Cuddy Ranch Area Groundwater Basin

- Groundwater Basin Number: 5-83
- County: Kern
- Surface Area: 4,203 acres (7 square miles)

Basin Boundaries and Hydrology

The Cuddy Ranch Area basin is within a series of east west trending intermountain valleys formed along the trace of the San Andreas Fault in the San Emigdio Mountains of southernmost Kern County (Jennings and Strand 1969). The valley is at an elevation of 5,200 to 6,000 feet. Two faults controlled formation of the basin and its boundaries. The east-west trending San Andreas Fault zone and Tecuya Mountain bound the north portion of the basin, and the southwest trending Big Pine Fault and numerous splays bound and underlie the southern portion of the basin. The basin is bound on the west by the flank of Mount Pinos, to the east by the flank of Frazier Mountain, and to the south by Lockwood Valley. The portion of the basin astride the Big Pine Fault zone is locally known as Little Cuddy Valley.

Small, ephemeral northeast flowing streams in the southern basin merge to become a small perennial stream in the northern basin where Tertiary sedimentary units form a narrow outlet to Cuddy Creek (Jennings and Strand 1969). Perennial grasses and springs at this outlet are evidence of the shallow nature of groundwater flow in this portion of the basin. Average precipitation is 13 to 16 inches annually.

Hydrogeologic Information

Water Bearing Formations

The Cuddy and Little Cuddy Valleys represent a relict intermontane drainage system and landscape (Davis 1983). Multiple, thick clay horizons in DWR well logs suggest the presence of recent lacustrine or marsh deposits formed during periods of at least partially closed drainage.

Surficial deposits include moderately indurated sandstone, conglomerate, siltstone and claystone of the Tertiary Caliente Formation (Davis 1983). These deposits form prominent high terraces on the southeast face of the basin. This unit is overlain by Pleistocene older alluvium, which is composed of unconsolidated gravel, sands, and silt and occupies the valley margins. Recent alluvium is found along the valley axis. At the south end of the basin, well logs show abundant clay in the subsurface profile along this axis. Metamorphic and granitic bedrock of the surrounding mountains floor the basin at varying depths.

The Recent alluvium thickens at the intersection of the San Andreas and Big Pine fault zones at the basin's northeast end. Sand, gravel, cobbles, and interbedded clay exist to a depth of at least 300 feet in this area based on interpretation of lithologic and electric well logs in DWR's San Joaquin District files.

Based on review of well logs, specific yields are anticipated to be less than approximately 5 percent in the majority (southern portion) of the basin. Specific yield is expected to be greater in the northernmost basin along the trace of the San Andreas Fault zone where a larger percentage of sand, gravel and cobbles is noted in well logs.

Restrictive Structures

Basin recharge is assumed to be from seasonal flow in ephemeral streams originating in the surrounding watershed along basin margins, and from deep percolation of precipitation. Seasonal flows along Cuddy Creek and from ephemeral streams draining the southern basin are the primary source of recharge in the northern basin where municipal supply wells are located.

Groundwater Budget (Type C)

There is not enough data to make an estimate of the groundwater budget at this time.

Groundwater Quality

The characterization of the basin has not been determined. TDS values range from 480 to 645 mg/L, with an average value of 550 mg/L, and EC values range from 760 to 1,000 μmhos with an average value of 870 μmhos (based on 4 wells). There are no known water use impairments.

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	6	1
Radiological	5	0
Nitrates	6	0
Pesticides	5	0
VOCs and SVOCs	5	0
Inorganics – Secondary	6	3

[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: 40 - 300	Average: 180 (4 well completion reports)
Domestic:	Range: 2 – 80	Average: 19 (16 well completion reports)
	Total depths (ft)	
Domestic	Range: 90 – 550	Average: 240 (16 well completion reports)
Municipal/Irrigation	Range: 180 – 500	Average: 390 (4 well completion reports)

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
Department of Health Services	Title 22 water quality	4 Varies

Basin Management

Groundwater management:

Water agencies

Public	None
Private	Lake of the Woods Mutual Water Company

References Cited

California Department of Water Resources, San Joaquin District. Well completion report files.

Davis, Thomas L. 1983. "Late Cenozoic Structure and Tectonic History of the Western "Big Bend" of the San Andreas Fault and Adjacent San Emigdio Mountains". Ph.D. Dissertation, University of California, Santa Barbara. 564 p.

Jennings, Charles W. and Strand, Rudolph G. (compilers). 1969. Los Angeles Sheet of Geologic Map of California. California Division of Mines and Geology (CDMG). Scale 1:250,000.

Additional References

Lake of the Woods Mutual Water Company (LWMWC). 2000. District file data reviewed on 06/28/00.

Errata

Changes made to the basin description will be noted here.