acre-feet based on a depth interval for alluvial deposits of 10- to 200-feet and specific yields ranging from 5- to 20-percent. Farrar (1986) estimates storage capacity to be 35,000 acre-feet to a depth of 100 feet assuming a saturated thickness of 90 feet and a specific yield of 8 percent.

Groundwater Budget (Type A)

Farrar (1986) estimates groundwater extraction from the basin to be 2,000 acre-feet per year. An additional 2,000 acre-feet contributes to baseflow of streams during the dry season based on discharge measurements of Outlet Creek.

Groundwater Quality

Characterization. Groundwater is characterized as calcium-magnesium bicarbonate and magnesium-calcium bicarbonate type water, with a few well waters being sodium bicarbonate and sodium chloride in character. Total dissolved solids concentrations from 17 wells sampled as part of a 1986 USGS study ranged from 97- to 1,710-mg/L, averaging 340 mg/L.

Impairments. Groundwater impairments included high concentrations of iron, manganese, and calcium. Locally, impairments include high TDS, EC, ammonia, and phosphorus. High boron concentrations are observed in the northern part of the valley.

Well Production characteristics

Well yields (gal/min)

Alluvial wells can yield 20- to 1,000-gpm. Wells installed in older basin deposits report yields of less than 1- to 45-gpm (Farrar 1986). DWR (1975) reports an average well yield of 300 gpm and a maximum yield of 1,000 gpm.

Total depths (ft)

Domestic	Range: 10 - 395	Average: 114 (187 Well Completion Reports)
Irrigation	Range: 45 - 454	Average: 174 (19 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR	Groundwater levels	7 wells semi-annually
DWR and cooperators	Miscellaneous water quality	7 wells biennial

Basin Management

Groundwater management:	No known groundwater management plans, groundwater ordinances, or basin adjudications.
Water agencies	
Public	City of Willits
Private	

Selected References

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Errata

Changes made to the basin description will be noted here.