Sacramento Valley Groundwater Basin, Bend Subbasin

- Groundwater Basin Number: 5-21.53
- County: Tehama
- Surface Area: 20,770 acres (32 square miles)

Basin Boundaries and Hydrology

The Bend Subbasin is located in the far northeastern portion the Sacramento Valley Groundwater Basin. The Sacramento River serves as the subbasin boundary to the west and the Cascade Range to the east. The subbasin is bounded on the north by the hydrologic divide between the Redding and Sacramento groundwater basins along the north side of Paynes Creek. The anticlinal structure above the projected trace of the Red Bluff fault serves as the subbasin boundary to the south. Annual precipitation ranges between 23- to 31-inches, increasing to the east.

Hydrogeologic Information

Water-Bearing Formations

The Bend Subbasin aquifer system is comprised of continental deposits of late Tertiary to Quaternary age. The Quaternary deposits include stream channel deposits, Holocene alluvium, and Pleistocene deposits of Modesto and Riverbank formations. The Tertiary deposits include the Tuscan Formation. Information on water-bearing formations is taken primarily from Helley and Harwood (1985).

Holocene Alluvium. Alluvial deposits in the subbasin consist of unconsolidated gravel, sand, silt and clay from stream channel and floodplain deposits. These deposits are found along stream and river channels. The thickness ranges up to 30 feet. This unit represents the perched water table and the upper part of the unconfined zone of the aquifer. Although the alluvium is moderately permeable, it is not a significant contributor to groundwater usage.

Pleistocene Modesto and Riverbank Formations. The Modesto and Riverbank Formations consist of poorly consolidated gravel with some sand and silt deposited during the Pleistocene. They are usually found as terrace deposits near the surface along the Sacramento River and its tributaries. The thickness ranges up to 50 feet. The deposits are highly permeable and yield limited domestic water supplies.

Pliocene Tuscan Formation. The Tuscan Formation is composed of a series of volcanic mudflows, tuff breccia, tuffaceous sandstone and volcanic ash layers and is the principal water-bearing formation in the subbasin. The formation is described as four separate but lithologically similar units, Units A through D (with Unit A being the oldest), which in some areas are separated by layers of thin tuff or ash units.

Unit A is the oldest water bearing unit of the formation and is characterized by the presence of metamorphic clasts within interbedded lahars, volcanic conglomerate, volcanic sandstone and siltstone.

Unit B is composed of a fairly equal distribution of lahars, tuffaceous sandstone, and conglomerate. Coarse cobble to boulder conglomerate predominates in the eastern and northern parts of mapped unit. The formation is approximately 430 feet thick.

Unit C is the primary surficial deposit and consists of several massive mudflow or lahar deposits with some interbedded volcanic conglomerate and sandstone. The thickness of Unit C exposed in the vicinity of Tuscan Springs and Tuscan Buttes ranges from 165- to 265-feet.

Unit D consists of fragmental deposits characterized by large monolithologic masses of andesite, pumice, and fragments of black obsidian in a mudstone matrix. The deposit varies in thickness from 30- to 160-feet.

Groundwater Level Trends

Groundwater level monitoring is not conducted in the subbasin.

Groundwater Storage

Groundwater Storage Capacity. No published information was found for groundwater storage in the subbasin.

Groundwater Budget (Type B)

Estimates of groundwater extraction are based on a survey conducted by the California Department of Water Resources 1994. Surveys included land use and sources of water. Estimates of groundwater extraction for agricultural and municipal/industrial uses are 220 and 120 acre-feet respectively. Deep percolation from applied water is estimated to be 340 acre-feet.

Groundwater Quality

Characterization. Groundwater in the subbasin is characterized as magnesium-calcium bicarbonate. Total dissolved solids (TDS) range from 334- to 360- mg/L (DWR unpublished data).

Impairments. Localized high calcium concentrations occur in the basin.

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	1	0
Radiological	1	0
Nitrates	1	0
Pesticides	0	0
VOCs and SVOCs	0	0
Inorganics – Secondary	1	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	275 (1 Well Completion Report)	
	Total depths (ft)	
Domestic	Range: 20 – 388	Average: 149 (102 Well Completion Reports)
Municipal/Irrigation	Range: 89 – 220	Average: 144 (4 Well Completion Reports)

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
	Groundwater levels	NKD
DWR	Miscellaneous Water Quality	3 wells bi-yearly
Department of Health Services and cooperators	Miscellaneous Water Quality	9

NKD – No known data.

Basin Management

Groundwater management:	Tehama County has adopted a countywide AB3030 plan. Tehama County adopted a groundwater management ordinance in 1994.
Water agencies	
Public	Tehama County Flood Control and Conservation District.
Private	

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Errata

Changes made to the basin description will be noted here.