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WESTERN WATER BULLETIN 1984

Flow of
The Colorado River
and other
Western Boundary Streams
and
Related Data

COLORADO RIVER
TIJUANA RIVER
SANTA CRUZ RIVER
SAN PEDRO RIVER
WHITEWATER DRAW

1984

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FOREWORD

This bulletin is the twenty-fifth annual compilation of stream discharges and other hydrographic data relating to international aspects of the Colorado River below Imperial Dam, the Tijuana River, and other streams crossing the western land boundary of the United States and Mexico. The compilation was prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission, solely for the purpose of presenting statistical data relating to stream flow and kindred subjects for the Colorado River from Imperial Dam to the Gulf of California, the Tijuana River and its important tributaries in the United States and Mexico, and other streams, including the Alamo and New Rivers which cross the California-Baja California boundary, and the Santa Cruz River and Whitewater Draw which cross the Arizona-Sonora boundary. This bulletin contains information for the year 1984.

Stream gaging on the Colorado River below Imperial Dam began in 1902 when the station at Yuma, Arizona was established. Stage records were obtained at this station from January 1878 until December 1973, when it was discontinued. Continuous stream gaging on the Tijuana River and its important tributaries in the United States and in Mexico began in 1936. Each government operates the gaging stations located within its own country.

Colorado River below Imperial Dam

Below Imperial Dam, the Colorado River flows southward 10 miles to the mouth of the Gila River, thence westward 11 miles to Pilot Knob Mountain, and south 1 mile to the point where the northerly international land boundary, between California and Baja California, intersects the river. From this point the river continues to flow southward and forms the boundary between the United States and Mexico for a distance of about 22 miles to the point where the southerly international land boundary between Arizona and Sonora intersects the river. From this point the river continues to flow southward about 90 miles to discharge into the Gulf of California.

The ordinary flows of Colorado river below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 10,900 square miles along the river from Hoover Dam to the mouth of the Gila River. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River, draining about 717 square miles below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 7,300 square miles below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects; and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's scheduled deliveries of waters of the Colorado River which in 1984 amounted to 1,700,000 acre-feet in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 1984.

Below Laguna Dam, measured and unmeasured flows are returned to the river principally as waste and drainage water from the irrigation projects in the United States. Waste and drainage waters from irrigation projects in the United States also cross the boundary into Mexico near San Luis, Arizona without returning to the river in the United States.

In the limitrophe section of the river, 1.1 miles downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date almost all the Colorado River flows that cross the northerly boundary (except emergency deliveries to Tijuana from August 1972 to August 1980) have been diverted to the Alamo Canal at Morelos Dam.

Tijuana River Basin

The total drainage area of the Tijuana River basin is 1,731 square miles, of which 27 percent lies in the United States and 73 percent in Mexico. This river is formed by the principal tributaries, Cottonwood Creek, which rises in the United States and Rio de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 21 miles from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 5 miles to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 6 miles to discharge into the Pacific Ocean 2 miles north of the boundary. The flow of Cottonwood Creek is partially controlled by Barrett and Morena Reservoirs in the United States, and the flow of the Rio de las Palmas is partially controlled by Rodriguez Reservoir in Mexico.

Whitewater Draw near Douglas, Arizona

Whitewater Draw rises in the United States and flows south into Mexico, crossing the international boundary near Douglas, Arizona, eventually discharging into the Gulf of California through the Yaqui River in Mexico. The total drainage area above the Douglas Gaging Station is 1,023 square miles. A number of mountain streams in the upper reaches of the basin are diverted for irrigation, but they would normally sink or go to ground water before reaching the main water course.

FOREWORD

San Pedro River at Palominas, Arizona

The San Pedro River rises in Mexico and flows north into the United States, crossing the boundary near Palominas, Arizona and thence northwesterly into the Gila River. The river in the vicinity of the international boundary drains an area of 741 square miles, of which 649 square miles are in Mexico.

Santa Cruz River near Nogales and Lochiel, Arizona

The Santa Cruz River rises in the United States and flows south into Mexico, crossing the international boundary near Lochiel, Arizona and returning to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 533 square miles. Of this amount, 348 square miles lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

Acknowledgments

Other agencies which have contributed to the data published herein include the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the National Weather Service, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; the Otay Municipal Water District; and the Ministry of Agriculture and Hydraulic Resources of Mexico. Specific notation is made of each of the above named agencies, where the data appear. The courtesy and cooperation of those who have made these contributions are acknowledged with appreciation.

Units of Measure

Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units. The Mexican data are converted and reported in this bulletin in English units. Conversion factors conform generally to those in the National Bureau of Standards Miscellaneous Publication 286 "Units of Weight and Measure (United States Customary and Metric) - Definitions and Tables of Equivalents." However, for convenience some of the factors have been shortened and modified to facilitate conversion, reconversion to the original units when necessary, and checking of data. Conversion of the mean daily discharges, the monthly average discharge, and the monthly and annual volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from the total monthly flow in second-foot days. For the same reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin:

<u>METRIC UNITS</u>	<u>ENGLISH UNITS</u>
<u>LENGTHS</u>	
1 Centimeter	0.39370 Inch
1 Meter	3.28084 Feet
1 Kilometer	0.62137 Mile
<u>AREAS</u>	
1 Square Meter	10.76391 Square Feet
1 Hectare	2.47105 Acres
1 Square Kilometer	0.38610 Square Mile
<u>VOLUMES</u>	
1 Cubic Meter	61023.74 Cubic Inches
1 Cubic Meter	35.31467 Cubic Feet
1 Cubic Meter	1.30795 Cubic Yards
1000 Cubic Meters	0.81071 Acre-Foot
1 Liter	0.26417 U.S. Gallon
<u>WEIGHTS</u>	
1 Kilogram	2.20462 Pounds
1 Metric Ton	2204.623 Pounds
1 Metric Ton	1.10231 Short Tons (2,000 lbs.)

Both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. The yearly figures for the summaries are obtained by direct conversion from English to metric system of units, except for those stations operated by the Mexican Section, where the figures furnished in the metric system of units are used.

GENERAL HYDROLOGIC CONDITIONS FOR 1984

Colorado River

Normally, there is no measurable amount of runoff from the portion of the Colorado River basin in the United States and Mexico below Hoover Dam, not including Bill Williams and Gila Rivers. There was no significant amount in 1984. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1984 measured at 5 index stations was 3.19 inches, compared to an average of 2.95 inches during the last 26 years (1959 to 1984).

The flow of the Colorado River reaching Imperial Dam was 19,104,800 acre-feet, about 231% of the 50-year average (1935-1984) of 8,265,658 acre-feet. At the northerly international boundary, the total flow of the river during 1984 was 15,430,412 acre-feet, about 395% of the 1935-1984 average of 3,907,837 acre-feet. At the southerly international boundary, the flow during 1984 was 12,692,946 acre-feet, or about 444% of the 1935-1984 average of 2,857,411 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1984 amounted to 15,668,632 acre-feet, 352% of the 1935-1984 average of 4,452,698 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, 5) in the Wellton-Mohawk Bypass Drain at the southerly land boundary near San Luis, Arizona and 6) the 242 Well Field near San Luis, Arizona.

During 1984, other waters arrived at the Mexican points of diversion and amounted to 13,843,000 acre-feet. These waters consisted mainly of floodwaters released from reservoirs on the Colorado River. A maximum instantaneous flow of 28,100 second-feet occurred in the Colorado River at the northerly boundary station on January 16, 1984.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 26,168,000 acre-feet, 92% of the usable capacity of 28,588,400 acre-feet. The greater part (24,081,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1984 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1984 was 1,212,723 acres; 680,335 acres in the United States and 532,388 acres in Mexico. An estimated 15% of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1984 was 6,390 acre-feet, about 1,281% of the 1956-1984 average of 499 acre-feet.

Tijuana River Basin

During 1984, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 63.3 degrees, 1.9 degrees above the 54-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 4,429 feet), the recorded temperatures during the year averaged 55 degrees, equal to the long-term average; and at Rodriguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 64 degrees, 2 degrees above the normal for many years.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 12.10 inches, 68% of normal; and at Chula Vista near the lower end of the basin, 8.40 inches, or 86% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico, was 12.76 inches, approximately 61% of the normal during the 21-year period; and at Rodriguez Dam in the lower portion of the basin in Mexico, 8.54 inches, 97% of the 47-year average.

Runoff above Barrett and Rodriguez Reservoirs during 1984 averaged more than 52% of normal. Above Morena Reservoir the runoff was 10,018 acre-feet, or about 90% of the 48-year 1937-1984 mean of 11,073 acre-feet. Above Barrett Reservoir the runoff was 8,062 acre-feet, or about 63% of the 48-year 1937-1984 mean of 12,787 acre-feet. At Rodriguez Reservoir, the runoff was 7,841 acre-feet, or about 32% of the 47-year mean of 24,837 acre-feet.

The flow of the Tijuana River at the international boundary was 16,786 acre-feet during 1984.

Whitewater Draw

During 1984, the average annual temperature over the watershed was 0.1 degree below normal, while the annual precipitation was 154% of normal. Runoff for the year at the gaging station near Douglas, Arizona, of 6,984 acre-feet, was about 112% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1984

San Pedro River

During 1984, the average annual temperature was 0.7 degree below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 148% of the 1961-1984 mean of 20.59 inches. The stream flow at the international boundary was 55,626 acre-feet, 235% of the 1951-1984 normal.

Santa Cruz River

During 1984, the average annual temperature over the watershed was somewhat below normal, and the annual precipitation was about 156% of the 46-year 1939-1984 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 79,885 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 17,376 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 62,509 acre-feet from the loop of the river lying in Mexico, or approximately 78% of the flow reaching the Nogales station.

Alamo and New Rivers

During 1984, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 72.9 degrees, 0.7 degree above normal; and over the drainage area of the New River, as recorded at Mexicali, Baja California, it was 73.0 degrees, 2 degrees above the 59-year average.

At El Centro, the precipitation was 2.33 inches, about 87% of the 54-year average; and in Mexicali, the annual precipitation was 2.91 inches, 91% of the 59-year average. The total flow of the New River at the international boundary in 1984 was 267,896 acre-feet, which was about 279% of the 1943-1984 normal.

Salton Sea

During 1984, the average annual temperature around the Salton Sea was about 101% of the long-term average, while the annual precipitation recorded at Brawley, California, was approximately 83% of the long-term mean of 2.70 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage, 226.8 feet below mean sea level, was recorded on April 12-25 and May 7-June 1, 1984, inclusive. The minimum stage, 227.9 feet below mean sea level, was recorded on November 14-16, 1984, inclusive.

RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 500 feet (152 m) upstream from railroad culvert and one mile (1.6 km) northwest of Yuma, Arizona. Discharge measurements are made from a footbridge immediately below the gage. The drainage canal discharges into the outfall channel of the Yuma Main Canal Wasteway 200 feet (61.0 m) downstream from the spillway structure, and thence into the Colorado River on the right bank, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on current meter measurements and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1984.

REMARKS: Reservation Main Drain No. 4 collects drainage and wastewater from the area east of the Yuma Main Canal on the Reservation Division of the Yuma Project, located in California. Since 1939, collection of seepage from the All-American Canal has caused large increases in drainage flows. Average annual flow prior to 1937 was 12,800 acre-feet (15,789,000 m³). Monthly and annual averages since 1937 are shown in the table below.

EXTREMES: Prior to 1937: Maximum annual flow 20,190 acre-feet (24,904,000 m³), 1916; minimum annual flow 8,920 acre-feet (11,003,000 m³), 1913.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.			
1	53	67	66	65	47	55	60	54	61	65	74	49			
2	57	71	68	63	70	55	51	55	63	66	67	47			
3	55	65	68	75	70	56	46	57	60	65	57	51			
4	56	64	69	76	71	62	51	59	59	68	63	53			
5	60	60	73	74	58	55	45	57	55	68	70	56			
6	63	61	66	76	49	54	49	56	55	69	62	61			
7	51	63	64	75	59	54	49	49	58	67	52	62			
8	60	65	62	77	58	55	50	48	54	66	49	58			
9	62	69	65	79	64	55	46	49	57	70	47	59			
10	65	66	69	59	54	53	49	54	53	72	47	58			
11	69	64	69	61	53	51	50	62	53	70	49	55			
12	77	59	70	64	44	51	51	58	56	68	49	53			
13	67	60	71	61	42	52	51	61	53	64	48	53			
14	64	62	74	65	43	54	51	66	54	63	49	53			
15	66	66	73	65	46	53	49	62	53	63	52	47			
16	64	62	65	65	44	51	50	65	55	64	53	45			
17	71	59	67	65	46	49	52	63	54	68	53	49			
18	65	58	67	65	52	50	49	64	57	69	54	51			
19	70	55	71	65	50	49	51	66	56	73	51	52			
20	70	62	67	65	50	55	53	68	56	72	50	45			
21	69	65	65	65	48	48	58	71	56	74	50	46			
22	67	67	63	65	50	51	55	67	56	93	54	48			
23	67	65	65	65	49	43	44	66	65	121	53	50			
24	68	62	64	65	50	48	47	66	73	109	50	51			
25	71	63	62	65	52	53	48	63	71	108	50	51			
26	66	59	64	65	54	54	49	60	67	98	48	45			
27	63	58	63	65	50	54	55	63	63	94	47	47			
28	62	62	63	65	50	51	55	61	65	88	47	54			
29	63	63	63	65	51	53	56	59	64	81	43	51			
30	67	60	60	65	50	55	48	67	65	83	43	45			
31	67	70	70	65	53	53	52	63	65	79	43	43			
Sum		1,822		2,010		1,627	1,579	1,879	1,767	2,378	1,581	1,588			
	2,005		2,066												
Current Year 1984												Period 1937-1984			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum				
							High	Low							
Jan.			12	77	1	53	64.7	3,977	3,161	4,780	877				
Feb.			2	71	19	55	62.8	3,614	2,979	4,320	563				
Mar.			14	74	30	60	66.6	4,098	3,667	5,240	1,240				
Apr.			9	79	10	59	67.0	3,987	3,675	5,250	1,160				
May			4	71	13	42	52.5	3,227	3,810	5,590	992				
June			1	62	23	43	52.6	3,132	3,663	5,580	885				
July			4	60	23	44	50.6	3,114	3,920	6,550	816				
Aug.			21	71	8	48	60.6	3,727	3,932	6,810	861				
Sept.			24	73	110	53	58.9	4,717	3,713	6,220	889				
Oct.			23	121	114	63	76.7	4,717	3,748	5,740	1,040				
Nov.			1	74	129	43	52.7	3,136	3,473	5,490	994				
Dec.			7	62	31	43	51.2	3,150	3,356	4,960	966				
Yearly				121		42	59.8	43,384	43,097	63,700	12,840				
	Meters		Cubic Meters per Second				Thousands of Cubic Meters								
				3.43		1.19	1.69	53,513	53,159	78,573	15,838				

0 Mean daily

! And other days

YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 1,645 feet (501 m) upstream from the intake of the Colorado River siphon, and 3.2 miles (5.1 km) downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 1,000 feet (305 m) upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles (10.5 km) upstream from the northerly international land boundary.

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1984.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 297,800 acre-feet (367,333,000 m³); maximum annual flow, 913,700 acre-feet (1,127,040,000 m³), 1932; minimum annual flow, 114,900 acre-feet (141,728,000 m³), 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet (57.2 m³/sec), December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second-Foot 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.3	5.8	6.4	14.0	10.0	9.0	9.3	9.0	9.6	7.0	7.7	8.2
2	11.0	6.9	9.2	9.3	8.8	9.0	10.0	9.0	8.5	6.8	11.0	8.4
3	9.3	6.5	8.4	9.1	8.5	9.0	14.0	9.0	7.7	7.0	14.0	14.0
4	7.0	6.7	11.0	12.0	8.5	9.0	15.0	9.0	7.7	7.6	159	8.4
5	6.2	6.5	11.0	8.7	8.5	9.3	12.0	9.0	7.7	7.5	2.0	8.3
6	6.2	6.2	11.0	12.0	9.0	11.0	8.5	9.0	8.0	10.0	2.0	7.7
7	6.2	6.2	11.0	14.0	9.0	8.6	8.5	9.9	8.0	9.9	17.0	7.7
8	9.8	6.2	11.0	10.0	8.7	15.0	8.2	9.0	8.0	10.0	6.8	7.7
9	6.6	5.7	10.0	15.0	8.5	8.5	9.0	7.8	8.0	13.0	8.8	11.0
10	7.6	5.4	10.0	10.0	8.5	8.5	11.0	7.7	8.0	14.0	9.6	8.1
11	6.7	5.4	15.0	10.0	8.5	8.5	8.7	11.0	8.0	11.0	7.7	7.7
12	6.3	5.4	11.0	10.0	8.6	8.5	11.0	8.4	8.0	9.2	7.7	7.9
13	6.5	5.4	11.0	10.0	14.0	8.5	48.0	8.2	8.0	10.0	8.8	8.5
14	6.9	5.4	21.0	10.0	8.5	8.5	9.0	8.6	8.0	9.3	7.7	8.9
15	7.2	5.4	13.0	13.0	8.1	8.5	9.0	9.0	8.0	9.0	7.7	6.8
16	7.4	7.5	11.0	9.3	7.7	8.1	9.0	11.0	7.0	11.0	8.0	6.8
17	7.0	6.2	20.0	10.0	7.7	10.0	9.0	9.7	7.0	8.4	7.7	6.8
18	6.9	5.4	11.0	9.3	7.7	8.5	9.0	10.0	7.0	8.4	7.7	8.5
19	7.9	5.4	11.0	12.0	7.7	8.5	9.0	9.6	7.0	14.0	7.7	6.3
20	8.9	8.4	14.0	8.2	7.7	8.5	9.0	9.5	7.0	8.4	7.7	6.0
21	6.7	5.4	11.0	8.1	7.7	7.8	9.0	8.1	7.0	8.4	7.7	6.0
22	6.7	8.9	11.0	8.5	7.7	7.7	9.0	7.8	7.0	8.4	9.4	6.0
23	6.6	5.7	9.3	8.5	7.7	7.7	9.0	7.9	7.0	12.0	40.0	6.0
24	6.9	5.4	9.6	8.5	7.7	8.0	9.0	9.6	7.0	10.0	21.0	5.7
25	6.9	5.4	9.6	8.5	8.0	7.7	9.0	9.4	7.0	8.2	28.0	7.0
26	6.9	5.4	12.0	10.0	12.0	7.7	9.0	7.3	7.0	7.7	14.0	8.4
27	6.9	9.4	9.6	7.7	9.3	8.3	9.0	7.2	7.0	8.9	9.2	6.0
28	6.8	6.2	9.3	7.7	9.3	10.0	9.0	7.7	7.0	9.6	9.0	6.0
29	6.5	6.5	9.3	12.0	9.3	15.0	9.0	8.5	7.0	7.7	8.4	6.0
30	6.6		9.3	9.3	12.0	9.3	9.0	10.0	7.0	7.7	8.4	6.0
31	6.7		9.3		8.6		9.0	9.1		7.7		6.0
Sum	225.1	181.3	346.3	304.7	273.5	272.2	335.2	276.0	226.2	286.8	471.4	232.8
Current Year 1984								Period 1935-1984				
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			2	11.0	15	6.2	7.26	446	48,346	110,700	446	
Feb.			27	9.4	110	5.4	6.25	360	42,442	89,140	360	
Mar.			14	21.0	1	6.4	11.2	687	41,969	90,190	357	
Apr.			9	15.0	127	7.7	10.2	604	42,451	86,580	326	
May			13	14.0	116	7.7	8.82	542	50,823	88,280	333	
June			8	15.0	122	7.7	9.07	540	44,419	86,960	342	
July			13	48.0	8	8.2	10.8	665	41,525	91,220	369	
Aug.			111	11.0	27	7.2	8.90	547	42,102	89,890	369	
Sept.			1	9.6	116	7.0	7.54	449	46,102	83,660	357	
Oct.			110	14.0	2	6.8	9.25	569	42,710	90,050	567	
Nov.			4	159	15	2.0	15.7	935	42,755	101,500	841	
Dec.			3	14.0	24	5.7	7.51	462	47,001	108,800	462	
Yearly				159		2.0	9.38	6,806	532,645	1,042,850	6,669	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				4.50	0.06	0.27	8,395	657,007	1,286,345	8,226		

0 Mean daily

! And other days

COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY AT YUMA, ARIZONA - DISCHARGES

DESCRIPTION: Water-stage recorder located in California on the right bank of the river, 1,000 feet (305 m) downstream from the mouth of the Yuma Main Canal Wasteway, 0.6 mile (1.0 km) downstream from the abandoned gaging station on the Colorado River at Yuma, 5.2 miles (8.4 km) downstream from the mouth of the Gila River, 19.6 miles (31.5 km) downstream from Imperial Dam, and 6.4 miles (10.3 km) upstream from the northerly international boundary. Zero of the gage is 101.99 feet (31.09 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1984. Records from January 1951 through September 1963 deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4" and "Yuma Main Canal Wasteway."

REMARKS: Reservoirs on the Colorado River, power developments, transmountain diversions, reservoirs on the Gila River, irrigation diversions, and return flows modify the river flow at this station.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15,300	17,700	15,600	14,100	9,420	11,600	16,700	17,900	13,000	12,300	11,400	16,400
2	15,100	17,400	15,800	13,600	9,810	11,900	16,600	17,400	13,300	12,400	11,700	16,000
3	14,800	17,800	16,000	13,200	9,390	11,900	16,000	16,900	13,200	12,300	11,900	15,700
4	14,700	18,200	16,100	13,000	9,100	12,800	16,400	16,900	13,200	12,200	12,500	15,500
5	14,300	18,800	14,400	12,800	10,200	13,700	16,000	17,300	13,100	12,300	13,700	15,400
6	14,400	18,800	13,400	12,800	12,600	14,400	15,900	16,700	12,500	12,500	14,100	15,600
7	15,400	18,300	13,200	13,800	10,900	14,500	15,700	16,500	12,200	12,500	14,200	15,900
8	16,900	17,800	14,100	14,400	9,890	15,100	15,900	16,400	12,300	12,500	14,300	15,900
9	18,100	17,000	14,700	14,000	9,920	15,900	16,000	16,000	12,400	12,400	14,300	16,000
10	18,100	17,000	14,800	13,700	10,500	16,400	15,500	15,500	12,400	12,500	14,600	16,200
11	18,100	17,200	15,000	13,500	11,200	16,400	15,800	14,400	12,500	12,500	14,900	16,500
12	16,800	17,800	14,800	13,300	11,200	16,400	15,800	14,500	12,300	12,400	14,800	16,600
13	17,800	18,000	14,500	13,000	11,500	16,100	16,000	13,800	12,600	12,400	14,600	16,700
14	18,600	17,600	14,400	13,000	11,700	16,000	16,500	12,900	12,800	12,600	14,400	16,800
15	18,500	17,200	14,100	13,100	11,800	15,800	16,500	13,000	13,100	12,800	14,400	16,800
16	18,900	17,400	14,300	12,800	11,800	15,400	16,300	13,200	13,300	12,600	14,500	16,600
17	18,600	17,900	14,700	12,400	11,700	16,000	16,500	13,400	13,400	12,400	14,600	16,300
18	18,700	17,900	15,200	12,400	11,300	16,000	16,600	14,000	13,300	12,200	14,700	16,300
19	18,000	18,400	15,000	12,300	11,500	16,000	16,200	14,600	13,400	12,200	14,800	16,300
20	17,800	17,500	14,700	12,800	12,000	15,900	16,100	14,400	13,400	12,200	14,800	16,300
21	18,000	16,600	14,400	14,000	11,800	15,500	16,700	14,600	13,200	12,300	14,800	16,000
22	18,400	16,500	13,800	13,200	11,700	15,400	17,500	14,700	12,800	11,500	15,000	15,700
23	18,500	16,200	13,800	10,500	11,700	15,200	19,200	14,700	12,200	10,300	15,300	15,500
24	18,200	16,400	13,900	9,800	11,700	15,600	18,500	14,100	12,100	10,300	15,600	15,500
25	17,700	16,300	14,300	9,740	11,500	15,500	18,300	15,800	11,900	10,400	15,900	15,700
26	18,000	16,300	13,800	9,720	11,700	15,700	18,200	16,000	12,100	10,800	16,300	15,700
27	18,500	16,300	13,500	9,080	12,200	16,100	17,900	14,900	12,300	11,100	16,600	15,500
28	18,400	16,000	13,500	10,500	12,100	16,000	17,600	15,700	12,300	11,200	16,700	15,700
29	18,300	15,800	13,300	12,500	11,700	15,700	17,300	16,700	12,400	11,300	16,600	16,000
30	17,800	13,200	13,200	10,100	12,100	16,300	18,200	14,300	12,300	11,300	16,500	16,100
31	17,800	13,700	13,700	11,900	11,900	16,300	18,000	13,400	12,300	11,300	16,500	15,900
Sum	538,500	502,100	446,000	373,140	347,530	455,200	520,400	470,600	381,300	370,000	438,500	497,100
Current Year 1984												
Period 1951-1984												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.	20.77	18.52	16	19,100	5 14,100	17,400	1,068,099	211,842	1,068,099	29,857		
Feb.	20.67	19.03	6	19,200	29 15,700	17,300	995,901	162,926	995,901	33,790		
Mar.	19.33	17.70	4	16,400	7 12,900	14,400	884,628	174,219	1,073,270	34,604		
Apr.	19.07	16.49	21	15,800	30 9,020	12,400	740,112	169,996	843,010	33,687		
May	18.15	15.64	6	13,000	3 8,850	11,200	689,316	171,103	863,860	45,872		
June	18.43	16.15	10	16,600	1 11,600	15,200	902,876	174,312	902,876	33,856		
July	19.64	17.83	23	19,900	10 15,500	16,800	1,032,198	213,465	1,632,595	34,413		
Aug.	19.02	16.57	1	18,200	14 12,900	15,200	933,421	219,457	1,681,388	33,610		
Sept.	16.97	16.05	16	13,600	124 11,900	12,700	756,297	191,471	1,353,719	43,182		
Oct.	16.52	15.16	15	12,800	23 10,200	11,900	773,884	171,469	1,451,107	34,965		
Nov.	17.64	15.94	127	16,700	1 11,300	14,600	869,752	174,741	1,047,471	34,832		
Dec.	17.91	17.18	114	16,800	5 15,400	16,000	985,983	200,785	1,114,550	33,023		
Yearly	20.77	15.16		19,900		8,850	14,600	10,592,467	2,235,786	10,592,467	513,755	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	6.33	4.62		564		251	413	13,065,596	2,757,797	13,065,596	633,712	

1 And other days

**COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES**

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.00	20.11	19.00	18.33	16.70	16.27	18.33	18.95	16.78	16.24	15.97	17.53
2	18.93	20.03	19.09	18.09	16.89	16.40	18.29	18.71	16.93	16.30	16.02	17.39
3	18.82	20.15	19.18	17.94	16.57	16.40	18.04	18.46	16.83	16.27	16.07	17.29
4	18.80	20.32	19.24	17.85	16.18	16.82	18.20	18.43	16.87	16.23	16.28	17.20
5	18.64	20.52	18.48	17.73	16.70	17.19	18.06	18.55	16.79	16.28	16.77	17.19
6	18.71	20.51	17.91	17.77	17.93	17.52	18.02	18.30	16.44	16.35	16.93	17.29
7	19.22	20.32	17.82	18.31	16.78	17.56	17.93	18.22	16.30	16.38	16.95	17.44
8	19.92	20.10	18.28	18.60	15.88	17.80	18.00	18.18	16.32	16.36	16.96	17.49
9	20.45	19.80	18.57	18.41	15.70	18.18	18.03	17.98	16.37	16.34	16.97	17.54
10	20.43	19.78	18.62	18.29	15.91	18.38	17.86	17.76	16.33	16.36	17.08	17.66
11	20.42	19.86	18.71	18.21	16.11	18.33	17.95	17.27	16.39	16.39	17.19	17.75
12	19.91	20.09	18.64	18.12	16.16	18.32	17.96	17.38	16.29	16.34	17.16	17.79
13	20.31	20.15	18.45	18.00	16.35	18.19	18.04	17.05	16.42	16.34	17.05	17.84
14	20.60	19.98	18.44	18.02	16.47	18.13	18.25	16.62	16.53	16.42	16.92	17.90
15	20.54	19.82	18.25	18.07	16.54	18.03	18.29	16.70	16.69	16.50	16.90	17.89
16	20.69	19.87	18.39	17.97	16.55	17.78	18.20	16.81	16.78	16.43	16.94	17.79
17	20.57	20.07	18.58	17.77	16.48	18.08	18.28	16.95	16.81	16.37	16.96	17.70
18	20.60	20.05	18.74	17.80	16.26	18.07	18.33	17.28	16.79	16.29	17.00	17.68
19	20.32	20.24	18.69	17.78	16.38	18.05	18.18	17.60	16.81	16.31	17.02	17.69
20	20.22	19.89	18.57	18.22	16.61	18.01	18.13	17.51	16.83	16.33	16.99	17.66
21	20.29	19.51	18.42	18.89	16.48	17.82	18.40	17.64	16.75	16.38	16.97	17.54
22	20.43	19.44	18.11	18.64	16.42	17.76	18.74	17.75	16.53	15.93	17.03	17.43
23	20.50	19.31	18.14	17.22	16.36	17.65	19.41	17.77	16.21	15.22	17.16	17.34
24	20.35	19.37	18.19	16.84	16.31	17.86	19.17	17.48	16.14	15.20	17.25	17.33
25	20.17	19.33	18.35	16.91	16.18	17.80	19.09	18.26	16.07	15.28	17.40	17.40
26	20.25	19.31	18.14	17.01	16.34	17.92	19.05	18.35	16.17	15.61	17.54	17.41
27	20.44	19.30	17.93	16.68	16.59	18.11	18.95	17.83	16.25	15.79	17.62	17.32
28	20.41	19.17	18.01	17.57	16.52	18.07	18.82	18.15	16.26	15.89	17.64	17.42
29	20.38	19.09	17.92	18.70	16.32	17.91	18.73	18.56	16.31	15.97	17.60	17.57
30	20.17		17.91	17.17	16.52	18.17	19.08	17.43	16.29	15.97	17.61	17.61
31	20.18		18.12		16.40		19.02	16.98		15.95		17.52
Avg.	20.02	19.84	18.42	17.90	15.44	17.75	18.42	17.77	16.51	16.13	17.00	17.54

**YUMA MESA OUTLET DRAIN
TO COLORADO RIVER NEAR YUMA, ARIZONA**

DESCRIPTION: Venturi meter with recorder 0.3 mile (0.5 km) from outlet to Colorado River, 0.5 mile (0.8 km) west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 1.7 miles (2.7 km) downstream from the mouth of Yuma Main Canal Wasteway.

RECORDS: Records are furnished by U. S. Geological Survey. Monthly discharge July 1970 through 1984. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.

REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

Mean Daily Discharge in Second-Foot 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	25	25	24	23	11	17	0	23	53	58	42	39
2	25	25	25	23	11	17	0	22	53	58	42	39
3	25	25	25	23	14	17	0	40	53	63	42	39
4	25	25	25	23	17	17	0	40	53	66	42	39
5	25	25	25	23	17	17	0	40	53	55	42	39
6	25	25	25	23	17	17	0	45	53	48	42	39
7	25	25	25	23	17	17	0	48	53	48	42	39
8	25	25	25	23	10	17	0	48	53	48	42	39
9	25	25	25	23	10	13	0	48	53	48	42	39
10	25	25	25	25	10	10	5.0	48	53	48	42	39
11	25	25	25	27	10	10	12	48	56	48	42	39
12	25	25	25	14	10	14	19	48	58	48	42	39
13	25	25	25	12	10	17	28	48	58	48	45	39
14	25	25	25	12	10	17	33	48	58	48	45	39
15	25	25	25	12	14	17	33	48	58	48	42	39
16	25	25	25	14	17	17	33	48	58	48	42	39
17	25	25	25	15	17	17	33	48	58	48	42	39
18	25	25	25	8.9	17	17	33	48	58	48	42	39
19	25	25	25	11	17	17	33	48	58	48	42	39
20	25	25	25	12	17	17	30	48	58	48	42	39
21	25	25	25	12	17	12	12	48	58	48	42	39
22	25	25	25	12	17	0	12	48	58	48	42	39
23	25	25	25	12	17	0	12	41	58	48	42	39
24	25	25	25	12	17	0	26	46	58	48	42	39
25	25	25	25	12	17	0	32	48	58	48	42	39
26	25	25	25	12	17	0	32	48	58	48	42	39
27	25	25	25	12	17	0	33	53	58	48	42	39
28	25	25	25	12	17	0	33	54	58	48	42	39
29	25	25	25	12	17	0	33	56	58	48	47	39
30	25	25	25	12	17	0	33	50	58	48	48	39
31	25	25	25	12	17	0	36	51	58	47	48	39
Sum	775	725	774	489.9	460	331	586	1,425	1,688	1,547	1,277	1,209
Current Year 1984									Period 1971-1984			
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			! 1	25	! 1	25	25.0	1,537	2,501	5,840	0	
Feb.			! 1	25	! 1	25	25.0	1,438	2,358	4,830	0	
Mar.			! 2	25	! 1	24	25.0	1,535	2,747	5,430	4	
Apr.			11	27	18	8.9	16.3	972	2,560	5,120	242	
May			! 4	17	! 8	10	14.8	912	2,432	4,933	0	
June			! 1	17	122	0	11.0	657	2,441	4,828	0	
July			31	36	! 1	0	18.9	1,162	2,763	5,510	692	
Aug.			29	56	2	22	46.0	2,826	2,987	6,000	180	
Sept.			!12	58	! 1	53	56.3	3,348	3,013	5,880	0	
Oct.			4	66	31	47	49.9	3,068	3,003	5,360	157	
Nov.			30	48	! 1	42	42.6	2,533	2,998	5,290	313	
Dec.			! 1	39	! 1	39	39.0	2,398	3,139	5,970	0	
Yearly				66		0	30.8	22,386	32,942	58,680	1,753	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.87		0	0.87	27,613	40,633	72,381	2,162	

Ø Mean daily

! And other days

DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 4.0 miles (6.4 km) downstream from Colorado River below Yuma Main Canal Wasteway, and 2.5 miles (4.0 km) upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain."

RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1984.

REMARKS: Drain 8-B, which was constructed in February 1948, collects seepage water in the westerly section of the Reservation Division of the Yuma Project which lies in California. Flow in the drain between the mouth and the U. S. Highway No. 80 culvert, about 3,200 feet (975 m) upstream, is affected by backwater from the river during ordinary high stages.

EXTREMES: Mean daily discharge: Maximum, 24 second-feet (0.68 m³/sec) on September 1, 1953; minimum, 0.1 second-foot (0.003 m³/sec) several days in February 1966.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	10	9.0	10	7.0	9.0	10	10	11	12	12	10
2	11	10	9.0	10	7.0	9.0	10	10	11	12	12	10
3	11	10	9.0	10	7.0	9.0	10	11	11	12	12	10
4	11	10	9.0	10	7.0	9.0	10	11	11	12	12	10
5	11	10	9.0	10	7.0	9.0	10	11	11	12	12	10
6	11	10	9.0	10	7.0	9.0	10	11	11	12	12	10
7	11	10	9.0	10	7.0	9.0	10	11	11	12	12	10
8	11	9.0	9.0	10	7.0	9.0	10	11	11	12	12	10
9	11	9.0	9.0	10	7.0	9.0	10	11	11	12	12	10
10	11	9.0	9.0	10	7.0	9.0	10	11	11	12	12	10
11	11	9.0	10	10	7.0	9.0	10	11	11	12	12	10
12	11	9.0	10	10	7.0	9.0	10	11	11	12	12	10
13	11	9.0	10	8.0	7.0	9.0	10	11	11	12	12	10
14	11	9.0	10	8.0	7.0	9.0	10	11	11	12	12	10
15	11	9.0	10	8.0	7.0	9.0	10	11	11	12	12	10
16	11	9.0	10	8.0	7.0	9.0	10	12	11	12	12	10
17	11	9.0	10	8.0	7.0	9.0	10	12	11	12	12	10
18	11	9.0	10	8.0	7.0	9.0	10	12	11	12	12	10
19	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
20	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
21	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
22	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
23	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
24	11	9.0	11	8.0	7.0	9.0	10	12	11	12	12	10
25	11	9.0	11	7.0	7.0	9.0	10	12	11	12	12	10
26	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
27	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
28	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
29	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
30	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
31	11	9.0	11	7.0	7.0	10	10	12	11	12	12	10
Sum	341	268.0	313.0	258.0	217.0	275.0	310	355	330	372	360	310

Month	Extreme Gage Feet		Current Year 1984				Average Second-Feet	Total Acre-Feet	Period 1948-1984			
	High	Low	Extreme Second-Feet		Total	Acre-Feet						
			Day	High		Day			Low	Average	Maximum	Minimum
Jan.	11	10	1	11	1	11	11.0	676	312	899	39.3	
Feb.	11	10	1	11	1	8	9.0	532	269	746	40.5	
Mar.	11	10	1	11	1	1	9.0	10.1	621	325	853	62.7
Apr.	11	10	1	11	10	125	7.0	8.60	512	339	1,000	66.8
May	11	10	1	11	7	0	1	7.00	430	347	966	58.3
June	11	10	1	11	10	1	9.0	9.17	545	365	1,030	67.4
July	11	10	1	11	10	1	10	10.0	615	421	1,260	72.8
Aug.	11	10	1	11	12	1	10	11.5	704	470	1,350	73.8
Sept.	11	10	1	11	11	1	11	11.0	655	453	1,370	53.6
Oct.	11	10	1	11	12	1	12	12.0	738	470	1,220	55.3
Nov.	11	10	1	11	12	1	12	12.0	714	423	1,240	57.7
Dec.	11	10	1	11	10	1	10	10.0	615	378	1,050	42.2
Yearly				12		7	7.0	10.1	7,357	4,572	12,429	774
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.34		0.20	0.29	9,075	5,639	15,331	955	

Ø Mean daily

! And other days

PILOT KNOB POWER PLANT AND WASTEWAY NEAR PILOT KNOB, CALIFORNIA

DESCRIPTION: The Pilot Knob Power Plant and Wasteway is located on the All-American Canal, 20.8 miles (33.5 km) downstream from the intake at Imperial Dam, 6 miles (9.7 km) west of Yuma, about one mile (1.6 km) north of the northerly international boundary and empties into the old Alamo Canal in the United States and thence into the Colorado River through Rockwood gates, about one mile (1.6 km) upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 550 feet (168 m) upstream from wasteway gates and 1,800 feet (549 m) from entrance to the power plant. Datum of gage is 150.00 feet (45.72 m) above mean sea level. Tailrace gage is on left bank, 680 feet (207 m) downstream from power plant with automatic recording equipment in control house. All bypass gates are equipped with calibrated openings which are read on all gate changes. Datum of tailrace gage is at mean sea level; elevation of sill of wasteway gates is 147.88 feet (45.07 m), U. S. C. & G. S. datum. Prior to October 1956, this station was published as "Pilot Knob Wasteway near Pilot Knob, California."

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1984. The wasteway was operated for the purpose of diverting Colorado River water to the Alamo Canal for use in Mexico from July 1944 to November 8, 1950 in accordance with arrangements between the United States and Mexico for emergency use of the All-American Canal facilities. Records since 1950 show water released through Pilot Knob Power Plant and Wasteway from the All-American Canal and returned to the Colorado River through Rockwood gates.

REMARKS: Pilot Knob Wasteway was completed in 1938, and the first flow occurred on February 5, 1939. Pilot Knob Power Plant was completed in January 1957, and the first flow occurred on January 14, 1957.

EXTREMES: Maximum mean daily discharge, 9,600 second-feet (272 m³/sec) on February 4, 1983; minimum daily discharge, no flow during long periods.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9,420	6,820	6,160	6,490	5,640	6,430	7,040	6,780	6,410	7,110	7,730	6,620
2	9,430	6,660	6,460	6,310	5,710	6,740	6,570	6,640	7,160	6,790	7,930	6,730
3	8,950	7,020	7,030	6,140	5,550	7,030	6,220	6,610	7,130	6,450	8,470	6,530
4	8,880	7,720	7,080	5,790	5,790	6,590	6,040	6,610	6,740	6,640	6,810	6,530
5	8,670	8,460	6,880	5,360	3,180	6,490	5,700	6,850	6,550	6,870	5,490	6,550
6	9,180	8,000	6,700	5,700	384	6,310	5,940	6,510	6,130	7,240	5,670	6,740
7	9,400	7,690	6,290	6,600	4,620	6,190	6,170	6,100	6,100	7,410	5,430	6,860
8	9,400	7,580	5,970	6,540	5,550	6,700	6,150	5,870	7,090	7,210	4,800	7,070
9	9,420	6,950	6,150	5,860	5,440	7,220	5,940	5,340	7,400	7,070	5,010	7,370
10	9,430	6,920	6,560	5,630	5,230	7,300	5,850	5,400	7,490	7,070	5,880	7,400
11	9,430	7,700	7,030	5,520	5,940	6,570	6,170	5,770	7,410	7,060	5,970	8,120
12	9,040	7,840	6,340	5,180	6,520	6,450	5,900	6,090	7,200	7,280	5,090	7,850
13	9,090	7,460	6,590	5,150	6,690	6,530	6,190	5,990	7,090	7,370	5,370	7,650
14	9,120	7,190	6,950	5,640	6,380	6,060	6,690	5,880	7,400	7,650	4,910	7,700
15	9,380	6,860	6,900	5,560	6,150	6,320	6,660	6,000	7,400	7,590	4,830	7,850
16	8,780	6,970	7,210	5,360	6,040	7,130	6,260	6,860	7,250	7,400	5,220	7,790
17	8,410	7,290	7,710	5,280	5,760	7,610	5,970	6,980	6,930	7,400	5,550	7,230
18	8,050	7,530	7,470	5,270	6,100	7,070	6,210	7,010	6,910	7,050	6,190	6,580
19	7,350	7,750	6,740	4,510	6,600	6,740	6,440	7,340	6,780	7,340	6,040	6,940
20	7,830	6,790	6,500	3,910	6,990	6,280	6,710	7,340	6,550	7,770	5,780	6,870
21	8,060	6,710	6,270	4,260	6,610	5,940	6,790	7,330	6,700	7,790	5,820	6,390
22	8,150	6,890	5,580	6,370	6,490	6,230	7,630	7,630	7,040	7,620	6,480	6,150
23	7,740	6,230	5,300	5,690	6,720	6,410	8,130	7,460	7,130	7,400	6,570	7,270
24	7,550	6,390	5,620	5,280	6,760	7,100	8,130	7,500	6,870	7,390	7,080	7,710
25	7,150	6,400	5,680	4,990	7,070	6,050	8,090	6,620	6,700	7,480	7,200	7,960
26	7,250	7,000	5,300	4,770	7,470	6,020	7,700	7,520	6,770	7,730	7,060	7,410
27	7,560	6,600	5,040	4,870	7,260	5,850	7,840	5,590	6,750	8,120	6,780	7,660
28	8,020	6,110	4,990	817	6,900	5,820	7,900	1,690	7,200	8,200	6,670	8,490
29	8,300	6,190	4,940	895	6,810	6,250	7,850	952	7,430	7,930	6,120	8,180
30	7,580		5,440	5,030	7,040	6,570	7,590	5,710	7,420	7,680	6,190	8,330
31	7,050		6,220		6,360		7,060	6,390		7,690		8,380
Sum	263,070	205,720	195,100	154,772	185,754	196,000	209,430	192,852	210,070	228,800	184,140	226,910
Current Year 1984								Period 1944-1984				
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	9,430	31	7,050	8,490	521,792	65,092	521,792	0	
Feb.			5	8,460	28	6,110	7,090	408,040	40,055	408,040	0	
Mar.			17	7,710	29	4,940	6,290	386,975	98,804	394,116	0	
Apr.			7	6,600	28	817	5,160	306,986	122,790	362,400	0	
May			26	7,470	6	384	5,990	368,438	48,247	368,438	0	
June			17	7,610	28	5,820	6,530	388,760	87,492	406,592	0	
July			123	8,130	5	5,700	6,760	415,398	134,267	415,398	0	
Aug.			19	7,830	29	952	6,220	382,516	136,867	382,516	0	
Sept.			10	7,490	6	6,130	7,000	416,668	74,127	479,683	0	
Oct.			28	8,200	3	6,450	7,380	453,818	43,475	499,477	0	
Nov.			3	8,470	8	4,800	6,140	365,236	43,483	480,337	0	
Dec.			28	8,490	22	6,150	7,320	450,069	73,029	543,868	0	
Yearly				9,430		384	6,700	4,864,696	967,728	4,864,696	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				267		10.9	190	6,000,505	1,193,673	6,000,505	0	

Ø Mean daily

! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 6.4 miles (10.3 km) downstream from Colorado River below Yuma Main Canal Wasteway, 5 miles (8.0 km) west of Yuma, Arizona, 1.1 miles (1.8 km) upstream from Morelos Diversion Structure, and about one mile (1.6 km) downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. Station is operated by the United States Section of the Commission.

RECORDS: Based on 310 current meter measurements during the year, 199 by the United States Section, 106 by the Mexican Section of the Commission, 5 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder 1,680 feet (512 m) upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1984; daily discharge records available January 1, 1950 through 1984.

REMARKS: Reservoirs on the Colorado River, including Lake Mead above Hoover Dam, where storage began in 1935, reservoirs on the Gila River, and many irrigation diversions and return flows regulate the river flow at this station except for infrequent flood flows. During 1984 the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 250,000 second-feet, (7,080 m³/sec), January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet (16,581,806,000 m³); maximum annual flow 25,480,000 acre-feet (31,429,325,000 m³), 1907; minimum annual flow 1,174,000 acre-feet (1,448,117,000 m³), 1934. Since January 1935: Maximum instantaneous discharge 40,600 second-feet (1,150 m³/sec) on August 20, 1983, minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23,600	24,400	22,100	19,900	15,700	18,200	24,400	23,800	19,200	19,000	19,600	22,200
2	23,400	24,100	22,500	19,900	15,700	18,600	23,300	23,700	20,100	18,800	19,400	21,800
3	23,100	24,400	22,600	19,500	15,700	19,000	22,400	23,300	20,100	18,500	19,200	21,600
4	23,000	25,100	22,500	18,900	15,800	19,400	22,600	23,100	19,800	18,600	19,200	21,500
5	22,700	26,000	20,400	18,300	15,500	20,200	21,900	23,600	19,300	19,100	19,300	21,700
6	22,900	25,500	19,300	18,900	16,200	20,900	22,000	22,900	18,500	19,500	19,300	22,100
7	23,700	24,900	18,900	19,600	17,300	21,000	22,300	22,200	18,900	19,600	19,400	22,800
8	25,100	24,700	20,200	20,100	16,000	22,000	22,800	22,100	19,100	19,300	19,500	22,900
9	27,200	23,900	21,100	19,700	15,600	23,700	22,500	21,300	19,600	19,200	19,500	23,500
10	27,000	23,700	21,400	19,400	16,000	24,200	22,100	20,500	19,600	19,400	19,200	23,900
11	27,000	24,300	21,700	19,300	17,200	23,100	22,900	19,900	19,700	19,200	19,100	24,200
12	26,200	24,700	21,400	19,000	18,100	22,800	22,400	20,500	19,400	19,500	18,700	24,200
13	27,200	24,700	21,100	18,900	18,700	22,700	22,700	19,300	20,100	19,500	19,000	24,100
14	27,700	24,300	21,200	18,900	18,600	22,100	23,500	18,400	20,600	19,900	18,500	23,900
15	27,800	23,800	20,900	19,000	18,800	22,100	23,400	18,800	20,700	20,000	19,000	23,700
16	27,900	23,900	21,300	18,300	18,700	22,500	22,500	19,900	20,900	19,600	19,900	23,300
17	27,500	24,600	21,700	17,500	18,300	23,800	22,800	20,400	20,500	19,500	20,100	22,900
18	26,800	24,600	21,700	17,700	18,100	23,300	23,000	21,300	20,600	19,400	20,500	22,300
19	25,600	25,100	21,400	16,900	18,900	23,100	22,700	23,000	20,100	19,800	19,900	22,900
20	25,700	24,100	21,100	17,400	19,700	23,000	23,000	22,700	19,700	20,600	19,500	22,700
21	26,100	23,600	20,700	19,100	19,000	22,400	24,200	22,600	19,400	20,700	19,700	22,100
22	26,400	23,400	19,200	20,100	18,800	22,500	25,600	22,400	19,100	18,700	20,500	21,400
23	25,900	22,800	18,700	16,600	18,700	22,600	27,100	22,500	18,700	16,000	21,000	22,100
24	25,500	22,900	19,000	15,100	18,600	23,800	26,000	22,600	18,500	16,200	21,800	22,500
25	25,000	22,800	19,400	14,800	18,600	22,700	25,500	23,300	18,200	17,300	22,700	23,100
26	24,900	23,000	18,900	15,000	19,400	22,800	24,800	24,000	18,600	19,200	23,000	22,700
27	25,200	22,800	18,500	14,700	19,900	23,400	24,800	21,900	18,600	20,200	22,300	22,900
28	25,500	22,500	18,500	14,200	19,300	23,100	24,800	19,700	19,100	20,000	22,500	24,200
29	25,500	22,500	18,800	15,900	18,600	23,000	24,600	20,300	19,400	19,300	21,900	24,100
30	24,700	19,300	17,000	19,100	19,100	24,100	24,600	21,200	19,400	18,700	22,900	23,900
31	24,400	19,500	19,500	18,400	18,400	23,700	23,700	20,000	19,200	18,200	23,600	23,600
Sum	790,200	597,100	535,100	540,600	553,000	666,200	730,900	671,200	585,700	592,900	605,800	710,800

Month	Extreme Gage Feet		Current Year 1984				Period 1935-1934				
	High	Low	Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
			Day	Day			Average	Maximum	Minimum		
Jan.	111.84	110.36	16	28,100	5	22,400	25,500	1,557,339	400,814	1,644,000	31,900
Feb.	111.10	108.92	5	26,300	128	22,200	24,000	1,382,673	332,195	1,382,678	60,400
Mar.	110.37	106.82	3	22,800	7	18,400	20,500	1,259,702	351,892	1,259,702	19,400
Apr.	108.38	105.40	21	20,300	127	14,100	18,000	1,072,264	297,703	1,072,264	0
May	108.52	105.67	26	20,100	6	14,800	17,800	1,095,959	289,712	1,151,000	71,400
June	109.57	107.55	10	24,600	1	18,000	22,200	1,321,388	291,191	1,321,388	8,500
July	111.04	108.87	23	27,900	5	21,500	23,600	1,449,719	313,659	1,867,835	24,400
Aug.	111.10	108.96	25	24,700	14	18,200	21,700	1,331,306	328,900	2,015,207	43,800
Sept.	110.46	109.49	16	21,100	25	18,100	19,500	1,161,719	285,749	1,853,355	53,851
Oct.	110.36	109.07	20	20,900	23	15,800	19,100	1,176,000	285,730	1,960,066	42,956
Nov.	110.97	109.21	125	23,300	14	19,200	20,200	1,201,587	324,657	1,532,231	41,403
Dec.	110.24	109.32	13	24,500	22	21,200	22,900	1,409,851	406,445	1,832,000	42,000
Yearly	111.84	105.40		28,100		14,100	21,300	15,430,412	3,997,837	15,430,412	722,100
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	34.09	32.13		796		399	603	19,033,105	4,820,239	19,033,105	990,696

! And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	110.89	110.35	108.90	107.69	105.94	107.68	109.49	110.52	109.68	110.16	110.13	109.51
2	110.84	110.16	109.10	107.49	105.98	107.80	109.30	110.41	109.97	110.05	110.52	109.47
3	110.67	110.33	109.21	107.26	105.89	* 107.98	109.07	110.23	110.01	109.89	110.76	109.42
4	110.14	110.64	109.25	107.05	105.91	* 108.27	109.11	110.20	109.97	109.92	110.73	109.40
5	110.45	111.05	108.98	106.94	105.80	108.54	108.97	110.34	109.90	110.06	110.68	109.42
6	110.56	110.81	108.42	107.09	106.08	108.69	109.03	110.20	* 109.63	110.17	110.64	109.54
7	110.94	110.56	108.24	107.74	106.61	108.66	109.11	110.07	109.70	110.19	110.52	109.67
8	111.42	110.42	108.06	107.84	105.86	108.84	109.21	110.09	109.75	110.10	110.38	109.64
9	111.80	110.00	108.40	107.37	105.81	109.34	109.17	109.93	109.96	110.08	110.41	109.77
10	111.72	109.92	108.57	107.18	106.18	109.52	109.09	109.72	109.98	110.10	110.65	109.90
11	111.68	110.22	108.76	107.15	106.80	109.19	109.31	109.54	110.04	110.10	110.63	110.15
12	111.21	110.42	109.08	106.97	107.25	109.09	109.19	109.69	110.05	110.16	110.38	110.17
13	111.54	110.39	108.36	106.86	107.55	109.08	109.30	109.35	110.16	110.15	110.39	110.16
14	111.68	110.19	108.38	107.01	107.55	108.95	109.65	109.05	110.31	110.27	110.25	110.16
15	111.64	109.96	108.14	107.07	107.68	108.90	109.67	109.22	110.32	110.26	109.89	110.06
16	111.65	110.00	108.38	107.00	107.67	108.95	109.48	109.52	110.39	110.11	109.67	109.99
17	111.53	110.30	108.67	106.83	107.45	109.23	109.57	109.67	110.30	110.05	109.66	109.95
18	111.32	110.29	108.67	106.88	107.36	109.18	109.64	109.90	110.35	109.86	109.68	109.75
19	110.93	110.53	108.41	106.83	107.76	109.07	109.54	110.19	110.39	109.87	109.43	109.82
20	110.94	110.06	108.22	106.94	108.08	109.93	109.62	110.02	110.39	109.94	109.27	109.80
21	111.10	109.80	107.98	107.58	107.90	108.68	109.95	110.23	110.35	109.90	109.30	109.67
22	111.18	109.71	107.38	108.09	107.84	108.74	110.35	110.44	110.22	109.41	109.51	109.43
23	110.97	109.35	107.16	106.53	107.79	108.74	110.91	110.45	110.07	109.12	109.53	109.52
24	110.88	109.39	107.46	106.22	107.81	109.00	110.74	110.33	110.03	109.21	109.63	109.63
25	110.71	109.31	107.61	106.19	107.84	108.76	110.71	110.70	109.93	109.44	109.75	109.75
26	110.68	109.43	107.26	106.20	108.25	108.88	110.60	110.78	110.06	109.82	109.78	109.66
27	110.84	109.62	106.98	106.00	108.47	109.03	110.59	110.18	110.08	109.94	109.70	109.76
28	110.95	109.48	106.91	105.94	108.21	109.02	110.64	109.81	110.24	109.88	109.61	110.19
29	111.00	109.50	106.92	106.45	107.88	108.90	110.64	109.92	110.34	109.72	109.46	110.15
30	110.54		107.08	106.52	108.11	109.22	110.75	110.12	110.32	109.62	109.49	110.09
31	110.45		107.40		107.84		110.60	109.84		109.72		109.99
Avg.	111.05	110.08	108.14	106.96	107.20	108.83	109.77	110.02	110.10	109.91	110.01	109.79

* Partly estimated

COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging regulatory waste water from the Cooper Canal to the Colorado River. This wasteway is located 0.5 mile (0.8 km) downstream from the northerly international boundary and 0.6 mile (1.0 km) upstream from Morelos Diversion Dam. Prior to July 14, 1971, the wasteway was located 0.4 mile (0.6 km) downstream from Morelos Diversion Dam. This wasteway discharges waste water from the Valley Division of the Yuma Project in the United States into the Colorado River. Since July 14, 1971, zero of the gage is 117.64 feet (35.86 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, March 1950 through 1984 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 914 acre-feet (1,127,000 m³) in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet (2.25 m³/sec) on June 19, 1965, at a maximum gage height of 114.13 feet (34.79 m) (old datum); minimum instantaneous discharge, zero during parts of each month.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	3.4	3.1	2.7	0.1	1.3	0	0	1.7	0.1	0.9	0.2
2	0	1.9	2.4	.2	0	1.2	0	0	0	6.8	.2	.1
3	.1	4.1	2.0	0	0	0	0	0	.2	.3	2.6	.1
4	.6	.2	2.0	0	0	1.0	0	1.2	.5	.1	3.5	0
5	1.6	2.9	0	0	2.3	4.5	1.9	1.2	.2	.1	.3	0
6	.9	.1	0	.1	.3	.1	1.7	.2	2.0	0	.1	0
7	2.6	0	0	3.3	.5	1.2	0	.1	3.1	0	0	0
8	.7	0	.1	.4	.1	.7	0	0	3.0	.9	0	0
9	1.4	0	.2	.2	.6	0	0	0	.2	2.8	0	1.6
10	2.1	.4	3.7	.2	.3	0	.1	0	0	.2	0	.1
11	2.2	2.7	1.0	.2	2.5	3.1	.1	0	.1	0	3.0	.1
12	.5	2.1	3.2	.1	1.2	.7	0	4.2	.2	0	.1	0
13	2.3	.7	1.0	0	2.6	.2	3.7	1.1	1.7	1.9	.1	2.5
14	3.1	1.3	.2	2.4	0	2.8	3.5	1.2	3.8	.3	.2	.3
15	.2	.6	1.8	.4	0	.6	.1	2.0	.2	.1	0	.2
16	.2	3.1	.9	0	0	.4	.1	4.2	.1	.1	0	.1
17	.2	1.1	.2	0	0	3.1	.1	.2	2.1	0	1.7	.1
18	.4	7.9	.3	0	0	.2	0	.1	3.3	0	1.0	.1
19	1.6	.3	.1	0	1.3	.1	0	2.5	4.8	3.5	1.6	2.7
20	.2	.1	0	0	.3	.1	0	3.8	.7	1.6	.5	.4
21	.2	0	.3	2.5	0	1.5	0	3.1	.2	.2	3.3	7.1
22	.2	2.3	.2	.1	0	1.0	3.7	1.2	2.1	.1	1.0	.1
23	4.3	5.0	.2	0	.6	0	.2	.8	3.1	.1	3.3	3.7
24	4.7	1.4	.1	0	.5	0	0	1.4	.6	1.8	.5	.3
25	.5	.4	.1	0	3.0	0	0	1.0	.4	.1	.1	.8
26	.2	2.5	.1	0	.2	.1	1.1	.7	.1	0	.1	.1
27	.2	3.4	.2	5.1	1.4	3.4	2.4	.1	2.3	.7	3.5	.1
28	.2	3.8	.2	3.5	1.1	1.5	.3	1.3	.2	.1	.8	.2
29	.1	4.7	.2	.7	0	0	0	1.6	.2	3.4	4.0	.1
30	.2	.2	.2	1.0	1.6	0	0	3.0	.2	1.4	2.0	.1
31	.2		1.5		.5		.1	.4		2.5		0
Sum	31.9	56.4	25.5	23.1	21.0	27.3	19.1	36.6	37.3	29.2	34.4	21.2

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1984 Acre-Feet			
	High	Low	Day	High		Day			Low	Average	Maximum	Minimum
				Day	Day							
Jan.	1.33	0	23	20.9	1	1	0	1.0	63.3	156	914	0
Feb.	1.49	0	15	24.3	1	6	0	1.9	112	139	400	6.0
Mar.	1.52	0	10	24.9	1	5	0	.8	50.5	149	517	0
Apr.	1.47	0	27	23.9	1	2	0	.3	45.9	154	425	16.7
May	1.43	0	25	23.0	1	1	0	.7	41.7	153	440	31.7
June	1.70	0	22	18.2	1	3	0	.9	55.1	141	595	22.6
July	1.23	0	22	19.9	1	1	0	.5	37.9	133	515	0
Aug.	1.31	0	15	20.5	1	1	0	1.2	72.6	101	617	0
Sept.	1.25	0	27	19.5	1	2	0	1.2	74.0	103	462	0
Oct.	1.37	0	31	21.8	1	2	0	.9	57.9	128	490	0
Nov.	1.52	0	11	24.9	1	5	0	1.1	55.2	149	452	9.0
Dec.	1.79	0	21	16.0	1	4	0	.7	42.0	167	592	13.7
Yearly	1.52	0		24.9			0	1.0	721	1,673	4,500	638
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.46	0		0.71			0	0.93	339	2,054	5,551	787

! Estimated * Partly estimated ! And other days

COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico attached to the upstream abutment of the gates of the Intake Canal at Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1984.

REMARKS: Prior to June 4, 1951, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage.

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 114.44 feet (34.88 m) on August 18, 1983; minimum mean daily elevation above mean sea level, 101.51 feet (30.94 m) on February 17, 1957.

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	110.24	109.48	108.01	106.79	105.41	106.89	108.46	109.51	108.96	109.68	109.71	107.97
2	110.14	109.32	108.17	106.59	105.45	107.02	108.20	109.35	109.19	109.61	110.10	108.01
3	109.94	109.48	108.30	106.40	105.38	107.19	108.01	109.15	109.22	109.42	110.33	107.97
4	109.94	109.78	108.37	106.20	105.41	107.38	108.04	109.19	109.25	109.42	110.37	107.97
5	109.78	110.17	108.14	106.10	105.31	107.61	107.91	109.38	109.15	109.55	109.97	108.04
6	109.84	109.91	107.61	106.23	105.61	107.78	107.94	109.32	108.86	109.65	109.71	108.17
7	110.30	109.68	107.41	106.89	106.14	107.78	108.07	109.09	108.92	109.71	109.61	108.27
8	110.60	109.55	107.12	107.02	105.38	108.04	108.17	109.19	108.96	109.61	109.48	108.30
9	110.93	109.15	107.45	106.56	105.31	108.53	108.17	109.02	109.15	109.61	109.51	108.40
10	110.86	109.06	107.61	106.36	105.68	105.38	108.17	108.83	109.12	109.65	109.74	108.56
11	110.83	109.32	107.81	106.33	106.27	108.23	108.33	108.63	109.12	109.65	109.71	108.79
12	110.37	109.55	108.20	106.17	106.66	108.01	108.20	108.83	109.12	109.65	109.38	108.86
13	110.66	109.51	107.41	106.10	106.92	107.91	108.37	108.53	109.19	109.65	109.35	108.86
14	110.79	109.32	107.45	106.23	106.99	107.71	108.66	108.23	109.32	109.74	109.12	108.86
15	110.76	109.09	107.22	106.30	106.96	107.71	108.66	108.37	109.38	109.74	108.60	108.73
16	110.76	109.12	107.45	106.23	106.99	107.74	108.46	108.63	109.48	109.58	108.20	108.63
17	110.66	109.42	107.78	106.10	106.76	108.07	108.53	108.73	109.48	109.55	108.17	108.53
18	110.47	109.42	107.78	106.14	106.59	108.04	108.56	108.99	109.55	109.32	108.17	108.37
19	110.07	109.65	107.51	106.14	107.02	107.87	108.53	109.35	109.58	109.32	107.87	108.43
20	110.10	109.19	107.32	106.20	107.32	107.64	108.66	109.22	109.58	109.38	107.71	108.37
21	110.24	108.92	107.09	106.86	107.09	107.45	108.86	109.42	109.58	109.35	107.71	108.23
22	110.30	108.79	106.50	107.38	106.96	107.48	109.25	109.55	109.45	108.86	107.91	108.04
23	110.10	108.46	106.30	105.94	106.92	107.45	109.84	109.51	109.35	108.53	107.97	108.14
24	109.97	108.46	106.59	105.64	106.92	107.68	109.65	109.38	109.35	108.66	108.04	108.20
25	109.84	108.40	106.73	105.64	106.92	107.48	109.58	109.71	109.28	108.86	108.14	108.33
26	109.81	108.50	106.40	105.68	107.25	107.58	109.48	109.84	109.42	109.19	108.17	108.23
27	109.94	108.79	106.10	105.48	107.51	107.81	109.48	109.38	109.48	109.28	108.07	108.40
28	110.07	108.63	106.00	105.48	107.35	107.74	109.51	108.99	109.65	109.25	107.97	108.89
29	110.07	108.66	106.04	105.84	107.05	107.78	109.55	109.12	109.74	109.09	107.87	108.89
30	109.74		106.17	106.00	107.28	108.27	109.61	109.35	109.78	109.02	107.87	108.83
31	109.58		106.50		107.02		109.55	109.12		109.15		108.73
Avg.	110.24	109.19	107.25	106.23	106.50	107.64	108.63	109.12	109.32	109.38	108.83	108.43

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet (61.0 m) downstream from the intake at Morelos Dam, 1,350 feet (410 m) upstream from the point where it joins the old Alamo Canal, 2.2 miles (3.5 km) upstream from Matamoros Check, and about one mile (1.6 km) south of the northerly international boundary. The zero of the gage is 0.16 foot (0.05 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limitrophe section of the Colorado River at the northerly international boundary, the flows that pass downstream from the structure, and leakage through the structure. Records available: November 8, 1950 through 1984. Records obtained and furnished by the Mexican Section of the Commission.

REMARKS: The canal is operated with a minimum hydraulic slope to permit the maximum retention of silt above Matamoros Check, and the lower velocities in the canal do not permit measuring the flow with a current meter. Records for this station show the amounts of Colorado River water diverted at Morelos Diversion Dam to the Intake Canal and thence to the Alamo Canal for use in Mexico. Under conditions set forth in the 1944 Water Treaty, water for use in Mexico may be diverted to the Alamo Canal in the United States directly from the river at Rockwood Heading or by means of Imperial Dam, the All-American Canal, and certain facilities of the Imperial Irrigation District. No diversions of this nature have been made during the years 1951 through 1984, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 6,600 second-feet (187 m³/sec), July 12 and 14, 1983; maximum mean daily gage height, 107.05 feet (32.63 m) November 8, 1950. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,260	3,220	4,170	5,720	3,960	3,040	5,120	4,800	3,960	3,070	2,140	2,100
2	3,290	3,230	4,170	5,690	3,990	3,110	5,260	4,660	4,030	3,010	2,080	1,980
3	3,260	3,280	4,200	5,650	3,920	3,080	5,160	4,660	4,200	3,030	2,030	1,920
4	3,270	3,280	4,200	5,720	3,960	3,150	5,120	4,770	4,270	3,000	1,950	1,920
5	3,230	3,320	4,130	5,790	3,920	3,320	5,160	4,800	4,310	3,030	1,990	1,970
6	3,230	3,290	4,310	5,860	4,060	3,400	5,090	4,800	4,450	3,020	1,770	2,150
7	3,250	3,300	4,270	5,900	4,100	3,460	5,160	4,800	4,450	3,020	1,630	2,170
8	3,250	3,320	4,410	5,860	3,880	3,670	5,120	4,910	4,450	3,010	1,660	2,040
9	3,230	3,310	4,630	5,760	3,600	3,600	5,160	5,160	4,450	2,990	1,710	2,030
10	3,260	3,310	4,840	5,760	3,530	3,570	5,120	5,120	4,170	3,000	1,790	1,820
11	3,260	3,330	4,800	5,690	3,330	3,670	5,120	5,160	4,130	2,990	1,780	1,420
12	3,260	3,370	4,800	5,620	3,190	3,640	5,090	5,300	4,060	3,040	1,820	1,460
13	3,290	3,390	4,300	5,580	3,250	3,810	5,050	5,230	3,920	3,110	1,980	1,570
14	3,270	3,370	4,800	5,580	3,220	4,030	4,870	5,050	3,810	3,170	2,090	1,570
15	3,250	3,380	4,800	5,440	3,210	4,200	4,630	4,910	3,710	3,130	2,170	1,570
16	3,250	3,410	4,870	5,300	3,210	4,130	4,700	4,800	3,530	3,130	2,220	1,570
17	3,250	3,430	4,800	5,330	3,230	4,200	4,770	4,770	3,350	3,110	2,210	1,610
18	3,230	3,440	4,940	5,400	3,230	4,270	4,770	4,770	3,300	3,110	2,200	1,700
19	3,220	3,480	5,120	5,260	3,270	4,380	4,870	4,660	2,970	3,170	2,190	1,880
20	3,230	3,500	5,230	5,470	3,290	4,380	4,870	4,410	2,890	3,200	2,210	1,910
21	3,230	3,450	5,190	5,400	3,230	4,340	4,940	4,100	2,960	3,200	2,280	2,050
22	3,220	3,420	5,370	5,230	3,200	4,380	4,660	3,920	3,120	3,140	2,260	2,270
23	3,170	3,490	5,440	5,050	3,160	4,480	4,450	3,600	3,140	3,020	2,250	2,270
24	3,200	3,600	5,510	4,730	3,130	4,800	4,520	3,810	3,080	2,850	2,210	2,240
25	3,200	3,710	5,370	4,590	3,150	4,840	4,520	3,850	3,050	2,730	2,010	2,250
26	3,210	3,850	5,190	4,520	3,200	4,800	4,560	3,990	3,080	2,630	1,830	2,270
27	3,230	3,920	5,300	4,170	3,170	4,700	4,730	3,960	3,130	2,620	1,650	1,880
28	3,230	4,030	5,470	4,030	3,160	4,730	4,730	3,880	3,170	2,610	1,840	1,410
29	3,230	4,100	5,470	4,100	3,130	5,010	4,730	3,920	3,130	2,610	2,100	1,470
30	3,210		5,470	3,990	3,130	5,010	4,800	3,960	3,100	2,580	2,160	1,470
31	3,230		5,580		3,040		4,910	3,920		2,440		1,520
Sum	100,400	100,530	151,650	159,190	106,050	121,200	151,660	140,550	109,370	91,770	60,110	57,470

Month	Current Year 1984						Period 1950-1984				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum
Jan.	104.20	103.84	1	3,290	23	3,170	3,240	199,188	79,053	207,383	966
Feb.	104.69	103.84	29	4,100	1	3,220	3,450	199,356	75,629	199,356	9,232
Mar.	105.74	104.43	31	5,580	5	4,130	4,910	300,845	179,666	300,845	97,992
Apr.	106.07	104.96	7	5,900	30	3,990	5,260	313,733	205,672	313,733	153,792
May	105.12	104.23	7	4,100	31	3,040	3,420	210,318	105,517	210,318	66,207
June	106.10	104.30	129	5,010	1	3,040	4,030	240,466	150,003	269,632	95,177
July	106.20	105.64	2	5,260	23	4,450	4,910	300,775	225,279	356,040	125,745
Aug.	106.46	105.71	12	5,300	23	3,600	4,520	278,780	221,255	341,044	130,298
Sept.	106.56	105.58	1	4,450	20	2,890	3,640	216,931	173,117	273,177	53,633
Oct.	106.56	104.86	21	3,220	31	2,440	2,960	182,083	66,321	227,661	10,453
Nov.	105.39	104.33	21	2,280	7	1,630	2,000	119,204	54,767	209,478	7,516
Dec.	105.84	103.94	22	2,270	28	1,410	1,850	113,992	84,814	200,974	8,825
Yearly	106.56	103.84		5,900		1,410	3,670	2,675,671	1,591,010	2,798,192	1,272,332
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	32.48	31.65		167		40.0	104	3,300,404	1,952,490	3,451,533	1,569,404

Ø Mean daily ! And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.94	104.00	104.56	105.68	104.95	104.30	106.04	106.00	106.30	105.68	104.76	105.09
2	103.97	104.04	104.66	105.61	105.02	104.33	106.04	106.04	106.43	105.64	104.59	105.09
3	103.97	103.97	104.66	105.68	104.95	104.33	106.07	106.07	106.43	105.68	104.59	105.12
4	104.00	103.97	104.72	105.71	104.99	104.36	106.14	106.10	106.43	105.61	104.53	105.15
5	103.97	104.04	104.72	105.77	104.95	104.49	106.07	106.10	106.46	105.68	104.49	105.18
6	103.97	104.00	104.72	105.87	105.02	104.53	106.10	106.10	106.46	105.64	104.49	105.41
7	103.97	104.00	104.72	105.91	104.95	104.56	106.07	106.14	106.53	105.64	104.43	105.64
8	103.97	104.00	104.79	105.87	104.95	104.69	106.10	106.17	106.50	105.61	104.43	105.61
9	103.97	104.07	104.95	105.84	104.72	104.69	106.07	106.20	106.50	105.64	104.43	105.61
10	103.97	104.04	105.15	105.84	104.56	104.76	106.14	106.30	106.33	105.64	104.49	105.41
11	103.97	104.00	105.15	105.81	104.46	104.92	106.07	106.40	106.40	105.64	104.49	105.05
12	103.97	104.04	105.15	105.71	104.33	104.95	106.04	106.36	106.33	105.71	104.56	105.05
13	103.94	104.10	105.18	105.68	104.33	104.99	106.00	106.33	106.30	105.77	104.59	105.05
14	104.00	104.10	105.15	105.74	104.33	104.99	105.91	106.27	106.17	105.81	104.59	105.05
15	104.00	104.10	105.18	105.74	104.53	105.12	105.81	106.27	106.17	105.71	104.63	105.05
16	103.97	104.10	105.25	105.64	104.49	105.18	105.81	106.23	106.17	105.74	104.66	105.05
17	103.97	104.10	105.25	105.71	104.33	105.25	105.84	106.14	106.07	105.74	104.63	105.02
18	103.97	104.10	105.31	105.74	104.33	105.28	105.84	106.07	105.87	105.81	104.63	105.09
19	103.97	104.10	105.31	105.74	104.33	105.38	105.84	106.10	105.71	105.74	104.59	105.15
20	103.97	104.13	105.31	105.71	104.36	105.48	105.84	106.00	105.71	105.74	104.56	105.15
21	103.97	104.10	105.31	105.64	104.36	105.58	105.91	105.91	105.68	105.74	104.66	105.25
22	103.97	104.10	105.38	105.41	104.33	105.64	105.77	105.91	105.71	105.61	104.63	105.38
23	103.97	104.07	105.41	105.18	104.30	105.71	105.68	105.91	105.84	105.51	104.59	105.38
24	103.97	104.10	105.41	105.18	104.30	105.81	105.68	105.87	105.74	105.22	104.66	105.35
25	103.94	104.30	105.41	105.22	104.33	105.74	105.68	105.87	105.68	105.12	104.59	105.41
26	104.04	104.43	105.48	105.25	104.33	105.81	105.71	106.04	105.74	105.15	104.59	105.35
27	103.97	104.43	105.58	105.05	104.27	105.81	105.77	106.10	105.71	105.12	104.53	104.95
28	103.97	104.46	105.64	105.05	104.33	105.87	105.74	106.14	105.74	105.09	104.72	104.10
29	103.94	104.49	105.64	105.05	104.40	106.00	105.77	106.20	105.71	105.09	104.99	104.00
30	103.97		105.61	104.95	104.40	106.04	105.77	106.27	105.71	105.12	105.02	104.00
31	103.97		105.64		104.33		105.84	106.27		105.02		104.04
Avg.	103.97	104.13	105.18	105.58	104.53	105.15	105.91	106.14	106.07	105.54	104.59	105.09

COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico immediately downstream from Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1984.

REMARKS: On June 7, 1966 a continuous water-stage recorder was installed; prior to this date, mean daily gage heights were determined from hourly readings of staff gage.

EXTREMES: Maximum mean daily gage height, 113.98 feet (34.74 m) on August 18, 1983; minimum mean gage height, 98.03 feet (29.88 m) several days during December 1982.

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109.68	109.12	107.84	106.69	104.89	106.63	108.04	108.92	108.50	109.09	108.56	107.78
2	109.55	108.92	108.04	106.50	105.12	106.76	107.84	108.86	108.73	109.02	108.76	107.87
3	109.38	109.12	108.14	106.30	105.05	106.92	107.68	108.66	108.66	108.83	108.86	107.87
4	109.38	109.42	108.17	106.10	104.86	107.12	107.71	108.69	108.69	108.83	108.89	107.91
5	109.22	109.81	107.38	105.61	104.59	107.35	107.58	108.86	108.73	108.92	108.96	107.91
6	109.35	109.58	106.82	105.77	105.05	107.51	107.61	108.73	108.46	109.06	108.89	108.04
7	109.68	109.35	106.59	106.79	106.04	107.51	107.74	108.60	108.53	109.09	108.86	108.17
8	110.14	109.22	106.96	106.92	105.28	107.78	107.84	108.60	108.60	109.02	108.83	108.20
9	110.47	108.79	107.25	106.46	105.15	108.20	107.84	108.46	108.79	108.99	108.86	108.27
10	110.40	108.73	107.41	106.30	105.41	108.37	107.71	108.27	108.76	108.99	109.02	108.43
11	110.37	109.02	107.61	106.27	105.91	108.01	107.84	108.14	108.69	109.06	108.96	108.66
12	109.88	109.22	107.48	106.10	106.40	107.81	107.78	108.33	108.69	109.09	108.69	108.66
13	110.24	109.19	107.25	106.04	106.69	107.71	107.91	108.10	108.73	109.12	108.66	108.63
14	110.37	109.02	107.32	106.14	106.66	107.51	108.23	107.84	108.92	109.09	108.50	108.60
15	110.27	108.79	107.09	106.23	106.69	107.48	108.27	107.97	108.89	109.06	108.27	108.50
16	110.30	108.83	107.32	106.14	106.69	107.61	108.10	108.20	108.96	108.92	108.17	108.40
17	110.20	109.09	107.68	105.68	106.53	107.84	108.17	108.30	108.96	108.89	108.10	108.30
18	110.01	109.15	107.71	105.81	106.46	107.81	108.20	108.43	109.02	108.73	108.04	108.20
19	109.65	109.38	107.45	105.28	106.79	107.64	108.14	108.73	109.02	108.79	107.71	108.27
20	109.71	108.89	107.25	105.84	107.02	107.48	108.23	108.66	109.06	108.86	107.55	108.20
21	109.81	108.56	107.02	106.69	106.86	107.22	108.50	108.92	109.09	108.76	107.55	108.04
22	109.91	108.53	106.43	107.25	106.69	107.28	108.79	109.09	108.96	108.20	107.81	107.91
23	109.68	108.14	106.23	105.64	106.63	107.28	109.32	108.89	108.83	107.87	107.87	108.01
24	109.58	108.17	106.53	104.56	106.66	107.55	109.19	108.83	108.79	107.94	107.94	108.07
25	109.45	108.10	106.66	104.20	106.63	107.28	109.12	109.25	108.69	108.20	108.01	108.20
26	109.42	108.23	106.33	104.17	106.96	107.38	109.02	109.55	108.79	108.56	108.01	108.04
27	109.55	108.07	106.00	103.97	107.22	107.55	108.99	108.99	108.79	108.69	107.94	108.20
28	109.65	107.97	105.94	103.48	107.05	107.51	109.02	108.53	109.02	108.60	107.84	108.69
29	109.71	107.97	105.94	105.45	106.76	107.55	109.06	108.66	109.15	108.46	107.71	108.66
30	109.35		106.10	105.87	106.99	107.84	109.09	108.89	109.15	108.37	107.71	108.66
31	109.19		106.43		106.73		108.96	108.60		108.46		108.53
Avg.	109.78	108.83	107.05	105.81	106.20	107.51	108.30	108.63	108.83	108.76	108.33	108.27

WELLTON-MOHAWK DRAINAGE WATER DISCHARGED TO COLORADO RIVER BELOW MORELOS DAM

DESCRIPTION: Water-stage recorder located on downstream end of the Wellton-Mohawk Drainage Extension Channel on the Arizona bank of the Colorado River at the east end of the weir section of Morelos Dam, 1.1 miles (1.8 km) downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1984.

REMARKS: Pursuant to Minute 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles (19.3 km), and placed in operation on November 16, 1965. Drainage flows may be discharged on an emergency basis to the Gila River and thence to the Colorado River at the diversion structure, Main Outlet Drain Extension No. 1, at the upstream end of the extension; directly to the Colorado River at Main Outlet Drain Extension No. 2, 1.9 miles (3.1 km) upstream from Morelos Dam; and directly to the Colorado River immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. On July 14, 1972, Minute No. 241 of the Commission became effective. The Minute called for discharge of all Wellton-Mohawk drainage waters to be made below Morelos Dam. On August 30, 1973, Minute No. 242 of the Commission became effective. The Minute called for construction of a concrete-lined bypass drain from Morelos Dam to the Santa Clara Slough in Mexico. On June 23, 1977, the first flow was recorded in the bypass drain. Drainage flows through Main Outlet Extension No. 3 will be only on an emergency basis.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	8.8	0	0	0	0	0	0
4	0	0	0	0	0	13.7	0	0	0	0	0	0
5	0	0	0	0	0	5.5	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	13.4	0	0	0	0	0	0
15	0	0	0	0	0	32.3	0	0	0	0	0	0
16	0	0	0	0	0	32.3	0	0	0	0	0	0
17	0	0	0	0	0	31.6	0	0	0	0	0	0
18	0	0	0	0	0	32.0	0	0	0	0	0	0
19	0	0	0	0	0	16.1	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
Sum	0	0	0	0	0	186.7	0	0	0	0	0	0
Current Year 1984								Period 1966-1984				
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	0	0		0	0	0	0	10,217	18,718	0		
Feb.	0	0		0	0	0	0	7,951	15,992	0		
Mar.	0	0		0	0	0	0	5,551	18,505	0		
Apr.	0	0		0	0	0	0	4,622	18,051	0		
May	0	0		0	0	0	0	7,559	19,091	0		
June	.81	0	14	38.2	1.1	6.2	370	5,955	18,755	0		
July	0	0		0	0	0	0	5,474	18,946	0		
Aug.	0	0		0	0	0	0	5,551	19,188	0		
Sept.	0	0		0	0	0	0	7,818	18,474	0		
Oct.	0	0		0	0	0	0	11,007	19,200	0		
Nov.	0	0		0	0	0	0	10,436	18,478	0		
Dec.	0	0		0	0	0	0	9,478	19,121	0		
Yearly	0.81	0		38.2	0	0.5	370	91,639	214,781	0		
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	0.25	0		1.08	0	0.01	456	113,035	264,930	0		

! And other days

COLORADO RIVER AT MORELOS GAGING STATION - DISCHARGES

DESCRIPTION: Water-stage recorder was located on the left (Arizona) bank of the river, and cableway 1.8 miles (2.9 km) downstream from the northerly international boundary, 0.7 mile (1.1 km) downstream from Morelos Diversion Dam, and about 9 miles (14.5 km) downstream from Yuma, Arizona, along the river levee. Zero of gage was at mean sea level, U. S. C. & G. S. datum. Cableway dismantled on August 22, 1983. Recorder destroyed on July 4, 1983. Temporary recorder was installed 0.4 mile (0.6 km) upstream, and levels were established to ensure continuous record to date.

RECORDS: Based on current meter measurements, continuous record of gage heights and, beginning August 23, 1983, from deduced flow computations. Before August 23, 1983, computations by shifting control methods. Records available: Daily discharges, January 1, 1954 through 1984; continuous record of gage heights, July 20, 1952 through 1984.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station. Deduced records beginning August 23, 1983 were derived by addition of flows at northerly international boundary, Cooper Wasteway, and M.O.D.E. No. 3, and subtraction of diversions into Alamo Canal at Morelos Dam. Diversion data were supplied by the Mexican Section of the International Boundary and Water Commission.

EXTREMES: Maximum instantaneous discharge, 38,000 second-feet (1,076 m³/sec) on August 18, 1983; maximum gage height, 112.99 feet (34.44 m) on August 18, 1983. Minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan. δ	Feb. δ	March δ	April δ	May δ	June δ	July δ	Aug. δ	Sept. δ	Oct. δ	Nov. δ	Dec. δ
1	20,300	21,200	17,900	14,200	11,700	15,200	19,300	19,000	15,200	15,900	17,500	20,100
2	20,100	20,900	18,300	14,200	11,700	15,500	18,000	19,000	16,100	15,900	17,300	19,800
3	19,800	21,100	18,400	13,800	11,300	15,900	17,200	18,500	15,900	15,500	17,200	19,700
4	19,700	21,800	18,400	13,200	11,800	16,300	17,500	18,300	15,500	15,600	17,300	19,600
5	19,500	22,700	16,300	12,500	11,600	16,900	16,700	18,800	15,000	16,100	17,400	19,700
6	19,700	22,200	15,000	13,000	12,100	17,500	16,900	18,100	14,200	16,500	17,500	20,000
7	20,500	21,600	14,600	13,700	13,200	17,500	17,100	17,400	14,500	16,600	17,800	20,500
8	21,900	21,400	15,800	14,200	12,100	18,300	17,700	17,200	14,700	16,300	17,800	20,900
9	24,000	20,600	16,500	13,900	12,000	20,100	17,300	16,100	15,200	16,200	17,300	21,500
10	23,700	20,400	16,600	13,600	12,500	20,600	17,000	15,400	15,400	16,400	17,400	22,100
11	23,700	21,000	16,900	13,600	13,900	19,400	17,800	14,700	15,600	16,200	17,300	22,800
12	22,900	21,300	16,600	13,400	14,900	19,200	17,300	15,200	15,300	16,500	16,900	22,700
13	23,900	21,300	16,300	13,300	15,500	18,900	17,700	14,100	16,200	16,400	17,000	22,500
14	24,400	20,900	16,400	13,300	15,400	18,100	18,600	13,400	16,800	16,700	16,400	22,300
15	24,600	20,400	16,100	13,600	15,600	17,900	18,300	13,900	17,000	16,900	16,800	22,100
16	24,700	20,500	16,400	13,000	15,500	18,400	17,800	15,100	17,400	16,500	17,700	21,700
17	24,300	21,200	16,900	12,200	15,100	19,600	18,000	15,600	17,200	16,400	17,900	21,300
18	23,600	21,200	16,800	12,300	14,900	19,100	18,200	16,600	17,300	16,300	18,300	20,600
19	22,400	21,600	16,300	11,600	15,600	18,700	17,800	18,300	17,100	16,600	17,700	21,000
20	22,500	20,600	15,900	11,900	16,400	18,600	18,100	18,300	16,800	17,400	17,300	20,800
21	22,900	20,200	15,500	13,700	15,800	18,100	19,400	18,500	16,400	17,500	17,400	20,000
22	23,200	20,000	13,800	14,900	15,600	18,200	20,900	18,500	16,000	15,000	13,300	19,100
23	22,700	19,300	13,300	11,600	15,500	18,100	22,700	18,900	15,600	13,000	18,300	19,800
24	22,300	19,300	13,500	10,400	15,500	19,000	21,500	18,800	15,500	13,400	19,600	20,300
25	21,800	19,100	14,000	10,200	15,500	17,900	21,000	19,500	15,200	14,600	20,700	20,900
26	21,700	19,200	13,700	10,500	16,200	18,000	20,200	20,000	15,500	16,600	21,200	20,400
27	22,000	18,900	13,200	10,500	16,700	18,700	20,100	17,900	15,300	17,600	21,200	21,000
28	22,300	18,500	13,000	10,200	16,100	18,400	20,100	15,800	15,900	17,400	20,700	22,800
29	22,300	18,400	13,300	12,800	15,500	18,000	19,900	16,400	16,300	16,700	19,800	22,600
30	21,500	13,800	13,000	13,000	16,000	19,100	19,800	17,200	16,300	16,100	19,800	22,400
31	21,200	13,900	13,900	15,400	15,400	18,800	18,800	16,100	16,300	16,800	16,800	22,100
Sum	690,100	596,800	483,400	382,300	447,100	545,200	579,200	530,600	476,600	501,500	545,800	553,200
Current Year 1984												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet δ	Total δ Acre-Feet	Period 1954-1984			
	High	Low	Day		Day				Acre-Feet			
			High	Low			Average	Maximum	Minimum			
Jan.	*110.07	*103.59	16	24,900	5	19,200	22,300	1,368,793	175,028	δ 1,368,793	478	
Feb.	*109.40	106.56	5	23,000	28	18,200	20,600	1,183,735	102,952	δ 1,183,735	491	
Mar.	107.79	105.43	3	13,600	28	12,900	15,600	958,810	79,696	δ 958,810	659	
Apr.	107.12	103.25	21	15,400	28	10,000	12,700	758,281	73,455	δ 758,281	745	
May	107.03	103.95	27	16,900	5	10,700	14,400	886,810	98,425	δ 886,810	460	
June	108.12	106.19	10	21,000	1	15,000	14,200	1,031,388	87,294	δ 1,031,388	507	
July	108.67	107.00	23	23,500	5	16,300	18,700	1,148,825	109,030	δ 1,148,825	584	
Aug.	*109.12	107.25	25	20,800	14	13,200	17,100	1,052,430	120,831	1,697,851	618	
Sept.	108.72	107.85	16	17,600	7	13,800	15,900	945,322	113,251	1,581,421	113	
Oct.	108.67	107.55	20	17,700	23	12,900	16,200	994,711	141,424	1,744,066	383	
Nov.	108.50	107.12	25	21,300	14	16,100	18,200	1,082,578	149,872	1,322,777	355	
Dec.	109.15	107.16	13	22,900	22	18,900	21,100	1,295,603	170,932	δ 1,295,603	465	
Yearly	*110.07	103.26		24,900		10,000	17,600	12,757,287	1,422,240	δ 12,757,287	31,755	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	33.55	31.47		705		283	493	15,735,858	1,754,305	15,735,853	39,170	

δ Deduced - see explanation in REMARKS paragraph in text above

* Partly estimated

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109.06	108.59	*107.24	106.30	104.46	106.27	107.46	108.28	108.12	108.51	108.04	107.21
2	108.94	108.42	*107.48	106.11	104.72	106.39	107.25	108.18	108.38	108.44	107.94	107.25
3	108.86	108.56	107.64	105.88	104.66	106.55	107.08	107.98	108.37	108.24	108.15	107.21
4	108.84	*108.94	107.70	*105.67	104.53	106.74	107.16	108.00	108.34	108.24	108.19	107.26
5	*108.70	*109.35	106.85	105.33	104.32	106.98	107.06	108.23	108.22	108.32	108.22	107.32
6	*108.78	*109.10	106.30	*105.54	104.66	107.13	107.11	108.14	107.97	108.42	108.30	107.44
7	*109.10	*108.86	106.10	*106.32	105.42	107.16	107.24	108.04	108.02	108.46	108.30	107.55
8	*109.62	*108.72	106.51	*106.42	104.87	107.44	107.29	108.07	108.06	108.38	108.26	107.55
9	*110.02	*108.30	106.84	*106.03	104.84	107.89	107.20	107.94	108.25	108.40	108.30	107.68
10	*109.95	*108.22	107.02	105.88	105.17	108.01	107.08	107.74	108.22	108.45	108.47	107.83
11	*109.90	*108.52	107.23	105.86	105.78	107.63	107.17	107.59	108.23	108.46	108.41	108.02
12	*109.40	*108.76	107.02	105.70	106.21	107.46	107.10	107.78	108.25	108.50	108.20	108.10
13	*109.70	*108.53	106.81	105.61	106.49	107.35	107.20	107.54	108.30	108.50	108.20	108.10
14	109.85	*108.31	106.92	105.75	106.47	107.15	107.52	107.31	108.47	108.55	108.04	108.07
15	109.78	*108.22	106.69	105.80	*106.49	107.15	107.54	107.45	108.51	108.54	108.00	107.98
16	109.80	*108.29	106.95	105.72	*106.43	107.22	107.39	107.69	108.60	108.41	107.99	107.90
17	109.67	*108.79	107.28	105.41	*106.22	107.46	107.50	107.79	108.54	108.37	107.92	107.82
18	109.50	108.79	107.27	105.49	*106.15	107.36	107.50	107.97	108.62	108.23	107.85	107.72
19	109.13	109.03	107.01	105.03	106.52	107.20	107.42	108.22	108.64	108.25	107.45	107.77
20	109.16	108.55	106.82	105.51	106.81	107.02	107.50	108.06	108.61	108.38	107.26	107.73
21	109.30	108.25	106.57	106.30	106.59	106.80	107.75	108.34	108.58	108.39	107.20	107.57
22	109.36	108.19	105.98	106.83	106.51	106.87	108.03	*108.51	108.44	107.90	107.33	107.34
23	109.17	107.84	105.79	105.24	106.50	106.84	108.55	*108.40	108.29	107.61	107.32	107.45
24	109.08	107.88	106.08	104.48	106.53	107.07	108.40	*108.29	108.27	107.71	107.37	107.53
25	108.92	107.79	106.23	*104.36	106.50	106.80	108.36	*108.73	108.19	107.90	107.47	107.69
26	108.89	107.90	105.98	*104.14	106.82	106.90	108.27	*109.04	108.31	108.29	107.51	107.57
27	109.05	107.74	105.60	104.03	107.04	107.06	108.30	*108.40	108.34	108.40	107.45	107.66
28	109.14	107.42	105.53	103.45	106.84	107.02	108.39	108.06	108.50	108.35	107.34	108.09
29	109.17	107.41	105.55	*104.86	106.52	107.01	108.40	108.23	108.59	108.23	107.19	108.01
30	108.82		105.71	*105.13	106.69	107.26	108.48	108.47	108.61	108.08	107.18	107.97
31	108.66		106.02		106.42		108.35	108.23		108.10		107.91
Avg.	109.27	108.39	106.60	105.47	105.94	107.11	107.65	108.09	108.36	108.29	107.83	107.69

* Partly estimated

ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona, 4.3 miles (6.9 km) downstream from the northerly international boundary and 3.2 miles (5.1 km) downstream from Morelos Diversion Dam. It is the largest of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limittrophe section of the Colorado River.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1984, obtained by the United States Section; monthly discharge, January 1924 through 1950, by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 9,740 acre-feet (12,014,000 m³) in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet (22.7 m³/sec) on December 3, 1961, at a maximum gage height of 117.60 feet (35.84 m); minimum instantaneous discharge, zero during parts of most years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	0.3	0.2	58.4	0.3	0.3	0.3	0.2	0	0.4	0.4	0.6
2	.3	.4	.2	32.6	.3	.3	.4	.2	.1	.2	1.7	40.1
3	.3	.4	5.8	4.2	.1	.3	.2	.2	.2	.3	.3	53.1
4	.3	3.2	34.8	2.0	.2	.3	.2	.2	.8	.4	41.8	3.1
5	.2	64.4	16.1	.3	.2	.3	.4	41.1	.4	.5	24.6	2.2
6	.4	33.0	3.2	.3	.2	.4	.4	28.9	.4	.4	2.1	.1
7	.3	4.4	2.1	.2	.2	.3	.4	2.8	1.0	.4	1.3	.2
8	.2	1.5	.2	.2	.3	.7	.3	2.1	.6	.2	.3	.4
9	.2	.2	.2	.2	0	.4	3.1	.3	.4	.4	1.4	3.0
10	.2	.2	.2	.3	.1	.3	.3	.4	.4	.5	1.1	* 1.0
11	3.0	.3	.1	.2	.2	.4	.4	.4	.4	.3	.2	* .8
12	.2	.2	.3	.2	.2	.3	.4	.2	.4	1.6	.3	0
13	.2	.2	.1	.2	42.3	.2	4.2	.2	.2	.4	.3	.1
14	.2	.2	.2	.2	42.7	.3	.3	.4	.4	3.3	1.7	.1
15	.2	.3	.2	.2	3.1	.3	.2	.2	.4	1.7	.4	.1
16	.3	.3	.1	.2	2.6	.3	.2	.2	.2	.6	1.4	.4
17	.3	.3	0	.3	.5	.2	.5	.2	11.1	.5	.6	.1
18	.3	.3	0	.2	.4	.1	.3	.2	.3	.2	1.7	.3
19	.4	.2	0	.2	.2	.2	.3	.2	.3	2.2	2.7	.2
20	.4	.1	.2	.2	.2	.2	.3	.2	.6	1.0	2.6	.1
21	.5	.2	0	.1	.1	.5	7.1	.5	.3	.1	1.5	.1
22	.5	.2	0	0	.2	.2	.2	.3	.3	.3	.2	.2
23	.3	.1	0	.4	.2	.2	.2	.3	.4	2.0	4.7	.2
24	.2	.1	.1	.3	.2	.2	.2	.3	.4	.3	4.4	.1
25	.3	.1	0	.3	.2	.2	.6	.3	.5	1.3	3.4	.1
26	.4	.1	0	.2	.2	.3	.4	.2	.2	.4	.2	.1
27	.4	.1	.2	.1	.2	.2	.4	.2	.3	.9	2.1	.3
28	.5	.3	.4	.2	.2	.2	.6	.5	.4	7.4	1.3	0
29	3.2	.4	.4	.1	.2	.2	.4	.2	1.5	.2	.4	.1
30	.3	.5	.2	.2	.2	.3	.4	.1	.3	.4	1.3	.1
31	.3	.4	.4	.2	.3	.3	.3	0	.4	.4	.4	.1
Sum	15.2	112.0	66.2	102.7	96.5	8.6	23.9	81.7	23.2	29.2	106.4	107.4

Month	Current Year 1984						Period 1935-1984				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	High	Day	Low			Average	Maximum	Minimum	
Jan.	113.16	111.74	11	80.8	1.5	0.1	0.5	30.1	2,683	9,570	0
Feb.	116.31	111.73	5	362	121	.1	3.9	222	2,191	8,430	14.5
Mar.	114.81	111.72	4	180	116	0	2.1	131	2,063	6,230	59.1
Apr.	115.85	111.72	1	288	22	0	3.4	204	1,911	6,300	0
May	115.54	111.72	13	245	1.9	0	3.1	191	2,259	9,320	8.3
June	111.90	111.74	8	2.0	118	.1	.3	17.1	2,155	7,440	10.5
July	113.76	111.73	21	114	3	.1	.8	47.4	2,160	8,320	9.1
Aug.	116.02	111.72	5	313	130	0	2.6	162	1,869	9,740	64.9
Sept.	113.33	111.72	17	99.5	1	1	.8	46.0	1,348	6,140	6.0
Oct.	112.80	111.74	28	58.0	3	.1	.9	57.9	1,839	5,680	11.9
Nov.	115.29	111.73	4	219	1.3	.1	3.5	211	2,221	8,220	15.8
Dec.	115.61	111.72	2	253	111	0	3.5	213	2,923	9,430	61.9
Yearly	116.31	111.72		362		0	2.1	1,532	25,622	82,900	943
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	35.45	34.05		10.25		0	0.06	1,890	31,604	102,255	1,163

* Partly estimated

! And other days

COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 4.3 miles (6.9 km) downstream from northerly international boundary, 3.2 miles (5.1 km) downstream from Morelos Diversion Dam, about 50 feet (15 m) downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 11 miles (17.7 km) downstream from Yuma, Arizona, along the river levee. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1984; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

REMARKS: This station is maintained by the United States Section of the Commission as part of the continuing study of channel conditions in the limitrophe section of the river.

EXTREMES: Since November 1947, maximum mean daily gage height, 108.77 feet (33.15 m) on June 23, 1983; minimum mean daily gage height, 94.95 feet (28.94 m) on June 22, 1963.

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	105.92	105.54	104.31	103.41	101.86	103.79	*105.20	105.39	105.24	105.56	105.22	104.92
2	105.89	105.41	104.49	103.25	102.11	103.94	*104.99	105.28	105.48	105.50	105.21	104.93
3	105.73	105.54	104.60	103.01	102.08	104.10	*104.82	105.12	105.50	*105.32	105.35	104.91
4	105.72	105.78	104.68	102.82	101.96	104.25	104.91	105.06	105.43	*105.32	105.32	104.95
5	105.56	106.11	103.95	102.47	101.80	104.49	104.80	105.16	105.36	*105.42	105.30	104.97
6	105.66	105.93	103.34	102.56	102.08	104.67	*104.84	104.93	105.13	*105.53	105.32	105.11
7	105.99	105.74	103.11	103.46	102.94	104.70	*104.95	104.71	105.21	*105.57	105.33	*105.12
8	106.39	105.64	103.49	103.56	102.21	104.94	*105.01	104.80	105.24	*105.51	105.24	*105.11
9	106.70	105.31	103.79	103.17	102.19	105.36	*104.95	104.77	105.36	*105.51	105.15	*105.20
10	106.62	105.22	103.95	103.00	102.50	105.45	*104.85	104.62	105.37	105.53	105.15	*105.29
11	106.56	105.49	104.14	102.98	103.06	105.12	104.93	104.48	105.36	105.54	105.04	*105.38
12	106.20	105.64	103.99	102.85	103.47	105.03	104.79	104.65	105.35	105.56	104.78	105.43
13	105.44	105.60	103.81	102.77	103.77	104.97	*104.83	104.37	105.38	105.55	104.67	105.47
14	106.56	105.41	103.87	102.89	103.77	104.85	*105.05	104.12	105.51	105.62	104.50	105.35
15	106.50	105.22	103.66	102.94	103.81	104.82	*105.04	104.16	105.60	*105.63	104.44	105.26
16	106.56	105.26	103.87	102.89	103.79	104.91	*104.81	104.37	105.73	*105.53	104.45	105.19
17	106.41	105.54	104.19	102.55	103.58	105.18	104.81	104.43	105.69	105.51	104.44	105.08
18	106.26	105.55	104.21	102.63	103.50	105.05	104.82	104.43	105.74	105.40	104.51	105.06
19	105.97	105.76	103.90	102.20	103.84	104.86	104.81	104.73	105.78	105.48	104.42	105.18
20	105.98	105.42	103.80	102.68	104.11	104.68	104.92	104.88	105.77	105.56	104.43	105.21
21	106.03	105.12	103.53	103.44	103.92	104.42	105.13	105.06	105.76	105.53	104.44	105.07
22	106.14	105.06	103.02	104.00	103.81	104.46	105.42	105.29	105.59	105.00	104.58	104.87
23	105.95	104.74	102.83	102.51	103.79	104.46	105.97	105.34	105.38	104.67	104.55	104.97
24	105.87	104.77	103.11	101.71	103.79	104.73	105.78	105.38	105.27	104.77	104.77	104.98
25	105.77	104.69	103.25	101.50	103.76	104.50	105.70	105.73	105.12	104.95	104.99	105.08
26	105.76	104.82	102.94	101.54	104.05	104.55	105.58	106.02	105.28	105.26	104.95	104.98
27	105.91	104.69	102.68	101.41	104.29	104.71	105.49	105.43	105.36	105.36	104.83	105.05
28	105.94	104.41	102.61	100.95	104.14	104.69	105.53	104.98	105.54	105.31	104.70	105.41
29	105.97	104.44	102.64	102.32	103.91	104.68	105.52	105.15	105.66	105.20	104.69	105.35
30	105.69		102.79	102.66	104.13	104.96	105.64	105.48	105.56	105.13	104.81	105.29
31	105.58		103.09		103.90		105.47	105.35		105.19		105.18
Avg.	106.07	105.31	103.60	102.67	103.29	104.71	105.14	104.96	105.46	105.37	104.85	105.14

* Partly estimated

TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway from West Main Canal to Colorado River. Located on east side of levee at site used prior to May 1, 1971. The site used May 1, 1971 to September 20, 1977 was located 200 feet (61 m) downstream from present site on west side of levee. This wasteway is located in Arizona, 18.5 miles (29.8 km) downstream from the northerly international boundary, 17.4 miles (28.0 km) downstream from Morelos Diversion Dam, and 2.2 miles (3.5 km) upstream from the southerly international boundary. It is the farthest downstream of the two wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. The elevation of the zero of the gage at the new location has not been determined.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1984, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

REMARKS: This wasteway was completed and flow began March 14, 1939. Since May 13, 1944, waste water from the West Main Canal which previously discharged across the southerly land boundary has been returned to the Colorado River through this wasteway. The West Main Canal Wasteway was completed in February of 1971, and the waste water from the West Main Canal is normally discharged across the southerly land boundary.

EXTREMES: Prior to January 1951, maximum monthly discharge 2,860 acre-feet (3,528,000 m³) in January 1946; minimum monthly discharge, 122 acre-feet (150,000 m³) in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet (2.89 m³/sec) on January 24, 1954, at a maximum gage height of 95.46 feet (29.10 m) (old datum); minimum instantaneous discharge, zero during a part of most months.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0.1	0.1
2	0	0	0	0	0	0	0	0	0	0	.1	.1
3	0	0	0	0	0	0	0	0	0	0	.1	2.1
4	0	0	0	0	0	0	0	0	0	0	.1	.1
5	0	0	0	0	0	0	0	0	0	0	.1	0
6	0	0	0	0	0	0	0	0	0	0	.1	0
7	0	0	0	0	0	0	0	0	0	17.1	0	0
8	0	0	0	0	0	0	3.7	0	0	0	0	0
9	0	0	0	0	0	0	.3	0	0	.1	.2	0
10	0	0	0	0	0	0	.3	0	0	.1	.2	0
11	0	0	0	0	0	0	.2	0	0	.1	.2	0
12	0	0	0	0	0	0	.2	0	0	0	.1	0
13	0	0	0	0	0	0	.2	0	0	0	.1	0
14	0	0	0	0	0	0	.2	0	0	0	.1	0
15	0	0	0	0	0	0	.1	0	0	0	0	0
16	0	0	0	0	0	0	.2	0	0	.1	0	0
17	0	0	0	0	0	0	.1	0	0	.1	0	0
18	0	0	0	0	0	0	0	0	0	0	.1	0
19	0	0	0	0	0	0	0	0	0	.2	.1	0
20	0	0	0	0	0	0	0	0	0	.1	.1	0
21	0	0	0	0	0	0	0	0	0	.1	.1	0
22	0	0	0	0	0	0	0	0	0	.2	.2	0
23	0	0	0	0	0	0	0	0	0	.1	.1	0
24	0	0	0	0	0	0	0	0	0	.1	.1	0
25	0	0	0	0	0	0	0	0	0	.1	.1	0
26	0	0	0	0	0	0	0	0	0	.2	.1	0
27	0	0	0	0	0	0	.1	0	0	.2	.1	0
28	0	0	0	0	0	0	.1	0	0	.2	.1	0
29	0	0	0	0	0	0	.1	0	0	.1	.1	0
30	0	0	0	0	0	0	.1	0	0	.1	.1	0
31	0	0	0	0	0	0	0	0	0	.1	.1	0
Sum	0	0	0	0	0	0	5.9	0	0	19.4	2.9	2.4
Current Year 1984									Period 1939-1984			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0	0		0		0	0	656	2,860	0		
Feb.	0	0		0		0	0	570	2,510	0		
Mar.	0	0		0		0	0	521	1,660	0		
Apr.	0	0		0		0	0	550	1,940	0		
May	0	0		0		0	0	681	2,470	0		
June	0	0		0		0	0	595	2,350	0		
July	1.40	0	8	36.0	1 1	0	.2	11.7	514	1,950	0	
Aug.	.11	0	7	.5	1 1	0	0	0	540	2,530	0	
Sept.	0	0		0		0	0	0	484	2,180	0	
Oct.	2.52	0	7	117	1 1	0	.6	38.5	588	2,100	0	
Nov.	.23	0	6	1.7	1 7	0	.1	5.8	630	2,380	0	
Dec.	2.79	0	3	79.6	1 4	0	.1	4.8	750	2,680	0	
Yearly	2.79	0		117		0	0.1	60.8	7,139	24,370	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.85	0		3.31		0	0	75.0	8,805	30,060	0	

1 And other days

EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 300 feet (91.4 m) north of the international boundary near San Luis, Arizona and 1.5 miles (2.4 km) east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder moved west 100 feet (30.5 m) to a temporary bypass channel. On April 7, 1978 recorder was moved back to original site.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1984. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the limitrophe section of the Colorado River.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.1	11.1	8.5	1.1	1.3	4.9	9.4	8.7	2.4	0.8	4.2	2.9
2	6.0	5.4	9.1	3.5	9.7	2.4	2.4	7.7	0	3.2	9.8	4.7
3	1.9	11.0	2.4	5.2	10.7	3.8	1.4	7.1	9.7	.8	11.5	2.2
4	3.8	11.0	9.6	7.0	10.2	17.5	3.1	6.4	7.4	.7	10.4	.5
5	4.6	5.0	4.4	4.3	6.2	13.8	8.0	4.9	8.7	2.3	15.3	1.4
6	7.4	4.4	1.7	7.8	8.0	11.7	1.6	11.4	12.7	12.5	2.0	.4
7	6.0	3.1	9.2	15.0	7.0	1.5	.4	3.8	10.6	4.3	.7	11.3
8	6.1	1.5	14.7	12.2	5.0	12.8	.6	1.8	8.8	14.0	.4	11.5
9	3.0	.9	1.6	8.4	3.7	6.6	3.4	5.4	12.8	16.9	2.8	8.9
10	2.0	6.6	4.4	9.5	1.7	7.3	3.5	7.3	10.2	7.4	4.8	13.0
11	1.0	3.4	2.6	10.2	6.3	3.2	2.3	5.4	3.0	4.5	6.2	22.1
12	1.0	3.3	5.7	5.0	5.6	9.0	.3	8.0	4.2	2.2	18.1	5.7
13	1.5	5.5	3.8	2.5	4.1	4.6	1.0	5.3	.2	4.6	12.8	5.1
14	3.2	3.4	1.3	.4	7.1	1.6	7.8	2.7	4.8	6.7	10.2	9.3
15	1.2	1.9	1.3	2.1	1.6	2.7	1.1	.5	13.4	20.6	7.5	1.1
16	8.5	.7	7.6	10.8	2.6	5.1	9.2	.1	5.2	14.0	4.2	3.1
17	4.2	2.8	5.0	3.0	10.4	8.7	3.7	6.3	1.9	1.9	15.4	10.2
18	4.8	14.6	20.2	.5	3.2	1.9	5.5	10.9	.8	1.6	17.4	3.2
19	5.7	15.6	9.3	.2	4.0	1.0	4.2	15.0	3.3	14.9	11.8	2.3
20	3.2	6.1	1.0	0	1.6	.2	3.3	3.6	3.8	9.5	9.6	2.4
21	1.7	3.2	.4	1.4	5.5	2.3	7.2	4.4	.5	8.1	8.6	3.2
22	5.3	1.7	.2	.7	7.9	8.9	11.8	.6	2.4	12.5	18.1	5.4
23	2.7	2.2	0	7.4	3.3	4.3	.6	1.9	2.3	9.6	9.9	6.7
24	.5	2.3	.3	1.2	2.6	.5	2.1	10.5	12.2	6.8	5.1	6.8
25	.4	7.3	3.2	1.5	2.4	5.1	4.2	2.9	10.8	3.6	13.7	7.6
26	6.1	1.2	3.4	1.7	4.2	5.4	.4	5.8	12.0	.9	5.0	4.5
27	10.6	1.4	9.5	2.4	7.9	7.6	10.1	7.9	4.0	3.6	1.2	5.4
28	4.8	1.7	5.9	1.9	7.3	2.4	11.1	2.3	1.7	.7	6.9	6.8
29	4.4	.5	1.3	1.0	1.2	15.2	6.5	1.7	.8	3.0	17.0	19.4
30	5.5	2.4	2.4	4.8	.9	13.3	6.7	1.9	3.7	5.2	7.8	17.2
31	1.5		3.4		1.8		6.4	2.3		7.8		16.2
Sum	123.7	138.8	153.4	132.7	155.0	185.3	139.3	164.5	174.3	205.1	268.4	220.5
Current Year 1984									Period 1935-1984			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum	
							High	Low				Day
Jan.	0.74	0.02	16	20.5	26	0.2	4.0	245	1,018	3,360	90.0	
Feb.	.87	.04	28	27.1	28	.4	4.8	275	858	3,170	133	
Mar.	1.14	0	13	41.6	122	0	4.9	304	986	2,920	154	
Apr.	1.02	0	7	35.1	119	0	4.4	263	959	3,170	175	
May	.70	.05	12	18.5	116	.5	5.0	307	1,060	3,040	228	
June	.99	0	4	33.5	120	0	6.2	368	904	3,660	161	
July	.90	0	22	28.7	19	0	4.5	276	972	3,590	170	
Aug.	.75	0	19	21.0	116	0	5.3	326	992	3,960	159	
Sept.	.92	0	6	29.8	11	0	5.8	346	942	3,170	159	
Oct.	1.09	.01	19	38.9	9	.1	6.6	407	985	3,280	307	
Nov.	.92	.01	4	29.8	9	.1	8.9	532	1,067	3,570	241	
Dec.	1.09	.04	7	38.9	14	.4	7.1	437	1,035	3,080	247	
Yearly	1.14	0		41.6		0	5.6	4,036	11,778	38,310	3,026	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.35	0		1.18		0	0.16	5,040	14,528	47,255	3,733	

1 And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay, with flow meters in the four discharge pipes at the Boundary Pumping Plant on the Main Drain about 200 feet (61 m) north of the international boundary near San Luis, Arizona, 1.3 miles (2.1 km) east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 (3.05) to 12 feet (3.66 m) at the pumping plant. Prior to April 1, 1969, discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969, discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges, June 1919 through 1951; daily discharges January 1952 through 1984.

REMARKS: Flows in the Main Drain are principally drainage waters from the Valley Division of the Yuma Project. The Main Drain, the East Main Canal Wasteway, West Main Canal Wasteway, and 242 Lateral discharge into Mexico at the international land boundary near San Luis, Sonora. The water is used for irrigation in Mexico on the left (Sonora) bank of the Colorado River and is considered as part of the volumes arriving at the limitrophe section of the river.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	127	131	131	155	130	134	133	127	138	127	153	144
2	117	133	133	146	138	131	129	105	148	134	155	139
3	123	140	148	136	135	126	136	112	136	144	163	137
4	121	127	139	139	129	117	139	123	137	154	169	119
5	138	134	133	140	130	146	142	131	135	156	163	121
6	134	128	120	139	138	134	144	129	138	152	140	129
7	128	132	124	146	136	155	140	123	137	140	145	137
8	130	130	115	129	139	148	136	120	138	159	137	147
9	126	132	120	139	138	153	137	117	138	160	137	137
10	119	134	128	128	138	107	130	125	136	171	163	145
11	119	145	137	128	160	113	135	134	137	162	165	147
12	117	135	135	134	153	128	131	132	136	165	148	137
13	134	135	126	132	145	136	139	118	149	155	146	127
14	129	138	128	134	145	129	130 *	143	143	146	152	131
15	132	136	132	148	137	142	130 *	133	143	154	153	130
16	122	136	143	133	124	142	130 *	130	137	151	154	137
17	122	144	142	135	139	149	134	130	132	139	139	134
18	118	143	178	134	135	144	133	134	129	159	155	117
19	127	144	142	130	144	142	134	138	141	159	165	133
20	135	155	135	131	142	130	136	143	141	144	153	126
21	122	138	137	135	143	134	127	138	141	155	162	131
22	125	135	134	129	137	144	178	129	137	148	146	131
23	116	135	147	129	137	141	111	132	133	152	168	139
24	125	129	138	126	136	138	113	138	140	149	155	126
25	128	141	131	135	148	144	117	123	145	148	148	119
26	139	135	144	128	140	139	140	102	157	148	141	136
27	126	141	134	145	157	139	126	106	148	149	134	147
28	139	129	133	148	138	137	136	129	153	138	138	143
29	135	126	128	145	128	136	130	130	134	156	133	118
30	129	133	143	134	145	137	145	126	130	143	134	120
31	129	145	145	136	136	118	118	137	137	150	108	108

Sum	3,931	3,941	4,193	4,099	4,309	4,103	4,131	3,937	4,187	4,567	4,514	4,092
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Month	Current Year 1984							Period 1935-1984			
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			126	139	23	116	127	7,797	7,567	11,203	1,740
Feb.			20	155	29	126	136	7,817	7,438	11,988	1,640
Mar.			18	178	8	115	135	8,317	8,549	12,430	1,940
Apr.			1	155	24	126	137	8,130	8,402	11,890	1,920
May			11	160	16	124	139	8,547	8,611	13,140	1,950
June			7	155	10	107	137	8,138	8,008	12,040	2,290
July			22	178	23	111	133	8,194	7,949	11,830	2,530
Aug.			114	143	26	102	127	7,809	7,913	11,960	2,560
Sept.			26	157	18	129	140	8,305	7,397	11,568	2,280
Oct.			10	171	1	127	151	9,257	8,785	12,385	2,940
Nov.			4	169	29	133	150	8,953	8,372	12,010	2,800
Dec.			1	147	31	108	132	8,116	8,031	11,480	2,450
Yearly				178		102	137	99,380	97,522	139,380	27,040
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
			5.04		2.89	3.88		122,593	120,291	171,922	33,353

Ø Mean daily

! And other days

▪ Partly estimated

WEST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder located about 0.3 mile (0.5 km) upstream from outlet to Yuma Main Drain, which is 175 feet (53.3 m) upstream from East Main Canal Wasteway outlet and 0.4 mile (0.6 km) west of San Luis, Arizona. Prior to August 1, 1975, the recorder was located about 150 feet (45.7 m) upstream from outlet to Yuma Main Drain.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements. Records available: February 23, 1971 through 1984.

REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.5	3.0	8.0	19.2	2.9	8.6	5.0	1.6	0.4	0.9	3.1	4.3
2	2.2	14.1	3.0	21.6	7.9	6.7	8.6	.6	9.8	.6	3.1	5.7
3	1.1	5.7	2.8	4.7	5.0	6.5	5.4	.8	1.7	.1	2.4	9.3
4	11.3	20.9	19.3	1.0	8.2	15.8	2.0	6.3	4.6	.2	9.7	1.7
5	1.9	19.5	20.6	5.8	4.9	14.2	6.1	6.7	6.2	1.0	26.9	1.1
6	7.2	21.8	3.6	11.2	6.8	8.4	2.8	16.1	1.4	3.5	3.9	.5
7	11.1	5.1	.9	10.2	.7	6.1	1.0	2.3	.9	12.3	1.1	4.8
8	10.5	1.1	.4	3.1	5.3	12.0	4.4	.4	3.1	6.6	.4	9.0
9	11.8	.5	4.1	5.7	2.1	10.0	4.1	.1	2.0	.9	1.7	19.3
10	11.3	9.0	7.6	1.7	.8	7.4	2.2	1.4	5.5	.1	3.3	14.8
11	2.1	12.0	6.3	2.3	.4	4.3	.5	3.0	6.4	3.0	2.8	10.0
12	.8	8.3	7.0	.4	9.1	7.6	.7	1.5	4.2	11.8	8.1	7.4
13	.8	.3	4.1	4.2	22.3	3.5	2.6	2.7	2.3	5.9	6.3	3.3
14	16.0	13.5	.4	6.1	27.6	5.1	3.1	4.8	2.7	10.0	1.3	1.7
15	2.1	10.6	5.4	5.1	4.5	4.4	1.5	3.4	2.2	5.9	5.5	.9
16	8.6	2.2	3.9	6.9	1.0	6.3	2.4	2.6	2.8	2.1	7.1	2.0
17	2.5	8.3	.2	1.0	1.1	1.4	1.7	7.4	2.6	4.9	13.7	3.6
18	1.5	5.2	1.5	6.1	3.9	1.7	4.5	8.7	2.2	1.7	9.9	.4
19	2.4	6.5	5.0	6.6	.9	4.3	3.3	4.0	2.0	9.9	13.2	.2
20	2.4	5.5	13.2	7.2	2.0	6.2	7.4	3.0	1.4	11.8	11.2	3.1
21	5.5	9.5	6.3	5.5	9.0	10.9	9.3	1.8	1.1	7.0	1.6	4.0
22	8.2	12.0	3.1	5.3	1.6	2.5	10.8	11.0	1.0	4.2	3.6	10.3
23	12.4	2.6	1.3	1.1	2.8	3.4	3.0	5.6	3.1	1.9	2.3	7.7
24	9.9	1.5	3.0	1.4	4.1	3.8	1.4	2.8	7.9	.9	2.1	9.9
25	.5	5.3	.8	3.0	4.6	6.7	1.4	5.6	5.6	5.0	6.8	9.3
26	2.2	5.2	1.2	6.9	1.6	4.4	4.4	7.0	4.4	9.5	7.8	8.2
27	14.0	5.2	3.1	2.3	.2	.6	1.3	.9	2.1	5.3	7.5	10.9
28	13.6	.7	4.6	1.5	.1	2.7	1.8	4.7	4.5	2.7	1.0	15.0
29	.7	7.7	.3	1.1	0	2.0	3.1	2.2	9.7	5.7	.6	9.8
30	2.4		11.2	1.9	1.1	4.5	2.6	2.2	5.3	4.1	4.4	6.6
31	5.9		8.4		11.1		.9	.5		1.8		4.8
Sum	186.4	222.8	160.6	160.1	153.6	182.0	109.3	121.7	109.1	141.3	172.4	199.6
Current Year 1984									Period 1971-1984			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	1.82	0.03	16	35.7	29	0.2	6.0	370	352	565	125	
Feb.	2.20	.04	11	39.0	13	.2	7.7	442	435	681	164	
Mar.	2.50	0	4	49.2	18	0	5.2	319	471	939	203	
Apr.	2.22	.03	2	39.7	15	.2	5.3	318	355	664	164	
May	2.02	0	14	33.3	128	0	5.0	305	292	434	148	
June	1.92	0	21	30.3	27	0	6.1	361	294	480	95.6	
July	1.75	0	21	25.2	17	0	3.5	217	294	555	93.2	
Aug.	1.75	0	6	25.2	12	0	3.9	241	304	536	98.0	
Sept.	1.59	.01	8	20.8	22	0	3.6	216	361	768	190	
Oct.	1.91	0	7	30.0	12	0	4.6	280	365	728	133	
Nov.	2.07	0	5	34.9	1	0	5.7	342	370	541	161	
Dec.	2.01	0	9	33.0	118	0	6.4	396	377	610	188	
Yearly	2.50	0		49.2		0	5.3	3,807	4,271	6,229	2,829	
Yearly	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	0.76	0		1.39		0	0.15	4,696	5,268	7,583	3,490	

! And other days

242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 12-foot (3.7 m) Parshall flume located 100 feet (30.5 m) upstream from confluence of East Main Canal Wasteway, 110 feet (33.5 m) north of the southerly land boundary, and 1.4 miles (2.3 km) east of the Colorado River.

RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1984.

REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona.

Mean Daily Discharge in Second-Foot 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.8	5.7	3.2	6.4	4.4	4.2	5.1	0	20.7	8.3	0	0
2	4.6	4.0	5.2	4.6	4.4	1.3	3.1	0	20.8	5.1	1.8	0
3	4.3	2.5	3.9	6.5	4.1	5.7	0	0	21.0	0	5.2	0
4	4.7	1.0	5.0	5.8	3.7	5.3	0	0	21.0	0	.2	2.0
5	2.4	5.1	4.8	6.2	3.9	5.4	0	0	21.0	0	0	3.0
6	1.5	4.3	4.3	8.3	4.0	5.5	0	0	27.7	0	0	0
7	2.2	.5	3.0	7.7	4.5	3.0	0	0	33.8	0	0	0
8	4.9	2.2	4.0	3.6	4.4	0	0	0	33.9	0	0	0
9	4.1	2.0	8.8	3.6	4.9	0	0	0	34.1	0	0	0
10	4.7	2.4	8.2	4.0	4.7	0	0	0	33.9	0	0	2.4
11	5.2	2.9	7.6	3.5	2.5	0	0	0	34.4	0	1.0	6.2
12	4.9	5.8	6.7	3.6	0	0	0	0	34.1	0	4.3	3.8
13	2.8	3.4	9.0	4.1	0	0	0	0	15.2	0	2.9	.2
14	6.5	2.5	7.0	6.6	0	0	0	0	4.5	0	.2	0
15	7.5	1.8	6.6	5.1	0	0	0	0	13.8	.1	0	0
16	6.2	4.4	8.0	3.0	0	0	0	4.9	13.7	5.6	0	0
17	6.5	3.9	5.5	2.9	0	0	0	9.9	9.9	7.9	0	0
18	6.7	3.4	7.5	5.1	0	0	0	11.7	4.9	6.1	0	0
19	6.3	3.5	7.0	3.9	0	0	0	11.4	7.6	5.7	1.0	1.7
20	6.2	4.7	6.7	4.2	0	0	0	10.7	5.2	4.8	2.9	3.5
21	5.4	5.7	7.0	4.5	0	0	0	10.4	6.9	0	0	.1
22	5.4	5.9	7.4	5.0	0	0	0	7.2	10.8	0	0	0
23	5.7	3.5	8.9	5.1	0	0	0	14.3	7.4	.7	0	0
24	5.7	4.8	9.2	4.5	0	0	0	14.2	1.4	3.7	0	0
25	4.2	6.4	8.4	5.0	0	0	0	15.1	2.6	3.8	0	0
26	2.8	2.5	7.1	2.7	0	0	0	15.1	6.2	0	0	0
27	5.6	4.7	8.4	5.4	0	9.4	0	15.2	2.8	0	2.0	.1
28	4.4	5.0	10.2	5.3	0	13.7	0	14.5	6.0	0	3.0	.1
29	3.0	5.8	6.9	5.2	0	12.0	0	14.5	7.2	0	0	0
30	4.4		5.5	3.0	0	8.7	0	17.8	8.5	0	0	0
31	2.1		4.4		3.9		0	20.4		0		1.0
Sum		110.3		144.9		74.2		208.6		51.8		24.1
	147.7		206.4		49.4		8.2		471.0		24.5	

Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
							High	Low			
Jan.	0.35	0	19	9.0	! 5	0	4.8	293	586	2,761	0
Feb.	.36	0	24	9.4	! 7	0	3.8	219	504	2,257	0
Mar.	.51	.05	23	15.4	! 1	1.1	6.7	409	495	2,132	0
Apr.	.49	.06	3	14.5	! 26	1.4	4.3	287	593	2,681	0
May	.60	0	31	19.8	! 2	0	1.6	98.0	1,062	2,750	11.3
June	.54	0	27	16.9	! 2	0	2.5	147	1,012	2,800	21.4
July	.38	0	2	10.1	! 3	0	.3	16.3	1,001	3,020	16.3
Aug.	.61	0	25	24.6	! 1	0	6.7	414	741	2,073	0
Sept.	.86	0	11	41.4	! 14	0	15.7	934	926	2,326	0
Oct.	.28	0	17	9.0	! 1	0	1.7	103	750	2,711	0
Nov.	.28	0	3	6.7	! 1	0	.8	48.6	220	1,011	0
Dec.	.32	0	10	6.5	! 1	0	.8	47.8	688	2,962	0
Yearly	0.86	0		41.4		0	4.2	3,017	8,578	23,566	163
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.26	0		1.17		0	0.12	3,721	10,581	29,068	201

! And other days

TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway, West Main Canal Wasteway, 242 Lateral, and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sanchez Mejorada Canal near San Luis, Arizona.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: February 23, 1971 through 1984; 242 Lateral from November 1978 through 1984.

REMARKS: Descriptions and flows of the individual stations, East Main Canal Wasteway, West Main Canal Wasteway, the Yuma Main Drain, and 242 Lateral are published separately in this bulletin on pages 28, 30, 29, and 31.

Mean Daily Discharge in Second-Foot 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	142	151	151	182	139	152	152	137	162	137	160	151
2	130	156	150	176	160	141	143	113	179	143	170	149
3	130	159	157	152	155	142	143	120	168	145	182	148
4	141	160	173	153	151	156	144	136	170	155	189	123
5	147	164	163	156	145	179	156	143	171	159	205	126
6	150	158	130	166	157	160	148	156	180	168	146	130
7	147	141	137	179	148	166	141	129	182	157	147	153
8	152	135	134	148	154	173	141	122	184	180	138	168
9	145	135	134	157	149	170	144	122	187	178	142	165
10	137	152	148	143	145	122	136	134	186	178	171	175
11	127	163	154	144	169	120	138	142	181	170	175	185
12	124	152	154	143	168	145	132	142	178	179	178	154
13	139	144	143	143	171	144	143	126	167	166	168	136
14	155	157	137	147	180	136	141	150	155	163	164	142
15	143	150	145	160	143	149	133	137	172	181	166	132
16	145	143	162	154	128	153	142	138	159	173	165	142
17	135	159	154	142	150	159	139	155	146	154	168	148
18	131	166	207	146	142	148	143	165	137	168	182	121
19	141	170	163	141	149	147	142	168	154	190	191	137
20	147	171	156	142	146	136	147	160	151	170	177	135
21	135	156	151	146	158	147	144	155	150	170	172	138
22	144	155	145	140	146	155	201	148	151	165	168	147
23	137	143	157	143	143	149	115	154	146	164	180	153
24	141	138	150	133	143	142	116	166	162	160	162	143
25	133	160	143	144	155	156	123	147	164	160	168	136
26	150	144	156	139	146	149	145	130	180	158	154	149
27	156	152	155	155	155	157	137	130	157	158	145	163
28	162	136	154	157	145	156	149	150	165	141	149	165
29	143	140	136	152	129	165	140	148	152	165	151	147
30	141		152	153	136	172	146	148	148	152	146	144
31	138		161		153		125	160		150		130
Sum	4,388	4,410	4,712	4,536	4,668	4,546	4,389	4,431	4,944	5,067	4,979	4,535
Current Year 1984								Period 1935-1984				
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			28	162	12	124	142	8,705	9,523	12,131	2,123	
Feb.			20	171	1	135	152	8,753	9,235	12,970	2,023	
Mar.			18	207	6	130	152	9,349	10,501	13,704	2,322	
Apr.			1	182	24	133	151	8,998	10,310	12,982	2,117	
May			14	190	16	128	151	9,257	11,025	13,900	2,473	
June			5	179	11	120	151	9,014	10,218	12,570	2,525	
July			22	201	23	115	142	8,703	10,216	12,420	2,927	
Aug.			19	168	2	113	143	8,790	9,950	12,657	2,989	
Sept.			9	187	18	137	165	9,801	10,126	12,450	2,602	
Oct.			19	190	1	137	163	10,047	10,885	13,898	3,444	
Nov.			5	205	8	138	166	9,876	10,029	12,712	3,407	
Dec.			11	185	18	121	146	8,997	10,131	12,050	2,888	
Yearly				207		113	152	110,290	122,149	149,010	31,840	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				5.86		3.20	4.30	136,041	150,668	183,802	39,274	

∅ Mean daily

* Partly estimated

! And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder was located in Mexico on the right bank of the river about 1,000 feet (305 m) upstream from the southerly international boundary, 2 miles (3.2 km) west of San Luis, Arizona, and 21.9 miles (35.2 km) downstream from Morelos Dam. The zero of the gage was at mean sea level, U. S. C. & G. S. datum. This gage was destroyed on January 19, 1983. Temporary gages have been installed on the United States side and levels were established to insure continuous record.

RECORDS: Records obtained and furnished by the United States Section of the Commission. Computations by shifting control methods. Records available: Daily discharges, January 1950 through 1983; continuous record of gage heights, January 1947 through 1984. Monthly flows for this station have been derived for the period January 1935 through 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec) on August 19, 1983; maximum gage height, 84.84 feet (25.86 m) on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1955.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20,500*	20,800*	18,000*	13,300	11,000	15,000	18,700	19,100	16,200	16,200	17,000*	19,600
2	20,100*	20,400*	18,000*	13,300	11,400	15,400	19,000	18,500	16,500	16,200	17,600*	19,900
3	20,300*	20,500*	18,100*	13,200	11,800	15,800	18,700	18,200*	16,800	16,100	17,500*	20,100
4	20,100*	21,300*	18,000*	13,400	11,500	16,500	18,500	17,800*	16,300	15,700	17,000*	19,600
5	19,900*	22,600*	17,300*	13,500	11,700	16,800	18,000	17,800*	15,700	16,300	17,500*	19,500
6	20,100*	21,500*	16,300*	13,700	11,500	17,200	17,700	18,300*	14,600	17,100	17,900*	19,500
7	20,900	20,700*	15,900*	14,000	13,900	17,400	17,700	17,400*	14,800	17,500	17,900*	20,100
8	21,900	20,400*	15,900*	14,200	12,700*	18,800	17,500	16,500	14,800	17,400	17,300	20,800
9	23,600	20,000*	16,400*	14,400	12,200*	19,700	17,300	15,900	15,300	16,900	17,100	21,600
10	24,300	19,300*	16,600*	14,500	12,600*	19,900	16,300	15,500	15,300	16,900	17,300	22,000
11	24,900*	19,700*	16,500*	14,400	13,400*	19,400	16,400	14,800	15,200	16,900	17,200	23,000
12	22,900*	21,000*	16,500*	14,000	14,000*	19,100	16,700	15,200	15,400	16,700	17,000	23,000
13	23,700*	21,600*	16,200*	13,700	14,800*	18,900	16,800	15,600	15,500	16,800	17,100	22,300
14	24,300	20,400*	15,900*	13,400	15,400*	18,600*	17,700	15,000	16,100	16,800	16,700	22,300*
15	24,400	19,900*	15,600*	13,200	15,500*	18,400*	18,400	14,900	16,700	16,000	16,800	22,000*
16	24,200	19,400*	15,600	13,100	15,200*	18,700*	18,400	16,000*	16,800	15,000*	16,900	21,800*
17	23,600	19,500*	16,000	12,900	14,800	19,300*	18,400	16,200*	16,900	14,800*	17,200	21,500
18	23,200	20,400*	16,100	12,700	14,700	19,500*	18,800	16,900*	16,600	15,100*	17,400	21,300*
19	22,200	20,700*	15,900	12,500	15,400	18,600*	18,900	17,800*	16,800	14,900*	17,700	20,800
20	21,900	20,900*	15,500	12,100	16,100	18,500*	18,700	18,200*	16,600	15,000*	17,500	20,600*
21	22,400	19,700*	15,100	12,400	15,700	18,200*	19,100	17,900*	16,100	14,800*	17,700	20,900
22	22,800	19,500*	14,300	12,900	16,100	18,200*	20,000	18,800*	15,700	14,600*	18,200	20,900
23	22,500	19,200*	13,600	11,900	15,900	18,100	21,200	18,400	15,700	14,200	18,800*	20,900
24	22,100*	19,000*	13,600	10,400	15,900	18,600	20,900	18,500	15,200	14,800	19,200	20,600
25	21,700*	19,100*	13,500	10,400	15,800	18,200	19,300	18,400	15,000*	15,000	19,600*	21,200
26	21,500*	19,300*	13,100	10,500	16,000	17,800	19,800	19,400*	15,000*	17,200	20,200	21,500
27	21,900*	19,100*	12,700	10,500	16,700	18,400	19,900	18,000*	15,400*	17,400	20,300	20,300
28	22,100*	18,100*	12,900	9,550	16,500	18,200	20,100	16,600*	16,200*	17,500	19,900	21,700*
29	22,000*	18,100*	12,700	11,300	15,500	17,900	19,600	16,300	16,700	17,300	19,500	22,500*
30	21,800*		13,000	12,900	15,800	18,400	19,600	17,700*	16,500	16,900	19,300	22,700*
31	21,100*		13,200	15,600	15,600		19,500	16,600*		16,700		22,100*
Sum	587,900	582,100	478,000	382,260	445,300	543,500	578,100	531,900	476,100	500,500	538,400	655,300

Sum	587,900	582,100	478,000	382,260	445,300	543,500	578,100	531,900	476,100	500,500	538,400	655,300
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Month	Current Year 1984							Period 1935-1934				
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Low	Day	Feet	Acre-Feet	Average	Maximum	Minimum	
Jan.	81.72	80.79	10	24,400	2	19,900	22,200	1,364,430	350,159	1,672,000	0	
Feb.	81.61	80.35	5	23,100	9	17,500	20,100	1,154,578	286,068	1,385,000	0	
Mar.	80.64	79.92	3	18,200	27	12,600	15,400	948,099	232,518	1,127,000	798	
Apr.	83.47	79.48	10	14,500	28	9,420	12,700	758,202	158,680	758,202	0	
May	84.25	82.90	27	16,800	1	10,900	14,400	853,240	219,214	1,160,000	0	
June	84.32	83.37	10	20,100	1	14,900	18,100	1,078,016	186,588	1,180,000	0	
July	84.37	83.42	23	21,500	110	16,300	18,600	1,146,645	162,063	1,477,091	0	
Aug.	84.57	83.22	26	19,900	11	14,700	17,200	1,055,008	179,465	1,705,190	0	
Sept.	83.05	83.16	3	17,100	6	14,300	15,900	944,331	199,674	1,586,380	0	
Oct.	83.83	83.09	8	17,800	23	14,000	16,100	992,727	243,252	1,738,999	0	
Nov.	83.14	82.22	126	20,600	16	16,500	17,900	1,067,901	290,097	1,428,000	0	
Dec.	84.42	82.63	11	23,500	22	18,900	21,100	1,299,769	351,528	1,839,000	0	
Yearly	84.57	79.48		24,400		9,420	17,500	12,592,946	2,957,411	12,692,946	9,570	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	25.78	24.23		691		267	496	15,656,495	3,524,559	15,656,495	11,804	

* Partly estimated

† Estimated

‡ And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 80.89	* 81.16	* 80.49	79.93	82.92	83.73	83.79	83.87	83.73	83.48	* 83.26	82.91
2	* 80.82	* 81.08	* 80.49	79.93	83.02	83.85	83.98	83.59	83.79	83.50	* 83.25	82.95
3	* 80.39	* 81.11	* 80.56	79.89	83.14	83.89	83.92	* 83.58	83.87	83.47	* 82.95	82.96
4	* 80.87	* 81.27	* 83.61	79.85	83.10	83.95	83.94	* 83.47	81.76	83.37	* 82.67	82.82
5	* 80.85	* 81.51	* 80.50	79.77	83.12	83.94	83.82	* 83.46	83.60	83.45	* 82.67	82.77
6	* 80.91	* 81.30	* 80.34	79.74	83.06	83.97	83.75	* 83.54	83.32	83.70	* 82.65	82.72
7	81.08	* 81.15	* 80.29	79.77	83.63	83.93	83.75	* 83.23	83.38	83.80	* 82.55	82.74
8	81.28	* 81.07	* 80.34	79.77	* 83.37	84.17	83.71	83.30	83.39	83.72	82.45	82.76
9	81.58	* 80.92	* 80.46	79.77	* 83.24	84.27	83.66	83.39	81.52	83.57	82.37	82.85
10	81.69	* 80.69	* 80.53	79.77	* 83.36	84.24	83.43	83.40	83.51	83.61	82.40	82.90
11	* 81.64	* 80.75	* 80.55	79.78	* 83.51	84.00	83.45	83.39	83.48	83.62	82.40	83.08
12	* 81.34	* 81.02	* 80.57	79.76	* 83.64	83.85	83.51	83.57	83.53	83.58	82.34	83.14
13	* 81.44	* 81.13	* 80.49	79.75	* 83.84	83.82	83.53	83.67	83.52	83.61	82.36	83.12
14	81.54	* 80.89	* 80.44	79.76	* 83.93	* 83.74	83.75	83.51	83.58	83.62	82.28	* 83.23
15	81.55	* 80.78	* 80.36	79.78	* 84.00	* 83.69	83.91	83.50	83.63	83.42	82.29	* 83.27
16	81.53	* 80.66	80.35	79.79	* 83.93	* 83.68	83.90	* 83.77	83.66	* 83.17	82.33	* 83.31
17	81.43	* 80.69	80.44	79.77	83.83	* 83.74	83.92	* 83.81	83.66	* 83.12	82.40	* 83.42
18	81.35	* 80.89	80.43	79.75	83.82	* 83.77	84.00	* 83.95	83.50	* 83.19	82.45	* 83.62
19	81.18	* 80.94	80.43	79.72	83.95	* 83.46	84.02	* 84.12	83.63	* 83.15	82.50	* 83.65
20	81.11	* 80.98	80.39	79.70	84.07	* 83.41	83.95	* 84.19	83.58	* 83.17	82.47	* 83.67
21	81.20	* 80.74	80.38	79.80	84.08	* 83.37	84.01	* 84.12	83.47	* 83.22	82.50	84.00
22	81.28	* 80.70	80.22	79.92	83.99	* 83.52	84.12	* 84.32	83.37	* 83.28	82.62	83.83
23	81.23	* 80.62	80.13	79.75	84.02	83.58	84.30	84.25	83.27	83.17	* 82.77	83.87
24	* 81.15	* 80.59	80.12	79.50	84.04	83.63	84.26	84.25	83.24	83.31	* 82.85	84.00
25	* 81.07	* 80.61	80.10	79.53	84.09	83.63	84.02	84.25	* 83.20	83.35	* 82.93	84.12
26	* 81.04	* 80.67	80.06	79.62	84.05	83.56	84.01	* 84.46	* 83.18	83.77	83.07	84.18
27	* 81.20	* 80.66	79.98	82.58	84.22	83.63	84.03	* 84.15	* 83.29	83.66	83.09	84.03
28	* 81.34	* 80.48	79.94	82.37	83.16	83.65	84.07	* 83.83	* 83.49	83.60	83.00	* 84.22
29	* 81.40	* 80.49	79.94	82.91	83.95	83.58	83.98	83.75	83.61	83.43	82.91	* 84.37
30	* 81.36		79.92	83.36	84.01	83.68	83.98	* 84.09	83.57	83.29	82.88	* 84.41
31	* 81.22		79.92		83.95		83.96	* 83.82		83.24		* 84.30
Avg.	81.24	80.88	80.32	80.17	83.71	83.77	83.88	83.80	83.52	83.44	82.66	83.46

* Partly estimated

* Estimated

Note: Due to changing river conditions, the recorder was moved 1 mile upstream from old location on April 27.

WELLTON-MOHAWK BYPASS DRAIN AT SOUTHERLY INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and Parshall flume located 80 feet (24.4 m) upstream from the southerly land boundary, 550 feet (168 m) east of the Colorado River, and 1.8 miles (2.9 km) west of San Luis, Arizona. The zero of the gage has not been determined.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1984.

REMARKS: Pursuant to Minute No. 242 of the Commission, a bypass drain of the Wellton-Mohawk extension channel was constructed from Morelos Dam to the Santa Clara Slough in Mexico along the left bank of the Colorado River.

Mean Daily Discharge in Second-Foot 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	225 #	163 #	170 #	187	200	178	171	159				
2	219 #	153 #	171 #	187	200	180	156	162	160	172	176	169
3	196 #	158 #	171 #	186	200	183	158	163	162	169	176	167
4	194 #	156 #	171 #	191	193	172	163	155	161	169	172	171
5	183 #	165 #	164 #	195	193	167	162	145	160	169	171	172
6	173 #	173 #	156 #	200	196	172	161	139	159	168	169	171
7	# 71.4	167 #	154 #	204	194	174	153	149	158	165	169	171
8	# 94.0	156 #	151 #	195	195	174	148	149	157	162	162	169
9	160 #	140 #	154 #	196	196	183	156	153	151	158	158	174
10	191 #	121 #	158 #	196	193	187	154	156	144	164	154	169
11	206 #	122 #	158 #	194	189	185	155	154	140	171	153	169
12	164 #	126 #	170	193	194	185	158	153	141	170	156	175
13	166 #	148 #	192	194	198	185	160	153	145	171	160	179
14	196 #	149 #	188	196	196	196	175	153	148	168	150	176
15	200 #	155 #	187	194	198	161	159	149	147	167	160	171
16	206 #	207 #	188	183	198	158	158	146	151	165	158	169
17	208 #	212 #	193	178	200	158	156	146	151	158	157	172
18	208 #	204 #	189	189	200	156	159	147	153	164	159	176
19	204 #	208 #	189	190	196	160	173	145	156	165	156	180
20	191 #	214 #	188	187	191	187	194	135	172	165	160	183
21	183 #	196 #	187	189	184	185	199	134	171	164	162	183
22	187 #	172 #	184	196	185	178	196	132	170	170	163	181
23	191 #	159 #	190	196	168	181	193	132	176	177	167	176
24	196 #	160 #	191	195	169	183	179	133	172	172	168	186
25	196 #	180 #	188	198	172	183	160	132	176	172	161	194
26	194 #	176 #	189	193	167	181	153	147	186	176	164	194
27	204 #	180 #	183	185	169	174	150	147	185	176	162	202
28	198 #	174 #	186	191	172	169	158	150	173	176	162	194
29	189 #	170 #	172	198	174	168	163	155	172	176	163	191
30	163 #		183	200	174	171	163	153	172	176	165	187
31	150 #		186		174		160	154		182		190
Sum		4,874		5,776		5,274		4,580		5,242		5,530
	5,706.4		5,501		5,828		5,103		4,831		4,899	
Current Year 1984												
Period 1977-1984												
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	1.95	0.88	1	238	7	64.4	184	11,318	13,231	17,542	9,241	
Feb.	1.83	1.27	17	218	111	118	168	9,667	12,161	14,896	9,667	
Mar.	1.82	1.48	12	212	8	151	177	10,911	13,970	17,427	10,911	
Apr.	1.80	1.60	6	208	16	171	193	11,457	13,751	16,711	11,203	
May	1.77	1.50	3	202	23	156	188	11,560	14,356	16,808	11,560	
June	1.82	1.47	14	218	19	153	176	10,451	13,406	16,056	10,461	
July	1.78	1.39	121	210	17	139	165	10,122	14,046	18,026	10,122	
Aug.	1.55	1.30	3	167	25	124	148	9,084	14,358	18,196	9,084	
Sept.	1.68	1.40	126	191	110	140	161	9,582	13,209	19,083	6,780	
Oct.	1.69	1.49	31	191	17	154	169	10,397	13,768	19,133	6,343	
Nov.	1.62	1.48	11	178	110	153	163	9,717	12,618	16,980	6,047	
Dec.	1.88	1.56	27	224	11	167	178	10,969	12,775	18,256	6,216	
Yearly	1.95	0.88		238		64.4	173	125,245	161,649	180,374	125,245	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.59	0.27		6.74		1.82	4.90	154,487	199,391	222,488	154,487	

Flow from Gila River due to its flooding of the conveyance channel upstream of Yuma, Arizona
 # March 1, 1984 to March 11, 1984, flow is from Gila River; thereafter, flow is from Wellton-Mohawk drainage wells
 ! And other days

WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the canal wasteway immediately upstream from where it discharges into the Colorado River, 0.6 mile (1.0 km) downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 16.8 miles (27.0 km) downstream from Morelos Dam, and 820 feet (250 m) south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Agriculture and Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1984.

REMARKS: The Colorado River Irrigation District transports water for irrigation of land on the left bank of the Colorado River by the Central Feeder Canal to a point called Kilometer 27. At this point, flows may be returned to the river through the wasteway or diverted to the Bacanora-Monumentos Canal system through the Sanchez Mejorada Siphon, which was placed in operation on June 28, 1963. As part of the rehabilitation works, started in 1968, of the Colorado River Irrigation District, the Canal de Conexion was enlarged and lined, and is now known as the Central Feeder Canal.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1956-1984		
		Average	Maximum	Minimum
January	46,720	9,209	69,527	0
February	16,327	3,596	23,550	0
March	12,269	5,840	35,492	0
April	22,578	11,389	68,714	0
May	31,971	9,775	58,365	0
June	15,757	9,696	50,025	0
July	35,812	12,310	46,139	0
August	22,603	16,718	107,162	0
September	28,726	13,164	68,053	0
October	65,577	13,125	110,417	0
November	13,863	12,427	99,044	0
December	12,863	8,904	70,213	0
Yearly	325,067	120,647	509,407	0
	Thousands of Cubic Meters			
	400,966	148,816	628,347	0

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Avg.												

NO RECORD DURING 1984

WASTEWAY TO COLORADO RIVER AT KILOMETER 38 IN MEXICO

DESCRIPTION: Wasteway to the Colorado River on the left bank of new Barrote Canal at old dam and bridge at Kilometer 18+251 (old Kilometer 38+000). The wasteway is located in the Colonia Bojorquez 0.8 mile (1.3 km) upstream from the Sonora-Baja California railroad bridge, 3.7 miles (5.9 km) downstream from the Miguel C. Rodriguez gaging station, and 28.1 miles (45.3 km) downstream from the southerly international boundary.

RECORDS: The records are computed by the Ministry of Agriculture and Hydraulic Resources and based upon gate openings. Records available: January 1964 through 1984.

REMARKS: The wasteway structure on the left bank of the Colorado River has two manually operated radial gates 9.8 feet (3.0 m) wide. It discharges into a dirt canal 656 feet (200 m) long with a total capacity of 459 second-feet (13.0 m³/sec) which discharges to the river.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1964-1984		
		Average	Maximum	Minimum
January	7,771	1,401	8,546	0
February	5,200	938	7,653	0
March	2,419	452	4,809	0
April	1,502	175	1,992	0
May	11,549	762	11,549	0
June	5,421	462	5,421	0
July	7,389	498	7,389	0
August	2,001	974	14,402	0
September	5,271	1,177	10,007	0
October	15,058	3,259	23,242	0
November	9,814	2,283	20,481	0
December	9,733	1,925	10,847	0
	83,129	14,304	83,688	0
Yearly	Thousands of Cubic Meters			
	102,538	17,644	103,228	0

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

Data are presented below for all large storage reservoirs in the Colorado River basin below Lee's Ferry, all of which are located in the United States. The monthly figures represent usable contents on the last day of the month, in thousands of acre-feet. The capacities indicated are usable capacities at the top of the spillway gates in closed position for those dams having controlled spillways; for all others, capacities indicated are at spillway level. Records furnished by the U. S. Geological Survey.

In Thousands of Acre-Feet

Month	LAKE MEAD (Capacity 26,159.0)		LAKE MOHAVE (Capacity 1,810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28,588.4)	
	1984	Average 1935-1984	1984	Average 1951-1984	1984	Average 1939-1984	1984	Estimated Average
Jan.	24,370	17,798	1,692	1,657	554.1	553.4	26,616.1	20,008.4
Feb.	24,046	17,607	1,725	1,674	557.9	555.9	26,328.9	19,836.9
Mar.	23,804	17,347	1,708	1,673	549.5	570.4	26,061.5	19,590.4
Apr.	23,784	17,419	1,521	1,667	579.2	600.9	25,884.2	19,686.9
May	24,358	18,206	1,608	1,729	569.4	603.3	26,535.4	20,538.3
June	24,726	19,352	1,636	1,628	563.9	602.3	26,925.9	21,582.3
July	24,841	19,532	1,690	1,505	578.1	590.8	27,109.1	21,627.8
Aug.	24,609	19,328	1,686	1,455	591.6	574.5	26,886.6	21,357.5
Sept.	24,406	19,080	1,584	1,430	588.0	570.3	26,578.0	21,080.3
Oct.	24,190	18,856	1,540	1,442	538.2	569.8	26,268.2	20,867.8
Nov.	24,139	18,681	1,492	1,515	555.0	560.1	26,186.0	20,756.1
Dec.	24,081	18,487	1,506	1,604	581.0	555.9	26,168.0	20,646.9
Avg.	24,280	18,474	1,616	1,582	567.2	575.6	26,463.2	20,631.6
Max.	24,841	I 27,780	1,725	I 1,808	591.6	I 688.7	27,109.1	I 29,132.3
Min.	23,784	* 10,727	1,492	!! 1,186	538.2	!! 76.9	25,884.2	!! 13,062.6

I Maximum end of month storage for period of record
!! Minimum end of month storage for period of record

* Minimum end of month storage since 1940

SUSPENDED SILT

The following tables are based on determinations of gravimetric percentages of dry silt in water samples taken at each station by one of the following methods.

A. By lowering a D-43 depth integrating sampler at verticals located at centers of sections of equal discharge in the river cross section, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

B. By lowering a D-43 depth integrating sampler at verticals located at centers of each span of the service bridge across the Alamo Canal, being careful to approach but not strike the bottom. The samples obtained in the section are combined to comprise a composite sample for that date.

C. By sampling at the stream surface with a separate bottle at each of three points, spaced 1/6, 1/2, and 5/6 of the stream width. The gravimetric percentage in each sample is determined, a coefficient of 1.10 is applied to the average of the three, and the product applied to the volume of the stream flow represented by that set of samples.

For ease of comparison, the assumption is made that 1,847 tons of deposited silt would occupy a volume of one acre-foot, or one cubic foot of deposited silt would weigh 85 pounds.

Month	1984						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Colorado River at Northerly International Boundary

										Period 1956-1984	
Jan.	2,130,013,700	696,300	4	0.0326	0.0383	0.0277	377	37.4	377	1.4	
Feb.	1,879,059,400	767,400	5	.0408	.0418	.0387	415	26.9	415	1.6	
Mar.	1,711,935,000	781,300	4	.0456	.0680	.0366	423	52.2	499	6.3	
Apr.	1,457,206,800	577,100	4	.0395	.0485	.0327	312	45.8	434	7.3	
May	1,490,631,400	833,600	5	.0558	.0655	.0515	451	29.3	451	2.2	
June	1,795,766,300	1,291,900	4	.0718	.0836	.0589	699	45.4	699	2.5	
July	1,970,168,100	1,332,900	4	.0675	.0823	.0625	722	60.8	722	2.5	
Aug.	1,809,294,900	1,139,600	5	.0629	.0851	.0503	617	51.6	617	3.8	
Sept.	1,578,776,100	956,900	4	.0605	.0790	.0401	518	32.3	518	1.6	
Oct.	1,598,184,000	835,400	5	.0522	.0935	.0346	452	27.0	452	.5	
Nov.	1,632,956,700	1,273,000	4	.0778	.0980	.0511	689	39.3	689	.5	
Dec.	1,915,987,500	1,320,100	4	.0688	.0939	.0565	715	50.6	715	.6	
Yearly	20,969,929,900	11,805,500	52	0.0562	0.0980	0.0277	6,390	499	6,390	37.1	

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

Intake Canal at Morelos Diversion Structure

										Period 1952-1984	
Jan.	270,833,000	37,212	4	0.0137	0.0214	0.0084	20.1	6.7	22.3	0.2	
Feb.	271,062,000	54,967	5	.0203	.0325	.0058	29.7	7.9	45.2	.9	
Mar.	409,054,000	145,956	4	.0357	.0979	.0054	78.8	40.5	154	5.3	
Apr.	426,579,000	438,121	4	.1027	.1898	.0355	237	41.3	237	7.5	
May	285,967,000	114,392	5	.0400	.0904	.0117	61.8	11.4	61.8	1.5	
June	326,958,000	167,612	4	.0513	.0712	.0244	90.6	27.2	109	2.3	
July	408,960,000	106,088	4	.0259	.0434	.0083	57.3	37.5	156	3.9	
Aug.	379,054,000	174,289	6	.0460	.1448	.0120	94.1	36.1	135	3.8	
Sept.	294,957,000	96,763	4	.0328	.0550	.0151	52.3	16.0	64.7	1.9	
Oct.	247,576,000	32,793	5	.0132	.0189	.0054	17.7	5.3	26.7	.3	
Nov.	162,079,000	101,630	4	.0627	.1246	.0200	54.9	4.7	54.9	.2	
Dec.	154,993,000	27,782	4	.0179	.0307	.0098	15.0	6.6	23.7	1.1	
Yearly	3,638,072,000	1,497,603	53	0.0412	0.1898	0.0054	809.0	241.1	809.0	51.4	

Samples and analyses by Mexican Section, Method B

Colorado River at Southerly International Boundary

										Period 1946-1984	
Jan.	1,854,260,400	2,474,600	1	0.1332	0.1463	0.1290	1,340				
Feb.	1,569,071,500	1,961,300	1	.1288	.1353	.1034	1,062				
Mar.	1,288,466,500	1,162,800	1	.0901	.1071	.0735	630				
Apr.	1,030,396,500	660,800	1	.0640	.0730	.0514	358				
May	1,200,323,200	663,000	1	.0551	.0683	.0444	359				
June	1,465,023,700	1,167,600	1	.0796	.0879	.0693	632				
July	1,558,290,600	1,437,400	1	.0921	.0977	.0854	778				
Aug.	1,433,755,900	1,089,700	1	.0759	.0845	.0695	590				
Sept.	1,283,345,800	951,600	1	.0740	.0897	.0650	515				
Oct.	1,349,116,000	1,478,900	1	.1094	.1236	.0910	801				
Nov.	1,451,277,500	1,903,200	1	.1309	.1369	.1240	1,030				
Dec.	1,766,386,100	2,051,400	1	.1159	.1301	.1131	1,111				
Yearly	17,249,713,700	17,002,300	12	0.0984	0.1463	0.0444	9,206				

Samples by U. S. Section and analyses by United States Bureau of Reclamation, Method A

CHEMICAL ANALYSES OF WATER SAMPLES
1984

The table below is based on chemical analyses of a monthly sample from the Colorado River at the Northerly International Boundary taken by the United States Section of the Commission and analyzed by the U. S. Bureau of Reclamation.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20.04; Mg, 12.16; Na 22.99; (CO₃ plus HCO₃) expressed as CO₃, 30.00; SO₄, 48.03; Cl, 35.45; NO₃, 62.00. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as EC x 10⁶ at 25°C, is a relative measure of the total salt concentration.

Month	No. of Samples	Dissolved Solids		ECx10 ⁶ @25°C	Boron p. p. m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter						
		Tons Per Acre-Foot	Total Tons						Ca	Mg	Na	CO ₃ + HCO ₃	SO ₄	Cl	NO ₃

Colorado River at Northerly International Boundary

Jan.	1	1.00	1,567,000	1,200		7.9	44	24	4.24	2.38	5.13	5.93	5.64	3.67	0.03	
Feb.	1	.96	1,327,000	1,140		7.9	42	21	3.99	2.55	4.74	5.77	5.75	3.05	.03	
Mar.	1	.97	1,222,000	1,140		7.9	42	21	4.29	2.38	4.87	5.60	5.95	3.10	.02	
Apr.	1	.93	997,000	1,120		7.7	41	18	4.34	2.30	4.57	6.10	5.60	2.65	.02	
May	1	.98	1,075,000	1,110		7.9	40	19	4.34	2.55	4.61	6.33	5.95	2.96	.02	
June	1	.90	1,189,000	1,070		7.9	40	16	4.09	2.22	4.26	6.57	5.45	2.37	.02	
July	1	.87	1,261,000	1,080		7.7	39	17	4.29	2.14	4.09	5.43	5.35	2.23	.02	
Aug.	1	.87	1,158,000	1,060		8.0	42	19	3.69	2.30	4.31	5.37	5.39	2.60	0	
Sept.	1	.82	953,000	1,060		7.7	47	19	3.14	1.73	4.26	4.87	5.14	2.31	.05	
Oct.	2	.88	1,035,000	1,050		8.0	35	18	4.34	2.43	3.59	5.50	5.54	2.38	.02	
Nov.	2	.89	1,069,000	1,040		7.8	37	18	4.20	2.61	3.94	5.56	5.40	2.48	.02	
Dec.	2	.82	1,156,000	1,020		7.9	38	17	4.11	1.97	3.72	5.68	4.98	2.17	.02	
Mean #	#15	0.91	#14,009,000	1,090		7.9	41	19	4.09	2.29	4.35	5.72	5.51	2.68	0.02	
Period Avg.		1.45	3,525,987	1,737		7.9			5.45	3.25	8.82	3.37	7.70	6.61		
Tons of Constituents				1984					1,720,000	584,000	2,098,000	3,600,000	5,552,000	1,993,000	26,000	
Avg. Tons				Period 1962-1984					383,000	137,000	633,000	534,000	1,276,000	694,000		

** Percent of total cations

*** Percent of total anions

Weighted mean

Ø Total

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1984

The following tables show electrical conductivity, expressed in mhos per centimeter x 10⁶ at 25° C, of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the northerly international boundary by both Sections of the Commission and at the southerly international boundary by the United States Section. Conductivity determinations for the northerly international boundary were made by the Bureau of Reclamation; and for the southerly international boundary, by the United States Section of the Commission. Samples for the Intake Canal at Morelos Dam and Miguel C. Rodriguez gaging station were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples.

Date	ECx10 ⁶ @25°C										
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Colorado River at Northerly International Boundary

January	February	April	May	July	August	October	November
1 * 1,200	16 1,170	1 * 1,130	16 1,140	1 * 1,080	16 1,110	1 1,070	16 1,050
2 * 1,210	17 * 1,170	2 1,120	17 1,140	2 1,080	17 1,110	2 1,080	17 * 1,050
3 1,200	18 * 1,170	3 1,130	18 1,140	3 1,100	18 * 1,100	3 1,090	18 * 1,050
4 1,220	19 * 1,170	4 1,140	19 * 1,140	4 * 1,100	19 * 1,090	4 1,090	19 1,030
5 1,220	20 * 1,180	5 1,150	20 * 1,130	5 1,090	20 1,080	5 1,080	20 1,050
6 1,200	21 1,180	6 1,140	21 1,130	6 1,090	21 1,090	6 * 1,070	21 1,060
7 * 1,190	22 1,180	7 * 1,140	22 1,130	7 * 1,090	22 1,080	7 * 1,070	22 * 1,060
8 * 1,180	23 1,180	8 * 1,130	23 1,130	8 * 1,090	23 1,090	8 * 1,080	23 1,060
9 1,180	24 1,160	9 1,140	24 1,130	9 1,090	24 1,090	9 1,090	24 * 1,050
10 1,170	25 * 1,160	10 1,140	25 1,140	10 1,090	25 * 1,100	10 1,070	25 * 1,040
11 1,180	26 * 1,150	11 1,140	26 * 1,130	11 1,080	26 * 1,100	11 1,080	26 1,040
12 1,170	27 1,150	12 1,160	27 * 1,130	12 1,090	27 1,100	12 1,070	27 1,040
13 1,170	28 1,160	13 1,150	28 * 1,140	13 1,080	28 1,080	13 * 1,070	28 1,040
14 * 1,170	29 1,170	14 * 1,150	29 1,140	14 * 1,079	29 1,070	14 * 1,070	29 1,040
15 * 1,170	March	15 * 1,150	30 1,120	15 * 1,080	30 1,080	15 1,080	30 1,030
16 1,150	1 1,160	16 1,150	31 1,130	16 1,080	31 1,080	16 1,040	November
17 1,150	2 1,140	17 1,150	June	17 1,080	September	17 1,080	1 * 1,030
18 1,150	3 * 1,140	18 1,160	1 1,140	18 1,090	1 * 1,190	18 1,070	2 * 1,030
19 1,170	4 * 1,140	19 1,150	2 * 1,140	19 1,080	2 * 1,080	19 1,070	3 1,030
20 1,170	5 1,140	20 1,150	3 * 1,130	20 1,070	3 * 1,080	20 * 1,070	4 1,030
21 * 1,160	6 1,150	21 * 1,160	4 1,070	21 * 1,060	4 * 1,060	21 * 1,070	5 1,020
22 * 1,160	7 1,180	22 * 1,160	5 1,100	22 * 1,050	5 1,090	22 1,120	6 1,020
23 1,150	8 1,140	23 1,180	6 1,120	23 1,050	6 1,100	23 1,120	7 1,030
24 1,150	9 1,160	24 1,160	7 1,120	24 1,070	7 1,090	24 1,090	8 * 1,030
25 1,150	10 * 1,150	25 1,160	8 1,110	25 1,070	8 * 1,090	25 1,060	9 * 1,020
26 1,160	11 * 1,140	26 1,160	9 * 1,100	26 1,070	9 1,080	26 * 1,060	10 1,020
27 1,160	12 1,140	27 1,160	10 * 1,110	27 1,070	10 1,090	27 * 1,060	11 1,020
28 * 1,160	13 1,140	28 * 1,170	11 1,100	28 * 1,070	11 1,100	28 * 1,060	12 1,020
29 * 1,160	14 1,150	29 * 1,160	12 1,100	29 * 1,070	12 1,100	29 1,060	13 1,020
30 1,160	15 1,140	30 1,170	13 1,100	30 1,080	13 1,100	30 1,070	14 1,020
31 1,170	16 1,130	May	14 1,100	31 1,080	14 1,090	31 1,060	15 * 1,020
February	17 * 1,130	1 1,150	15 1,100	August	15 * 1,090	November	16 * 1,020
1 1,160	18 * 1,130	2 1,150	16 * 1,100	1 1,070	16 * 1,090	1 1,060	17 1,010
2 1,170	19 1,130	3 1,150	17 1,120	2 1,060	17 1,100	2 1,060	18 1,020
3 * 1,170	20 1,140	4 1,150	18 1,120	3 1,060	18 1,100	3 * 1,050	19 1,010
4 * 1,160	21 1,140	5 * 1,160	19 1,100	4 * 1,070	19 1,090	4 * 1,050	20 1,020
5 * 1,160	22 1,150	6 * 1,160	20 1,100	5 * 1,060	20 1,070	5 1,050	21 1,020
6 1,140	23 1,130	7 1,110	21 1,100	6 1,060	21 1,080	6 1,070	22 * 1,030
7 1,150	24 * 1,120	8 1,160	22 1,100	7 1,080	22 * 1,090	7 1,060	23 * 1,030
8 1,160	25 * 1,120	9 1,150	23 * 1,100	8 1,080	23 * 1,100	8 1,060	24 1,030
9 1,160	26 1,120	10 1,130	24 1,090	9 1,070	24 1,090	9 1,060	25 * 1,030
10 1,170	27 1,120	11 1,140	25 1,090	10 1,100	25 1,080	10 * 1,060	26 1,030
11 * 1,160	28 1,110	12 * 1,140	26 1,090	11 * 1,110	26 1,070	11 * 1,060	27 1,020
12 * 1,160	29 1,150	13 * 1,130	27 1,090	12 * 1,100	27 1,080	12 * 1,060	28 1,010
13 1,160	30 1,140	14 1,120	28 1,110	13 1,110	28 1,070	13 1,050	29 * 1,000
14 1,180	31 * 1,130	15 1,120	29 1,100	14 1,120	29 * 1,080	14 1,040	30 * 1,010
15 1,170			30 * 1,090	15 1,120	30 * 1,080	15 1,040	31 1,020

* Estimated

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1984

Date	ECx10 ⁶ @25°C								
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Intake Canal at Morelos Diversion Structure

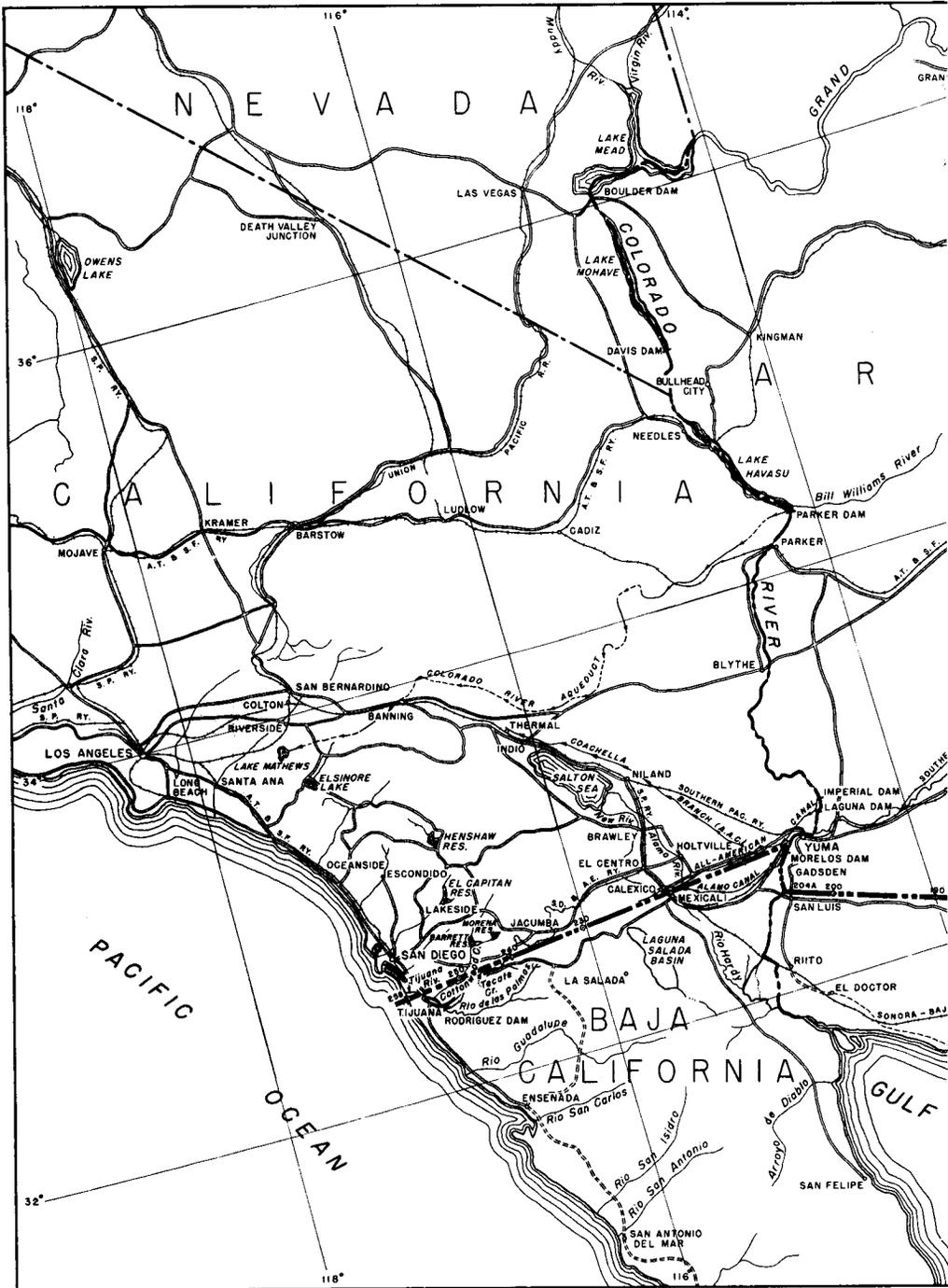
January	February	April	May	July	August	October	November
1 1,130	16 1,160	1 1,100	16 1,090	1 1,060	16 1,080	1 1,050	16 1,050
2 1,150	17 1,100	2 1,120	17 1,070	2 1,080	17 1,070	2 1,040	17 1,040
3 1,180	18 1,110	3 1,120	18 1,080	3 1,070	18 1,050	3 1,060	18 1,040
4 1,170	19 1,100	4 1,130	19 1,090	4 1,060	19 1,080	4 1,040	19 1,050
5 1,150	20 1,130	5 1,110	20 1,090	5 1,040	20 1,070	5 1,040	20 1,050
6 1,140	21 1,140	6 1,100	21 1,100	6 1,040	21 1,060	6 1,040	21 1,040
7 1,110	22 1,150	7 1,100	22 1,090	7 1,060	22 1,080	7 1,060	22 1,040
8 1,120	23 1,090	8 1,100	23 1,100	8 1,080	23 1,030	8 1,040	23 1,030
9 1,160	24 1,130	9 1,120	24 1,100	9 1,120	24 1,060	9 1,050	24 1,030
10 1,160	25 1,120	10 1,120	25 1,150	10 1,060	25 1,030	10 1,040	25 1,030
11 1,160	26 1,120	11 1,140	26 1,100	11 1,050	26 1,000	11 1,050	26 1,030
12 1,130	27 1,110	12 1,100	27 1,100	12 1,040	27 1,070	12 1,040	27 1,020
13 1,100	28 1,140	13 1,100	28 1,100	13 1,030	28 1,060	13 1,030	28 1,030
14 1,140	29 1,120	14 1,120	29 1,100	14 1,040	29 1,060	14 1,040	29 1,020
15 1,100	March	15 1,110	30 1,100	15 1,100	30 1,030	15 1,040	30 1,020
16 1,130	1 1,110	16 1,120	31 1,090	16 1,080	31 1,030	16 1,040	December
17 1,140	2 1,090	17 1,140	June	17 1,070	September	17 1,040	1 1,020
18 1,130	3 1,080	18 1,120	1 1,120	18 1,060	1 1,040	18 1,030	2 1,020
19 1,120	4 1,100	19 1,130	2 1,090	19 1,070	2 1,040	19 1,040	3 1,020
20 1,100	5 1,150	20 1,130	3 1,080	20 1,040	3 1,040	20 1,030	4 1,020
21 1,140	6 1,140	21 1,120	4 1,110	21 1,040	4 1,070	21 1,030	5 1,020
22 1,130	7 1,140	22 1,130	5 1,070	22 1,040	5 1,060	22 1,050	6 1,000
23 1,150	8 1,090	23 1,160	6 1,100	23 1,050	6 1,060	23 1,050	7 1,020
24 1,130	9 1,130	24 1,120	7 1,100	24 1,060	7 1,040	24 1,070	8 1,020
25 1,130	10 1,100	25 1,140	8 1,090	25 1,030	8 1,040	25 1,030	9 1,010
26 1,110	11 1,130	26 1,160	9 1,090	26 1,040	9 1,040	26 1,030	10 1,010
27 1,110	12 1,110	27 1,150	10 1,100	27 1,040	10 1,050	27 1,040	11 1,000
28 1,110	13 1,120	28 1,140	11 1,090	28 1,050	11 1,050	28 1,040	12 1,020
29 1,120	14 1,120	29 1,170	12 1,090	29 1,090	12 1,050	29 1,040	13 1,010
30 1,120	15 1,080	30 1,160	13 1,090	30 1,080	13 1,040	30 1,040	14 1,020
31 1,140	16 1,110	May	14 1,110	31 1,070	14 1,050	31 1,050	15 1,010
February	17 1,110	1 1,140	15 1,110	August	15 1,040	November	16 1,010
1 1,140	18 1,090	2 1,140	16 1,120	1 1,050	16 1,050	1 1,030	17 1,010
2 1,080	19 1,100	3 1,140	17 1,110	2 1,040	17 1,040	2 1,030	18 1,010
3 1,100	20 1,100	4 1,130	18 1,100	3 1,040	18 1,040	3 1,040	19 1,010
4 1,080	21 1,120	5 1,140	19 1,100	4 1,080	19 1,030	4 1,030	20 1,000
5 1,110	22 1,120	6 1,150	20 1,100	5 1,050	20 1,030	5 1,040	21 1,010
6 1,130	23 1,120	7 1,160	21 1,060	6 1,080	21 1,040	6 1,040	22 1,020
7 1,140	24 1,080	8 1,140	22 1,060	7 1,080	22 1,060	7 1,040	23 1,020
8 1,140	25 1,120	9 1,130	23 1,060	8 1,050	23 1,050	8 1,030	24 1,000
9 1,140	26 1,100	10 1,060	24 1,080	9 1,050	24 1,040	9 1,050	25 1,010
10 1,120	27 1,080	11 1,120	25 1,070	10 1,040	25 1,050	10 1,040	26 1,010
11 1,110	28 1,100	12 1,110	26 1,070	11 1,040	26 1,050	11 1,030	27 1,000
12 1,120	29 1,120	13 1,110	27 1,080	12 1,030	27 1,040	12 1,040	28 1,010
13 1,130	30 1,110	14 1,100	28 1,090	13 1,050	28 1,030	13 1,040	29 1,000
14 1,140	31 1,090	15 1,100	29 1,060	14 1,080	29 1,040	14 1,030	30 1,010
15 1,150			30 1,100	15 1,090	30 1,030	15 1,020	31 1,000

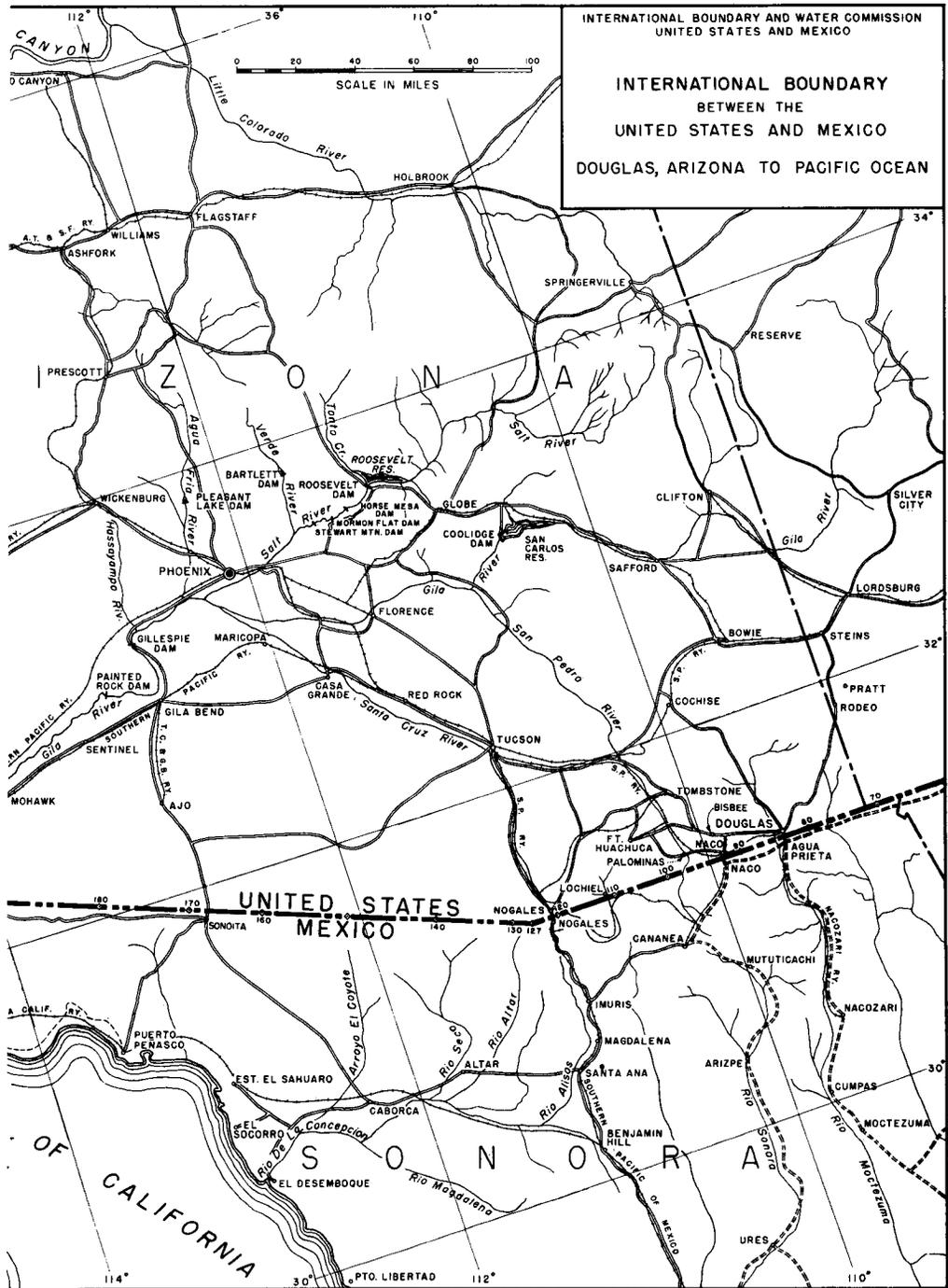
Colorado River at Southerly International Boundary

September	October	November				
24 1,050	23 1,080	6 1,050				

Colorado River at Miguel C. Rodriguez Gaging Station

No samples taken in 1984						





RAINFALL ON THE COLORADO RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall at stations located in California and Arizona in the United States and in Baja California and Sonora in Mexico, with averages for their periods of record. Records of daily rainfall amounts, where available, are on file in the offices of the United States or Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on page 49 in this bulletin.

In the United States

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	1984	Average 1931-1984	1984	Average 1931-1984	1984	Average 1931-1984	1984	Average 1931-1984	1984	Average 1978-1984
Jan.	0.31	0.36	0.21	0.38	0.06	0.44	0.26	0.42	0	1.19
Feb.	0	.34	0	.36	0	.43	0	.35	0	.99
Mar.	0	.25	0	.23	T	.42	0	.27	0	1.48
Apr.	T	.09	0	.09	0	.13	.43	.11	.01	.17
May	0	.02	0	.01	0	.02	0	.02	0	.20
June	0	.01	0	.01	T	.04	0	.02	0	.01
July	#	.06	.34	.09	1.09	.19	3.12	.20	3.12	.73
Aug.	.02	.40	.09	.37	2.28	.83	.63	.59	1.28	1.31
Sept.	.13	.33	0	.27	0	.37	.14	.34	.08	.54
Oct.	0	.23	0	.23	0	.28	T	.39	0	.35
Nov.	.27	.16	.36	.18	.56	.24	.45	.18	1.62	.68
Dec.	1.46	.45	1.33	.46	3.77	.55	1.77	.44	4.25	1.14
Yearly	2.25	2.70	2.33	2.68	7.78	3.95	6.80	3.33	10.36	8.79

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1984	Average 1948-1984	1984	Average 1926-1984	1984	Average 1948-1984	1984	Average 1949-1984	1984	Average 1948-1984
Jan.	0.16	0.43	0.16	0.35	0.24	0.39	0.31	0.35	0.31	0.35
Feb.	0	.24	0	.31	0	.20	0	.31	0	.28
Mar.	0	.16	0	.24	0	.16	0	.24	0	.16
Apr.	.55	.08	T	.08	.94	.12	0	.04	0	.08
May	0	T	T	T	0	T	0	.04	0	T
June	0	T	0	T	0	.04	0	.04	0	T
July	1.65	.08	.71	.16	.43	.08	.31	.24	.55	.08
Aug.	.43	.39	.31	.39	.71	.28	1.22	.47	.28	.28
Sept.	0	.16	.12	.39	.08	.12	.16	.28	0	.24
Oct.	0	.28	0	.28	0	.28	0	.35	0	.31
Nov.	.35	.16	.31	.16	.08	.16	.28	.43	T	.12
Dec.	1.42	.39	1.30	.75	1.50	.28	1.26	.51	.87	.35
Yearly	4.56	2.37	2.91	3.11	3.98	2.11	3.54	3.30	2.01	2.25

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe, Baja California		El Centinela, Baja California	
	1984	Average 1952-1984	1984	Average 1975-1984	1984	Average 1959-1984	1984	Average 1971-1984	1984	Average 1969-1984	1984	Average 1978-1984
Jan	0.35	0.51	0.24	0.39	0	0.31	0.28	0.28	0	0.35	0.16	0.39
Feb.	T	.31	0	.43	0	.24	0	.31	0	.16	0	.39
Mar.	0	.28	0	.12	0	.20	0	.12	0	.12	0	.12
Apr.	0	.08	0	.08	.08	.04	0	.04	0	.08	0	0
May	0	.04	0	.04	0	T	0	.04	0	.04	0	0
June	0	T	0	0	0	.04	0	T	0	.04	0	0
July	1.10	.20	.79	.20	.16	.08	.67	.04	1.50	.16	.08	T
Aug.	.08	.35	#	.87	.91	.31	2.52	.43	2.05	.51	0	.71
Sept.	.04	.28	0	.83	0	.51	.08	.31	0	.39	0	.08
Oct.	0	.43	0	.16	0	.39	0	.55	0	.24	0	.16
Nov.	.08	.24	.20	.12	.16	.24	#	.08	0	.20	.08	T
Dec.	1.10	.35	1.30	.94	1.85	.43	.04	.31	2.20	.47	.55	.63
Yearly	2.75	3.07		4.18	3.16	2.79		2.51	5.75	2.76	0.87	2.48

Blythe FAA Airport

T Trace

Missing record

* Partly estimated

LOCATION OF RAINFALL STATIONS ON THE COLORADO RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1984.

In the United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	♠ ELEV. (FT.)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	268	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	100	1908	Agricultural Research Service
Bullhead City, Arizona	35° 07'	114° 36'	580	1980	Bullhead City Fire Department
El Centro, California	32° 46'	115° 34'	30	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	191	1923	University of Arizona Experimental Farm

In Mexico

NAME OF STATION	LATI- TUDE	LONGI- TUDE	♠ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 34'	115° 00'	** 66	1948	# S. A. R. H.
Colonia Juarez, Baja California	32° 18'	115° 05'	49	1952	S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	** 39	1948	S. A. R. H.
El Centinela, Baja California	32° 35'	115° 45'	164	1978	S. A. R. H.
Laguna Salada, Baja California	32° 12'	115° 44'	7	1975	S. A. R. H.
Los Algodones, Baja California	32° 42'	114° 44'	115	1948	S. A. R. H.
Mexicali, Baja California	32° 40'	115° 28'	13	1926	S. A. R. H.
Riito, Sonora	32° 08'	114° 54'	43	1959	S. A. R. H.
San Felipe, Baja California	31° 01'	114° 51'	72	1969	S. A. R. H.
San Luis, R. C., Sonora	32° 28'	114° 47'	131	1949	S. A. R. H.
Santa Clara, Sonora	31° 42'	114° 29'	49	1971	S. A. R. H.

* Not shown on map

♠ Elevation above mean sea level except Brawley and El Centro, which are elevations below mean sea level

** Elevations obtained from International Boundary and Water Commission topographic maps

Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at one station in Arizona and at eleven stations in Baja California and Sonora, Mexico. The station in the United States is operated by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Agriculture and Hydraulic Resources. The type of pan used at all these stations was the National Weather Service standard pan of 4-foot diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," page 49 in this bulletin.

In the United States

Month	Yuma Citrus Station, Arizona	
	1984	Average 1931-1984
Jan.	5.05	3.87
Feb.	5.54	4.79
Mar.	8.22	7.41
Apr.	9.42	10.06
May	13.36	13.01
June	12.67	14.28
July	* 12.28	15.33
Aug.	10.77	13.48
Sept.	10.14	10.69
Oct.	6.90	7.55
Nov.	3.83	4.93
Dec.	2.40	3.65
Yearly	100.58	109.05

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		El Centinela, Baja California		Bataques, Baja California		San Luis, R. C. Sonora		Delta, Baja California	
	1984	Average 1948-1984	1984	Average 1926-1984	1984	Average 1977-1984	1984	Average 1963-1984	1984	Average 1953-1984	1984	Average 1948-1984
Jan.	5.75	4.45	2.05	2.60			4.88	3.78	4.49	3.35	4.17	3.27
Feb.	6.26	5.28	3.35	5.51			5.24	4.69	4.65	4.06	5.51	4.33
Mar.	9.09	7.56	5.59	5.87			8.35	6.89	5.43	6.26	5.51	6.14
Apr.	10.00	10.24	7.28	7.99			9.09	8.62	5.43	8.23	8.70	8.11
May	13.58	12.87	10.63	10.59			14.06	11.50	5.43	11.06	13.35	10.43
June	12.36	13.98	10.63	11.73			14.02	13.03	12.76	12.64	11.42	11.42
July	10.79	13.78	8.39	11.77			13.27	12.91	13.11	13.70	10.91	12.09
Aug.	10.16	12.40	6.61	10.12			12.05	11.02	12.05	12.28	10.71	10.98
Sept.	9.92	10.31	6.30	8.07			11.30	9.37	5.43	9.49	5.43	8.58
Oct.	7.76	8.15	5.28	5.75			8.31	6.54	5.43	6.38	5.43	6.34
Nov.	4.33	5.31	2.72	3.39			* 5.35	4.84	4.69	4.21	6.97	4.41
Dec.	2.40	4.26	1.10	2.40			2.40	3.46	3.31	3.19	5.43	3.27
Yearly	102.40	108.59	69.93	85.79			108.32	96.65		94.85		89.37

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		Santa Clara, Sonora		San Felipe, Baja California	
	1984	Average 1970-1984	1984	Average 1975-1984	1984	Average 1963-1984	1984	Average 1971-1984	1984	Average 1952-1984
Jan.	6.02	3.62	3.74	4.17			4.80	5.00		
Feb.	6.38	4.37	4.80	4.61			5.24	4.76		
Mar.	7.87	6.42	6.46	6.97			6.14	6.14		
Apr.	9.88	8.11	5.43	8.35			6.57	7.60		
May	14.17	10.63	5.43	11.06			10.08	8.58		
June	13.70	12.36	5.43	13.19			9.65	10.67		
July	13.78	12.44	12.60	13.62			8.86	10.94		
Aug.	11.77	10.98	5.43	12.24			8.98	10.00		
Sept.	12.17	9.65	5.43	8.46			9.02	9.02		
Oct.	9.41	7.48	5.43	7.87			6.69	7.28		
Nov.	5.39	4.88	5.43	5.39			5.43	5.79		
Dec.	2.95	3.58	5.43	3.82			5.16	5.08		
Yearly	113.49	94.52		99.75				90.86		

* Estimated

5.43 No record

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 49 in this bulletin.

In the United States

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1984			Average 1931-84	1984			Average 1931-84	1984			Average 1931-84
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	55.0	77	32	52.7	55.7	79	32	53.2	57.8	84	31	53.9
Feb.	56.8	80	33	57.4	56.7	80	33	57.0	59.6	85	34	58.1
Mar.	65.0	92	37	62.9	64.0	91	34	62.0	65.2	91	34	63.1
Apr.	670.6	6104	644	70.0	67.2	100	39	68.5	68.4	103	43	69.7
May	685.5	6114	656	77.5	81.2	113	49	75.8	81.3	114	52	77.2
June	85.5	113	60	85.4	83.9	110	60	83.6	84.5	113	55	85.0
July	91.9	115	72	92.4	90.4	112	70	91.0	*91.9	#	#	91.9
Aug.	91.0	115	70	90.9	89.2	114	69	90.2	91.5	118	73	91.3
Sept.	86.7	111	63	85.0	87.2	110	66	85.0	88.9	113	62	86.2
Oct.	69.3	98	45	73.0	69.6	98	41	73.4	72.4	101	45	74.9
Nov.	58.5	85	34	60.1	58.8	86	33	61.3	61.9	90	33	62.4
Dec.	52.1	70	32	53.2	52.8	70	31	54.5	54.2	74	31	55.1
Yearly	72.3	115	32	71.7	71.4	114	31	71.3	*73.1	118	31	72.4

Month	El Centro, California				Bullhead City, Arizona							
	1984			Average 1931-84	1984			Average 1978-84				
	Mean	Max.	Min.		Mean	Max.	Min.					
Jan.	57.2	80	32	53.9	57.1	76	35	53.3				
Feb.	58.4	84	33	58.1	58.5	82	34	57.7				
Mar.	65.2	94	37	63.0	66.4	94	35	62.7				
Apr.	68.0	101	41	69.4	71.7	105	40	70.1				
May	82.2	112	52	77.1	87.2	116	55	80.1				
June	85.0	112	60	85.0	89.6	126	64	89.5				
July	91.3	113	71	91.7	96.2	123	71	94.7				
Aug.	91.3	117	71	91.0	93.7	117	69	93.0				
Sept.	89.1	110	65	85.7	89.3	114	66	87.6				
Oct.	71.4	101	46	74.5	70.8	100	47	73.6				
Nov.	61.5	87	35	62.1	59.4	89	34	60.7				
Dec.	53.7	74	33	54.8	51.3	68	30	53.0				
Yearly	72.9	117	32	72.2	74.3	126	30	73.0				

In Mexico

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1984		1948-1984		1984		1926-1984		1984		1948-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	77	34	88	23	79	28	93	19	79	34	113	16
Feb.	79	36	95	28	82	39	93	23	82	36	99	21
Mar.	88	36	100	32	97	41	100	30	88	43	113	25
Apr.	100	43	109	37	102	46	106	34	100	45	118	16
May	111	52	117	43	115	54	117	43	113	45	124	34
June	106	61	126	52	115	61	120	48	109	61	135	43
July	109	70	118	61	111	72	118	55	113	66	133	45
Aug.	109	72	120	61	115	72	120	54	117	64	129	46
Sept.	108	70	122	50	108	63	122	48	113	63	135	39
Oct.	99	46	111	32	97	46	111	32	99	36	118	32
Nov.	90	36	100	27	82	36	104	28	86	34	115	32
Dec.	68	32	90	23	66	34	90	23	70	34	97	25
Yearly	111	32	126	23	115	28	122	19	117	34	135	16

6 Blythe FAA Airport

* Partly estimated

Missing record

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

Month	Riito, Sonora				Santa Clara, Sonora				San Felipe, Baja California			
	1984		1949-1984		1984		1971-1984		1984		1969-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	77	34	91	19	79	41	90	18	72	41	99	30
Feb.	79	36	95	21	79	43	90	23	79	43	102	32
Mar.	86	36	100	25	82	48	90	37	84	41	104	32
Apr.	88	41	109	36	90	50	102	46	95	46	113	34
May	108	48	115	41	102	57	106	50	104	54	120	41
June	108	59	124	45	95	68	117	57	104	57	124	50
July	108	68	140	52	104	72	115	64	104	72	124	50
Aug.	111	72	122	46	106	72	106	68	102	68	135	41
Sept.	106	57	118	39	104	72	108	61	104	68	126	37
Oct.	97	41	115	30	93	50	102	41	91	50	117	23
Nov.	84	39	118	27	84	41	93	36	84	37	118	21
Dec.	75	36	86	21	79	41	86	25	66	41	97	28
Yearly	111	34	140	19			117	18	104	37	135	21

Month	San Luis, R. C., Sonora				Delta, Baja California				Colonia Juarez, Baja California			
	1984		1949-1984		1984		1948-1984		1984		1964-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	82	34	100	19	82	41	104	27	77	34	91	19
Feb.	82	36	109	27	86	36	104	28	81	36	97	21
Mar.	90	39	108	28	90	41	113	28	91	36	99	25
Apr.	102	43	115	37	100	46	118	32	99	39	115	30
May	115	50	115	41	111	55	129	32	113	50	117	36
June	111	57	126	45	111	59	133	36	108	59	122	39
July	118	68	126	59	113	77	135	45	111	72	122	45
Aug.	115	68	122	55	122	70	140	52	113	72	118	50
Sept.	109	68	118	50	113	68	135	39	113	63	122	39
Oct.	102	46	118	32	84	41	117	34	100	41	118	36
Nov.	90	32	113	28	84	41	120	32	90	34	104	25
Dec.	77	41	102	23	70	41	104	27	73	32	97	19
Yearly	118	32	126	19	122	36	140	27	113	32	122	19

Month	Laguna Salada, Baja California				El Centinela, Baja California							
	1984		1975-1984		1984		1977-1984					
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				
Jan.	82	34	84	18	73	39	75	34				
Feb.	79	28	95	27	79	41	82	41				
Mar.	95	32	95	32	84	41	90	41				
Apr.	97	41	100	36	106	50	106	46				
May	115	50	115	39	113	59	113	54				
June	113	57	120	50	111	68	118	50				
July	115	63	122	54	104	68	120	68				
Aug.	84	41	118	52	106	64	115	64				
Sept.	84	41	118	48	102	64	115	52				
Oct.	99	39	118	36	90	52	108	50				
Nov.	84	30	95	28	84	41	93	39				
Dec.	68	32	86	19	68	36	82	32				
Yearly			122	18	113	36	120	32				

84 Missing record

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1984

The total drainage area within the Colorado River basin is about 246,000 square miles, of which 184,600 square miles lie above Imperial Dam and about 61,400 square miles are below the dam. Of the area below Imperial Dam, 59,400 square miles are in the United States and about 2,000 square miles are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 58,200 square miles, of which about 1,100 square miles are in Mexico.

The irrigated areas tabulated below comprise the areas in the United States and Mexico which are served by diversions from the Colorado River at or below Imperial Dam. The diversions are supplemented by some pumping from wells in both countries. The areas in the United States include: 1) those within the U. S. Bureau of Reclamation Projects and in the North and South Gila Valleys located near Yuma, Arizona, the data for which are furnished by the U. S. Bureau of Reclamation; 2) those within the Coachella Valley, California, the data for which are furnished by the Coachella Valley County Water District; and 3) those within the Imperial Valley, California, the data for which are furnished by the Imperial Irrigation District. The areas in Mexico include those in the Mexicali Valley located in the states of Baja California and Sonora, the data for which are furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico. The areas tabulated below refer to the total areas farmed, and insofar as possible, duplication of irrigated areas because of double cropping has been eliminated.

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	46,410
Reservation Division	14,137
Yuma Mesa	18,512
Yuma Aux. Project Unit "B" (Yuma Mesa)	3,261
South Gila Valley	9,991
North Gila Valley	5,963
Wellton-Mohawk	60,924
Coachella Valley	58,504
Imperial Valley	449,993
Warren Act	80
Non-Project lands adjacent to Colorado River	12,560
Total in United States	680,335
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 532,388
Total in United States and Mexico	1,212,723

* An estimated 15% of total acreage is served by pumping from ground water in Mexicali Valley

ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Staff gage located on the right bank of the river, about 7 miles (11.3 km) east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and a few feet upstream from a 4-foot (1.22 m) Cipolletti weir in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal.

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. Records available: June 1982 through 1984.

REMARKS: The flow at this station normally comprises seepage from the All-American Canal and drainage water from the Mexicali Valley which enters the United States.

EXTREMES: Maximum mean daily discharge, 258 second-feet (7.31 m³/sec) (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.23	2.75	2.95	2.75	3.24	1.92	2.13	3.52	2.23	1.92	1.92	2.13
2	2.23	2.75	2.86	2.75	3.65	2.13	2.23	3.24	2.23	1.92	2.75	2.13
3	2.34	2.65	2.86	2.75	3.65	2.13	1.92	2.54	1.74	2.13	2.96	2.34
4	2.65	2.54	4.90	2.75	3.24	2.13	2.13	2.34	1.92	1.74	2.23	2.13
5	2.75	2.54	2.75	3.24	3.65	1.92	2.13	2.34	1.92	1.74	2.13	2.34
6	2.96	2.65	2.75	3.24	3.24	5.72	2.13	2.34	1.74	1.64	3.24	2.34
7	2.75	2.54	2.75	2.96	3.24	3.24	2.13	1.92	3.10	1.92	2.75	2.34
8	2.54	2.54	2.75	2.96	3.24	2.34	2.13	1.92	2.23	1.92	3.52	2.54
9	2.54	2.75	2.75	2.96	3.38	2.13	2.13	2.44	3.10	2.13	2.96	2.13
10	2.54	2.75	2.75	2.96	2.54	2.54	2.02	2.44	3.93	2.13	2.54	2.75
11	2.44	2.65	2.75	3.10	2.54	2.54	2.02	2.33	2.23	2.13	2.54	2.65
12	2.54	2.65	2.86	3.10	2.54	2.65	1.92	1.92	2.75	2.13	2.34	2.23
13	2.44	2.65	2.86	3.10	2.96	2.02	1.92	1.92	2.54	1.92	2.96	2.23
14	2.44	2.75	2.96	3.24	3.38	2.02	2.13	1.92	2.96	1.74	3.79	2.13
15	2.44	2.75	2.96	3.24	3.65	2.23	2.13	1.74	2.13	1.74	2.44	1.92
16	2.54	2.75	2.96	2.95	2.75	1.92	2.54	1.92	2.13	1.74	1.92	1.92
17	2.65	2.75	2.96	2.96	2.75	1.92	2.54	2.13	1.92	1.74	1.92	1.92
18	2.65	2.44	2.96	3.24	2.96	2.54	2.75	1.92	2.54	1.74	2.13	1.92
19	2.96	2.54	2.96	3.24	2.96	2.54	2.54	2.02	1.92	1.74	2.44	2.13
20	2.86	2.54	2.96	3.24	3.24	2.54	2.34	2.02	2.13	1.92	2.34	2.13
21	2.75	2.54	2.96	3.10	2.23	2.96	2.34	2.86	2.34	1.92	2.13	2.13
22	2.75	2.96	2.75	3.10	2.44	2.95	1.92	2.96	2.34	2.65	2.13	2.75
23	2.96	2.96	2.75	3.10	2.55	2.96	2.44	2.65	1.74	2.13	2.13	2.44
24	2.75	2.95	2.36	2.96	2.34	2.75	2.44	2.75	2.13	2.13	2.13	2.44
25	2.75	2.96	2.96	2.96	2.34	2.96	2.13	2.13	1.92	2.13	2.13	2.44
26	2.65	2.75	2.96	3.24	2.13	2.95	2.13	2.13	2.13	2.13	2.23	2.13
27	2.75	2.75	2.96	3.24	2.13	2.34	1.92	2.23	2.13	2.13	2.23	2.44
28	2.75	2.75	3.10	3.24	2.13	2.34	1.92	2.54	2.13	1.92	1.92	2.65
29	2.75	2.96	3.10	3.24	2.13	2.23	4.35	2.34	1.74	1.92	1.92	2.65
30	2.65	2.96	2.96	3.24	1.92	2.13	2.23	2.13	1.74	1.92	2.34	2.13
31	2.65	2.96	2.96	3.24	1.92	1.92	3.24	2.34	1.92	1.92	2.13	2.13
Sum	81.55	78.52	91.69	92.16	87.16	75.71	71.98	71.94	67.73	60.63	73.11	70.68
Current Year 1984												
Period 1943-1984												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.40	0.33	1 6	2.96	1 1	2.23	2.63	162'	313	2,790	99	
Feb.	.40	.35	122	2.95	18	2.44	2.71	156	284	2,822	90.2	
Mar.	.54	.38	4	4.90	1 5	2.75	2.96	182	323	3,154	87.1	
Apr.	.42	.38	1 5	3.24	1 1	2.75	3.07	183	341	2,222	97	
May	.45	.30	1 2	3.65	130	1.92	2.81	173	268	1,799	73	
June	.60	.30	6	5.72	1 1	1.92	2.52	150	260	1,686	61	
July	.50	.30	29	4.35	1 3	1.92	2.32	143	241	1,712	59	
Aug.	.44	.28	1	3.52	15	1.74	2.32	143	286	1,672	65.7	
Sept.	.47	.28	10	3.93	3	1.74	2.26	134	270	1,406	83.5	
Oct.	.37	.27	22	2.65	6	1.64	1.95	120	284	1,845	61.6	
Nov.	.46	.30	14	3.79	1 1	1.92	2.44	145	293	2,080	62.4	
Dec.	.38	.30	110	2.75	115	1.92	2.28	140	277	1,686	80.0	
Yearly	0.60	0.27		5.72		1.64	2.52	1,831	3,440	22,146	1,071	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.18	0.08		0.16		0.05	0.07	2,259	4,243	27,317	1,321	

Ø Mean daily

! And other days

NEW RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder located on the left (west) bank of the river in the limits of the city of Calexico, California, 1,400 feet (427 m) downstream (north) from the international land boundary between the United States and Mexico. Measurements are made from a foot bridge at the gage.

RECORDS: Based on a continuous record of gage heights and weekly current meter measurements, supplemented by additional measurements during periods of high flow, by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1984.

REMARKS: The New River flows northward from Mexico into the United States and thence into the Salton Sea. The flow at this station normally comprises 1) a portion of the waste and drainage water from the irrigation system in the Mexicali Valley, and 2) sewage and other wastes from Mexicali, Baja California. Flood waters enter the river from local drainage in Mexico, and such waters can reach damaging rates during violent desert storms. Waste flows from the Mexican system of canals are limited to an average annual quantity of 35,000 acre-feet (43,172,000 m³) during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum mean daily discharge, 1,030 second-feet (29.2 m³/sec) on December 9, 1982; minimum mean daily discharge, 2 second-feet (0.06 m³/sec) on May 14, 1945. Prior to the period of record, and since 1900, much higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a considerable part of its flow passed through the New River channel.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	272	377	346	301	443	362	282	399	340	358	356	275
2	295	338	335	349	411	334	290	384	357	384	334	287
3	314	321	316	402	383	345	315	339	349	419	334	346
4	358	307	322	399	331	332	338	343	356	414	358	416
5	398	315	338	386	308	321	358	357	368	398	368	393
6	467	357	383	379	352	328	349	373	345	383	369	316
7	496	388	385	376	361	317	300	390	315	337	358	292
8	443	390	369	376	376	320	284	403	311	315	337	288
9	384	379	353	412	422	315	299	394	333	337	291	352
10	333	339	349	469	422	329	349	390	376	368	271	491
11	339	333	349	482	399	350	367	362	395	341	299	455
12	357	353	346	475	392	367	350	363	407	322	311	414
13	344	358	386	409	384	345	320	373	385	296	299	369
14	341	363	388	358	384	332	307	422	335	296	300	361
15	356	367	402	358	384	344	300	479	319	323	310	294
16	398	358	397	356	406	368	316	511	325	346	332	280
17	388	332	381	410	419	381	321	491	359	325	334	304
18	363	339	371	402	381	359	335	513	401	313	300	313
19	379	371	375	361	375	347	359	523	411	295	288	308
20	350	385	394	362	377	362	433	557	372	289	310	253
21	311	394	393	415	381	352	375	556	329	315	315	278
22	323	388	357	449	419	335	386	555	317	337	355	299
23	343	384	338	475	399	328	451	524	320	358	439	304
24	353	367	335	516	377	314	523	465	331	361	461	328
25	353	316	339	495	353	351	524	423	383	334	493	333
26	349	308	334	403	351	381	526	399	414	319	504	402
27	328	321	347	376	353	372	502	394	436	341	457	544
28	344	366	372	395	363	319	487	407	390	366	337	645
29	361	358	363	429	418	308	440	439	366	362	265	626
30	352	337	337	465	392	310	402	419	363	368	260	428
31	376	320	320	389	389	389	407	376	375	375	352	352
Sum	11,178	10,272	11,120	12,240	11,905	10,228	11,595	13,333	10,808	10,695	10,345	11,346
Current Year 1984								Period 1943-1984				
Month	Extreme Gage ** Feet		Extreme Second-Feet				Average Second- Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High		Day			Low	Average	Maximum	Minimum
				Day	Low							
Jan.	33.60	40.03	7	496	1	272	361	22,171	8,636	22,171	1,751	
Feb.	39.26	40.09	21	394	4	307	354	20,374	7,542	20,374	1,258	
Mar.	39.25	39.94	15	402	3	316	359	22,056	8,485	22,056	1,008	
Apr.	38.77	39.90	24	516	1	301	408	24,279	8,745	24,278	1,390	
May	38.56	39.57	1	443	5	398	384	23,613	7,938	23,613	629	
June	39.49	40.09	17	381	29	308	341	20,287	6,821	20,287	1,087	
July	37.99	40.06	26	526	1	282	374	22,998	7,188	22,998	817	
Aug.	37.90	39.66	21	566	3	339	430	26,446	8,323	27,618	1,139	
Sept.	38.98	39.90	27	436	8	311	360	21,437	8,008	23,714	1,795	
Oct.	39.19	40.13	3	419	20	289	345	21,213	8,086	22,758	2,081	
Nov.	38.52	40.37	26	504	30	260	345	20,519	7,584	20,519	2,483	
Dec.	37.72	40.57	28	645	20	253	366	22,504	8,597	22,504	1,763	
Yearly	37.72	40.57		645		253	369	267,896	95,953	267,896	24,573	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	11.50	12.37		18.3		7.16	10.5	330,444	118,356	330,444	30,310	

** Feet below mean sea level

∅ Mean daily

! And other days

WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: An 11.5-foot (3.50 m) Parshall flume installed by the State Commission of Public Services of Mexicali. Located 1.2 miles (2.0 km) upstream of the pumping plant on the supply canal. Excess water discharges into an open channel, thence into a 36-inch (91 cm) diameter pipe that empties into Rivera Drain (Drain 134), which is 1.2 miles (2.0 km) below the plant and 1.2 miles (2.0 km) south of the international boundary. From this point the waste is carried by a closed concrete box conduit into New River.

RECORDS: During 1984 the mean daily flows were computed from the total inflow to the potable water plant as measured at the Parshall flume, less the water pumped to the city and the water used in the maintenance of the plant. The records are obtained and furnished by the State Commission of Public Services of Mexicali. Records available: January 1968 through December 1984.

REMARKS: The plant began operation on September 28, 1963 by the State Commission of Public Services of Mexicali. Before 1968 the flow was small and infrequent. The potable water plant obtains water from the West Main Canal, which is a part of Mexico's system of canals in the Colorado Irrigation System. Excess water discharges into a closed conduit that empties into New River 0.9 mile (1.4 km) upstream of the international boundary.

EXTREMES: Maximum instantaneous discharge, 81.9 second-feet (2.32 m³/sec) on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 1984.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.1	1.8	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.4
2	1.8	1.8	1.8	1.8	0	1.8	0	1.8	1.8	0	1.8	0
3	1.1	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	.7	1.8	1.1
4	1.1	.7	1.8	1.8	0	1.8	1.1	.7	1.8	1.8	1.8	1.1
5	.7	1.8	1.8	1.8	1.8	1.8	.4	0	0	1.8	1.8	1.1
6	0	1.8	2.1	1.8	0	1.8	1.8	.7	2.1	1.8	1.8	1.1
7	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.1
8	1.1	1.8	2.5	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	1.1
9	.7	1.8	1.8	1.8	0	1.8	1.1	1.1	1.8	1.8	1.8	1.1
10	1.8	1.8	1.8	1.8	0	1.8	1.1	1.8	1.8	1.8	1.8	0
11	.7	1.8	1.8	1.8	1.8	1.1	1.8	1.8	1.8	1.8	1.8	0
12	1.1	1.8	1.8	1.8	0	1.8	1.8	1.8	1.8	1.8	1.8	.7
13	0	1.8	1.8	1.8	.7	1.8	1.8	0	1.8	0	1.8	.7
14	1.8	.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0
15	1.8	1.8	1.8	0	.7	1.8	1.8	0	1.8	1.8	1.8	0
16	1.8	1.8	1.8	0	1.4	0	1.8	1.1	1.8	1.8	1.8	1.8
17	2.5	1.8	1.4	1.8	1.8	1.8	1.8	1.1	1.8	1.8	1.8	0
18	1.8	0	1.8	1.8	1.8	1.8	1.8	2.1	0	1.8	1.8	0
19	1.8	1.8	1.8	1.8	1.8	0	1.8	2.5	1.1	1.8	1.8	.7
20	1.8	0	0	1.8	1.8	1.8	1.8	1.8	1.8	2.1	1.8	0
21	0	1.4	1.4	1.8	.7	1.1	1.8	0	1.8	1.8	.4	1.1
22	1.8	1.8	1.8	1.8	0	1.1	1.8	0	0	1.1	2.8	1.1
23	1.8	0	1.8	0	0	1.8	2.5	0	3.2	1.8	2.5	.7
24	1.8	1.4	1.8	1.8	1.8	2.1	1.8	1.8	1.8	0	1.8	1.1
25	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	2.1	0	1.8	1.1
26	1.8	1.8	1.8	1.8	1.8	1.8	2.5	1.1	1.8	1.8	1.8	.7
27	1.8	1.8	0	1.8	0	0	1.8	1.1	1.8	1.8	0	.7
28	1.8	1.8	1.8	1.8	.7	.4	2.8	1.8	1.8	1.8	0	.7
29	1.8	1.8	1.8	.7	.4	1.8	0	1.8	0	1.8	0	0
30	1.8	1.8	1.8	1.8	0	1.8	0	1.1	0	1.8	0	0
31	1.8	0	0	1.8	1.8	1.8	1.8	2.1	1.8	1.8	0	0
Sum	43.5	43.8	50.6	45.7	29.8	45.4	49.3	39.9	46.3	47.1	47.1	19.2
Current Year 1984									Period 1968-1984			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			17	2.5	16	0	1.4	85.1	182	520	0	
Feb.			1	1.8	118	0	1.4	85.1	110	311	0	
Mar.			8	2.5	20	0	1.8	98.9	226	871	33.6	
Apr.			12	1.8	1	0	1.4	89.2	215	431	89.2	
May			1	1.8	12	0	1.1	58.1	228	435	46.2	
June			24	2.1	116	0	1.4	88.4	203	409	21.0	
July			28	2.8	12	0	1.4	95.7	259	528	0	
Aug.			19	2.5	15	0	1.4	77.7	287	596	77.7	
Sept.			23	3.2	15	0	1.4	90.0	268	549	67.2	
Oct.			20	2.1	12	0	1.4	91.6	248	507	91.6	
Nov.			22	2.8	127	0	1.4	91.6	216	504	90.0	
Dec.			16	1.8	12	0	.7	37.1	204	597	32.9	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
			0.09		0	0.04	1,219.4	3,328	6,610	1,160		

0 Mean daily

! And other days

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1984 the only flow to the New River in Mexico was waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Xochimilco.

RECORDS: Records of the Potable Water Plant are based on flows measured on a Parshall flume less pumping to the city. Records obtained and furnished by the State Commission of Public Services of Mexicali. Records available: Wisteria Wasteway, January 1951 through 1975; Sifon Wasteway, January 1952 to April 30, 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through December 1984.

REMARKS: To obtain data for Sifon and Pueblo Nuevo Wasteways, see bulletins 1 to 6 (1960-1965); and for Wisteria Wasteway, bulletins 1 to 16 (1960-1975). For data on wastes from Potable Water Plant, see page 56 of this bulletin.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1956-1984		
		Average	Maximum	Minimum
January	85.1	1,047	8,758	6.3
February	85.1	750	7,281	18.2
March	98.9	523	2,610	21.7
April	89.2	468	3,194	16.1
May	58.1	319	1,176	9.1
June	88.4	417	5,670	0
July	95.7	630	10,251	0
August	77.7	559	4,137	0
September	90.0	461	3,215	21.0
October	91.6	614	3,474	8.4
November	91.6	640	3,784	0
December	37.1	1,009	8,691	0
Yearly	989	7,437	27,430	399
	Thousands of Cubic Meters			
	1,219.4	9,176	33,835	492

SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 15.5 miles (24.9 km) northwest of Westmoreland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 8,360 square miles (21,652 km²). Zero of the gage is 250.0 feet (76.2 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1984. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 22 miles (35.4 km) northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmoreland, California." The elevation of the old station is at a datum of one foot (0.30 m) higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

REMARKS: Runoff from the basin, irrigation drainage and waste water from Imperial and Coachella Valleys in the United States, and drainage and waste water from part of the Mexicali Valley in Mexico discharge into the Salton Sea. Water from Mexico enters the United States in the Alamo and New River channels. The bottom of the sea is 277.7 feet (84.6 m) below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during year, 226.8 feet (69.1 m) below mean sea level. Minimum elevation during year, 227.9 feet (69.5 m) below mean sea level. Extremes for period of record, maximum elevation 195.9 feet (59.7 m) below mean sea level, February 10 to March 29, 1907; minimum elevation since 1906, 251.6 feet (76.7 m) below mean sea level in November 1924.

Mean Daily Water Surface Elevation in Feet below Mean Sea Level - 1984

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	227.5	227.3	227.1	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8
2	227.5	227.3	227.1	226.9	226.9	226.9	227.1	227.1	227.3	227.6	227.8	227.8
3	227.5	227.3	227.1	226.9	226.9	226.9	227.1	227.1	227.3	227.6	227.8	227.8
4	227.5	227.3	227.1	226.9	226.9	226.9	227.1	227.1	227.3	227.6	227.8	227.8
5	227.5	227.3	227.1	226.9	226.9	226.9	227.1	227.1	227.3	227.6	227.8	227.8
6	227.5	227.3	227.1	226.9	226.9	226.9	227.1	227.1	227.3	227.6	227.8	227.8
7	227.5	227.2	227.1	226.9	226.8	226.9	227.1	227.2	227.3	227.6	227.8	227.8
8	227.5	227.2	227.1	226.9	226.8	226.9	227.1	227.2	227.3	227.6	227.8	227.8
9	227.5	227.2	227.0	226.9	226.8	226.9	227.1	227.2	227.3	227.6	227.8	227.8
10	227.4	227.2	227.0	226.9	226.8	227.0	227.1	227.2	227.3	227.6	227.8	227.8
11	227.4	227.2	227.0	226.9	226.8	227.0	227.1	227.2	227.3	227.6	227.8	227.8
12	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.6	227.8	227.8
13	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.6	227.8	227.8
14	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.6	227.9	227.8
15	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.6	227.9	227.8
16	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.7	227.9	227.8
17	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.7	227.8	227.8
18	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.8	227.8	227.8
19	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.3	227.8	227.8	227.8
20	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.4	227.8	227.8	227.7
21	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.4	227.8	227.8	227.7
22	227.4	227.2	227.0	226.8	226.8	227.0	227.1	227.2	227.4	227.8	227.8	227.7
23	227.4	227.1	227.0	226.8	226.8	227.0	227.1	227.2	227.4	227.8	227.8	227.7
24	227.4	227.1	226.9	226.8	226.8	227.0	227.1	227.2	227.4	227.8	227.8	227.7
25	227.4	227.1	226.9	226.8	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.7
26	227.4	227.1	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.7
27	227.3	227.1	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.6
28	227.3	227.1	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.6
29	227.3	227.1	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.6
30	227.3	226.9	226.9	226.9	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.6
31	227.3	226.9	226.9	226.8	226.8	227.0	227.1	227.2	227.5	227.8	227.8	227.6
Avg.	227.4	227.2	227.0	226.9	226.8	227.0	227.1	227.2	227.4	227.7	227.8	227.7

Month	Current Year 1984		Period 1935-1984		
	Ø Extreme Elevation Feet		Elevation Feet		
	High	Low	# Average	# Maximum	! Minimum
Jan.	227.3	227.5	236.29	227.4	249.3
Feb.	227.1	227.3	235.98	227.2	248.8
Mar.	226.9	227.1	235.71	227.0	248.6
Apr.	226.8	226.9	235.52	226.9	248.7
May	226.8	226.9	235.50	226.8	248.5
June	226.8	227.0	235.65	227.0	248.8
July	227.0	227.1	235.81	227.1	249.1
Aug.	227.1	227.2	236.00	227.2	249.4
Sept.	227.2	227.5	236.18	227.3	249.4
Oct.	227.5	227.8	236.25	227.4	249.8
Nov.	227.8	227.9	236.28	227.5	250.0
Dec.	227.6	227.8	236.15	227.5	249.6
Yearly	226.8	227.9	235.94	227.1	250.0

Area and Capacity Table		
Elevation	Area	Capacity
Feet Below M.S.L.	Acres	Acres-Feet
277.7	0	0
274.0	20,600	25,700
270.0	62,900	188,700
266.0	94,600	510,600
260.0	122,600	1,170,000
256.0	134,700	1,684,000
252.0	148,800	2,250,000
244.0	179,700	3,562,000
240.0	196,900	4,315,000
235.0	221,800	5,360,000
230.0	235,800	6,504,000
220.0	262,000	8,993,000
210.0	288,500	11,740,000
200.0	315,500	14,760,000

Ø Mean daily

Mean monthly

! Reading near first day of month

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES 1984

The following table shows electrical conductivity, expressed in mhos per centimeter $\times 10^6$ at 25°C, of individual water samples from the New River in Mexico at the international boundary. Samples were taken by the Mexican Section of the Commission, who also made the determinations.

Electrical conductivity is a relative indication of the concentration of dissolved solids in the water samples.

Date	ECx10 ⁶ @25°C												
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New River at International Boundary

January		February		May		July		August		September		October		November	
4	5,980	15	6,200	23	6,060	4	5,540	8	6,210	12	5,780	17	4,210	21	4,040
11	5,860	22	6,500	30	5,490	11	6,310	15	6,030	19	4,240	24	4,070	28	5,770
18	5,340	29	7,600		June	18	7,000	22	6,210	26	4,560	31	3,700		December
25	6,150		March	6	5,400	25	5,680	29	5,270		October		November	5	3,500
	February	7	5,520	13	6,200		August		September	3	4,110	7	4,580	12	4,740
1	5,730	14	5,850	20	6,450	1	6,060	5	5,110	10	4,540	14	4,050	19	4,140
9	5,600													26	4,170

COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 1.8 miles (2.9 km) upstream from the mouth of Hauser Creek, 8.5 miles (13.7 km) upstream from Barrett Dam, and about 20 miles (32.2 km) upstream from the international boundary. The zero of the gage is 2,882.4 feet (878.56 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the city of San Diego, California. Records April 1911 through 1984.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1984 computed on basis of area-capacity curves determined from 1948 resurvey. Various changes have been made to the spillway section since construction of the dam. Elevation of the present crest of ungated spillway is 157.00 feet (47.85 m), gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet (61,934,000 m³). The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the city of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

EXTREMES: Maximum monthly inflow since 1937, 45,274 acre-feet (55,845,000 m³), March 1983. Prior to 1937, maximum monthly inflow, 37,200 acre-feet (45,886,000 m³), January 1916; minimum no flow during parts of many years.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1937-1984		
		Average	Maximum	Minimum
January	1,690	699	7,472	0
February	2,401	2,139	33,569	8.0
March	715	3,169	45,274	19.3
April	1,160	1,800	23,130	3.3
May	651	918	15,113	0
June	7.5	473	8,247	0
July	764	314	6,203	0
August	570	267	7,228	0
September	68	179	5,133	0
October	174	153	3,905	0
November	436	257	4,567	0
December	1,382	705	7,679	4.4
Yearly	10,018	11,073	143,966	121
	Thousands of Cubic Meters			
	12,357	13,658	177,579	149

COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

DESCRIPTION: Two water-stage recorders, one on the upstream side of the southeast abutment of Morena Dam for measuring head on the spillway crest and one immediately below the dam with a rectangular control weir for measuring ordinary reservoir releases, and cableway located about 0.8 mile (1.3 km) downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the city of San Diego, California. Records available: January 1911 through 1984.

REMARKS: Flows at this station are regulated by Morena Dam; storage began March 1910. Water is released from Morena Reservoir as required and flows down the natural channel of Cottonwood Creek to Barrett Reservoir. There are no major diversions above Morena Dam.

EXTREMES: Maximum monthly discharge since 1937, 45,088 acre-feet (55,615,000 m³) March 1983. Prior to 1937, maximum monthly discharge, 21,400 acre-feet (26,397,000 m³), February 1916; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1937-1984		
		Average	Maximum	Minimum
January	2,094	182	2,094	0
February	1,690	924	15,926	0
March	315	1,824	45,088	0
April	548	1,427	22,829	0
May	315	728	14,674	0
June	305	518	7,507	0
July	332	306	5,056	0
August	332	289	6,435	0
September	305	338	5,880	0
October	315	172	3,761	0
November	305	202	4,111	0
December	350	426	7,377	0
Yearly	7,206	7,336	136,550	0
	Thousands of Cubic Meters			
	8,888	9,049	168,432	0

COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 8.5 miles (13.7 km) downstream from Morena Dam, 1 mile (1.6 km) downstream from the mouth of Pine Valley Creek, and about 12 miles (19.3 km) upstream from the international boundary. Zero of gage is 1,446.12 feet (440.78 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases, and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall furnished by the city of San Diego, California. Records available: January 1921 through 1984. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

REMARKS: Storage began at Barrett Reservoir in January 1921. The area-capacity-elevation curves used in the inflow calculations are dated 1948, 1951, and 1955 and were furnished by the city of San Diego, California. Capacity of reservoir at top of flash gates on spillway (gage height 168.88 feet (51.47 m)) is 44,755 acre-feet (55,205,000 m³). Capacity at spillway crest (gage height 160.88 feet (49.04 m)) is 37,950 acre-feet (46,811,000 m³). Dead storage, 719 acre-feet (887,000 m³) below lowest outlet (gage height (58.88 feet) (17.95 m) is included in these capacities. The entire capacity of Barrett Reservoir is used to furnish a part of the water supply of the city of San Diego, California.

EXTREMES: Maximum monthly discharge since 1937, 54,755 acre-feet (67,540,000 m³) February 1980. Prior to 1937, maximum monthly discharge, 54,800 acre-feet (67,595,000 m³) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1937-1984		
		Average	Maximum	Minimum
January	2,422	793	4,926	5.2
February	116	2,844	54,755	7.6
March	1,104	4,517	45,700	14.1
April	484	2,133	21,630	10.2
May	388	874	8,311	0
June	350	375	3,906	0
July	844	200	1,687	0
August	257	116	596	0
September	248	117	759	0
October	139	85.2	645	.1
November	406	169	1,200	0
December	1,304	564	5,549	1.7
Yearly	8,062	12,787	114,330	129
	Thousands of Cubic Meters			
	9,944	15,773	141,024	159

DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.5 mile (0.8 km) downstream from Barrett Dam on right bank of Dulzura Conduit 50 feet (15.2 m) upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the city of San Diego, California. Records available: January 1909 through 1984.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 1.5 miles (2.4 km) upstream. The conduit carries diversions from Barrett Reservoir on Cottonwood Creek westerly across the divide into Otay Reservoir for municipal use by the city of San Diego. Prior to September 30, 1958, station was located 8 miles (12.9 km) along the conduit from Barrett Dam, being reported as "Dulzura Conduit near Dulzura;" and the draft from Barrett Reservoir was computed from the discharges obtained at the conduit gaging station, multiplied by the factor 1.05 to allow for channel loss in the reach from the reservoir to the gaging station.

EXTREMES: Since 1937: Maximum mean daily discharge, 55 second-feet (1.56 m³/sec) on March 15, 1954; minimum discharge, no flow for long periods on many occasions.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.7	17.3	24.7	28.8	29.2	0	26.1	25.9	29.8	30.1	28.6	0
2	26.7	20.6	24.7	28.8	29.2	0	26.9	26.1	29.8	29.8	28.6	0
3	26.7	20.6	24.5	28.8	29.2	0	26.9	26.3	29.6	30.1	28.6	0
4	26.7	25.9	24.5	28.8	29.2	0	26.9	26.7	29.4	30.1	28.4	0
5	26.7	25.9	24.5	28.8	29.0	0	26.7	26.3	29.2	29.8	28.4	0
6	26.9	25.9	0	29.0	29.0	0	26.9	26.3	29.2	29.4	28.4	0
7	26.9	25.7	9.3	29.0	29.0	0	26.5	26.3	29.2	29.0	28.4	0
8	26.9	25.7	15.1	29.0	28.6	0	26.5	0	29.2	28.8	28.4	0
9	26.9	25.7	15.1	29.2	28.4	0	26.7	0	27.1	28.2	28.4	0
10	27.1	25.9	15.1	29.2	28.2	0	26.5	11.6	27.1	28.0	28.4	0
11	27.1	25.7	15.0	29.4	28.2	0	26.3	11.6	28.8	28.0	28.4	0
12	27.1	25.7	21.4	29.6	28.0	0	26.1	11.6	28.8	28.0	28.4	0
13	27.1	25.5	21.6	29.8	28.0	0	25.7	11.4	29.0	0	28.4	0
14	27.3	25.5	21.6	30.1	27.8	11.3	25.7	11.4	29.4	0	28.2	0
15	27.3	25.5	28.4	30.1	28.0	18.5	25.7	11.4	29.6	0	28.2	0
16	27.3	25.5	28.4	30.1	28.0	18.5	25.7	11.4	29.8	0	28.2	0
17	27.3	25.1	28.4	30.1	28.0	18.5	25.1	11.4	29.4	0	28.2	0
18	27.5	24.9	28.4	30.1	28.0	18.7	24.9	11.4	29.2	0	28.2	0
19	27.5	24.7	28.4	30.1	28.0	26.7	24.7	11.6	29.6	0	28.2	0
20	0	24.7	28.4	30.1	28.0	33.4	26.3	11.6	30.3	0	0	0
21	0	24.7	28.4	29.6	28.0	33.7	26.1	11.6	30.7	0	0	0
22	0	24.7	28.4	29.6	28.0	29.8	26.1	11.6	30.5	0	0	0
23	0	24.9	28.4	29.6	28.0	29.8	26.1	11.6	30.3	0	0	0
24	0	24.7	28.4	29.6	28.2	29.8	25.9	11.6	30.1	0	0	0
25	0	24.7	28.4	29.4	28.2	30.1	25.9	11.6	30.1	0	0	0
26	0	24.7	28.4	29.4	28.2	26.5	25.9	11.6	30.7	11.9	0	0
27	0	24.7	28.4	29.4	28.2	26.7	25.9	11.6	30.9	11.9	0	0
28	11.3	24.7	28.4	29.4	28.2	26.1	25.9	17.6	30.7	17.1	0	0
29	11.3	24.7	28.4	29.2	0	26.1	26.3	17.6	30.5	22.5	0	0
30	11.3	28.8	29.2	0	26.3	0	26.1	30.3	30.5	28.8	0	0
31	17.5	28.8	28.8	0	0	0	25.9	30.1	0	28.6	0	0
Sum	565.1	714.5	740.7	883.3	794.0	430.5	808.9	487.1	888.5	470.1	539.0	0
Current Year 1984										Period 1937-1984		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			118	27.5	120	0	18.2	1,121	362	2,350	0	
Feb.			14	25.9	1	17.3	24.6	1,417	393	2,130	0	
Mar.			130	28.8	6	0	23.9	1,469	530	2,330	0	
Apr.			114	30.1	1	28.8	29.4	1,752	788	2,860	0	
May			1	29.2	129	0	25.6	1,575	904	3,040	0	
June			21	33.7	1	0	14.4	854	945	2,920	0	
July			1	26.9	19	24.7	26.1	1,604	822	2,920	0	
Aug.			30	30.3	1	0	15.7	966	763	2,820	0	
Sept.			27	30.9	1	9	27.1	29.6	1,762	583	2,320	0
Oct.			1	30.1	113	0	15.2	932	468	2,450	0	
Nov.			1	28.6	120	0	18.0	1,069	508	2,760	0	
Dec.				0	0	0	0	0	447	2,305	0	
				33.7		0	20.0	14,521	7,513	27,170	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
			0.95		0	0.57	17,911	9,267	33,514	0		

u Estimated Ø Mean daily † And other days

COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 2.5 miles (4.0 km) downstream from Barrett Dam and 0.5 mile (0.8 km) upstream from Rattlesnake Canyon for measuring Barrett Dam spills; and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 1,000 feet (305 m) (from topographic map).

RECORDS: Data furnished by the city of San Diego, California. Prior to January 1953, the records were furnished by the city of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. Spillway discharges have occurred in May 1943, March, April 1979, January to May of 1980, April, December 1982, and the entire year of 1983. Spillway discharges included in the period record below were computed by the city of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1984. Storage began in Barrett Reservoir in January 1921.

REMARKS: Records reported below represent the water available in the natural channel of Cottonwood Creek immediately below Barrett Dam. Records of draft from Barrett Reservoir are not included, inasmuch as all releases are made to Dulzura Conduit, which transports water outside the basin. Leakage is mainly through the spillway gates.

EXTREMES: Maximum monthly discharge since 1937, 90,618 acre-feet (111,775,000 m³) March 1983. Prior to 1937, maximum monthly discharge 38,400 acre-feet (47,366,000 m³) February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1937-1984		
		Average	Maximum	Minimum
January	3,359	210	6,048	0
February	287	1,972	70,318	0
March	212	3,783	90,618	0
April	0	2,156	36,820	0
May	0	913	22,933	0
June	0	416	10,947	0
July	0	155	4,306	0
August	0	105	3,410	0
September	0	9.5	298	0
October	0	4.1	123	0
November	0	87.3	4,135	0
December	0	134	4,911	0
Yearly	3,858	9,945	206,002	0
	Thousands of Cubic Meters			
	4,759	12,267	254,099	0

COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 1.6 miles (2.6 km) upstream from the international land boundary between the United States and Mexico, 0.8 mile (1.3 km) upstream from the confluence with Tecate Creek, and 5.1 miles (8.2 km) south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway, which is located 700 feet (213 m) downstream from the gage. Zero of the gage is 569.40 feet (173.55 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1984.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 (16.1 km) and 18 miles (29.0 km), respectively, upstream from this station.

EXTREMES: Maximum discharge 11,700 second-feet (331 m³/sec) February 21, 1980 (gage height 11.15 feet) (3.40 m). Minimum discharge, no flow during part of each year.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42.0	16.0	5.20	1.80	0.44	0	0	0	0	0	0	0.10
2	44.0	12.0	4.40	1.70	.42	0	0	0	0	0	0	.09
3	45.0	9.10	3.80	1.70	.41	0	0	0	0	0	0	.17
4	45.0	8.20	3.00	1.60	.35	0	0	0	0	0	0	.17
5	38.0	7.20	2.60	1.50	.31	.03	0	0	0	0	0	.13
6	26.0	6.50	2.50	1.70	.27	.06	0	0	0	0	0	.09
7	22.0	5.40	2.70	1.60	.19	.03	0	0	0	0	0	.17
8	19.0	4.80	4.80	1.40	.12	.01	0	0	0	0	0	.70
9	14.0	4.60	5.10	1.30	.06	0	0	0	0	0	0	.29
10	13.0	4.80	4.80	1.20	.04	0	0	0	0	0	0	.42
11	12.0	4.50	4.10	1.10	.05	0	0	0	0	0	0	.68
12	13.0	4.10	3.60	.94	.05	0	0	0	0	0	0	.48
13	20.0	3.90	3.40	.83	.04	0	0	0	0	0	0	.05
14	14.0	3.90	3.20	.63	.03	0	0	0	0	0	0	.13
15	8.40	3.70	3.00	.52	.05	0	0	0	0	0	0	.24
16	7.60	3.90	3.00	.45	.06	0	0	0	0	0	0	.26
17	7.30	4.00	2.90	.47	.05	0	0	0	0	0	0	.58
18	7.70	4.20	2.60	.51	.03	0	0	0	0	0	0	.24
19	7.90	4.20	2.60	.74	.02	0	0	0	0	0	0	.20
20	14.0	4.10	2.70	.70	.02	0	0	0	0	0	0	.13
21	25.0	4.10	2.60	.60	.03	0	0	0	0	0	0	.32
22	25.0	4.10	2.40	.46	.03	0	0	0	0	0	0	.31
23	25.0	3.90	2.30	.33	.02	0	0	0	0	0	0	.47
24	26.0	3.90	2.20	.33	.02	0	0	0	0	0	0	.47
25	24.0	3.80	2.10	.37	.01	0	0	0	0	0	0	.53
26	24.0	3.20	2.20	.41	0	0	0	0	0	0	0	.19
27	36.0	2.90	2.20	.46	0	0	0	0	0	0	0	.11
28	57.0	3.10	1.90	.45	0	0	0	0	0	0	0	.18
29	37.0	5.50	1.80	.44	0	0	0	0	0	0	0	.15
30	27.0	1.80	1.80	.44	0	0	0	0	0	0	0	.11
31	22.0	1.80	1.80	.44	0	0	0	0	0	0	0	.11
Sum	747.90	153.60	93.30	26.68	3.12	0.13	0	0	0	0	4.67	33.34

Month	Current Year 1984						Period 1937-1984				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.			28	57.0	17	7.30	24.1	1,483	525	11,918	0
Feb.			1	16.0	27	2.90	5.3	305	2,554	69,019	0
Mar.			1	5.20	129	1.80	3.01	185	4,121	88,707	0
Apr.			1	1.80	123	.33	.89	52.9	2,476	40,240	0
May			1	.44	126	0	.10	6.2	894	18,192	0
June			6	.06	1	1	0	.3	296	5,919	0
July			0	0	0	0	0	0	79.3	2,918	0
Aug.			0	0	0	0	0	0	62.4	1,500	0
Sept.			0	0	0	0	0	0	15.8	645	0
Oct.			0	0	0	0	0	0	8.5	236	0
Nov.			17	.58	1	1	0	.16	9.3	44.6	1,117
Dec.			28	7.60	1	2	.09	1.08	66.1	178	2,569
Yearly				57.0		0	2.90	2,108	11,255	178,808	0
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				1.61		0	0.08	2,600	13,883	220,556	0

0 Mean daily

1 And other days

CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.5 mile (0.8 km) upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 3.5 miles (5.6 km) southwest of Campo, California. Zero of gage is 2,178.92 feet (664.13 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1984.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station was partially regulated by a small conservation reservoir, 1 mile (1.6 km) upstream, from August 1956 to February 20, 1980, when it was destroyed by a flood.

EXTREMES: Maximum discharge, 895 second-feet (25.3 m³/sec), March 24, 1983 (gage height 5.39 feet (1.64 m) present datum), from rating curve extended above 110 second-feet (3.12 m³/sec) on basis of velocity-depth relation and cross-section area at the control. Minimum discharge, no flow during part of most years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	19.0	15.0	16.0	15.0	9.9	4.1	1.4	5.0	4.0	2.9	6.7	10.0	
2	17.0	15.0	13.0	14.0	10.0	4.5	1.4	4.7	3.7	2.9	6.7	9.6	
3	19.0	15.0	15.0	15.0	9.5	4.6	1.4	4.7	3.6	3.1	6.7	9.7	
4	19.0	14.0	14.0	13.0	9.8	4.6	1.4	4.6	3.2	3.3	6.9	9.3	
5	19.0	15.0	13.0	14.0	9.8	4.7	1.2	3.9	3.1	3.3	7.4	9.0	
6	21.0	15.0	15.0	13.0	10.0	5.5	1.1	3.5	3.1	3.3	7.5	9.0	
7	20.0	14.0	15.0	13.0	9.5	5.1	1.2	3.0	3.1	3.4	7.5	8.7	
8	19.0	14.0	14.0	12.0	7.7	4.9	3.0	2.6	3.1	3.5	8.0	9.5	
9	19.0	12.0	14.0	13.0	6.7	3.7	2.9	2.4	3.2	3.7	8.4	8.8	
10	19.0	14.0	14.0	12.0	5.8	3.3	2.8	3.1	3.4	3.8	8.2	8.7	
11	19.0	15.0	13.0	12.0	4.9	2.8	2.7	3.1	3.5	4.0	7.8	9.1	
12	18.0	15.0	14.0	10.0	4.8	2.5	2.5	3.0	3.3	4.2	7.4	8.4	
13	18.0	14.0	14.0	8.7	4.5	2.6	2.6	2.7	3.1	4.1	7.4	8.3	
14	18.0	14.0	14.0	10.0	3.9	2.5	2.6	3.7	2.9	4.4	8.0	7.7	
15	18.0	13.0	15.0	11.0	3.7	2.7	2.6	3.4	2.7	4.6	8.4	7.3	
16	19.0	14.0	15.0	10.0	4.4	2.6	2.7	3.3	2.7	4.5	8.8	7.4	
17	20.0	15.0	16.0	11.0	5.1	2.3	2.8	3.5	2.8	4.8	9.8	7.0	
18	18.0	15.0	13.0	10.0	5.1	2.2	2.8	3.4	2.9	5.2	10.0	6.6	
19	17.0	15.0	13.0	12.0	4.6	2.1	3.0	9.0	3.1	5.1	8.7	8.9	
20	17.0	13.0	14.0	11.0	4.7	2.1	3.0	21.0	3.7	5.1	8.0	8.1	
21	18.0	15.0	14.0	11.0	4.8	2.1	3.1	3.7	3.6	5.4	8.9	7.2	
22	17.0	15.0	14.0	9.3	4.4	1.8	3.1	3.8	3.2	5.5	10.0	7.1	
23	16.0	15.0	14.0	9.2	4.0	1.5	3.1	4.0	3.1	5.5	11.0	7.1	
24	17.0	12.0	14.0	9.1	3.9	1.3	3.1	3.8	3.3	5.6	11.0	7.1	
25	17.0	16.0	14.0	9.1	3.8	1.3	3.1	4.4	3.4	5.5	11.0	6.9	
26	17.0	16.0	16.0	9.4	3.4	1.5	3.1	3.8	3.4	5.4	11.0	7.1	
27	15.0	15.0	16.0	8.8	3.3	1.3	3.1	4.5	4.2	5.8	11.0	9.7	
28	15.0	14.0	14.0	9.3	3.0	1.4	3.1	4.3	3.8	6.2	11.0	8.2	
29	14.0	16.0	14.0	11.0	3.4	1.6	4.0	5.0	3.6	6.5	11.0	7.4	
30	14.0	16.0	16.0	9.6	3.9	1.5	6.2	4.5	3.2	6.3	10.0	7.1	
31	15.0	15.0	15.0	4.1	4.1	6.4	4.2	4.2	6.6	6.6	7.1	7.1	
Sum	548.0	420.0	445.0	335.5	176.4	84.7	86.5	139.6	99.0	143.5	264.2	253.1	
Current Year 1984												Period 1937-1984	
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet					
	High	Low	Day	High	Low			Average	Maximum	Minimum			
Jan.			6	21.0	129	14.0	17.7	1,087	174	1,087	0		
Feb.			125	16.0	19	12.0	14.5	833	356	4,287	0		
Mar.			11	16.0	12	13.0	14.4	883	645	9,394	0		
Apr.			11	15.0	13	8.7	11.2	665	446	7,204	0		
May			12	10.0	28	3.0	5.7	350	212	3,207	0		
June			6	5.5	124	1.3	2.8	168	102	1,811	0		
July			31	6.4	6	1.1	2.8	172	60.2	1,236	0		
Aug.			20	21.0	9	2.4	4.5	277	61.9	1,628	0		
Sept.			27	4.2	115	2.7	3.3	196	44.8	984	0		
Oct.			31	6.6	11	2.9	4.6	285	53.1	879	0		
Nov.			123	11.0	11	6.7	8.8	524	87.7	1,234	0		
Dec.			1	10.0	18	6.6	8.2	502	152	1,583	0		
Yearly				21.0		1.1	8.2	5,942	2,395	31,325	0		
	Meters		Cubic Meters per Second			Thousands of Cubic Meters							
				0.59		0.03	0.23	7,329	2,954	38,639	0		

0 Mean daily

! And other days

COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and cableway, 0.6 mile (1.0 km) upstream from the international land boundary between the United States and Mexico, 0.5 mile (0.8 km) downstream from the confluence of Cottonwood Creek and Tecate Creek, and 5.5 miles (8.9 km) south of Dulzura, California. This station is published by the U. S. Geological Survey under the name "Tijuana River near Dulzura, California." Low water discharge measurements are made by wading at the gage. The zero of the gage is 542.42 feet (165.33 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1984.

REMARKS: Flow is partially controlled by Barrett and Morena Reservoirs, 11 (17.7 km) and 19 miles (30.6 km), respectively, upstream from this station. The flow at this station represents the amount of water passing the Marron Dam site.

EXTREMES: Maximum discharge, 13,600 second-feet (385 m³/sec), March 3, 1983 (gage height 7.03 feet); (2.14 m); maximum gage height, 11.19 feet (3.41 m) February 18, 1980; minimum discharge, no flow for part of most years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76.0	35.0	29.0	20.0	10.0	0.35	0.10	3.1	0.72	0.13	4.5	12.0
2	80.0	35.0	25.0	20.0	9.0	.35	.09	2.4	.61	.08	3.8	9.0
3	82.0	34.0	27.0	19.0	8.0	.35	.09	1.4	.56	.07	3.3	11.0
4	83.0	34.0	25.0	20.0	8.0	.35	.08	2.0	.50	.03	1.6	13.0
5	72.0	32.0	22.0	19.0	7.0	.35	.08	1.3	.36	.08	3.2	13.0
6	56.0	31.0	23.0	22.0	7.0	.35	.03	.90	.26	.08	5.1	13.0
7	50.0	31.0	23.0	21.0	6.0	.35	.05	.50	.22	.08	7.4	11.0
8	45.0	29.0	24.0	20.0	6.0	.30	.06	.42	.19	.08	11.0	16.0
9	46.0	29.0	24.0	20.0	5.0	.30	.05	.38	.15	.09	14.0	20.0
10	42.0	30.0	24.0	21.0	4.0	.30	.05	.36	.16	.12	14.0	22.0
11	42.0	32.0	26.0	17.0	4.0	.30	.04	.28	.15	.36	10.0	28.0
12	46.0	31.0	24.0	19.0	3.0	.30	.03	.24	.15	1.9	8.1	24.0
13	56.0	30.0	24.0	14.0	3.0	.25	.03	.18	.12	1.6	11.0	22.0
14	51.0	31.0	25.0	15.0	2.5	.25	.23	.16	.17	.69	13.0	21.0
15	49.0	31.0	26.0	12.0	2.5	.25	.45	.14	.19	.55	12.0	19.0
16	50.0	30.0	25.0	13.0	2.5	.25	9.30	.11	.24	.39	17.0	25.0
17	50.0	31.0	23.0	16.0	2.0	.25	.87	19.0	.20	1.1	28.0	23.0
18	47.0	32.0	23.0	12.0	2.0	.25	.42	17.0	.20	.56	30.0	20.0
19	48.0	31.0	22.0	15.0	1.5	.20	.35	2.6	.20	1.7	30.0	50.0
20	48.0	30.0	19.0	17.0	1.5	.20	.35	44.0	.22	2.6	30.0	63.0
21	54.0	30.0	21.0	14.0	1.3	.20	.30	24.0	.26	4.9	39.0	31.0
22	55.0	31.0	19.0	12.0	1.1	.20	.25	6.6	.33	7.0	54.0	22.0
23	52.0	31.0	19.0	10.0	1.0	.20	.20	3.3	.38	5.5	55.0	18.0
24	51.0	32.0	18.0	10.0	.9	.20	.20	2.3	.39	4.1	61.0	15.0
25	46.0	34.0	19.0	8.3	.8	.20	.16	1.9	.36	4.3	42.0	13.0
26	38.0	27.0	23.0	6.3	.8	.20	.12	1.6	.28	4.8	18.0	14.0
27	50.0	27.0	23.0	7.8	.7	.15	32.0	1.4	.24	6.1	15.0	119
28	61.0	27.0	20.0	13.0	.6	.15	30.0	1.0	.19	7.0	15.0	86.0
29	38.0	27.0	19.0	11.0	.5	.10	13.0	.95	.12	5.3	13.0	45.0
30	37.0		19.0	11.0	.4	.10	7.0	.76	.11	8.1	16.0	36.0
31	36.0		20.0		.4		3.2	.76		8.4		30.0
Sum	1,637.0	895.0	703.0	455.4	103.0	7.55	99.24	141.04	8.23	77.84	595.0	864.0
Current Year 1984										Period 1937-1984		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Low	Day	Acre-Feet	Average	Maximum	Minimum		
Jan.			4	83.0	31	36.0	52.8	3,247	1,008	20,792	0	
Feb.			1	35.0	126	27.0	30.9	1,775	4,712	143,486	0	
Mar.			1	29.0	24	13.0	22.7	1,394	7,116	133,180	0	
Apr.			6	22.0	26	6.3	15.2	903	3,406	51,060	0	
May			1	10.0	130	.40	3.3	204	1,158	20,955	0	
June			1	.35	129	.10	.3	15.0	408	8,428	0	
July			27	32.0	112	.03	3.2	197	164	3,497	0	
Aug.			20	44.0	16	.11	4.5	280	166	5,494	0	
Sept.			1	.72	30	.11	.3	16.3	50.2	1,144	0	
Oct.			31	8.4	3	.07	2.5	154	71.7	1,626	0	
Nov.			23	65.0	4	1.6	19.8	1,180	183	3,568	0	
Dec.			27	119	2	9.0	27.9	1,714	555	5,839	0	
Yearly				119		0.03	15.3	11,079	18,998	288,517	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				3.37		0	0.43	13,665	23,434	355,880	0	

0 Mean daily

! And other days

INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodriguez Dam is located in Mexico on Rio de las Palmas, the principal tributary to the Tijuana River, about 5.6 miles (9.0 km) upstream from its confluence with Cottonwood Creek, 10.6 miles (17.0 km) upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 9.9 miles (16.0 km) southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, rainfall and including Emergency Deliveries of Colorado River Water to Tijuana beginning in August 1972. The Emergency Deliveries of Colorado River Water to Tijuana are made pursuant to Minute 240 of this Commission. Records obtained by the Ministry of Agriculture and Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1984. Storage began in Rodriguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodriguez Reservoir, including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 380.08 feet (115.85 m) above mean sea level; at top of spillway gates 410.10 feet (125.00 m) above mean sea level. Reservoir capacity at spillway crest 74,885 acre-feet (92,370,000 m³); at top of spillway gates 111,880 acre-feet (138,000,000 m³).
EXTREMES: Maximum monthly inflow, 157,453 acre-feet (194,216,000 m³); February 1980; minimum, no flow during part of most years.

Monthly Discharge in Acre-Feet

Month	Current Year 1984			Period 1938-1984		
	Natural Inflow	Otay Aqueduct	Total	Average	Maximum	Minimum
January	2,985	0	2,985	2,206	54,820	0
February	1,074	0	1,074	6,369	157,453	5.8
March	278	0	278	10,932	139,893	4.2
April	106	0	106	3,449	77,790	0
May	302	0	302	673	11,460	0
June	113	0	113	211	4,661	0
July	192	0	192	101	1,464	0
August	16.7	0	16.7	61.5	770	0
September	111	0	111	60.7	466	0
October	276	0	276	74.2	344	0
November	298	0	298	168	1,940	0
December	2,823	0	2,823	952	15,686	8.4
Yearly	8,577	0	8,577	25,258	309,298	254
	Thousands of Cubic Meters					
	10,579	0	10,579	31,156	381,515	313

DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipeline which carries water from Rodriguez Reservoir to Gate No. 1 (Poblado Press) and to Gate No. 2 (City Aqueduct). Formerly, water for irrigation was also diverted to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records through May 1961 were obtained by the Ministry of Agriculture and Hydraulic Resources; from June 1961 to March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana; and from April 1966 through 1984 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1984.

REMARKS: Beginning in January 1937, diversions for irrigation began from both sides for the Tijuana valley and for domestic use at the village by Rodriguez Dam and the city of Tijuana. Since February 1960, no water has been released for irrigation of farmlands.

EXTREMES: Maximum monthly diversion, 1,963 acre-feet (2,421,000 m³), July 1944; minimum, no flow March and April 1941, August 1960, and December 1962.

Monthly Discharge in Acre-Feet

Month	Current Year 1984	Period 1938-1984		
		Average	Maximum	Minimum
January	1,338	291	1,338	1.5
February	1,259	302	1,259	.8
March	1,343	357	1,343	0
April	1,277	461	1,602	0
May	1,399	599	1,676	1.8
June	1,377	679	1,857	1.9
July	1,461	721	1,963	1.9
August	1,436	657	1,859	0
September	1,428	560	1,428	1.9
October	1,476	498	1,476	1.9
November	1,368	407	1,368	1.9
December	1,401	374	1,401	0
Yearly	16,563	591	16,563	29.3
	Thousands of Cubic Meters			
	20,430	729	20,430	36.2

TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 0.7 mile (1.1 km) downstream (north) from boundary, 1.1 miles (1.8 km) upstream from the new Dairy Mart Road bridge, and 1.4 miles (2.3 km) west of the international gate at San Ysidro, California. Zero of the gage is 38.04 feet (11.59 m) above mean sea level, U. S. C. & G. S. datum. Gage was silted in and inoperable from May 28 to August 1 and August 10 to October 26, 1983.

RECORDS: Based on current meter measurements, staff gage readings and record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1984.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec), February 21, 1980; minimum discharge, no flow during many years since 1951.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	137	49.0	32.2	26.1	u 8.6	3.2	1.4	4.0	3.2	3.6	0.9	0.4
2	125	58.9	33.9	32.2	u 8.2	3.2	1.9	3.8	3.2	3.8	1.4	.4
3	118	52.9	37.3	27.0	u 7.9	3.8	1.9	3.8	3.2	3.8	1.4	6.5
4	122	58.9	37.3	17.8	u 7.5	4.5	1.9	3.8	3.8	4.5	1.4	.4
5	111	48.0	39.0	14.1	u 7.2	3.2	1.9	3.8	3.8	4.5	2.5	.8
6	86.8	39.0	33.1	56.9	u 6.8	3.2	1.9	3.8	3.8	4.5	2.5	1.4
7	67.5	39.0	24.6	33.9	u 6.5	3.8	2.5	3.2	3.8	4.5	2.5	21.9
8	58.9	41.0	27.5	26.6	u 6.1	2.5	2.5	3.2	3.2	4.5	2.5	81.8
9	54.9	45.0	29.0	17.8	u 5.8	2.5	3.2	3.2	3.2	5.1	3.2	35.3
10	58.4	45.0	26.1	9.4	u 5.4	2.5	2.5	3.2	3.2	5.1	3.2	71.4
11	52.3	50.9	29.0	11.7	u 5.1	1.9	2.5	3.2	3.8	6.2	3.8	210
12	45.0	55.2	33.9	11.7	u 5.1	1.9	2.5	3.2	3.2	7.2	4.5	33.5
13	47.0	45.0	32.2	8.3	u 4.5	2.5	2.5	3.2	3.2	5.1	3.8	14.1
14	49.0	37.9	33.9	8.3	* 4.5	2.5	23.8	3.8	3.8	7.3	3.2	4.5
15	51.2	49.0	30.5	8.3	4.1	2.5	8.9	3.8	3.2	5.1	3.2	1.9
16	51.6	46.4	32.2	7.3	1.9	1.9	5.1	3.8	3.8	5.1	29.1	117
17	49.0	41.3	32.2	7.3	2.5	1.9	5.1	3.8	3.2	9.4	54.8	13.0
18	45.0	37.3	33.9	9.4	3.2	1.9	4.5	11.7	3.2	.9	1.4	94.1
19	43.0	42.4	37.3	10.8	3.2	1.9	3.8	3.8	3.2	.4	.4	192
20	41.0	35.6	33.9	10.5	3.2	1.9	4.5	3.8	3.2	1.9	.4	170
21	64.0	33.9	30.5	12.9	3.2	1.9	3.8	3.2	5.8	1.4	47.2	63.7
22	87.5	32.5	26.1	11.7	3.2	1.9	3.8	3.2	2.5	.9	74.1	20.3
23	72.3	30.5	23.1	u 11.3	3.2	1.9	3.2	3.2	1.9	.9	52.6	4.5
24	68.3	32.2	23.1	u 11.0	2.5	1.4	3.8	3.2	1.4	.9	82.4	1.9
25	85.1	35.6	26.1	u 10.7	2.5	1.4	3.8	3.2	3.2	.9	* 35.3	1.2
26	76.0	35.6	30.5	u 10.3	3.2	1.9	4.5	3.2	2.5	.9	* 1.4	20.0
27	65.4	32.2	32.2	u 10.0	2.5	1.9	3.8	3.2	3.2	.4	1.4	509
28	116	29.0	32.2	u 9.6	1.9	1.9	4.5	2.5	3.2	.9	.4	440
29	106	29.0	29.0	u 11.7	2.5	1.4	3.8	3.2	3.2	.9	.4	173
30	76.3	26.1	u 8.9	3.2	1.4	3.2	3.2	3.8	3.2	.9	.4	104
31	54.9	24.6	24.6	3.2	3.2	1.4	3.2	3.8	3.2	1.4	.4	74.2
Sum		1,208.2		463.5		70.2		115.6		102.9		2,482.2
	2,285.4		952.5		138.4		126.2		98.3		420.7	
Current Year 1984												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Period 1947-1984			
	High	Low	Day	High	Low		Acres-Feet	Acres-Feet	Acres-Feet			
				Day	Day	Average			Maximum	Minimum		
Jan.	39.90	39.40	28	153	111	39.0	73.7	4,533	2,869	72,441	0	
Feb.	39.57	39.34	! 4	74.0	122	29.0	41.7	2,396	9,937	315,328	0	
Mar.	39.41	39.29	19	41.0	! 7	21.8	30.7	1,889	13,559	293,494	0	
Apr.	40.17	39.16	6	228	110	6.2	15.4	919	3,514	62,938	0	
May		39.08	1	u 8.6	16	.9	4.5	275	1,934	42,599	0	
June	39.18	39.08	7	8.3	! 29	.9	2.3	139	509	9,696	0	
July	40.15	39.09	14	222	1	1.4	4.1	250	364	9,242	0	
Aug.	39.70	39.10	18	104	25	1.4	3.7	229	532	17,092	0	
Sept.	39.28	39.15	21	9.4	24	1.4	3.3	195	77.6	978	0	
Oct.	39.75	39.23	17	78.2	18	0	3.3	204	90.1	1,237	0	
Nov.	41.18	39.15	17	512	119	.4	14.0	834	265	4,377	0	
Dec.	42.00	39.14	28	755	! 1	.4	80.1	4,923	617	6,705	0	
	42.00	39.08		755		0	23.1	16,786	34,268	595,739	0	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	12.80	11.91		21.4		0	0.65	20,705	42,269	734,838	0	

u Estimated

* Partly estimated

! And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

Data are presented below for all storage reservoirs in the Tijuana River basin. The data represent contents on the last day of the month in acre-feet. The reservoir capacities indicated are total capacities at the top of the spillway gates in closed position on the controlled spillways of Barrett and Rodriguez Dams, and at spillway level for Morena Dam, which has had an uncontrolled spillway since the spillway gates were removed in 1942. The records of storage reported below for Morena, Barrett, and Rodriguez Reservoirs are based on the capacities as determined by the following surveys: Morena 1948; Barrett 1948, 1951, and 1955; and Rodriguez 1927, when the reservoir area was initially surveyed.

Records for Morena and Barrett Reservoirs are obtained and furnished by the city of San Diego and the U. S. Geological Survey. Records for Rodriguez Reservoir obtained and furnished by the State of Baja California Commission of Public Services for Tijuana.

In Acre-Feet

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 50,210)		BARRETT RESERVOIR, CALIFORNIA (Capacity 44,760)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 111,880)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 206,850)	
	1984	Average 1937-1984	1984	Average 1937-1984	1984	Average 1937-1984	1984	Average 1937-1984
Jan.	49,960	17,210	38,044	12,844	80,244	33,033	168,248	63,087
Feb.	50,206	18,324	37,996	14,173	79,424	34,411	167,626	66,908
Mar.	50,052	19,522	37,495	16,112	77,484	38,818	165,031	74,452
Apr.	50,052	19,659	36,518	16,619	75,582	39,107	162,152	75,385
May	49,439	19,536	35,238	16,180	73,591	38,685	158,268	74,401
June	48,080	19,095	34,657	15,440	71,469	37,638	154,206	72,173
July	47,695	18,647	33,921	14,669	69,269	36,248	150,885	69,564
Aug.	46,970	18,219	33,195	13,913	67,013	34,893	147,178	67,025
Sept.	45,923	17,729	31,625	13,513	64,873	33,970	142,421	65,212
Oct.	45,347	17,443	30,943	13,120	62,976	33,205	139,266	63,768
Nov.	45,189	17,362	30,497	12,790	61,384	32,689	137,070	62,841
Dec.	46,096	17,544	32,109	13,115	62,295	33,080	140,500	63,739
Average	47,917	18,358	34,353	14,374	70,467	35,482	152,737	68,214
Maximum	50,206	! # 61,670	38,044	! * 45,920	80,244	! 112,272	168,248	! 213,600
Minimum	45,189	! ! 10	30,497	! ! 106	61,384	! ! 0	137,070	! ! 1,264

March 31, 1941 - Prior to removal of spillway gates

* April 30, 1937 - Sandbags were placed on crest of spillway

! Maximum end of month storage for period of record

!! Minimum end of month storage for period of record

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in California and Baja California. Daily records, where available, are on file in the offices of the United States and Mexican Sections of the Commission. For location, elevation, period of record, and the observer, see alphabetical listing of these stations on page 76.

In the United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Potrero, California		Sawday Ranch, California	
	1984	Average 1906-1984	1984	Average 1907-1984	1984	Average 1951-1984	1984	Average 1914-1984	1984	Average 1950-1984
Jan.	0.12	3.80	0.12	3.45	0.20	2.89	0.24	3.43	0.06	3.43
Feb.	.04	3.76	.08	3.43	0	2.24	.08	3.65	.04	2.98
Mar.	.06	3.54	.08	3.19	0	2.92	.05	3.23	.12	3.45
Apr.	.52	1.71	.74	1.56	.30	1.29	.33	1.75	.62	1.61
May	0	.63	0	.55	0	.38	0	.61	0	.42
June	.06	.13	.05	.06	0	.06	0	.09	0	.05
July	4.01	.39	2.20	.13	.40	.04	2.12	.21	5.35	.59
Aug.	1.08	.54	.55	.25	.60	.14	2.20	.24	2.29	.80
Sept.	.22	.38	0	.25	.10	.26	0	.29	1.03	.44
Oct.	.24	.85	.52	.69	.60	.41	.40	.72	.11	.50
Nov.	1.68	1.60	1.96	1.43	.20	1.49	1.91	1.56	1.55	1.76
Dec.	5.41	3.21	5.80	2.86	6.60	2.23	4.75	3.07	6.17	2.58
Yearly	13.44	20.54	12.10	17.85	9.00	14.35	12.08	18.85	17.34	18.61

Month	Campo, California		Chula Vista, California		Lower Otay Dam, California		Brown Field, California			
	1984	Average 1900-1984	1984	Average 1930-1984	1984	Average 1906-1984	1984	Average 1964-1984		
Jan.	0.12	3.03	0.18	1.84	0.33	2.17	0.35	1.82		
Feb.	0	3.24	T	1.68	.02	1.50	.02	1.43		
Mar.	.04	2.84	.02	1.73	0	2.25	.06	2.22		
Apr.	.24	1.41	.78	.83	.52	1.08	.61	1.04		
May	0	.50	0	.23	5.70	.46	0	.21		
June	.55	.07	T	.05	.08	.07	.03	.06		
July	1.51	.50	.07	.02	.44	.04	.16	.05		
Aug.	2.29	.55	0	.09	.47	.13	.24	.13		
Sept.	.67	.34	0	.17	.03	.22	0	.16		
Oct.	.18	.62	.09	.39	.35	.33	.35	.32		
Nov.	1.43	1.39	2.01	1.09	1.65	1.31	2.69	1.53		
Dec.	4.25	2.51	5.25	1.64	5.87	1.58	5.54	1.79		
Yearly	11.28	17.00	8.40	9.76	15.46	11.14	10.05	10.76		

In Mexico

Month	La Rumorosa, Baja California		Valle Redondo, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodriguez Dam, Baja California	
	1984	Average 1945-1984	1984	Average 1971-1984	1984	Average 1946-1959 1961-1984	1984	Average 1948-1959 1961-1983	1984	Average 1938-1984
Jan.	0.59	0.94	0.16	2.64	0.24	2.68	0.39	1.81	0.16	1.61
Feb.	0	.55	0	2.44	T	1.85	.08	1.54	T	1.42
Mar.	.04	.75	.08	2.76	.08	2.52	0	1.73	.04	1.65
Apr.	.12	.31	.39	.94	.39	1.10	.35	.67	.51	.75
May	0	.12	0	.28	0	.31	0	.20	0	.16
June	0	.04	0	.04	.08	.12	0	.04	T	.04
July	6.06	.43	.83	.08	2.52	.16	.16	.04	.39	.04
Aug.	1.81	.79	.39	.20	.87	.28	.08	.04	.08	.12
Sept.	.79	.35	0	.31	.08	.12	*	.16	T	.24
Oct.	0	.39	.20	.55	.47	.39	*	.31	.12	.31
Nov.	.83	.51	2.09	1.73	1.85	1.38	*	1.06	1.73	.98
Dec.	2.76	.79	3.50	1.69	4.72	2.13	*	1.26	5.51	1.57
Yearly	13.00	5.97	7.64	13.66	11.30	13.04		8.86	8.54	8.89

T Trace

* Missing record

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

In Mexico

Month	Valle de las Palmas, Baja California		P. B. Rosarito, Baja California		El Pinal, Baja California		San Juan de Dios, Baja California		El Hongo, Baja California	
	1984	Average 1948-1984	1984	Average 1967-1984	1984	Average 1964-1984	1984	Average 1956-1984	1984	Average 1980-1984
Jan.	0.08	1.69	0.31	1.93	0.24	3.15	*	2.68	0.20	1.97
Feb.	T	1.18	0	1.85	.04	3.50		2.80	T	2.20
Mar.	.04	1.54	0	2.13	.08	3.86		2.56	.08	4.45
Apr.	.24	.63	.87	.75	.91	1.77		.94	.20	1.06
May	0	.12	0	.28	0	.43		.28	0	.24
June	0	.04	0	.04	T	.04		.08	.20	.04
July	.75	.08	.39	.04	4.25	.79		1.14	2.52	.83
Aug.	.43	.24	.08	.08	.75	1.02		1.26	2.83	1.54
Sept.	0	.20	0	.20	.04	.71		.67	T	.28
Oct.	0	.24	.12	.31	.20	.39		.59	.12	.24
Nov.	1.26	.83	1.77	1.14	1.26	2.05		1.57	1.54	1.93
Dec.	3.58	1.10	5.55	1.38	5.00	3.07		1.97	3.27	1.73
Yearly	6.38	7.89	9.09	10.13	12.77	20.78		16.54	10.96	16.51

Month	El Carrizo, Baja California		Belen, Baja California							
	1984	Average 1980-1984	1984	Average 1965-1984						
Jan.	0.20	1.61	0.28	2.64						
Feb.	T	1.54	0	2.64						
Mar.	.08	3.86	*	3.03						
Apr.	.39	1.02	.39	1.18						
May	0	.20	*	1.22						
June	.12	.04	*	.20						
July	1.06	.28	T	.16						
Aug.	.39	.24	.51	.35						
Sept.	.04	.12	T	.43						
Oct.	.16	.28	T	.51						
Nov.	2.05	1.69	1.18	1.65						
Dec.	3.23	1.69	4.21	2.20						
Yearly	7.72	12.57		16.21						

T Trace

* No data available

LOCATION OF RAINFALL STATIONS ON THE TIJUANA RIVER WATERSHED

The precipitation records of the stations listed alphabetically below began on the date shown and extend through 1984.

In the United States

NAME OF STATION	LATI- TUDE	LONGI- TUDE	§ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,623	1907	City of San Diego
Brown Field, California	32° 34'	116° 59'	515	1964	City of San Diego
Campo, California	32° 38'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Lower Otay Dam, California	32° 37'	116° 56'	540	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	550	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	3,075	1906	City of San Diego
Potrero, California	32° 37'	116° 36'	2,400	1914	County of San Diego
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

In Mexico

NAME OF STATION	LATI- TUDE	LONGI- TUDE	§ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Belen, Baja California	32° 12'	116° 29'	1,821	1965	§ S. A. R. H.
El Carrizo, Baja California	32° 29'	116° 42'	1,624	1980	S. A. R. H.
El Hongo, Baja California	32° 31'	116° 18'	3,150	1980	S. A. R. H.
El Pinal, Baja California	¶ 32° 11'	116° 17'	¶ 4,429	1964	S. A. R. H.
La Rumorosa, Baja California	32° 31'	116° 04'	4,042	1945	S. A. R. H.
P. B. Rosarito, Baja California	32° 18'	117° 02'	72	1967	S. A. R. H.
Rodriguez Dam, Baja California	32° 26'	116° 54'	394	1938	S. A. R. H.
San Juan de Dios, Baja California	31° 59'	116° 00'	4,199	1956	S. A. R. H.
Tecate, Baja California	32° 33'	116° 41'	1,575	1946	S. A. R. H.
Tijuana, Baja California	32° 31'	117° 02'	180	1948	S. A. R. H.
Valle de Las Palmas, Baja California	32° 23'	116° 40'	919	1948	S. A. R. H.
Valle Redondo, Baja California	32° 31'	116° 45'	794	1971	S. A. R. H.

§ Elevation above mean sea level

¶ Ministry of Agriculture and Hydraulic Resources

¶ Estimated from topographic maps

EVAPORATION IN THE TIJUANA RIVER BASIN IN INCHES

Tabulated below are records of evaporation observed at three stations in California and at six stations in Baja California, with averages for their periods of records. The stations in California are observed by Western Salt Company, city of San Diego, California, and the United States Section of the Commission; those in Baja California are observed by the Ministry of Agriculture and Hydraulic Resources of Mexico. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 76 in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1984, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
2. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1984, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
3. Lower Otay Dam: January 1950 through 1984, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

In the United States

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam, California			
	1984	Average 1916-1984	1984	Average 1921-1984	1984	Average 1950-1984		
Jan.	2.61	2.11	2.18	1.88	2.27	1.91		
Feb.	2.62	2.16	2.77	2.20	2.99	2.29		
Mar.	3.62	3.31	4.49	3.40	4.17	3.34		
Apr.	4.08	4.66	4.90	4.72	5.42	4.60		
May	6.49	6.52	7.90	6.68	7.96	6.07		
June	6.01	8.41	7.48	8.24	7.86	6.83		
July	5.79	9.68	7.20	9.76	8.70	8.40		
Aug.	6.95	8.96	7.06	9.15	7.74	7.88		
Sept.	5.78	7.15	7.27	7.49	7.43	6.50		
Oct.	3.00	5.01	4.26	5.26	5.17	4.72		
Nov.	1.90	3.27	1.83	3.27	2.42	2.83		
Dec.	.92	2.34	.84	2.02	1.61	2.14		
Yearly	49.77	63.58	58.18	64.07	63.74	57.51		

In Mexico

Month	Rodriguez Dam, Baja California		Valle de las Palmas, Baja California		San Juan de Dios, Baja California		Valle Redondo, Baja California		El Carrizo, Baja California		Belen, Baja California	
	1984	Average 1939-1942 1946-1984	1984	Average 1952-1984	1984	Average 1956-1984	1984	Average 1976-1984	1984	Average 1980-1984	1984	Average 1974-1984
Jan.	4.09	4.33	4.06	3.50	*	2.68	4.09	3.39	5.79	5.04	*	2.44
Feb.	3.62	4.53	3.62	3.46		2.83	4.29	3.15	6.73	4.80		2.87
Mar.	5.28	4.61	*	4.76		4.13	6.22	4.02	8.50	6.10		3.78
Apr.	5.04	5.59	*	6.14		5.00	7.20	5.63	7.80	6.81		6.10
May	7.28	5.00	*	7.48		6.65	9.25	7.28	10.83	7.83		6.85
June	7.05	7.72	*	9.17		8.07	9.13	9.53	10.51	10.71		10.51
July	8.03	8.70	*	10.71		9.02	8.94	10.20	9.29	11.18		10.94
Aug.	6.73	7.99	*	9.72		8.07	8.82	9.57	9.29	10.47		10.51
Sept.	6.81	6.77	*	8.31		7.36	8.90	7.48	10.24	9.25		7.48
Oct.	4.88	5.63	*	6.14		5.28	5.43	5.20	6.61	8.46		5.63
Nov.	2.36	4.57	*	4.41		3.70	2.56	3.54	3.50	5.28		4.09
Dec.	2.13	3.54	*	3.74		3.23	2.36	2.72	2.13	4.09		3.11
Yearly	63.30	68.98		77.54		66.02	77.19	71.71	91.22	90.02		74.31

* No record

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly average temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 76 in this bulletin.

In the United States

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	1984			Average 1931- 1984	1984			Average 1951- 1984	1984			Average 1931- 1984
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	53.0	78	34	48.9	49.6	72	24	47.2	58.6	83	40	53.1
Feb.	53.3	78	32	50.7	49.2	76	22	48.4	56.9	80	38	54.3
Mar.	57.1	83	35	53.2	52.9	81	27	49.6	59.8	81	42	55.6
Apr.	58.2	93	38	57.5	55.2	93	29	53.1	60.8	79	46	58.1
May	68.8	108	41	62.6	66.1	102	32	58.5	64.4	83	49	60.8
June	69.6	98	48	68.4	66.1	98	37	65.1	66.5	85	49	63.3
July	78.7	100	57	76.1	75.2	103	48	73.2	74.2	92	60	67.1
Aug.	77.2	100	57	76.2	74.2	101	45	73.2	73.5	86	58	68.7
Sept.	78.7	103	56	72.5	73.3	98	47	69.1	75.8	91	58	67.6
Oct.	62.4	90	39	64.1	57.7	90	28	60.6	65.9	83	48	63.2
Nov.	53.8	83	35	55.8	50.1	86	25	52.5	58.5	77	41	58.2
Dec.	48.9	70	30	50.6	45.0	68	21	47.9	54.6	77	34	54.4
Yearly	63.3	108	30	61.4	59.6	103	21	58.2	64.1	92	34	60.4

Month	Potrero, California				Average 1975- 1984						
	1984										
	Mean	Max.	Min.								
Jan.	51.5	78	28	51.0							
Feb.	52.4	78	28	51.8							
Mar.	56.6	88	32	51.8							
Apr.	58.0	94	32	55.8							
May	68.3	110	34	61.5							
June	68.6	100	40	69.4							
July	78.7	104	69	76.7							
Aug.	76.4	100	54	75.8							
Sept.	84.4	102	54	74.3							
Oct.	59.4	88	32	64.6							
Nov.	51.6	86	30	56.0							
Dec.	46.9	70	28	51.8							
Yearly	62.7	110	28	61.7							

In Mexico

Month	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1984		1946-1984		1984		1946-1984		1984		1948-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	66	27	81	5	79	30	100	16	86	43	93	27
Feb.	70	27	82	10	82	30	100	18	82	39	102	32
Mar.	68	25	88	16	86	34	97	23	86	46	93	34
Apr.	73	30	91	23	97	37	100	28	84	50	97	34
May	95	36	97	27	108	37	108	36	86	54	100	43
June	95	41	113	34	102	43	106	32	90	57	108	41
July	90	48	104	39	102	54	115	36	93	61	120	46
Aug.	93	54	102	46	102	55	113	34	88	63	106	52
Sept.	88	50	104	34	108	52	115	36	*	*	120	46
Oct.	77	32	95	25	91	36	106	27	*	*	117	41
Nov.	72	27	95	14	86	30	97	27	*	*	108	34
Dec.	57	27	84	10	73	27	97	23	*	*	99	25
Yearly	95	25	113	5	108	27	115	16			120	25

* Missing data

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

Month	Rodriguez Dam, Baja California				Valle de las Palmas, Baja California				P. B. Rosarito, Baja California			
	1984		1938-1984		1984		1948-1984		1984		1967-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	86	39	90	27	84	28	91	12	84	48	93	36
Feb.	82	39	93	32	82	28	99	23	82	43	90	36
Mar.	84	43	90	32	86	30	100	28	82	46	90	34
Apr.	90	43	93	36	99	39	104	28	82	48	88	36
May	97	46	100	37	111	37	111	36	81	50	104	43
June	93	50	108	46	100	46	118	39	79	50	104	43
July	95	63	104	46	106	55	120	45	90	61	90	50
Aug.	93	63	106	50	106	54	111	41	82	61	93	50
Sept.	104	57	109	48	109	52	117	43	88	61	108	48
Oct.	88	46	108	34	95	37	109	32	81	50	100	43
Nov.	79	41	99	30	88	32	100	19	81	46	97	32
Dec.	73	36	93	27	72	30	95	21	73	43	90	36
Yearly	104	36	109	27	111	28	120	12	90	43	108	32

Month	El Pinal, Baja California				San Juan de Dios, Baja California				Valle Redondo, Baja California			
	1984		1964-1984		1984		1956-1984		1984		1974-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	66	27	77	3	66	25	88	3	90	32	90	21
Feb.	68	27	81	14	77	25	84	16	84	32	95	23
Mar.	73	28	84	19	77	28	84	14	88	39	90	27
Apr.	75	27	84	18	77	27	102	19	91	39	95	32
May	91	39	91	25	*	*	91	19	106	39	106	39
June	93	39	99	25	*	*	106	27	99	41	113	41
July	91	43	102	32	91	46	120	36	100	55	111	48
Aug.	88	43	104	32	95	39	106	32	100	50	111	48
Sept.	90	43	102	25	*	*	106	25	109	55	115	39
Oct.	72	28	95	23	*	*	100	18	93	41	115	39
Nov.	73	27	88	14	*	*	99	12	86	36	97	28
Dec.	66	27	79	10	63	18	88	12	73	32	91	30
Yearly	93	27	104	3			120	3	109	32	115	21

Month	El Hongo, Baja California				El Carrizo, Baja California				Belen, Baja California			
	1984		1981-1984		1984		1980-1984		1984		1965-1984	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	70	28	70	28	81	39	81	34	77	28	93	21
Feb.	70	28	79	25	82	37	88	37	77	32	90	21
Mar.	73	32	79	30	82	41	82	39	*	*	97	25
Apr.	82	30	86	30	88	43	90	39	86	34	97	27
May	100	36	100	36	102	43	102	43	*	*	104	32
June	97	45	100	39	97	52	106	48	*	*	109	37
July	97	54	102	45	97	57	102	52	100	59	113	43
Aug.	99	61	102	50	93	55	106	52	100	55	113	46
Sept.	97	48	97	37	106	57	106	48	100	52	111	39
Oct.	86	32	86	32	95	45	97	43	86	37	104	21
Nov.	81	30	82	28	82	43	91	39	82	41	93	25
Dec.	57	27	75	25	73	37	86	36	70	36	91	19
Yearly	100	27	102	25	106	37	106	34	100	28	113	19

* Missing record

DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG TIJUANA RIVER AND TRIBUTARIES

1984

The total area within the Tijuana River basin is 1,731 square miles, as determined from the best available maps from both the United States and Mexico. The drainage areas shown below are tabulated according to their downstream sequence.

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the Tijuana River Valley Association or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1984 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	114	0	114	0	0	0
Morena Dam to Barrett Dam	133	0	133	0	0	0
above Barrett Dam	247	0	247	0	0	0
below Barrett Dam and above Tecate Creek	65	0	65	0	0	0
above Tecate Creek	312	0	312	0	0	0
Campo Creek above International Boundary	82	4	86	0	0	0
Tecate Creek above International Boundary (not including Campo Creek)	19	64	83	0	0	0
Cottonwood Creek above International Boundary Station	413	68	481	100	0	100
Rio de las Palmas above Rodriguez Dam	7	981	988	0	(b) 0	0
Tijuana River above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	(a) 545	(c) 0	545

(a) Data from Tijuana River Valley County Water Users Association

(b) Areas in upper valleys may be irrigated by pumping from ground water.

(c) There was no irrigation in 1984 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



WHITEWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 450 feet (137 m) upstream from the Southern Pacific Railroad bridge, 1.5 miles (2.4 km) upstream from the international boundary, and 2 miles (3.2 km) west of Douglas, Arizona. Zero of gage is 3,909.14 feet (1,191.51 m) above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 200 feet (61.0 m) upstream from bridge. Datum 4.40 feet (1.34 m) higher.

RECORDS: Based on current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Section of the Commission. Records poor. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), July 1930 to December 1933, May 1935 to July 1947, October 1947 through 1984 (July 1954 to March 1955, monthly discharge only).

REMARKS: Diversions above this station are mainly by pumping from ground water for irrigation. Records show flow at the international boundary into Mexico except for some smelter waste water entering the stream a short distance below this station.

EXTREMES: Prior to 1936: Maximum recorded discharge, 3,450 second-feet (97.7 m³/sec) August 10, 1931 (gage height 12.15 feet (3.70 m); maximum estimated discharge, 4,050 second-feet (115 m³/sec) July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet (143 m³/sec) August 7, 1955; maximum gage height, 16.55 feet (5.04 m) July 29, 1966; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0.9	0.2	13.6	0	0	0
2	0	0	0	0	0	0	.4	.1	9.6	0	0	0
3	0	0	0	0	0	0	10.7	.1	2.1	7.6	0	0
4	0	0	0	0	0	0	33.7	.4	1.4	13.8	0	.1
5	0	0	0	0	0	0	7.6	39.7	.9	8.6	0	.1
6	0	0	0	0	0	0	.6	29.2	.6	17.2	0	.1
7	0	0	0	0	0	0	.1	38.2	.5	15.2	0	.1
8	0	0	0	0	0	0	0	134	.4	13.6	0	.1
9	0	0	0	0	0	0	0	162	.2	12.9	0	.1
10	0	0	0	0	0	0	0	193	4.2	10.4	0	0
11	0	0	0	0	0	0	0	119	69.8	8.7	0	.1
12	0	0	0	0	0	0	0	68.2	45.8	7.3	0	.2
13	0	0	0	0	0	0	0	360	13.7	6.3	0	.4
14	0	0	0	0	0	0	0	447	.4	5.3	0	2.4
15	0	0	0	0	0	0	6.4	101	.3	4.3	0	.8
16	0	0	0	0	0	0	3.9	55.0	.3	3.0	0	.3
17	0	0	0	0	0	0	4.8	137	.2	2.5	0	.2
18	0	0	0	0	.1	0	60.0	138	.1	1.9	0	.1
19	0	0	0	0	0	0	46.9	176	.1	1.3	0	.1
20	0	0	0	0	0	0	2.5	130	.1	1.1	0	2.7
21	0	0	0	0	0	0	17.0	85.5	0	.8	0	1.5
22	0	0	0	0	0	0	.9	52.9	0	.6	0	.3
23	0	0	0	0	0	0	.2	28.6	0	.4	0	.1
24	0	0	0	0	0	0	.3	16.3	0	2.3	0	.1
25	0	0	0	0	0	49.9	.7	26.9	0	4.5	0	.1
26	0	0	0	0	0	1.9	.1	110	0	1.9	0	.1
27	0	0	0	0	0	29.6	0	16.1	0	1.3	0	.1
28	0	0	0	0	0	85.1	35.3	8.5	0	.2	0	.3
29	0	0	0	0	0	37.0	6.5	14.1	0	.1	0	1.9
30	0	0	0	0	0	11.0	.7	39.3	0	0	0	.7
31	0	0	0	0	0	0	.4	8.8	0	0	0	.3
Sum	0	0	0	0	0.1	214.5	240.6	2,735.1	164.3	153.1	0	13.4
Current Year 1984												
Period 1936-1984												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	4.59		20	0.1	! 1	0	0	36.0	451	0		
Feb.				0		0	0	18.3	132	0		
Mar.				0		0	0	25.6	295	0		
Apr.				0		0	0	17.5	173	0		
May	4.80		18	.3	! 1	0	0	12.9	138	0		
June	7.54		28	307	! 1	0	7.2	425	121	1,590		
July	6.71		19	135	! 8	0	7.8	477	1,906	8,110		
Aug.	8.56		13	629	! 3	0	88.2	5,425	2,942	14,480		
Sept.	6.85		11	157	! 21	0	5.5	326	698	3,170		
Oct.	6.08		! 4	57.1	! 1	0	4.9	304	342	6,103		
Nov.				0		0	0	33.9	352	0		
Dec.	5.34		120	9.0	! 1	0	.4	26.6	110	2,363		
Yearly	8.56			629		0	9.6	6,984	6,263	22,321	235	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	2.61			17.8		0	0.27	8,615	7,725	27,533	290	

! And other days

SEWAGE INFLUENT, DOUGLAS ARIZONA INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in the influent line to the old plant and a Parshall flume in the new headworks, located about 200 feet (61 m) east of the old treatment plant. The plant is located about one mile (1.6 km) west of the Douglas-Agua Prieta Port of Entry.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1984.

REMARKS: The treatment plant was constructed in 1947 by the governments of the United States and Mexico to correct a serious international sanitation problem. Since April 8, 1968, all sewage flows from Agua Prieta have been diverted to oxidation ponds located in Mexico, 1.6 miles (2.6 km) south of the international boundary. Since December 1970, sewage effluent from the plant flows into Mexico and then crosses to the right bank of the Agua Prieta Arroyo, by means of a canal bridge, to be used for irrigation. On July 1, 1973, ownership and operation of the plant was transferred from the Commission to the city of Douglas. The plant was modified in 1980. The flow entering the plant is divided; about one-third treated at the old plant and two-thirds at the new plant. The old and new plant effluent is combined, disinfected, and discharged to Mexico.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1984			Period 1952-1984		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	41.852	0	41.852	2.157	0.640	1.350	2.157	0.416	1.078
Feb.	39.180	0	39.180	1.370	1.330	1.351	1.784	.543	1.082
Mar.	42.276	0	42.276	1.777	.944	1.364	1.932	.590	1.082
Apr.	40.841	0	40.841	1.593	1.098	1.361	2.047	.380	1.084
May	36.866	0	36.866	1.621	.640	1.189	1.850	.510	1.086
June	35.355	0	35.355	1.439	.680	1.178	2.060	.555	1.141
July	37.005	0	37.005	1.620	.685	1.194	3.209	.483	1.194
Aug.	38.919	0	38.919	1.477	1.033	1.255	2.681	.365	1.212
Sept.	37.570	0	37.570	1.804	.746	1.252	1.904	.470	1.165
Oct.	38.845	0	38.845	1.385	1.095	1.253	1.945	.603	1.127
Nov.	37.884	0	37.884	1.469	1.052	1.263	1.596	.587	1.103
Dec.	39.136	0	39.136	1.464	.989	1.262	3.330	.500	1.101
Yearly	465.729	0	465.729	2.157	0.640	1.273	3.330	0.365	1.121

SEWAGE INFLUENT, AGUA PRIETA, SONORA INTERNATIONAL OXIDATION PONDS

DESCRIPTION: Parshall flume equipped with staff gage in influent line to oxidation ponds. Since April 8, 1968, all sewage from Agua Prieta, Sonora has been diverted to oxidation ponds, which are located in Mexico; if necessary, sewage from Douglas, Arizona may be included, but this has never been done.

RECORDS: Discharges are computed from daily 11:00 a.m. readings of the staff gage by applying an index for that hour, determined from 7 days of hourly measurements from which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Mean daily flows from April 8, 1968 through 1982.

REMARKS: The construction of the international oxidation ponds in Agua Prieta, Sonora was completed in April 1968 by the government of Mexico, fulfilling an international agreement to solve the problem of insufficient capacity at the international treatment plant in Douglas, where the combined flows from Douglas and Agua Prieta were treated. If necessary, sewage from Agua Prieta may be treated in this plant, but since the completion of the oxidation ponds, this has never been done. The ponds are located 1.6 miles (2.6 km) south of international monument 85a.

DATA FOR 1983 AND 1984 NOT RECEIVED IN TIME FOR PUBLICATION IN THIS BULLETIN.

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on downstream side of the bridge pier at Highway 92, 0.7 mile (1.1 km) east of Palominas, 2.5 miles (4.0 km) upstream from Green Brush Draw, 4.5 miles (7.2 km) downstream from international boundary, and 12 miles (19 km) southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet (1,276.39 m) above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1984. Records obtained and furnished by U. S. Geological Survey to September 30, 1981; thereafter by the United States Section of the Commission.

REMARKS: There are some small diversions for irrigation of a few hundred acres above this station, mostly in Mexico. Record shows approximate flow of river at international boundary.

EXTREMES: Maximum daily discharge, 22,000 second-feet (623 m³/sec) on August 14, 1940 (gage height 16.16 feet (4.93 m) present datum), from rating curve extended above 5,600 second-feet (159 m³/sec) on basis of slope-area measurement of peak flow; no flow at times in most years. Greatest flood known occurred on September 28, 1926 (gage height, about 23.9 feet (7.28 m) present datum, from flood marks; discharge not determined).

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.0	18.4	10.0	8.8	17.6	4.7	2.7	* 165	104	6.8	7.4	15.2
2	16.7	18.4	10.1	9.4	18.4	5.6	2.7	u 23.2	207	8.1	7.9	15.2
3	27.7	18.4	10.3	9.4	19.4	0	3.3	u 7.4	122	12.1	8.1	15.2
4	61.7	18.4	10.7	8.6	15.0	0	3.6	u 6.2	u 91.2	40.7	8.1	19.5
5	85.3	18.4	10.7	7.1	14.8	0	1.2	u 465	u 75.8	18.1	8.1	20.0
6	490	17.6	10.4	7.1	14.4	0	1.7	* 127	u 66.5	9.4	8.5	18.4
7	399	17.6	10.7	10.1	13.1	0	2.3	u 7.5	u 51.0	7.4	8.1	17.6
8	424	17.6	10.4	9.4	11.8	0	1.7	* 631	u 37.5	6.2	7.4	16.6
9	212	16.8	10.1	7.4	10.1	0	11.9	* 391	u 25.5	6.2	8.8	15.2
10	117	16.8	9.7	5.0	10.5	0	26.8	u 2,380	u 16.0	5.5	9.4	16.0
11	84.5	16.8	9.5	4.0	1.5	0	1.7	1,190	* 42.6	5.5	9.4	22.3
12	66.5	16.0	9.2	3.4	.3	0	10.7	674	* 69.8	6.2	9.4	30.0
13	u 48.2	15.2	9.2	4.9	6.4	0	16.5	672	u 22.0	5.5	9.4	52.6
14	u 29.9	15.2	8.1	u 5.0	7.1	0	9.0	1,730	u 16.0	6.2	10.1	124
15	u 26.4	14.4	7.4	u 5.0	4.3	0	261	701	u 13.6	6.8	10.1	62.2
16	u 26.4	u 14.4	6.8	u 5.0	8.1	0	57.6	961	u 12.0	6.2	10.1	31.0
17	u 26.4	u 13.6	7.4	u 5.0	9.6	0	* 864	299	u 10.7	5.5	10.7	27.7
18	u 26.4	u 12.8	7.4	u 5.0	5.9	1.4	1,410	436	u 9.4	5.5	10.7	27.7
19	u 26.4	u 12.0	8.1	u 5.0	7.6	3.6	* 374	328	u 8.1	5.5	10.7	31.2
20	u 26.4	u 11.4	7.0	u 5.0	7.3	0	u 51.6	113	u 6.8	5.5	11.2	120
21	u 26.4	u 11.4	7.2	u 5.0	1.7	0	* 125	* 92.1	u 6.2	5.5	11.4	188
22	u 26.4	u 10.7	6.5	u 5.0	0	0	* 45.8	* 92.1	u 5.5	6.2	12.0	89.3
23	u 26.4	u 10.7	6.2	u 5.0	0	0	* 105	* 82.6	* 5.5	6.5	17.3	50.1
24	u 26.3	u 10.1	6.5	u 5.0	0	.5	* 34.8	* 75.0	6.2	9.7	20.7	42.7
25	u 22.2	u 10.1	5.9	u 5.0	0	.1	u 16.0	u 71.6	7.4	6.2	14.4	38.8
26	21.1	10.1	6.6	14.6	0	.5	9.2	* 71.6	6.2	6.8	13.9	33.6
27	21.1	10.7	6.7	17.8	0	.6	7.2	66.6	6.8	7.4	13.6	52.6
28	20.0	10.7	8.5	17.6	0	1.6	91.9	129	6.2	6.2	14.4	4,760
29	18.4	10.1	9.3	19.2	0	1.2	51.5	87.4	6.2	6.8	13.8	492
30	18.4		6.9	20.2	0	2.7	* 170	70.4	6.2	7.4	13.6	244
31	18.4		7.4		.5		u 8.3	u 56.6		7.4		146
Sum	2,478.0	414.8	260.9	244.0	205.4	22.5	3,778.7	12,152.3	1,069.9	255.0	328.7	6,834.7

Current Year 1984							Period 1951-1984					
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	6.15	3.35	6	990	1 1	12.0	79.9	4,915	1,500	27,763	2.6	
Feb.	3.36	3.22	! 1	19.2	29	8.8	14.3	823	721	6,764	3.0	
Mar.	3.26	3.10	! 3	11.4	30	4.7	8.4	517	701	7,401	13.3	
Apr.	3.44	3.00	30	26.6	111	1.2	8.1	484	158	1,039	0	
May	3.41	2.98	3	23.3	111	0	6.6	407	60.5	407	0	
June	3.26	2.98	2	10.7	1 3	0	.8	44.6	162	1,391	0	
July	9.85	2.99	18	4,280	11	.3	122	7,495	5,613	17,238	184	
Aug.	10.41	u 2.70	14	4,950	1 4	u 6.2	392	24,104	8,740	36,369	165	
Sept.	4.43	* 2.69	1	30.4	23	4.7	35.7	2,122	1,896	16,344	11.3	
Oct.	3.40	2.74	4	56.6	10	4.7	8.2	506	2,037	47,322	0	
Nov.	3.22	2.91	24	24.4	1	6.8	11.0	652	258	2,563	0	
Dec.	14.15	3.06	28	10,600	! 1	14.4	220	13,556	1,834	25,479	6.2	
Yearly	14.15	2.69		10,600		0	76.6	55,626	23,680	62,788	4,400	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	4.31	0.82		300		0	2.17	68,614	29,209	77,448	5,427	

u Estimated * Partly estimated ! And other days

SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

DESCRIPTION: Water-stage recorder located in the United States near left bank on the downstream side of concrete bridge pier of county highway bridge, 2.5 miles (4.0 km) northeast of Lochiel, Arizona, and 1.7 miles (2.7 km) upstream from the international land boundary. The elevation of the zero of the gage has not been determined, but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet (1,408 m).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 1984.

REMARKS: There are small diversions by ground water pumping for irrigating about 200 acres (80.9 ha) above this station.

EXTREMES: Maximum discharge, 12,800 second-feet (362 m³/sec) on August 15, 1984 (gage height 10.47 feet) (3.19 m); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	2.7	2.4	1.3	1.0	0.68	0.75	31	24	8.0	6.2	4.3
2	6.2	2.7	2.3	1.3	1.1	.68	.90	26	23	10	6.4	4.3
3	4.7	2.6	2.3	1.3	1.1	.98	.99	26	22	37	6.6	4.3
4	3.5	2.6	2.1	1.3	.97	1.1	1.1	24	21	11	6.4	6.9
5	12	2.6	2.1	1.3	.89	.87	.77	66	20	8.5	6.4	4.4
6	9.0	2.6	2.1	1.4	.92	.70	.62	69	20	8.0	6.3	4.0
7	38	2.6	2.0	1.5	.99	.58	.59	49	21	7.7	6.3	3.9
8	13	2.6	1.9	1.5	1.0	.49	.60	35	20	7.5	6.3	3.9
9	5.2	2.6	1.9	1.5	.97	.43	7.3	196	20	7.5	6.2	3.8
10	4.3	2.6	1.9	1.5	1.0	.43	5.5	732	20	7.4	6.1	3.9
11	4.1	2.6	1.9	1.4	1.0	.41	2.1	193	21	7.3	6.0	6.2
12	4.1	2.5	1.9	1.3	.98	.39	2.5	529	19	7.3	5.9	4.7
13	3.8	2.5	1.8	1.2	.70	.39	2.6	1,000	18	7.2	5.8	9.5
14	3.8	2.4	1.7	1.2	.46	.40	2.8	97	16	7.1	5.7	5.1
15	3.6	2.3	1.7	1.1	.39	.43	2.4	1,230	15	7.2	5.6	4.6
16	3.6	2.4	1.7	1.1	.30	.43	2.3	646	15	6.9	5.5	4.2
17	3.6	2.3	1.6	1.0	.34	.46	62	226	13	6.7	5.4	3.9
18	3.4	2.3	1.5	.96	.42	.46	36	133	12	6.8	5.3	3.9
19	3.4	2.3	1.6	.96	.38	.48	15	83	11	6.6	5.2	4.3
20	3.3	2.3	1.5	.94	.36	.49	7.3	50	11	6.7	5.1	8.2
21	3.3	2.3	1.6	.88	.39	.43	564	40	9.7	6.7	5.0	4.9
22	3.3	2.4	1.6	.92	.42	.43	34	30	9.0	6.7	4.9	4.1
23	3.3	2.3	1.5	.97	.47	.43	101	25	8.2	6.7	4.8	3.9
24	3.3	2.3	1.6	.90	.48	.33	38	40	7.9	6.9	4.7	3.9
25	3.2	2.2	1.7	.92	.48	.35	7.2	30	8.0	6.8	4.6	3.9
26	3.0	2.0	1.6	1.0	.54	.20	2.5	25	7.9	7.1	4.5	3.9
27	2.8	2.1	1.4	1.0	.54	.16	1.8	67	7.8	7.1	4.4	105
28	2.8	2.2	1.4	1.0	.55	.39	87	35	7.4	7.0	4.3	119
29	2.8	2.5	1.4	1.1	.57	.55	117	25	7.2	7.0	4.2	29
30	2.7	2.4	1.4	1.0	.66	.71	141	25	7.1	7.0	4.2	29
31	2.6		1.3		.68		42	24		6.8		29
Sum	169.0	70.4	54.4	34.75	21.05	15.26	1,289.62	5,807	442.2	258.2	164.3	433.9
Current Year 1984								Period 1949-1984				
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total	Acre-Feet			
	High	Low	Day	High	Day	Low	Acre-Feet	Average	Maximum	Minimum		
Jan.	2.97	2.11	7	85.0	29	2.6	5.4	335	131	2,895	1.3	
Feb.	2.12	2.08	1	2.8	26	2.0	2.4	140	70.1	589	1.8	
Mar.	2.11	2.04	1	2.6	14	1.3	1.8	108	105	2,103	.7	
Apr.	2.08	1.99	6	1.9	21	.81	1.16	68.9	35.9	262	0	
May	2.01	1.90	1	1.2	15	.30	.68	41.8	18.3	170	0	
June	1.98	1.84	3	1.3	26	.10	.51	30.3	15.0	169	0	
July	7.61	1.92	21	3,070	6	.50	41.6	2,558	565	4,270	1.6	
Aug.	10.47	2.39	15	12,800	4	22	187	11,518	1,139	11,518	.08	
Sept.	2.43	2.24	1	27.0	26	7.0	14.7	877	343	2,634	0	
Oct.	3.78	2.19	3	253	31	6.4	8.3	512	345	4,732	0	
Nov.	2.20	2.16	2	7.0	29	3.9	5.5	326	63.9	403	0	
Dec.	4.89	2.15	27	710	8	3.5	14.0	861	119	1,093	0	
Yearly	10.47	1.84		12,800		0.10	23.9	17,376	2,590	17,376	126	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	3.19	0.56		362		0	0.68	21,433	3,195	21,433	155	

SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 5.5 miles (8.9 km) east of Nogales, Arizona, 0.8 mile (1.3 km) downstream from the international boundary and 6 miles (9.7 km) upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 3,702.54 feet (1,128.53 m) above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements or observation of no flow during the year. Records obtained and furnished by the U. S. Geological Survey. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record); January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only); May 1930 to December 1933; and July 1935 through 1984.

REMARKS: Diversions in both countries affect the flow at this station. The major diversions occur in Mexico for domestic and irrigation uses. There are no storage dams above the station as of December 1984.

EXTREMES: Maximum discharge, 33,500 second-feet (949 m³/sec) on October 9, 1977 (gage height 15.5 feet) (4.72 m); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second-Feet 1984 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41	38	31	13	11	0.54	230	116	241	37	36	29
2	46	46	26	13	10	.58	75	164	239	44	36	29
3	80	39	27	12	9.5	.54	50	143	172	76	36	31
4	75	41	24	13	9.8	.57	40	107	160	74	36	45
5	119	39	27	13	7.9	.57	40	109	151	55	36	38
6	260	44	31	13	8.1	.55	30	327	142	46	36	35
7	175	46	28	13	7.2	.49	30	213	131	43	36	34
8	181	39	20	15	6.9	.48	30	166	124	42	36	34
9	119	35	20	14	5.9	.44	20	176	120	42	35	32
10	75	35	22	13	4.7	.42	50	1,610	123	41	34	33
11	58	29	21	14	4.0	.42	65	1,080	119	41	34	43
12	60	36	20	13	3.9	.33	50	898	128	42	33	40
13	56	35	21	13	3.9	.37	50	2,170	124	41	32	320
14	59	36	24	12	4.5	.40	75	970	98	40	30	230
15	58	35	25	12	3.4	.34	80	834	86	41	30	140
16	53	40	32	12	2.3	.26	70	1,610	75	40	30	116
17	58	40	27	12	2.3	.20	386	641	61	39	32	109
18	57	37	26	13	2.0	.18	888	599	56	37	31	103
19	61	39	21	12	2.3	0	288	442	51	37	31	109
20	59	35	20	11	1.8	0	151	290	50	38	31	538
21	62	33	19	12	1.5	0	1,080	185	50	38	30	227
22	63	34	18	11	1.3	0	374	157	48	38	30	131
23	63	27	16	11	1.2	0	179	93	48	38	33	150
24	57	24	16	11	.99	0	252	79	48	38	32	119
25	56	26	15	10	.92	0	124	108	48	39	31	95
26	55	29	16	10	.68	.79	87	205	46	39	31	87
27	54	29	15	9.1	.67	123	83	192	45	38	30	1,780
28	49	32	14	10	.54	81	120	223	43	38	30	3,500
29	48	32	12	10	.55	140	129	172	40	37	30	890
30	54	33	13	11	.56	300	176	131	39	37	30	600
31	41		12		.59		140	107		36		400
Sum	2,352	1,030	659	361.1	120.90	730.68	5,442	14,317	2,906	1,312		10,067
	Current Year 1984						Period 1936-1984					
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	5.25	4.18	6	621	31	31	75.9	4,665	1,779	30,282	0	
Feb.	4.32	4.12	6	54	24	21	35.5	2,043	1,376	16,449	0	
Mar.	4.24	4.11	6	37	31	11	21.3	1,307	1,420	19,575	0	
Apr.	4.23	4.23	8	17	27	8.1	12.0	716	346	2,955	0	
May	4.31	4.14	4	12	28	.49	3.90	240	105	1,031	0	
June	6.20		30	2,200	119	0	24.4	1,449	90.0	1,449	0	
July	6.92		21	3,500	9	20	176	10,794	2,836	15,610	45	
Aug.	7.66	4.67	13	4,980	25	60	462	28,397	5,947	45,790	91	
Sept.	5.82	4.65	1	939	29	38	96.9	5,764	1,573	9,431	0	
Oct.	5.02	4.65	3	159	1	36	42.3	2,602	2,017	59,025	0	
Nov.	4.67	4.60	23	40	21	28	32.6	1,940	538	7,384	0	
Dec.	9.14	4.61	27	7,080	1	28	325	19,968	2,693	33,568	0	
Yearly	9.14			7,080		0	110	79,885	20,720	87,615	2,234	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	2.79			201		0	3.12	98,537	25,558	108,072	2,756	

1 And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Three 24-inch (61.0 cm) Parshall flumes, each with a recording flow meter and continuous totalizer, one located at the international boundary for measuring effluent from Nogales, Sonora, one located in the influent line to the treatment plant, and one on the plant effluent line. Nogales International Treatment Plant is located approximately 6 miles (9.7 km) north of the international boundary.

RECORDS: Flows from the United States are deduced from total plant influent less the flows measured crossing the international boundary from Mexico. Records available: Continuous monthly record for plant influent since August 1951, daily records for plant influent, January 1952 through 1984.

REMARKS: Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately two miles (3.2 km) north of the international boundary. Nogales International Treatment Plant treats combined sewage from Nogales, Arizona and Nogales, Sonora by means of aerated stabilization lagoons. Chlorination of plant effluent, which may be used for irrigation of lands lying north of the plant, is carried out by the United States at its expense.

Month	Total Monthly Flows			Mean Daily Flows-Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1984			Period 1952-1984		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	124.533	152.050	276.583	10.789	8.233	8.922	10.789	0.650	3.428
Feb.	116.038	139.188	255.226	9.389	8.347	8.801	13.523	.650	3.556
Mar.	112.656	139.734	252.390	8.928	7.388	8.142	18.861	.750	3.560
Apr.	95.932	126.003	221.935	8.033	6.692	7.398	10.902	.700	3.373
May	98.170	119.346	217.516	7.435	6.373	7.017	9.054	.550	3.197
June	90.895	116.730	207.625	8.056	5.923	6.921	8.056	.700	3.031
July	131.623	158.262	289.885	12.539	6.458	9.351	12.539	.700	3.202
Aug.	162.959	185.796	348.755	13.120	8.720	11.250	13.120	.750	3.552
Sept.	150.512	185.395	335.907	12.312	9.039	11.197	12.312	.800	3.788
Oct.	126.441	140.053	266.494	10.177	7.818	8.597	13.055	.700	3.707
Nov.	108.902	149.019	257.921	9.798	7.667	8.597	10.352	.800	3.604
Dec.	128.477	201.878	330.355	15.605	7.169	10.657	15.605	.350	3.636
Yearly	1,447.138	1,813.454	3,260.592	15.605	5.923	8.904	18.861	0.350	3.470

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED IN INCHES

Tabulated below are the monthly records of rainfall with averages for their periods of record at stations located in Arizona. Two stations are operated and maintained by the United States Section of the Commission and two by the National Weather Service. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations on this page.

In the United States

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales Sanitation Plan 6-N, Arizona			
	1984	Average 1973-1984	1984	Average 1930-1984	1984	Average 1930-1984	1984	Average 1953-1984		
Jan.	2.63	1.58	2.04	1.21	1.80	1.26	2.25	1.13		
Feb.	0	1.26	0	1.05	0	1.04	0	.70		
Mar.	0	1.33	0	.87	0	.94	0	.92		
Apr.	.80	.48	.06	.34	.80	.33	.37	.18		
May	* .10	.10	.27	.14	.05	.18	.45	.23		
June	2.10	.48	.69	.78	.86	.50	1.52	.41		
July	7.38	5.69	6.99	4.22	5.52	4.41	10.22	4.87		
Aug.	2.16	2.80	7.20	4.22	9.05	4.02	*	3.84		
Sept.	.25	2.35	.75	1.80	.66	1.83	.52	1.71		
Oct.	* .14	1.44	1.54	.98	.78	1.06	2.32	1.33		
Nov.	.70	.98	1.05	.80	.79	.81	.59	.65		
Dec.	5.80	1.47	5.54	1.41	5.60	1.42	5.88	1.45		
Yearly		19.96	26.13	17.82	25.91	17.80		17.42		

* Missing record

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ WATERSHED

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 1984.

In the United States

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
Canelo, Arizona	S	31° 33'	110° 32'	5,010	1930	R. E. Ewing
Nogales Sanitation Plant 6N, Arizona	S	31° 25'	110° 57'	3,560	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	4,190	1930	George R. Proctor
San Rafael #2, Arizona	S	31° 22'	110° 38'	4,860	Jan. 1973	I. B. & W. C.

S Standard 8" rain gage

TEMPERATURE, HUMIDITY, EVAPORATION, AND WIND IN THE SANTA CRUZ RIVER BASIN

Tabulated below are monthly records of temperature, humidity, evaporation, and wind at the station located at the Nogales Sanitation Plant in Arizona 6 miles (9.7 km) north of the international boundary. December 18, 1971 the station was moved to correspond with a new Nogales Sanitation Plant. Prior to this date, the station was located 2 miles (3.2 km) north of the international boundary at the old Nogales Sanitation Plant. This station is operated and maintained by the United States Section of the Commission. The equipment at the Nogales Sanitation Plant - 6N consists of: Standard 8-inch (203 mm) rain gage, 48-inch (1,219 mm) evaporation pan with stillwell and hook gage, maximum and minimum thermometer, anemometer (registers miles), hygrothermograph, and psychrometer, hand turbine type.

For specific location of this station, refer to data opposite same station name shown in "Location of Rainfall Stations," page 89 of this bulletin.

In the United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 6N		
	1984		
	Mean	Max.	Min.
Jan.	46.0	74	18
Feb.	47.0	77	19
Mar.	52.9	83	24
Apr.	57.0	91	24
May	70.3	102	35
June	74.1	98	48
July	76.7	98	57
Aug.	* 77.0	98	56
Sept.	73.0	97	45
Oct.	59.9	89	34
Nov.	50.8	85	18
Dec.	46.4	74	19
Yearly	60.9	102	18

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 6N	
	1984	
	Max.	Min.
Jan.	100	43
Feb.	100	9
Mar.	92	32
Apr.	100	38
May	100	41
June	100	46
July	100	68
Aug.	95	70
Sept.	100	51
Oct.	100	52
Nov.	100	23
Dec.	100	37
Yearly	100	9

Evaporation - Inches

Month	Nogales Sanitation Plant - 6N	
	1984	Average 1953-1984
	Jan.	# 4.48
Feb.	5.74	4.58
Mar.	9.07	7.19
Apr.	# 12.06	9.56
May	**	12.17
June	**	13.76
July	**	10.59
Aug.	**	8.53
Sept.	**	8.18
Oct.	**	7.16
Nov.	**	4.61
Dec.	**	3.52
Yearly		93.48

Mean Wind Speed - Miles Per Hour

Month	Nogales Sanitation Plant - 6N	
	1984	Average 1953-1984
	Jan.	1.0
Feb.	1.2	2.2
Mar.	1.5	2.4
Apr.	1.8	2.4
May	**	2.4
June	**	2.2
July	**	1.6
Aug.	**	1.1
Sept.	**	1.2
Oct.	**	1.5
Nov.	**	1.5
Dec.	**	1.6
Yearly		1.8

Record missing; determined by average of maximum and minimum

Estimated

** No record

**DRAINAGE AREAS ABOVE GAGING STATIONS AND IRRIGATED AREAS ALONG
SANTA CRUZ RIVER, SAN PEDRO RIVER, AND WHITEWATER DRAW
1984**

The drainage basin areas tabulated below are derived from the best available maps from both the United States and Mexico.

Data on irrigated areas in the Whitewater Draw Basin were furnished by the Soil Conservation Service at Douglas, Arizona and estimated from aerial photographs.

Designation of Areas	Drainage Basin - Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	100	0	100
Above El Cajon, Mexico Gaging Station	179	125	304	100	2,352	2,452
Above Nogales, Arizona Gaging Station	185	348	533	100	2,696	2,796
San Pedro River:						
Above Palominas, Arizona Gaging Station	92	649 *	741	2,000	3,459	5,459
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	30,000	0	30,000

* An additional 47 square miles in Mexico is tributary to the San Pedro River downstream from this station.

CORRECTIONS TO PREVIOUS WATER BULLETINS

<u>Water Bulletin Year and Page No.</u>	<u>Heading</u>	<u>Reference</u>	<u>Published As</u>	<u>Correction</u>
1981-13	Yuma Mesa Outlet Drain to Colorado River near Yuma, Arizona	Annual Summary, Column headed Average Second-Feet Yearly		38.9
1975-29	East Main Canal Wasteway (Valley Division, Yuma Project)	Annual Summary, Column headed Extreme Second-Feet, High Yearly	63.1	66.0
1983-34	Colorado River at Southerly International Boundary - Discharges	Annual Summary, Column headed Extreme Gage, Low December	* 80.88	u 80.52
1983-43	Suspended Silt, Colorado River, Table for Intake Canal at Morelos Diversion Structure	Column headed Water, Tons	Jan. 281,976 Feb. 166,698 Mar. 308,433 Apr. 399,340 May 226,432 June 270,176 July 484,103 Aug. 436,674 Sep. 371,435 Oct. 301,310 Nov. 284,824 Dec. 273,262 Yearly 3,804,663	281,976,000 166,698,000 308,433,000 399,340,000 226,432,000 270,176,000 484,103,000 436,674,000 371,435,000 301,310,000 284,824,000 273,262,000 3,804,663,000
1983-43	Suspended Silt Table for Colorado River at Southerly International Boundary	Footnote	Samples and analyses by U.S. Section, Method A	Samples by U.S. Section and analyses by U.S. Bureau of Reclamation, Method A
1983-44	Suspended Silt Table for Miguel C. Rodriguez Gaging Station	Column headed Water, Tons	Jan. 498,489 Feb. 350,276 Mar. 6,236 Apr. 217,976 May 672,963 June 1,127,161 July 2,046,606 Aug. 1,113,828	498,489,000 350,276,000 6,236,000 217,976,000 672,963,000 1,127,161,000 2,046,606,000 1,113,828,000
1983-70	Campo Creek near Campo, California	Period Summary, Column headed Maximum Yearly	31,395 38,725 TM ³	31,325 38,639 TM ³
1983-88	Santa Cruz River near Lochiel, Arizona	November mean daily discharges	1 16 16 6.1 2 17 17 6.0 3 19 18 5.9 4 20 19 5.9 5 21 20 5.9 6 21 21 5.9 7 15 22 5.9 8 6.3 23 5.9 9 6.6 24 5.7 10 6.6 25 5.9 11 6.5 26 5.7 12 6.1 27 5.9 13 6.4 28 5.0 14 6.1 29 5.4 15 6.4 30 5.4 Yearly 266.5	1 8.6 16 6.5 2 8.5 17 6.5 3 9.0 18 6.5 4 8.6 19 6.5 5 8.7 20 6.5 6 7.3 21 6.0 7 7.0 22 6.0 8 7.0 23 6.0 9 7.0 24 6.0 10 7.0 25 6.0 11 7.0 26 6.0 12 7.0 27 6.0 13 7.0 28 5.7 14 6.5 29 5.3 15 6.5 30 5.2 203.4
<u>Annual Summary</u>				
<u>November</u>				
	Average Second-Feet	8.88		6.78
	Total Acre-Feet	529		403
<u>Yearly</u>				
	Average Second-Feet	15.61		15.43
	Total Acre-Feet	11,298		11,172
	Total Acre-Feet	13,936 TM ³		13,781 TM ³
<u>Period Summary</u>				
<u>November</u>				
	Average Acre-Feet	60.0		56.4
	Maximum Acre-Feet	529		403
<u>Yearly</u>				
	Average Acre-Feet	2,542		2,538
	Average Acre-Feet	3,136 TM ³		3,131 TM ³