Coachella Valley Groundwater Basin, Mission Creek Subbasin

- Groundwater Basin Number: 7-21.02
- County: Riverside
- Surface Area: 49,000 acres (76 square miles)

Basin Boundaries and Hydrology

Mission Creek Subbasin is located northwest of the Salton Sea, within the Colorado Desert region which is characterized by low precipitation, averaging about 6 inches per year, and a wide range of temperatures. The subbasin underlies the northwest portion of the Coachella Valley and is bounded by the impermeable rocks of the San Bernardino Mountains on the west and the Banning fault on the south. The Mission Creek fault bounds the northern and eastern edges of the subbasin and the Indio Hills bound the subbasin on the southeast.

Major surface water features in the area are the Whitewater River, Mission Creek, San Gorgonio River, Little and Big Morongo Washes. These drainages flow intermittently during high precipitation events.

Hydrogeologic Information

Water Bearing Formations

Primary water-bearing deposits in the subbasin are relatively unconsolidated late Pleistocene deposits, Holocene alluvial fan deposits, and terrace deposits. Pleistocene deposits consist of formations such as the Ocotillo Conglomerate; a thick sequence of poorly bedded coarse sand and gravel and the Cabezon Fanglomerate; a boulder conglomerate with abundant sand, silt, along with some clay. The shallow water-bearing zones in the Mission Creek Upland are probably correlative with the older alluvial fan and terrace deposits (DWR 1964).

While sediment deposits may be as deep as 7,000 feet, only the upper 2,000 feet may be considered water-bearing (Slade 1981). Water quality becomes more saline at depth and poor hydraulic connection exists between shallow and deeper deposits (Planert and Williams 1995). High specific yields exist in most of these coarse grained and relatively unconsolidated deposits with well yields as high as 3,000 gallons per minute (Slade 1981). Some confined conditions exist as indicated by flowing wells, however most of the groundwater occurs in an unconfined state throughout the subbasin (Slade 1981). Groundwater movement is generally southward; however, in spite of the moderate to high permeability of the water-bearing materials, a semi-flat gradient suggests that the rate of movement is low (DWR 1964).

Restrictive Structures

The Mission Creek Basin is in the northwestern part of a large structural trough that includes the Gulf of California. The west-trending Banning and northwest-trending Mission Creek faults are the major groundwater controls in the subbasin. Both act as barriers to groundwater movement as these

faults have folded sedimentary deposits, displaced water bearing deposits, and caused once permeable sediments to become impermeable (DWR 1964).

Recharge Areas

Runoff from the surrounding highlands drains into the subbasin from intermittent creeks and rivers supplying most of the recharge to the subbasin (DWR 1964). Subsurface leakage occurs across the Mission Creek Fault approximately three miles southeast from the City of Desert Hot Springs, allowing groundwater of different quality to enter the subbasin from the neighboring Desert Hot Springs Subbasin (Slade 1981).

Groundwater Level Trends

Water levels have been declining since the early 1950's due to scarce annual precipitation and groundwater extractions (DWR 1964, Slade 1981). Groundwater level data indicate that since 1952, water levels have declined at a rate of 0.5 foot to 1.5 feet per year (CVWD 2000). In 1971 the United States Geological Survey (USGS) determined water levels within the subbasin and found a semi-flat gradient to exist making groundwater movement slow with general movement to the southwest. Current water levels vary in domestic wells from 140 to 721 feet below ground surface with an average depth to water being 372 feet (MSWD 2000).

Groundwater Storage

Groundwater Storage Capacity. Total storage capacity for the subbasin is estimated to be 2,600,000 af (DWR 1964). This is the amount of groundwater the subbasin can theoretically contain based on 1935 to 1936 groundwater levels and using a maximum depth below surface of 1,000 feet. The 1935-1936 levels are considered to be steady state pre-development conditions.

Groundwater in Storage. Groundwater in storage for the subbasin is estimated to be 1,400,000 af (MSWD 2000).

Groundwater Budget (Type A)

Groundwater extractions for the year 2000 within the subbasin were 8,923 af by the Mission Springs Water District (MSWD 2000) and 3,176 af by the Coachella Valley Water District (Levy 2002). Estimated average seasonal tributary runoff to the subbasin is 6,000 af (DWR 1964).

Groundwater Quality

Characterization. Groundwater in the subbasin ranges in character from a calcium-magnesium bicarbonate type in the northwest to sodium chloride-sulfate type in the southeast. Total dissolved solids (TDS) content is generally below 500 mg/L (Slade and Associates 2000).

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	14	0
Radiological	15	2
Nitrates	15	1
Pesticides	14	0
VOCs and SVOCs	14	0
Inorganics – Secondary	14	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	Range: 5 to 3500	Average yield: 715 (58 well completion reports)
	Total depths (ft)	
Domestic	Range: 50 -1000	Average: 260 (226 well completion reports)
Municipal/Irrigation	Range: 75-1100	Average: 480 (58 well completion reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Department of Health Services	Title 22 Water Quality	15
MSWD	Groundwater Levels	5

Basin Management

Groundwater management:	Mission Springs Water District, Coachella Valley Water District, Desert Water Agencies have wells within the subbasin. The subbasin is not adjudicated but is managed due to the overdraft conditions. Management concerns to slow or stop overdraft include plans to construct groundwater recharge spreading grounds in the northwestern portion of the subbasin. The recharge water source will come from the Colorado River Aqueduct. Water conservation is also a major goal of the

	MSWD.
Water agencies	
Public	Mission Springs Water District, Desert Water Agency, Coachella Valley Water District.
Private	

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Errata

Changes made to the basin description will be noted here.