Upper Santa Ana Valley Groundwater Basin, Rialto-Colton Subbasin

- Groundwater Basin Number: 8-2.04
- County: Riverside, San Bernardino
- Surface Area: 30,100 acres (47 square miles)

Basin Boundaries and Hydrology

The Rialto-Colton Subbasin underlies a portion of the upper Santa Ana Valley in southwestern San Bernardino County and northwestern Riverside County. This subbasin is bounded by the San Gabriel Mountains on the north, the San Jacinto fault on the east, the Box Spring Mountains on the south, and the Rialto-Colton fault on the west. Lytle Creek drains this part of the valley southeastward to its confluence with the Santa Ana River in the southern part of the subbasin.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the Rialto-Colton Subbasin can be found in alluvial deposits. Specific yield ranges from about 6 percent northwest of Rialto to about 16 percent near Colton (DWR 1934). Groundwater within the subbasin is primarily unconfined to semi-confined (Wildermuth 2000).

Alluvial Deposits.
Water-bearing alluvium consists of gravel, sand, silt, and clay. Holocene age alluvial deposits are found beneath the current courses of Lytle and Cajon Creeks along the eastern part of the subbasin, and the Santa Ana River, which crosses the southern part of the subbasin. These Holocene deposits are typically less compacted and weathered than older deposits and have higher permeability (DWR 1970). Alluvial deposits of Pliocene and Pleistocene age are composed of somewhat compacted and weathered deposits of gravel, sand, silt, and clay in discontinuous lenticular bodies. The coarsest material occurs near the mouth of Lytle Creek and the material becomes finer toward the southeast where the coarsest gravels contain few cobbles. Sorting increases southeastward and deposits of highest permeability are well sorted sands found near the Santa Ana River (DWR 1934; DWR 1970).

Restrictive Structures

The San Jacinto fault, its extension barrier "E", and the Rialto-Colton fault are northwest trending barriers to groundwater movement in this subbasin (DWR 1934; DWR 1970; Wildermuth 2000). The San Jacinto fault displaces water levels about 50 feet in older deposits, but is not a barrier in the youngest materials, particularly beneath the Santa Ana River (DWR 1970). Barrier "E" (Dutcher and Garrett 1963) lies south of the San Jacinto fault and displaces groundwater elevations by about 25 to 50 feet (Wildermuth 2000). The Rialto-Colton fault is a barrier to groundwater flow along much of its length, especially in its northern reaches where groundwater elevations can reach near 400 feet higher within the Rialto-Colton Subbasin than in the Chino Subbasin to the west (Wildermuth 2000). Barrier "J" (Dutcher and Garrett 1963) is a northeast-trending, southward

step in groundwater elevation of about 100 feet in the northern part of the subbasin that may be a barrier to groundwater movement southward (Dutcher and Garrett 1963; Wildermuth 2000) or may be a groundwater cascade (DWR 1970).

Recharge Areas

The principal recharge areas are Lytle Creek in the northwestern part of the subbasin, Reche Canyon in the southeastern part, and the Santa Ana River in the south-central part. Lesser amounts of recharge are provided by percolation of precipitation to the valley floor, underflow, and irrigation and septic returns (DWR 1970; Wildermuth 2000). Underflow occurs from fractured basement rock (DWR 1970; Wildermuth 1970) and through the San Jacinto fault in younger Santa Ana River deposits at the south end of the subbasin (Dutcher and Garrett 1958) and in the northern reaches of the San Jacinto fault system (Wildermuth 2000).

Groundwater Level Trends

Groundwater moves toward the Santa Ana River from Lytle Wash in the northwest, and from Reche Canyon in the southeast (DPW 1934; DWR 1970; Wildermuth 2000). In the northern part of the subbasin, hydrographs show quick rises of water levels during high precipitation years and slower decline towards a baseline level over several years. Years of high precipitation may raise groundwater levels 40 or more feet and the range of water levels through the 1990s for a well is typically about 50 feet. In the southern part of the subbasin, near the Santa Ana River, groundwater levels have been relatively stable through the 1990s, fluctuating between 5 and 10 feet of elevation.

Groundwater Storage

Groundwater Storage Capacity. A total storage capacity of about 210,000 af of groundwater is estimated for this subbasin (DPW 1934). About 120,000 af is estimated for the Rialto portion of the subbasin and about 93,000 af is estimated for the Colton portion (DPW 1934). The total storage capacity has also been estimated at 2,517,000 af (DWR 1986).

Groundwater in Storage. An estimated 1,521,000 af of groundwater was in storage in 1984 (DWR 1986).

Groundwater Budget (Type A)

Extractions for the southern portion of the subbasin were 11,295 af for calendar year 1999 (WSBW 2001).

Groundwater Quality

Characterization. Water sampled from 41public supply wells show an average TDS content of 264 mg/L with a range of 163 to 634 mg/L. Groundwater in this subbasin has a TDS content ranging from 201 to 291 mg/L (DWR 1986) and average of 230 mg/L (Wildermuth 2000).

Impairments. No information is available.

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	38	0
Radiological	40	0
Nitrates	38	2
Pesticides	40	0
VOCs and SVOCs	40	3
Inorganics – Secondary	38	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: to 5,000 gal/min	Average: 545 gal/min
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
US Geological Survey	Groundwater levels	50
US Geological Survey	Miscellaneous water quality	5
Department of Health Services and cooperators	Title 22 water quality	41

Basin Management

Groundwater management:	The southern portion of the subbasin is managed as part of the adjudicated San Bernardino, Colton, and Riverside basins judgement by the Western-San Bernardino Watermaster.
Water agencies	
Public	Western-San Bernardino Watermaster, Western Municipal Water District, San Bernardino Valley Municipal Water District.
Private	

References Cited

California Department of Public Works, Division of Water Resources (DPW). 1934. *South Coastal Basin Investigation: Geology and Ground Water Storage Capacity of Valley Fill.* Bulletin No. 45. 279 p.

California Department of Water Resources (DWR). 1970. *Meeting Water Demands in the Chino-Riverside Area.* Bulletin 104-3, Appendix A: Water Supply. 108 p.

_____. 1986. *San Bernardino-San Gorgonio: Water Resources Management Investigation.* 83 p.

Dutcher, L. C., and Garrett, A. A. 1958. *Geologic and Hydrologic Features of the San Bernardino Area, California, with Special Reference to Underflow Across the San Jacinto Fault.* U. S. Geological Survey Open-File Report.

_____. 1963. *Geologic and Hydrologic Features of the San Bernardino Area, California.* U. S. Geological Survey Water-Supply Paper 1419.

Wildermuth Environmental, Inc. (Wildermuth). 2000. *TIN/TDS Study - Phase 2A of the Santa Ana Watershed; Final Technical Memorandum*. San Clemente, California, July 2000.

Additional References

June, Laurane. 2000. City of Colton, Oral Communication, December 2000.

Tincher, Robert M. 2000. *Change in Groundwater Storage for the San Bernardino Basin* Area *– Calendar Years 1934 to 1998*. San Bernardino Valley Municipal Water District.

Errata

Substantive changes made to the basin description will be noted here.