SANTA ANA RIVER WATERMASTER

ORANGE COUNTY WATER DISTRICT v. CITY OF CHINO, et al.
CASE NO. 117628--COUNTY OF ORANGE

WATERMASTER
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April 30, 2024

To: Clerk of Superior Court of Orange County and all Parties

Re: Watermaster Report for Water Year October 1, 2022 - September 30, 2023

Ladies and Gentlemen:

We have the honor of submitting herewith the Fifty-third Annual Report of the Santa Ana River Watermaster. The supporting Basic Data Appendices are bound separately.

The principal findings of the Watermaster for the Water Year 2022-23 are as follows:

At Prado

1	Measured Outflow at Prado	312,263	acre-feet
2	Base Flow at Prado	89,199	acre-feet
3	Annual Weighted TDS in Base and Storm Flows	354	mg/L
4	Annual Adjusted Base Flow	114,918	acre-feet
5	Cumulative Adjusted Base Flow	6,077,984	acre-feet
6	Other Credits (Debits)	1,248	acre-feet
7	Cumulative Entitlement of OCWD	2,226,000	acre-feet
8	Cumulative Credit	3,896,258	acre-feet
9	One-Third of Cumulative Debit	0	acre-feet
10	Minimum Required Base Flow in 2023-24	34,000	acre-feet

At Riverside Narrows

1	Base Flow at Riverside Narrows	32,610	acre-feet
2	Annual Weighted TDS in Base Flow	601	mg/L
3	Annual Adjusted Base Flow	32,610	acre-feet
4	Cumulative Adjusted Base Flow	2,238,422	acre-feet
5	Cumulative Entitlement of IEUA and WMWD	808,250	acre-feet
6	Cumulative Credit	1,430,172	acre-feet
7	One-Third of Cumulative Debit	0	acre-feet
8	Minimum Required Base Flow in 2023-24	12,420	acre-feet

Based on these findings, the Watermaster concludes that there was full compliance with the provisions of the Stipulated Judgment in 2022-23.

At the end of the 2022-23 Water Year, Inland Empire Utilities Agency (formerly Chino Basin Municipal Water District) and Western Municipal Water District have a cumulative credit of 3,896,258 acre-feet to their Base Flow obligation at Prado Dam. San Bernardino Valley Municipal Water District has a cumulative credit of 1,430,172 acre-feet to its Base Flow obligation at Riverside Narrows.

The Watermaster continued to exercise surveillance over the many active and proposed projects within the watershed for their potential effect on Base Flow.

Sincerely yours,
Santa Ana River Watermaster

By: Shivaji Deshmukh
Shivaji Deshmukh

John C Kennedy
John C. Kennedy

Heather Dyer
Heather P. Dyer

Craig Miller
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Roy L. Herndon
Roy L. Herndon

SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT

v. CITY OF CHINO, et al.

CASE NO. 117628 - COUNTY OF ORANGE

FIFTY-THIRD
ANNUAL REPORT
OF THE
SANTA ANA RIVER WATERMASTER

FOR WATER YEAR
OCTOBER 1, 2022 - SEPTEMBER 30, 2023

APRIL 30, 2024

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The following appendices are bound separately and available for review at the office of the Secretary of the Santa Ana River Watermaster.

CHAPTER I

WATERMASTER ACTIVITIES AND WATER CONDITIONS

Introduction

This Fifty-Third Annual Report of the Santa Ana River Watermaster covers Water Year 2022-23. The annual report is required by the Stipulated Judgment (Judgment) in the case of Orange County Water District v. City of Chino, et al., Case No. 117628-County of Orange, entered by the court on April 17, 1969. The Judgment became effective on October 1, 1970. It contains a declaration of rights of the water users and other entities in the Lower Area of the Santa Ana River Basin downstream of Prado Dam as against those in the Upper Area tributary to Prado Dam and provides a physical solution to satisfy those rights. Chapter IV presents a history of the litigation and a summary of the Judgment.

The physical solution accomplishes, in general, a regional intrabasin allocation of the surface flow of the Santa Ana River System. The Judgment leaves to each of the major hydrologic units within the basin the determination and regulation of individual rights therein and the development and implementation of its own water management plan subject only to compliance with the physical solution.

The Judgment designates four public agencies to represent the interests of the Upper and Lower Areas and gives them the responsibility to fulfill the obligations set forth in the Judgment, including the implementation of the physical solution. The Lower Area is represented by Orange County Water District (OCWD). The Upper Area is represented by San Bernardino Valley Municipal Water District (SBVMWD), Western Municipal Water District of Riverside County (WMWD), and Inland Empire Utilities Agency (IEUA), formerly the Chino Basin Municipal Water District (CBMWD). The locations of the districts are shown on Plate 1, "Santa Ana River Watershed".

The court appoints a five-member Watermaster Committee (Watermaster) to administer the provisions of the Judgment. The duties of the Watermaster are to maintain a continuous accounting of each of the items listed in the letter of transmittal at the front of this report and to report thereon annually for each water year to the court and the parties. The water year begins October 1 and ends the following September 30. The time for submission of the annual report was amended by the court (dated December 24, 1981) to be seven months after the end of the water year (April 30).

The Watermaster Committee signing the Water Year 2022-23 Annual Report consisted of Shivaji Deshmukh, Heather Dyer, Roy L. Herndon, John C. Kennedy, and Craig D. Miller. At the January 29, 2024 meeting, Mr. Herndon was re-elected Chairman and Ms. Dyer was re-elected Secretary/Treasurer. The history of the Watermaster membership is presented in Chapter IV.

Compilation of Basic Data

The Watermaster annually compiles the basic hydrologic and water quality data necessary to determine compliance with the provisions of the Judgment. The data include records of stream discharge (flow) and quality for the Santa Ana River (River) at Prado Dam and at Riverside Narrows as well as discharges for most tributaries; flow and quality of Nontributary water entering the River; rainfall records at locations in or adjacent to the Watershed; and other data that may be used to support the determinations of the Watermaster. For Water Year 2022-23 the United States Geological Survey (USGS) provided discharge and water quality data for the River at two gaging stations, "Santa Ana River Below Prado Dam" (Prado) and "Santa Ana River at Metropolitan Water District (MWD) Crossing" (Riverside Narrows). The discharge data at both stations consist of computed daily mean discharges, expressed in cubic feet per second (cfs), and are based on continuous recordings. At times the USGS must estimate daily mean discharges due to damaged or malfunctioning recording equipment.

The USGS also provided discharge data for other gaging stations for streams tributary to Prado, including, among others, the Santa Ana River at E Street in San Bernardino, Temescal Creek above Main Street in Corona, Cucamonga Creek near Mira Loma, Chino Creek at Schaefer Avenue, Lytle Creek at Colton, Warm Creek near San Bernardino, and San Timoteo Creek near Loma Linda (see Appendix A). Based on a determination by the Watermaster in Water Year 2011-12, the USGS was requested to establish a new gaging station at the spillway at Lee Lake. Expenses associated with the installation and measurements at this gage were added to the Watermaster costs paid by the Parties. Beginning in Water Year 2012-13, the new Temescal Creek at Corona Lake "Lee Lake" (near Corona) gage provided useful data (also included in Appendix A) to assist in the determination of the amount of water discharged from the San Jacinto Watershed that arrived at Prado.

The Water Year 2022-23 daily mean discharge records at Prado are rated "good" by the USGS. Daily mean discharges at the station are controlled at times by storage operations in the reservoir behind Prado Dam just upstream. The maximum and minimum daily mean discharge values during the water year were, respectively, 4,980 cfs on March 15 and 16, 2023 and 61.9 cfs on October 1, 2022. The Water Year 2022-23 daily mean discharge record at Riverside Narrows was rated "poor" by the USGS. The maximum and minimum daily mean discharge values during the year were, respectively, 4,400 cfs on March 15, 2023 and 26.9 cfs on October 7, 2022.

The water quality data at Prado consist of daily maximum and minimum and mean values for electrical conductivity (EC), measured as specific conductance and expressed in microsiemens per centimeter (μs/cm) based on a continuous recording, and 40 measured values (three to four per month) for EC and/or total dissolved solids (TDS) expressed in milligrams per liter (mg/L). The water quality data at Riverside Narrows consist of 24 values measured by the USGS (generally twice per month) and 104 values measured by the City of Riverside (generally twice per week) for both EC and TDS. The maximum and minimum, daily, flow-weighted mean EC values reported by the USGS for the River at Prado were 1,260 μs/cm on June 20 and 23, 2023 and 230 μs/cm on January 17, 2023, respectively.

The corresponding calculated TDS concentrations were 754 and 138 mg/L. At Riverside Narrows, the maximum and minimum EC values were, respectively, 1,040 μs/cm on October 19, 2022, November 17, 2022, and July 28, 2023 as reported by the USGS and 130 μs/cm on January 5, 2023 as reported by the USGS. The corresponding measured TDS concentrations on these dates were 633, 638, 603 mg/L for the maximum and 100 mg/L for the minimum, respectively. Specific conductance records are affected by releases from Prado Dam. Interruptions in the record occur at times due to malfunction of recording or sensing equipment. A portion of chemical data was collected for the National Water-Quality Assessment (NAWQA) Program. There were multiple interruptions of the Prado EC records occurring on March 6 to June 13, July 23, July 27, July 28, and July 30 to August 20 due to malfunction of recording or sensing equipment.

To assist in making its determinations each year the Watermaster refers to the records of many precipitation stations located in or near the Santa Ana River Watershed. The record for the former Perris Hill Station 163 in the Bunker Hill-San Timoteo area, operated by the San Bernardino County Flood Control District, was used to define the hydrologic base period for the physical solution in the Judgment. Due to precipitation station losses and other changes over the years, the Watermaster has used a sequence of stations with the goal of using a station that correlates as closely as practicable with data collected at or near the former Station 163 location. A history of the precipitation stations can be found in the Fifty-Second and prior annual reports.

Since Water Year 2005-06, the Watermaster has used the Gilbert Street Precipitation Gage (USGS No. 340742117161701) as an accurate and reliable station for providing suitable precipitation data and has included funding for its operation and maintenance by the USGS in the Watermaster's budget.

For Water Year 2022-23, the total precipitation recorded at the Gilbert Street gage was 25.72 inches, or 143% of the average of 17.98 inches that occurred during the 26-year base period (1934-35 through 1959-60) that was used in the formulation of the physical solution. Plate 3 graphically portrays the annual precipitation from 1934-35 through 2022-23.

Watermaster Determinations

Each year the Watermaster uses its long-established procedures to analyze the basic hydrologic and water quality data in order to determine, at Riverside Narrows and at Prado, the Base Flow, the Adjusted Base Flow, the Cumulative Credits or Debits to Upper Area parties, and the Minimum Required Base Flow for the following water year. The procedures include determining, for both locations, the amounts of Nontributary Flow or other non-storm flow to be excluded from Base Flow.

During Water Year 2022-23 there were no sources of Nontributary Flow in the River at Riverside Narrows or Prado Dam.

There was one source of non-storm flow in the River at Prado that the Watermaster has not included in Base Flow. Eastern Municipal Water District (EMWD) reported 6,291 AF of treated wastewater discharge to Temescal Creek for Water Year 2022-23. Discharges from the San Jacinto Watershed were not taken into account in the settlement discussions and calculations that led to the flow obligations in the Judgment. In the past the Watermaster decided that fifty percent of any portion of such discharges that reach Prado Reservoir and that are subsequently captured by OCWD should be added to the Cumulative Credit at Prado (after the usual water quality adjustment).

The determinations of the Watermaster for Water Year 2022-23 are explained in detail for Prado in Chapter II and for Riverside Narrows in Chapter III. A summary of the annual determinations by the Watermaster is presented in Table 1 for both locations for the period of 1970-71 through 2022-23. Note that the Base Flow obligations set forth in the Judgment at both Prado and Riverside Narrows have been met for the water year and cumulative credits have accrued to the upper respective Districts.

TABLE 1

SUMMARY OF FINDINGS AT PRADO

Water Year	Rainfall (in)[1]	USGS Measured Flow (ac-ft)	Total Flow (ac-ft)[2]	Base Flow (ac-ft)[3]	Weighted TDS (mg/L)[4]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)[5]
1971-72	9.62	51,743	51,743	40,416	707	40,416	-5,182
1972-73	18.46	76,848	77,484	48,999	638	51,531	4,349
1973-74	12.72	128,436	62,511	43,106	633	45,513	7,862
1974-75	13.49	93,397	61,855	50,176	694	51,263	17,125
1975-76	15.86	120,590	59,209	45,627	635	48,098	23,223
1976-77	11.95	72,278	62,953	48,387	660	50,000	31,223
1977-78	30.47	255,043	252,850	58,501	383	73,955	63,178
1978-79	17.51	145,198	134,506	71,863	580	79,049	100,227
1979-80	30.93	536,174	527,760	82,509	351	106,505	164,732
1980-81	10.45	118,300	117,888	74,875	728	74,875	205,652
1981-82	18.34	143,702	143,367	81,548	584	89,431	253,083
1982-83	32.36	426,273	426,750	111,692	411	138,591	353,036
1983-84	10.81	178,730	177,606	109,231	627	115,876	431,514
1984-85	12.86	163,247	162,912	125,023	617	133,670	523,184
1985-86	17.86	196,900	197,373	127,215	567	141,315	622,499
1986-87	8.08	140,872	143,191	119,848	622	127,638	708,137
1987-88	13.78	176,292	166,818	124,104	582	136,308	802,445
1988-89	12.64	159,659	152,743	119,572	583	131,230	891,675
1989-90	8.53	144,817	143,463	119,149	611	127,986	977,661
1990-91	15.48	195,186	186,426	111,151	514	128,379	1,064,040
1991-92	16.54	198,280	189,677	106,948	499	124,862	1,146,902
1992-93	30.92	571,138	566,630	128,067	368	163,499	1,268,401
1993-94	11.62	159,560	152,808	111,186	611	119,432	1,345,833
1994-95	25.14	429,270	422,816	123,468	415	152,792	1,458,387
1995-96	11.92	217,160	190,553	131,861	514	152,299	1,568,686
1996-97	18.64	249,685	198,459	136,676	514	157,861	1,684,547
1997-88[6]	33.41	462,646	456,316	155,711	392	195,677	1,838,224
1998-99	8.02	184,998	182,310	158,637	581	174,369	1,970,593
1999-00	11.09	207,850	188,538	148,269	527	169,644	2,098,237
2000-01	16.13	222,559	208,535	153,914	525	176,360	2,232,597
2001-02	5.08	174,968	156,596	145,981	587	159,728	2,350,325
2002-03	16.22	256,157	245,947	146,113	463	174,970	2,484,182
2003-04[7]	10.80	214,102	201,967	143,510	502	167,190	2,609,619
2004-05	29.89	638,513	637,568	154,307	348	199,570	2,769,555
2005-06	13.23	247,593	246,101	147,736	517	170,266	2,901,383
2006-07	4.61	156,147	153,823	129,830	604	140,216	3,005,130
2007-08	13.70	199,690	194,309	116,483	495	136,382	3,103,677
2008-09	10.14	162,698	161,026	102,711	527	117,519	3,181,385
2009-10	17.79	243,776	243,690	103,099	443	125,179	3,266,053
2010-11[7]	23.50	324,892	313,018	102,031	522	117,166	3,342,412

TABLE 1 (continued)

SUMMARY OF FINDINGS AT PRADO

Water Year	Rainfall (in)[1]	USGS Measured Flow (ac-ft)	Total Flow (ac-ft)[2]	Base Flow (ac-ft)[3]	Weighted TDS (mg/L)[4]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)[5]
2011-12	9.01	121,123	121,123	93,068	597	101,056	3,401,833
2012-13	9.53	100,003	99,735	81,452	621	86,814	3,446,890
2013-14	12.42	86,486	86,486	63,536	582	69,784	3,474,674
2014-15	11.09	107,600	107,600	64,048	522	73,548	3,506,222
2015-16	8.84	115,023	102,610	71,225	560	79,535	3,543,757
2016-17[9]	21.57	191,539	191,539	69,806	405	86,967	3,589,347
2017-18[9	6.81	82,554	82,554	65,438	625	69,528	3,616,875
2018-19[9	19.85	251,974	251,974	97,993	395	122,900	3,698,925
2019-20[9	12.74	160,915	160,915	74,465	462	89,234	3,747,267
2020-21	8.19	99,158	99,158	74,580	609	80,236	3,785,640
2021-22	10.99	118,370	118,370	67,197	499	78,452	3,822,092
2022-23	25.72	312,263	312,263	89,199	354	114,918	3,896,258

TABLE 1 (continued)

SUMMARY OF FINDINGS AT RIVERSIDE NARROWS

Water Year	Rainfall (in)[1]	USGS Measured Flow (ac-ft)	Total Flow (ac-ft)[2]	Base Flow (ac-ft)[3]	Weighted TDS (mg/L)[4]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)[5]
1971-72	9.62	41,257	22,253	16,157	712	16,017	2,529
1972-73	18.46	33,048	32,571	17,105	700	17,105	4,384
1973-74	12.72	25,494	24,494	16,203	700	16,203	5,337
1974-75	13.49	20,970	19,644	15,445	731	15,100	5,187
1975-76	15.86	27,627	26,540	17,263	723	16,977	6,914
1976-77	11.95	24,871	23,978	18,581	722	18,286	9,950
1977-78	30.47	182,500	181,760	22,360	726	21,941	16,641
1978-79	17.51	47,916	47,298	26,590	707	26,456	27,847
1979-80	30.93	254,333	253,817	25,549	676	25,549	38,146
1980-81	10.45	34,698	34,278	19,764	715	19,550	42,446
1981-82	18.34	83,050	82,708	32,778	678	32,778	59,974
1982-83	32.36	279,987	279,645	57,128	610	57,128	101,852
1983-84	10.81	83,087	82,745	56,948	647	56,948	143,550
1984-85	12.86	79,113	78,771	69,772	633	69,772	198,072
1985-86	17.86	99,600	99,258	68,220	624	68,220	251,042
1986-87	8.08	78,093	77,752	59,808	649	59,808	295,600
1987-88	13.78	80,047	79,706	55,324	620	55,324	335,674
1988-89	12.64	62,717	62,376	52,259	607	52,259	372,683
1989-90	8.53	58,500	58,159	53,199	590	53,583	411,016
1990-91	15.48	74,525	73,790	45,041	616	45,041	440,807
1991-92	16.54	71,768	71,427	40,306	620	40,306	465,863
1992-93	30.92	267,384	267,043	41,434	634	41,434	492,047
1993-94	11.62	45,477	45,006	31,278	677	31,278	508,075
1994-95	25.14	245,617	243,411	45,562	646	45,562	538,387
1995-96	11.92	83,256	81,786	54,548	625	54,548	577,685
1996-97	18.64	107,280	104,518	62,618	624	62,618	625,053
1997-98	33.41	214,375	213,033	65,013	601	65,013	674,816
1998-99	8.02	76,294	76,294	73,094	603	73,094	732,660
1999-00	11.09	75,572	75,572	63,499	602	63,499	780,909
2000-01	16.13	78,091	75,331	61,872	603	61,872	827,531
2001-02	5.08	68,844	59,434	58,705	606	58,705	870,986
2002-03	16.22	92,166	88,502	57,747	617	57,747	913,483
2003-04	10.80	77,336	75,799	54,788	634	54,788	953,021
2004-05	29.89	355,503	355,503	65,760	616	65,760	1,003,531
2005-06	13.23	111,840	111,113	67,161	608	67,161	1,055,442
2006-07	4.61	57,868	56,022	56,123	635	56,123	1,096,315
2007-08[8]	13.70	78,619	74,554	46,776	674	46,776	1,127,841
2008-09	10.14	69,027	67,567	43,902	663	43,902	1,156,493
2009-10	17.79	112,631	112,631	45,887	643	45,887	1,187,130
2010-11	23.50	174,075	174,075	49,753	654	49,753	1,221,633

TABLE 1 (continued)

SUMMARY OF FINDINGS
AT RIVERSIDE NARROWS

Water Year	Rainfall (in)[1]	USGS Measured Flow (ac-ft)	Total Flow (ac-ft)[2]	Base Flow (ac-ft)[3]	Weighted TDS (mg/L)[4]	Adjusted Base Flow (ac-ft)	Cumulative Credit (ac-ft)[5]
2011-12	9.01	45,049	45,049	42,641	664	42,641	1,249,024
2012-13	9.53	41,337	41,337	36,407	662	36,407	1,270,181
2013-14	12.42	42,766	42,766	32,313	646	32,313	1,287,244
2014-15	11.09	41,958	41,958	28,302	630	28,302	1,300,296
2015-16	8.84	41,007	41,007	30,877	635	30,877	1,315,923
2016-17	21.57	83,601	83,601	36,090	650	36,090	1,336,763
2017-18	6.81	34,792	34,792	28,378	662	28,378	1,349,891
2018-19	19.85	97,063	97,063	36,604	652	36,604	1,371,245
2019-20	12.74	56,622	56,622	32,096	627	32,096	1,388,091
2020-21	8.19	39,311	39,311	31,099	623	31,099	1,403,940
2021-22	10.99	39,021	39,021	24,122	634	24,122	1,412,812
2022-23	25.72	111,626	111,626	32,610	601	32,610	1,430,172

TABLE 1 (continued)

SUMMARY OF FINDINGS
FOOTNOTES

(1) Measured at San Bernardino County Department of Public Works (SBCDPW) Station 2146 (former San Bernardino County Hospital) until Water Year 2000-01. Estimated for that location for Water Years 2000-01 through 2003-04. Measured at SBCDPW Station 2146-A for Water Year 2004-05. Measured at USGS Gilbert Street Precipitation Gage at San Bernardino for Water Year 2005-06. For 2006-07, measured at SBCDPW 2146 from Oct. 1 to Dec. 21 and at USGS Gilbert Street Precipitation Gage for the remainder of the year. Measured at USGS Gilbert Street Precipitation Gage at San Bernardino since Water Year 2007-08.

(2) As determined by the Watermaster, Total Flow based on Computed Inflow at Prado or measured flow at Riverside Narrows in any year may be exclusive of any Nontributary Flow, Exchange Water or other "water management" flows and, at Prado, may include discharges from Lake Elsinore or the San Jacinto Watershed that reach the Santa Ana River.

(3) As determined by the Watermaster: (a) Base Flow at Prado in any year is exclusive of Storm Flow and may be exclusive of any Nontributary Flow, Exchange Water or other "water management" flows as well as any discharges from Lake Elsinore or the San Jacinto Watershed that reach the Santa Ana River; (b) Base Flow at Riverside Narrows in any year is exclusive of Storm Flow and may be exclusive of any Nontributary Flow, Exchange Water or other "water management" flows and, beginning in 1979-80, includes wastewater from Rubidoux CSD that is treated at the Riverside Regional WWTP.

(4) For Base and Storm Flow at Prado and Base Flow only at Riverside Narrows.

(5) As determined by the Watermaster, Cumulative Credit at Prado in any year may include credit for a portion of any water discharged from Lake Elsinore or the San Jacinto Watershed that reach the Santa Ana River.

(6) The Base Flow and Adjusted Base flow for Water Year 1997-98 were returned to their originally published values to correct an error in the adjustment to account for San Jacinto Watershed flows arriving at Prado. This correction is also reflected in the Cumulative Credit for this and subsequent years.

(7) A correction was made for Water Years 2003-04 and 2010-11 in the calculation of Weighted TDS based on an adjustment to account for OC-59 water that arrived at Prado. This correction is reflected in the Weighted TDS and Adjusted Base Flow for these years. This correction is also reflected in the Cumulative Credit for these and subsequent years.

(8) The Base Flow amount for Water Year 2007-08 at Riverside Narrows was published as 47,760 acre-feet in the Thirty-Eighth Annual Report. The correct amount is 46,776 acre-feet.

(9) In 2021, EMWD identified that its recycled water discharges to Temescal Creek in Water Year 2016-17 were not reflected in the Watermaster annual reports. This omission was corrected by estimating the volume of the San Jacinto Watershed discharge that arrived at Prado using procedures described in Appendix E of the Fifty-First Annual Report. Accordingly, adjustments were made to the Total Flow, Base Flow, and Adjusted Base Flow at Prado for Water Year 2016-17, and to the Cumulative Credit at Prado for Water Years 2016-17 through 2019-20.

Notable Watershed Programs and Activities

Each year when the Watermaster is compiling and analyzing the information it needs to prepare its report to the court, it also takes notice of programs and activities in the Watershed that, while they do not directly enter into the determinations of the Watermaster, do have significant potential to affect River flow or quality. The following are brief descriptions of such items.

Upper Area Treated Wastewater Discharges

Data on treated wastewater discharged in the Upper Area are compiled annually because wastewater is a major contributor to Base Flow in the River. The historical data on treated wastewater discharged are summarized in Table 2. The locations of wastewater treatment plants are shown on Plate 2.

Salt Exports from the Upper Area

High salinity water, mostly from groundwater desalters, is exported from the Upper Area to the ocean through Santa Ana Watershed Project Authority's Santa Ana Regional Interceptor (SARI) in Orange County and Inland Empire Brine Line (IEBL) in San Bernardino and Riverside Counties and IEUA's Non-Reclaimable Wastewater System (NRWS). This salt export helps to protect River water quality and, therefore, helps the Upper Area parties comply with the Judgment. The available historical data on salt export are summarized in Table 3. The SARI/IEBL first went into service in Water Year 1985-86. The NRWS went into service prior to 1970, but records of NRWS flow data are only available beginning with Water Year 1981-82. The locations of the SARI/IEBL and NRWS pipelines are shown on Plate 2.

Arundo donax Eradication

California waterways face ecological challenges due to the invasion of *Arundo donax*, a non-native species of reed. *Arundo* displaces native vegetation, increases fire risk, and consumes water at a rate significantly higher than native plants. In response, a consortium of local, state, and federal agencies initiated a long-term eradication program within the Santa Ana River Watershed in 1997, focusing on upstream locations and progressing towards the river mouth. As of now, approximately 8,500 acres of *Arundo*-infested land have been successfully eradicated, with continuing efforts by multiple agencies. Further refinement of *Arundo* removal strategies, including the utilization of high-resolution imagery for accurate areal estimation, is underway to optimize habitat restoration and water conservation in the watershed. The consortium is also working to better estimate the net water savings associated with *Arundo* removal.

TABLE 2
TREATED WASTEWATER EFFLUENT DISCHARGED ABOVE PRADO
(acre-feet)

Water Year	Wastewater discharges upstream from Colton that generally do not flow continuously to Santa Ana River above E Street				Wastewater discharges to Santa Ana River and its tributaries that have hydraulic continuity to the Santa Ana River above Riverside Narrows					Wastewater discharges to the Santa Ana River between Riverside Narrows and Prado Dam								Wastewater discharges to Temescal Creek or its tributaries which have hydraulic continuity to the Santa Ana River					Total Discharge to surface flow of the Santa Ana River	Total Waste Water Discharged in the Watershed
	Redlands	Beaumont	Yucaipa[8]	Subtotal (A)	San Bernardino[7]	Colton	Rialto	RIX[1]	Subtotal (B)	Riverside	Corona[2]	IEUA RP 1[3]	IEUA RP 2	IEUA RP 5	IEUA CCWRF[4]	WRCRWA[5,9]	Subtotal (C)	EMWD Discharge[10] (1)	Est. EMWD Arriving at Prado[10] (2)	Temescal Valley[6] WRP (3)	Elsinore Valley MWD (4)	Subtotal (D) (2+3+4)	(B+C+D)	(A+B+C+D+1-2)
1970-71	2,650	no record	-	2,650	17,860	2,520	2,270	-	22,650	18,620	3,190	-	-	-	-	-	21,810	-	-	-	-	-	44,460	47,110
1971-72	2,830	no record	-	2,830	16,020	2,230	2,400	-	20,650	19,010	3,230	6,740	-	-	-	-	28,980	-	-	-	-	-	49,630	52,460
1972-73	2,810	450	-	3,260	18,670	2,530	2,260	-	23,460	19,060	3,340	10,380	-	-	-	-	32,780	-	-	-	-	-	56,240	59,500
1973-74	2,770	600	-	3,370	17,680	2,530	2,320	-	22,530	19,560	3,510	11,440	2,320	-	-	-	36,830	-	-	-	-	-	59,360	62,730
1974-75	2,540	570	-	3,110	16,750	1,980	2,320	-	21,050	19,340	4,020	14,960	2,280	-	-	-	40,600	-	-	-	-	-	61,650	64,760
1975-76	2,450	620	-	3,070	17,250	2,540	2,240	-	22,030	19,580	4,700	15,450	2,950	-	-	-	42,680	-	-	-	-	-	64,710	67,780
1976-77	3,170	580	-	3,750	17,650	3,260	2,330	-	23,240	18,770	5,010	14,640	3,380	-	-	-	41,800	-	-	-	-	-	65,040	68,790
1977-78	3,280	620	-	3,900	18,590	3,810	2,380	-	24,780	20,310	5,200	14,650	4,060	-	-	-	44,220	-	-	-	-	-	69,000	72,900
1978-79	3,740	670	-	4,410	19,040	3,850	3,050	-	25,940	21,070	5,390	15,040	5,070	-	-	-	46,570	-	-	-	-	-	72,510	76,920
1979-80	4,190	690	-	4,880	20,360	4,190	2,990	-	27,540	22,910	5,360	14,410	5,520	-	-	-	48,200	-	-	-	-	-	75,740	80,620
1980-81	4,410	690	-	5,100	20,550	3,930	3,370	-	27,850	24,180	5,590	17,270	5,260	-	-	-	52,300	-	-	-	-	-	80,150	85,250
1981-82	4,420	700	-	5,120	23,340	3,780	3,470	-	30,590	25,640	5,410	19,580	5,360	-	-	-	55,990	-	-	-	-	-	86,580	91,700
1982-83	4,530	710	-	5,240	24,160	3,600	3,620	-	31,380	25,020	5,860	20,790	4,290	-	-	-	55,960	-	-	-	-	-	87,340	92,580
1983-84	5,150	800	-	5,950	22,080	3,700	3,830	-	29,610	26,090	6,200	20,950	3,950	-	-	-	57,190	-	-	-	-	-	86,800	92,750
1984-85	4,990	840	-	5,830	23,270	3,830	4,070	-	31,170	27,750	6,250	25,160	4,280	-	-	-	63,440	-	-	-	-	-	94,610	100,440
1985-86	5,200	820	-	6,020	24,720	4,010	4,720	-	33,450	28,820	5,900	28,240	2,660	-	-	-	65,620	-	-	-	-	-	99,070	105,090
1986-87	5,780	880	800	7,460	26,810	4,170	5,350	-	36,330	30,340	6,170	27,160	5,000	-	-	-	68,670	-	-	-	-	-	105,000	112,460
1987-88	6,060	940	1,850	8,850	27,880	5,240	6,040	-	39,160	34,660	6,050	31,290	5,500	-	-	-	77,500	-	-	-	-	-	116,660	125,510
1988-89	5,250	1,030	2,260	8,540	27,640	5,550	6,280	-	39,470	35,490	8,080	35,510	6,180	-	-	-	85,260	-	-	-	-	-	124,730	133,270
1989-90	6,360	1,100	2,370	9,830	28,350	5,810	6,260	-	40,420	33,210	9,140	34,760	5,730	-	-	-	82,840	-	-	-	-	-	123,260	133,090
1990-91	6,690	1,120	2,490	10,300	27,570	5,670	6,290	-	39,530	32,180	9,110	36,840	6,100	-	-	-	84,230	-	-	-	-	-	123,760	134,060
1991-92	6,230	1,150	2,580	9,960	25,060	5,660	6,360	-	37,080	32,660	9,010	40,360	5,780	-	1,550	-	89,360	-	-	-	-	-	126,440	136,400
1992-93	6,880	1,180	2,580	10,640	25,550	6,210	6,460	-	38,220	34,100	9,600	41,510	5,640	-	4,720	-	95,570	-	-	-	-	-	133,790	144,430
1993-94	6,440	1,150	2,710	10,300	23,800	5,830	6,540	-	36,170	32,640	7,790	37,310	5,430	-	7,010	-	90,180	-	-	-	-	-	126,350	136,650
1994-95	6,720	1,180	2,560	10,460	26,330	5,500	6,820	-	38,650	33,950	7,340	39,680	5,360	-	8,690	-	95,020	-	-	-	-	-	133,670	144,130
1995-96	6,550	1,260	2,640	10,450	13,240	2,770	6,890	20,760	43,660	33,960	7,850	39,590	4,810	-	9,060	-	95,270	-	-	-	-	-	138,930	149,380
1996-97	6,510	1,280	2,780	10,570	0	0	7,160	42,800	49,960	34,240	5,040	39,940	4,790	-	9,750	-	93,760	-	-	-	-	-	143,720	154,290
1997-98	7,022	1,356	3,116	11,494	0	0	7,063	49,683	56,746	35,422	8,718	44,940	4,969	-	9,264	1,461	104,774	1,779	1690	-	-	1,690	163,210	174,793
1998-99	7,379	1,367	3,128	11,874	0	0	6,524	47,587	54,111	34,844	11,629	43,354	5,345	-	9,534	4,594	109,300	-	-	-	3,049	3,049	166,460	178,334
1999-00	7,670	1,373	3,284	12,327	0	0	7,392	45,012	52,404	35,399	13,152	42,967	4,378	-	9,954	2,371	108,221	-	-	-	4,159	4,159	164,784	177,111
2000-01	7,379	1,377	3,345	12,101	0	0	8,346	49,407	57,753	35,663	13,100	43,863	4,401	-	11,615	2,210	110,852	-	-	-	4,245	4,245	172,850	184,951
2001-02	7,395	1,434	3,285	12,114	0	0	7,952	44,513	52,465	35,586	12,378	40,377	4,056	-	10,677	2,380	105,454	-	-	352	4,477	4,829	162,748	174,862
2002-03	7,499	1,593	3,480	12,572	217	4	8,042	45,570	53,833	36,298	12,027	45,838	4,343	-	10,837	2,409	111,752	2,312	2,024	444	5,012	7,480	173,065	185,925
2003-04	6,625	1,793	3,898	12,316	124	0	8,158	44,526	52,808	36,664	11,394	39,734	2,307	4,821	9,113	2,818	106,851	4,345	1,140	549	5,037	6,726	166,386	181,907
2004-05	7,632	2,051	3,899	13,583	4,406	183	7,815	42,025	54,428	38,123	12,558	40,644	-	8,777	8,637	3,521	112,260	15,195	13,746	653	7,025	21,424	188,112	203,144
2005-06	5,789	2,246	3,945	11,981	1,184	101	7,883	45,259	54,427	37,358	13,021	35,486	-	9,036	8,389	3,311	106,601	14,669	12,631	701	6,259	19,591	180,618	194,637
2006-07	4,991	2,555	4,056	11,601	10	0	7,654	44,011	51,676	36,355	11,727	31,829	-	12,534	6,851	4,376	103,672	13,105	11,092	691	4,792	16,575	171,922	185,537
2007-08	3,665	2,856	4,055	10,576	518	0	7,258	42,476	50,252	35,703	9,408	26,001	-	12,200	8,029	5,952	97,293	10,808	8,930	811	1,553	11,294	158,839	171,293
2008-09	2,386	2,894	3,993	9,273	263	0	6,724	40,311	47,299	33,636	9,062	23,854	-	9,711	8,920	6,374	91,557	6,669	4,653	948	518	6,119	144,975	156,264
2009-10	2,876	2,956	4,105	9,937	298	0	6,658	40,672	47,628	33,731	8,808	21,983	-	8,046	7,258	6,153	85,978	4,961	4,814	934	876	6,624	140,231	150,315
2010-11	3,271	3,050	4,196	10,516	1,292	0	6,710	39,333	47,335	33,487	9,275	18,177	-	7,279	5,987	6,486	80,690	5,680	5,418	622	4,464	10,504	138,529	149,308

TABLE 2 (continued)
TREATED WASTEWATER EFFLUENT DISCHARGED ABOVE PRADO
(acre-feet)

Water Year	Wastewater discharges upstream from Colton that generally do not flow continuously to Santa Ana River above E Street				Wastewater discharges to Santa Ana River and its tributaries that have hydraulic continuity to the Santa Ana River above Riverside Narrows					Wastewater discharges to the Santa Ana River between Riverside Narrows and Prado Dam									Wastewater discharges to Temescal Creek or its tributaries which have hydraulic continuity to the Santa Ana River					Total Discharge to surface flow of the Santa Ana River	Total Waste Water Discharged in the Watershed
	Redlands	Beaumont	Yucaipa[8]	Subtotal (A)	San Bernardino[7]	Colton	Rialto	RIX[1]	Subtotal (B)	Riverside	Corona[2]	IEUA RP 1[3]	IEUA RP 2	IEUA RP 5	IEUA CCWRF[4]	WRCRWA[5,9]	Subtotal (C)	EMWD Discharge[10] (1)	Est. EMWD Arriving at Prado[10] (2)	Temescal Valley[6] WRP (3)	Elsinore Valley MWD (4)	Subtotal (D) (2+3+4)	(B+C+D)	(A+B+C+D+1-2)
2011-12	3,503	3,054	4,112	10,669	76	0	6,703	37,966	44,745	31,622	9,249	14,563	-	7,184	5,137	6,409	74,164	1,225	735	507	786	2,027	120,936	132,096
2012-13	3,652	3,139	4,191	10,982	13	0	6,611	35,390	42,014	31,996	9,406	10,647	-	5,388	5,015	6,994	69,446	2,727	502	502	650	1,654	113,113	126,321
2013-14	3,549	3,345	4,133	11,028	175	0	6,527	33,271	39,973	30,302	8,662	9,898	-	3,188	3,606	6,402	62,058	0	0	533	623	1,156	103,187	114,215
2014-15	3,149	3,428	2,892	9,469	0	0	6,285	31,668	37,954	29,673	9,611	11,589	-	3,957	4,124	7,173	66,127	0	0	605	626	1,231	105,311	114,780
2015-16	3,274	3,372	3,148	9,794	15	0	6,420	32,343	38,778	29,074	10,425	12,531	-	2,910	3,368	7,575	65,883	0	0	174	644	818	105,479	115,273
2016-17	3,084	3,645	3,445	10,174	327	0	6,755	35,306	42,387	30,030	8,445	12,390	-	3,324	3,813	7,363	65,365	2,919	1,400	894	589	2,882	110,634	122,327
2017-18	1,891	3,749	3,562	9,202	0	-	6,210	32,493	38,703	28,922	8,574	12,564	-	3,854	1,627	7,610	63,151	0	0	1154	626	1,780	103,634	112,836
2018-19	3,909	4,043	3,430	11,382	0	-	6,892	32,925	39,817	24,962	8,851	19,093	-	6,831	2,944	7,829	70,510	6,116	4,317	1,070	520	5,907	116,234	129,414
2019-20	3,633	4,272	2,996	10,901	0	-	7,385	32,506	39,890	23,283	8,668	16,228	-	4,982	2,872	7,483	63,516	7,280	4,597	139	569	5,305	108,712	122,295
2020-21	3,748	4,151	2,904	10,803	0	-	7,675	31,902	39,577	28,798	8,744	13,615	-	5,223	2,416	9,062	67,858	2,480	273	819	540	1,631	109,066	122,076
2021-22	3,733	4,046	2,920	10,699	0	-	7,793	31,440	39,233	29,343	9,222	11,612	-	4,024	2,081	8,758	65,040	0	0	555	604	1,159	105,432	116,130
2022-23	3,160	3,733	3,283	10,175	0	-	7,820	31,822	39,641	30,166	8,175	18,140	-	4,779	2,786	9,378	73,424	7,872	6,291	730	469	7,490	120,555	132,311

1. RIX = Rapid Infiltration and Extraction Facility for San Bernardino and Colton, including over-extraction of groundwater
2. A portion of the Corona discharge goes to ponds, which are considered tributary to the Santa Ana River
3. Beginning in 1997-98, includes IEUA Plant #4 flows. In 2016-17 RP1 effluent includes flows into Prado Regional Park Lake
4. CCWRF = Carbon Canyon Water Reclamation Facility
5. WRCRWA = Western Riverside County Regional Wastewater Authority (Treatment Plant)
6. Lee Lake WTP name changed to Temescal Valley WRP in WY 2014-15
7. Discharge data were updated during the 2016-17 reporting cycle
8. Discharge data for Water Year 2014-15 through 2018-19 were updated during the 2019-20 reporting cycle
9. Discharge data for Water Year 2014-15 through 2017-18 were updated during the 2020-21 reporting cycle
10. Discharge data for Water Year 2016-17 were updated during the 2020-21 reporting cycle

Dashes = A treatment plant cannot have a release because it either was not built at the time (i.e. RIX pre 1995), has been decommissioned, or the flows ultimately end up being released through another plant (i.e. IEQA #2 post 2004)

Zeros = A treatment plant with a permit to allow wet weather releases

The amounts shown in this table were determined from data provided by the agencies

TABLE 3

HIGH SALINITY WATER EXPORTED
FROM THE SANTA ANA RIVER WATERSHED

Water Year	Inland Empire Utility Agency Non-Reclaimable Wastewate North System[4] (acre-feet)	Santa Ana Watershed Project Authority Santa Ana Regional Interceptor (SARI)[1] SARI Flow[2] (acre-feet)	Average TDS (mg/L)	Total IEUA and SARI Flow (acre-feet)
1980-81	NA	0		NA
1981-82	4,236	0		4,236
1982-83	4,651	0		4,651
1983-84	4,142	0		4,142
1984-85	2,346	0 [1]		2,346
1985-86	2,995	2,791 [3]	NA	5,786 [3]
1986-87	4,943	2,869 [3]	NA	7,813 [3]
1987-88	5,177	2,948 [3]	NA	8,125 [3]
1988-89	5,949	3,622 [3]	NA	9,572 [3]
1989-90	5,240	7,393	1,649	12,633
1990-91	2,847	7,340	1,906	10,187
1991-92	3,421	6,457	2,346	9,878
1992-93	3,774	5,277	2,516	9,051
1993-94	3,764	7,860	2,302	11,624
1994-95	4,131	8,656	1,903	12,787
1995-96	3,863	9,597	2,175	13,460
1996-97	4,191	10,225	2,292	14,417
1997-98	4,575	8,210	2,456	12,785
1998-99	3,666	4,305	2,611	7,971
1999-00	4,272	7,711	2,154	11,983
2000-01	5,075	8,205	2,504	13,280
2001-02	4,297	8,385	3,289	12,682
2002-03	3,926	9,331	3,482	13,257
2003-04	3,950	10,505	3,798	14,455
2004-05	4,220	10,971	3,460	15,191
2005-06	5,085	12,847	4,118	17,932
2006-07	4,609	13,168	4,120	17,777
2007-08	4,658	13,168	4,986	17,826
2008-09	4,284	13,168	5,037	17,452
2009-10	3,865	13,168	5,003	17,033
2010-11	3,443	13,282	5,066	16,725
2011-12	3,668	13,471	5,884	17,139
2012-13	3,862	12,061	5,626	15,923
2013-14	4,190	12,185	5,350	16,375
2014-15	4,063	12,056	5,460	16,119
2015-16	4,110	11,396	5,364	15,506
2016-17	4,324	11,957	5,361	16,281
2017-18	4,410	11,520	5,626	15,930
2018-19	4,193	11,336	5,953	15,529
2019-20	4,033	12,628	5,806	16,661
2020-21	4,177	12,299	6,239	16,476
2021-22	3,691	12,502	5,791	16,193
2022-23	3,761	14,149	5,383	17,910

(1) Santa Ana Regional Interceptor began operation in 1985-86.
(2) IEUA Non-Reclaimable Wastewater from the South System goes into the SARI and is included in SARI Flow.
(3) SARI flow and Total Flow for 1985-86 through 1988-89 is partial flow.
(4) From WY1970-21 to WY1980-81, IEUA Non-reclaimable Wastewater North System Discharges Data are not available (NA).

Chino Groundwater Basin Hydraulic Control

During most of the twentieth century much of the land overlying the Chino Basin was devoted to irrigated agriculture that obtained its water supply directly from the basin. In more recent times agriculture is being replaced by urban development, but the agricultural water use left behind a legacy of high concentrations of nitrates and other salts in the groundwater, making it unsuitable for urban use unless treated. As agricultural pumping of groundwater in the lower part of the Basin was cut back, the California Regional Water Quality Control Board, Santa Ana Region ("RWQCB"), and OCWD both became concerned about the outlook for increased amounts of poor quality water rising in the Santa Ana River above Prado Dam.

Under historic anti-degradation water quality standards, the recharge of recycled water in the Chino Basin was impossible because the Basin lacked assimilative capacity. In order to allow for the use and recharge of recycled water, the RWQCB amended the Basin Plan for the Santa Ana Watershed to allow for the use of special "maximum benefit" standards. As a condition of approval of the use of the maximum benefit standards, the RWQCB's Water Quality Control Plan requires that the Chino Basin entities develop and implement a Hydraulic Control Program with the dual objectives of minimizing the loss of groundwater to the River and protecting the River against the salts by increasing pumping from wells low in the Basin. Much of the pumped groundwater is treated in desalination facilities, with the product water being served to municipalities and the brine stream being exported to the ocean via the SARI/IEBL.

The Chino Basin Watermaster files an annual report with RWQCB on the program, water chemistry, hydrologic balance, piezometric groundwater surface elevations, and groundwater modeling. In February 2016, Chino Basin Watermaster announced that hydraulic control had been achieved.

Watermaster Service Expenses

In accordance with Paragraph 7(d) of the Judgment, the fees and expenses of each of the members of the Watermaster are borne by the parties by whom they were nominated. All other Watermaster service expenses are shared by the parties with OCWD paying 40% of the cost and WMWD, SBVMWD, and IEUA each paying 20% of the cost.

The Watermaster annually adopts a budget for the costs of services other than those provided by the USGS. Table 4 shows the budget and actual expenses incurred for such services during the 2022-23 fiscal year as well as the budget adopted for the 2023-24 fiscal year. A financial review was performed by OCWD and is reported in Appendix C.

TABLE 4

WATERMASTER SERVICE BUDGET AND EXPENSES

Budget Item	July 1, 2022 to June 30, 2023 Budget	July 1, 2022 to June 30, 2023 Expenses	July 1, 2023 to June 30, 2024 Budget
Support Services	$9,000.00	$9,000.00*	$9,000.00
Reproduction of Annual Report	$1,000.00	$615.00*	$1,000.00
TOTAL	$10,000.00	$9,615.00*	$10,000.00

* The expenses for Fiscal Year 2022-23 were paid during Fiscal Year 2023-24.

Stream flow measurements and water quality data required by the Watermaster are, for the most part, furnished by the USGS through a cooperative monitoring program which also includes some precipitation data to supplement data provided by the USGS and other agencies. The costs of the cooperative monitoring program for Water Year 2022-23, and each party's share of the costs, are set forth in Table 5.

TABLE 5

COSTS TO THE PARTIES AND USGS FOR MEASUREMENTS WHICH PROVIDE DATA USED BY THE SANTA ANA RIVER WATERMASTER

October 1, 2022 to September 30, 2023

	Total Cost	USGS Share	Parties' Share
USGS PRECIPITATION GAGING STATIONS			
Gilbert Street Precipitation Gage at San Bernardino	$9,610	$0	$9,610
Middle Fork Lytle Creek Precipitation	$9,610	$0	$9,610
USGS FLOW AND WATER QUALITY GAGING			
Santa Ana River at MWD Crossing (Riverside Narrows)			
Surface Water Gage	$37,190	$9,920	$27,270
Water Quality Monitoring TDS Sampling	$15,840	$4,410	$11,430
Santa Ana River below Prado Dam			
Surface Water Gage	$0	$0	$0
Water Quality Monitoring	$22,160	$6,400	$15,760
Water Quality Monitoring TDS Sampling	$15,840	$3,450	$12,390
Temescal Creek above Main St., near Corona	$24,710	$7,330	$17,380
Chino Creek at Schaefer Avenue	$24,710	$7,330	$17,380
Cucamonga Creek near Mira Loma	$24,710	$7,330	$17,380
Temescal Creek at Corona Lake near Corona	$15,800	$0	$15,800
TOTAL COST AND SHARES	$200,180	$46,170	$154,010
COST DISTRIBUTION AMONG PARTIES			
Inland Empire Utilities Agency	20%		$30,802
Orange County Water District	40%		$61,604
San Bernardino Valley Municipal Water District	20%		$30,802
Western Municipal Water district	20%		$30,802

CHAPTER II

BASE FLOW AT PRADO

This chapter deals with determinations of 1) the components of flow at Prado, which include Nontributary Flow, water discharged from San Jacinto Watershed, Storm Flow, and Base Flow and 2) the Adjusted Base Flow at Prado credited to IEUA and WMWD.

Flow at Prado

During Water Year 2022-23, the flow of the River as measured at the USGS gaging station below Prado Dam amounted to 312,263 acre-feet. There was no water in storage at the beginning of the Water Year, and 10 AF of water remained in storage at the end of the Water Year. Inflow to the reservoir included 89,199 acre-feet of Base Flow and 216,783 acre-feet of Storm Flow. There were no Nontributary Flows to Prado. Water discharged from the San Jacinto Watershed was excluded from Base Flow but was partially credited to the Cumulative Credit at Prado. There were 6,291 AF of discharges from the San Jacinto Watershed calculated to have reached Prado Reservoir. The monthly components of flow of the River at Prado Dam for Water Year 2022-23 are listed in Table 6 and are shown graphically on Plate 4. Historical Base and Storm Flows of the River below Prado during Water Years 1934-35 through 2022-23 are presented on Plate 5.

Nontributary Flow

Nontributary Flow includes water that originated outside the watershed and other water that the Watermaster has determined should be excluded from Base Flow. During Water Year 2022-23, there were no Nontributary Flows that were determined to have reached Prado. Some flows from the San Jacinto Watershed were determined to have reached Prado Reservoir. In the past, Nontributary Flows have included, and may include in the future, other water discharged to the River pursuant to water exchange or other such programs.

Releases to San Antonio Creek

Since May 1973, OCWD has from time to time purchased State Water Project water for the replenishment of the groundwater basin in Orange County. The water has been released at two locations: Santa Ana River above Riverside Narrows (1972-73 only) and San Antonio Creek near the City of Upland. The general procedure used by the Watermaster to account for Nontributary Flows released to San Antonio Creek via OC-59 is fully described in the Twelfth (1981-82) Annual Report. During Water Year 2022-23, there was no water discharged to San Antonio Creek for OCWD via OC-59.

TABLE 6

COMPONENTS OF FLOW AT PRADO DAM
WATER YEAR 2022-23
(acre-feet)

	USGS Measured Outflow	Storage Change (1)	Computed Inflow	San Jacinto Watershed Flow at Prado (2)	San Antonio Creek (3)	Storm Flow	Base Flow
2022							
October	5,519	2	5,521	0	0	458	5,063
November	16,485	62	16,547	0	0	10,242	6,305
December	13,727	593	14,320	0	0	6,282	8,038
2023							
January	53,107	14,052	67,159	277	0	57,550	9,332
February	23,619	5,552	29,171	1,059	0	19,766	8,346
March	98,408	(861)	97,547	3,250	0	83,849	10,448
April	24,230	(5,333)	18,897	1,705	0	7,320	9,872
May	24,653	(7,146)	17,507	0	0	8,348	9,159
June	16,723	(6,920)	9,803	0	0	2,581	7,222
July	5,684	0	5,684	0	0	0	5,684
August	15,694	5,551	21,245	0	0	16,751	4,494
September	14,414	(5,542)	8,872	0	0	3,636	5,236
Total	312,263	10	312,273	6,291	0	216,783	89,199

(1) The monthly change in storage is included in the monthly components of flow.

(2) Discharge due to overflow of Lake Elsinore and/or discharge of wastewater by EMWD from the San Jacinto Watershed.

(3) State Water Project water released into San Antonio Creek from turnout OC-59 for OCWD and calculated to have reached Prado this Water Year.

San Jacinto Watershed Discharge

Prior to Water Year 1997-98, discharges from the San Jacinto Watershed reaching Prado Reservoir were due to discharges from Lake Elsinore and had been accounted for as "Lake Elsinore Discharge." In 1998, Eastern Municipal Water District (EMWD) completed its Reach 4 discharge pipeline to Wasson Canyon, which is tributary to Temescal Wash. The pipeline discharges tertiary-treated wastewater to Temescal Wash above Lee Lake when flows exceed EMWD's storage facility capacity. The collective discharges from Lake Elsinore and EMWD to Temescal Wash are referred to herein as San Jacinto Watershed discharges.

During Water Year 2022-23, EMWD discharged 7,872 AF of treated wastewater to Temescal Wash. It was determined that 6,291 AF of EMWD discharges reached Prado Reservoir. Because discharges from the San Jacinto Watershed were not envisioned in the formulation of the Judgment, the Watermaster previously determined that to the extent such discharges occur and are captured by OCWD, fifty percent of such captured water will be added as Cumulative Credit at Prado. For Water Year 2022-23, OCWD was able to recharge 2,496 AF of San Jacinto Outflow. Thus, the Water Year 2022-23 Cumulative Credit at Prado includes 1,248 AF of San Jacinto Watershed outflow. Summaries of the EMWD Discharges, San Jacinto Watershed Discharge Calculations, and San Jacinto Watershed Discharges are contained in Appendix E. Page E-16 of Appendix E includes hydrographs of Discharge of Temescal Creek at Main Street in Corona, Lee Lake Discharge, EMWD Discharge, and Elsinore Precipitation. These hydrographs illustrate the known and estimated components of flow of Temescal Creek.

Storm Flow

Portions of storm flows are retained behind Prado Dam for flow regulation and for water conservation purposes. The United States Army Corps of Engineers (USACE) owns and operates the Dam according to a flow release schedule which allows for water to be captured and subsequently released at rates which can be captured and recharged by OCWD. The Dam has a spillway elevation of 543 feet above mean sea level. In 1995 the USACE, the United States Fish and Wildlife Service (USFWS), and OCWD reached an agreement to increase the seasonal water conservation pool from elevation 494 to elevation 505 feet after March 1 of each year in exchange for a $1 million contribution by OCWD to the USFWS to be used to develop least Bell's vireo habitat by the removal of a non-native plant, *Arundo donax*. In 2006 the USACE and OCWD signed an agreement to increase the winter conservation pool elevation from elevation 494 to 498 in exchange for a $930,000 contribution from OCWD to habitat restoration in the watershed and other commitments from OCWD. In 2018 the USACE began operating the winter conservation pool elevation to 505 feet as part of a multi-year planned deviation to the Prado Dam Water Control Manual. In 2022 the USACE South Pacific Division Commander approved updating the Water Control Manual for the winter conservation pool elevation to be 505 feet on a permanent basis. With this update, the water conservation pool elevation is 505 feet without seasonal restrictions. Monthly and annual quantities of Storm Flow at Prado Dam are shown in Table 6.

During Water Year 2022-23, the maximum volume of water stored in Prado Reservoir reached 29,483 acre-feet on January 16, 2023, and the maximum daily mean flow released from Prado Dam to the River was 4,980 cfs on March 15 and 16, 2023.

Base Flow

The Base Flow is that portion of the total flow remaining after subtracting Storm Flow, Nontributary Flow and certain other flows determined by the Watermaster. Flows affecting the determination of Base Flow in Water Year 2022-23 did not include discharges from the San Jacinto Watershed. The general procedure used by the Watermaster to separate the Water Year 2022-23 flow components was the same as used for previous years and is fully described in the Fifth (1974-75) Annual Report. Table 6 shows the monthly and annual quantities of Base Flow.

Water Quality Adjustments

The flow-weighted average TDS for the total flow passing Prado Dam was calculated to be 354 mg/L. This determination was based on records from a continuous monitoring device operated by the USGS for EC of the River flow below Prado Dam. This record was supplemented by forty (40) grab samples for EC collected by the USGS and then analyzed for TDS.

For Water Year 2022-23 a correlation between TDS and EC yields the following best fit equation:

$$TDS = EC \times 0.5982$$

(where the units of TDS and EC are mg/L and μs/cm, respectively)

Using the daily EC data, flow-weighted average daily concentrations for TDS were calculated using the above equation. The plot of TDS on Plate 6 shows the average daily TDS concentration of the River flow passing Prado Dam. A summary of daily TDS and EC of the River below Prado Dam is contained in Appendix F. At Prado Dam, the flow-weighted average annual TDS concentration of 354 mg/L represents the quality of the total flow including releases to San Antonio Creek and discharges from San Jacinto Watershed, if any. The Judgment requires that Base Flow shall be subject to adjustment based on the TDS of Base Flow and Storm Flow only. Hence, a determination of the TDS of Base Flow plus Storm Flow only is detailed in the following paragraphs.

Adjustment for State Water Project Flow to San Antonio Creek

No State Water Project flows discharged to San Antonio Creek reached Prado Dam.

Adjustment for San Jacinto Watershed Discharge

There were 6,291 AF of discharges from the San Jacinto Watershed during Water Year 2022-23 estimated to have reached Prado Reservoir. Using EMWD discharge data, the TDS data for the discharge, and monthly volume of the discharge estimated to have reached

Prado, a flow-weighted average TDS of 821 mg/L was calculated. A summary of these calculations is contained in Appendix E.

Flow Component	Annual Flow (acre-feet)	Average TDS	Annual Flow X Average TDS
1. Measured Outflow	312,263	363	113,351,469
2. Less Nontributary Flow San Antonio Creek	0	---	---
3. Less San Jacinto Watershed Discharge	6,291	821	5,164,911
4. Measured Outflow less lines 2 and 3	305,972		108,186,558
Average TDS in Total Base and Storm Flow	108,186,558 ÷ 305,972 = 354 mg/L		

As shown above, the flow-weighted average annual TDS of Storm Flow and Base Flow for Water Year 2022-23 is 354 mg/L.

Adjusted Base Flow at Prado

The Judgment provides that the amount of Base Flow at Prado received during any year shall be subject to adjustment based on flow-weighted average annual TDS of the Base Flow and Storm Flow at Prado as follows:

If the Weighted Average TDS in Base Flow and Storm Flow at Prado is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 800 mg/L	$Q - \frac{35}{42{,}000} Q(TDS-800)$
700 mg/L to 800 mg/L	Q
Less than 700 mg/L	$Q + \frac{35}{42{,}000} Q(700-TDS)$

where Q = Base Flow actually received.

The flow-weighted average annual TDS of 354 mg/L is less than 700 mg/L. Therefore, the Base Flow of 89,199 acre-feet must be adjusted by the above equation for TDS less than 700 mg/L. Thus, the Adjusted Base Flow is as follows:

$$(89{,}199 \text{ acre-feet}) + \frac{35}{42{,}000} \times (89{,}199 \text{ acre-feet}) \times (700 - 354) = 114{,}918 \text{ acre-feet}$$

Entitlement and Credit or Debit

Paragraph 5(c) of the Judgment states that "CBMWD (now IEUA) and WMWD shall be responsible for an average annual Adjusted Base Flow of 42,000 acre-feet at Prado. CBMWD (IEUA) and WMWD each year shall be responsible for not less than 37,000 acre-feet of Base Flow at Prado, plus one-third of any cumulative debit; provided, however, that for any year commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 30,000 acre-feet, said minimum shall be 34,000 acre-feet."

The Watermaster agreed that San Jacinto Watershed outflows were not envisioned during the formulation of the Judgment and because of the periodic occurrence of San Jacinto Watershed flows at Prado, the Watermaster decided, as in previous years, to credit one-half of any such outflows recharging the groundwater basin in Orange County to IEUA and WMWD.

The findings of the Watermaster concerning flow at Prado for Water Year 2022-23 required under the Judgment are as follows:

1.	Measured Outflow at Prado	312,263 acre-feet
2.	Base Flow at Prado	89,199 acre-feet
3.	Annual Weighted TDS of Base and Storm Flow	354 mg/L
4.	Annual Adjusted Base Flow	114,918 acre-feet
5.	Cumulative Adjusted Base Flow	6,077,984 acre-feet
6.	Other Credits (Debits) [1]	1,248 acre-feet
7.	Cumulative Entitlement of OCWD	2,226,000 acre-feet
8.	Cumulative Credit [2]	3,896,258 acre-feet
9.	One-Third of Cumulative Debit	0 acre-feet
10.	Minimum Required Base Flow in 2023-24	34,000 acre-feet

1. Other Credits (Debits) are comprised of San Jacinto Watershed outflow.
2. Cumulative Credit includes 44,274 acre-feet of San Jacinto Watershed cumulative outflow.

TABLE 7
HISTORICAL WATERMASTER FINDINGS AT PRADO DAM
(acre-feet)

Water Year	Base Flow	Annual Adjusted Base Flow	Cumulative Adjusted Base Flow	Other Credits (Debits)[1]	Cumulative Entitlement of OCWD	Cumulative Credit[2]
1970-71	38,402	38,402	38,402	0	42,000	-3,598
1971-72	40,416	40,416	78,818	0	84,000	-5,182
1972-73	48,999	51,531	130,349	0	126,000	4,349
1973-74	43,106	45,513	175,862	0	168,000	7,862
1974-75	50,176	51,263	227,125	0	210,000	17,125
1975-76	45,627	48,098	275,223	0	252,000	23,223
1976-77	48,387	50,000	325,223	0	294,000	31,223
1977-78	58,501	73,955	399,178	0	336,000	63,178
1978-79	71,863	79,049	478,227	0	378,000	100,227
1979-80	82,509	106,505	584,732	0	420,000	164,732
1980-81	74,875	74,875	659,607	8,045	462,000	205,652
1981-82	81,548	89,431	749,038	0	504,000	253,083
1982-83	111,692	138,591	887,629	3,362	546,000	353,036
1983-84	109,231	115,876	1,003,505	4,602	588,000	431,514
1984-85	125,023	133,670	1,137,175	0	630,000	523,184
1985-86	127,215	141,315	1,278,490	0	672,000	622,499
1986-87	119,848	127,638	1,406,128	0	714,000	708,137
1987-88	124,104	136,308	1,542,436	0	756,000	802,445
1988-89	119,572	131,230	1,673,666	0	798,000	891,675
1989-90	119,149	127,986	1,801,652	0	840,000	977,661
1990-91	111,515	128,379	1,930,031	0	882,000	1,064,040
1991-92	106,948	124,862	2,054,893	0	924,000	1,146,902
1992-93	128,067	163,499	2,218,392	0	966,000	1,268,401
1993-94	111,186	119,432	2,337,824	0	1,008,000	1,345,833
1994-95	123,468	152,792	2,490,616	1,762	1,050,000	1,458,387
1995-96	131,861	152,299	2,642,915	0	1,092,000	1,568,686
1996-97	136,676	157,861	2,800,776	0	1,134,000	1,684,547
1997-98[3]	155,711	195,677	2,996,453	0	1,176,000	1,838,224
1998-99	158,637	174,369	3,170,822	0	1,218,000	1,970,593
1999-00	148,269	169,644	3,340,466	0	1,260,000	2,098,237
2000-01	153,914	176,360	3,516,826	0	1,302,000	2,232,597
2001-02	145,981	159,728	3,676,554	0	1,344,000	2,350,325
2002-03	146,113	174,970	3,851,524	887	1,386,000	2,484,182
2003-04[4]	143,510	167,190	4,018,714	247	1,428,000	2,609,619
2004-05	154,307	199,570	4,218,284	2,366	1,470,000	2,769,555
2005-06	147,736	170,266	4,388,550	3,562	1,512,000	2,901,383
2006-07	129,830	140,216	4,528,766	5,531	1,554,000	3,005,130
2007-08	116,483	136,382	4,665,148	4,165	1,596,000	3,103,677
2008-09	102,711	117,519	4,782,667	2,189	1,638,000	3,181,385
2009-10	103,099	125,179	4,907,846	1,489	1,680,000	3,266,053
2010-11[4]	102,031	117,166	5,025,012	1,193	1,722,000	3,342,412
2011-12	93,068	101,056	5,126,068	365	1,764,000	3,401,833
2012-13	81,452	86,814	5,212,882	243	1,806,000	3,446,890

TABLE 7 (Continued)
HISTORICAL WATERMASTER FINDINGS AT PRADO DAM
(acre-feet)

Water Year	Base Flow	Annual Adjusted Base Flow	Cumulative Adjusted Base Flow	Other Credits (Debits)[1]	Cumulative Entitlement of OCWD	Cumulative Credit[2]
2013-14	63,536	69,784	5,282,666	0	1,848,000	3,474,674
2014-15	64,048	73,548	5,356,214	0	1,890,000	3,506,222
2015-16	71,225	79,535	5,435,749	0	1,932,000	3,543,757
2016-17[5]	69,806	86,967	5,522,716	623	1,974,000	3,589,347
2017-18[5]	65,438	69,528	5,592,244	0	2,016,000	3,616,875
2018-19[5]	97,993	122,900	5,715,144	1,150	2,058,000	3,698,925
2019-20[5]	74,465	89,234	5,804,378	1,108	2,100,000	3,747,267
2020-21	74,580	80,236	5,884,614	137	2,142,000	3,785,640
2021-22	67,197	78,452	5,963,066	0	2,184,000	3,822,092
2022-23	89,199	114,918	6,077,984	1,248	2,226,000	3,896,258

(1) Other Credits (Debits) are comprised of San Jacinto Watershed outflow which is the sum of discharge from Lake Elsinore and wastewater discharged by EMWD.

(2) Cumulative Credit includes 44,274 acre-feet of San Jacinto Watershed cumulative outflow.

(3) The Base Flow and Adjusted Base Flow for Water Year 1997-98 were returned to their originally published values to correct an error in the adjustment to account for San Jacinto Watershed flow arriving at Prado. This correction is also reflected in the Cumulative Credit for this and subsequent years.

(4) A correction was made for Water Years 2003-04 and 2010-11 in the calculation of Weighted TDS based on an adjustment to account for OC-59 water that arrived at Prado. This correction is reflected in the Weighted TDS and Adjusted Base Flow for these years. This correction is also reflected in the Cumulative Credit for these and subsequent years.

(5) In 2021, EMWD identified that their recycled water discharges to Temescal Creek in Water Year 2016-17 were not reflected in the Watermaster annual reports. This omission was corrected by estimating the volume of the San Jacinto Watershed discharge that arrived at Prado using procedures described in Appendix E of the Fifty-First Annual Report. Accordingly, adjustments were made to the Base Flow, Adjusted Base Flow, and Other Credits at Prado for Water Year 2016-17, and to the Cumulative Adjusted Base Flow and Cumulative Credit at Prado for Water Years 2016-17 through 2019-20.

CHAPTER III

BASE FLOW AT RIVERSIDE NARROWS

This chapter deals with determinations of 1) the components of flow at Riverside Narrows, which include Storm Flow and Base Flow and 2) the Adjusted Base Flow at Riverside Narrows credited to SBVMWD.

Flow at Riverside Narrows

The flow of the River at Riverside Narrows was to 111,626 acre-feet, measured at the USGS gaging station near the MWD Crossing. Separated into its components, Base Flow was 32,610 acre-feet and Storm Flow was 80,912 acre-feet. Included in Base Flow is 1,896 acre-feet of treated wastewater from Rubidoux Community Services District (Rubidoux CSD) that now bypasses the USGS gaging station. The Storm and Base Flow components of the flow of the River at Riverside Narrows for each month in the Water Year 2022-23 are listed in Table 8 and shown graphically on Plate 7. The components of flow of the River at Riverside Narrows during the period 1934-35 through 2022-23 are presented on Plate 8.

Nontributary Flow

Nontributary Flow includes water that originated outside the watershed, as well as other water that the Watermaster has determined should be excluded from Base Flow. During Water Year 2022-23, no Nontributary Flow was delivered to the River upstream of Riverside Narrows and Prado Dam. In the past, Nontributary Flows have included, and may include in the future, other water discharged to the River pursuant to water exchange or other such programs.

Base Flow

Based on the hydrograph shown on Plate 7 a separation was made between Storm Flow and the sum of Base Flow and Nontributary Flow utilizing in general the procedures reflected in the Work Papers of the engineers (as referenced in Paragraph 2 of the Engineering Appendix of the Judgment).

In April 1980, Rubidoux CSD made the first delivery of treated wastewater to the regional treatment plant at Riverside. Prior to that time, Rubidoux CSD had discharged to the River upstream of the Riverside Narrows gaging station. Treated wastewater from Rubidoux CSD during Water Year 2022-23, in the amount of 1,896 acre-feet, has been added to the Base Flow as measured at the gaging station. A summary of Rubidoux CSD discharges is contained in Appendix G.

TABLE 8

COMPONENTS OF FLOW AT RIVERSIDE NARROWS
WATER YEAR 2022-23
(acre-feet)

	Month	USGS Measured Flow	Storm Flow	Rubidoux Waste-water	Base Flow [1]
2022	October	1,908	121	161	1,948
	November	5,513	3,546	155	2,122
	December	3,762	1,500	159	2,421
2023	January	21,392	18,785	160	2,767
	February	11,227	8,663	143	2,707
	March	33,130	29,948	162	3,344
	April	8,241	5,081	153	3,313
	May	7,039	3,936	158	3,261
	June	2,813	189	153	2,777
	July	2,729	0	163	2,892
	August	10,178	7,995	169	2,352
	September	3,694	1,148	160	2,706
Total		111,626	80,912	1,896	32,610

(1) Base Flow equals USGS measured flow minus Storm Flow plus Rubidoux Wastewater flow that now bypasses the USGS gaging station.

Water Quality Adjustments

The determination of water quality at the Riverside Narrows Gaging Station was made using periodic grab samples taken and analyzed for TDS by the USGS and the City of Riverside. A summary of TDS and EC data of the River at Riverside Narrows is contained in Appendix H.

In October 2013, the City of Riverside changed the TDS and EC location for sampling. That new sampling location was further upstream and was not representative of stream flow at the Riverside Narrows. Beginning October 2016, the City of Riverside again changed its sampling location, and its TDS and EC data are again representative of stream flow at the Riverside Narrows. The City of Riverside data are used in the water quality adjustments for Water Year 2022-23.

Adjustment for Nontributary Flow

During Water Year 2022-23, there was no Nontributary Flow. Therefore, no water quality adjustment was required.

Adjustment for Treated Wastewater Discharges from the Rubidoux Community Services District

The flow-weighted water quality of treated wastewater from Rubidoux CSD was 787 mg/L. A monthly summary of discharges and quality is contained in Appendix G.

The Base Flow quality adjustments resulting from exclusion of the Nontributary Flow and inclusion of the Rubidoux CSD treated wastewater are shown in the following table, and resulted in an annual weighted TDS in Base Flow of 601 mg/L.

Flow Component	Annual Flow (acre-feet)	Average TDS (mg/L)	Annual Flow x Average TDS
1. Base Flow plus Nontributary Flow	30,714	590	18,121,260
2. Less Nontributary Flow	0	---	---
3. Plus Rubidoux CSD Treated Wastewater	1,896	787	1,492,152
4. Base Flow (line 1 less line 2 plus line 3)	32,610		19,613,412
Average TDS of Base Flow		19,613,412 ÷ 32,610 = 601 mg/L	

Adjusted Base Flow at Riverside Narrows

The Judgment provides that the amount of Base Flow at Riverside Narrows credited during any year shall be subject to adjustment based on weighted average annual TDS in the Base Flow as follows:

If the Weighted Average TDS in Base Flow at Riverside Narrows is:	Then the Adjusted Base Flow shall be determined by the formula:
Greater than 700 mg/L	$Q - \frac{11}{15,250}Q(TDS-700)$
600 mg/L to 700 mg/L	Q
Less than 600 mg/L	$Q + \frac{11}{15,250}Q(600-TDS)$

where Q = Base Flow actually received.

From the previous subsection, the weighted average annual TDS in the Base Flow at Riverside Narrows for Water Year 2022-23 was 601 mg/L and is between 600 and 700 mg/L. Therefore, no adjustment is necessary, and the Adjusted Base Flow is 32,610 acre-feet.

Entitlement and Credit or Debit

Paragraph 5(b) of the Judgment states that "SBVMWD shall be responsible for an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows. SBVMWD each year shall be responsible for not less than 13,420 acre-feet of Base Flow plus one-third of any cumulative debit, provided, however, that for any year commencing on or after October 1, 1986, when there is no cumulative debit, or for any year prior to 1986 whenever the cumulative credit exceeds 10,000 acre-feet, said minimum shall be 12,420 acre-feet."

Findings of the Watermaster concerning flow at Riverside Narrows for Water Year 2022-23 required under the Judgment are as follows:

1.	Base Flow at Riverside Narrows	32,610 acre-feet
2.	Annual Weighted TDS of Base Flow	601 mg/L
3.	Annual Adjusted Base Flow	32,610 acre-feet
4.	Cumulative Adjusted Base Flow	2,238,422 acre-feet
5.	Cumulative Entitlement of IEUA and WMWD	808,250 acre-feet
6.	Cumulative Credit	1,430,172 acre-feet
7.	One-Third of Cumulative Debit	0 acre-feet
8.	Minimum Required Base Flow in 2023-24	12,420 acre-feet

CHAPTER IV

HISTORY AND SUMMARY OF THE JUDGMENT in the case of Orange County Water District v. City of Chino, et al. (Case No. 117628-County of Orange)

History of Litigation

The complaint in the case was filed by Orange County Water District on October 18, 1963, seeking an adjudication of water rights against substantially all water users in the area tributary to Prado Dam within the Santa Ana River Watershed, but excluding the area tributary to Lake Elsinore. Thirteen cross-complaints were filed in 1968, extending the adjudication to include substantially all water users in the area downstream from Prado Dam. With some 4,000 parties involved in the case (2,500 from the Upper Area and 1,500 from the Lower Area), it became obvious that every effort should be made to arrive at a settlement and physical solution in order to avoid enormous and unwieldy litigation.

Efforts to arrive at a settlement and physical solution were pursued by public officials, individuals, attorneys, and engineers. Attorneys for the parties organized in order to facilitate settlement discussions and, among other things, provided guidance for the formation and activities of an engineering committee to provide information on the physical facts.

An initial meeting of the engineers representing the parties was held on January 10, 1964. Agreement was reached that it would be beneficial to undertake jointly the compilation of basic data. Liaison was established with the Department of Water Resources, State of California, to expedite the acquisition of data. Engineers representing the parties were divided into subcommittees which were given the responsibility of investigating such things as the boundary of the Santa Ana River Watershed and its subareas, standardization of the terminology, the location and description of wells and diversion facilities, waste disposal and transfer of water between subareas.

In response to a request from the attorneys' committee at a meeting held April 17, 1964, on April 30, 1964, the joint engineering committee prepared a list of preliminary engineering studies directed toward settlement of the Santa Ana River water rights litigation. Special assignments were made to individual engineers on selected items requested by the attorneys' committee.

The attorneys and engineers for the defendants then commenced a series of meetings separate from the representatives of the plaintiffs in order to consolidate their positions and to determine a course of action. On October 7, 1964, engineers for the defendants presented the results of the studies made by the joint engineering committee. The defendants' attorneys requested that additional information be provided on the methods of measuring flow at Prado Dam, the historical supply and disposal of water passing Prado Dam, segregation of flow into components, and determination of the amount of supply which was usable by the downstream area. On December 11, 1964, the supplemental information was presented to the defendants' attorneys.

During 1965, engineers and attorneys for the defendants held numerous conferences and conducted additional studies in an attempt to determine their respective positions in the case. Early in 1966, the plaintiff and defendants exchanged drafts of possible principles for settlement. Commencing March 22 and ending April 13, 1966, four meetings were held by the engineers to discuss the draft of principles for settlement.

On February 25, 1968, the defendants submitted a request to the Court that the Order of Reference be issued requesting the California Department of Water Resources to determine the physical facts. On May 9, 1968, the plaintiffs' attorney submitted motions opposing the Order of Reference and requested that a preliminary injunction be issued. In the meantime, every effort was being made to come to an agreement on the Judgment. Commencing on February 28, 1968 and extending until May 14, 1968, six meetings were held to determine the scope of physical facts on which agreement could be reached so that if an Order of Reference were to be approved by the Court, the work under the proposed reference would not repeat the extensive basic data collection and compilation which had already been completed and on which engineers for both plaintiffs and defendants had reached substantial agreement. Such basic data were compiled and published in two volumes under the date of May 14, 1968, entitled "Appendix A, Basic Data."

On May 21, 1968, an outline of a proposal for settlement of the case was prepared and a committee of attorneys and engineers for the parties commenced preparation of the settlement documents. On June 16, 1968, the Court held a hearing on the motions it had received requesting a preliminary injunction and an Order of Reference. The parties requested that the Court delay the preliminary hearings on these motions in view of the efforts toward settlement that were underway. The plaintiff, however, was concerned regarding the necessity of bringing the case to trial within the statutory limitation and, accordingly, on July 15, 1968, submitted a motion to set the complaint in the case for trial. On October 15, 1968, the trial was commenced and was adjourned after one-half day of testimony on behalf of the plaintiff. Thereafter, the parties filed with the Court the necessary Settlement Documents including a Stipulation for Judgment. The Court entered the Judgment on April 17, 1969, along with Stipulations and Orders dismissing all defendants and cross-defendants except for the four major public water districts overlying, in aggregate, substantially all of the major areas of water use in the watershed. The districts, the locations of which are shown on Plate 1, "Santa Ana River Watershed", are as follows:

(1) Orange County Water District (OCWD), representing all lower basin entities located within Orange County downstream of Prado Dam.

(2) Western Municipal Water District (WMWD), representing middle basin entities located within Riverside County on both sides of the Santa Ana River primarily upstream from Prado Dam.

(3) Inland Empire Utilities Agency (IEUA), formerly Chino Basin Municipal Water District (CBMWD), located in the San Bernardino County Chino Basin area, representing middle basin entities within its boundaries and located primarily upstream from Prado Dam.

(4) San Bernardino Valley Municipal Water District (SBVMWD), representing all entities within its boundaries, and embraced within the upper portion of the Riverside Basin area, the Colton Basin area (being an upstream portion of the middle basin) and the San Bernardino Basin area, being essentially the upper basin.

Summary of Judgment

Declaration of Rights

The Judgment sets forth a declaration of rights. Briefly stated, the Judgment provides that the water users in the Lower Area have rights, as against the water users in the Upper Area, to receive certain average and minimum annual amounts of non-storm flow ("Base Flow") at Prado Dam, together with the right to all storm flow reaching Prado Dam. The amount of the Lower Area entitlement is variable based on the quality of the water received by the Lower Area. Water users in the Upper Area have the right as against the water users in the Lower Area to divert, pump, extract, conserve, store and use all surface and groundwater supplies originating within the Upper Area, so long as the Lower Area receives the water to which it is entitled under the Judgment and there is compliance with all of its provisions.

Physical Solution

The Judgment also sets forth a comprehensive "physical solution" for satisfying the rights of the Lower Area. To understand the physical solution, it is necessary to understand the following terms that are used in the Judgment:

Storm Flow – That portion of the total flow which originates from precipitation and runoff and which passes a point of measurement (either Riverside Narrows or Prado Dam) without having first percolated to groundwater storage in the zone of saturation, calculated in accordance with procedures referred to in the Judgment.

Base Flow - That portion of the total surface flow passing a point of measurement (either Riverside Narrows or Prado Dam) which remains after deduction of storm flow, nontributary flows, exchange water purchased by OCWD, and certain other flows as determined by the Watermaster.

Adjusted Base Flow - Actual Base Flow in each year adjusted for water quality pursuant to formulas specified in the Judgment. The adjustment of Base Flow for water quality is intended to provide an incentive to the Upper Area to maintain a better quality of water in the River. When the TDS is lower than a specified value at one of the measuring points, the water quantity obligation is lower. When the TDS is higher than a specified value, the water quantity obligation is higher. This is the first comprehensive adjudication in Southern California in which the quality of water is taken into consideration in the quantification of water rights.

Credits and Debits - Under the accounting procedures provided for in the Judgment, credits accrue to SBVMWD in any year when the Adjusted Base Flow exceeds

15,250 acre-feet at Riverside Narrows and jointly to IEUA and WMWD when the Adjusted Base Flow exceeds 42,000 acre-feet at Prado Dam. Debits accrue in any year when the Adjusted Base Flows fall below those levels. Credits or debits accumulate year to year.

Obligation at Riverside Narrows

SBVMWD has an obligation to assure an average annual Adjusted Base Flow of 15,250 acre-feet at Riverside Narrows, subject to the following:

(1) A minimum Base Flow of 13,420 acre-feet plus one-third of any cumulative debit.

(2) After October 1, 1986, if no cumulative debit exists, the minimum Base Flow shall be 12,420 acre-feet.

(3) Prior to 1986, if the cumulative credits exceed 10,000 acre-feet, the minimum Base Flow shall be 12,420 acre-feet.

(4) All cumulative debits shall be removed by the discharge of a sufficient Base Flow at Riverside Narrows at least once in any ten consecutive years following October 1, 1976. Any cumulative credits shall remain on the books of account until used to offset any subsequent debits or until otherwise disposed of by SBVMWD.

(5) The Base Flow at Riverside Narrows shall be adjusted using weighted average annual TDS in such Base Flow in accordance with the formula set forth in the Judgment.

Obligation at Prado Dam

IEUA and WMWD have a joint obligation to assure an average annual Adjusted Base Flow of 42,000 acre-feet at Prado Dam, subject to the following:

(1) Minimum Base Flow at Prado shall not be less than 37,000 acre-feet plus one-third of any cumulative debit.

(2) After October 1, 1986, if no cumulative debit exists, the minimum Base Flow quantity shall be 34,000 acre-feet.

(3) Prior to 1986, if the cumulative credit exceeds 30,000 acre-feet, the minimum Base Flow shall be 34,000 acre-feet.

(4) Sufficient quantities of Base Flow shall be provided at Prado to discharge completely any cumulative debits at least once in any ten consecutive years following October 1, 1976. Any cumulative credits shall remain on the books

of account until used to offset any debits, or until otherwise disposed of by IEUA and WMWD.

(5) The Base Flow at Prado during any year shall be adjusted using the weighted average annual TDS in the total flow at Prado (Base Flow plus Storm Flow) in accordance with the formula set forth in the Judgment.

Other Provisions

SBVMWD, IEUA and WMWD are enjoined from exporting water from the Lower Area to the Upper Area, directly or indirectly. OCWD is enjoined from exporting or "directly or indirectly causing water to flow" from the Upper Area to the Lower Area. Any inter-basin acquisition of water rights will have no effect on Lower Area entitlements. OCWD is prohibited from enforcing two prior judgments so long as the Upper Area Districts are in compliance with the physical solution. The composition of the Watermaster and the nomination and appointment process for members are described along with a definition of the Watermaster's duties and a formula for sharing its costs. The court retains continuing jurisdiction over the case. There are provisions for appointment of successor parties and rules for dealing with future actions that might conflict with the physical solution.

History of the Watermaster Committee Membership

The Santa Ana River Watermaster is a committee composed of five members nominated by the parties and appointed by the court. SBVMWD, IEUA (formerly CBMWD), and WMWD nominate one member each and OCWD nominates two. The Watermaster members annually elect a Chairman, Secretary, and Treasurer.

The original five members were appointed at the time of entry of the Judgment. They prepared a *pro forma* annual report for the 1969-70 Water Year. The first annual report required by the Judgment was prepared for the 1970-71 Water Year, and reports have been prepared annually since then.

The membership of the Watermaster has changed over the years. The historical listing of members and officers shown in Table 9 reflects the signatories to each annual report.

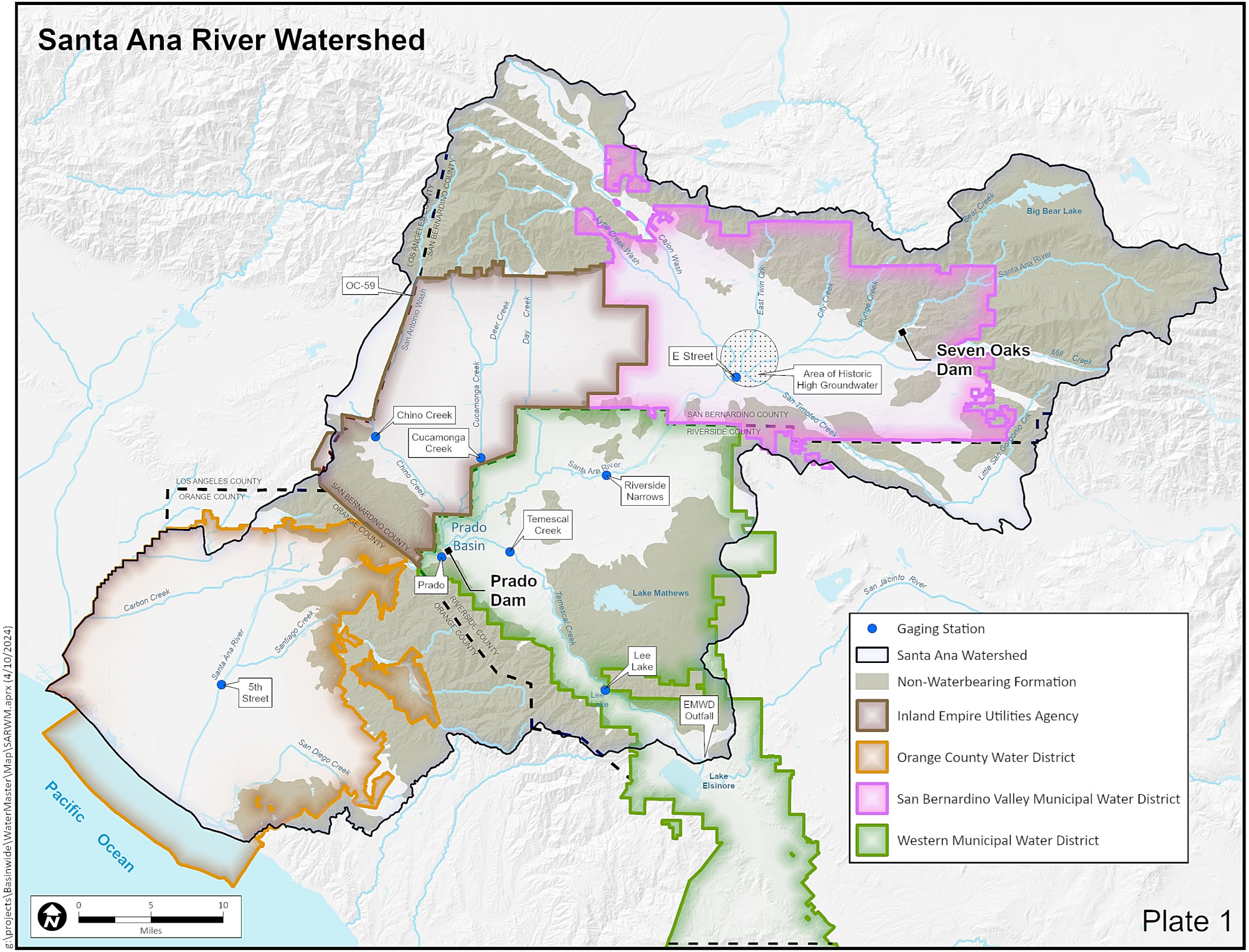
TABLE 9

HISTORY OF THE WATERMASTER COMMITTEE MEMBERSHIP

Water Year	SBVMWD	IEUA	WMWD	OCWD	OCWD
1969-70	Clinton O. Henning	William J. Carroll	Albert A. Webb (2)	Max Bookman (1)	John M. Toups
1970-71 through 1973-74	James C. Hanson	William J. Carroll	Albert A. Webb (2)	Max Bookman (1)	John M. Toups
1974-75 through 1977-78	James C. Hanson	William J. Carroll	Donald L. Harriger	Max Bookman (1)	John M. Toups (2)
1978-79 through 1981-82	James C. Hanson	William J. Carroll	Donald L. Harriger	Max Bookman (1)	William R. Mills, Jr. (2)
1982-83 through 1983-84	James C. Hanson	William J. Carroll	Donald L. Harriger	Harvey O. Banks (1)	William R. Mills, Jr. (2)
1984-85 through 1988-89	Robert L. Reiter	William J. Carroll	Donald L. Harriger	Harvey O. Banks (1)	William R. Mills, Jr. (2)
1989-90 through 1994-95	Robert L. Reiter (2), (3)	William J. Carroll	Donald L. Harriger	Harvey O. Banks (1)	William R. Mills, Jr.
1995-96	Robert L. Reiter (2) (3)	William J. Carroll (1)	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr.
1996-97	Robert L. Reiter (2) (3)	William J. Carroll	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr. (1)
1997-98	Robert L. Reiter (2) (3)	Robb D. Quincey	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr. (1)
1998-99 through 2000-01	Robert L. Reiter (2) (3)	Richard W. Atwater	Donald L. Harriger	Bill B. Dendy	William R. Mills, Jr. (1)
2001-02 through 2002-03	Robert L. Reiter (2) (3)	Richard W. Atwater	Donald L. Harriger (1)	Bill B. Dendy	Virginia L. Grebbien
2003-04 through 2005-06	Robert L. Reiter (1) (3)	Richard W. Atwater	John V. Rossi	Bill B. Dendy (2)	Virginia L. Grebbien
2006-07 through 2007-08	Samuel H. Fuller (2) (3)	Richard W. Atwater	John V. Rossi	Bill B. Dendy (1)	Craig D. Miller
2008-09	Samuel H. Fuller (2) (3)	Richard W. Atwater	John V. Rossi	Robert C. Wagner	Craig D. Miller (1)
2009-10	Samuel H. Fuller (2) (3)	Thomas A. Love	John V. Rossi (1)	Michael R. Markus	Roy L. Herndon
2010-11	Samuel H. Fuller (2) (3)	Thomas A. Love (1)	John V. Rossi	Michael R. Markus	Roy L. Herndon
2011-12	Samuel H. Fuller (2) (3)	Thomas A. Love	John V. Rossi	Michael R. Markus	Roy L. Herndon (1)
2012-13 through 2015-16	Douglas D. Headrick (2) (3)	P. Joseph Grindstaff	John V. Rossi	Michael R. Markus	Roy L. Herndon (1)
2016-17 through 2017-18	Douglas D. Headrick (2) (3)	Halla Razak	Craig D. Miller	Michael R. Markus	Roy L. Herndon (1)
2018-19 through 2019-20	Wen B. Huang (2) (3)	Shivaji Deshmukh	Craig D. Miller	Michael R. Markus	Roy L. Herndon (1)
2020-21 to 2021-22	Heather P. Dyer (2) (3)	Shivaji Deshmukh	Craig D. Miller	Michael R. Markus	Roy L. Herndon (1)
2022-23	Heather P. Dyer (2) (3)	Shivaji Deshmukh	Craig D. Miller	John C. Kennedy	Roy L. Herndon (1)

Footnotes:

(1) Watermaster Committee Member serving as Chairman during the Water Year.
(2) Watermaster Committee Member serving as Secretary during the Water Year.
(3) Watermaster Committee Member serving as Treasurer during the Water Year.


Santa Ana River Watershed
OC-59
San Antonio Wash
Chino Creek
Cucamonga Creek
Deer Creek
Day Creek
Lytle Creek Wash
Cajon Wash
East Twin Crk
City Creek
Plunge Creek
Bear Creek
Big Bear Lake
Santa Ana River
Mill Creek
Seven Oaks Dam
E Street
Area of Historic High Groundwater
San Timoteo Creek
Little San Gorgonio Crk
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
LOS ANGELES COUNTY
ORANGE COUNTY
Riverside Narrows
Temescal Creek
Prado Basin
Prado
Prado Dam
Lake Mathews
San Jacinto River
Carbon Creek
Santiago Creek
5th Street
Lee Lake
EMWD Outfall
San Diego Creek
Lake Elsinore
Pacific Ocean
0
5
10
Miles
Gaging Station
Santa Ana Watershed
Non-Waterbearing Formation
Inland Empire Utilities Agency
Orange County Water District
San Bernardino Valley Municipal Water District
Western Municipal Water District
Plate 1
g:\projects\Basinwide\WaterMaster\Map\SARWM.aprx (4/10/2024)

Santa Ana River Watershed Wastewater Treatment Plants and Salt Export Pipelines

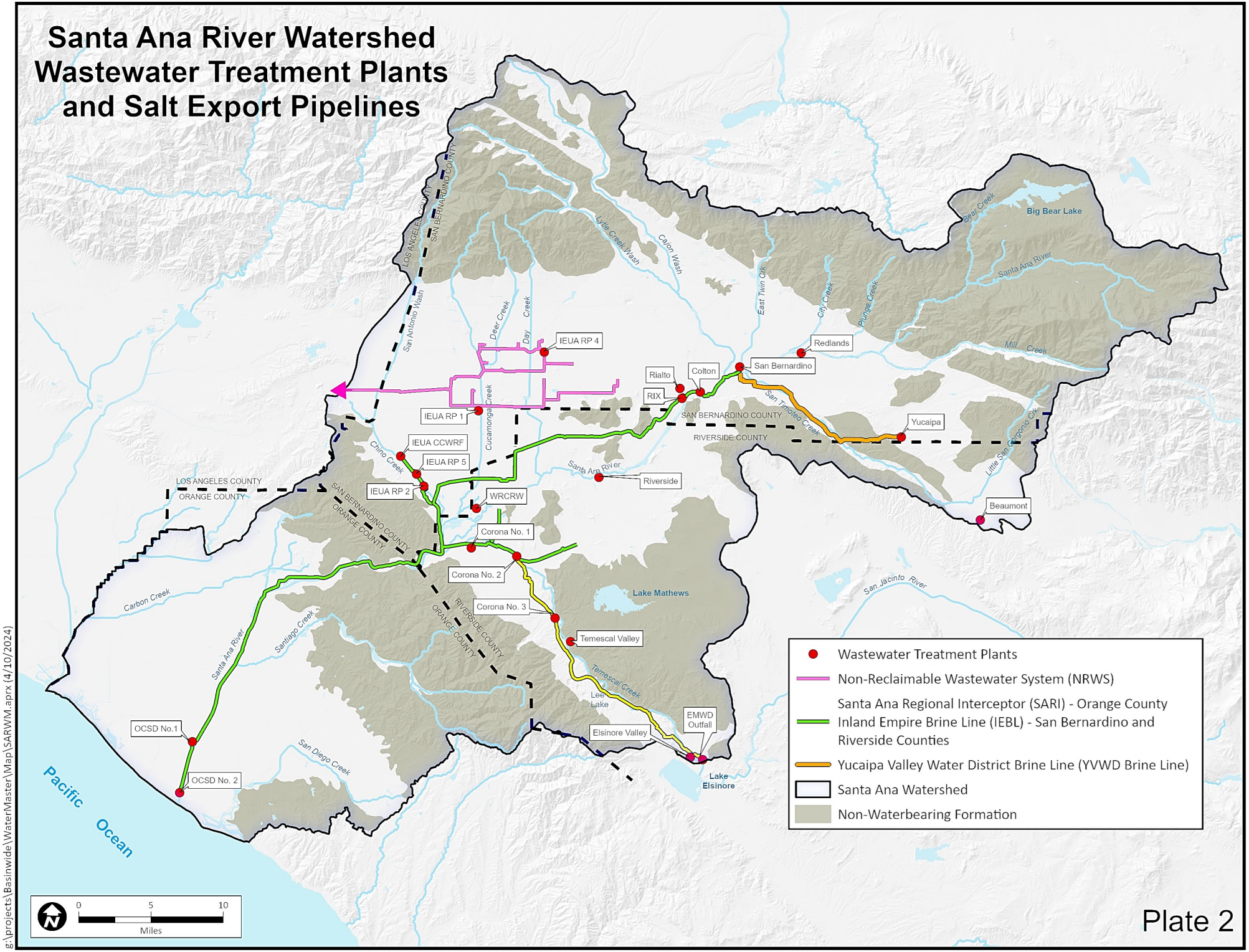


Plate 2

g:\projects\Basinwide\WaterMaster\Map\SARWM.aprx (4/10/2024)

PRECIPITATION AT SAN BERNARDINO STARTING IN 1934-35

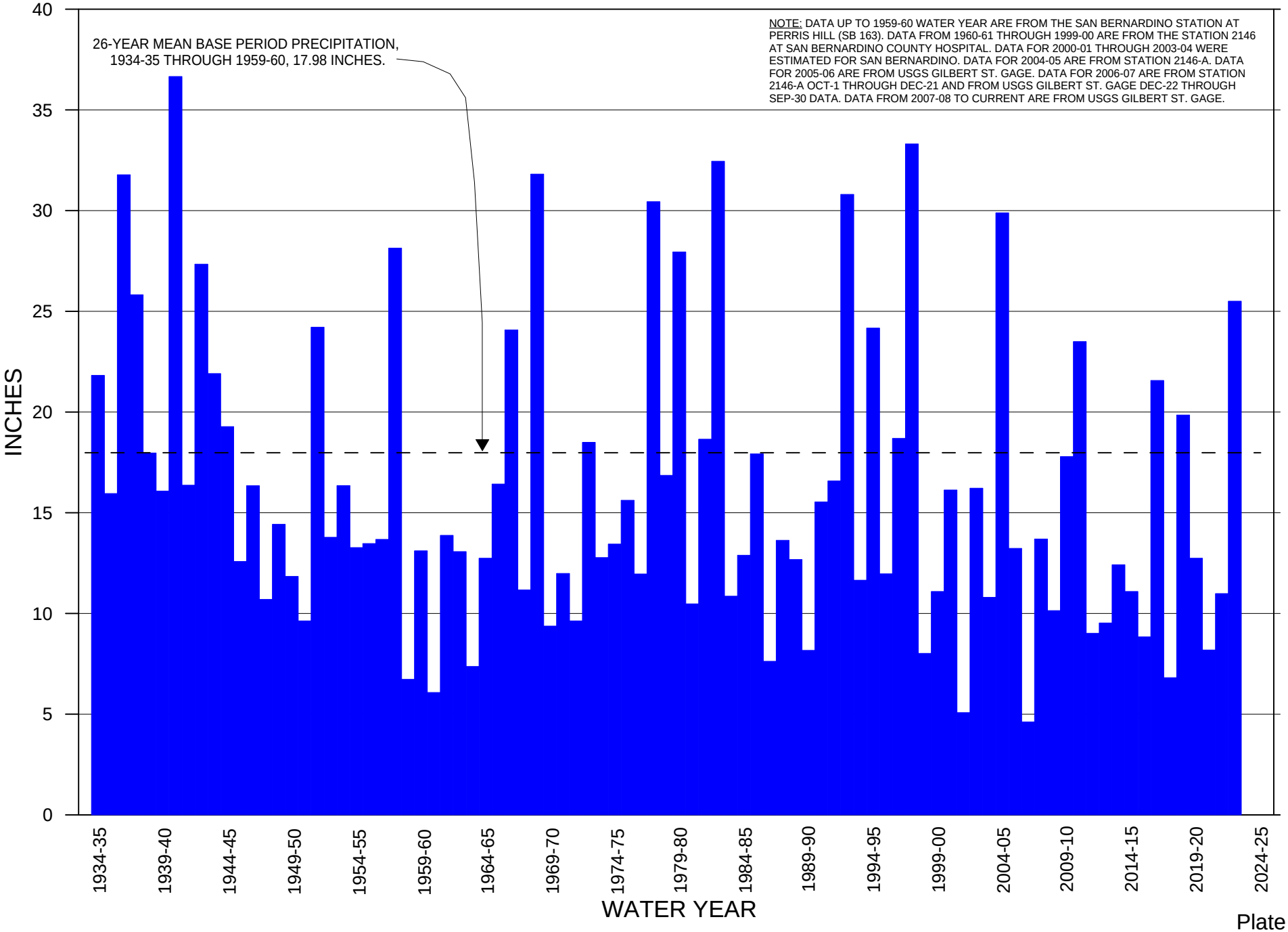


Plate 3

2022-23 SAN BERNARDINO PRECIPITATION
USGS GILBERT STREET GAGE
TOTAL = 25.72"

INCHES

0.38" 1.47" 2.28" 5.81" 4.38" 7.18" 0.54" 0.50" 0.04" 0.00" 2.69" 0.45"

PERIODS OF WATER STORAGE GREATER THAN 100 ACRE-FEET BEHIND PRADO DAM

CUBIC FEET PER SECOND

STORM FLOW

INFLOW TO PRADO DAM LESS SAN JACINTO WATERSHED DISCHARGES AND NONTRIBUTARY FLOWS REACHING PRADO

USGS MEASURED OUTFLOW

SAN JACINTO WATERSHED WATER ARRIVAL AT PRADO GAGE

October November December January February March April May June July August September

DISCHARGE OF THE SANTA ANA RIVER AT PRADO DAM & SAN BERNARDINO PRECIPITATION
WATER YEAR 2022-23

Plate 4

DISCHARGE OF SANTA ANA RIVER AT PRADO STARTING WITH 1934-35

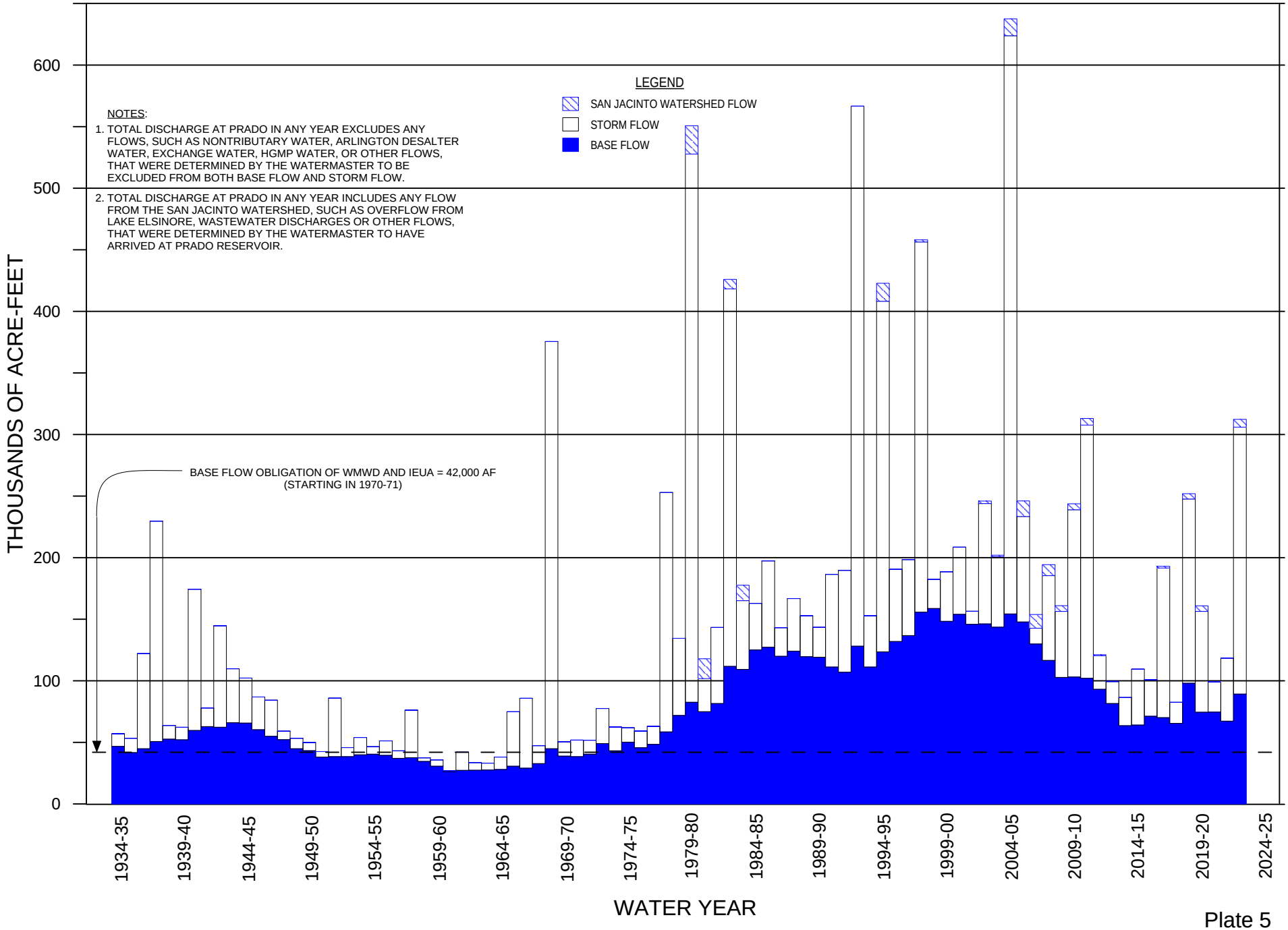
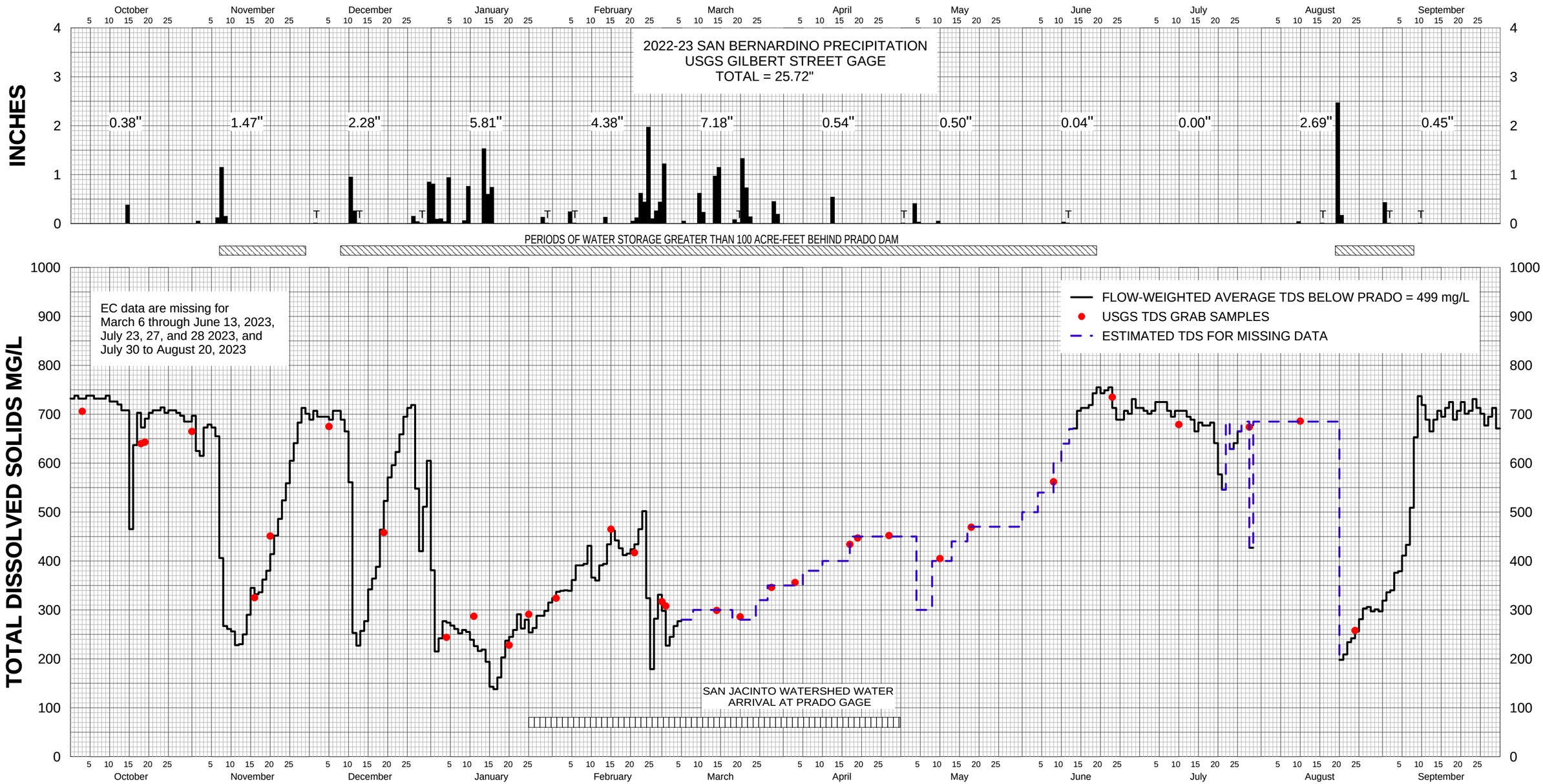
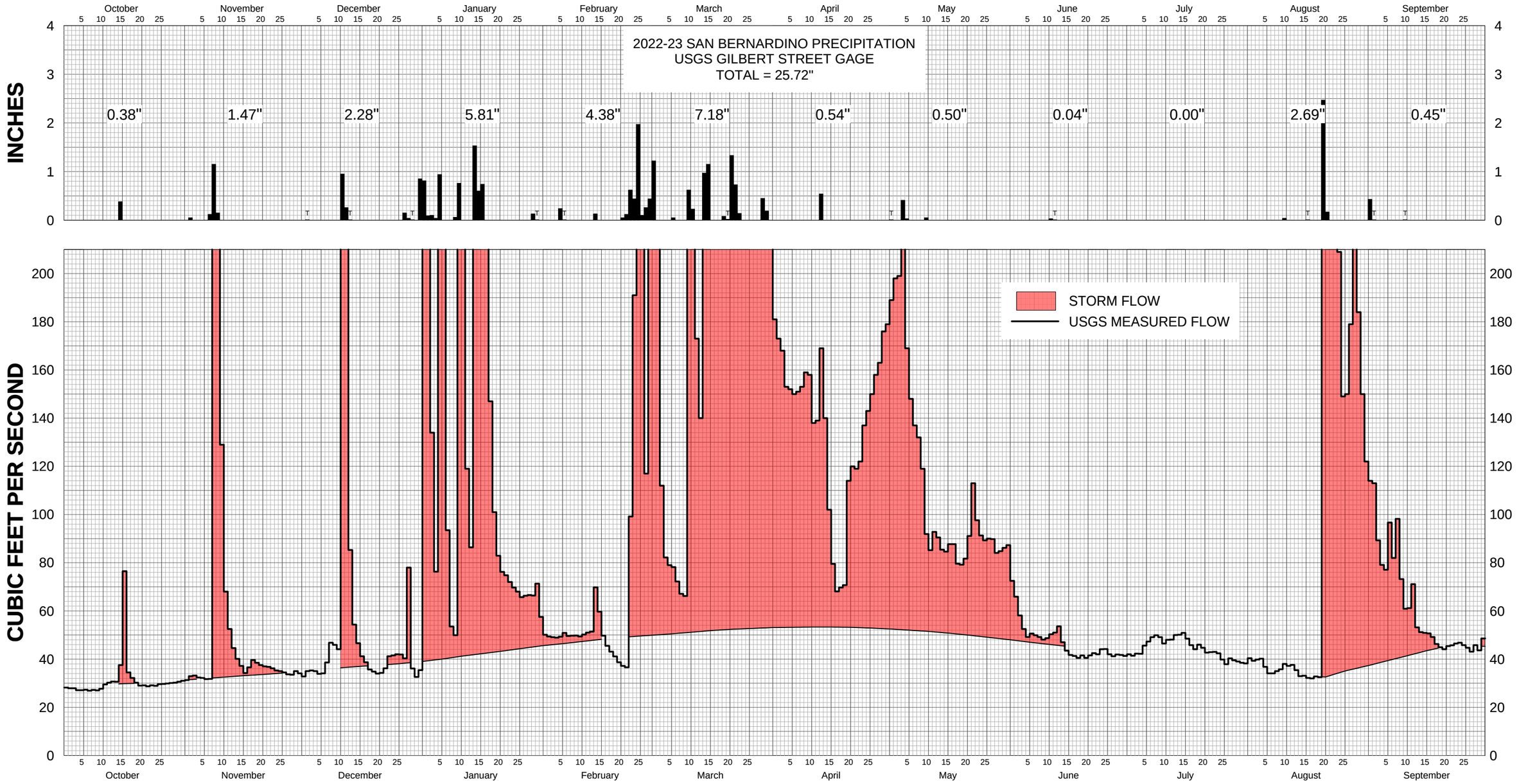


Plate 5



DISSOLVED SOLIDS IN SANTA ANA RIVER BELOW PRADO DAM
WATER YEAR 2022-23

Plate 6



DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS & SAN BERNARDINO PRECIPITATION
WATER YEAR 2022-23

Plate 7

DISCHARGE OF SANTA ANA RIVER AT RIVERSIDE NARROWS STARTING WITH 1934-35

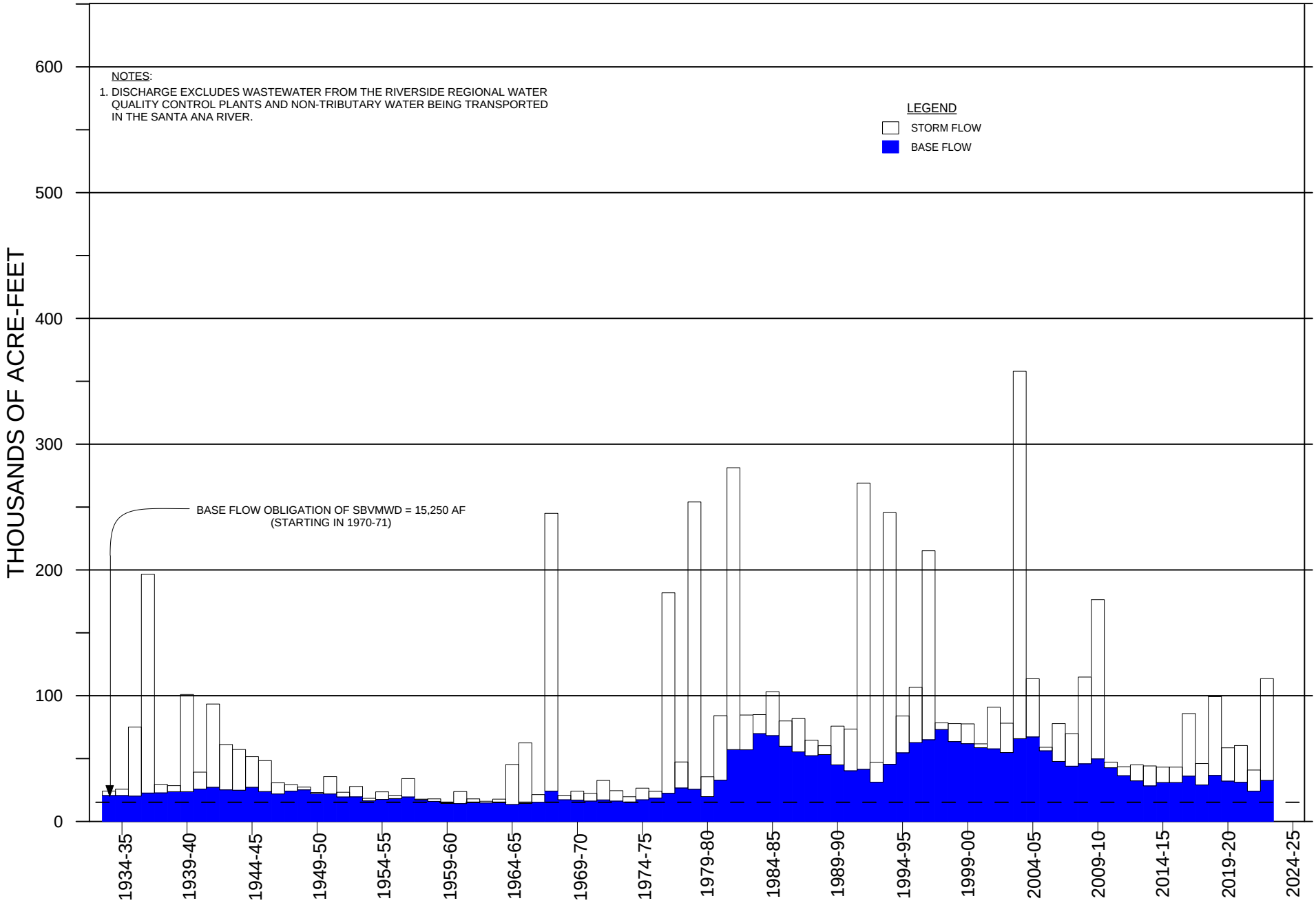


Plate 8

SANTA ANA RIVER WATERMASTER

FOR

ORANGE COUNTY WATER DISTRICT

v. CITY OF CHINO et al.

CASE NO. 117628 - COUNTY OF ORANGE

BASIC DATA

FOR THE

FIFTY-THIRD ANNUAL REPORT

OF THE

SANTA ANA RIVER WATERMASTER

FOR WATER YEAR

OCTOBER 1, 2022 - SEPTEMBER 30, 2023

April 30, 2024

TABLE OF CONTENTS

APPENDICES

The following appendices are bound separately and available for review at the office of the Secretary of the Santa Ana River Watermaster.

APPENDIX A

USGS FLOW MEASUREMENTS OF THE SANTA ANA RIVER FLOWS BELOW PRADO, AT MWD CROSSING, AND WATER QUALITY RECORDS FOR THE SANTA ANA RIVER AT PRADO DAM AND AT MWD CROSSING; USGS FLOW MEASUREMENTS AT E STREET, OF TEMESCAL CREEK ABOVE MAIN STREET (AT CORONA), TEMESCAL CREEK AT CORONA LAKE “LEE LAKE” (NEAR CORONA), CUCAMONGA CREEK (NEAR MIRA LOMA), CHINO CREEK AT SCHAEFER AVENUE (NEAR CHINO),LYTLE CREEK, WARM CREEK, AND SAN TIMOTEO CREEK NEAR LOMA LINDA

WATER YEAR 2022-23

USGS Water-Year Summary 2023

11074000 Santa Ana River below Prado Dam, CA

LOCATION - Lat 33°53'00", long 117°38'40" referenced to North American Datum of 1927, in sec.00, T.3 S., R.7 W., Riverside County, CA, Hydrologic Unit 18070203, in La Sierra Grant, on left bank of outlet channel, 2,500 ft downstream from axis of Prado Dam, and 4.5 mi west of Corona.

DRAINAGE AREA - 2,258 mi² of which 768 mi² probably is noncontributing. above Lake Elsinore.

REVISIONS HISTORY - 12/06/2016: Unit and daily value water temperature and specific conductance from April 8, 2016 through Sept. 8, 2016 have been revised superseding those published at http://waterdata.usgs.gov site 11074000.

SURFACE-WATER RECORDS

PERIOD OF RECORD - May 1930 to November 1939 (irrigation seasons only), March 1940 to current year. Published as "at Santa Fe Railroad Bridge, near Prado" May 1930 to November 1931, as "at Atchison, Topeka, and Santa Fe Railroad Bridge, near Prado" May 1932 to November 1939, and as "below Prado Dam, near Prado" March 1940 to September 1950.

GAGE - Water-stage recorder and concrete control August 1944 through Apr. 25, 2005, and since Nov. 14, 2005. Datum of gage is 451.58 ft above NAVD of 1988. Prior to Mar. 18, 1940, at about same site at various datums. From Apr. 26, 2005, to Nov. 13, 2005, gage was located on right bank of a temporary bypass (diversion) channel, in use during the construction of an improved outlet channel from Prado Dam. Temporary gage was at a different datum. From Nov. 14, 2005 to Oct. 7, 2008, gage was located on right bank of reconstructed outlet channel. Since Oct. 7, 2008, gage is located on left bank of channel.

REMARKS - Flow regulated since 1940 by Prado Flood-Control Reservoir, capacity, 196,200 acre-ft. Natural streamflow affected by extensive ground-water withdrawals, diversion for irrigation, discharges of treated effluent, and return flow from irrigated areas. Releases of imported water are made to the basin by the California Water Project at times in some years, via San Antonio Creek from Rialto Pipeline below San Antonio Dam. During the current year, 12,780 acre-ft was released. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES OUTSIDE PERIOD OF RECORD - Flood of Mar. 2, 1938, reached a discharge of 100,000 ft³/s, on basis of slope-area measurement of peak flow at site 2.5 mi downstream.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 13,200 ft³/s, Jan. 15, 2005, gage height, 8.73 ft, site and datum then in use, from rating curve extended above 11,600 ft³/s; minimum daily, 2.4 ft³/s, July 29 to Aug. 3, Sept. 20, 1978 (result of gate closure).

U.S. Department of the Interior
U.S. Geological Survey

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	61.9	103	146	235	423	2,740	847	428	274	97.0	80.3	527
2	62.5	149	114	259	377	3,350	844	418	271	101	74.0	519
3	64.2	132	112	382	323	1,400	561	373	278	98.4	73.9	510
4	65.4	109	113	435	320	795	285	308	284	94.4	75.1	498
5	63.1	112	138	309	317	577	222	270	309	94.1	77.4	545
6	64.8	116	122	404	313	465	195	271	369	92.4	80.8	549
7	67.5	121	116	404	333	394	195	273	405	94.9	80.1	617
8	66.6	165	102	400	342	405	197	329	340	99.6	75.3	596
9	65.6	304	95.5	306	338	418	200	434	318	102	73.3	480
10	75.3	487	110	802	334	890	268	455	316	102	74.5	174
11	69.8	484	137	396	335	1,100	307	457	312	98.2	77.3	142
12	72.1	480	311	419	333	678	387	460	461	96.8	77.4	135
13	75.6	478	451	419	279	678	372	466	515	94.6	73.4	131
14	71.4	398	372	1,240	250	2,420	322	477	496	91.2	75.7	118
15	71.3	344	321	3,100	265	4,980	325	449	476	91.5	82.1	116
16	238	339	318	4,030	284	4,980	327	459	455	95.1	75.6	114
17	144	346	316	4,050	281	2,040	431	475	430	94.3	63.2	117
18	85.8	360	315	3,520	280	1,070	507	472	395	91.3	62.9	117
19	93.1	350	312	875	281	1,090	517	460	343	89.2	67.3	111
20	87.7	340	305	406	282	1,080	421	449	214	88.6	104	102
21	111	331	298	405	285	3,180	385	442	127	86.7	371	99.4
22	101	312	291	404	244	4,710	394	449	118	85.8	589	97.6
23	99.5	286	283	400	222	2,980	401	449	117	86.9	662	102
24	98.8	276	273	399	232	1,190	469	436	120	89.1	654	103
25	98.2	269	261	397	256	846	498	405	124	90.0	644	110
26	89.7	261	243	395	879	841	492	384	124	91.5	634	103
27	94.5	251	176	395	1,590	834	483	371	125	85.9	636	99.9
28	105	233	186	395	1,910	830	470	360	125	83.6	634	100
29	103	205	202	395		892	454	349	96.4	83.7	539	104
30	108	170	190	395		912	440	309	93.8	82.7	503	130
31	108		191	404		849		292		93.3	523	
Total	2,782	8,311	6,921	26,770	11,910	49,610	12,220	12,430	8,431	2,866	7,913	7,267
Mean	89.8	277	223	864	425	1,600	407	401	281	92.4	255	242
Max	238	487	451	4050	1910	4980	847	477	515	102	662	617
Min	61.9	103	95.5	235	222	394	195	270	93.8	82.7	62.9	97.6
Ac-ft	5,518	16,480	13,730	53,110	23,620	98,410	24,230	24,650	16,720	5,684	15,690	14,410

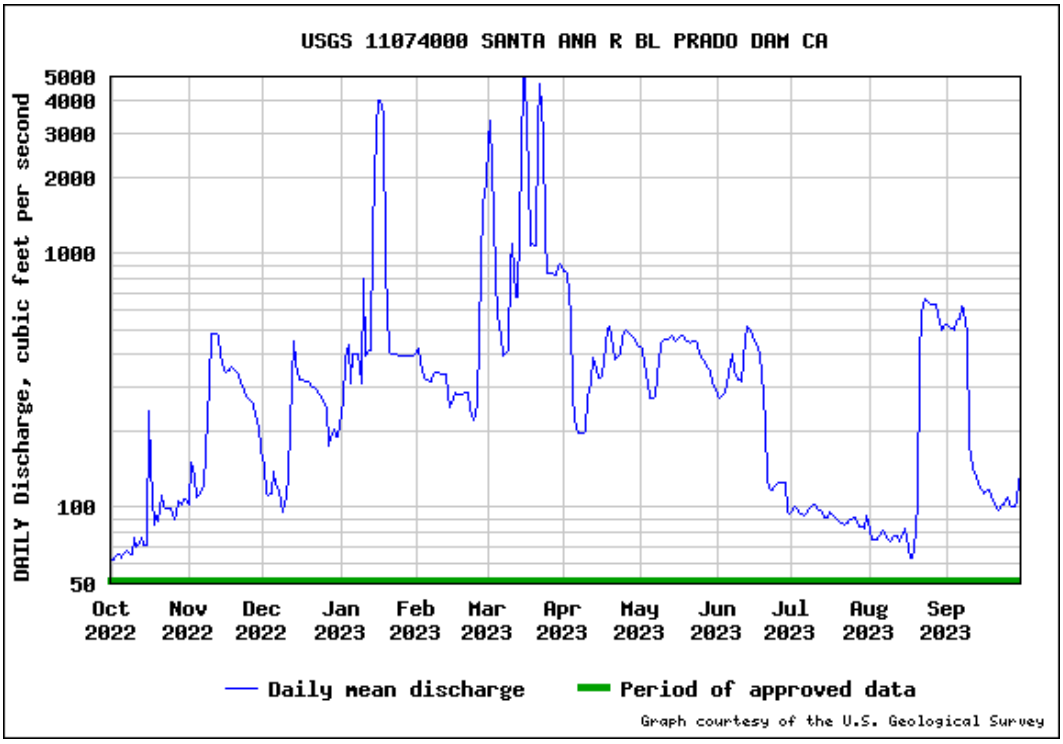
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	126	149	244	399	432	397	261	188	151	122	106	102
Max	910	322	1,300	3,543	2,733	2,556	1,101	915	736	446	403	372
(WY)	(2005)	(1997)	(2011)	(1993)	(1998)	(1980)	(1980)	(1998)	(1983)	(1998)	(2005)	(1997)
Min	22.4	33.5	39.5	49.2	49.8	54.3	43.3	35.2	29.0	17.7	14.8	16.2
(WY)	(1962)	(1963)	(1963)	(1963)	(1961)	(1961)	(1961)	(1961)	(1961)	(1960)	(1960)	(1960)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1941 - 2023	
Annual total	157,400			
Annual mean	431.3		222.1	
Highest annual mean			882.0	2005
Lowest annual mean			36.4	1961
Highest daily mean	4,980	Mar 15	11,400	Jan 14, 2005
Lowest daily mean	61.9	Oct 01	2.40	Jul 29, 1978
Annual 7-day minimum	64.2	Oct 01	3.00	Sep 24, 1973
Maximum peak flow	5,090[a]	Mar 15	13,200[a]	Jan 15, 2005
Maximum peak stage	7.89	Mar 15	8.73	Jan 15, 2005
Annual runoff (cfsm)	0.191		0.098	
Annual runoff (inches)	2.59		1.34	
10 percent exceeds	724.8		390.0	
50 percent exceeds	304.0		135.0	
90 percent exceeds	83.7		44.0	

[a] Discharge affected by Regulation or Diversion



USGS Water-Year Summary 2023

11074000 Santa Ana River below Prado Dam, CA

LOCATION - Lat 33°53'00", long 117°38'40" referenced to North American Datum of 1927, in sec.00, T.3 S., R.7 W., Riverside County, CA, Hydrologic Unit 18070203, in La Sierra Grant, on left bank of outlet channel, 2,500 ft downstream from axis of Prado Dam, and 4.5 mi west of Corona.

DRAINAGE AREA - 2,258 mi² of which 768 mi² probably is noncontributing. above Lake Elsinore.

REVISIONS HISTORY - 12/06/2016: Unit and daily value water temperature and specific conductance from April 8, 2016 through Sept. 8, 2016 have been revised superseding those published at http://waterdata.usgs.gov site 11074000.

WATER-QUALITY RECORDS

PERIOD OF RECORD -

DISCRETE WATER-QUALITY DATA:
CHEMICAL DATA: Water years 1967 to current year.
BIOLOGICAL DATA: Water years 1975-81.
SEDIMENT DATA: Water years 1974-94, 1999 to current year.

CONTINUOUS WATER-QUALITY DATA:
SPECIFIC CONDUCTANCE: Water years February 1968 to current year.
WATER TEMPERATURE: Water years February 1968 to current year.
CHLORIDE: Water years October 1970 to September 1971.
SUSPENDED-SEDIMENT DISCHARGE: Water years October 1973 to June 1982.

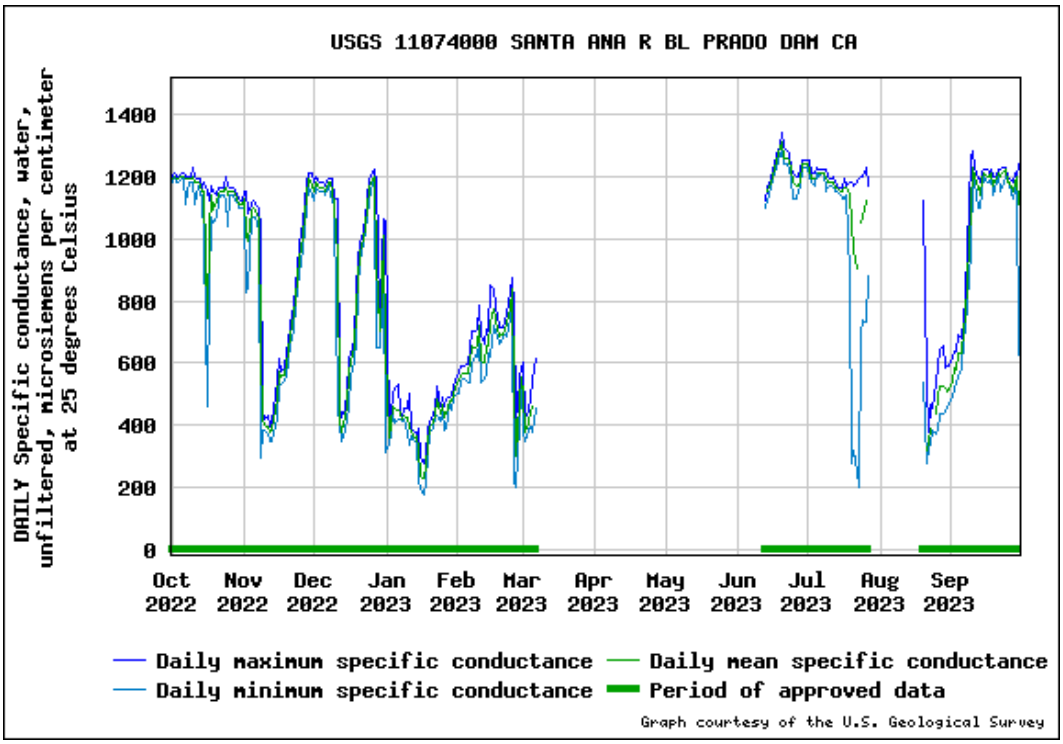
INSTRUMENTATION - Water-quality monitor recording specific conductance and water temperature since October 1969. On October 26th 2016 (QM 3915) Continuous water quality equipment setup (YSI 600R)moved to ~30 ft down stream of the gage house.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8184_8185_8186_8187&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11074000&agency_cd=USGS

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
YEAR 2022-10-01 to 2023-09-30
DAILY VALUES

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	October			November			December			January			February			March			April			May			June			July			August			September		
1	1,200	1,180	1,190	1,150	1,100	1,130	1,180	1,120	1,150	1,050	312	635	570	501	541	600	378	498	---	---	---	---	---	---	---	---	---	1,250	1,230	1,240	---	---	---	621	491	543
2	1,210	1,190	1,200	1,150	826	1,010	1,200	1,160	1,180	378	335	358	591	540	562	419	349	379	---	---	---	---	---	---	---	---	---	1,250	1,190	1,220	---	---	---	638	519	582
3	1,200	1,180	1,190	1,080	839	994	1,180	1,150	1,160	443	377	404	588	549	566	450	384	409	---	---	---	---	---	---	---	---	---	1,210	1,180	1,190	---	---	---	638	529	578
4	1,200	1,180	1,190	1,110	1,070	1,090	1,180	1,150	1,160	496	440	462	590	552	568	483	394	446	---	---	---	---	---	---	---	---	---	1,210	1,170	1,190	---	---	---	692	553	635
5	1,210	1,190	1,200	1,120	1,070	1,100	1,180	1,150	1,160	518	406	457	599	537	565	547	377	463	---	---	---	---	---	---	---	---	---	1,230	1,210	---	---	---	---	679	578	634
6	1,210	1,190	1,200	1,110	1,070	1,090	1,170	1,140	1,150	529	418	447	652	540	602	615	458	---	---	---	---	---	---	---	---	---	---	1,220	1,200	1,210	---	---	---	739	674	703
7	1,200	1,110	1,190	1,100	1,030	1,060	1,190	1,170	1,180	441	421	436	704	598	653	---	---	---	---	---	---	---	---	---	---	---	---	1,220	1,210	1,210	---	---	---	814	710	751
8	1,200	1,180	1,190	1,030	296	646	1,190	1,140	1,180	427	416	421	703	628	652	---	---	---	---	---	---	---	---	---	---	---	---	1,220	1,210	1,210	---	---	---	967	792	864
9	1,200	1,180	1,190	441	382	414	1,190	1,120	1,150	457	419	432	706	622	657	---	---	---	---	---	---	---	---	---	---	---	---	1,220	1,150	1,190	---	---	---	1,260	961	1,100
10	1,230	1,180	1,200	417	383	403	1,120	1,100	1,110	457	380	425	783	665	719	---	---	---	---	---	---	---	---	---	---	---	---	1,200	1,160	1,180	---	---	---	1,280	1,200	1,230
11	1,200	1,110	1,180	429	372	395	1,130	461	936	502	338	399	683	535	610	---	---	---	---	---	---	---	---	---	---	---	---	1,190	1,170	1,180	---	---	---	1,230	1,180	1,200
12	1,190	1,170	1,180	396	347	381	461	399	422	393	366	377	663	552	600	---	---	---	---	---	---	---	---	---	---	---	---	1,200	1,160	1,180	---	---	---	1,190	1,100	1,160
13	1,190	1,140	1,170	410	348	383	425	349	378	379	349	360	711	562	653	---	---	---	---	---	---	---	---	---	1,120	1,100	---	1,180	1,150	1,160	---	---	---	1,180	1,100	1,140
14	1,160	1,140	1,150	454	374	417	453	387	429	374	352	366	701	631	657	---	---	---	---	---	---	---	---	---	1,160	1,120	1,150	1,170	1,150	1,160	---	---	---	1,210	1,150	1,190
15	1,180	987	1,150	541	425	484	500	418	463	389	222	324	848	619	724	---	---	---	---	---	---	---	---	---	1,190	1,160	1,180	1,160	1,140	1,150	---	---	---	1,220	1,200	1,210
16	1,150	463	743	617	522	575	611	461	570	298	195	239	837	719	771	---	---	---	---	---	---	---	---	---	1,220	1,190	1,200	1,160	1,130	1,150	---	---	---	1,220	1,180	1,200
17	1,120	853	1,030	572	531	554	630	558	607	278	179	230	777	702	737	---	---	---	---	---	---	---	---	---	1,240	1,210	1,220	1,190	1,130	1,160	---	---	---	1,210	1,180	1,200
18	1,170	1,070	1,140	580	542	561	673	610	647	305	217	271	751	688	710	---	---	---	---	---	---	---	---	---	1,270	1,230	1,250	1,170	1,140	1,160	---	---	---	1,220	1,200	1,210
19	1,150	1,050	1,090	640	556	604	834	673	774	384	299	338	712	659	687	---	---	---	---	---	---	---	---	---	1,300	1,270	1,290	1,180	887	1,140	---	---	---	1,200	1,140	1,170
20	1,140	1,070	1,120	662	609	634	927	834	873	410	379	395	716	678	693	---	---	---	---	---	---	---	---	---	1,340	1,280	1,310	1,180	276	1,050	1,120	540	---	1,200	1,180	1,190
21	1,160	1,120	1,140	729	655	690	984	927	952	437	391	409	728	693	707	---	---	---	---	---	---	---	---	---	1,290	1,240	1,260	1,170	322	965	540	278	318	1,220	1,200	1,210
22	1,160	1,140	1,150	786	710	755	1,020	983	995	447	424	433	762	688	724	---	---	---	---	---	---	---	---	---	1,280	1,240	1,260	1,180	257	902	379	327	349	1,220	1,150	1,200
23	1,160	1,140	1,150	851	782	811	1,070	1,020	1,040	524	433	485	825	745	776	---	---	---	---	---	---	---	---	---	1,270	1,220	1,250	1,190	201	---	469	335	392	1,230	1,160	1,210
24	1,200	1,120	1,160	897	842	875	1,120	1,070	1,100	459	412	437	873	784	838	---	---	---	---	---	---	---	---	---	1,230	1,190	1,220	1,200	689	1,050	457	384	---	1,230	1,200	1,220
25	1,170	1,040	1,140	979	884	933	1,190	1,120	1,160	491	445	467	784	221	540	---	---	---	---	---	---	---	---	---	1,210	1,130	1,180	1,200	741	1,070	537	373	437	1,200	1,180	1,180
26	1,160	1,140	1,150	1,050	970	1,010	1,210	1,180	1,190	460	384	424	404	200	299	---	---	---	---	---	---	---	---	---	1,200	1,130	1,170	1,230	730	1,120	590	387	490	1,190	1,170	1,180
27	1,160	1,140	1,150	1,110	1,030	1,070	1,220	1,150	1,200	485	389	439	549	401	471	---	---	---	---	---	---	---	---	---	1,200	1,150	1,170	1,170	878	---	641	439	524	1,180	1,130	1,150
28	1,150	1,120	1,140	1,180	1,100	1,140	1,180	648	914	490	470	481	585	526	553	---	---	---	---	---	---	---	---	---	1,220	1,160	1,180	---	---	---	655	437	528	1,210	1,150	1,180
29	1,140	1,120	1,130	1,210	1,170	1,190	765	650	700	494	448	480				---	---	---	---	---	---	---	---	---	1,250	1,220	1,240	---	---	---	587	443	519	1,200	1,190	1,200
30	1,130	1,100	1,110	1,210	1,140	1,170	941	765	853	527	483	498				---	---	---	---	---	---	---	---	---	1,250	1,230	1,240	---	---	---	593	457	509	1,240	626	1,110
31	1,120	1,100	1,110				1,060	941	1,010	546	495	525				---	---	---				---	---	---				---	---	---	590	471	513			
Max	1230	1190	1200	1210	1170	1190	1220	1180	1200	1050	495	635	873	784	838																			1280	1200	1230
Min	1120	463	743	396	296	381	425	349	378	278	179	230	404	200	299																			621	491	543


USGS 11074000 SANTA ANA R BL PRADO DAM CA
DAILY Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius
1400
1200
1000
800
600
400
200
0
Oct 2022
Nov 2022
Dec 2022
Jan 2023
Feb 2023
Mar 2023
Apr 2023
May 2023
Jun 2023
Jul 2023
Aug 2023
Sep 2023
Daily maximum specific conductance
Daily mean specific conductance
Daily minimum specific conductance
Period of approved data
Graph courtesy of the U.S. Geological Survey

USGS Water-Year Summary 2023

11066460 Santa Ana River at Metropolitan Water District Crossing, near Arlington, CA

LOCATION - Lat 33°58'06.50", long 117°26'53.60" referenced to North American Datum of 1983, in NE 1/4 SW 1/4 sec.30, T.2 S., R.5 W., Riverside County, CA, Hydrologic Unit 18070203, near center of Metropolitan Water District pipeline crossing, 0.7 mi downstream from Union Pacific Railroad Bridge, 1.1 mi upstream from bridge on Van Buren Boulevard, and 3.3 mi north of Arlington.

DRAINAGE AREA - 852 mi².

REVISIONS HISTORY - WDR CA-83-1: Drainage area.

SURFACE-WATER RECORDS

PERIOD OF RECORD - March 1970 to current year.

GAGE - Water-stage recorder and crest-stage gage. Datum of gage is 685.64 ft above NAVD of 1988. Prior to Apr. 15, 1985, water-stage recorder at site 300 ft upstream on left bank at different datum. From Apr. 15 to Sept. 30, 1985, water-stage recorder near right bank (atop pier 9 of Metropolitan Water District pipeline crossing), at same site and datum. From Oct. 1, 1985, to June 16, 1993, water-stage recorder and crest-stage gage on right bank at same site and datum. From June 17, 1993, to Sept. 30, 2003, water-stage recorder and crest-stage gage on left bank at same site and datum. From Oct. 1, 2003 to Oct. 17, 2005, water-stage recorder in reach-in shelter on pipeline catwalk, near pier #13 at same site and datum. Since Oct. 18, 2005, water-stage recorder is situated in reach-in shelter on upper deck platform, near pier #13 at same site and datum. On March 29, 2018 the water-stage recorder was moved back to the reach-in shelter on pipeline catwalk, near pier #13 at same site and datum.

REMARKS - Flow partly regulated by Big Bear Lake (station 11049000) and, since November 1999, by Seven Oaks Flood-Control Reservoir, capacity, 145,600 acre-ft. Natural streamflow affected by ground-water withdrawals, diversions for irrigation, return flows from irrigated areas, and discharges of treated effluent. The records at this station are equivalent to those collected at "Santa Ana River at Riverside Narrows, near Arlington" minus the flow at "Riverside Water-Quality Control Plant at Riverside Narrows, near Arlington". See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES OUTSIDE PERIOD OF RECORD - Maximum discharge since at least 1927, 100,000 ft³/s, Mar. 2, 1938, on basis of slope-area measurement, at site 1.1 mi downstream. Flood of Jan. 22, 1862, 320,000 ft³/s, on basis of slope-conveyance study, at site 8.2 mi upstream. Stage at that site was 5 ft higher than that of Mar. 2, 1938.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 49,100 ft³/s, Dec. 21, 2010, gage height, 16.83 ft, from rating curve extended above 21,900 ft³/s on basis of area-velocity studies; maximum gage height, 20.23 ft, site and datum then in use, Mar. 4, 1978; minimum daily, 15 ft³/s, Sept. 7, 8, 1980.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web
(USGS Water Data for the Nation), accessed [March 25, 2024],
https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8098&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11066460&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	28.2	31.3	32.8	1,380	50.1	2,470	181	189	72.5	42.0	40.4	114
2	27.9	32.9	35.0	261	49.4	250	173	198	65.9	41.4	39.3	113
3	27.9	33.2	35.3	134	49.1	112	168	199	58.1	42.3	39.8	89.3
4	27.1	32.4	35.0	76.3	48.9	82.2	153	307	52.5	42.2	40.2	79.1
5	27.1	32.2	33.9	645	49.3	79.0	152	169	49.2	45.6	36.8	77.1
6	27.3	31.7	34.1	326	50.9	78.2	150	148	50.6	47.3	34.1	96.7
7	26.9	31.8	38.6	93.5	49.6	72.2	151	137	49.9	49.1	34.1	82.0
8	27.2	882	46.8	53.5	49.7	67.1	153	132	49.2	49.9	35.0	98.2
9	27.0	763	45.9	49.9	49.8	66.2	159	119	48.1	49.1	35.8	73.2
10	27.7	129	44.1	1,180	49.4	322	158	91.9	48.7	46.5	38.0	60.9
11	29.5	68.0	455	389	50.2	262	138	85.2	50.3	48.0	37.2	61.2
12	30.2	52.5	230	119	51.0	173	139	92.8	51.0	48.1	37.6	71.1
13	30.7	44.6	85.3	86.4	51.4	140	169	90.5	53.6	50.0	35.4	53.2
14	30.6	40.1	54.3	696	69.8	449	140	85.4	47.0	50.1	32.9	51.2
15	37.5	37.2	46.6	1,810	59.7	4,400	102	84.6	43.5	50.9	33.1	50.9
16	76.5	34.2	41.2	1,970	49.7	820	79.5	87.7	41.7	48.5	32.2	50.7
17	34.5	36.6	38.7	430	45.5	321	68.1	87.7	41.3	45.8	32.0	49.2
18	32.2	39.6	35.7	147	43.1	277	69.7	79.6	40.5	44.1	32.8	46.3
19	30.2	38.5	34.8	101	41.1	263	70.7	79.2	41.5	46.0	32.5	44.9
20	29.0	37.5	34.0	82.9	38.7	298	114	81.7	40.5	44.7	848	44.1
21	29.1	37.0	34.3	76.2	37.2	1,130	120	91.1	41.5	42.7	1,690	45.4
22	28.7	36.8	36.2	74.8	36.6	1,660	119	113	42.5	42.9	274	45.7
23	29.1	36.2	41.2	72.0	99.2	601	122	97.6	42.0	43.0	284	46.5
24	28.9	35.3	41.5	69.7	191	357	137	91.3	44.1	42.4	209	46.8
25	29.6	35.0	42.0	68.0	3,490	293	143	89.3	44.2	39.8	149	45.8
26	29.7	34.5	41.9	65.7	482	261	150	90.0	42.0	37.9	150	44.7
27	29.9	33.7	40.3	66.3	117	239	158	89.8	41.2	40.3	179	43.1
28	30.1	33.5	78.0	66.6	211	221	163	84.1	41.9	39.5	213	45.8
29	30.2	35.0	36.1	66.4		332	176	84.8	41.7	39.0	184	43.6
30	30.6	34.1	32.6	71.3		386	179	86.2	41.3	38.5	150	48.6
31	31.0		35.4	57.5		221		87.3		38.2	122	
Total	962	2,779	1,897	10,790	5,659	16,700	4,155	3,549	1,418	1,376	5,131	1,862
Mean	31.0	92.6	61.2	348	202	539	139	114	47.3	44.4	166	62.1
Max	76.5	882	455	1970	3490	4400	181	307	72.5	50.9	1690	114
Min	26.9	31.3	32.6	49.9	36.6	66.2	68.1	79.2	40.5	37.9	32.0	43.1
Ac-ft	1,908	5,513	3,762	21,390	11,230	33,130	8,241	7,039	2,813	2,728	10,180	3,694

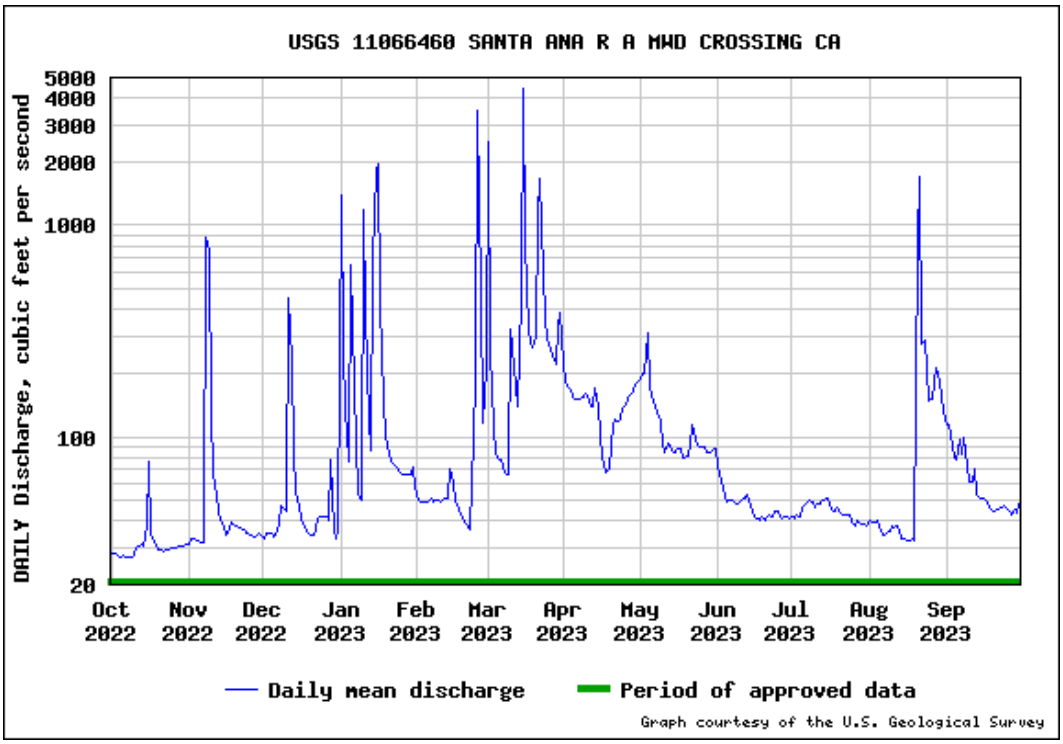
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	78.3	81.2	201	269	198	146	119	80.6	59.4	52.7	60.7	55.3
Max	498	141	1,729	2,350	756	539	501	314	192	137	201	97.6
(WY)	(2005)	(2003)	(2011)	(2005)	(2005)	(2023)	(2005)	(2005)	(2005)	(2005)	(2005)	(2015)
Min	30.1	36.4	37.7	36.9	34.9	32.1	33.6	26.6	20.2	18.2	16.1	27.9
(WY)	(2018)	(2018)	(2018)	(2014)	(2022)	(2015)	(2022)	(2022)	(2022)	(2022)	(2022)	(2021)

SUMMARY STATISTICS

	Water Year 2023		Water Years 2000 - 2023	
Annual total	56,280			
Annual mean	154.2		116.5	
Highest annual mean			491.0	2005
Lowest annual mean			48.1	2018
Highest daily mean	4,400	Mar 15	22,000	Jan 11, 2005
Lowest daily mean	26.9	Oct 07	15.1	Aug 18, 2022
Annual 7-day minimum	27.2	Oct 04	15.4	Aug 14, 2022
Maximum peak flow	8,950[a,b]	Mar 15	49,100[a,b]	Dec 21, 2010
Maximum peak stage	11.91	Mar 15	16.83	Dec 21, 2010
Annual runoff (cfsm)	0.181		0.137	
Annual runoff (inches)	2.46		1.86	
10 percent exceeds	261.4		120.0	
50 percent exceeds	50.1		63.3	
90 percent exceeds	32.6		32.2	

[a] Discharge affected to unknown degree by Regulation or Diversion
[b] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



SAR@MWDXing Water Quality				
	EC (um/cm)	TDS (mg/L)		TDS/EC Ratio
Date			**Source**	
10/4/2022	1020	647	USGS	0.63
10/19/2022	1040	633	USGS	0.61
11/1/2022	1010	621	USGS	0.61
11/17/2022	1040	638	USGS	0.61
12/5/2022	1020	612	USGS	0.60
12/19/2022	1010	614	USGS	0.61
1/5/2023	130	100	USGS	0.77
1/20/2023	875	537	USGS	0.61
2/1/2023	1010	597	USGS	0.59
2/21/2023	948	623	USGS	0.66
3/1/2023	212	129	USGS	0.61
3/20/2023	455	255	USGS	0.56
4/3/2023	515	321	USGS	0.62
4/17/2023	929	567	USGS	0.61
5/10/2023	689	412	USGS	0.60
5/23/2023	607	356	USGS	0.59
6/8/2023	851	569	USGS	0.67
6/23/2023	963	572	USGS	0.59
7/10/2023	943	556	USGS	0.59
7/28/2023	1040	603	USGS	0.58
8/10/2023	977	617	USGS	0.63
8/24/2023	550	348	USGS	0.63
9/7/2023	712	415	USGS	0.58
9/20/2023	927	597	USGS	0.64
Average	811	497		0.62

USGS Water-Year Summary 2023

11059300 Santa Ana River at E Street, near San Bernardino, CA

LOCATION - Lat 34°03'54", long 117°17'58" referenced to North American Datum of 1927, San Bernardino County, CA, Hydrologic Unit 18070203, in San Bernardino Grant, on left bank, 0.4 mi downstream from E Street Bridge, 0.4 mi upstream from Warm Creek, 1.2 mi downstream from San Timoteo Creek, 2.8 mi south of San Bernardino, and 26 mi downstream from Big Bear Lake.

DRAINAGE AREA - 541 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - March 1939 to September 1954, October 1966 to current year.

GAGE - Water-stage recorder and crest-stage gage. Datum of gage is 951.91 ft above NAVD of 1988. Prior to Nov. 10, 1950, on right bank 0.4 mi upstream at datum 24.50 ft higher. Nov. 11, 1950, to September 1954, on both banks 0.4 mi upstream at datum 24.50 ft higher. October 1966 to September 1976, on right bank 0.4 mi upstream at datum 14.50 ft higher. October 1976 to September 1977, gage was removed for channel construction. October 1977 to Jan. 28, 1981, on right bank, 0.5 mi upstream at elevation 10 ft higher.

REMARKS - San Bernardino County Flood Control District (SBCFCD) declared growth in channel 'semi-permanent' citing environmental regulation in 2016. Flow partly regulated by Big Bear Lake (station 11049000) and, since November 1999, by Seven Oaks Flood-Control Reservoir, capacity, 145,600 acre-ft. Natural flow of stream affected by ground-water withdrawals and diversion for domestic use and irrigation upstream from station. Effluent from sewage reclamation plant 1.0 mi upstream caused sustained flow past gage from 1967 to Mar. 21, 1996. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 35,700 ft³/s, Jan. 11, 2005, gage height, 9.04 ft, current site and datum, from rating curve extended above 5,930 ft³/s on basis of critical-depth computations; maximum gage height, 11.9 ft, Feb. 25, 1969, site and datum then in use; no flow for many days many years prior to 1967 and since Mar. 21, 1996.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [April 10, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8056&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11059300&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	0.00	12.1	5.09	1,090	11.5	1,480	e99.4	51.3	73.7	0.00	6.11	e81.4
2	0.02	13.9	5.27	99.0	10.4	269	93.9	51.1	84.7	0.00	1.68	e91.3
3	0.09	14.8	3.29	65.6	11.0	116	98.3	58.1	100	0.00	e2.00	e65.5
4	0.13	15.2	3.19	38.0	10.0	91.4	97.4	e149	123	0.00	9.93	e53.5
5	0.22	15.4	5.59	793	10.5	81.7	e97.7	e80.7	e159	0.00	0.06	e52.2
6	0.15	15.6	4.84	258	17.0	84.2	e95.1	e67.4	e85.9	0.00	0.11	e76.5
7	0.21	20.1	4.93	72.1	11.7	82.1	e97.2	e60.3	99.5	0.00	1.89	e56.2
8	0.02	872	5.01	51.0	11.2	79.1	e97.0	e48.2	98.5	0.00	1.98	e74.9
9	0.02	330	4.96	48.9	11.4	72.6	e115	e42.9	83.0	0.00	0.02	e55.1
10	0.15	47.4	5.53	839	11.6	326	125	e42.0	89.0	0.00	1.22	e47.8
11	0.72	25.0	170	242	12.0	271	66.1	e33.0	97.0	0.00	0.00	e44.9
12	6.92	19.6	67.2	81.3	11.8	160	47.9	37.8	108	0.00	0.04	e50.0
13	7.06	18.1	16.5	55.1	12.6	126	78.6	29.3	e118	0.00	0.00	e39.7
14	5.07	17.7	2.93	728	21.5	352	54.9	30.0	e97.1	0.00	0.01	e34.9
15	20.5	16.7	2.90	1,660	14.6	2,350	49.6	33.2	e70.8	0.00	0.00	e32.0
16	27.3	13.7	2.68	1,820	11.4	893	37.6	31.3	e51.7	0.00	0.02	e30.6
17	8.95	12.8	1.19	459	10.5	433	40.6	28.3	e37.7	0.00	2.81	e29.5
18	6.66	12.6	1.72	121	9.81	257	33.2	46.4	e27.5	0.00	0.00	e27.0
19	5.21	10.3	2.24	79.7	10.3	206	54.5	42.2	e20.0	0.00	0.00	e26.2
20	6.32	9.76	2.07	55.8	9.40	220	91.5	45.9	e10.5	0.00	e678	e25.7
21	6.74	7.86	2.10	43.8	9.51	1,070	80.9	72.8	3.03	0.00	e1,260	e21.9
22	7.69	7.79	2.54	34.9	11.2	1,440	37.4	67.3	0.25	0.00	e136	e14.0
23	10.4	5.83	1.65	30.6	88.2	627	11.3	60.1	0.00	0.00	e224	e9.46
24	9.16	4.84	1.91	27.3	206	255	25.9	61.3	0.00	0.00	e160	e3.54
25	8.99	4.30	2.81	23.2	1,490	185	28.2	62.6	0.00	0.00	e121	2.97
26	9.11	3.55	1.95	22.6	172	145	30.1	65.3	0.00	0.00	e116	5.89
27	10.7	3.68	3.76	20.9	61.2	120	26.5	70.0	0.00	0.00	e139	e9.07
28	10.6	6.58	23.7	17.6	184	103	38.5	72.6	0.00	0.00	e180	e26.6
29	8.90	6.19	2.83	15.4		201	44.0	75.1	0.00	0.00	e142	33.8
30	10.6	5.36	1.43	22.6		239	38.1	80.7	0.00	0.00	e112	38.2
31	12.3		6.76	12.9		114		82.1		0.00	e88.6	
Total	201	1,569	369	8,928	2,462	12,450	1,931	1,778	1,638	.000	3,384	1,160
Mean	6.48	52.3	11.9	288	87.9	402	64.4	57.4	54.6	.000	109	38.7
Max	27.3	872	170	1820	1490	2350	125	149	159	0.00	1260	91.3
Min	0.00	3.55	1.19	12.9	9.40	72.6	11.3	28.3	0.00	0.00	0.00	2.97
Ac-ft	398	3,111	731	17,710	4,884	24,690	3,831	3,527	3,249	.000	6,713	2,301

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2023, BY WATER YEAR (WY)

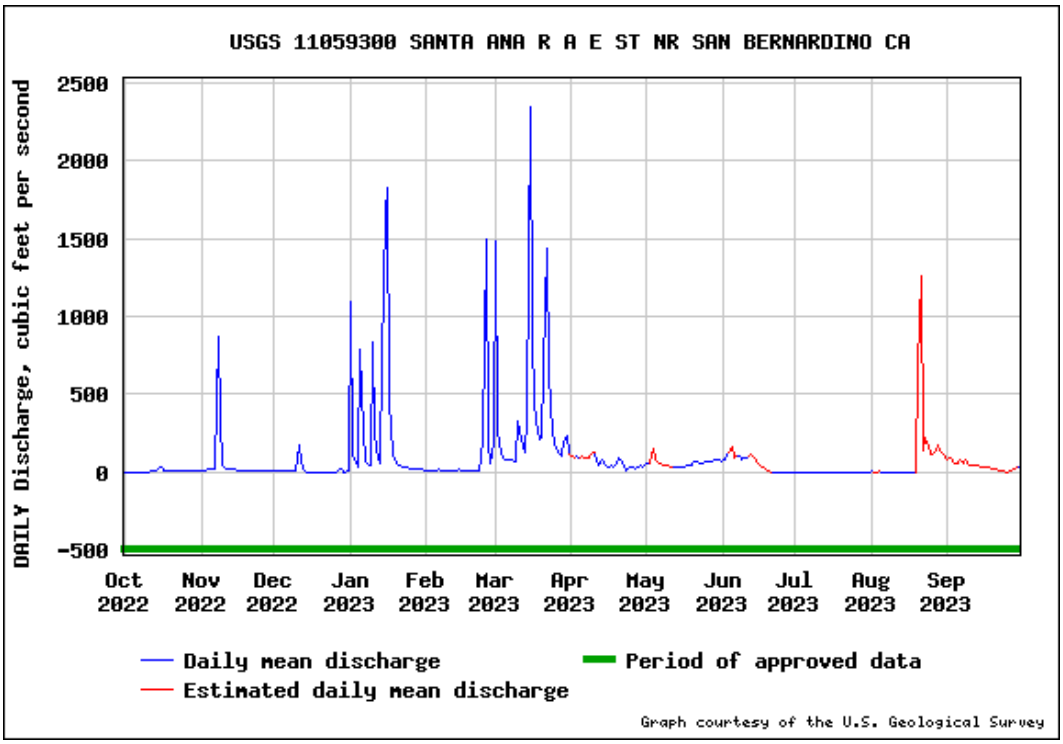
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	12.4	15.1	67.6	107	69.7	64.7	46.6	24.7	8.04	4.34	10.2	5.14
Max	200	52.3	764	1,185	376	402	351	247	112	52.9	109	40.6
(WY)	(2005)	(2023)	(2011)	(2005)	(2005)	(2023)	(2005)	(2005)	(2005)	(2005)	(2023)	(2005)
Min	.000	.67	.98	.000	.82	4.11	.041	.000	.000	.000	.000	.000
(WY)	(2003)	(2001)	(2018)	(2003)	(2002)	(2008)	(2002)	(2002)	(2002)	(2002)	(2002)	(2002)

SUMMARY STATISTICS

	Water Year 2023		Water Years 2000 - 2023	
Annual total	35,870			
Annual mean	98.3		36.2	
Highest annual mean			264.8	2005
Lowest annual mean			1.70	2002
Highest daily mean	2,350	Mar 15	12,500	Jan 11, 2005
Lowest daily mean	0.0	Oct 01	0.0	May 14, 2000
Annual 7-day minimum	0.0	Jun 23	0.0	Sep 11, 2000
Maximum peak flow	5,230[a,b]	Mar 15	35,700[a,b]	Jan 11, 2005
Maximum peak stage	5.82	Mar 15	9.04	Jan 11, 2005
Annual runoff (cfsm)	0.182		0.067	
Annual runoff (inches)	2.47		0.908	
10 percent exceeds	175.2		44.9	
50 percent exceeds	23.2		1.07	
90 percent exceeds	0.0		0.0	

[a] Discharge affected by Regulation or Diversion

[b] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11072100 Temescal Creek above Main Street, at Corona, CA

LOCATION - Lat 33°53'21", long 117°33'43" referenced to North American Datum of 1927, Riverside County, CA, Hydrologic Unit 18070203, in La Sierra Grant, on right bank, 500 ft upstream from Main Street Bridge in Corona, and 1.5 mi upstream from topographic boundary of Prado Flood-Control Basin.

DRAINAGE AREA - 224 mi². excludes 768 mi² above Lake Elsinore.

REVISIONS HISTORY -

On January 23, 2015, discharge records were revised for the period of September 10, 2013 to October 5, 2014.

Period October 4, 2018 to October 1, 2019 was accidentally approved in Aquarius Time-Series with no Analysis record.

SURFACE-WATER RECORDS

PERIOD OF RECORD - October 1980 to July 1983, February 1984 to current year.

GAGE - Water-stage recorder and concrete-lined flood-control channel. Datum of gage 573.23 ft above NAVD of 1988. December 1967 to September 1974, water-stage recorder at site 1.2 mi downstream at different datum (published as station 11072200, "Temescal Creek at Corona"). October 1980 to July 1983 at site 500 ft downstream at different datum.

REMARKS - Flow regulated by several small storage reservoirs. Many diversions upstream from station for irrigation. Water discharged to channel from Arlington Desalter at times since September 1990; records for water years 1981 to 1990 and 1991 to current year are not equivalent. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES OUTSIDE PERIOD OF RECORD - Maximum discharge, 8,850 ft³/s, Feb. 25, 1969, gage height, 8.17 ft, from floodmark, at old site (station 11072200) 1.2 mi downstream on basis of slope-area measurement of peak flow.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 6,140 ft³/s, Feb. 14, 2019, gage height, 7.22 ft, from rating curve on basis of step-backwater 2018 analysis; minimum daily, 0.05 ft³/s, July 24, 2022.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8161&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11072100&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	2.27	1.34	1.05	207	41.5	307	115	32.7	10.1	8.29	1.83	12.7
2	2.32	6.24	2.04	18.3	40.7	129	111	29.4	11.0	7.13	1.79	1.62
3	2.06	1.24	1.05	37.9	40.7	107	109	32.2	10.7	5.01	1.99	1.91
4	2.43	1.09	1.00	28.2	40.2	93.5	101	169	8.87	3.29	2.49	1.47
5	2.97	1.35	1.40	163	39.3	85.3	94.6	22.4	8.10	3.57	2.52	1.32
6	3.48	1.52	1.33	20.0	39.0	83.1	89.0	12.1	7.74	3.16	2.02	1.37
7	3.76	8.15	1.31	14.9	37.0	80.1	84.1	9.94	8.44	3.06	1.80	1.32
8	4.18	182	1.00	13.2	37.1	78.5	77.9	9.07	8.02	3.36	1.66	0.95
9	4.38	38.3	1.30	12.9	36.0	76.4	77.4	9.02	8.97	3.13	1.89	0.99
10	5.71	0.55	1.53	129	36.4	216	75.8	8.62	10.1	3.53	2.86	1.51
11	7.88	0.28	60.4	14.3	32.3	99.7	70.1	9.11	10.7	3.32	2.00	1.06
12	28.7	0.58	65.2	12.3	27.2	73.5	67.8	9.33	11.5	5.11	1.76	0.79
13	21.6	0.86	1.17	10.5	24.3	79.1	61.0	9.56	10.9	4.54	2.00	0.77
14	15.9	0.48	0.79	424	38.6	296	53.7	8.76	12.2	4.20	2.30	0.67
15	48.2	1.48	1.10	206	22.1	695	53.6	7.91	12.0	4.30	1.76	0.87
16	4.44	0.65	0.42	398	16.9	222	56.8	7.07	11.3	3.97	2.27	0.70
17	0.85	0.86	0.34	116	15.8	162	57.2	6.50	12.0	4.23	1.38	0.66
18	0.90	0.47	0.69	51.2	15.2	127	52.3	6.11	11.8	3.79	1.81	0.83
19	1.00	0.74	0.71	38.6	14.6	114	47.9	5.39	13.0	3.23	1.86	1.04
20	1.23	0.64	0.46	29.3	14.5	110	47.1	5.72	12.7	3.18	478	0.97
21	1.08	0.91	0.52	20.8	13.4	588	45.7	5.67	11.7	3.62	22.5	0.68
22	0.98	0.67	0.88	16.7	12.5	505	46.6	6.15	12.1	3.79	1.58	0.64
23	0.82	0.72	1.01	14.2	54.3	255	41.4	5.75	11.7	3.72	1.57	1.08
24	0.99	0.84	1.16	11.7	50.5	181	36.7	5.51	10.5	3.80	1.06	1.03
25	0.73	0.60	1.26	10.1	461	152	33.9	5.94	10.3	3.54	1.17	0.75
26	1.81	0.75	1.12	15.8	171	138	32.5	5.50	9.31	2.55	1.35	0.51
27	1.55	1.15	32.8	31.3	84.4	128	30.9	6.51	8.02	2.22	1.62	0.74
28	1.66	2.68	43.6	37.2	85.9	122	30.6	6.59	7.84	2.57	1.97	1.20
29	2.13	1.23	0.82	40.1		208	28.8	7.72	9.55	2.02	1.91	1.42
30	1.73	1.66	0.70	44.5		216	27.4	8.37	9.53	1.90	1.97	1.48
31	1.48		75.2	43.1		126		8.27		2.11	2.15	
Total	179	260	303	2,230	1,542	5,853	1,857	482	311	115	555	43.0
Mean	5.78	8.67	9.79	71.9	55.1	189	61.9	15.5	10.4	3.72	17.9	1.43
Max	48.2	182	75.2	424	461	695	115	169	13.0	8.29	478	12.7
Min	0.73	0.28	0.34	10.1	12.5	73.5	27.4	5.39	7.74	1.90	1.06	0.51
Ac-ft	355	516	602	4,423	3,059	11,610	3,683	956	616	229	1,101	85.4

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2023, BY WATER YEAR (WY)

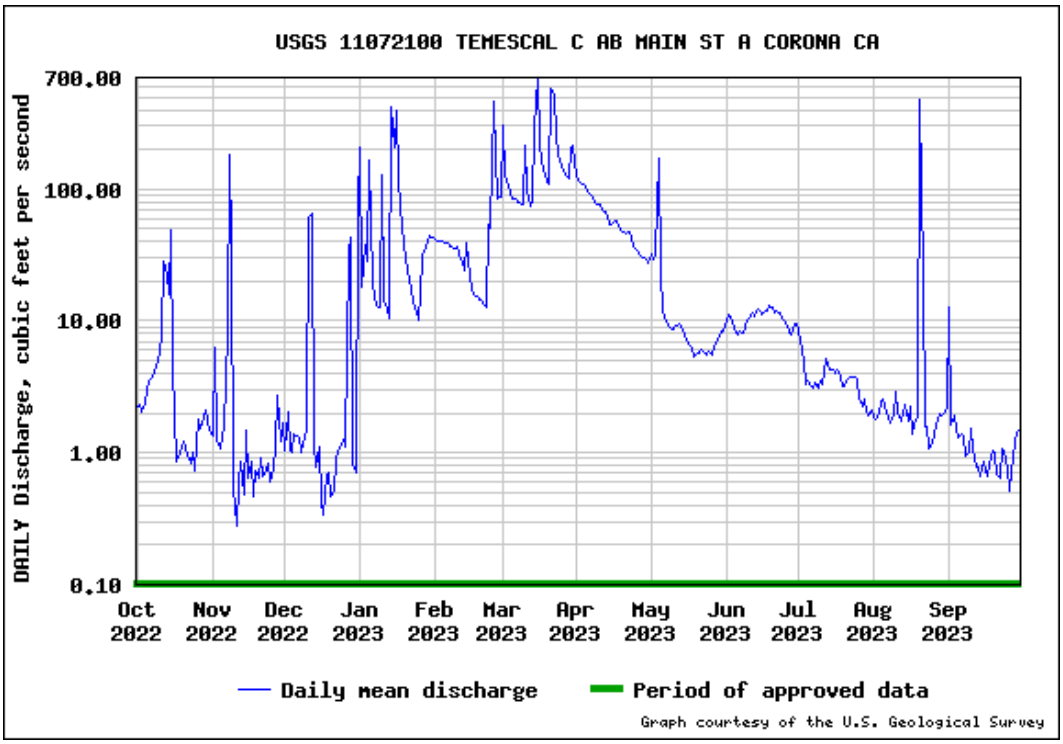
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	10.8	14.0	25.2	47.4	71.3	53.3	31.3	15.6	8.98	7.90	7.93	7.98
Max	52.6	58.3	222	335	400	349	190	100	34.3	24.9	20.7	30.4
(WY)	(2005)	(2006)	(2011)	(2005)	(2005)	(1995)	(1995)	(1995)	(1995)	(1993)	(2005)	(2005)
Min	1.95	1.76	1.59	1.73	2.40	1.75	1.15	.79	1.38	.21	1.58	1.25
(WY)	(2015)	(2016)	(2018)	(2022)	(2022)	(2015)	(2018)	(2016)	(2016)	(2022)	(2015)	(2018)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1991 - 2023	
Annual total	13,730			
Annual mean	37.6		24.9	
Highest annual mean			104.4	2005
Lowest annual mean			4.09	2018
Highest daily mean	695.0	Mar 15	2,870	Dec 22, 2010
Lowest daily mean	0.280	Nov 11	0.050	Jul 24, 2022
Annual 7-day minimum	0.574	Dec 16	0.096	Jul 20, 2022
Maximum peak flow	3,520[a,b]	Aug 20	6,140[a,b]	Feb 14, 2019
Maximum peak stage	6.16	Aug 20	7.27	Dec 22, 2010
Annual runoff (cfsm)	0.168		0.111	
Annual runoff (inches)	2.28		1.51	
10 percent exceeds	107.8		51.8	
50 percent exceeds	7.84		8.30	
90 percent exceeds	0.856		1.51	

[a] Discharge affected by Regulation or Diversion

[b] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11071900 Temescal Creek at Corona Lake, near Corona, CA

LOCATION - Lat 33°45'01", long 117°26'45" referenced to North American Datum of 1983, in SE 1/4 NW 1/4 sec.07, T.5 S., R.5 W., Riverside County, CA, Hydrologic Unit 18070203, on left bank, 10 ft upstream from Corona Lake Weir Control into Temescal Creek, 9.3 mi downstream of Lake Elsinore, and 12.3 mi south of Corona.

DRAINAGE AREA - 57.9 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - November 5, 2012 to current year.

GAGE - Water-stage recorder and concrete spillway control. Datum of gage is 1103.86 ft above NAVD of 1988.

REMARKS - Gage established for the purpose of monitoring discharges from concrete weir on spill way of Corona Lake flowing into Temescal Creek.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 1090 ft³/s, Feb. 19, 2019, gage height, 39.93 ft; minimum discharge, 0.00 ft³/s, on many days, gage height, <17.34 ft., many days in 2015, while stage was below orifice.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8159&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11071900&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES

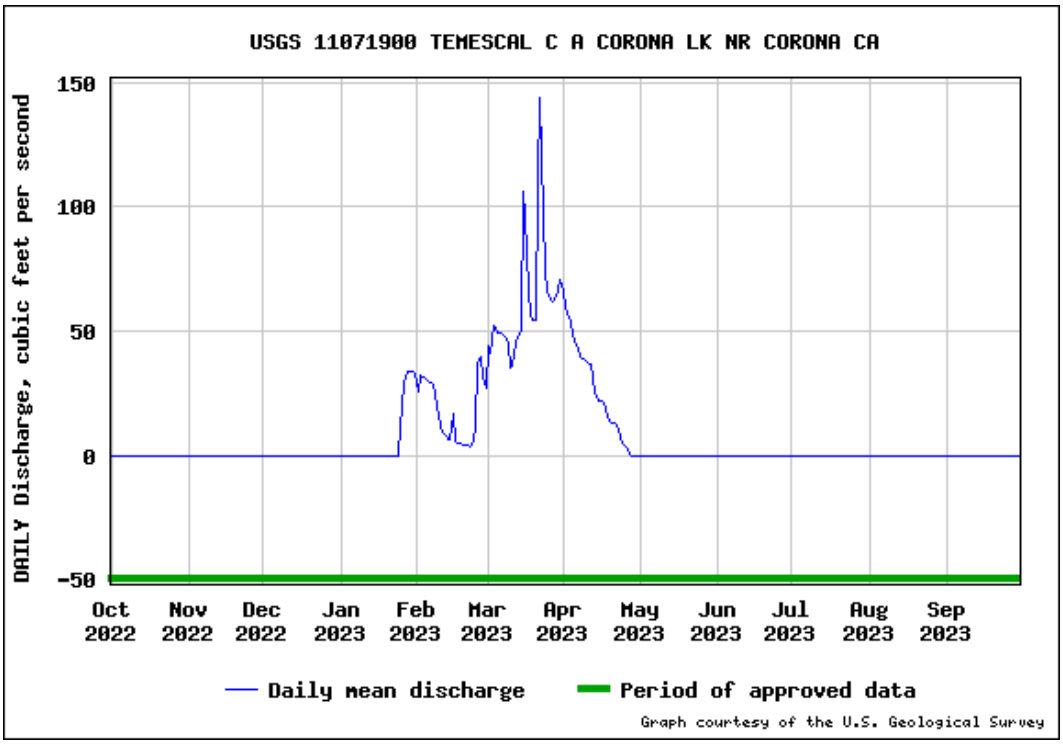
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	0.00	0.00	0.00	0.00	25.8	44.4	59.9	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	31.9	40.8	56.7	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	31.7	52.0	54.8	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	31.0	50.5	47.9	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	29.9	49.1	46.6	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	29.0	49.1	42.3	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	28.3	48.5	39.9	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	23.8	47.6	38.6	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	16.3	44.5	38.1	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	11.6	34.9	37.4	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	9.11	36.0	37.0	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	7.81	44.8	30.9	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	6.22	47.6	24.7	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	6.17	50.3	21.8	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	16.6	106	21.8	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	5.85	95.7	22.0	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	5.04	66.4	18.7	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	4.85	55.9	15.3	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	4.25	54.8	14.1	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	3.81	54.8	13.3	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	3.94	110	12.7	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	3.57	144	10.5	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	5.30	97.3	7.45	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	11.7	74.5	5.07	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	11.7	37.6	65.8	3.66	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	28.9	39.8	62.4	2.14	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	31.2	31.7	61.5	0.46	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	33.7	27.1	63.7	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	34.0		66.2	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	33.6		70.6	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00	32.8		66.2		0.00		0.00	0.00	
Total	.000	.000	.000	206	490	1,956	724	.000	.000	.000	.000	.000
Mean	.000	.000	.000	6.64	17.5	63.1	24.1	.000	.000	.000	.000	.000
Max	0.00	0.00	0.00	34.0	39.8	144	59.9	0.00	0.00	0.00	0.00	0.00
Min	0.00	0.00	0.00	0.00	3.57	34.9	0.00	0.00	0.00	0.00	0.00	0.00
Ac-ft	.000	.000	.000	408	971	3,879	1,436	.000	.000	.000	.000	.000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2013 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	.000	.000	.000	2.42	10.6	13.1	6.45	.092	.000	.000	.000	.000
Max	.000	.000	.000	10.5	56.4	63.1	38.0	1.01	.000	.000	.000	.000
(WY)	(2014)	(2014)	(2013)	(2020)	(2019)	(2023)	(2020)	(2020)	(2013)	(2013)	(2013)	(2013)
Min	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	(2014)	(2014)	(2013)	(2014)	(2014)	(2014)	(2013)	(2013)	(2013)	(2013)	(2013)	(2013)

SUMMARY STATISTICS

	Water Year 2023		Water Years 2013 - 2023	
Annual total	3,375			
Annual mean	9.25		2.80	
Highest annual mean			9.25	2023
Lowest annual mean			0.0	2014
Highest daily mean	144.0	Mar 22	449.0	Feb 14, 2019
Lowest daily mean	0.0	Oct 01	-0.010	Feb 02, 2017
Annual 7-day minimum	0.0	Oct 01	-0.001	Jan 30, 2017
Maximum peak flow	211	Feb 15	1,090	Feb 19, 2019
Maximum peak stage	38.05	Feb 15	39.93	Feb 19, 2019
Annual runoff (cfsm)	0.160		0.046	
Annual runoff (inches)	2.17		0.632	
10 percent exceeds	39.8		0.0	
50 percent exceeds	0.0		0.0	
90 percent exceeds	0.0		0.0	



USGS Water-Year Summary 2023

11073495 Cucamonga Creek near Mira Loma, CA

LOCATION - Lat 33°58'58", long 117°35'55" referenced to North American Datum of 1927, in SW 1/4 NE 1/4 sec.22, T.2 S., R.7 W., San Bernardino County, CA, Hydrologic Unit 18070203, on right bank, 300 ft upstream from Merrill Avenue Bridge, and 4.6 mi west of Mira Loma.

DRAINAGE AREA - 75.8 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - January 1968 to July 1977, December 1978 to current year. CHEMICAL DATA: Water years 1999-2000. SPECIFIC CONDUCTANCE: Water years 1999-2000. WATER TEMPERATURE: Water years 1999-2000. SEDIMENT DATA: Water years 1999-2000.

GAGE - Water-stage recorder, crest-stage gage, and concrete-lined flood-control channel. Datum of gage is 641.25 ft above NAVD of 1988. Prior to July 1977 at site 100 ft downstream at different datum.

REMARKS - Channel is a trapezoidal concrete floodway; records for low and medium flows prior to July 31, 1977, are not equivalent (channel concrete lined since July 31, 1977). Inland Empire Utilities Agency Tertiary Plant No. 1 began discharging effluent 3.3 mi upstream from station on May 8, 1985. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 17,300 ft³/s, Oct. 20, 2004, gage height, 6.58 ft, from rating curve extended above 617 ft³/s on basis of step-backwater computations; maximum gage height, 7.85 ft, Feb. 27, 1983. Prior to operation of Plant No. 1, no flow for most of some years. Minimum daily since 1985, 0.00 ft³/s, For several days for this period.

U.S. Department of the Interior
U.S. Geological Survey

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	6.31	0.04	48.3	277	25.1	936	77.6	59.0	8.76	5.54	0.01	40.8
2	5.11	6.18	30.3	13.8	25.7	40.8	87.8	59.9	5.47	4.71	0.51	6.78
3	6.18	0.01	25.7	12.2	21.3	32.8	84.1	74.3	8.60	0.29	0.03	8.16
4	7.13	0.00	32.1	7.71	15.0	24.1	90.7	365	13.8	0.92	0.11	5.15
5	7.94	0.85	30.0	907	19.3	28.6	64.3	77.8	10.5	0.42	1.03	3.45
6	9.27	3.28	15.2	165	20.5	39.8	61.6	83.0	14.9	1.58	2.31	2.42
7	9.69	35.2	8.20	130	29.2	35.9	76.9	80.5	11.1	3.53	0.46	3.23
8	6.12	1,030	8.74	92.4	32.3	32.1	85.2	65.9	9.61	4.85	0.31	3.09
9	11.3	174	19.0	238	25.8	33.6	82.9	66.0	8.85	9.19	0.69	6.63
10	18.9	59.6	19.5	1,230	8.74	334	88.1	47.4	19.1	4.04	1.55	10.9
11	18.3	40.5	e663	91.4	19.8	205	92.1	48.6	23.6	0.64	6.58	6.28
12	14.0	31.8	141	117	28.0	105	83.8	33.1	21.0	0.02	10.7	2.95
13	12.7	31.8	137	81.2	24.9	108	68.6	32.4	25.2	0.01	20.6	1.88
14	2.75	46.7	110	1,420	46.6	759	77.3	62.0	14.2	0.09	18.0	2.78
15	22.6	41.9	79.0	548	31.5	1,540	87.1	38.0	8.03	0.00	15.0	2.79
16	16.0	63.1	59.6	602	23.7	246	106	10.0	8.72	0.25	4.44	5.46
17	3.27	76.6	57.5	16.2	16.3	186	124	14.7	7.05	0.63	4.87	9.17
18	7.41	55.7	40.5	4.57	12.9	156	134	14.3	13.2	0.43	2.62	6.59
19	5.73	39.8	19.0	0.04	21.4	172	69.8	12.8	18.8	0.31	44.5	1.67
20	2.38	68.4	18.4	0.12	17.0	147	44.2	17.3	22.6	0.35	735	5.42
21	1.09	39.0	44.0	7.41	29.4	729	41.1	15.8	13.1	0.60	435	10.7
22	2.88	18.8	55.1	53.9	41.8	663	39.2	13.5	6.62	0.82	23.3	11.2
23	3.37	20.3	187	85.8	114	675	38.2	8.59	9.23	12.3	18.1	15.4
24	3.58	39.4	104	78.8	484	440	35.6	7.68	8.99	21.9	19.8	15.0
25	4.33	33.2	497	116	1,180	372	33.8	10.7	10.4	23.8	7.95	9.08
26	1.68	39.4	498	130	328	367	25.1	8.95	7.87	73.8	2.29	4.12
27	0.29	29.6	133	128	157	342	35.3	10.1	4.19	35.2	15.7	3.73
28	2.09	27.4	107	89.9	148	244	32.7	15.7	2.12	3.52	79.4	5.01
29	3.77	25.9	15.1	179		235	39.6	10.7	1.17	0.38	47.0	5.36
30	0.55	48.4	29.7	17.8		172	42.0	10.6	0.40	3.48	181	51.9
31	0.14		173	11.1		78.2		7.77		8.13	44.6	
Total	217	2,127	3,405	6,851	2,947	9,479	2,049	1,382	337	222	1,743	267
Mean	7.00	70.9	110	221	105	306	68.3	44.6	11.2	7.15	56.2	8.90
Max	22.6	1030	663	1420	1180	1540	134	365	25.2	73.8	735	51.9
Min	0.14	0.00	8.20	0.04	8.74	24.1	25.1	7.68	0.40	0.00	0.01	1.67
Ac-ft	430	4,219	6,754	13,590	5,846	18,800	4,064	2,741	669	440	3,458	530

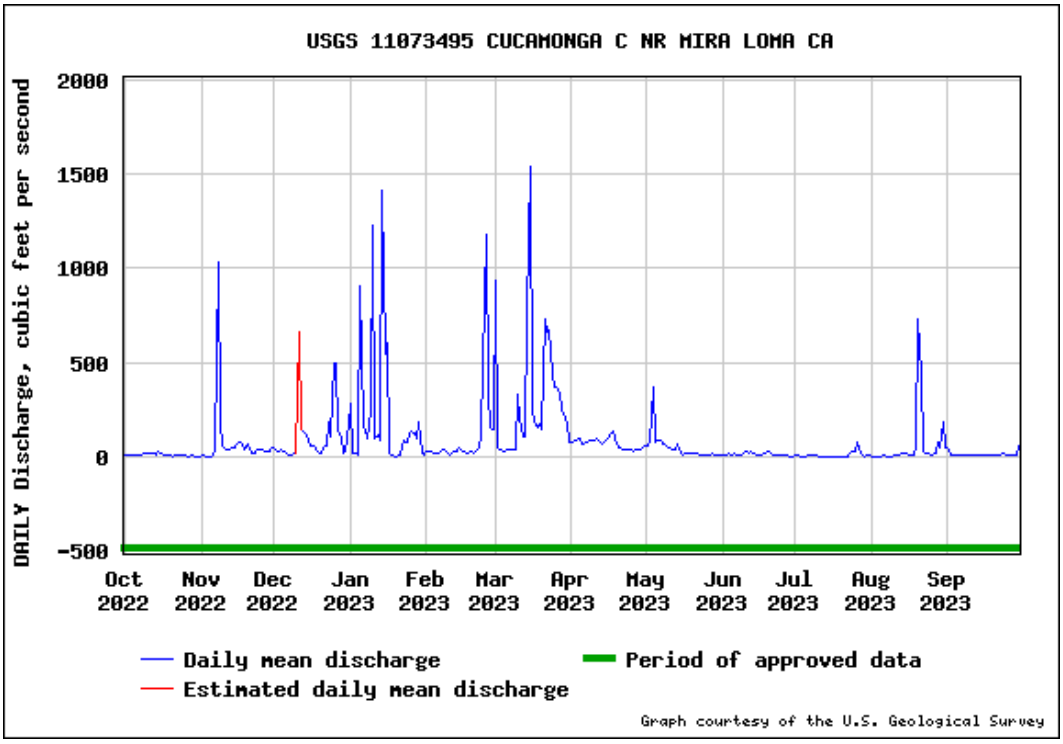
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	37.5	41.0	67.2	90.7	94.5	67.0	42.3	32.3	26.9	25.0	25.5	28.9
Max	223	102	328	442	350	306	114	69.4	57.1	53.4	56.2	52.0
(WY)	(2005)	(2003)	(2011)	(2005)	(2005)	(2023)	(2006)	(2003)	(1992)	(2004)	(2023)	(1986)
Min	4.82	12.5	16.7	15.6	14.5	12.1	6.27	6.60	2.54	1.86	2.67	3.86
(WY)	(2020)	(2013)	(2014)	(2014)	(2016)	(2017)	(2013)	(2014)	(2017)	(2018)	(2015)	(2016)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1986 - 2023	
Annual total	31,030			
Annual mean	85.0		48.0	
Highest annual mean			137.4	2005
Lowest annual mean			15.8	2013
Highest daily mean	1,540	Mar 15	5,200	Jan 09, 2005
Lowest daily mean	0.0	Nov 04	0.0	Jun 21, 2019
Annual 7-day minimum	0.204	Jul 12	0.0	Nov 10, 2019
Maximum peak flow	6,370[a]	Jan 14	17,300[a]	Oct 20, 2004
Maximum peak stage	5.06	Jan 14	6.58	Oct 20, 2004
Annual runoff (cfsm)	1.12		0.633	
Annual runoff (inches)	15.2		8.60	
10 percent exceeds	176.0		62.0	
50 percent exceeds	20.5		32.0	
90 percent exceeds	1.40		7.45	

[a] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11073360 Chino Creek at Schaefer Avenue, near Chino, CA

LOCATION - Lat 34°00'14", long 117°43'34" referenced to North American Datum of 1927, San Bernardino County, CA, Hydrologic Unit 18070203, in Santa Ana del Chino Grant, on right bank, 300 ft downstream from old Schaefer Avenue Bridge, 0.8 mi downstream from San Antonio Creek, and 1.5 mi southwest of Chino.

DRAINAGE AREA - 48.9 mi².

REVISIONS HISTORY - WDR CA-84-1: 1983 (instantaneous maximum discharge). WDR CA-95-1: 1992, 1993.

SURFACE-WATER RECORDS

PERIOD OF RECORD - October 1969 to current year. CHEMICAL DATA: Water year 1998. SEDIMENT DATA: Water year 1998.

GAGE - Water-stage recorder and concrete-lined flood-control channel. Concrete dikes formed low-water control from October 1975 to Apr. 16, 1991. Datum of gage is 672.14 ft above NAVD of 1988.

REMARKS - Since 1997, due to construction in area of gage, Schaefer Avenue no longer extends to the Chino Creek crossing. The Schaefer Avenue Bridge, however, remains. Flow mostly regulated by San Antonio Flood-Control Reservoir, capacity, 7,700 acre-ft. Natural streamflow affected by extensive ground-water withdrawals, diversions for power, domestic use, irrigation, and return flow from irrigated areas. Releases of imported water are made to the basin by the California Water Project at times in some years, via San Antonio Creek from Rialto Pipeline below San Antonio Dam, at a site approximately 11 mi upstream. During the current water year, the California Water Project reported no releases were made into the basin. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES OUTSIDE PERIOD OF RECORD - Flood of Jan. 25, 1969, reached a stage of 9.23 ft, present datum, discharge, 9,200 ft³/s, on basis of contracted-opening measurement at site 6.1 mi downstream.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 12,700 ft³/s, Feb. 27, 1983, gage height, 10.32 ft, from rating curve extended above 560 ft³/s, on basis of slope-conveyance study; no flow May 21, June 30, July 1, Oct. 30, Nov. 3, 1977.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8167&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11073360&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	1.11	0.43	1.33	118	0.71	266	3.42	0.46	0.43	0.94	0.92	3.51
2	0.29	16.7	3.19	2.19	0.75	2.57	2.13	0.43	0.39	0.99	0.87	8.19
3	0.29	0.68	0.92	14.1	0.80	1.62	2.29	0.44	0.39	0.93	0.84	1.75
4	0.35	0.72	1.72	8.91	0.75	1.49	1.30	205	0.39	0.92	0.85	1.19
5	0.42	0.65	3.08	380	0.80	1.46	2.36	10.6	0.42	0.88	0.90	1.20
6	0.33	0.59	0.70	2.51	0.73	5.28	2.31	0.80	0.82	0.97	0.89	1.08
7	0.54	10.1	0.85	1.26	0.77	1.28	1.37	0.69	1.05	0.91	0.96	1.08
8	0.41	811	0.86	0.94	0.65	1.17	1.43	0.69	1.09	0.88	1.06	1.02
9	0.41	97.0	0.25	186	0.71	1.10	1.52	0.60	1.24	0.89	1.06	0.99
10	0.36	3.77	0.26	482	1.08	153	1.69	0.53	1.05	0.91	1.26	2.45
11	0.40	1.05	302	4.02	0.63	30.6	1.85	0.48	1.04	0.93	1.15	1.74
12	0.74	0.67	29.8	1.72	0.55	3.00	1.75	0.51	1.06	0.83	0.99	1.31
13	0.43	0.62	0.97	1.49	1.05	2.19	1.41	0.53	1.04	0.85	1.14	1.28
14	0.50	0.74	0.50	567	3.72	e363	0.63	0.53	1.11	0.91	1.01	1.60
15	38.8	0.84	0.70	187	0.60	616	0.40	0.52	1.08	1.69	1.10	1.09
16	3.27	0.75	0.66	292	0.57	6.74	0.39	0.51	1.09	1.70	0.99	1.10
17	0.99	0.89	0.35	4.61	0.45	2.71	0.44	0.49	1.09	0.77	0.97	1.03
18	0.70	0.76	0.40	2.36	0.50	2.44	0.47	0.48	1.08	0.76	1.08	1.00
19	0.55	0.72	0.42	1.98	0.43	2.73	0.46	0.48	1.49	0.80	1.47	0.97
20	1.12	0.63	0.33	1.68	0.43	14.2	0.51	0.46	1.04	0.78	542	1.17
21	0.51	0.67	0.28	1.47	2.41	458	0.50	0.46	1.05	0.72	188	0.89
22	0.78	0.65	0.33	1.25	1.68	319	0.50	0.47	1.13	1.08	2.07	0.88
23	0.73	0.61	0.33	1.06	27.0	13.4	0.51	0.45	1.13	1.42	1.55	0.86
24	0.35	0.73	0.28	1.01	268	4.09	0.48	0.47	1.49	0.89	1.36	0.92
25	0.34	0.80	0.27	0.91	521	2.99	0.44	0.47	1.12	0.85	1.33	0.85
26	0.39	0.88	0.28	1.06	37.8	2.37	0.41	0.43	1.02	1.74	1.27	0.94
27	0.55	0.82	15.6	1.21	53.8	2.83	0.40	0.42	1.08	1.29	1.28	0.80
28	0.48	1.06	18.5	1.25	112	3.73	0.46	0.44	1.01	0.90	1.14	0.85
29	0.44	0.88	0.50	1.61		67.3	0.41	0.42	0.95	0.95	1.58	0.96
30	0.41	0.95	0.66	2.52		32.1	0.41	0.42	0.92	1.80	1.37	1.35
31	0.43		173	0.79		4.94		0.54		1.92	1.14	
Total	57.4	957	559	2,274	1,040	2,389	32.6	230	29.3	32.8	764	44.1
Mean	1.85	31.9	18.0	73.4	37.2	77.1	1.09	7.43	.98	1.06	24.6	1.47
Max	38.8	811	302	567	521	616	3.42	205	1.49	1.92	542	8.19
Min	0.29	0.43	0.25	0.79	0.43	1.10	0.39	0.42	0.39	0.72	0.84	0.80
Ac-ft	114	1,899	1,109	4,510	2,064	4,739	64.8	457	58.1	65.1	1,515	87.4

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 2023, BY WATER YEAR (WY)

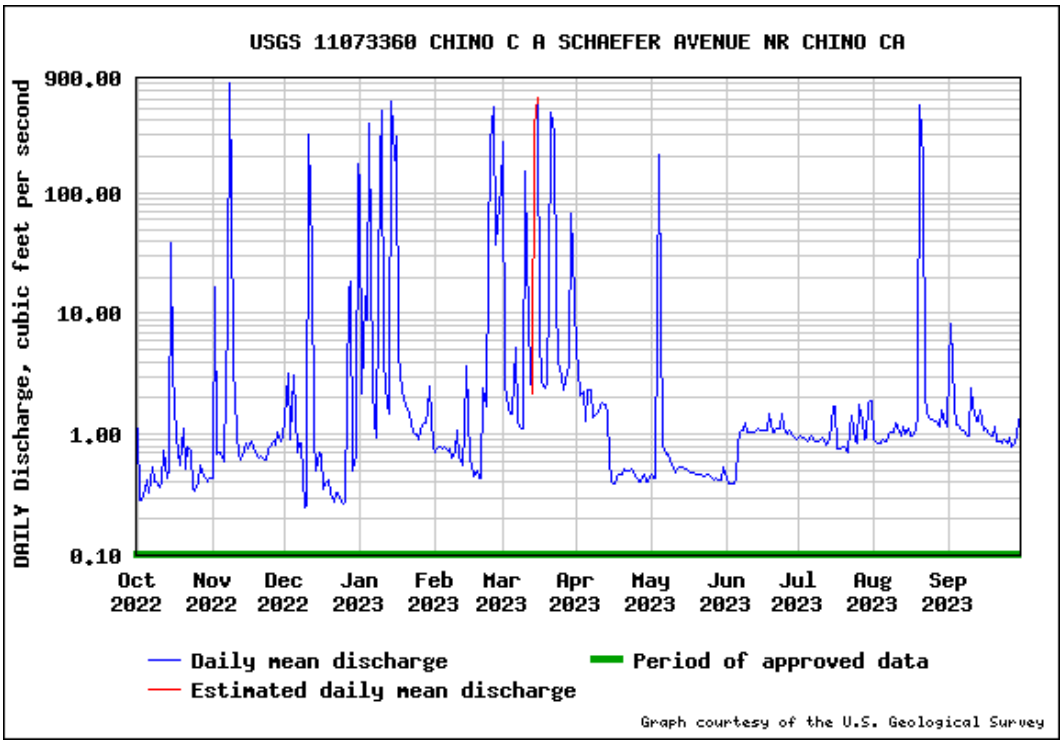
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	13.2	13.7	24.4	31.5	32.6	23.3	8.01	9.49	13.5	15.3	13.8	10.8
Max	126	113	189	221	193	257	68.6	104	184	176	191	198
(WY)	(1979)	(1976)	(1976)	(2005)	(1980)	(1978)	(1974)	(1997)	(1976)	(1974)	(1974)	(1997)
Min	.061	.20	.29	.48	.26	.30	.14	.22	.062	.069	.12	.13
(WY)	(1978)	(2018)	(2018)	(2014)	(2020)	(1972)	(1977)	(1973)	(1977)	(1977)	(2015)	(1977)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1970 - 2023	
Annual total	8,410			
Annual mean	23.0		17.4	
Highest annual mean			92.4	1974
Lowest annual mean			2.09	2018
Highest daily mean	811.0	Nov 08	2,060	Mar 01, 1978
Lowest daily mean	0.250	Dec 09	0.0	May 21, 1977
Annual 7-day minimum	0.300	Dec 20	0.024	Oct 28, 1977
Maximum peak flow	4,980[a,b]	Nov 08	13,100[a,b]	Feb 27, 1983
Maximum peak stage	7.67	Nov 08	10.32	Feb 27, 1983
Annual runoff (cfsm)	0.471		0.356	
Annual runoff (inches)	6.40		4.84	
10 percent exceeds	13.7		51.0	
50 percent exceeds	0.970		1.10	
90 percent exceeds	0.420		0.300	

[a] Discharge affected by Regulation or Diversion

[b] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11065000 Lytle Creek at Colton, CA

LOCATION - Lat 34°04'44", long 117°18'17" referenced to North American Datum of 1927, San Bernardino County, CA, Hydrologic Unit 18070203, in San Bernardino Grant, on right bank, 400 ft downstream from Colton Avenue, 1,930 ft upstream from outlet end of channel, and 1.3 mi northeast of Colton.

DRAINAGE AREA - 186 mi².

REVISIONS HISTORY - WDR CA-83-1: Drainage area.

SURFACE-WATER RECORDS

PERIOD OF RECORD - October 1957 to September 1983, October 1984 to current year.

GAGE - Water-stage recorder and concrete-lined flood-control channel. Datum of gage is 974.67 ft above NGVD of 1929 and 976.98 ft above NAVD of 1988.

REMARKS - Flow partly regulated by Lytle Creek spreading grounds 3.2 mi upstream. Diversions upstream from station for irrigation, power development, domestic use, and ground-water replenishment. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 17,500 ft³/s, Mar. 4, 1978, gage height, 14.8 ft, from rating curve extended above 4,200 ft³/s, on basis of discharge for design flood at gage height 21.4 ft; no flow at times.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8090&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11065000&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	0.12	0.35	0.45	e195	0.14	274	9.61	7.51	13.0	45.7	38.0	16.8
2	0.30	0.39	0.48	2.37	0.96	15.1	8.79	6.97	13.0	46.1	37.7	11.5
3	0.11	0.16	0.49	1.67	1.49	15.0	14.0	e8.76	10.6	51.0	38.0	14.6
4	0.12	0.22	0.48	0.80	1.47	14.6	12.1	24.7	12.9	59.2	38.4	15.6
5	0.10	0.33	0.38	122	2.12	13.8	11.3	7.96	15.6	55.0	38.8	15.6
6	0.08	0.40	0.32	0.74	2.72	15.1	12.6	6.95	12.4	54.9	36.4	15.8
7	0.09	0.45	0.52	0.24	3.38	16.1	11.2	8.38	23.6	56.7	37.2	16.4
8	0.16	186	0.39	0.41	3.87	16.0	12.1	6.89	21.2	54.1	39.8	18.1
9	0.07	11.7	0.36	2.51	3.01	15.9	8.01	6.83	26.5	53.1	33.9	18.7
10	0.09	0.79	0.36	610	3.57	40.4	8.04	6.52	27.9	51.5	33.6	20.9
11	0.07	1.38	73.2	24.6	4.51	29.7	e9.91	6.26	28.6	52.6	31.9	19.0
12	0.22	1.38	6.67	1.13	4.23	12.8	12.5	6.01	e28.7	54.1	29.7	18.5
13	0.31	1.21	0.28	e0.88	4.45	11.2	13.5	6.78	e29.8	56.1	29.4	16.8
14	0.27	1.34	0.33	185	8.46	99.4	8.40	8.10	28.9	58.0	27.0	16.8
15	4.54	1.45	0.41	67.7	1.46	539	9.17	7.75	31.8	67.8	28.3	16.6
16	0.17	1.46	0.48	197	1.32	69.0	7.41	7.71	31.1	74.2	29.1	17.8
17	0.12	1.47	0.36	5.16	1.03	26.0	6.72	7.55	30.7	69.5	30.5	18.6
18	0.18	0.68	0.32	0.36	1.01	18.6	7.00	6.46	31.2	67.1	31.2	20.4
19	0.26	0.45	0.43	0.23	1.39	13.1	7.15	10.5	37.6	100	37.2	17.4
20	0.25	0.40	0.28	0.54	1.01	22.7	7.13	9.64	45.9	63.8	e183	e17.7
21	0.21	0.43	0.46	0.40	0.61	374	7.39	12.7	48.7	45.1	e28.9	15.9
22	0.22	0.45	0.50	0.20	1.52	217	7.73	11.1	52.4	43.3	12.9	e16.2
23	0.03	0.42	0.43	0.26	14.1	40.5	6.71	12.2	51.0	44.5	12.8	14.8
24	0.36	0.36	0.44	0.28	79.6	23.8	19.1	9.84	55.6	44.0	e12.3	e9.59
25	0.50	0.25	0.49	0.28	486	25.6	7.29	e9.04	45.5	39.9	14.4	e11.7
26	0.48	0.30	0.45	0.35	21.8	19.2	9.46	9.63	43.1	40.7	15.8	e8.63
27	0.44	0.37	1.71	0.25	18.7	19.6	12.8	9.61	41.3	39.6	16.5	e9.40
28	0.48	e1.61	1.70	0.11	32.2	e11.1	11.7	9.14	42.2	41.4	16.1	e8.78
29	0.40	0.47	0.42	1.08		41.4	7.50	9.93	40.3	39.7	15.6	e9.53
30	0.26	0.52	0.43	0.28		e32.9	9.15	11.2	43.5	37.6	15.2	e8.74
31	0.27		22.6	0.17		11.2		11.4		37.9	16.3	
Total	11.3	217	117	1,422	706	2,094	295	284	965	1,644	1,006	457
Mean	.36	7.24	3.76	45.9	25.2	67.5	9.85	9.16	32.2	53.0	32.4	15.2
Max	4.54	186	73.2	610	486	539	19.1	24.7	55.6	100	183	20.9
Min	0.03	0.16	0.28	0.11	0.14	11.1	6.71	6.01	10.6	37.6	12.3	8.63
Ac-ft	22.4	431	231	2,819	1,401	4,153	586	563	1,913	3,261	1,995	906

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2023, BY WATER YEAR (WY)

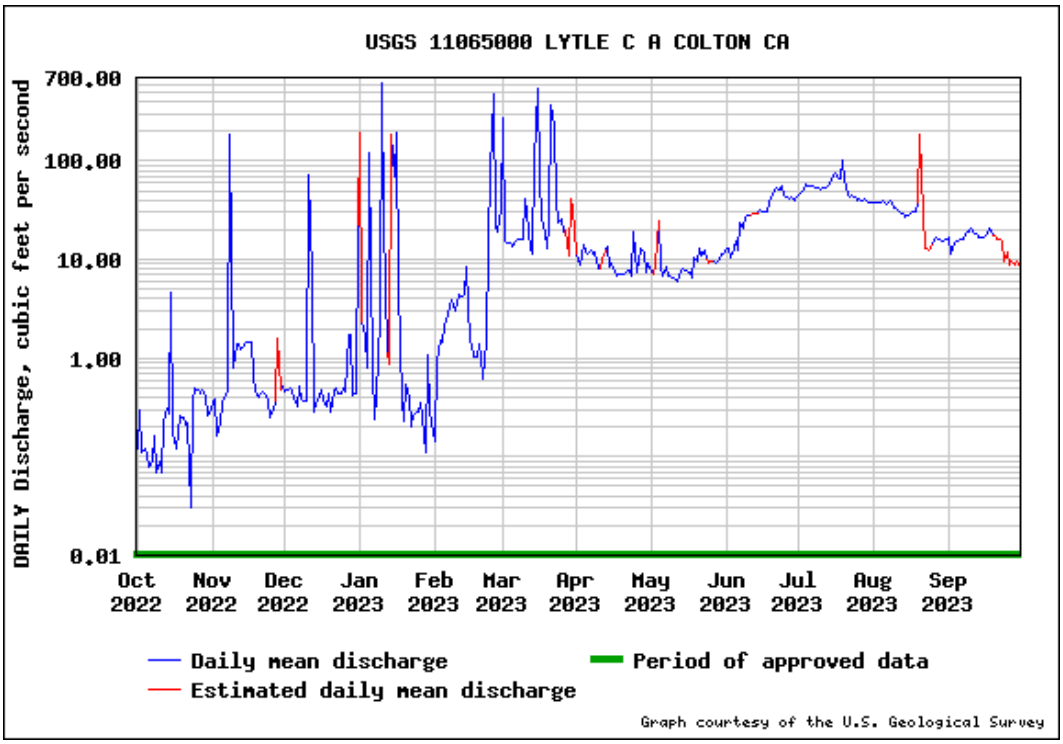
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1.93	3.55	9.43	18.7	25.5	14.8	3.79	3.21	2.24	1.93	1.25	.84
Max	83.2	79.1	142	318	363	326	57.3	87.6	61.3	53.0	32.4	15.2
(WY)	(2005)	(1966)	(2011)	(1969)	(1980)	(1978)	(1969)	(1969)	(1978)	(2023)	(2023)	(2023)
Min	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	(1958)	(1958)	(1959)	(1963)	(1961)	(1959)	(1961)	(1959)	(1958)	(1958)	(1958)	(1958)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1958 - 2023	
Annual total	9,218			
Annual mean	25.3		7.19	
Highest annual mean			65.4	1969
Lowest annual mean			0.008	1977
Highest daily mean	610.0	Jan 10	5,040	Jan 25, 1969
Lowest daily mean	0.030	Oct 23	0.0	Oct 01, 1957
Annual 7-day minimum	0.094	Oct 05	0.0	Oct 01, 1957
Maximum peak flow			17,500[a,b]	Mar 04, 1978
Maximum peak stage			14.80	Mar 04, 1978
Annual runoff (cfsm)	0.136		0.038	
Annual runoff (inches)	1.84		0.523	
10 percent exceeds	51.2		3.50	
50 percent exceeds	9.93		0.0	
90 percent exceeds	0.280		0.0	

[a] Discharge affected to unknown degree by Regulation or Diversion

[b] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11060400 Warm Creek near San Bernardino, CA

LOCATION - Lat 34°04'42", long 117°17'58" referenced to North American Datum of 1927, San Bernardino County, CA, Hydrologic Unit 18070203, in San Bernardino Grant, on left bank, 0.2 mi downstream from Interstate Highway 215 Bridge, and 2.0 mi southwest of San Bernardino.

DRAINAGE AREA - 11 mi².

REVISIONS HISTORY - WDR CA-83-1: Drainage area. WDR CA-92-1: 1978 (instantaneous maximum discharge), 1980-81 (instantaneous maximum discharge), 1983-86 (instantaneous maximum discharge).

SURFACE-WATER RECORDS

PERIOD OF RECORD - February 1964 to September 1972, October 1974 to current year. CHEMICAL DATA: Water years 1999-2004. SPECIFIC CONDUCTANCE: Water years 1999-2001. WATER TEMPERATURE: Water years 1999-2001. SEDIMENT DATA: Water years 1999-2004.

GAGE - Water-stage recorder and concrete-lined flood-control channel. Datum of gage is 958.55 ft above NAVD of 1988. Prior to Oct. 1, 1974, at site 0.1 mi upstream at different datum.

REMARKS - Natural channel prior to October 1972; concrete-lined channel since October 1974. Possible diversion during high flows into Warm Creek from Lytle Creek flood detention basin 3.4 mi upstream. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 8,500 ft³/s, Mar. 4, 1978, gage height, 4.88 ft, from rating curve extended above 420 ft³/s, on basis of step-backwater analysis, maximum gage height, 6.33 ft, Nov. 22, 1965, site and datum then in use; no flow at times in some years.

U.S. Department of the Interior
U.S. Geological Survey

Suggested citation: U.S. Geological Survey, 2024, National Water Information System data available on the World Wide Web (USGS Water Data for the Nation), accessed [March 25, 2024], https://nwis.waterdata.usgs.gov/nwis/wys_rpt?dv_ts_ids=&8060&adr_begin_date=2022-10-01&adr_end_date=2023-09-30&site_no=11060400&agency_cd=USGS

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	0.48	0.00	0.00	72.0	0.00	185	0.10	0.04	0.56	0.00	2.45	11.9
2	0.03	1.51	0.00	0.85	0.00	0.49	0.08	0.12	0.21	0.00	2.61	1.88
3	0.02	0.02	0.00	0.83	0.01	0.15	0.08	0.11	0.13	0.00	2.37	2.88
4	0.01	0.00	0.00	0.14	0.05	0.04	0.04	26.0	0.07	0.02	0.96	3.53
5	0.06	0.00	0.05	35.6	3.49	0.01	0.01	0.23	0.11	0.04	0.80	3.81
6	0.02	0.00	0.00	0.06	3.84	0.73	0.00	0.08	0.13	0.23	0.85	3.60
7	0.00	1.79	0.00	0.00	0.16	0.12	0.00	0.14	0.14	1.58	0.62	1.56
8	0.00	123	0.00	0.00	0.12	0.04	0.03	0.13	0.14	0.74	1.35	1.05
9	0.02	10.6	0.00	0.51	0.15	0.09	0.00	0.01	0.17	0.55	2.21	0.35
10	0.00	0.08	0.00	35.2	0.12	48.4	0.00	0.01	0.17	0.52	2.74	0.23
11	0.00	0.00	93.5	0.02	0.11	22.7	0.00	0.01	0.29	0.48	2.19	0.21
12	0.00	0.00	16.1	0.00	0.05	0.43	0.00	0.00	0.50	0.51	1.42	0.10
13	0.02	0.00	0.14	0.00	0.07	5.67	12.6	0.00	0.10	0.50	1.44	0.15
14	0.04	0.00	0.00	94.2	8.72	120	0.19	0.00	0.08	0.52	1.95	0.24
15	11.1	0.19	0.00	32.0	0.13	189	0.03	0.00	0.11	0.53	2.30	1.14
16	1.22	0.21	0.00	50.5	0.00	1.00	0.06	0.00	0.07	0.57	1.64	1.13
17	0.05	0.03	0.00	0.05	0.00	0.26	0.03	0.00	0.06	0.60	1.60	1.58
18	0.05	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.07	0.71	1.22	1.71
19	0.01	0.00	0.00	0.00	0.01	0.35	0.00	0.00	0.09	0.79	0.00	1.49
20	0.04	0.00	0.00	0.00	0.05	0.70	1.09	0.02	0.15	0.82	236	1.48
21	0.02	0.00	0.02	0.00	0.47	134	0.00	0.00	0.18	0.75	22.7	1.24
22	0.22	0.00	0.00	0.00	2.27	66.3	0.00	0.01	0.20	0.82	0.09	1.09
23	0.22	0.00	0.00	0.00	43.5	12.0	0.00	0.00	0.30	1.03	0.00	0.93
24	0.08	0.00	0.02	0.00	42.6	0.50	0.00	0.00	0.46	1.15	0.00	0.88
25	0.00	0.00	0.03	0.00	198	0.08	0.03	0.01	0.47	0.73	0.00	0.87
26	0.00	0.00	0.04	0.00	12.9	0.04	0.14	0.15	0.42	2.67	0.41	0.81
27	0.00	0.00	2.34	0.00	11.9	0.37	0.41	0.13	0.30	3.49	1.09	0.90
28	0.00	0.00	3.36	0.00	39.8	0.60	0.14	0.00	0.31	2.65	1.03	1.00
29	0.00	0.00	0.00	0.36		34.3	0.00	0.57	0.23	2.25	0.70	1.08
30	0.00	0.00	0.00	0.47		20.4	0.00	0.57	0.04	2.13	0.35	1.65
31	0.00		37.1	0.00		0.34		0.58		2.50	0.39	
Total	13.7	137	153	323	369	844	15.1	28.9	6.26	29.9	293	50.5
Mean	.44	4.58	4.93	10.4	13.2	27.2	.50	.93	.21	.96	9.47	1.68
Max	11.1	123	93.5	94.2	198	189	12.6	26.0	0.56	3.49	236	11.9
Min	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.10
Ac-ft	27.2	273	303	640	731	1,675	29.9	57.4	12.4	59.3	582	100

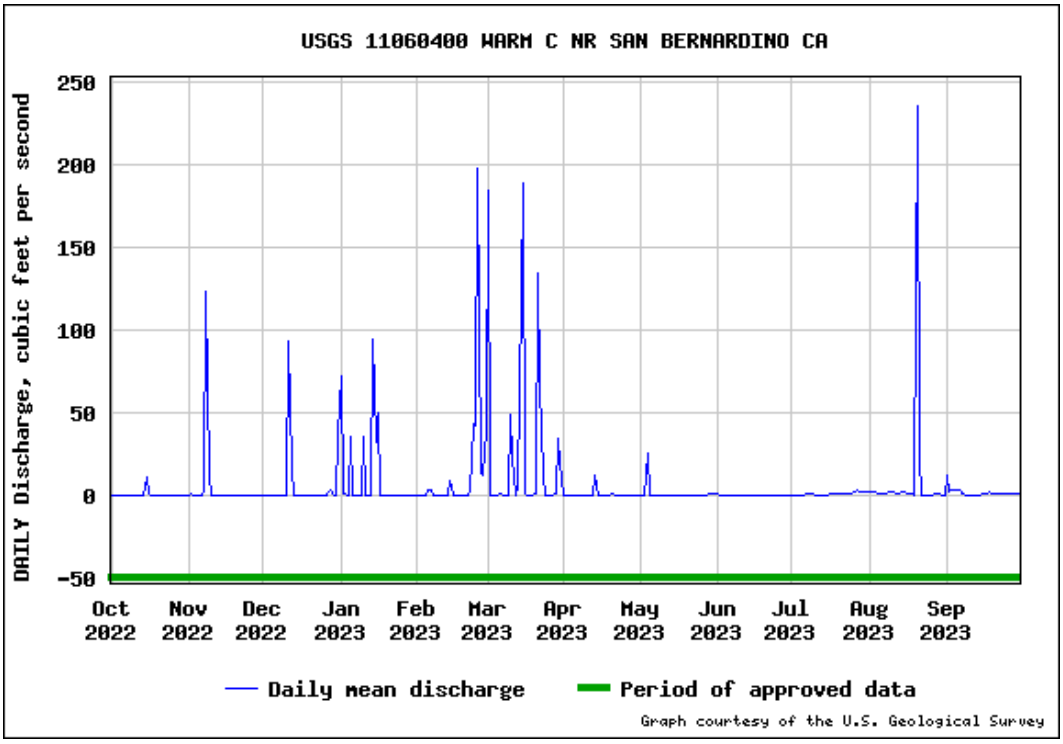
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	5.01	6.49	10.1	13.2	24.6	21.4	9.61	7.37	5.36	4.75	4.74	4.51
Max	32.4	33.1	48.3	41.2	418	376	44.2	86.7	43.6	34.5	50.6	30.3
(WY)	(1984)	(1986)	(2011)	(1993)	(1978)	(1978)	(1986)	(1980)	(1980)	(1980)	(1983)	(1983)
Min	.011	.006	.14	.066	.37	.12	.049	.068	.008	.011	.002	.022
(WY)	(2015)	(2022)	(2018)	(2003)	(2022)	(2015)	(2018)	(2021)	(2015)	(2016)	(2016)	(2016)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1975 - 2023	
Annual total	2,264			
Annual mean	6.20		9.68	
Highest annual mean			70.5	1978
Lowest annual mean			1.23	2002
Highest daily mean	236.0	Aug 20	3,400	Mar 01, 1978
Lowest daily mean	0.0	Oct 07	0.0	Nov 29, 1974
Annual 7-day minimum	0.0	Oct 25	0.0	Dec 07, 1974
Maximum peak flow	1,370[a]	Mar 15	8,500[a]	Mar 04, 1978
Maximum peak stage	2.61	Mar 15	4.88	Mar 04, 1978
Annual runoff (cfsm)	0.564		0.880	
Annual runoff (inches)	7.65		12.0	
10 percent exceeds	3.82		23.0	
50 percent exceeds	0.130		1.42	
90 percent exceeds	0.0		0.020	

[a] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other



USGS Water-Year Summary 2023

11057500 San Timoteo Creek near Loma Linda, CA

LOCATION - Lat 34°03'41", long 117°16'00" referenced to North American Datum of 1927, in NW 1/4 NE 1/4 sec.26, T.1 S., R.4 W., San Bernardino County, CA, Hydrologic Unit 18070203, on left bank, 1,500 ft upstream from Redlands Boulevard Bridge, and 0.6 mi northwest of Loma Linda.

DRAINAGE AREA - 125 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD - October 1954 to September 1965, February 1968 to September 1975, April 1979 to current year. Discharge measurements only, October 1997 to September 1998. WATER TEMPERATURE: Water years 1979-82, 1992-94. SEDIMENT DATA: Water years 1979-82, 1992-94.

GAGE - Water-stage recorder and concrete-lined flood-control channel. Datum of gage is 1,036.43 ft above NAVD of 1988. Prior to April 1979, water-stage recorder at site 0.45 mi downstream at different datum. April 1979 to Dec. 7, 1997, at site 0.25 mi downstream at different datum.

REMARKS - Since Dec. 7, 1997, channel is a trapezoidal concrete floodway. No regulation upstream from station. Natural flow affected by pumping and return flow from irrigated areas. See schematic diagram of Santa Ana River Basin available from the California Water Science Center.

EXTREMES FOR PERIOD OF RECORD - Maximum discharge, 15,000 ft³/s, Feb. 25, 1969, gage height, 8.2 ft, from floodmark, from rating curve extended above 2,100 ft³/s, on basis of slope-conveyance study of peak flow, at site and datum then in use; no flow for many days most years.

U.S. Department of the Interior
U.S. Geological Survey

DISCHARGE, CUBIC FEET PER SECOND
YEAR 2022-10-01 to 2023-09-30
DAILY MEAN VALUES
[e, Value has been estimated.]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	2022	2022	2022	2023	2023	2023	2023	2023	2023	2023	2023	2023
1	2.50	4.32	5.57	246	8.57	154	13.7	8.25	3.54	3.37	2.92	3.39
2	2.95	5.91	5.37	59.5	7.24	51.0	14.8	7.35	4.29	2.57	1.24	4.79
3	3.35	5.15	4.90	21.1	7.08	22.0	e19.4	8.10	2.79	2.59	1.53	1.34
4	2.86	4.81	5.51	13.0	6.40	13.1	e16.5	14.2	2.95	8.24	4.66	1.19
5	2.91	4.74	8.00	46.6	7.96	12.5	e15.9	3.83	5.83	9.91	0.48	1.12
6	3.23	4.92	6.35	64.0	11.5	13.1	31.9	0.36	5.13	6.54	1.16	1.59
7	3.41	12.5	8.62	8.49	7.70	11.3	24.1	0.46	4.59	24.3	1.84	0.78
8	3.54	69.1	7.19	5.80	8.50	11.4	19.6	1.59	7.45	71.7	2.61	0.83
9	5.24	101	5.57	3.63	9.40	10.2	e11.9	2.32	5.59	44.5	2.16	1.11
10	5.25	21.6	5.90	50.9	8.72	27.7	e9.55	3.95	5.47	22.8	7.08	1.29
11	4.10	9.41	24.8	41.5	7.41	63.9	e7.08	2.67	9.74	21.8	5.05	3.04
12	5.65	8.02	26.9	10.1	7.36	23.9	5.63	2.06	11.2	20.6	6.61	2.14
13	7.15	7.54	13.6	5.50	9.34	14.9	10.1	1.98	4.66	19.6	6.50	1.97
14	5.51	7.56	7.69	60.4	46.1	29.3	13.3	1.75	4.19	5.86	6.37	4.74
15	9.49	7.62	8.16	237	84.1	324	13.1	0.60	4.30	1.66	4.55	5.04
16	20.7	6.52	7.79	273	66.1	75.7	13.2	0.48	2.83	1.44	4.93	3.67
17	5.79	6.07	5.64	63.8	60.9	29.4	16.9	0.22	1.92	0.64	2.32	2.59
18	5.09	6.37	6.62	24.7	52.0	24.4	18.8	0.82	2.58	3.00	0.45	3.35
19	3.98	6.16	8.32	17.9	61.2	22.0	7.89	0.32	2.40	2.51	1.78	2.39
20	4.03	6.10	8.08	16.0	56.2	22.5	6.86	0.28	1.91	5.99	88.3	3.37
21	4.21	5.57	8.71	13.7	51.0	156	5.82	0.71	1.53	1.83	e160	6.21
22	4.72	5.74	9.17	8.21	63.5	179	5.34	0.70	2.83	0.55	19.8	6.41
23	4.71	4.62	8.63	8.12	92.7	42.2	5.61	1.24	1.95	0.73	7.02	5.55
24	4.31	4.78	9.34	7.70	39.2	26.0	7.54	0.61	1.98	0.88	5.65	6.40
25	4.39	4.81	10.2	6.37	288	25.2	14.1	0.54	3.17	0.44	4.14	5.34
26	4.45	4.82	9.79	8.66	85.0	26.6	6.76	1.45	3.07	1.51	3.18	2.08
27	4.11	5.02	12.3	8.07	28.4	22.8	3.65	1.39	2.02	0.44	1.80	0.60
28	3.93	6.66	18.3	6.65	38.5	18.7	3.08	1.80	3.06	0.67	2.35	0.46
29	3.12	5.58	11.1	7.90		30.6	4.45	3.09	4.06	0.35	1.34	0.62
30	3.62	5.60	10.4	9.32		35.9	4.23	3.21	2.02	0.78	0.83	1.10
31	4.33		22.1	8.14		24.8		3.22		1.16	0.86	
Total	153	359	311	1,361	1,220	1,544	351	79.6	119	289	360	84.5
Mean	4.92	12.0	10.0	43.9	43.6	49.8	11.7	2.57	3.97	9.32	11.6	2.82
Max	20.7	101	26.9	273	288	324	31.9	14.2	11.2	71.7	160	6.41
Min	2.50	4.32	4.90	3.63	6.40	10.2	3.08	0.22	1.53	0.35	0.45	0.46
Ac-ft	303	711	616	2,701	2,420	3,063	696	158	236	573	713	168

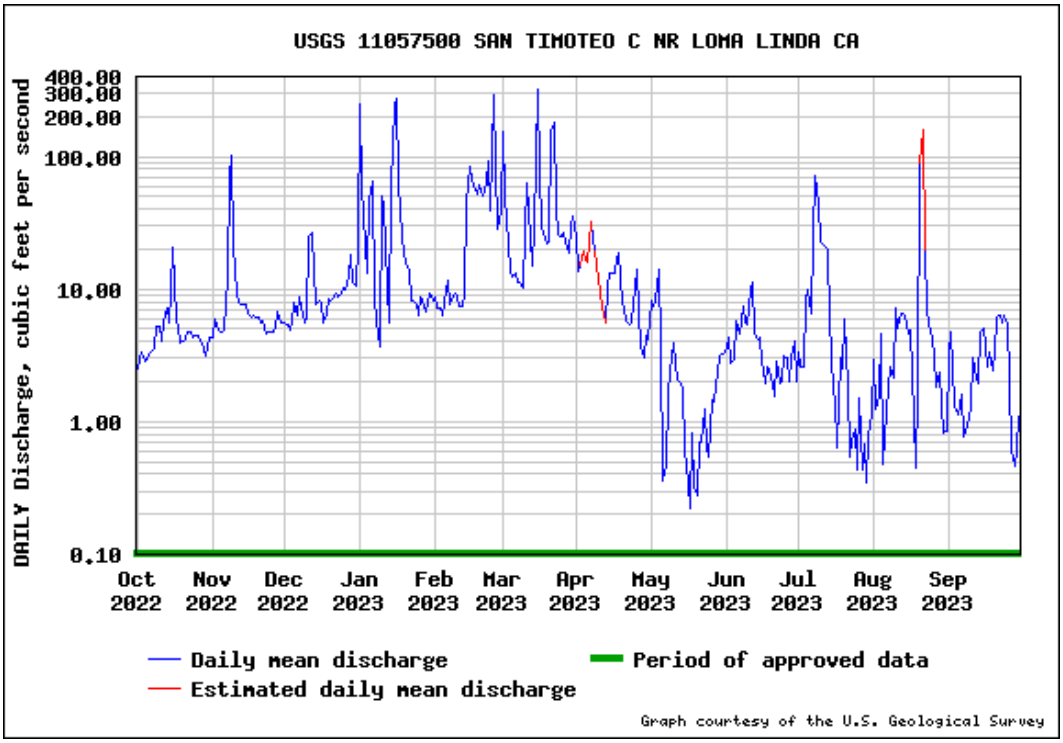
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1955 - 2023, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	2.19	3.34	7.68	14.9	15.1	9.22	4.02	2.39	1.38	1.11	1.02	1.03
Max	39.8	19.2	76.2	124	186	53.7	30.5	23.4	7.37	9.32	11.6	4.95
(WY)	(2005)	(2020)	(2011)	(2005)	(1969)	(1991)	(2020)	(2019)	(2013)	(2022)	(2023)	(2015)
Min	.000	.000	.16	.079	.17	.000	.000	.000	.000	.000	.000	.000
(WY)	(1996)	(1996)	(1996)	(1972)	(1968)	(1997)	(1979)	(1996)	(1996)	(1995)	(1995)	(1995)

SUMMARY STATISTICS

	Water Year 2023		Water Years 1955 - 2023	
Annual total	6,230			
Annual mean	17.1		5.42	
Highest annual mean			25.3	2005
Lowest annual mean			0.447	2002
Highest daily mean	324.0	Mar 15	3,500	Feb 25, 1969
Lowest daily mean	0.220	May 17	0.0	Feb 04, 1968
Annual 7-day minimum	0.490	May 15	0.0	Apr 15, 1969
Maximum peak flow	665[a]	Mar 15	15,000	Feb 25, 1969
Maximum peak stage	2.43	Mar 15	8.50[b]	Feb 16, 1980
Annual runoff (cfsm)	0.137		0.042	
Annual runoff (inches)	1.85		0.566	
10 percent exceeds	40.1		7.84	
50 percent exceeds	5.86		0.800	
90 percent exceeds	1.22		0.0	

[a] All or part of the record affected by Urbanization, Mining, Agricultural changes, Channelization, or other
[b] Gage datum changed during this year



APPENDIX B

DAILY PRECIPITATION DATA
FOR SAN BERNARDINO

WATER YEAR 2022-23

TABLE B-1

DAILY PRECIPITATION
USGS GILBERT STREET PRECIPITATION GAGE AT SAN BERNARDINO
NEAR FORMER COUNTY HOSPITAL SITE
(inches)

	2022			2023								
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.00	0.00	0.00	0.81	0.00	1.22	0.00	0.01	0.00	0.00	0.00	0.43
2	0.00	0.05	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.94	0.24	0.00	0.00	0.03	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.15	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.76	0.00	0.62	0.00	0.05	0.00	0.00	0.04	0.01
11	0.00	0.00	0.95	0.00	0.00	0.23	0.00	0.00	0.03	0.00	0.00	0.00
12	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
13	0.00	0.00	0.01	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	1.53	0.13	0.97	0.00	0.00	0.00	0.00	0.00	0.00
15	0.38	0.00	0.00	0.60	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	2.47	0.00
21	0.00	0.00	0.00	0.00	0.05	1.33	0.00	0.00	0.00	0.00	0.17	0.00
22	0.00	0.00	0.00	0.00	0.12	0.73	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.62	0.14	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.15	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.04	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.01	0.13		0.45	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.01		0.19	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.85	0.00		0.00		0.00		0.00	0.00	
Total	0.38	1.47	2.28	5.81	4.38	7.18	0.54	0.50	0.04	0.00	2.69	0.45

Total Rainfall = 25.72 Inches

APPENDIX C

SANTA ANA RIVER WATERMASTER
FINANCIAL STATEMENTS WITH REPORT
ON EXAMINATION BY
ORANGE COUNTY WATER DISTRICT CONTROLLER

WATER YEAR 2022-23

SINCE 1933

ORANGE COUNTY WATER DISTRICT

ORANGE COUNTY'S GROUNDWATER AUTHORITY

March 12, 2024

Santa Ana River Watermaster

C/O SBVMWD
P.O. Box 5906
San Bernardino, CA 92412-5906

Subject: Review of Fiscal Year 2022-23 Financial Transactions

Ladies and Gentlemen:

I have reviewed the transactions and prepared the attached Statement of Assets and Liabilities comprised of cash transactions for the Santa Ana River Watermaster, and the related Statement of Revenue, Expenses and Changes in Fund Balance for the year ended June 30, 2023. This review includes examining supporting documentation that supports the amounts and disclosures in the financial statements. We have reviewed minutes of meetings, annual budgets as well as Bank of America Checking Accounts' transactions and statements and have concluded that all transactions were properly recorded.

Best Regards,

ORANGE COUNTY WATER DISTRICT

Dianne Swanson
Finance Manager

CC: M. Ochoa
R. Fick

SANTA ANA RIVER WATERMASTER

FINANCIAL STATEMENTS
CASH BASIS

JUNE 30, 2023

SANTA ANA RIVER WATERMASTER

STATEMENT OF ASSETS AND LIABILITIES

CASH BASIS

JUNE 30, 2023

ASSETS

Cash in Bank Account	$ 10,970

LIABILITIES AND NET ASSETS

Total Net Assets	$ 10,970

SANTA ANA RIVER WATERMASTER

STATEMENT OF REVENUE AND EXPENSES

CASH BASIS

FOR THE PERIOD ENDED JUNE 30, 2023

	Actual	Budget	Variance - Favorable (Unfavorable)	
REVENUE COLLECTED:				
Water District Contributions				
Orange County Water District	$ 4,000	$ 4,000	-	
Inland Empire Utilities Agency	4,000	2,000	2,000	
Western Municipal Water District	-	2,000	(2,000)	
San Bernardino Valley Municipal Water District	-	2,000	(2,000)	
TOTAL REVENUE COLLECTED	$ 8,000	$ 10,000	$ (2,000)	(A)
EXPENSES PAID:				
Professional Engineering Services	$ -	$ 10,000	10,000	(B)
Administrative Expenses:				
Auditing Services	-	-	-	
Reproduction of Annual Report	660	-	(660)	(C)
Bank service charges	-	-	-	
TOTAL EXPENSES PAID	$ 660	$ 10,000	$ 9,340	
CHANGE IN NET ASSETS	$ 7,340			
NET ASSETS - BEGINNING OF THE YEAR	$ 3,630			
NET ASSETS - END OF THE YEAR	$ 10,970			

(A) Of the $10,000 total budgeted revenue for FY22-23, only $2,000 was deposited in FY22-23. The remaining $8,000 revenues were received and deposited in August 2023. In addition, $6,000 contributions received in FY22-23, were budgeted in prior fiscal year, FY21-22.

(B) No payment was made to IEUA during the FY22-23 for the reproduction of annual reports of FY22-23.

(C) $660 made to OCWD during FY22-23 are for administrative services related to FY21-22.

SANTA ANA RIVER WATERMASTER

NOTES TO FINANCIAL STATEMENTS

JUNE 30, 2023

1. SIGNIFICANT ACCOUNTING POLICIES:

Basis of Accounting:

The Santa Ana River Watermaster's ("Watermaster") policy is to prepare its financial statements on the cash basis of accounting. Consequently, certain revenues are recognized when received rather than when earned, and certain expenses are recognized when cash is disbursed rather than when the obligation is incurred.

2. ORGANIZATION AND HISTORY:

The Santa Ana River Watermaster is composed of a committee of five representatives from four water districts. Two representatives serve from Orange County Water District and one representative each serves from the Inland Empire Utilities Agency, Western Municipal Water District and San Bernardino Valley Municipal Water District. The committee was established on April 23, 1969, by order of the Superior Court of California in Orange County as part of a judgment resulting from a lawsuit by the Orange County Water District as plaintiff vs. City of Chino, et al, as defendants.

Costs and expenses incurred by the individual representatives are reimbursed directly from the water districts. Collective Watermaster costs and expenses are budgeted and paid for by the Watermaster after receiving contributions from the water districts. Water districts contributions are made in the following ratios:

Orange County Water District	40%
Inland Empire Utilities Agency	20%
Western Municipal Water District	20%
San Bernardino Valley Municipal Water District	20%
Total	100%

For FY 2022-2023, $10,000 was budgeted as the contributions to cover the anticipated cost of FY 2022-2023.

The Watermaster issues a report each year to satisfy its obligation to monitor and test water flows from the Upper Area to the Lower Area of the Santa Ana River.

3. CASH IN BANK:

The following disclosures are made in accordance with Statement No. 3 of the Governmental Accounting Standards Board (GASB 3):

Cash as of June 30, 2023, consisted of the following:

Bank of America:	$10,970

All cash is fully insured by the FDIC.

BANK OF AMERICA

P.O. Box 15284
Wilmington, DE 19850

Business Advantage

Customer service information

1.888.BUSINESS (1.888.287.4637)

bankofamerica.com

Bank of America, N.A.
P.O. Box 25118
Tampa, FL 33622-5118

SANTA ANA RIVER WATERMASTER
C/O SBVMWD
380 E VANDERBILT WAY
SAN BERNARDINO, CA 92408-3593

Your Business Economy Checking

for June 1, 2023 to June 30, 2023

Account number: 0005 9571 1534

SANTA ANA RIVER WATERMASTER

Account summary

Beginning balance on June 1, 2023	$8,969.67
Deposits and other credits	2,000.00
Withdrawals and other debits	-0.00
Checks	-0.00
Service fees	-0.00
Ending balance on June 30, 2023	**$10,969.67**

# of deposits/credits: 1

# of withdrawals/debits: 0

# of deposited items: 0

# of days in cycle: 30

Average ledger balance: $9,703.00

IMPORTANT INFORMATION:
BANK DEPOSIT ACCOUNTS

How to Contact Us - You may call us at the telephone number listed on the front of this statement.

Updating your contact information - We encourage you to keep your contact information up-to-date. This includes address, email and phone number. If your information has changed, the easiest way to update it is by visiting the Help & Support tab of Online Banking.

Deposit agreement - When you opened your account, you received a deposit agreement and fee schedule and agreed that your account would be governed by the terms of these documents, as we may amend them from time to time. These documents are part of the contract for your deposit account and govern all transactions relating to your account, including all deposits and withdrawals. Copies of both the deposit agreement and fee schedule which contain the current version of the terms and conditions of your account relationship may be obtained at our financial centers.

Electronic transfers: In case of errors or questions about your electronic transfers - If you think your statement or receipt is wrong or you need more information about an electronic transfer (e.g., ATM transactions, direct deposits or withdrawals, point-of-sale transactions) on the statement or receipt, telephone or write us at the address and number listed on the front of this statement as soon as you can. We must hear from you no later than 60 days after we sent you the FIRST statement on which the error or problem appeared.

- Tell us your name and account number.
- Describe the error or transfer you are unsure about, and explain as clearly as you can why you believe there is an error or why you need more information.
- Tell us the dollar amount of the suspected error.

For consumer accounts used primarily for personal, family or household purposes, we will investigate your complaint and will correct any error promptly. If we take more than 10 business days (10 calendar days if you are a Massachusetts customer) (20 business days if you are a new customer, for electronic transfers occurring during the first 30 days after the first deposit is made to your account) to do this, we will provisionally credit your account for the amount you think is in error, so that you will have use of the money during the time it will take to complete our investigation.

For other accounts, we investigate, and if we find we have made an error, we credit your account at the conclusion of our investigation.

Reporting other problems - You must examine your statement carefully and promptly. You are in the best position to discover errors and unauthorized transactions on your account. If you fail to notify us in writing of suspected problems or an unauthorized transaction within the time period specified in the deposit agreement (which periods are no more than 60 days after we make the statement available to you and in some cases are 30 days or less), we are not liable to you and you agree to not make a claim against us, for the problems or unauthorized transactions.

Direct deposits - If you have arranged to have direct deposits made to your account at least once every 60 days from the same person or company, you may call us to find out if the deposit was made as scheduled. You may also review your activity online or visit a financial center for information.

Deposits and other credits

Date	Description	Amount
06/20/23	INLAND EMPIRE UT DES:DISBURSEMN ID:8714253 INDN:SANTA ANA RIVER WATERM CO ID:XXXXXXXXX CCD	2,000.00
Total deposits and other credits		**$2,000.00**

Daily ledger balances

Date	Balance ($)	Date	Balance($)
06/01	8,969.67	06/20	10,969.67

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APPENDIX D

WATER QUALITY AND DISCHARGE OF WATER RELEASED BY MWDSC TO SAN ANTONIO CREEK NEAR UPLAND (CONNECTION OC-59)

WATER YEAR 2022-23

There was no discharge of OC-59 water to Santa Ana River during the 2022-23 water year.

APPENDIX E

WATER QUALITY AND DISCHARGE FROM THE SAN JACINTO WATERSHED

WATER YEAR 2022-23

TABLE E-1

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
October 2022

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	2.3	2.3	0.0	0.0	0.0	0.0	0.0
2	2.3	2.3	0.0	0.0	0.0	0.0	0.0
3	2.1	2.1	0.0	0.0	0.0	0.0	0.0
4	2.4	2.4	0.0	0.0	0.0	0.0	0.0
5	3.0	3.0	0.0	0.0	0.0	0.0	0.0
6	3.5	3.5	0.0	0.0	0.0	0.0	0.0
7	3.8	3.8	0.0	0.0	0.0	0.0	0.0
8	4.2	4.2	0.0	0.0	0.0	0.0	0.0
9	4.4	4.4	0.0	0.0	0.0	0.0	0.0
10	5.7	4.2	1.5	0.0	0.0	0.0	0.0
11	7.9	4.0	3.9	0.0	0.0	0.0	0.0
12	28.7	3.7	25.0	0.0	0.0	0.0	0.0
13	21.6	3.3	18.3	0.0	0.0	0.0	0.0
14	15.9	2.9	13.0	0.0	0.0	0.0	0.0
15	48.2	2.2	46.0	0.0	0.0	0.0	0.0
16	4.4	1.4	3.0	0.0	0.0	0.0	0.0
17	0.9	0.9	0.0	0.0	0.0	0.0	0.0
18	0.9	0.9	0.0	0.0	0.0	0.0	0.0
19	1.0	1.0	0.0	0.0	0.0	0.0	0.0
20	1.2	1.2	0.0	0.0	0.0	0.0	0.0
21	1.1	1.1	0.0	0.0	0.0	0.0	0.0
22	1.0	1.0	0.0	0.0	0.0	0.0	0.0
23	0.8	0.8	0.0	0.0	0.0	0.0	0.0
24	1.0	1.0	0.0	0.0	0.0	0.0	0.0
25	0.7	0.7	0.0	0.0	0.0	0.0	0.0
26	1.8	1.8	0.0	0.0	0.0	0.0	0.0
27	1.6	1.6	0.0	0.0	0.0	0.0	0.0
28	1.7	1.7	0.0	0.0	0.0	0.0	0.0
29	2.1	2.1	0.0	0.0	0.0	0.0	0.0
30	1.7	1.7	0.0	0.0	0.0	0.0	0.0
31	1.5	1.5	0.0	0.0	0.0	0.0	0.0
Total (cfs)	179.2	68.5	110.7	0.0	0.0	0.0	0.0
(acre-feet)	355.0	136.0	220.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
November 2022

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	1.3	1.3	0.0	0.0	0.0	0.0	0.0
2	6.2	1.3	5.0	0.0	0.0	0.0	0.0
3	1.2	1.2	0.0	0.0	0.0	0.0	0.0
4	1.1	1.1	0.0	0.0	0.0	0.0	0.0
5	1.4	1.4	0.0	0.0	0.0	0.0	0.0
6	1.5	1.5	0.0	0.0	0.0	0.0	0.0
7	8.2	1.7	6.5	0.0	0.0	0.0	0.0
8	182.0	1.6	180.4	0.0	0.0	0.0	0.0
9	38.3	1.3	37.0	0.0	0.0	0.0	0.0
10	0.6	0.6	0.0	0.0	0.0	0.0	0.0
11	0.3	0.3	0.0	0.0	0.0	0.0	0.0
12	0.6	0.6	0.0	0.0	0.0	0.0	0.0
13	0.9	0.9	0.0	0.0	0.0	0.0	0.0
14	0.5	0.5	0.0	0.0	0.0	0.0	0.0
15	1.5	1.5	0.0	0.0	0.0	0.0	0.0
16	0.7	0.7	0.0	0.0	0.0	0.0	0.0
17	0.9	0.9	0.0	0.0	0.0	0.0	0.0
18	0.5	0.5	0.0	0.0	0.0	0.0	0.0
19	0.7	0.7	0.0	0.0	0.0	0.0	0.0
20	0.6	0.6	0.0	0.0	0.0	0.0	0.0
21	0.9	0.9	0.0	0.0	0.0	0.0	0.0
22	0.7	0.7	0.0	0.0	0.0	0.0	0.0
23	0.7	0.7	0.0	0.0	0.0	0.0	0.0
24	0.8	0.8	0.0	0.0	0.0	0.0	0.0
25	0.6	0.6	0.0	0.0	0.0	0.0	0.0
26	0.8	0.8	0.0	0.0	0.0	0.0	0.0
27	1.2	1.2	0.0	0.0	0.0	0.0	0.0
28	2.7	2.7	0.0	0.0	0.0	0.0	0.0
29	1.2	1.2	0.0	0.0	0.0	0.0	0.0
30	1.7	1.7	0.0	0.0	0.0	0.0	0.0
Total (cfs)	260.0	31.2	228.9	0.0	0.0	0.0	0.0
(acre-feet)	516.0	62.0	454.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
December 2022

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	1.1	1.1	0.0	0.0	0.0	0.0	0.0
2	2.0	1.0	1.0	0.0	0.0	0.0	0.0
3	1.1	1.1	0.0	0.0	0.0	0.0	0.0
4	1.0	1.0	0.0	0.0	0.0	0.0	0.0
5	1.4	1.4	0.0	0.0	0.0	0.0	0.0
6	1.3	1.3	0.0	0.0	0.0	0.0	0.0
7	1.3	1.3	0.0	0.0	0.0	0.0	0.0
8	1.0	1.0	0.0	0.0	0.0	0.0	0.0
9	1.3	1.3	0.0	0.0	0.0	0.0	0.0
10	1.5	1.5	0.0	0.0	0.0	0.0	0.0
11	60.4	1.4	59.0	0.0	0.0	0.0	0.0
12	65.2	1.2	64.0	0.0	0.0	0.0	0.0
13	1.2	1.2	0.0	0.0	0.0	0.0	0.0
14	0.8	0.8	0.0	0.0	0.0	0.0	0.0
15	1.1	1.1	0.0	0.0	0.0	0.0	0.0
16	0.4	0.4	0.0	0.0	0.0	0.0	0.0
17	0.3	0.3	0.0	0.0	0.0	0.0	0.0
18	0.7	0.7	0.0	0.0	0.0	0.0	0.0
19	0.7	0.7	0.0	0.0	0.0	0.0	0.0
20	0.5	0.5	0.0	0.0	0.0	0.0	0.0
21	0.5	0.5	0.0	0.0	0.0	0.0	0.0
22	0.9	0.9	0.0	0.0	0.0	0.0	0.0
23	1.0	1.0	0.0	0.0	0.0	0.0	0.0
24	1.2	1.2	0.0	0.0	0.0	0.0	0.0
25	1.3	1.3	0.0	0.0	0.0	0.0	0.0
26	1.1	1.1	0.0	0.0	0.0	0.0	0.0
27	32.8	1.3	31.5	0.0	0.0	0.0	0.0
28	43.6	1.1	42.5	0.0	0.0	0.0	0.0
29	0.8	0.8	0.0	0.0	0.0	0.0	0.0
30	0.7	0.7	0.0	0.0	0.0	0.0	0.0
31	75.2	0.8	74.4	0.0	0.0	0.0	0.0
Total (cfs)	303.4	31.0	272.4	0.0	0.0	0.0	0.0
(acre-feet)	602.0	61.0	540.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
January 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	207.0	1.0	206.0	0.0	0.0	0.0	0.0
2	18.3	1.3	17.0	0.0	0.0	0.0	0.0
3	37.9	1.5	36.4	0.0	0.0	0.0	0.0
4	28.2	1.8	26.4	0.0	0.0	0.0	0.0
5	163.0	2.0	161.0	0.0	0.0	0.0	0.0
6	20.0	2.3	17.7	0.0	0.0	0.0	0.0
7	14.9	2.5	12.4	0.0	0.0	0.0	0.0
8	13.2	2.8	10.4	0.0	0.0	0.0	0.0
9	12.9	3.0	9.9	0.0	0.0	0.0	0.0
10	129.0	3.3	125.7	0.0	0.0	0.0	0.0
11	14.3	3.5	10.8	0.0	0.0	0.0	0.0
12	12.3	3.8	8.5	0.0	0.0	0.0	0.0
13	10.5	4.0	6.5	0.0	0.0	0.0	0.0
14	424.0	4.3	419.7	0.0	0.0	877.8	0.0
15	206.0	4.5	201.5	0.0	0.0	2,869.9	0.0
16	398.0	4.8	393.2	0.0	0.0	3,703.5	0.0
17	116.0	5.0	111.0	0.0	0.0	3,597.7	0.0
18	51.2	5.3	45.9	0.0	0.0	3,069.0	0.0
19	38.6	5.5	33.1	48.5	0.0	63.2	0.0
20	29.3	5.8	23.5	58.2	0.0	0.0	0.0
21	20.8	6.0	14.8	56.1	0.0	0.0	0.0
22	16.7	6.3	10.4	43.9	0.0	0.0	0.0
23	14.2	6.5	7.7	66.6	0.0	0.0	0.0
24	11.7	6.8	4.9	42.5	0.0	0.0	0.0
25	10.1	7.0	3.1	53.9	0.0	0.0	0.0
26	15.8	7.1	2.9	68.5	2.9	0.0	2.9
27	31.3	7.2	3.8	56.5	13.1	0.0	13.1
28	37.2	7.2	0.0	42.2	25.1	0.0	25.1
29	40.1	7.3	0.0	65.4	31.4	0.0	31.4
30	44.5	7.4	4.0	42.1	33.3	0.0	33.3
31	43.1	7.5	3.0	55.3	33.8	0.0	33.8
Total (cfs)	2230.1	144.3	1931.2	699.8	139.6	14180.9	139.6
(acre-feet)	4423.0	286.0	3830.0	1388.0	277.0	28127.0	277.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
February 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	41.5	7.6	1.5	51.5	33.5	0.0	33.5
2	40.7	7.7	0.0	63.3	33.1	0.0	33.1
3	40.7	7.7	0.0	43.4	33.0	0.0	33.0
4	40.2	7.8	0.0	40.8	32.7	0.0	32.7
5	39.3	7.9	0.0	52.1	31.9	0.0	31.9
6	39.0	8.0	0.0	35.5	31.2	0.0	31.2
7	37.0	8.1	0.0	30.2	30.0	0.0	30.0
8	37.1	8.2	0.0	15.7	28.9	0.0	28.9
9	36.0	8.2	0.0	10.1	28.4	0.0	28.4
10	36.4	8.3	0.0	10.7	27.9	0.0	27.9
11	32.3	8.4	0.0	8.9	26.0	0.0	26.0
12	27.2	8.5	0.0	7.2	21.3	0.0	21.3
13	24.3	8.6	0.0	21.8	17.2	0.0	17.2
14	38.6	8.6	22.9	11.3	11.4	0.0	11.4
15	22.1	8.7	7.2	9.4	6.6	0.0	6.6
16	16.9	8.8	0.0	8.7	7.1	0.0	7.1
17	15.8	8.9	0.0	8.1	7.5	0.0	7.5
18	15.2	9.0	0.0	9.1	6.6	0.0	6.6
19	14.6	9.1	0.0	10.1	5.9	0.0	5.9
20	14.5	9.1	0.0	8.0	5.5	0.0	5.5
21	13.4	9.2	0.0	8.0	4.8	0.0	4.8
22	12.5	9.3	0.0	17.6	3.7	0.0	3.7
23	54.3	9.3	41.2	21.1	3.5	0.0	3.5
24	50.5	9.3	42.7	20.6	4.1	0.0	4.1
25	461.0	9.4	449.1	27.0	6.5	0.0	6.5
26	171.0	9.4	143.0	24.7	16.6	608.1	0.0
27	84.4	9.4	36.3	30.4	31.7	1,416.4	0.0
28	85.9	9.4	40.7	19.9	37.2	1,756.5	0.0
Total (cfs)	1,542.4	241.8	784.8	625.2	533.8	3781.0	448.3
(acre-feet)	3,059.0	480.0	1557.0	1240.0	1059.0	7499.0	889.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
March 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	307.0	9.4	268.2	60.7	32.6	2,479.9	0.0
2	129.0	9.4	83.8	66.1	32.6	3,078.1	0.0
3	107.0	9.5	54.9	69.2	39.2	1,357.7	0.0
4	93.5	9.5	37.6	67.1	44.5	600.2	0.0
5	85.3	9.5	24.6	69.2	48.8	329.2	0.0
6	83.1	9.5	23.8	65.2	50.5	154.8	0.0
7	80.1	9.5	21.5	65.7	49.5	44.1	5.4
8	78.5	9.5	20.2	61.2	49.0	116.4	0.0
9	76.4	9.6	18.8	15.5	48.4	193.4	0.0
10	216.0	9.6	160.4	45.5	47.1	742.7	0.0
11	99.7	9.6	50.4	60.4	42.9	983.6	0.0
12	73.5	9.6	28.4	62.7	37.6	440.4	0.0
13	79.1	9.6	29.1	63.0	37.9	494.8	0.0
14	296.0	9.6	240.2	64.3	43.3	2,339.1	0.0
15	695.0	9.7	636.4	69.8	47.6	4,999.1	0.0
16	222.0	9.7	164.2	63.3	48.6	4,984.5	0.0
17	162.0	9.7	86.5	62.2	57.0	1,894.7	0.0
18	127.0	9.7	51.2	68.0	66.0	761.6	0.0
19	114.0	9.7	43.1	68.9	63.6	779.3	0.0
20	110.0	9.7	44.9	64.2	58.3	833.4	0.0
21	588.0	9.8	523.4	62.1	55.1	3,103.8	0.0
22	505.0	9.8	432.8	68.7	58.6	4,684.3	0.0
23	255.0	9.8	181.2	61.1	63.2	2,862.6	0.0
24	181.0	9.8	105.5	73.4	64.8	1,003.2	0.0
25	152.0	9.8	76.3	53.6	65.8	603.8	0.0
26	138.0	9.8	63.0	82.2	65.5	594.2	0.0
27	128.0	9.9	54.0	72.4	64.6	585.7	0.0
28	122.0	9.9	50.2	70.7	63.0	584.8	0.0
29	208.0	9.9	135.5	71.5	62.3	650.0	0.0
30	216.0	9.9	141.1	61.5	63.8	676.8	0.0
31	126.0	9.9	47.7	66.0	66.7	619.3	0.0
Total (cfs)	5853.2	299.9	3898.9	1975.3	1638.4	43575.4	5.4
(acre-feet)	11610.0	595.0	7733.0	3918.0	3250.0	86431.0	11.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
April 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	115.0	9.9	36.7	53.3	68.4	599.8	0.0
2	111.0	10.0	38.0	64.2	65.7	582.3	0.0
3	109.0	10.0	40.7	59.0	60.7	290.3	0.0
4	101.0	10.0	35.3	51.6	57.0	0.0	57.0
5	94.6	10.0	33.3	43.7	53.6	0.0	53.6
6	89.0	9.9	31.8	39.3	49.3	0.0	49.3
7	84.1	9.9	29.7	38.4	45.9	0.0	45.9
8	77.9	9.9	26.9	38.7	42.8	0.0	42.8
9	77.4	9.9	28.3	47.2	40.2	0.0	40.2
10	75.8	9.8	27.6	47.9	38.8	0.0	38.8
11	70.1	9.8	22.5	27.7	38.1	0.0	38.1
12	67.8	9.8	20.8	21.6	37.5	0.0	37.5
13	61.0	9.8	17.3	20.7	35.6	0.0	35.6
14	53.7	9.7	16.2	23.2	30.9	0.0	30.9
15	53.6	9.7	20.7	25.6	25.5	0.0	25.5
16	56.8	9.7	25.3	12.6	22.5	0.0	22.5
17	57.2	9.6	25.7	11.8	21.9	0.0	21.9
18	52.3	9.6	22.3	12.6	21.1	0.0	21.1
19	47.9	9.6	21.3	13.2	18.7	0.0	18.7
20	47.1	9.6	22.8	13.4	15.9	0.0	15.9
21	45.7	9.5	22.5	3.0	14.2	0.0	14.2
22	46.6	9.5	24.1	0.0	13.4	0.0	13.4
23	41.4	9.5	20.3	0.0	12.3	0.0	12.3
24	36.7	9.5	18.3	0.0	10.3	0.0	10.3
25	33.9	9.4	18.2	0.0	7.6	0.0	7.6
26	32.5	9.4	18.7	0.0	5.3	0.0	5.3
27	30.9	9.4	18.6	0.0	3.6	0.0	3.6
28	30.6	9.3	20.0	0.0	2.1	0.0	2.1
29	28.8	9.3	19.3	0.0	0.8	0.0	0.8
30	27.4	9.3	18.1	0.0	0.1	0.0	0.1
Total (cfs)	1856.8	290.3	741.2	668.7	859.8	1472.4	665.0
(acre-feet)	3683.0	576.0	1470.0	1326.0	1705.0	2920.0	1319.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
May 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	32.7	9.3	23.4	0.0	0.0	0.0	0.0
2	29.4	9.2	20.2	0.0	0.0	0.0	0.0
3	32.2	9.2	23.0	0.0	0.0	0.0	0.0
4	169.0	9.2	159.8	0.0	0.0	0.0	0.0
5	22.4	9.2	13.2	0.0	0.0	0.0	0.0
6	12.1	9.1	3.0	0.0	0.0	0.0	0.0
7	9.9	9.1	0.0	0.0	0.0	0.0	0.0
8	9.1	9.1	0.0	0.0	0.0	0.0	0.0
9	9.0	9.0	0.0	0.0	0.0	0.0	0.0
10	8.6	8.6	0.0	0.0	0.0	0.0	0.0
11	9.1	9.1	0.0	0.0	0.0	0.0	0.0
12	9.3	9.3	0.0	0.0	0.0	0.0	0.0
13	9.6	9.6	0.0	0.0	0.0	0.0	0.0
14	8.8	8.8	0.0	0.0	0.0	0.0	0.0
15	7.9	7.9	0.0	0.0	0.0	0.0	0.0
16	7.1	7.1	0.0	0.0	0.0	0.0	0.0
17	6.5	6.5	0.0	0.0	0.0	0.0	0.0
18	6.1	6.1	0.0	0.0	0.0	0.0	0.0
19	5.4	5.4	0.0	0.0	0.0	0.0	0.0
20	5.7	5.7	0.0	0.0	0.0	0.0	0.0
21	5.7	5.7	0.0	0.0	0.0	0.0	0.1
22	6.2	6.2	0.0	0.0	0.0	0.0	0.0
23	5.8	5.8	0.0	0.0	0.0	0.0	0.0
24	5.5	5.5	0.0	0.0	0.0	0.0	0.0
25	5.9	5.9	0.0	0.0	0.0	0.0	0.0
26	5.5	5.5	0.0	0.0	0.0	0.0	0.0
27	6.5	6.5	0.0	0.0	0.0	0.0	0.0
28	6.6	6.6	0.0	0.0	0.0	0.0	0.0
29	7.7	7.7	0.0	0.0	0.0	0.0	0.0
30	8.4	8.4	0.0	0.0	0.0	0.0	0.0
31	8.3	8.3	0.0	0.0	0.0	0.0	0.0
Total (cfs)	481.9	238.4	242.6	0.0	0.0	0.0	0.1
(acre-feet)	956.0	473.0	481.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
June 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	10.1	8.5	1.6	0.0	0.0	0.0	0.0
2	11.0	8.5	2.5	0.0	0.0	0.0	0.0
3	10.7	8.5	2.2	0.0	0.0	0.0	0.0
4	8.9	8.9	0.0	0.0	0.0	0.0	0.0
5	8.1	8.1	0.0	0.0	0.0	0.0	0.0
6	7.7	7.7	0.0	0.0	0.0	0.0	0.0
7	8.4	8.4	0.0	0.0	0.0	0.0	0.0
8	8.0	8.0	0.0	0.0	0.0	0.0	0.0
9	9.0	9.0	0.0	0.0	0.0	0.0	0.0
10	10.1	10.1	0.0	0.0	0.0	0.0	0.0
11	10.7	10.7	0.0	0.0	0.0	0.0	0.0
12	11.5	11.5	0.0	0.0	0.0	0.0	0.0
13	10.9	10.9	0.0	0.0	0.0	0.0	0.0
14	12.2	12.2	0.0	0.0	0.0	0.0	0.0
15	12.0	12.0	0.0	0.0	0.0	0.0	0.0
16	11.3	11.3	0.0	0.0	0.0	0.0	0.0
17	12.0	12.0	0.0	0.0	0.0	0.0	0.0
18	11.8	11.8	0.0	0.0	0.0	0.0	0.0
19	13.0	13.0	0.0	0.0	0.0	0.0	0.0
20	12.7	12.7	0.0	0.0	0.0	0.0	0.0
21	11.7	11.7	0.0	0.0	0.0	0.0	0.0
22	12.1	12.1	0.0	0.0	0.0	0.0	0.0
23	11.7	11.7	0.0	0.0	0.0	0.0	0.0
24	10.5	10.5	0.0	0.0	0.0	0.0	0.0
25	10.3	10.3	0.0	0.0	0.0	0.0	0.0
26	9.3	9.3	0.0	0.0	0.0	0.0	0.0
27	8.0	8.0	0.0	0.0	0.0	0.0	0.0
28	7.8	7.8	0.0	0.0	0.0	0.0	0.0
29	9.6	9.6	0.0	0.0	0.0	0.0	0.0
30	9.5	9.5	0.0	0.0	0.0	0.0	0.0
Total (cfs)	310.7	304.4	6.3	0.0	0.0	0.0	0.0
(acre-feet)	616.0	604.0	12.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
July 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	8.3	8.3	0.0	0.0	0.0	0.0	0.0
2	7.1	7.1	0.0	0.0	0.0	0.0	0.0
3	5.0	5.0	0.0	0.0	0.0	0.0	0.0
4	3.3	3.3	0.0	0.0	0.0	0.0	0.0
5	3.6	3.6	0.0	0.0	0.0	0.0	0.0
6	3.2	3.2	0.0	0.0	0.0	0.0	0.0
7	3.1	3.1	0.0	0.0	0.0	0.0	0.0
8	3.4	3.4	0.0	0.0	0.0	0.0	0.0
9	3.1	3.1	0.0	0.0	0.0	0.0	0.0
10	3.5	3.5	0.0	0.0	0.0	0.0	0.0
11	3.3	3.3	0.0	0.0	0.0	0.0	0.0
12	5.1	5.1	0.0	0.0	0.0	0.0	0.0
13	4.5	4.5	0.0	0.0	0.0	0.0	0.0
14	4.2	4.2	0.0	0.0	0.0	0.0	0.0
15	4.3	4.3	0.0	0.0	0.0	0.0	0.0
16	4.0	4.0	0.0	0.0	0.0	0.0	0.0
17	4.2	4.2	0.0	0.0	0.0	0.0	0.0
18	3.8	3.8	0.0	0.0	0.0	0.0	0.0
19	3.2	3.2	0.0	0.0	0.0	0.0	0.0
20	3.2	3.2	0.0	0.0	0.0	0.0	0.0
21	3.6	3.6	0.0	0.0	0.0	0.0	0.0
22	3.8	3.8	0.0	0.0	0.0	0.0	0.0
23	3.7	3.7	0.0	0.0	0.0	0.0	0.0
24	3.8	3.8	0.0	0.0	0.0	0.0	0.0
25	3.5	3.5	0.0	0.0	0.0	0.0	0.0
26	2.6	2.6	0.0	0.0	0.0	0.0	0.0
27	2.2	2.2	0.0	0.0	0.0	0.0	0.0
28	2.6	2.6	0.0	0.0	0.0	0.0	0.0
29	2.0	2.0	0.0	0.0	0.0	0.0	0.0
30	1.9	1.9	0.0	0.0	0.0	0.0	0.0
31	2.1	2.1	0.0	0.0	0.0	0.0	0.0
Total (cfs)	115.2	115.2	0.0	0.0	0.0	0.0	0.0
(acre-feet)	229.0	229.0	0.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
August 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	1.8	1.8	0.0	0.0	0.0	0.0	0.0
2	1.8	1.8	0.0	0.0	0.0	0.0	0.0
3	2.0	2.0	0.0	0.0	0.0	0.0	0.0
4	2.5	2.5	0.0	0.0	0.0	0.0	0.0
5	2.5	2.5	0.0	0.0	0.0	0.0	0.0
6	2.0	2.0	0.0	0.0	0.0	0.0	0.0
7	1.8	1.8	0.0	0.0	0.0	0.0	0.0
8	1.7	1.7	0.0	0.0	0.0	0.0	0.0
9	1.9	1.9	0.0	0.0	0.0	0.0	0.0
10	2.9	2.9	0.0	0.0	0.0	0.0	0.0
11	2.0	2.0	0.0	0.0	0.0	0.0	0.0
12	1.8	1.8	0.0	0.0	0.0	0.0	0.0
13	2.0	2.0	0.0	0.0	0.0	0.0	0.0
14	2.3	2.3	0.0	0.0	0.0	0.0	0.0
15	1.8	1.8	0.0	0.0	0.0	0.0	0.0
16	2.3	2.3	0.0	0.0	0.0	0.0	0.0
17	1.4	1.4	0.0	0.0	0.0	0.0	0.0
18	1.8	1.8	0.0	0.0	0.0	0.0	0.0
19	1.9	1.9	0.0	0.0	0.0	0.0	0.0
20	478.0	1.8	476.2	0.0	0.0	0.0	0.0
21	22.5	1.7	20.8	0.0	0.0	0.0	0.0
22	1.6	1.6	0.0	0.0	0.0	0.0	0.0
23	1.6	1.6	0.0	0.0	0.0	0.0	0.0
24	1.1	1.1	0.0	0.0	0.0	0.0	0.0
25	1.2	1.2	0.0	0.0	0.0	0.0	0.0
26	1.4	1.4	0.0	0.0	0.0	0.0	0.0
27	1.6	1.6	0.0	0.0	0.0	0.0	0.0
28	2.0	2.0	0.0	0.0	0.0	0.0	0.0
29	1.9	1.9	0.0	0.0	0.0	0.0	0.0
30	2.0	2.0	0.0	0.0	0.0	0.0	0.0
31	2.2	2.2	0.0	0.0	0.0	0.0	0.0
Total (cfs)	554.8	57.8	497.0	0.0	0.0	0.0	0.0
(acre-feet)	1101.0	115.0	986.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23
September 2023

Day	[1] Temescal Creek Flow	[2] Temescal Creek Base Flow	[3] Scalped Storm Flow	[4] EMWD Discharge to Temescal Creek	[5] San Jacinto Watershed Outflow At Prado	[6] Santa Ana River Flow Lost to the Ocean	[7] San Jacinto Outflow Recharged by OCWD
1	12.7	1.7	11.0	0.0	0.0	0.0	0.0
2	1.6	1.6	0.0	0.0	0.0	0.0	0.0
3	1.9	1.9	0.0	0.0	0.0	0.0	0.0
4	1.5	1.5	0.0	0.0	0.0	0.0	0.0
5	1.3	1.3	0.0	0.0	0.0	0.0	0.0
6	1.4	1.4	0.0	0.0	0.0	0.0	0.0
7	1.3	1.3	0.0	0.0	0.0	0.0	0.0
8	1.0	1.0	0.0	0.0	0.0	0.0	0.0
9	1.0	1.0	0.0	0.0	0.0	0.0	0.0
10	1.5	1.5	0.0	0.0	0.0	0.0	0.0
11	1.1	1.1	0.0	0.0	0.0	0.0	0.0
12	0.8	0.8	0.0	0.0	0.0	0.0	0.0
13	0.8	0.8	0.0	0.0	0.0	0.0	0.0
14	0.7	0.7	0.0	0.0	0.0	0.0	0.0
15	0.9	0.9	0.0	0.0	0.0	0.0	0.0
16	0.7	0.7	0.0	0.0	0.0	0.0	0.0
17	0.7	0.7	0.0	0.0	0.0	0.0	0.0
18	0.8	0.8	0.0	0.0	0.0	0.0	0.0
19	1.0	1.0	0.0	0.0	0.0	0.0	0.0
20	1.0	1.0	0.0	0.0	0.0	0.0	0.0
21	0.7	0.7	0.0	0.0	0.0	0.0	0.0
22	0.6	0.6	0.0	0.0	0.0	0.0	0.0
23	1.1	1.1	0.0	0.0	0.0	0.0	0.0
24	1.0	1.0	0.0	0.0	0.0	0.0	0.0
25	0.8	0.8	0.0	0.0	0.0	0.0	0.0
26	0.5	0.5	0.0	0.0	0.0	0.0	0.0
27	0.7	0.7	0.0	0.0	0.0	0.0	0.0
28	1.2	1.2	0.0	0.0	0.0	0.0	0.0
29	1.4	1.4	0.0	0.0	0.0	0.0	0.0
30	1.5	1.5	0.0	0.0	0.0	0.0	0.0
Total (cfs)	43.1	32.1	11.0	0.0	0.0	0.0	0.0
(acre-feet)	85.0	64.0	22.0	0.0	0.0	0.0	0.0

TABLE E-1 (continued)

SAN JACINTO WATERSHED DISCHARGE CALCULATIONS
WATER YEAR 2022-23

FOOTNOTES

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1. USGS measured flow of Temescal Creek above Main St. at Corona, which can be found in Appendix A.

2. Temescal base flow was assumed to be the flow present when there are no sources of non-tributary flow and there has been no precipitation to cause storm flow.

3. Temescal Creek flow attributed to storm events.

4. Eastern Municipal Water District wastewater discharge to Temescal Creek at Wasson Canyon.

5. Flow in Temescal Creek at Corona attributed to EMWD discharge of wastewater to Temescal Creek.

6. Due to apparent inaccuracies and inconsistencies in the 5th Street stream gage readings, OCWD determined beginning in WY2018/19 to calculate Santa Ana River flow lost to the ocean as follows: 1) when Prado outflow is less than 1,000 cfs, the Prado and Imperial gages are typically within 5% of each other, and the loss to the ocean of Prado outflow is presumed to be zero, with OCWD capturing all such Prado outflow and 2) when Prado outflow is greater than or equal to 1,000 cfs, the Prado and Imperial gages typically differ by more than 5%, and losses to the ocean are calculated as Prado discharge minus OCWD's measured capture.

7. When the Santa Ana River flow lost to the ocean is greater than the San Jacinto watershed outflow reaching Prado Dam, it is assumed that no San Jacinto watershed outflow could be recharged by OCWD. When San Jacinto watershed outflow reaching Prado Dam was greater than the Santa Ana River flow lost to the ocean, San Jacinto watershed outflow recharged by OCWD was calculated as the difference between the two.

TABLE E-2

SUMMARY OF SAN JACINTO WATERSHED DISCHARGE
WATER YEAR 2022-23

MONTHLY TOTALS
(ACRE-FEET)

Month	EMWD Discharge to Temescal Creek	San Jacinto Watershed Outflow At Prado	Santa Ana River Flow Lost to the Ocean	San Jacinto Outflow Recharged By OCWD
2022				
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
2023				
January	1,388	277	28,127	277
February	1,240	1,059	7,499	889
March	3,918	3,250	86,431	11
April	1,326	1,705	2,920	1,319
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
Total	7,872	6,291	124,977	2,496

TABLE E-3

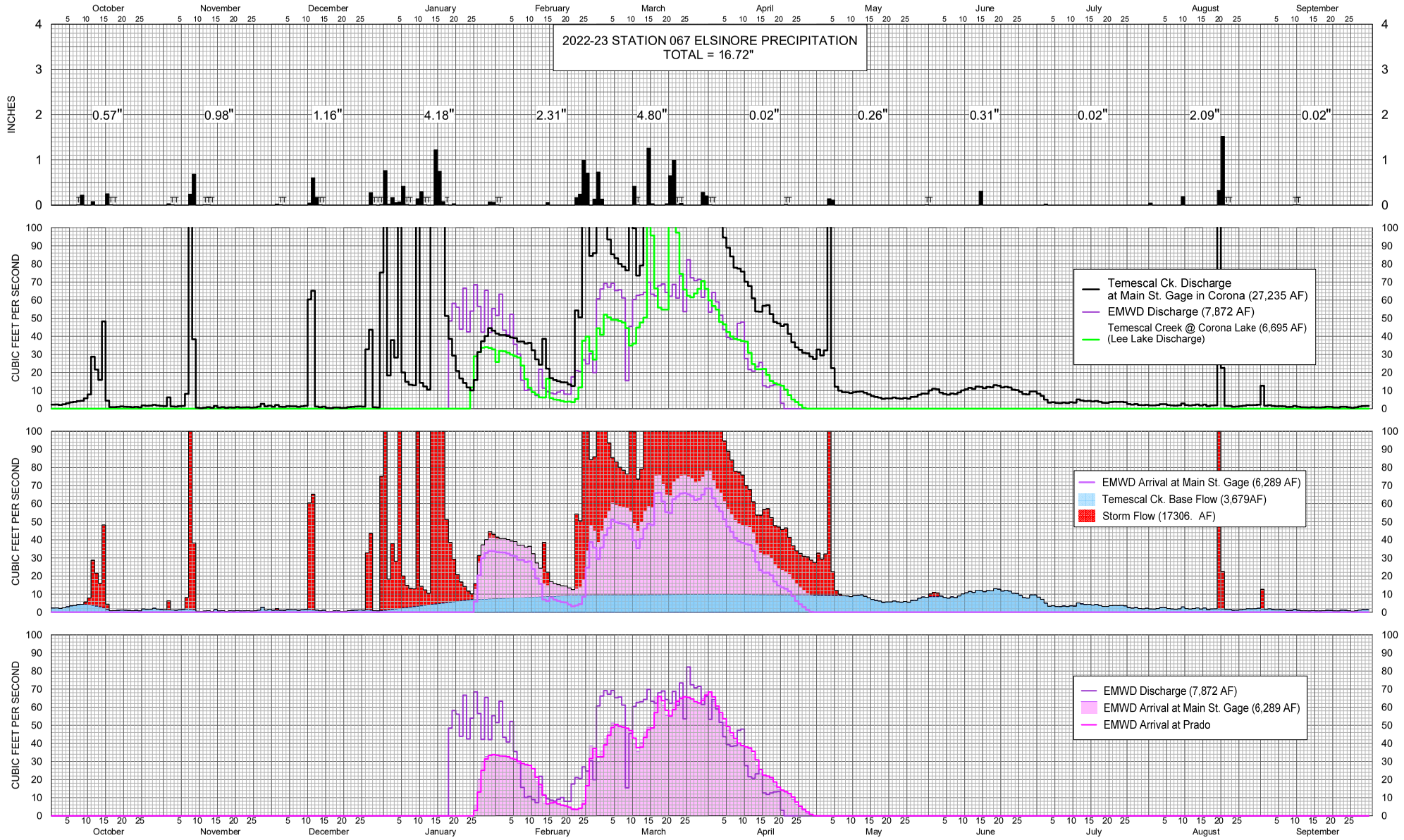
SUMMARY OF FLOW-WEIGHTED AVERAGE TDS
OF SAN JACINTO WATERSHED DISCHARGE
CALCULATED TO REACH PRADO RESERVOIR
WATER YEAR 2022-23

Month	EMWD Discharge to Temescal Creek (acre-feet) (1)	EMWD Discharge TDS (mg/L) (2)	EMWD Discharge x TDS (3)	San Jacinto Watershed Outflow At Prado (acre-feet)	EMWD Flow at Prado Reservoir x TDS (4)
2022					
October	0	---	---	0	0
November	0	---	---	0	0
December	0	---	---	0	0
2023					
January	1,388	780	1,082,640	277	216,060
February	1,240	805	998,200	1,059	852,495
March	3,918	813	3,185,334	3,250	2,642,250
April	1,326	852	1,129,752	1,705	1,452,660
May	0	---	---	0	0
June	0	---	---	0	0
July	0	---	---	0	0
August	0	---	---	0	0
September	0	---	---	0	0
Total	7,872		6,395,926	6,291	5,163,465

Flow-weighted TDS of EMWD Discharge (3) = 812 mg/L

Flow-weighted TDS of San Jacinto Watershed Outflow At Prado (4) = 821 mg/L

(1) Actual EMWD discharge to Temescal Creek at Wasson Canyon.
(2) Monthly Average TDS of EMWD Surface Water Discharge to Wasson Canyon.
(3) Water quality for EMWD discharge at Wasson Canyon =
(Sum of Monthly Discharge Volume X Discharge TDS)/Total Discharge Volume.
(4) Water quality for EMWD discharge arriving at Prado reservoir =
(Sum of Volume Arriving at Prado X Discharge TDS)/(Sum of Monthly Volume Arriving at Prado less 5%)



WATER YEAR 2022-23 DISCHARGE OF TEMESCAL CREEK AT MAIN STREET IN CORONA, LEE LAKE DISCHARGE, EMWD DISCHARGE, AND ELSINORE PRECIPITATION

APPENDIX F

WATER QUALITY AND DISCHARGE OF THE SANTA ANA RIVER BELOW PRADO DAM

WATER YEAR 2022-23

TABLE F-1

WATER QUALITY SAMPLES BELOW PRADO DAM
WATER YEAR 2022-23

Date	EC (um/cm)	TDS (mg/L)	TDS/EC Ratio	Source
10/4/2022	1140	706	0.62	USGS
10/19/2022	1110	640	0.58	USGS
10/19/2022	1090	643	0.59	USGS
11/1/2022	1110	665	0.60	USGS
11/17/2022	540	325	0.60	USGS
11/21/2022	742	451	0.61	USGS
12/5/2022	1150	675	0.59	USGS
12/19/2022	763	458	0.60	USGS
12/19/2022	785			USGS
1/4/2023	244	130	0.53	USGS
1/11/2023	364	287	0.79	USGS
1/20/2023	394	228	0.58	USGS
1/25/2023	481	291	0.60	USGS
2/1/2023	562	324	0.58	USGS
2/15/2023	780	465	0.60	USGS
2/21/2023	750	417	0.56	USGS
2/28/2023	540	317	0.59	USGS
3/1/2023	528	308	0.58	USGS
3/14/2023	474	299	0.63	USGS
3/20/2023	478	286	0.60	USGS
3/28/2023	556	346	0.62	USGS
4/3/2023	609	356	0.58	USGS
4/17/2023	744	434	0.58	USGS
4/19/2023	762	447	0.59	USGS
4/27/2023	765	452	0.59	USGS
5/10/2023	692	405	0.59	USGS
5/18/2023	790	469	0.59	USGS
5/23/2023	830			USGS
5/31/2023	829			USGS
6/8/2023	830	562	0.68	USGS
6/16/2023	1150		0.00	USGS
6/23/2023	1220	735	0.60	USGS

TABLE F-1 (continued)

WATER QUALITY SAMPLES BELOW PRADO DAM
WATER YEAR 2022-23

Date	EC (um/cm)	TDS (mg/L)	TDS/EC Ratio	Source
6/28/2023	1140			USGS
7/10/2023	1090	679	0.62	USGS
7/26/2023	1120		0.00	USGS
7/28/2023	1150	674	0.59	USGS
8/10/2023	1180	686	0.58	USGS
8/24/2023	434	258	0.59	USGS
8/28/2023	672			USGS
9/6/2023	678			USGS

TABLE F-2

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

October 2022

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	62	1,190	731	45,249
2	63	1,200	737	46,063
3	64	1,190	731	46,930
4	65	1,190	731	47,807
5	63	1,200	737	46,505
6	65	1,200	737	47,758
7	68	1,190	731	49,343
8	67	1,190	731	48,685
9	66	1,190	731	47,954
10	75	1,200	737	55,496
11	70	1,180	725	50,605
12	72	1,180	725	52,273
13	76	1,170	719	54,356
14	71	1,150	707	50,480
15	71	1,150	707	50,409
16	238	743	464	110,432
17	144	1,030	635	91,440
18	86	1,140	701	60,146
19	93	1,090	671	62,470
20	88	1,120	689	60,425
21	111	1,140	701	77,811
22	101	1,150	707	71,407
23	100	1,150	707	70,347
24	99	1,160	713	70,444
25	98	1,140	701	68,838
26	90	1,150	707	63,418
27	95	1,150	707	66,812
28	105	1,140	701	73,605
29	103	1,130	695	71,585
30	108	1,110	683	73,764
31	108	1,110	683	73,764
Total	2,782			1,906,619

Monthly Flow-weighted TDS = 685 mg/L

(1) TDS = EC x 0.5982

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

November 2022

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	103	1,130	695	71,585
2	149	1,010	623	92,827
3	132	994	614	81,048
4	109	1,090	671	73,139
5	112	1,100	677	75,824
6	116	1,090	671	77,836
7	121	1,060	653	79,013
8	165	646	406	66,990
9	304	414	267	81,168
10	487	403	260	126,620
11	484	395	256	123,904
12	480	381	228	109,440
13	478	383	229	109,462
14	398	417	249	99,102
15	344	484	290	99,760
16	339	575	344	116,616
17	346	554	331	114,526
18	360	561	336	120,960
19	350	604	361	126,350
20	340	634	379	128,860
21	331	690	413	136,703
22	312	755	452	141,024
23	286	811	485	138,710
24	276	875	523	144,348
25	269	933	558	150,102
26	261	1,010	604	157,644
27	251	1,070	640	160,640
28	233	1,140	682	158,906
29	205	1,190	712	145,960
30	170	1,170	700	119,000
Total	8,311			3,428,067
		Monthly Flow-weighted TDS =	412	mg/L

(1) TDS = EC x 0.5982

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

December 2022

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	146	1,150	688	100,448
2	114	1,180	706	80,484
3	112	1,160	694	77,728
4	113	1,160	694	78,422
5	138	1,160	694	95,772
6	122	1,150	688	83,936
7	116	1,180	706	81,896
8	102	1,180	706	72,012
9	96	1,150	688	65,704
10	110	1,110	664	73,040
11	137	936	560	76,720
12	311	422	252	78,372
13	451	378	226	101,926
14	372	429	257	95,604
15	321	463	277	88,917
16	318	570	341	108,438
17	316	607	363	114,708
18	315	647	387	121,905
19	312	774	463	144,456
20	305	873	522	159,210
21	298	952	569	169,562
22	291	995	595	173,145
23	283	1,040	622	176,026
24	273	1,100	658	179,634
25	261	1,160	694	181,134
26	243	1,190	712	173,016
27	176	1,200	718	126,368
28	186	914	547	101,742
29	202	700	419	84,638
30	190	853	510	96,900
31	191	1,010	604	115,364
Total	6,921			3,477,227
		Monthly Flow-weighted TDS =	502	mg/L

(1) TDS = EC x 0.5982

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

January 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	235	635	380	89,300
2	259	358	214	55,426
3	382	404	242	92,444
4	435	462	276	120,060
5	309	457	273	84,357
6	404	447	267	107,868
7	404	436	261	105,444
8	400	421	252	100,800
9	306	432	258	78,948
10	802	425	254	203,708
11	396	399	239	94,644
12	419	377	226	94,694
13	419	360	215	90,085
14	1,240	366	219	271,560
15	3,100	324	194	601,400
16	4,030	239	143	576,290
17	4,050	230	138	558,900
18	3,520	271	162	570,240
19	875	338	202	176,750
20	406	395	236	95,816
21	405	409	245	99,225
22	404	433	259	104,636
23	400	485	290	116,000
24	399	437	261	104,139
25	397	467	279	110,763
26	395	424	254	100,330
27	395	439	263	103,885
28	395	481	288	113,760
29	395	480	287	113,365
30	395	498	298	117,710
31	404	525	314	126,856
Total	26,775			5,379,403
		Monthly Flow-weighted TDS =	201	mg/L

(1) TDS = EC x 0.5982

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

February 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	423	541	324	137,052
2	377	562	336	126,672
3	323	566	339	109,497
4	320	568	340	108,800
5	317	565	338	107,146
6	313	602	360	112,680
7	333	653	391	130,203
8	342	652	390	133,380
9	338	657	393	132,834
10	334	719	430	143,620
11	335	610	365	122,275
12	333	600	359	119,547
13	279	653	391	109,089
14	250	657	393	98,250
15	265	724	433	114,745
16	284	771	461	130,924
17	281	737	441	123,921
18	280	710	425	119,000
19	281	687	411	115,491
20	282	693	415	117,030
21	285	707	423	120,555
22	244	724	433	105,652
23	222	776	464	103,008
24	232	838	501	116,232
25	256	540	323	82,688
26	879	299	179	157,341
27	1,590	471	282	448,380
28	1,910	553	331	632,210
Total	11,908			4,178,222

Monthly Flow-weighted TDS = 351 mg/L

(1) TDS = EC x 0.5982

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

March 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)		Computed TDS [1]	Outflow X TDS
1	2,740	498		298	816,520
2	3,350	379		227	760,450
3	1,400	409		245	343,000
4	795	446		267	212,265
5	577	463		277	159,829
6	465	---	[2]	280	130,200
7	394	---	[2]	280	110,320
8	405	---	[2]	280	113,400
9	418	---	[2]	300	125,400
10	890	---	[2]	300	267,000
11	1,100	---	[2]	300	330,000
12	678	---	[2]	300	203,400
13	678	---	[2]	300	203,400
14	2,420	---	[2]	300	726,000
15	4,980	---	[2]	300	1,494,000
16	4,980	---	[2]	300	1,494,000
17	2,040	---	[2]	300	612,000
18	1,070	---	[2]	300	321,000
19	1,090	---	[2]	280	305,200
20	1,080	---	[2]	280	302,400
21	3,180	---	[2]	280	890,400
22	4,710	---	[2]	280	1,318,800
23	2,980	---	[2]	280	834,400
24	1,190	---	[2]	280	333,200
25	846	---	[2]	320	270,720
26	841	---	[2]	320	269,120
27	834	---	[2]	320	266,880
28	830	---	[2]	350	290,500
29	892	---	[2]	350	312,200
30	912	---	[2]	350	319,200
31	849	---	[2]	350	297,150
Total	49,614				14,432,354
		Monthly Flow-weighted TDS =		291 mg/L	

(1) TDS = EC x 0.5982

(2) EC data are missing for March 6 through March 31, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

April 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	847	--- [2]	350	296,450
2	844	--- [2]	350	295,400
3	561	--- [2]	350	196,350
4	285	--- [2]	350	99,750
5	222	--- [2]	350	77,700
6	195	--- [2]	380	74,100
7	195	--- [2]	380	74,100
8	197	--- [2]	380	74,860
9	200	--- [2]	380	76,000
10	268	--- [2]	380	101,840
11	307	--- [2]	400	122,800
12	387	--- [2]	400	154,800
13	372	--- [2]	400	148,800
14	322	--- [2]	400	128,800
15	325	--- [2]	400	130,000
16	327	--- [2]	400	130,800
17	431	--- [2]	400	172,400
18	507	--- [2]	450	228,150
19	517	--- [2]	450	232,650
20	421	--- [2]	450	189,450
21	385	--- [2]	450	173,250
22	394	--- [2]	450	177,300
23	401	--- [2]	450	180,450
24	469	--- [2]	450	211,050
25	498	--- [2]	450	224,100
26	492	--- [2]	450	221,400
27	483	--- [2]	450	217,350
28	470	--- [2]	450	211,500
29	454	--- [2]	450	204,300
30	440	--- [2]	450	198,000
Total	12,216			5,023,900
		Monthly Flow-weighted TDS =	411 mg/L	

(1) TDS = EC x 0.5982

(2) EC data are missing for April 1 through April 30, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

May 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	428	---[2]	450	192,600
2	418	---[2]	450	188,100
3	373	---[2]	450	167,850
4	308	---[2]	450	138,600
5	270	---[2]	300	81,000
6	271	---[2]	300	81,300
7	273	---[2]	300	81,900
8	329	---[2]	300	98,700
9	434	---[2]	400	173,600
10	455	---[2]	400	182,000
11	457	---[2]	400	182,800
12	460	---[2]	400	184,000
13	466	---[2]	400	186,400
14	477	---[2]	440	209,880
15	449	---[2]	440	197,560
16	459	---[2]	440	201,960
17	475	---[2]	440	209,000
18	472	---[2]	470	221,840
19	460	---[2]	470	216,200
20	449	---[2]	470	211,030
21	442	---[2]	470	207,740
22	449	---[2]	470	211,030
23	449	---[2]	470	211,030
24	436	---[2]	470	204,920
25	405	---[2]	470	190,350
26	384	---[2]	470	180,480
27	371	---[2]	470	174,370
28	360	---[2]	470	169,200
29	349	---[2]	470	164,030
30	309	---[2]	470	145,230
31	292	---[2]	470	137,240
Total	12,429			5,401,940
		Monthly Flow-weighted TDS=	435 mg/L	

(1) TDS = EC x 0.5982

(2) EC data are missing for May 1 through May 31, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

June 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	274	--- [2]	500	137,000
2	271	--- [2]	500	135,500
3	278	--- [2]	500	139,000
4	284	--- [2]	500	142,000
5	309	--- [2]	540	166,860
6	369	--- [2]	540	199,260
7	405	--- [2]	540	218,700
8	340	--- [2]	540	183,600
9	318	--- [2]	600	190,800
10	316	--- [2]	600	189,600
11	312	--- [2]	640	199,680
12	461	--- [2]	640	295,040
13	515	--- [2]	670	345,050
14	496	1,120	670	332,320
15	476	1,180	706	336,056
16	455	1,190	712	323,960
17	430	1,190	712	306,160
18	395	1,200	718	283,610
19	343	1,240	742	254,506
20	214	1,260	754	161,356
21	127	1,240	742	94,234
22	118	1,250	748	88,264
23	117	1,260	754	88,218
24	120	1,190	712	85,440
25	124	1,150	688	85,312
26	124	1,150	688	85,312
27	125	1,180	706	88,250
28	125	1,170	700	87,500
29	96	1,220	730	70,372
30	94	1,190	712	66,786
Total	8,431			5,379,746
		Monthly Flow-weighted TDS =	638 mg/L	

(1) TDS = EC x 0.5982

(2) EC data are missing for June 1 through June 13, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

July 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)		Computed TDS [1]	Outflow X TDS
1	97	1,190		712	69,064
2	101	1,180		706	71,306
3	98	1,170		700	68,880
4	94	1,180		706	66,646
5	94	1,210		724	68,128
6	92	1,210		724	66,898
7	95	1,210		724	68,708
8	100	1,180		706	70,318
9	102	1,160		694	70,788
10	102	1,180		706	72,012
11	98	1,180		706	69,329
12	97	1,180		706	68,341
13	95	1,160		694	65,652
14	91	1,150		688	62,746
15	92	1,110		664	60,756
16	95	1,140		682	64,858
17	94	1,130		676	63,747
18	91	1,130		676	61,719
19	89	1,140		682	60,834
20	89	1,070		640	56,704
21	87	962		575	49,853
22	86	911		545	46,761
23	87	---	[2]	685	59,527
24	89	1,050		628	55,955
25	90	1,070		640	57,600
26	92	1,110		664	60,756
27	86	---	[2]	685	58,842
28	84	---	[2]	685	57,266
29	84	712		426	35,656
30	83	---	[2]	685	56,650
31	93	---	[2]	685	63,911
Total	2,866				1,930,208
		Monthly Flow-weighted TDS =		795 mg/L[3]	
Total	2,427 [3]				

(1) TDS = EC x 0.5982

(2) EC data are missing for July 23, 27, 28, 30 and 31, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

(3) Total outflow less outflow on days where EC data are missing.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

August 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	80	---[2]	685	55,006
2	74	---[2]	685	50,690
3	74	---[2]	685	50,622
4	75	---[2]	685	51,444
5	77	---[2]	685	53,019
6	81	---[2]	685	55,348
7	80	---[2]	685	54,869
8	75	---[2]	685	51,581
9	73	---[2]	685	50,211
10	75	---[2]	685	51,033
11	77	---[2]	685	52,951
12	77	---[2]	685	53,019
13	73	---[2]	685	50,279
14	76	---[2]	685	51,855
15	82	---[2]	685	56,239
16	76	---[2]	685	51,786
17	63	---[2]	685	43,292
18	63	---[2]	685	43,087
19	67	---[2]	685	46,101
20	104	---[2]	685	71,240
21	371	330	197	73,087
22	589	348	208	122,512
23	662	390	233	154,246
24	654	404	242	158,268
25	644	427	255	164,220
26	634	469	281	178,154
27	636	505	302	192,072
28	634	510	305	193,370
29	539	496	297	160,083
30	503	502	300	150,900
31	523	495	296	154,808
Total	7,913			2,745,386
		Monthly Flow-weighted TDS =	347 mg/L	

(1) TDS = EC x 0.5982

(2) EC data are missing for August 1 through August 20, 2023. Computed TDS values are estimated from grab samples listed in Table F-1 and as interpreted on Plate 6.

TABLE F-2 (continued)

SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM
WATER YEAR 2022-23

September 2023

Day	Prado Outflow (cfs)	Daily Mean EC (microsiemens/cm)	Computed TDS [1]	Outflow X TDS
1	527	533	319	168,113
2	519	561	336	174,384
3	510	568	340	173,400
4	498	627	375	186,750
5	545	632	378	206,010
6	549	685	410	225,090
7	617	722	432	266,544
8	596	849	508	302,768
9	480	1,090	652	312,960
10	174	1,230	736	128,064
11	142	1,200	718	101,956
12	135	1,150	688	92,880
13	131	1,110	664	86,984
14	118	1,150	688	81,184
15	116	1,180	706	81,896
16	114	1,160	694	79,116
17	117	1,190	712	83,304
18	117	1,210	724	84,708
19	111	1,150	688	76,368
20	102	1,180	706	72,012
21	99	1,210	724	71,966
22	98	1,170	700	68,320
23	102	1,180	706	72,012
24	103	1,220	730	75,190
25	110	1,190	712	78,320
26	103	1,170	700	72,100
27	100	1,130	676	67,532
28	100	1,160	694	69,400
29	104	1,190	712	74,048
30	130	1,120	670	87,100
Total	7,267			3,720,479

Monthly Flow-weighted TDS = 512 mg/L

(1) TDS = EC x 0.5982

TABLE F-3

ANNUAL SUMMARY OF FLOW-WEIGHTED TDS BELOW PRADO DAM

WATER YEAR 2022-23

Month	Monthly OutFlow (cfs-days)	Monthly Flow-weighted TDS (mg/L)	Monthly Flow x TDS
2022			
October	2,782	685	1,906,619
November	8,311	412	3,428,067
December	6,921	502	3,477,227
2023			
January	26,775	201	5,379,403
February	11,908	351	4,178,222
March	49,614	291 (1)	14,432,354
April	12,216	411 (1)	5,023,900
May	12,429	435 (1)	5,401,940
June	8,431	638 (1)	5,379,746
July	2,427	795 (1)	1,930,208
August	7,913	347	2,745,386
September	7,267	512	3,720,479
Total	156,994		57,003,551
		Yearly Flow-weighted TDS = 363	

(1) TDS monthly averages included daily TDS values estimated from TDS grab samples and flow rate trends for days when EC data readings are missing.

APPENDIX G

WATER QUALITY AND FLOW OF WASTEWATER FROM RUBIDOUX COMMUNITY SERVICES DISTRICT DISCHARGED BELOW THE RIVERSIDE NARROWS GAGING STATION

WATER YEAR 2022-23

TABLE G-1

QUANTITY AND QUALITY OF WASTEWATER FROM RUBIDOUX
DISCHARGED BELOW THE
RIVERSIDE NARROWS GAGING STATION

WATER YEAR 2022-23

MONTH	Discharge (acre -feet)	TDS (mg/L)	Discharge xTDS
2022			
October	161	818	131,698
November	155	803	124,465
December	159	779	123,861
2023			
January	160	773	123,680
February	143	800	114,400
March	162	741	120,042
April	153	803	122,859
May	158	792	125,136
June	153	774	118,422
July	163	788	128,444
August	169	789	133,341
September	160	786	125,760
Total	1,896		1,492,108

Flow-weighted TDS = $\frac{1,492,108}{1,896}$ = 787 mg/L

APPENDIX H

WATER QUALITY AND DISCHARGE OF THE SANTA ANA RIVER AT RIVERSIDE NARROWS

WATER YEAR 2022-23

TABLE H-1

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
WATER YEAR 2022-23

	Date Sampled	EC (microsiemens/cm)	TDS (mg/L)	Source of Data	Ratio	Monthly Average TDS
2022	10/02/22	1022	651	C of R	0.64	
	10/04/22	1033	668	C of R	0.65	
	10/04/22	1020	647	USGS	0.63	
	10/09/22	998	637	C of R	0.64	
	10/11/22	1011	687	C of R	0.68	
	10/16/22	988	598	C of R	0.61	
	10/18/22	1001	613	C of R	0.61	
	10/19/22	1040	633	USGS	0.61	
	10/23/22	990	590	C of R	0.60	
	10/25/22	1007	610	C of R	0.61	
	10/30/22	1003	595	C of R	0.59	***630***
	11/01/22	1016	603	C of R	0.59	
	11/01/22	1010	621	USGS	0.61	
	11/06/22	1009	587	C of R	0.58	
	11/08/22	965	614	C of R	0.64	
	11/13/22	987	578	C of R	0.59	
	11/15/22	993	592	C of R	0.60	
	11/17/22	1040	638	USGS	0.61	
	11/20/22	997	586	C of R	0.59	
	11/22/22	1010	598	C of R	0.59	
	11/27/22	1012	583	C of R	0.58	
	11/29/22	1004	586	C of R	0.58	***599***
	12/04/22	994	593	C of R	0.60	
	12/05/22	1020	612	USGS	0.60	
	12/06/22	995	586	C of R	0.59	
	12/11/22	956	559	C of R	0.58	
	12/13/22	977	580	C of R	0.59	
	12/18/22	974	576	C of R	0.59	
	12/19/22	1010	614	USGS	0.61	
	12/20/22	983	584	C of R	0.59	
	12/25/22	984	572	C of R	0.58	
	12/27/22	999	576	C of R	0.58	***585***

TABLE H-1 (continued)

WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
WATER YEAR 2022-23

	Date Sampled	EC (microsiemens/cm)	TDS (mg/L)		Source of Data	Ratio	Monthly Average TDS
2023	01/01/23	892	529		C of R	0.59	
	01/03/23	966	575		C of R	0.60	
	01/05/23	130	100	*	USGS	0.77	
	01/08/23	993	580		C of R	0.58	
	01/10/23	969	564		C of R	0.58	
	01/15/23	875	516		C of R	0.59	
	01/17/23	970	587		C of R	0.61	
	01/20/23	875	537		USGS	0.61	
	01/22/23	998	597		C of R	0.60	
	01/24/23	1009	607		C of R	0.60	
	01/29/23	1000	594		C of R	0.59	
	01/31/23	1000	596		C of R	0.60	***571***
	02/01/23	1010	597		USGS	0.59	
	02/05/23	992	600		C of R	0.60	
	02/07/23	1000	604		C of R	0.60	
	02/12/23	996	591		C of R	0.59	
	02/14/23	1002	606		C of R	0.60	
	02/19/23	979	591		C of R	0.60	
	02/21/23	978	582		C of R	0.60	
	02/21/23	948	623		USGS	0.66	
	02/26/23	903	552		C of R	0.61	
	02/28/23	1002	607		C of R	0.61	***595***
	03/01/23	212	129	*	USGS	0.61	
	03/05/23	1007	613		C of R	0.61	
	03/07/23	1008	611		C of R	0.61	
	03/12/23	988	595		C of R	0.60	
	03/14/23	990	586		C of R	0.59	
	03/19/23	1030	619		C of R	0.60	
	03/20/23	455	255	*	USGS	0.56	
	03/21/23	982	579		C of R	0.59	
	03/26/23	999	613		C of R	0.61	
	03/28/23	1004	613		C of R	0.61	***604***

TABLE H-1 (continued)
WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
WATER YEAR 2022-23

Date Sampled	EC (microsiemens/cm)	TDS (mg/L)		Source of Data	Ratio	Monthly Average TDS
04/02/23	998	595		C of R	0.60	
04/03/23	515	321	*	USGS	0.62	
04/04/23	1016	610		C of R	0.60	
04/09/23	979	592		C of R	0.60	
04/11/23	984	608		C of R	0.62	
04/16/23	976	577		C of R	0.59	
04/17/23	929	567		USGS	0.61	
04/18/23	989	570		C of R	0.58	
04/23/23	974	569		C of R	0.58	
04/25/23	971	588		C of R	0.61	
04/30/23	968	547		C of R	0.57	***582***
05/02/23	980	592		C of R	0.60	
05/07/23	955	576		C of R	0.60	
05/09/23	961	578		C of R	0.60	
05/10/23	689	412	*	USGS	0.60	
05/14/23	943	573		C of R	0.61	
05/16/23	955	594		C of R	0.62	
05/21/23	942	567		C of R	0.60	
05/23/23	960	583		C of R	0.61	
05/23/23	607	356	*	USGS	0.59	
05/28/23	952	575		C of R	0.60	
05/30/23	952	578		C of R	0.61	***580***
06/04/23	945	572		C of R	0.61	
06/06/23	955	594		C of R	0.62	
06/08/23	851	569		USGS	0.67	
06/11/23	943	567		C of R	0.60	
06/13/23	954	604		C of R	0.63	
06/18/23	939	561		C of R	0.60	
06/20/23	976	590		C of R	0.60	
06/23/23	963	572		USGS	0.59	
06/25/23	960	584		C of R	0.61	
06/27/23	971	581		C of R	0.60	***579***

TABLE H-1 (continued)
WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
WATER YEAR 2022-23

Date Sampled	EC (microsiemens/cm)	TDS (mg/L)		Source of Data	Ratio	Monthly Average TDS
07/02/23	968	584		C of R	0.60	
07/04/23	981	604		C of R	0.62	
07/09/23	959	584		C of R	0.61	
07/10/23	943	556		USGS	0.59	
07/11/23	984	614		C of R	0.62	
07/12/23	983	599		C of R	0.61	
07/16/23	962	595		C of R	0.62	
07/18/23	991	603		C of R	0.61	
07/23/23	966	599		C of R	0.62	
07/25/23	984	606		C of R	0.62	
07/28/23	1040	603		USGS	0.58	
07/30/23	969	589		C of R	0.61	***595***
08/01/23	982.00	602		C of R	0.61	
08/06/23	971	579		C of R	0.60	
08/08/23	994	608		C of R	0.61	
08/10/23	977	617		USGS	0.63	
08/13/23	963	589		C of R	0.61	
08/15/23	979	587		C of R	0.60	
08/20/23	885	511		C of R	0.58	
08/22/23	961	580		C of R	0.60	
08/24/23	550	348	*	USGS	0.63	
08/27/23	964	592		C of R	0.61	
08/29/23	982	598		C of R	0.61	***586***
09/03/23	958	582		C of R	0.61	
09/05/23	970	595		C of R	0.61	
09/07/23	712	415	*	USGS	0.58	
09/10/23	958	591		C of R	0.62	
09/12/23	970	584		C of R	0.60	
09/17/23	953	581		C of R	0.61	
09/19/23	960	582		C of R	0.61	
09/20/23	927	597		USGS	0.64	
09/24/23	962	591		C of R	0.61	
09/26/23	961	600		C of R	0.62	***589***

TABLE H-1 (continued)
WATER QUALITY SAMPLES AT RIVERSIDE NARROWS
WATER YEAR 2022-23

Date Sampled	EC (microsiemens/cm)	TDS (mg/L)	Source of Data	Ratio	Monthly Average TDS
Max	1040	623		0.67	604
Min	130	129		0.56	571

* Data influenced by storm flow and thus not used in monthly average base flow TDS
C of R City of Riverside
USGS U.S. Geological Survey

TABLE H-2

ANNUAL SUMMARY OF FLOW-WEIGHTED TDS AT RIVERSIDE NARROWS
WATER YEAR 2022-23

	Month	Stream Flow [1] (acre-feet)	Monthly Average TDS [2] (mg/L)	Monthly Flow x TDS
2022	October	1,787	630	1,125,810
	November	1,967	599	1,178,233
	December	2,262	585	1,323,270
2023	January	2,607	571	1,488,597
	February	2,564	595	1,525,580
	March	3,182	604	1,921,928
	April	3,160	582	1,839,120
	May	3,103	580	1,799,740
	June	2,624	579	1,519,296
	July	2,729	595	1,623,755
	August	2,183	586	1,279,238
	September	2,546	589	1,499,594
	Total Stream Flow	30,714		18,124,161

$$\text{Flow-weighted TDS} = \frac{18{,}124{,}161}{30{,}714} = 590 \text{ mg/L}$$

(1) USGS measured flow minus storm flow.
(2) TDS based on water quality data from Table H-1.