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WESTERN WATER BULLETIN 2002

**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

2002

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FOREWORD

This bulletin is the forty-third 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 2002.

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 16 kilometers to the mouth of the Gila River, thence westward 18 kilometers to Pilot Knob Mountain, and south 1.6 kilometers 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 35 kilometers 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 145 kilometers 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 28,200 square kilometers 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 1,857 square kilometers below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 18,900 square kilometers 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 2002 amounted to 1,850,234 thousand cubic meters, in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 2002.

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, 1.8 kilometers 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 Colorado River waters diverted by Mexico (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 4,483 square kilometers, 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 34 kilometers from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 8 kilometers to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 10 kilometers to discharge into the Pacific Ocean 3 kilometers 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 2,650 square kilometers. 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 1,919 square kilometers, of which 1,681 square kilometers 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 1,380 square kilometers. Of this amount, 901 square kilometers 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 National Water Commission 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

This Bulletin is published in System International (SI) units which are based on the metric system. The following conversion constants may be used to convert to the English system of measurement. Data collected by the Mexican Section are computed and published in a Spanish version of the water bulletin in metric units.

METRIC TO ENGLISH CONVERSION CONSTANTS

METRIC UNITS		ENGLISH UNITS	
<u>LENGTH</u>			
Millimeters	x	0.03937	= Inches
Meters	x	3.28084	= Feet
Kilometers	x	0.62137	= Miles
<u>AREA</u>			
Square Meters	x	10.76391	= Square Feet
Hectares	x	2.47105	= Acres
Square Kilometers	x	0.38610	= Square Miles
<u>VOLUME</u>			
1,000	Cubic Meters	x	35.31467 = Cubic Feet
	Cubic Meters	x	0.81071 = Acre-Feet
<u>WEIGHT</u>			
	Kilograms	x	2.20462 = Pounds
	Megagrams	x	1.10231 = Tons (2,000 lbs.)
<u>TEMPERATURE</u>			
	Degrees Celsius	x	1.8 + 32 = Degrees Fahrenheit

GENERAL HYDROLOGIC CONDITIONS FOR 2002

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 2002. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 2002 measured at 3 index stations was 3 millimeters, compared to an average of 50 millimeters during the last 44 years (1959 to 2002).

The flow of the Colorado River reaching Imperial Dam was 7,574,924 thousand cubic meters, about 77% of the 68-year average (1935-2002) of 9,860,452 thousand cubic meters. At the Northerly International Boundary, the total flow of the river during 2002 was 1,832,267 thousand cubic meters, about 40% of the 1935-2002 average of 4,620,657 thousand cubic meters. At the Southerly International Boundary, the flow during 2002 was 60,157 thousand cubic meters, about 2% of the 1935-2002 average of 3,102,551 thousand cubic meters.

The total of all flows of the Colorado River entering Mexico in 2002 amounted to 2,152,329 thousand cubic meters, 41% of the 1935-2002 average of 5,192,917 thousand cubic meters, 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) from the 242 Well Field near San Luis, Arizona.

During 2002, other waters arrived at the Mexican points of diversion and amounted to 151,919 thousand cubic meters. These waters consisted mainly of excess waters released from reservoirs on the Colorado River. A maximum instantaneous flow of 158 cubic meters per second occurred in the Colorado River at the Northerly International Boundary station on April 8, 2002.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 23,366.0 million cubic meters, 66% of the usable capacity of 35,263.2 million cubic meters. The greater part (20,621.3 million cubic meters) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 2002 due to drought or accident to the irrigation system.

The total reported area irrigated from waters of the Colorado River below Imperial Dam in 2002 was 436,965 hectares; 303,852 hectares in the United States and 133,113 hectares in Mexico. An estimated 33% of the total area irrigated in Mexico is served by pumping from ground water.

TIJUANA RIVER BASIN

During 2002, the temperatures at Barrett Dam, California (elevation 533.40 meters) in the upper portion of the basin in the United States averaged 17.1 degrees Celsius, 0.5 degree Celsius above the 72-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 1394.96 meters), the recorded temperatures during the year could not be determined due to incomplete records. At Rodriguez Dam, Baja California (elevation 139.90 meters), the recorded temperatures averaged 20 degrees Celsius, about 1 degree Celsius below the normal for many years.

At Barrett Dam, in the upper portion of the basin in the United States, the recorded precipitation was 213 millimeters, 48% of normal; and at Lower Otay Dam near the lower end of the basin, 152 millimeters, or 54% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico could not be determined due to incomplete records. At Rodriguez Dam, in the lower portion of the basin in Mexico, the recorded precipitation was 97 millimeters, 42% of the 64-year average.

Runoff above Barrett and Rodriguez Reservoirs during 2002 was about 2% of normal. Above Morena Reservoir, the runoff was 1,361 thousand cubic meters, or about 11% of the 66-year 1937-2002 mean of 12,770 thousand cubic meters. Above Barrett Reservoir, the runoff was 815 thousand cubic meters, or about 5% of the 66-year 1937-2002 mean of 17,020 thousand cubic meters. At Rodriguez Reservoir, there was no measurable runoff during the year.

The flow of the Tijuana River at the international boundary was 4,144 thousand cubic meters during 2001.

WHITEWATER DRAW

During 2002, the average annual temperature over the watershed was 1.2 degrees Celsius above normal, while the annual precipitation was 71% of normal. Runoff for the year at the gaging station near Douglas, Arizona, could not be determined due to a loss of record.

GENERAL HYDROLOGIC CONDITIONS FOR 2002

SAN PEDRO RIVER

During 2002, the average annual temperature was 0.3 degree Celsius above normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 81% of the 1961-2002 mean of 524 millimeters. The stream flow at the international boundary was 8,704 thousand cubic meters, 33% of the 1951-2002 average.

SANTA CRUZ

During 2002, the average annual temperature over the watershed averaged 16.7 degrees Celsius, 0.5 degree Celsius above the long term average. The annual precipitation was about 66% of the 64-year 1939-2002 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 775 thousand cubic meters. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 270 thousand cubic meters. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 505 thousand cubic meters from the loop of the river lying in Mexico, or approximately 65% of the flow reaching the Nogales Station.

ALAMO AND NEW RIVERS

During 2002, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 23.2 degrees Celsius, 0.6 degree Celsius above normal; and over the drainage area of the New River as recorded at Mexicali, Baja California, it was 24 degrees Celsius, 2 degrees Celsius above the 77-year average.

At El Centro, the precipitation was 9 millimeters, about 14% of the 72-year average; and in Mexicali, the annual precipitation was 7 millimeters, 9% of the 77-year average. The total flow of the New River at the international boundary in 2002 was 141,475 thousand cubic meters, which was about 97% of the 1943-2002 average.

SALTON SEA

During 2002, the average annual temperature around the Salton Sea was 0.1 degree Celsius above the long-term average, while the annual precipitation recorded at Brawley, California was approximately 15% of the long-term mean of 68 millimeters. The water surface of the Salton Sea dropped slightly during the year. The maximum stage, 69.405 meters below mean sea level, was recorded on April 12 through April 15 and May 16 through May 18. The minimum stage, 69.740 meters below mean sea level, was recorded on October 28 through November 20 and November 28 and 29.

09-5300.00 RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 152 meters upstream from railroad culvert and 1.6 kilometers 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 61.0 meters downstream from the spillway structure, and thence into the Colorado River on the right bank, 305 meters upstream from Colorado River below Yuma Main Canal Wasteway, and 10.5 kilometers 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 2002.

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 15,789 TCM. Monthly and annual averages since 1937 are shown in the table below.

EXTREMES: Prior to 1937: Maximum annual flow 24,904 TCM, 1916; minimum annual flow 11,003 TCM, 1913.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.73	1.78	1.70	1.73	1.90	1.84	1.78	1.76	1.90	1.84	1.76	1.73
2	1.70	1.90	1.73	1.73	1.87	1.81	1.78	1.84	1.90	1.76	1.84	1.81
3	1.70	1.90	1.98	1.73	2.01	1.81	1.78	1.78	1.90	1.81	1.84	1.90
4	1.70	1.87	2.49	1.73	2.10	2.10	1.76	1.78	1.90	1.84	1.95	1.93
5	1.70	1.84	2.78	1.73	2.12	2.10	1.87	1.81	1.87	1.87	1.90	1.95
6	1.67	1.95	2.18	1.78	2.12	1.90	1.81	1.84	1.87	1.90	1.93	1.93
7	1.61	1.87	2.07	1.90	2.07	1.78	1.84	1.78	1.84	1.84	1.93	1.78
8	1.64	1.78	2.32	1.87	1.95	1.78	1.81	1.81	1.84	1.84	1.95	1.87
9	1.64	1.76	2.35	1.76	2.04	1.78	1.90	1.76	1.84	1.78	1.93	1.90
10	1.61	1.78	2.38	1.76	1.93	1.78	1.84	1.70	1.78	1.76	1.95	1.90
11	1.61	1.73	2.21	1.78	2.07	1.78	1.84	1.76	1.90	1.78	1.95	1.93
12	1.61	1.81	1.93	1.81	2.15	1.84	1.87	2.01	1.84	1.78	1.87	1.93
13	1.59	1.84	1.81	1.81	2.15	1.81	1.78	2.04	1.93	1.84	1.56	1.93
14	1.61	1.70	1.73	1.78	2.24	1.98	1.78	2.01	1.90	1.81	1.64	1.95
15	1.64	1.84	1.73	1.84	2.18	1.93	1.76	2.04	1.73	1.81	1.47	1.93
16	1.70	1.78	1.73	1.81	2.04	1.84	1.78	1.95	1.90	1.78	1.53	1.95
17	1.70	1.84	1.78	1.76	1.98	1.78	1.76	1.98	1.93	1.81	1.53	1.95
18	1.73	1.95	1.95	1.76	1.98	1.81	1.76	1.98	1.90	1.84	1.56	1.95
19	1.70	1.84	1.84	1.76	1.98	1.81	1.76	1.98	1.93	2.04	1.67	1.90
20	1.73	1.90	1.73	1.81	1.98	1.87	1.78	1.95	1.95	2.29	1.64	1.67
21	1.67	1.76	1.73	1.81	2.01	1.78	1.84	1.95	1.95	1.84	1.61	1.67
22	1.67	1.73	1.76	1.84	2.01	1.76	1.76	1.95	1.98	1.81	1.64	1.67
23	1.78	1.70	1.73	1.78	2.04	1.81	1.78	1.98	1.95	1.78	1.61	1.56
24	1.73	1.73	1.76	1.78	2.04	1.76	1.76	1.95	1.93	1.84	1.70	1.64
25	1.70	1.76	1.73	1.78	2.18	1.70	1.81	2.04	1.84	1.78	1.64	1.59
26	1.81	1.73	1.76	1.78	2.04	1.73	1.78	1.98	1.76	1.76	1.61	1.61
27	1.64	1.84	1.70	1.81	1.95	1.61	1.78	1.93	1.73	1.76	1.67	1.56
28	1.70	1.70	1.67	1.78	2.04	1.67	1.84	1.90	1.78	1.73	1.59	1.53
29	1.81	1.70	1.78	1.78	2.12	1.73	1.78	1.90	1.81	1.78	1.61	1.59
30	1.78	1.70	1.84	1.84	1.95	1.73	1.84	1.87	1.84	2.10	1.64	1.61
31	1.76		1.70		1.87		1.81	1.93		1.84		1.53
Sum	52.37	50.61	59.36	53.62	63.11	54.41	55.82	58.94	56.12	57.04	51.72	55.35

Current Year 2002

Period 1937-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters					
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum		
Jan.			126	1.81	13	1.59	1.69	4,525	4,190	6,054	711		
Feb.			! 6	1.95	!14	1.70	1.81	4,373	3,868	5,493	456		
Mar.			5	2.78	28	1.67	1.91	5,129	4,749	6,617	1,005		
April			7	1.90	! 1	1.73	1.79	4,633	4,749	6,476	940		
May			14	2.24	! 2	1.87	2.04	5,453	4,953	6,895	804		
June			! 4	2.10	27	1.61	1.81	4,701	4,749	6,883	717		
July			9	1.90	! 4	1.76	1.80	4,823	4,993	8,079	662		
Aug.			113	2.04	10	1.70	1.90	5,092	5,008	8,400	698		
Sapt.			22	1.98	115	1.73	1.87	4,849	4,754	7,672	721		
Oct.			20	2.29	28	1.73	1.84	4,928	4,999	7,080	843		
Nov.			! 4	1.95	15	1.47	1.72	4,469	4,739	7,367	806		
Dec.			! 5	1.95	!28	1.53	1.79	4,782	4,527	6,241	783		
Yearly					2.78		1.47		1.83	57,757	56,278	78,573	10,410

φ Mean daily

! And other days

09-5250.00 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, 501 meters upstream from the intake of the Colorado River siphon, and 5.1 kilometers downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 305 meters upstream from Colorado River below Yuma Main Canal Wasteway, and 10.5 kilometers 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 2002.

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: Maximum annual flow, 367,333 TCM; maximum annual flow, 1,127,040 TCM, 1932; minimum annual flow, 141,728 TCM, 1917. Since 1935: Maximum mean daily discharge, 57.2 CMS, December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.91	2.86	4.70	1.70	2.55	1.73	2.35	0.06	15.7	9.86	2.97	8.50
2	1.93	2.86	5.35	1.19	2.46	1.59	2.35	.45	15.4	5.35	11.8	8.98
3	1.59	4.81	4.84	2.86	5.78	2.01	1.67	.14	15.7	6.00	11.4	8.92
4	1.59	4.56	3.09	3.51	16.5	1.90	2.04	.37	15.9	6.74	15.6	13.8
5	2.69	2.41	3.37	3.14	15.3	2.44	2.89	3.43	16.2	6.40	16.4	15.5
6	6.06	3.26	3.82	2.35	8.98	2.01	3.51	.28	10.1	5.66	18.7	7.65
7	4.30	3.26	3.68	2.27	14.7	1.42	3.74	.28	10.5	3.71	20.1	6.23
8	3.00	2.89	4.08	1.73	8.84	1.33	3.14	.28	12.7	5.41	19.5	16.5
9	2.66	3.48	4.50	2.89	12.7	1.39	2.41	1.33	12.7	4.22	19.1	14.3
10	2.46	3.99	4.73	3.46	8.24	.82	3.77	.62	5.27	2.32	20.1	17.9
11	2.44	3.48	3.77	4.22	4.98	1.81	3.68	4.25	.76	7.16	20.9	15.0
12	2.07	3.17	3.06	3.85	1.39	1.59	2.63	17.2	3.82	6.97	17.3	16.3
13	1.67	3.82	3.96	4.19	.34	1.42	2.55	18.4	14.3	5.55	.28	16.7
14	2.46	2.38	4.50	3.20	.82	1.39	2.41	1.33	13.5	4.70	.65	16.2
15	2.83	1.78	4.36	2.35	1.05	1.42	1.81	18.2	7.50	1.73	.96	15.8
16	2.75	2.44	4.53	2.75	1.33	2.12	.76	15.4	14.6	5.07	1.08	14.2
17	1.95	2.41	4.87	4.50	2.89	1.64	1.67	19.1	11.8	6.80	.68	15.9
18	2.07	4.19	12.2	4.25	5.52	1.98	2.49	18.5	17.4	10.6	.28	13.8
19	2.69	2.69	2.80	4.28	9.01	1.64	2.04	19.7	19.2	22.1	.51	11.7
20	3.14	4.13	3.40	4.11	3.09	1.53	3.74	17.8	17.8	22.3	.79	2.83
21	3.34	4.33	3.65	3.46	5.66	2.29	2.38	18.1	20.6	3.82	1.53	2.89
22	3.09	3.51	5.04	3.46	5.35	2.01	1.61	18.2	20.9	6.40	1.47	2.89
23	3.29	3.43	3.23	3.43	6.01	2.61	1.47	17.7	22.9	5.12	1.19	2.18
24	2.35	4.08	2.92	3.68	6.70	3.06	1.98	14.7	5.52	7.54	1.30	2.63
25	1.50	9.26	2.55	3.68	2.24	2.24	2.18	11.1	1.64	6.12	1.30	5.78
26	2.80	6.97	1.78	3.74	4.47	2.52	1.44	9.66	1.61	6.23	1.16	2.49
27	2.78	3.71	4.19	2.61	3.54	2.24	1.05	12.3	.28	4.53	1.53	1.93
28	2.95	3.54	2.32	1.98	9.46	1.84	1.90	10.8	.28	3.96	1.93	1.78
29	3.17		2.01	2.24	15.5	1.84	1.87	11.4	2.21	6.62	1.76	1.56
30	2.52		.45	2.44	8.61	2.15	1.05	9.88	12.4	.57	2.21	1.44
31	2.41		1.30		1.05		1.33	15.8		.37		2.35
Sum	84.46	103.70	119.05	93.32	195.06	55.98	69.91	323.03	339.19	193.93	214.48	284.63

Current Year 2002

Period 1935-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	φ High		φ Low		Average	Total	Average	Maximum	Minimum
			Day	φ	Day	φ					
Jan.			6	6.06	25	1.50	2.72	7,297	52,392	136,546	550
Feb.			25	9.26	15	1.78	3.70	8,960	42,850	109,952	444
Mar.			18	12.2	30	.45	3.84	10,286	42,729	111,248	440
April			17	4.30	2	1.19	3.11	8,063	42,062	106,795	402
May			4	16.5	13	.34	6.29	16,853	50,021	108,892	411
June			24	3.06	10	.82	1.87	4,837	43,474	107,263	422
July			10	3.77	16	.76	2.26	6,040	40,753	112,518	455
Aug.			19	19.7	1	.06	10.4	27,910	44,668	110,878	455
Sept.			23	22.9	127	.28	11.3	29,306	49,226	103,193	440
Oct.			20	22.3	31	.37	6.26	16,756	43,860	111,075	699
Nov.			11	20.9	113	.28	7.15	18,531	44,793	125,198	882
Dec.			10	17.9	30	1.44	9.18	24,592	51,081	136,203	570
Yearly				22.9		0.06	5.69	179,431	547,909	1,286,335	8,226

φ Mean daily

! And other days

09-5211.00 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, 305 meters downstream from the mouth of the Yuma Main Canal Wasteway, 1.0 kilometers downstream from the abandoned gaging station on the Colorado River at Yuma, 8.4 kilometers downstream from the mouth of the Gila River, 31.5 kilometers downstream from Imperial Dam, and 10.3 kilometers upstream from the northerly international boundary. Zero of the gage is 31.09 meters 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 2002. 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.3	18.7	20.4	29.5	30.3	21.3	24.5	20.2	35.1	27.2	30.0	28.9
2	17.2	19.1	21.8	30.6	27.1	21.6	23.4	21.7	35.1	22.6	33.1	60.3
3	16.6	20.5	36.5	31.4	42.5	22.9	27.5	21.5	35.4	22.4	32.6	51.3
4	17.6	21.2	67.1	32.6	75.0	41.1	27.4	21.5	35.7	22.6	36.0	48.4
5	18.4	19.1	89.5	32.6	66.6	41.6	29.7	24.5	35.4	22.6	35.1	48.7
6	18.7	19.7	56.4	38.2	53.2	26.3	25.2	25.3	34.6	30.6	36.0	53.5
7	17.8	19.4	50.1	47.3	40.5	23.5	21.9	24.3	34.3	23.1	36.2	65.1
8	17.5	19.0	74.2	45.0	34.0	22.9	22.7	26.8	54.9	22.9	36.8	56.4
9	17.2	19.1	83.3	33.7	37.4	22.9	29.2	24.2	56.4	22.2	36.2	53.0
10	17.1	19.8	96.9	33.4	33.1	22.8	25.3	23.8	56.4	21.7	37.4	51.3
11	16.9	19.1	88.1	34.6	39.4	22.5	24.1	25.7	69.4	21.8	37.7	49.3
12	16.8	19.1	55.5	34.6	61.2	22.7	26.5	37.7	51.3	22.6	35.4	49.0
13	16.7	19.7	38.4	34.8	67.4	23.3	25.0	39.1	33.4	22.6	20.4	49.6
14	17.4	18.7	29.2	34.6	48.7	34.8	24.2	37.7	41.6	23.6	22.2	48.4
15	18.2	18.7	27.3	37.4	47.3	32.9	24.0	37.9	60.0	24.5	21.3	48.7
16	18.2	18.7	26.5	34.3	37.4	24.9	26.8	37.7	42.5	23.0	22.3	47.3
17	17.9	19.4	33.4	30.6	33.7	23.8	24.3	37.9	36.8	23.7	22.3	48.1
18	17.7	26.8	62.9	27.7	34.0	26.6	22.9	37.7	35.1	25.6	21.4	45.6
19	17.4	23.6	47.6	28.0	34.3	26.8	24.2	37.9	36.8	41.6	22.0	42.8
20	18.0	23.0	31.4	31.7	36.5	29.7	23.6	36.5	36.5	55.2	22.5	26.1
21	17.7	20.9	30.6	30.0	36.0	24.4	23.2	36.2	35.7	28.6	22.2	24.6
22	17.6	19.9	32.3	33.7	34.8	21.0	22.0	36.5	36.0	23.3	21.4	23.8
23	18.1	19.9	30.3	29.5	34.6	21.7	22.1	36.5	36.8	22.8	21.2	22.4
24	18.2	20.1	30.9	29.2	37.7	22.2	22.9	36.8	32.9	23.4	21.6	21.6
25	17.8	20.4	30.6	28.3	47.3	21.0	23.1	49.8	23.6	22.5	21.2	23.1
26	17.9	22.0	31.2	27.8	39.4	20.6	22.5	44.2	22.1	22.6	20.8	19.9
27	17.6	27.2	26.9	29.2	35.4	20.2	21.9	35.7	20.2	23.2	21.3	18.3
28	17.7	21.5	23.4	27.4	36.0	20.3	24.3	35.4	20.2	23.5	21.8	17.8
29	17.6	22.3	27.2	27.2	37.9	21.8	26.6	35.4	20.2	32.6	21.4	17.8
30	19.0	22.3	29.5	30.0	30.0	22.0	25.7	34.6	27.3	47.6	22.0	16.9
31	18.5	24.9	24.9	24.4	24.4	24.5	24.5	34.6	36.8	36.8	17.0	17.0
Sum	550.3	574.3	1,342.2	974.4	1,273.1	750.1	761.2	1,015.3	1,131.7	829.0	811.8	1,195.0

Month	Current Year 2002							Period 1951-2002			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			1	19.3	3	16.6	17.8	47,546	258,073	1,317,479	36,828
Feb.			27	27.2	1	18.7	20.5	49,620	211,394	1,228,424	41,083
Mar.			10	96.9	1	20.4	43.3	115,966	234,085	1,610,496	42,683
April			7	47.3	29	27.2	32.5	84,188	208,846	1,119,312	41,552
May			4	75.0	31	24.4	41.1	109,996	208,108	1,065,554	43,373
June			5	41.6	27	20.2	25.0	64,809	202,344	1,113,679	36,996
July			5	29.7	1	21.9	24.6	65,768	228,180	2,013,773	37,956
Aug.			25	49.8	1	20.2	32.8	87,722	234,113	2,073,958	41,457
Sept.			11	69.4	127	20.2	37.7	97,779	211,178	1,669,785	53,264
Oct.			20	55.2	10	21.7	26.7	71,626	182,001	1,789,911	43,129
Nov.			11	37.7	13	20.4	27.1	70,140	184,353	1,292,035	42,965
Dec.			7	65.1	30	16.9	38.5	103,248	214,624	1,374,775	40,733
Yearly				96.9		16.6	30.7	968,408	2,577,299	13,065,596	633,707

φ Mean daily

! And other days

09-5211.01 COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES

(See Preceding Page for Description)

(See Preceding Page for Description)
MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.245	3.230	3.245	3.370	3.370	3.175	3.250	3.140	3.465	3.300	3.315	3.210
2	3.190	3.240	3.280	3.390	3.305	3.180	3.225	3.180	3.465	3.195	3.380	3.805
3	3.175	3.275	3.575	3.410	3.600	3.215	3.320	3.180	3.470	3.190	3.370	3.650
4	3.205	3.290	4.080	3.425	4.175	3.585	3.315	3.180	3.470	3.195	3.430	3.595
5	3.225	3.245	4.405	3.420	4.035	3.605	3.370	3.250	3.465	3.190	3.415	3.600
6	3.235	3.255	3.910	3.535	3.815	3.290	3.265	3.265	3.445	3.370	3.425	3.675
7	3.210	3.250	3.815	3.710	3.580	3.225	3.190	3.240	3.445	3.200	3.430	3.875
8	3.205	3.240	4.180	3.665	3.450	3.215	3.205	3.300	3.825	3.195	3.440	3.735
9	3.195	3.240	4.310	3.445	3.515	3.215	3.355	3.245	3.845	3.175	3.425	3.680
10	3.190	3.255	4.495	3.440	3.435	3.210	3.265	3.235	3.850	3.160	3.445	3.655
11	3.185	3.235	4.360	3.465	3.555	3.200	3.240	3.275	4.060	3.165	3.450	3.620
12	3.180	3.235	3.900	3.465	3.945	3.205	3.295	3.530	3.750	3.180	3.400	3.620
13	3.180	3.250	3.620	3.465	4.045	3.220	3.260	3.555	3.425	3.180	3.065	3.630
14	3.195	3.220	3.405	3.465	3.730	3.470	3.245	3.530	3.585	3.200	3.110	3.620
15	3.220	3.220	3.380	3.515	3.705	3.430	3.235	3.535	3.915	3.220	3.085	3.625
16	3.220	3.220	3.360	3.455	3.515	3.260	3.305	3.525	3.605	3.180	3.105	3.605
17	3.210	3.235	3.485	3.375	3.445	3.230	3.245	3.535	3.495	3.195	3.105	3.625
18	3.205	3.400	4.000	3.315	3.455	3.300	3.215	3.525	3.465	3.245	3.080	3.580
19	3.200	3.335	3.750	3.320	3.460	3.305	3.245	3.530	3.495	3.565	3.095	3.530
20	3.215	3.320	3.450	3.405	3.505	3.360	3.230	3.500	3.495	3.815	3.100	3.195
21	3.205	3.265	3.430	3.365	3.490	3.245	3.220	3.495	3.480	3.295	3.090	3.165
22	3.205	3.245	3.460	3.440	3.470	3.165	3.190	3.500	3.485	3.180	3.070	3.145
23	3.220	3.240	3.420	3.355	3.465	3.180	3.195	3.500	3.500	3.165	3.060	3.115
24	3.220	3.245	3.425	3.350	3.525	3.195	3.215	3.505	3.415	3.180	3.070	3.095
25	3.210	3.250	3.420	3.330	3.705	3.165	3.215	3.745	3.215	3.160	3.055	3.140
26	3.215	3.290	3.425	3.320	3.560	3.155	3.200	3.640	3.180	3.160	3.045	3.060
27	3.205	3.410	3.330	3.350	3.485	3.140	3.185	3.485	3.135	3.170	3.055	3.020
28	3.205	3.275	3.245	3.310	3.490	3.145	3.245	3.475	3.130	3.175	3.065	3.015
29	3.205		3.215	3.305	3.535	3.185	3.300	3.475	3.155	3.370	3.050	3.020
30	3.240		3.215	3.355	3.370	3.190	3.280	3.455	3.300	3.665	3.065	2.995
31	3.230		3.265	3.320	3.245	3.250	3.250	3.455		3.460		3.000
Avg.	3.210	3.265	3.640	3.420	3.580	3.255	3.250	3.420	3.500	3.260	3.210	3.415

09-5302.00 YUMA MESA OUTLET DRAIN
TO COLORADO RIVER NEAR YUMA, ARIZONA

DESCRIPTION: Venturi meter with recorder 0.5 kilometer from outlet to Colorado River, 0.8 kilometer west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 2.7 kilometers downstream from the mouth of Yuma Main Canal Wasteway.
RECORDS: Records are furnished by U. S. Geological Survey. Records available: July 1970 through 2002. 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.49	2.52	2.55	2.44	2.63	2.61	2.61	1.30	2.10	2.12	1.93	2.12
2	2.49	2.52	2.52	2.38	2.63	2.49	2.49	1.30	2.10	2.12	1.93	2.12
3	2.49	2.52	2.52	1.95	2.63	2.49	2.49	1.30	2.10	2.12	1.93	2.12
4	2.49	2.52	2.58	1.93	2.63	2.49	2.49	1.30	2.10	2.12	1.93	2.12
5	2.49	2.52	2.61	2.21	2.63	2.49	2.49	1.81	2.15	2.12	1.93	2.12
6	2.49	2.52	2.10	2.21	2.55	2.41	2.41	2.18	2.18	2.12	1.93	2.12
7	2.41	2.52	1.50	2.21	2.38	2.24	2.24	2.18	2.18	2.12	1.93	2.12
8	2.35	2.52	1.50	2.32	2.38	2.21	2.21	2.18	2.18	2.12	1.93	2.12
9	2.35	2.52	1.50	2.44	2.38	2.18	2.18	2.18	2.18	2.12	1.93	2.12
10	2.44	2.52	1.50	2.52	2.38	2.27	2.27	2.18	2.18	2.12	1.93	2.29
11	2.49	2.52	1.50	2.58	2.38	2.32	2.32	2.18	2.18	2.12	1.93	2.46
12	2.49	2.52	1.50	2.58	2.38	2.32	2.32	2.18	2.18	2.12	1.93	2.46
13	2.49	2.52	1.50	2.58	2.38	2.32	2.32	2.18	2.18	2.12	1.93	2.46
14	2.49	2.52	1.50	2.58	2.38	2.32	2.32	2.18	2.18	2.12	1.93	2.46
15	2.49	2.52	1.50	2.58	2.49	2.44	2.41	2.18	2.18	2.12	1.93	2.46
16	2.49	2.52	1.50	2.58	2.63	2.49	2.49	2.18	2.18	2.12	1.93	2.46
17	2.49	2.52	1.50	2.52	2.63	2.49	2.49	2.18	2.18	2.12	1.93	2.46
18	2.49	2.52	1.50	2.52	2.63	2.55	2.55	2.18	2.18	2.12	1.93	2.46
19	2.49	2.52	1.50	2.63	2.63	2.58	2.58	2.18	2.18	2.12	2.01	2.46
20	2.49	2.52	1.50	2.63	2.63	2.58	2.58	2.18	2.18	2.12	2.12	2.46
21	2.49	2.52	1.50	2.63	2.63	2.58	2.58	2.18	2.18	2.12	2.12	2.46
22	2.49	2.52	1.50	2.63	2.61	2.58	2.58	2.18	2.18	2.12	2.12	2.46
23	2.49	2.52	1.50	2.63	2.58	2.58	2.58	2.18	2.24	2.12	2.12	2.46
24	2.49	2.52	1.50	2.63	2.58	2.58	2.58	2.18	2.32	2.12	2.12	2.46
25	2.49	2.52	1.50	2.63	2.58	2.58	2.55	2.18	2.24	2.12	2.12	2.46
26	2.49	2.52	1.50	2.63	2.58	2.58	1.95	2.18	2.15	2.12	2.12	2.46
27	2.49	2.52	1.50	2.63	2.58	2.55	1.59	2.18	2.15	2.12	2.18	2.46
28	2.49	2.55	1.93	2.63	2.58	2.52	1.59	2.18	2.15	2.32	2.44	2.44
29	2.49		2.44	2.63	2.58	2.52	1.59	2.18	2.15	2.15	2.24	2.44
30	2.49		2.44	2.63	2.49	2.46	1.59	2.10	2.07	2.07	2.18	2.35
31	2.49		2.44		2.44		0	0	2.07	2.07		.79
Sum	76.78	70.59	55.63	74.69	78.61	73.85	69.44	61.43	65.08	65.85	60.63	71.21

Current Year 2002

Period 1971-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	2.49	! 8	2.35	2.48	6,634	3,043	7,204	0
Feb.			28	2.55	! 1	2.52	2.52	6,099	2,858	6,099	0
Mar.			5	2.61	! 7	1.50	1.79	4,806	3,167	6,698	4.9
April			!19	2.63	4	1.93	2.49	6,453	3,222	6,453	299
May			! 1	2.63	! 7	2.38	2.54	6,792	3,259	7,617	0
June			1	2.61	9	2.18	2.46	6,381	3,023	7,206	0
July			1	2.61	31	0	2.24	6,000	3,192	6,796	613
Aug.			! 6	2.18	31	0	1.98	5,308	3,221	7,401	222
Sept.			24	2.32	30	2.07	2.17	5,623	3,149	7,253	0
Oct.			28	2.32	!30	2.07	2.12	5,689	3,256	7,106	194
Nov.			28	2.44	! 1	1.93	2.02	5,238	3,280	7,103	386
Dec.			!11	2.46	31	.79	2.30	6,153	3,527	7,580	0
Yearly				2.63		0	2.26	71,176	38,197	72,381	2,162

φ Mean daily

! And other days

09-5305.00 DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 6.4 kilometers downstream from Colorado River below Yuma Main Canal Wasteway, and 4.0 kilometers 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 2002.

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 975 meters upstream, is affected by backwater from the river during ordinary high stages.

EXTREMES: Mean daily discharge: Maximum, 0.85 CMS on May 31, 2000; minimum no flow several days in February 1966.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.28	0.28	0.28	0.26	0.37	0.34	0.34	0.31	0.34	0.37	0.57	0.31
2	.28	.28	.28	.27	.34	.34	.34	.34	.34	.37	.54	.31
3	.28	.27	.31	.27	.34	.34	.34	.34	.34	.37	.51	.31
4	.28	.26	.31	.27	.34	.34	.34	.34	.34	.37	.48	.31
5	.28	.26	.31	.27	.34	.34	.34	.34	.34	.37	.45	.31
6	.28	.27	.31	.28	.34	.34	.34	.34	.34	.37	.45	.31
7	.28	.28	.31	.28	.34	.34	.34	.34	.34	.34	.42	.31
8	.31	.31	.34	.28	.34	.34	.34	.34	.34	.34	.40	.31
9	.34	.28	.31	.28	.34	.34	.34	.34	.34	.34	.40	.31
10	.40	.28	.31	.28	.34	.34	.34	.34	.34	.34	.40	.31
11	.40	.28	.28	.28	.34	.34	.34	.34	.34	.34	.40	.31
12	.40	.28	.28	.28	.34	.34	.34	.34	.34	.37	.40	.31
13	.40	.27	.28	.28	.34	.34	.34	.34	.34	.37	.37	.28
14	.37	.27	.27	.31	.34	.34	.34	.37	.34	.37	.37	.28
15	.37	.27	.27	.31	.34	.34	.34	.37	.34	.37	.37	.28
16	.37	.26	.26	.31	.34	.34	.31	.37	.34	.37	.37	.28
17	.37	.26	.25	.31	.34	.34	.31	.34	.34	.40	.37	.31
18	.37	.25	.24	.31	.34	.34	.31	.34	.34	.40	.37	.31
19	.37	.25	.24	.34	.34	.34	.31	.34	.37	.40	.34	.34
20	.34	.25	.23	.34	.34	.34	.31	.34	.37	.40	.34	.34
21	.34	.24	.22	.34	.34	.34	.31	.34	.37	.40	.34	.34
22	.34	.25	.23	.34	.34	.34	.31	.34	.37	.42	.34	.34
23	.34	.25	.23	.34	.34	.34	.31	.34	.37	.42	.34	.34
24	.34	.26	.24	.37	.34	.34	.31	.34	.37	.42	.34	.31
25	.31	.26	.24	.37	.34	.34	.31	.34	.37	.45	.34	.31
26	.31	.27	.24	.37	.34	.34	.31	.34	.37	.45	.34	.31
27	.31	.27	.25	.37	.34	.34	.31	.34	.37	.48	.34	.31
28	.31	.28	.25	.37	.34	.34	.31	.34	.37	.51	.34	.31
29	.31		.25	.37	.34	.34	.31	.34	.37	.51	.34	.31
30	.28		.26	.37	.34	.34	.31	.34	.37	.54	.31	.28
31	.28		.26	.34	.34	.34	.31	.34		.57		.28
Sum	10.24	7.49	8.34	9.42	10.57	10.20	10.06	10.60	10.56	12.54	11.69	9.58

Current Year 2002

Period 1948-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Total	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High		Day			φ Low	Average	Maximum	Minimum
				Day	φ							
Jan.			110	0.40	1	0.28	0.33	885	514	1,337	48.5	
Feb.			8	.31	21	.24	.27	647	431	920	50.0	
Mar.			8	.34	21	.22	.27	721	503	1,052	77.3	
April			124	.37	1	.26	.31	814	510	1,233	82.4	
May			1	.37	1	.2	.34	913	545	1,551	71.9	
June			1	.34	1	.34	.34	881	526	1,270	83.1	
July			1	.34	116	.31	.32	869	591	1,554	89.8	
Aug.			114	.37	1	.31	.34	916	652	1,665	91.0	
Sept.			119	.37	1	.34	.35	912	665	1,690	66.1	
Oct.			31	.57	7	.34	.40	1,083	747	1,505	68.2	
Nov.			1	.57	30	.31	.39	1,010	690	1,530	71.2	
Dec.			119	.34	113	.28	.31	828	596	12,295	52.1	
Yearly				0.57		0.22	0.33	10,479	6,970	15,331	955	

φ Mean daily

! And other days

09-5270.00 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, 33.5 kilometers downstream from the intake at Imperial Dam, 9.7 kilometers west of Yuma, about 1.6 kilometers 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 1.6 kilometers upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 168 meters upstream from wasteway gates and 549 meters from the entrance to the power plant. Datum of gage is 45.72 meters above mean sea level. Tailrace gage is on left bank, 207 meters 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 45.07 meters, 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 2002. 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, 281 CMS on October 6, 1985; minimum daily discharge, no flow during long periods.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26.3	42.8	53.0	79.0	26.3	25.3	24.6	30.3	0	0	0	26.0
2	27.4	45.3	51.5	71.3	31.4	28.3	26.3	28.6	0	0	0	0
3	28.9	46.2	40.2	58.6	27.8	28.6	24.3	28.2	0	0	0	0
4	33.4	49.8	23.4	57.2	0	25.5	29.5	28.6	0	0	0	0
5	42.2	54.1	23.0	56.1	0	25.5	31.4	24.8	0	0	0	0
6	55.2	53.0	23.5	60.0	0	22.3	37.7	20.7	0	0	0	0
7	37.1	49.8	26.8	76.7	0	23.0	41.3	23.7	0	0	0	0
8	38.2	46.2	23.0	80.8	0	24.3	39.9	20.1	0	0	0	0
9	54.4	48.7	23.0	80.1	0	24.3	23.1	20.4	0	0	0	0
10	78.2	48.7	23.4	67.4	0	25.0	28.3	20.6	9.54	0	0	0
11	48.7	54.7	31.2	54.7	0	24.4	30.6	20.8	17.7	0	0	0
12	35.4	54.7	36.2	54.4	0	24.4	40.5	0	32.3	0	.85	0
13	36.2	51.5	61.5	53.5	0	25.6	38.5	0	11.7	0	24.6	0
14	39.4	50.1	64.3	58.3	0	34.0	30.3	0	0	0	24.0	0
15	36.0	50.1	57.2	49.0	0	32.0	28.0	0	0	0	22.1	0
16	36.0	50.1	51.3	53.5	0	54.7	19.8	0	0	0	22.8	0
17	36.0	50.1	54.4	57.8	0	39.6	21.7	0	0	0	22.8	0
18	36.0	47.9	36.0	62.9	0	22.3	25.2	0	0	0	24.1	0
19	34.0	49.3	55.5	64.6	0	21.9	25.8	0	0	0	25.1	1.27
20	34.0	50.1	56.6	59.5	0	20.2	27.6	0	0	0	25.2	25.5
21	36.2	51.8	52.4	65.4	0	24.9	27.9	0	0	0	25.2	27.7
22	38.5	53.2	53.5	53.2	0	25.9	28.6	0	0	0	25.3	25.9
23	38.5	53.2	55.8	53.2	0	27.2	28.6	0	0	0	26.1	24.1
24	38.8	53.2	65.1	51.3	0	25.4	27.7	0	10.3	0	27.0	26.6
25	37.4	53.2	52.4	52.4	0	28.0	26.8	0	41.6	0	28.6	20.3
26	38.8	52.1	51.3	51.0	0	28.3	28.3	0	27.9	0	29.0	20.6
27	40.5	46.4	55.2	54.1	0	27.6	27.8	0	21.9	0	28.3	22.0
28	44.2	50.7	59.5	50.7	0	27.1	26.3	0	22.2	0	28.3	22.8
29	46.2		64.0	48.1	1.19	26.2	23.6	0	19.9	0	28.3	22.9
30	40.8		66.0	44.2	9.20	27.7	25.0	0	11.6	0	28.3	25.1
31	44.5		101		22.1		25.7	0		0		25.9
Sum	1,237.4	1,407.0	1,491.2	1,779.0	117.99	819.5	890.7	266.8	226.64	0	465.95	316.67

Current Year 2002

Period 1944-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low	Average	Total	Average	Maximum	Minimum
Jan.			10	78.2	1	26.3	39.9	106,911	115,422	643,620	0
Feb.			111	54.7	1	42.8	50.3	121,565	95,003	579,127	0
Mar.			31	101	1.5	23.0	48.1	128,840	146,705	501,939	0
April			8	80.8	30	44.2	59.3	153,706	152,739	447,013	0
May			2	31.4	1.4	0	3.81	10,194	74,907	454,461	0
June			16	54.7	20	20.2	27.3	70,805	114,195	501,523	0
July			7	41.3	16	19.8	28.7	76,956	161,311	512,385	0
Aug.			1	30.3	112	0	8.61	23,052	155,676	498,782	0
Sept.			25	41.6	1	0	7.55	19,582	98,856	591,679	0
Oct.			1	0	1	0	0	0	70,515	617,269	0
Nov.			26	29.0	1	0	15.5	40,258	70,307	609,196	0
Dec.			21	27.7	1	0	10.2	27,360	108,434	700,894	0
Yearly				101		0	24.7	779,229	1,364,070	6,000,505	0

φ Mean daily

! And other days

09-5220.00 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 10.3 kilometers downstream from Colorado River below Yuma Main Canal Wasteway, 8.0 kilometers west of Yuma, Arizona, 1.8 kilometers upstream from Morelos Diversion Structure, and about 1.6 kilometers downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. On May 1, 1988, the gage was relocated 52 meters upstream of the old gage on the left bank. Zero of the new gage is at mean sea level, U. S. C. & G. S. datum. Elevation of the new gage is equal to that of the old gage. Station is operated by the United States Section of the Commission.

RECORDS: Based on 185 current meter measurements during the year, 121 by the United States Section, 62 by the Mexican Section of the Commission, 2 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder 512 meters 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 2002; daily discharge records available January 1, 1950 through 2002.

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 2002 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 7,080 CMS, January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 16,581,806 TCM; maximum annual flow 31,429,325 TCM, 1907; minimum annual flow 1,448,117 TCM, 1934. Since January 1935: Maximum instantaneous discharge 1,150 CMS on August 20, 1983, minimum discharge, no flow during April 1935.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	48.0	65.2	75.1	104	58.8	50.3	48.4	47.7	37.3	34.0	35.8	50.6
2	46.2	66.2	77.4	102	55.9	51.2	48.4	46.7	36.5	24.9	36.0	59.8
3	46.3	65.5	80.7	92.6	62.7	52.3	50.3	46.9	38.2	23.4	38.6	56.2
4	51.3	73.6	95.2	93.2	79.6	65.9	57.7	47.2	39.9	23.2	39.9	52.3
5	64.3	70.2	111	93.3	74.1	71.0	64.2	46.4	37.9	23.5	40.8	52.0
6	75.0	70.6	87.7	105	62.8	52.3	68.0	46.5	40.3	35.2	41.5	55.6
7	56.8	74.4	80.1	123	49.8	48.3	68.0	46.7	38.9	27.2	42.1	64.5
8	53.1	64.1	101	138	40.7	48.4	64.6	47.3	58.2	24.0	43.2	59.6
9	80.5	68.0	108	131	43.5	48.4	52.8	45.0	62.7	24.3	42.7	58.6
10	94.2	73.4	121	110	41.9	50.3	52.0	44.8	68.4	22.5	42.6	55.4
11	72.6	81.0	123	96.6	46.5	49.1	52.8	45.6	83.1	20.4	42.9	55.7
12	58.9	81.1	105	90.6	65.3	49.3	67.2	40.2	84.6	22.1	42.5	54.5
13	54.1	79.1	112	89.1	69.1	45.9	67.2	42.5	47.8	24.4	42.6	55.2
14	59.8	75.8	102	93.5	56.1	66.3	55.9	41.4	44.7	26.2	44.4	55.5
15	58.6	75.4	92.0	91.3	56.2	65.5	54.8	41.4	57.9	28.5	42.0	55.6
16	57.9	75.1	85.0	89.0	47.4	73.8	51.3	41.6	48.9	26.6	42.7	52.4
17	57.3	76.5	87.5	90.8	38.6	61.5	50.4	41.3	42.1	27.3	43.2	53.3
18	53.8	84.9	101	89.6	40.6	51.4	49.7	42.5	37.7	28.9	43.3	52.9
19	53.1	82.1	105	91.8	40.5	46.4	49.2	41.6	38.3	40.6	43.4	51.7
20	54.9	81.2	95.2	92.2	46.0	53.0	52.1	39.7	39.0	52.6	44.1	51.6
21	58.5	80.1	85.4	94.2	42.4	50.1	51.7	37.9	38.0	36.6	43.7	51.9
22	63.7	79.6	88.6	88.1	41.5	49.4	50.8	39.4	38.2	28.4	42.8	50.4
23	63.0	79.8	88.5	80.9	40.7	49.4	50.8	39.5	40.2	27.3	42.6	48.4
24	62.3	80.8	98.1	80.1	46.4	50.0	50.4	40.2	46.1	27.8	43.9	47.8
25	59.1	82.2	85.6	79.4	55.8	50.1	51.4	50.8	66.6	27.1	44.7	47.1
26	60.4	82.1	87.6	77.0	50.0	50.0	51.7	50.4	51.0	26.4	45.3	44.8
27	61.0	86.2	85.7	83.4	42.1	51.1	49.1	40.9	43.7	27.6	45.0	42.9
28	68.3	81.0	84.5	77.8	41.6	52.1	47.7	39.3	41.7	29.7	45.6	42.8
29	68.8	84.8	84.8	73.2	45.4	52.2	47.4	39.2	38.8	34.5	45.2	42.8
30	63.7	87.3	74.8	74.8	46.3	52.6	48.2	39.7	40.4	48.2	45.2	44.5
31	66.5	113			50.8		48.0	37.6		42.9		45.2
Sum	1,892.0	2,135.2	2,934.0	2,815.5	1,579.1	1,607.6	1,672.2	1,337.9	1,427.1	916.3	1,278.3	1,611.6

Current Year 2002

Period 1935-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High		Day		Total	Average	Maximum	Minimum
				Day	Low						
Jan.	32.170	31.745	10	103	2	44.2	61.0	163,469	483,423	2,027,841	39,348
Feb.	32.135	31.755	18	99.6	3	61.2	76.3	184,481	416,001	1,705,506	74,502
Mar.	32.380	31.885	31	140	7	71.7	94.6	253,498	446,829	1,642,378	23,930
April	32.535	32.020	8	158	28	67.0	93.9	243,259	368,384	1,322,616	0
May	32.165	31.605	13	83.8	17	36.8	50.9	136,434	347,562	1,419,735	88,077
June	32.135	31.725	16	99.7	19	43.4	53.6	138,897	346,741	1,629,906	10,485
July	32.025	31.500	12	82.4	29	43.9	53.9	144,478	368,595	2,303,937	30,097
Aug.	31.895	31.590	25	55.8	31	34.3	43.2	115,595	375,975	2,485,717	54,026
Sept.	32.205	31.605	10	134	30	34.1	47.6	123,301	335,104	2,286,076	66,424
Oct.	32.155	31.445	20	55.2	11	19.0	29.6	79,168	323,544	2,417,702	52,985
Nov.	31.930	31.660	26	46.3	1	30.8	42.6	110,445	358,026	1,889,976	51,070
Dec.	32.245	31.790	7	72.9	29	41.6	52.0	139,242	450,473	2,259,735	51,806
Yearly	32.535	31.445		158		19.0	58.1	1,832,267	4,620,657	19,033,104	890,696

09-5220.01 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.810	32.110	31.905	32.230	31.875	31.820	32.000	31.630	31.685	31.600	31.770	31.940
2	31.780	32.100	31.945	32.225	31.830	31.825	32.000	31.625	31.665	31.505	31.745	32.110
3	31.795	32.065	31.980	32.175	31.995	31.810	31.985	31.630	31.685	31.475	31.820	32.055
4	31.860	32.040	32.105	32.180	32.135	31.940	31.955	31.640	31.695	31.460	31.835	31.970
5	31.970	32.000	32.120	32.190	32.055	32.000	31.925	31.645	31.675	31.480	31.850	31.965
6	32.005	32.000	32.025	32.295	31.935	31.830	31.915	31.665	31.700	31.605	31.840	32.035
7	31.930	31.905	31.980	32.285	31.745	31.775	31.890	31.660	31.700	31.550	31.845	32.165
8	32.005	31.770	32.140	32.385	31.625	31.780	31.830	31.675	31.910	31.495	31.875	32.115
9	32.035	31.800	32.205	32.415	31.655	31.780	31.640	31.650	31.950	31.540	31.865	32.100
10	32.015	31.820	32.250	32.330	31.690	31.815	31.610	31.655	31.955	31.530	31.850	32.030
11	31.995	31.870	32.250	32.215	31.740	31.795	31.625	31.675	32.010	31.490	31.855	32.045
12	31.930	31.875	32.215	32.165	31.960	31.800	31.735	31.640	32.020	31.515	31.850	32.010
13	31.925	31.855	32.250	32.175	31.925	31.830	31.725	31.665	31.780	31.545	31.850	32.030
14	32.030	31.820	32.170	32.220	31.865	31.995	31.580	31.660	31.720	31.565	31.895	32.030
15	32.025	31.815	32.080	32.230	31.885	31.985	31.570	31.670	31.910	31.615	31.830	32.040
16	32.015	31.810	32.065	32.195	31.800	32.025	31.525	31.670	31.775	31.585	31.840	32.030
17	32.025	31.830	32.120	32.205	31.685	31.970	31.515	31.660	31.690	31.595	31.860	32.045
18	32.020	31.920	32.245	32.180	31.715	31.945	31.520	31.685	31.675	31.620	31.865	32.045
19	31.995	31.895	32.260	32.190	31.725	31.885	31.535	31.670	31.670	31.830	31.860	32.010
20	32.005	31.870	32.215	32.190	31.795	31.975	31.580	31.655	31.690	32.085	31.880	32.000
21	32.040	31.845	32.180	32.200	31.735	31.940	31.575	31.620	31.685	31.790	31.870	32.010
22	32.115	31.840	32.205	32.150	31.730	31.945	31.565	31.635	31.695	31.630	31.850	31.985
23	32.090	31.845	32.205	32.095	31.725	31.945	31.575	31.640	31.725	31.620	31.840	31.950
24	32.075	31.870	32.260	32.095	31.795	31.955	31.575	31.645	31.790	31.615	31.875	31.940
25	32.020	31.900	32.170	32.085	31.895	31.955	31.560	31.775	31.960	31.600	31.895	31.925
26	32.035	31.885	32.205	32.070	31.840	31.955	31.585	31.770	31.845	31.585	31.910	31.875
27	32.045	31.940	32.185	32.115	31.730	31.975	31.570	31.665	31.735	31.605	31.905	31.830
28	32.105	31.885	32.170	32.080	31.715	31.980	31.580	31.660	31.715	31.665	31.915	31.830
29	32.115		32.145	32.045	31.750	31.980	31.600	31.660	31.700	31.730	31.910	31.830
30	32.080		32.160	32.065	31.780	31.985	31.630	31.680	31.725	31.995	31.905	31.795
31	32.110		32.250		31.835		31.620	31.655		31.900		31.810
Avg.	32.000	31.900	32.150	32.190	31.810	31.905	31.680	31.660	31.770	31.625	31.860	31.985

09-5318.50 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 0.8 kilometer downstream from the northerly international boundary and 1.0 kilometer upstream from Morelos Diversion Dam. Prior to July 14, 1971, the wasteway was located 0.6 kilometer 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 35.86 meters 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 2002 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 1,127 TCM in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 2.25 CMS on June 19, 1965, at a maximum gage height of 34.785 meters (old datum); minimum instantaneous discharge, zero during parts of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0.02	0	0	0	0	0.16	0	0.33	0.16
2	.34	0	.12	.02	0	0	0	.08	.20	0	.01	.07
3	.06	0	.02	.01	0	.01	0	.01	0	0	.22	0
4	.01	0	.06	0	0	.06	0	0	0	.07	0	0
5	.10	0	.08	0	0	0	0	0	0	.22	0	0
6	.03	0	0	0	.01	.05	0	0	.15	.15	0	.06
7	.01	.14	0	.01	.06	.02	0	0	.23	.06	.02	.02
8	.01	.11	0	.04	.01	.01	0	0	.16	0	.06	0
9	.01	.06	.05	0	.04	0	0	0	.17	.10	.05	0
10	0	.04	0	0	.08	0	0	0	.02	.08	0	0
11	0	0	0	0	.02	0	0	0	0	0	0	0
12	0	0	0	.01	0	.03	0	0	.08	0	0	0
13	0	0	.23	.30	0	0	0	0	.10	0	.19	0
14	.64	0	.11	.11	0	0	0	0	.07	0	.05	0
15	.38	0	.04	0	0	0	0	0	0	0	.01	.08
16	.39	0	.13	0	.01	0	0	0	.06	.06	.01	.07
17	.30	0	.07	0	0	0	0	0	.05	0	.01	.06
18	.12	0	.03	0	.03	0	0	0	.04	.01	.01	.01
19	.01	0	.04	0	.02	0	0	0	.06	.11	.01	.01
20	0	0	.03	0	.02	.05	0	0	0	.38	.01	.01
21	0	.07	.03	0	.01	.01	0	0	0	.21	.09	.01
22	0	.03	.01	0	0	.01	0	0	0	.13	.18	.17
23	0	0	0	.03	.02	0	0	0	0	.25	.14	.11
24	.02	0	0	.11	.01	0	0	0	0	.40	.13	.01
25	.02	0	0	.06	0	0	0	0	.04	.05	.06	.01
26	.24	0	0	.02	.07	.04	.12	.04	.01	.43	0	.01
27	.02	0	0	0	.01	.01	.02	.08	.04	.10	.04	.21
28	.01	0	0	.03	0	0	0	.06	.07	.06	.01	.04
29	0	0	0	0	0	0	0	.10	0	.13	.10	.11
30	0	0	0	0	0	0	0	.14	0	.05	.21	.02
31	0	0	0	0	0	0	0	.16	0	.06	.01	.01
Sum	2.72	0.45	1.05	0.77	0.42	0.30	0.14	0.67	1.71	3.11	1.95	1.26

Month	Current Year 2002						Period 1935-2002				
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.700	0	2	1.41	1	0	0.09	235	183	1,127	0
Feb.	.620	0	9	1.17	1	0	.02	38.9	160	493	7.4
Mar.	.435	0	4	.68	1	0	.03	90.7	167	638	0
April	.470	0	13	.77	1	0	.03	66.5	163	524	20.6
May	.495	0	26	.83	1	0	.01	36.3	164	543	36.3
June	.380	0	4	.56	1	0	.01	25.9	146	734	19.0
July	.455	0	26	.74	1	0	0	12.1	137	636	0
Aug.	.390	0	30	.59	1	0	.02	57.9	115	761	0
Sept.	.530	0	9	.93	3	0	.06	148	127	570	0
Oct.	.745	0	26	1.55	1	0	.07	269	176	604	0
Nov.	.565	0	3	1.02	2	0	.07	168	182	570	11.1
Dec.	.595	0	27	1.11	1	0	.04	109	198	750	16.9
Yearly	0.745	0		1.55		0	0.04	1,257	1,918	5,551	787

! And other days

09-5220.21 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, 1.8 kilometers downstream from the northerly international boundary, and about 12.1 kilometers 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 0.05 meter 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 2002.

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, 35.91 meters on February 15, 1998; minimum mean daily elevation above mean sea level, 30.94 meters on February 17, 1957.

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.940	32.230	31.840	31.840	31.990	31.820	32.010	31.610	31.680	31.620	31.790	31.950
2	31.890	32.200	31.870	31.870	32.080	31.780	32.010	31.610	31.660	31.540	31.760	32.110
3	31.910	32.170	31.910	31.910	31.950	31.820	31.990	31.610	31.680	31.490	31.850	32.060
4	31.970	31.980	32.020	32.020	31.780	31.940	31.950	31.620	31.700	31.480	31.850	31.980
5	32.070	31.940	32.020	32.020	31.820	32.000	31.890	31.630	31.680	31.500	31.870	31.980
6	32.110	31.950	31.940	31.940	31.880	31.850	31.860	31.660	31.690	31.620	31.860	32.040
7	32.040	31.840	31.900	31.900	31.700	31.780	31.850	31.650	31.700	31.570	31.860	32.170
8	32.110	31.690	32.060	32.060	31.570	31.790	31.810	31.670	31.890	31.510	31.880	32.100
9	32.150	31.720	32.120	32.120	31.600	31.790	31.620	31.640	31.920	31.560	31.880	32.100
10	32.130	31.750	32.160	32.160	31.650	31.820	31.570	31.640	31.920	31.550	31.860	32.020
11	32.100	31.800	32.160	32.160	31.700	31.810	31.590	31.660	31.980	31.510	31.880	32.050
12	32.050	31.800	32.130	32.130	31.910	31.810	31.690	31.630	31.990	31.530	31.870	32.020
13	32.040	31.780	32.160	32.160	31.900	31.830	31.670	31.650	31.770	31.570	31.850	32.040
14	32.170	31.750	32.100	32.100	31.860	31.990	31.530	31.660	31.710	31.590	31.920	32.040
15	32.150	31.740	32.010	32.010	31.880	31.970	31.480	31.650	31.880	31.630	31.850	32.040
16	32.130	31.740	32.000	32.000	31.810	32.010	31.480	31.660	31.770	31.610	31.850	32.040
17	32.130	31.760	32.040	32.040	31.700	31.960	31.480	31.650	31.680	31.620	31.880	32.060
18	32.130	31.840	32.170	32.170	31.720	31.940	31.480	31.680	31.680	31.650	31.890	32.050
19	32.110	31.820	32.160	32.160	31.740	31.890	31.490	31.660	31.680	31.840	31.880	32.020
20	32.120	31.790	32.140	32.140	31.800	31.980	31.540	31.650	31.690	32.080	31.910	32.000
21	32.160	31.770	32.100	32.100	31.740	31.950	31.540	31.620	31.690	31.790	31.890	32.030
22	32.220	31.770	32.130	32.130	31.740	31.960	31.540	31.630	31.680	31.640	31.880	32.000
23	32.220	31.770	32.130	32.130	31.740	31.960	31.540	31.650	31.720	31.630	31.870	31.960
24	32.200	31.800	32.180	32.180	31.810	31.970	31.540	31.660	31.770	31.630	31.900	31.940
25	32.130	31.840	32.100	32.100	31.890	31.970	31.530	31.770	31.940	31.620	31.930	31.950
26	32.150	31.850	32.120	32.120	31.850	31.970	31.550	31.770	31.820	31.600	31.950	31.900
27	32.160	31.870	32.100	32.100	31.750	31.990	31.540	31.660	31.740	31.620	31.930	31.860
28	32.210	31.820	32.090	32.090	31.730	31.990	31.550	31.660	31.710	31.680	31.950	31.850
29	32.060		32.080	32.080	31.750	31.980	31.580	31.660	31.700	31.740	31.940	31.850
30	32.050		32.080	32.080	31.790	31.990	31.610	31.680	31.740	32.000	31.930	31.810
31	32.220		32.160		31.840		31.600	31.660		31.920		31.830
Avg.	32.105	31.850	32.070	32.065	31.795	31.910	31.650	31.655	31.760	31.645	31.880	31.995

09-5220.30 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 61 meters downstream from the intake at Morelos Dam, 410 meters upstream from the point where it joins the old Alamo Canal, 3.5 kilometers upstream from Matamoros Check, and about 1.6 kilometers south of the northerly international boundary. The zero of the gage is 0.05 meter 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 2002. 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 2002, 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, 187 CMS, July 12 and 14, 1983; maximum mean daily gage height, 32.96 meters October 30, 1993 and other days. Minimum daily discharge, no flow on various occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	48.0	65.2	75.1	93.0	58.8	50.3	48.4	47.7	37.5	34.0	36.1	50.8
2	46.5	66.2	77.5	92.1	55.9	51.2	48.4	46.8	36.7	24.9	36.0	59.9
3	46.4	65.5	80.7	84.2	62.7	52.3	50.3	46.9	38.2	23.4	38.8	56.2
4	51.3	73.6	95.3	84.9	79.6	57.2	57.7	47.2	39.9	23.3	39.9	52.3
5	61.2	70.2	95.6	90.8	74.1	67.7	64.2	46.4	37.9	23.7	40.8	52.0
6	66.7	70.6	87.7	95.2	62.8	52.3	68.0	46.5	40.4	35.4	41.5	55.7
7	56.8	74.5	80.1	96.9	49.9	48.3	68.0	46.7	39.1	27.3	42.1	64.5
8	53.1	64.2	88.9	104	40.7	48.4	64.6	47.3	58.4	24.0	43.3	59.6
9	63.9	68.1	93.7	111	43.5	48.4	52.8	45.0	62.9	24.4	42.7	58.6
10	62.9	73.4	100	100	42.0	50.3	52.0	44.8	55.4	22.6	42.6	55.4
11	56.4	81.0	100	93.8	46.5	49.1	52.8	45.6	66.3	20.4	42.9	55.7
12	56.8	81.1	99.6	90.6	59.7	49.3	67.2	40.2	67.8	22.1	42.5	54.5
13	53.8	79.1	99.0	89.4	66.2	45.9	67.2	42.5	47.9	26.4	42.8	55.2
14	59.0	75.8	97.6	93.6	55.8	58.0	55.9	41.4	44.8	26.2	44.4	55.2
15	59.0	75.4	92.0	91.3	56.2	56.7	54.8	41.4	57.9	28.5	42.0	55.7
16	58.3	75.1	85.1	89.0	47.4	61.7	51.3	41.6	49.0	26.7	42.7	52.5
17	57.6	76.5	87.6	90.8	38.6	61.5	50.4	41.3	42.1	27.3	43.2	53.4
18	53.9	84.9	96.2	89.6	40.6	51.4	49.7	42.5	37.7	28.9	43.3	52.9
19	53.1	82.1	95.3	91.8	40.5	46.4	49.2	41.6	38.4	40.7	43.4	51.7
20	54.9	81.2	93.7	92.2	46.0	53.0	52.1	39.7	39.0	53.0	44.1	51.6
21	58.5	80.2	85.4	94.2	42.4	50.1	51.7	37.9	38.0	36.8	43.8	51.9
22	63.7	79.6	88.6	88.1	41.5	49.4	50.8	39.4	38.2	28.5	43.0	50.6
23	63.0	79.8	88.5	80.9	40.7	49.4	50.8	39.5	40.2	27.6	42.7	48.5
24	62.3	80.8	76.5	80.2	46.4	50.0	50.4	40.2	46.1	28.2	44.0	47.8
25	59.1	82.2	85.6	79.5	55.8	50.1	51.4	45.9	60.1	27.2	44.8	47.1
26	60.6	82.1	87.6	77.0	50.1	50.0	51.8	50.4	51.0	26.8	45.3	44.8
27	61.0	86.2	85.7	83.4	42.1	51.1	49.1	41.0	43.7	27.7	45.0	43.1
28	68.3	81.0	84.5	77.8	41.6	52.1	47.7	39.4	41.8	29.8	45.6	42.8
29	68.8		84.8	73.2	45.4	52.2	47.4	39.3	38.8	34.6	45.3	42.9
30	63.7		87.3	74.8	46.3	52.6	48.2	39.8	40.4	48.2	45.4	44.5
31	66.5		95.4		50.8		48.0	37.8		43.0		45.2
Sum	1,815.1	2,135.6	2,770.6	2,673.3	1,570.6	1,566.4	1,672.3	1,333.7	1,375.6	919.6	1,280.0	1,612.9

Current Year 2002

Period 1950-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			29	68.8	3	46.4	58.6	156,825	119,265	275,305	1,192
Feb.			27	86.2	8	64.2	76.3	184,516	128,116	292,464	11,387
Mar.			110	100	1	75.1	89.4	239,380	237,048	435,370	120,761
April			9	111	29	73.2	89.1	230,973	253,510	404,698	189,700
May			4	79.6	17	38.6	50.7	135,700	194,581	286,174	81,665
June			5	67.7	13	45.9	52.2	135,337	194,581	332,588	117,400
July			6	68.0	29	47.4	53.9	144,487	256,638	439,171	144,487
Aug.			26	50.4	31	37.8	43.0	115,232	245,065	420,675	113,219
Sept.			12	67.8	2	36.7	45.9	118,852	154,851	336,960	66,156
Oct.			20	53.0	11	20.4	29.7	79,453	93,505	280,817	12,894
Nov.			28	45.6	2	36.0	42.7	110,592	87,483	258,388	9,271
Dec.			7	64.5	28	42.8	52.0	139,355	118,024	247,899	10,886
Yearly				111		20.4	56.8	1,790,702	2,038,861	3,451,533	1,569,404

φ Mean daily

! And other days

09-5220.31 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31.740	32.030	31.790	32.090	32.090	31.790	31.340	31.580	31.650	31.590	31.760	31.920
2	31.690	32.000	31.820	32.100	32.100	31.750	31.510	31.580	31.640	31.510	31.730	32.080
3	31.710	31.970	31.860	32.050	32.050	31.790	31.400	31.580	31.650	31.460	31.820	32.030
4	31.770	31.930	31.970	32.050	32.050	31.910	31.390	31.590	31.670	31.450	31.820	31.950
5	31.870	31.890	31.970	32.050	32.050	31.970	31.380	31.610	31.650	31.470	31.840	31.950
6	31.910	31.900	31.890	32.140	32.140	31.820	31.380	31.630	31.660	31.600	31.830	32.010
7	31.840	31.790	31.850	32.140	32.140	31.750	31.450	31.620	31.670	31.540	31.830	32.140
8	31.910	31.640	32.010	32.230	32.230	31.760	31.430	31.640	31.860	31.480	31.850	32.070
9	31.950	31.670	32.070	32.260	32.260	31.760	31.570	31.610	31.890	31.530	31.850	32.070
10	31.930	31.700	32.110	32.190	32.190	31.790	31.640	31.610	31.890	31.520	31.830	32.000
11	31.900	31.750	32.110	32.080	32.080	31.780	31.650	31.630	31.950	31.480	31.850	32.020
12	31.850	31.750	32.080	32.020	32.020	31.780	31.520	31.600	31.960	31.500	31.840	31.990
13	31.840	31.730	32.110	32.030	32.030	31.800	31.490	31.620	31.740	31.540	31.820	32.000
14	31.970	31.700	32.050	32.080	32.080	31.960	31.470	31.630	31.680	31.560	31.890	32.010
15	31.950	31.690	31.960	32.100	32.100	31.940	31.410	31.620	31.740	31.600	31.820	32.010
16	31.930	31.690	31.950	32.060	32.060	31.980	31.390	31.630	31.740	31.580	31.820	32.000
17	31.930	31.710	31.990	32.080	32.080	31.930	31.370	31.620	31.650	31.590	31.850	32.010
18	31.930	31.790	32.120	32.050	32.050	31.910	31.390	31.650	31.650	31.620	31.860	32.020
19	31.910	31.770	32.110	32.060	32.060	31.860	31.410	31.630	31.640	31.510	31.850	31.990
20	31.920	31.740	32.090	32.070	32.070	31.950	31.360	31.620	31.660	32.060	31.880	31.970
21	31.960	31.720	32.060	32.080	32.080	31.920	31.330	31.590	31.660	31.760	31.860	32.000
22	32.020	31.720	32.080	32.030	32.030	31.930	31.360	31.600	31.650	31.610	31.840	31.970
23	32.020	31.720	32.080	31.980	31.980	31.930	31.370	31.620	31.690	31.600	31.830	31.930
24	32.000	31.750	32.130	31.980	31.980	31.940	31.400	31.630	31.740	31.600	31.860	31.910
25	31.930	31.790	32.050	31.960	31.960	31.940	31.520	31.740	31.910	31.590	31.880	31.920
26	31.950	31.780	32.070	31.960	31.960	31.940	31.520	31.740	31.790	31.570	31.900	31.870
27	31.960	31.820	32.050	32.000	32.000	31.960	31.270	31.680	31.710	31.590	31.890	31.830
28	32.010	31.770	32.040	31.970	31.970	31.960	31.270	31.630	31.680	31.650	31.910	31.820
29	32.020		32.030	31.930	31.930	31.950	31.440	31.630	31.670	31.710	31.910	31.820
30	31.990		32.030	31.930	31.930	31.950	31.380	31.650	31.710	31.970	31.900	31.780
31	32.020		32.110	31.950	31.210		31.400	31.630		31.890		31.800
Avg.	31.915	31.780	32.020	32.060	32.030	31.880	31.425	31.625	31.730	31.605	31.845	31.965

09-5220.41 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, 1.8 kilometers downstream from the northerly international boundary, and about 12.1 kilometers 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 0.05 meter 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 2002.

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, 35.87 meters on February 15, 1998; minimum mean gage height, 29.06 meters from October 3, 1996 to January 13, 1997.

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30.550	30.500	30.500	30.610	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.610
2	30.500	30.500	30.500	30.570	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.570
3	30.500	30.500	30.500	30.500	30.500	30.540	30.500	30.500	30.500	30.500	30.350	30.500
4	30.500	30.500	30.500	30.500	30.500	30.530	30.500	30.500	30.500	30.500	30.500	30.500
5	30.600	30.590	30.780	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
6	30.840	30.500	30.590	30.520	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.520
7	30.590	30.500	30.500	30.610	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.610
8	30.500	30.500	30.550	30.550	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
9	30.620	30.500	30.630	30.510	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.510
10	30.670	30.500	30.760	30.510	30.500	30.500	30.500	30.500	30.510	30.500	30.500	30.510
11	30.550	30.500	30.810	30.500	30.500	30.500	30.500	30.500	30.510	30.500	30.500	30.500
12	30.580	30.500	30.550	30.500	30.510	30.500	30.500	30.500	30.720	30.500	30.500	30.500
13	30.500	30.500	30.540	30.500	30.650	30.500	30.500	30.500	30.950	30.500	30.500	30.500
14	30.500	30.500	30.570	30.500	30.510	30.530	30.500	30.500	30.500	30.500	30.500	30.500
15	30.500	30.500	30.500	30.500	30.500	30.560	30.500	30.500	30.500	30.500	30.500	30.500
16	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
17	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
18	30.500	30.500	30.550	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
19	30.500	30.500	30.680	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
20	30.500	30.500	30.570	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
21	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
22	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
23	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
24	30.500	30.500	30.620	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.550
25	30.500	30.500	30.530	30.500	30.500	30.500	30.500	30.500	30.550	30.500	30.500	30.500
26	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
27	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
28	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
29	30.500		30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
30	30.500		30.510	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
31	30.500		30.650	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500	30.500
Avg.	30.530	30.505	30.560	30.515	30.505	30.505	30.500	30.500	30.525	30.500	30.495	30.515

09-5319.00 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, 1.8 kilometers 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 2002.

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 19.3 kilometers, 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, 3.1 kilometers 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	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	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	.76
7	0	0	0	0	0	0	0	0	0	0	0	.05
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	.15	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	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	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	0.15	0	0	0	0	0	0.81

Current Year 2002

Period 1966-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0	0	11	0	11	0	0	0	6,552	23,088	0
Feb.	0	0	11	0	11	0	0	0	5,037	20,959	0
Mar.	0	0	11	0	11	0	0	0	3,554	22,827	0
April	0	0	11	0	11	0	0	0	3,183	22,944	0
May	0	0	11	0	11	0	0	0	4,798	23,548	0
June	.390	0	11	2.10	11	0	.01	13.0	3,777	23,135	0
July	0	0	11	0	11	0	0	0	3,468	23,370	0
Aug.	0	0	11	0	11	0	0	0	3,526	23,668	0
Sept.	0	0	11	0	11	0	0	0	4,956	22,787	0
Oct.	0	0	11	0	11	0	0	0	6,975	23,683	0
Nov.	0	0	11	0	11	0	0	0	6,612	22,792	0
Dec.	.845	0	6	6.91	11	0	.03	70.0	6,083	23,585	0
Yearly	0.845	0		6.91		0	0	83.0	58,521	264,928	0

! And other days

09-5325.00 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, 6.9 kilometers downstream from the northerly international boundary and 5.1 kilometers 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 limnographic section of the Colorado River. Since June 1986, zero of the gage is 34.05 meters above mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 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, January 1951 through 2002, obtained by the United States Section; monthly discharge, January 1924 through 1950 by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 12,014 TCM in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 22.7 CMS on December 3, 1961, at a maximum gage height of 35.845 meters; minimum instantaneous discharge, zero during parts of most years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.97	0.79	0.09	0.59	0.10	0.20	0.40	0.02	0.50	0.53	0.30	1.27
2	.20	1.15	.40	.02	.38	.02	.21	.19	.35	1.33	.84	1.76
3	.31	.90	.10	.02	.02	.03	.30	.06	.04	.88	.94	.78
4	.67	.22	.26	.02	.10	.17	.15	.63	.05	.71	.48	.13
5	.90	.26	0	.07	.90	.03	.07	.12	.25	.42	.01	.03
6	.92	.90	0	.05	.20	.03	.26	.07	1.23	.52	.11	.06
7	.41	.55	0	.33	.78	.31	.14	.02	.78	.79	.31	1.18
8	.13	.72	.01	.49	.21	.06	.49	.01	.49	.77	.49	.90
9	.07	.62	.02	.03	.05	.45	.06	.03	1.34	.50	.40	.84
10	.08	1.12	.28	.03	.04	.04	.40	.02	1.12	.28	.94	.51
11	1.13	.42	.33	.44	.07	.03	.27	.02	.80	.55	.44	.69
12	.74	.98	.03	.14	.82	.03	.85	.12	.88	1.19	.03	.72
13	.90	1.23	.22	.26	.28	.03	.22	.02	1.17	.87	.07	.43
14	.54	1.34	.56	.63	.12	.04	.63	.10	.49	.82	.68	.75
15	.52	.10	.38	.03	.03	.34	.58	.17	.70	.70	.03	.62
16	.28	.66	.89	.13	.03	.86	.02	.10	.85	.91	.83	.09
17	.81	1.31	1.58	.03	.02	.15	.26	.01	.98	.56	.90	.50
18	1.25	1.09	.65	.03	.03	.19	.08	.03	.62	.82	1.13	.18
19	1.38	.21	.04	.02	.24	.24	.87	.01	.62	1.34	.55	.35
20	.90	.26	.07	.02	.04	.23	1.09	.06	.47	1.06	.08	.31
21	.58	.95	.86	.09	.02	.16	.32	.22	.39	.41	.36	.88
22	.58	.28	.25	.27	.13	.06	.24	.52	1.05	.37	.76	.51
23	.52	.08	1.34	.03	.04	.48	.02	.02	.91	1.01	.43	.40
24	.72	.11	1.57	.06	1.19	.59	.06	.17	.09	.72	1.02	.26
25	.46	.47	.77	.28	.64	.19	.71	.58	.57	.38	.63	.08
26	.53	.06	.04	.02	.89	.24	.97	.02	.29	1.13	.22	.53
27	1.43	.15	.05	.03	.40	.58	1.01	.01	1.13	.85	.42	.68
28	1.08	.31	.03	.02	.55	.83	.55	.02	1.00	.24	.12	.70
29	.77	.03	.48	.48	.50	.95	.59	.64	1.15	.03	.45	1.96
30	.25	.43	.18	.04	.04	.03	.14	.56	.56	.15	.63	1.01
31	.12	.70	.70	.26	.26	.26	.13	.25	.68	.68	.68	1.07
Sum	20.15	17.24	11.98	4.84	9.12	7.59	11.63	4.82	20.75	21.52	14.80	20.18

Current Year 2002										Period 1935-2002			
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters					
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum		
Jan.	0.580	0.045	5	2.37	28	0.04	0.65	1,741	2,540	11,804	0		
Feb.	.575	.050	13	2.33	15	.05	.62	1,490	2,078	10,398	17.9		
Mar.	.590	0	24	2.45	14	0	.39	1,035	1,953	7,685	51.8		
April	.565	.015	14	2.28	113	.01	.16	418	1,786	7,771	0		
May	.620	.020	27	2.64	14	.01	.29	788	2,113	11,496	10.2		
June	1.015	.020	16	5.71	11	.02	.25	656	2,011	9,177	13.0		
July	.810	.015	1	4.02	116	.01	.38	1,005	2,040	10,263	11.2		
Aug.	.580	.005	30	2.37	11	.01	.16	416	1,764	12,014	18.1		
Sept.	.640	.015	23	2.75	13	.01	.69	1,793	1,319	7,574	7.4		
Oct.	.940	.005	12	5.07	125	0	.69	1,859	1,820	7,006	14.7		
Nov.	.830	.015	18	4.16	11	.01	.49	1,279	2,190	10,139	23.2		
Dec.	.895	.020	1	4.70	14	.02	.65	1,744	2,798	11,632	51.8		
Yearly	1.015	0		5.71		0	0.45	14,224	24,412	102,255	707		

! And other days

09-5221.00 COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, 6.9 kilometers downstream from northerly international boundary, 5.1 kilometers downstream from Morelos Dam, about 15 meters downstream from the mouth of Eleven Mile Wasteway of the Yuma Project, and 17.7 kilometers downstream from Yuma, Arizona, along the river levee. The zero of the gage is at mean sea level, U. S. C. & G. S. datum. On April 1, 1988, the gage was relocated 399 meters downstream of the old gage on the left bank. Zero of the new gage is at mean sea level, U. S. C. & G. S. datum. Elevation of the new gage is 0.12 meter lower than the old gage. On August 1, 1993, the gage was relocated 81.0 meters upstream of the original 1947 gage. The datum is equal to the 1947 gage.

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 2002; 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, 33.840 meters on February 18, 1998; minimum mean daily gage height, 27.630 meters on April 7, 1999.

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27.920	27.850	27.775	28.795	27.825	27.805	27.780	27.755	27.810	27.655	27.685	27.825
2	27.995	27.890	27.805	28.415	27.845	27.785	27.785	27.775	27.790	27.740	27.720	27.895
3	27.860	27.870	27.775	27.865	27.820	28.070	27.770	27.760	27.755	27.700	27.745	27.800
4	27.895	27.810	27.795	27.860	27.825	27.970	27.740	27.815	27.760	27.695	27.710	27.735
5	28.160	27.810	28.740	27.860	27.895	28.100	27.755	27.770	27.775	27.655	27.670	27.720
6	28.395	27.865	28.245	27.890	27.825	27.790	27.770	27.770	27.875	27.655	27.680	27.795
7	28.300	27.835	27.795	28.725	27.880	27.780	27.765	27.760	27.800	27.680	27.695	27.905
8	27.860	27.850	28.105	28.895	27.830	27.755	27.800	27.750	27.790	27.685	27.735	27.835
9	28.620	27.815	28.385	28.025	27.810	27.790	27.975	27.760	28.050	27.675	27.720	27.810
10	29.295	27.855	28.705	27.930	27.810	27.755	28.185	27.765	27.885	27.655	27.780	27.770
11	28.535	27.810	28.825	27.875	27.805	27.795	28.290	27.770	28.730	27.660	27.725	27.790
12	28.130	27.840	28.090	27.850	28.010	27.815	28.415	27.780	28.825	27.740	27.685	27.790
13	27.880	27.865	28.060	27.875	28.705	27.835	28.535	27.770	27.830	27.700	27.690	27.760
14	28.020	27.885	28.180	27.905	28.025	27.960	28.240	27.775	27.710	27.720	27.755	27.785
15	27.840	27.775	27.825	27.870	27.890	28.570	28.110	27.785	27.695	27.695	27.680	27.775
16	27.820	27.815	27.850	27.815	27.810	28.290	27.775	27.775	27.710	27.705	27.755	27.715
17	27.845	27.885	27.900	27.810	27.800	28.635	27.825	27.765	27.735	27.680	27.770	27.760
18	27.885	27.865	28.260	27.825	27.790	27.855	27.815	27.780	27.710	27.700	27.790	27.735
19	27.915	27.785	28.685	27.825	27.815	27.830	27.905	27.780	27.705	27.760	27.735	27.750
20	27.870	27.780	28.150	27.835	27.790	27.825	27.850	27.785	27.700	27.755	27.695	27.740
21	27.840	27.845	27.865	27.850	27.780	27.825	27.845	27.815	27.680	27.685	27.720	27.810
22	27.845	27.790	27.805	27.880	27.800	27.805	27.760	27.845	27.735	27.665	27.775	27.765
23	27.835	27.770	27.890	27.820	27.780	27.830	27.745	27.770	27.735	27.740	27.740	27.745
24	27.845	27.775	28.265	27.825	27.880	27.790	27.745	27.790	27.645	27.700	27.805	27.730
25	27.835	27.815	28.220	27.845	27.835	27.805	27.810	27.920	28.030	27.675	27.775	27.715
26	27.835	27.775	27.820	27.820	27.870	27.895	27.835	27.930	27.680	27.745	27.720	27.760
27	27.895	27.790	27.815	27.820	27.820	27.895	27.850	27.760	27.735	27.730	27.725	27.760
28	27.885	27.805	27.815	27.820	27.835	27.920	27.810	27.755	27.715	27.670	27.695	27.785
29	27.865		27.810	27.860	27.825	27.845	27.835	27.830	27.730	27.655	27.745	27.910
30	27.820		27.820	27.840	27.790	27.755	27.775	27.815	27.670	27.670	27.770	27.830
31	27.805		28.820		27.810		27.785	27.780		27.710		27.830
Avg.	28.010	27.825	28.095	27.970	27.865	27.910	27.900	27.790	27.835	27.695	27.730	27.785

09-5330.00 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 61 meters downstream from present site on west side of levee. This wasteway is located in Arizona, 29.8 kilometers downstream from the northerly international boundary, 28.0 kilometers downstream from Morelos Diversion Dam, and 3.5 kilometers 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 2002, 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 3,528 TCM in January 1946; minimum monthly discharge, 150 TCM in September 1950. Since January 1, 1951, maximum instantaneous discharge, 2.89 CMS on January 24, 1954, at a maximum gage height of 29.095 meters (old datum); minimum instantaneous discharge, zero during a part of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.73	0.32	0.32	0.45	0.08	0.28	0.45	0	0	0.08	0.26	0.49
2	.40	.74	.25	.07	.44	.32	.49	.04	0	.09	.27	.43
3	.22	.60	.31	.07	.41	.09	.51	.08	0	.49	.35	.75
4	.30	.23	.66	.27	.34	.26	.29	.08	0	.51	.23	.26
5	.40	.03	.04	.59	.10	.27	.49	.08	0	.21	.29	.34
6	.44	.29	.02	.58	.13	.05	.21	.05	0	.07	.40	.34
7	.31	.02	.02	.55	.27	.32	.04	.02	0	.32	.38	.28
8	.20	.01	.10	.26	.17	.36	.50	.02	.04	.40	.57	.36
9	.21	.01	.07	.34	.20	.26	.52	.06	.08	.33	.33	.47
10	.14	.03	.36	.44	.01	.37	.52	.12	0	.50	.46	.47
11	.44	.45	.14	.38	.14	.12	.51	.25	0	.54	.31	.60
12	.30	.52	.22	.19	.96	.15	.57	.22	0	.56	.28	.42
13	.17	.85	.15	.53	.54	.36	.40	.13	0	.38	.10	.26
14	.15	.37	.25	.60	.27	.62	.51	.12	0	.47	.27	.40
15	.10	.05	.37	.22	.37	.38	.45	.24	0	.29	.06	.43
16	.04	.02	.57	.71	.46	.31	.39	.22	0	.34	.05	.18
17	.10	.33	.72	.64	.40	.46	.19	.26	0	.20	.54	.43
18	.40	.46	.64	.35	.31	.51	.18	.81	0	.32	.32	.18
19	.53	.23	.33	.42	.64	.53	.24	.72	.05	.36	.06	.02
20	.54	.23	.63	.31	.55	.52	.53	.70	.11	.52	.12	.26
21	.24	.24	.57	.54	.13	.29	.53	.78	.06	.33	.04	.12
22	.09	.14	.51	.50	.31	.29	.35	.65	.35	.30	.18	.57
23	.05	.24	.27	.41	.13	.54	0	.83	.43	.37	.13	.38
24	.51	.47	.46	.38	.34	.45	.13	.49	.31	.52	.37	.53
25	.63	.64	.54	.14	.49	.58	.17	.43	.15	.54	.14	.41
26	.28	.10	.42	.18	.39	.51	0	.69	.29	.37	.14	.16
27	.06	.34	.19	.48	.66	.54	0	.42	.32	.41	.26	.36
28	.04	.25	.16	.23	.02	.75	0	.20	.22	.59	.43	.36
29	.17	.33	.30	.22	.71	0	0	.11	.38	.22	.47	.42
30	.04	.47	.25	.12	.39	0	0	0	.27	.33	.64	.26
31	.05	.70	.70	.56	.56	0	0	0	.45	.45	.36	.36
Sum	8.28	8.21	10.79	11.38	10.16	11.59	9.17	8.82	3.06	11.41	8.45	11.30

Month	Current Year 2002						Period 1939-2002				
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.510	0.035	25	1.04	12	0.02	0.27	715	623	3,528	0
Feb.	.620	.010	13	1.42	22	0	.29	709	527	3,096	0
Mar.	.625	0	16	1.44	18	0	.35	932	487	2,048	0
April	.540	.015	16	1.09	12	0	.38	983	519	2,393	0
May	.600	.005	12	1.32	11	0	.33	878	629	3,047	0
June	.620	.005	25	1.22	11	0	.39	1,001	552	2,899	0
July	.540	0	3	1.00	17	0	.30	792	476	2,405	0
Aug.	.590	0	23	1.14	11	0	.28	762	497	3,121	0
Sept.	.555	0	23	1.04	11	0	.10	264	444	2,689	0
Oct.	.605	0	12	1.19	11	0	.37	986	595	2,590	0
Nov.	.635	.005	2	1.27	11	0	.28	730	718	2,936	0
Dec.	.560	.010	22	1.06	2	0	.36	976	738	3,306	0
Yearly	0.635	0		1.44		0	0.31	9,728	6,805	30,060	0

! And other days

09-5345.00 EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 91 meters north of the international boundary near San Luis, Arizona and 2.4 kilometers east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder was moved west 31 meters to a temporary bypass channel. On April 7, 1978, recorder was moved back to original site. On August 17, 1992, flow ceased through the wasteway due to construction upstream of the gage. The gage was relocated 20 meters west of the original site providing continuous record since December 21, 1992.

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 2002. 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 land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.08	0.28	0.12	0	0.36	0.21	0.12	0.17	0.08	0.56	0.03	0.06
2	.11	.12	.13	.27	.09	.01	.09	.21	.15	.26	.16	.26
3	.01	.05	.07	.16	.05	.11	.48	.05	.17	.19	.31	.03
4	.16	0	.16	.23	.06	.04	.40	.09	.10	.21	.20	.02
5	.04	.04	.01	.05	.13	.36	.38	.21	.05	.02	.27	.10
6	.10	.25	.13	.18	.06	.08	.34	.06	.18	.12	.24	.26
7	.07	.06	.17	0	.18	.21	.29	0	.15	.26	.06	.05
8	.17	.15	.03	0	.02	.24	.19	0	.33	.08	.15	.14
9	.15	.36	.31	0	0	.42	.18	0	.33	.20	.02	.01
10	.42	.38	.08	0	0	.17	.21	.30	.09	.50	.19	.21
11	.04	.38	.14	0	0	.26	.19	.05	.13	.52	.30	.22
12	.03	.29	.10	0	0	.35	.13	.01	.09	.32	.07	.30
13	.02	.42	.09	.13	0	.42	.05	.13	.43	.32	.03	.20
14	.27	.34	.02	.15	0	.28	0	.05	.16	.26	.21	.14
15	.36	.23	.10	.22	0	.06	.22	0	.21	.24	.03	.38
16	.43	.27	.07	.27	0	.21	.39	.29	.03	.43	.18	.38
17	.38	.19	.09	.27	.04	.51	.34	.20	.15	.16	.14	.10
18	.36	.06	0	.09	.17	.12	.07	.35	.10	.15	.17	.10
19	.14	.09	.10	.17	.02	.55	.08	.16	.42	.20	.40	.34
20	.12	0	.02	0	.12	.65	.13	.13	.31	.44	.13	.16
21	.02	.04	.03	0	0	.46	.34	.18	.23	.14	.15	.22
22	0	.48	0	.08	0	.20	.10	.42	.29	.20	.20	.42
23	.22	.03	.28	.07	.12	.42	.27	.15	.03	.12	.07	.44
24	.21	.25	.05	0	.04	.34	.36	.06	.04	.05	.24	.09
25	.08	.19	.19	0	.05	.02	.34	.11	.14	.03	.01	.01
26	.05	.05	.15	0	.07	.31	.41	.21	.32	.39	.29	.14
27	0	.01	.05	0	.18	.08	.14	.33	.17	.23	.07	.23
28	.03	.02	0	.12	.09	.01	.26	.22	.03	.05	.12	.28
29	.09	0	.17	.12	.04	.25	.23	.24	.25	.29	.10	.28
30	.43	.05	.16	.11	.11	.24	.25	.15	.24	.06	.10	.33
31	.35	.26		.02	.12		.20	.07		.06		.09
Sum	4.94	5.03	3.17	2.74	2.02	7.59	7.18	4.60	5.44	7.06	4.64	5.73

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.250	0	18	0.58	1	0	0.16	427	1,100	4,144	111
Feb.	.260	0	10	.60	1	0	.18	435	917	3,910	164
Mar.	.245	0	23	.56	1	0	.10	274	1,044	3,602	175
April	.255	0	16	.58	1	0	.09	237	1,010	3,910	165
May	.210	0	1	.44	2	0	.07	175	1,133	3,750	175
June	.295	0	1	.72	1	0	.25	656	949	4,515	157
July	.240	0	5	.53	1	0	.23	620	1,023	4,428	210
Aug.	.245	0	22	.55	7	0	.15	397	1,052	4,885	196
Sept.	.290	0	20	.70	4	0	.18	470	987	3,910	0
Oct.	.290	0	11	.70	3	0	.23	610	1,043	4,046	0
Nov.	.255	0	19	.59	1	0	.15	401	1,128	4,404	0
Dec.	.230	0	23	.50	1	0	.18	495	1,111	3,799	51.0
Yearly	0.295	0		0.72		0	0.16	5,197	12,497	47,255	3,733

! And other days

09-5340.00 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 61 meters north of the international boundary near San Luis, Arizona, 2.1 kilometers east of the Colorado River.

RECORDS: Main Drain discharges are lifted 3.05 to 3.66 meters 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 2002.

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 land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.54	4.50	3.38	4.57	3.42	4.07	4.19	2.76	4.56	5.84	5.34	6.01
2	3.78	5.46	3.60	4.10	3.43	4.72	3.54	3.62	4.48	5.21	6.01	6.07
3	3.54	4.00	3.70	5.03	3.97	4.56	3.71	3.14	4.32	4.37	6.12	5.31
4	4.50	3.50	3.50	4.31	3.75	3.83	3.67	3.54	3.63	4.75	4.12	5.28
5	4.27	3.89	3.03	4.11	4.35	3.85	3.13	3.39	4.27	4.93	5.34	4.74
6	4.58	4.36	3.07	4.21	4.35	3.87	3.14	3.12	4.25	5.61	5.97	4.31
7	4.34	4.39	3.59	4.74	4.07	3.83	3.56	2.56	4.87	5.34	6.07	5.35
8	3.46	4.42	4.03	4.31	3.59	2.95	3.14	2.39	4.49	4.82	6.26	4.63
9	3.52	4.24	3.69	3.55	3.73	3.58	2.69	3.13	4.30	5.01	5.97	4.94
10	3.88	4.09	4.23	3.63	4.30	3.88	3.29	4.14	4.12	5.04	5.69	5.11
11	4.09	3.76	4.26	3.55	4.34	3.81	3.05	3.72	4.44	5.46	5.91	3.54
12	3.35	3.91	4.29	3.62	4.87	3.18	3.12	3.77	4.46	5.72	5.17	3.71
13	3.63	3.78	4.63	3.58	4.43	3.82	3.24	3.11	4.59	5.17	5.58	3.30
14	3.52	4.24	3.60	4.01	4.03	3.73	3.38	3.76	4.66	5.22	5.70	4.47
15	3.12	3.43	4.00	3.79	4.31	3.67	3.47	4.02	4.56	5.62	5.93	4.75
16	3.38	3.24	3.91	4.01	4.60	3.70	3.40	3.80	4.41	5.38	6.03	4.62
17	3.76	4.17	4.94	4.01	3.99	3.79	3.14	4.40	4.40	5.84	6.17	4.06
18	3.68	3.97	3.98	3.88	3.95	3.14	2.85	4.38	4.21	6.25	6.30	3.25
19	3.74	3.48	3.27	3.59	4.56	3.31	3.13	4.25	4.50	6.22	5.45	4.11
20	3.74	3.42	3.59	3.71	3.78	3.33	3.56	3.59	4.03	6.04	5.62	4.30
21	4.29	3.42	3.42	5.56	3.71	3.31	3.39	4.55	4.93	6.07	5.57	3.71
22	3.97	3.89	3.21	5.53	3.99	4.00	3.02	3.63	5.64	5.76	5.80	4.82
23	3.61	3.73	3.33	4.39	4.08	3.88	2.88	3.94	5.46	5.93	5.56	4.97
24	3.10	4.51	4.15	3.92	4.64	4.03	2.72	4.26	5.32	6.20	6.15	4.28
25	3.36	4.13	3.55	3.68	4.43	3.21	2.28	3.62	4.93	5.49	6.45	5.38
26	3.85	3.42	3.39	3.67	4.22	4.01	3.15	3.83	5.28	6.13	5.47	4.38
27	3.82	3.33	3.05	4.32	4.45	3.43	3.78	3.36	4.55	6.16	5.15	4.21
28	4.39	4.04	3.20	4.61	4.00	3.64	3.79	3.94	5.46	6.07	5.48	3.91
29	3.75	3.21	4.55	3.59	3.69	3.50	3.79	5.34	5.84	6.17	4.09	4.09
30	3.15	3.78	3.60	4.03	4.12	3.30	3.30	4.08	5.57	5.42	5.57	3.87
31	3.51	4.14		3.70		3.01		4.29	3.96			3.47
Sum	117.22	110.72	114.72	124.14	126.66	111.94	101.22	113.88	140.03	170.87	172.12	138.95

Current Year 2002

Period 1935-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High		Low		Total	Average	Maximum	Minimum
				Day	Low						
Jan.			3	6.54	1	2	3.78	10,128	9,414	13,819	2,146
Feb.			20	6.42	22	0	3.95	9,566	9,038	14,787	2,023
Mar.			17	6.31	1	0	3.70	9,912	10,292	15,332	2,393
April			4	6.39	3	0	4.14	10,726	10,270	14,666	2,368
May			110	6.11	1	8	4.09	10,943	10,601	16,208	2,405
June			4	6.18	24	0	3.73	9,672	9,695	14,851	2,825
July			3	6.08	23	.92	3.27	8,745	9,587	14,715	3,121
Aug.			25	6.67	13	0	3.67	9,839	9,536	14,752	3,158
Sept.			5	7.09	7	0	4.67	12,099	9,734	14,269	2,812
Oct.			16	6.66	1	.08	5.51	14,763	11,381	15,277	3,626
Nov.			25	6.92	4	2.03	5.74	14,871	10,945	14,871	3,454
Dec.			9	7.00	11	0	4.48	12,005	10,234	14,160	3,022
Yearly				7.09		0	4.23	133,269	120,727	171,922	33,353

! And other days

09-5343.00 WEST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder located about 0.5 kilometer upstream from outlet to Yuma Main Drain, which is 53 meters upstream from East Main Canal Wasteway outlet and 0.6 kilometer west of San Luis, Arizona. Prior to August 1, 1975, the recorder was located about 46 meters 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 2002.

REMARKS: Wasteway discharges from West Main Canal Wasteway comprise regulatory waste from the West Main Canal and this water is considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.01	0	0	0.08	0	0.04	0.56	0.44	0	0	0.01
2	0	.02	.04	0	.10	0	0	.91	.44	0	0	.01
3	0	.01	0	0	.01	0	0	.37	.17	0	0	0
4	0	.02	0	0	.06	0	0	.36	.16	0	0	0
5	0	.01	0	0	.03	0	0	.75	.20	.01	.01	0
6	.02	.06	0	0	.05	0	0	.21	.11	0	0	0
7	.01	.02	0	0	.02	0	0	.05	.12	.01	.01	.02
8	.01	0	0	0	0	.07	.06	.02	.28	.06	.02	.04
9	.01	0	0	.04	.04	0	0	.07	.26	0	.01	.03
10	.01	.02	.10	.02	0	0	0	.19	.27	0	0	.02
11	.03	.03	.01	0	0	0	0	.13	.34	.01	0	.45
12	0	0	.11	.04	0	0	0	.18	.19	.01	0	.21
13	0	0	.09	.08	0	0	.01	.08	.26	0	0	.04
14	.03	0	.07	.11	0	.01	.01	.07	.17	0	0	0
15	.03	0	.07	0	0	0	.01	.38	.09	0	0	0
16	0	0	.02	.02	0	0	.01	.31	.18	0	0	0
17	.05	0	.01	.02	0	0	.02	.37	.41	0	.01	0
18	.02	0	.03	0	0	0	0	.09	.21	0	.01	.02
19	.03	0	.02	0	0	0	0	.04	.40	0	.01	.01
20	.02	0	.05	0	0	.01	0	.01	.29	0	0	.02
21	.02	.03	0	0	0	.02	0	.06	.13	0	0	.02
22	.01	.11	0	0	0	0	.03	.03	.20	0	.01	.21
23	.01	.07	.02	.03	0	0	.04	.02	.18	0	0	.01
24	.11	.07	.01	0	0	0	.01	.04	.08	0	.01	.01
25	0	.01	0	0	0	0	.23	.01	.01	.01	.01	0
26	0	0	.03	0	0	0	.32	.03	0	.02	0	0
27	0	0	.03	.11	.01	0	.11	.05	.01	.04	0	.05
28	0	0	.02	.03	.01	.05	.29	.19	0	.01	.01	.02
29	.06	0	.01	.02	.04	.07	.21	.80	0	0	.02	.06
30	.01	0	.05	.05	0	.06	.65	.65	0	0	.01	.03
31	.03	0	0	0	0	0	.61	.87	0	0	0	.03
Sum	0.52	0.49	0.79	0.57	0.45	0.29	2.66	7.90	5.60	0.18	0.15	1.32

Current Year 2002

Period 1971-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.590	0	24	0.46	1	0	0.02	44.9	591	1,376	44.9
Feb.	.530	0	22	.29	1	0	.02	42.3	546	1,117	42.3
Mar.	.630	0	14	.62	1	0	.03	68.3	581	1,158	68.3
April	.635	0	27	.63	1	0	.02	49.2	564	1,280	49.2
May	.610	0	2	.54	1	0	.01	38.9	501	1,445	38.9
June	.595	0	8	.49	1	0	.01	25.1	464	1,067	25.1
July	.745	0	31	1.08	1	0	.09	230	474	944	77.3
Aug.	.950	0	2	1.87	1	0	.25	683	567	1,447	121
Sept.	.750	0	4	1.10	1	0	.19	484	554	1,128	234
Oct.	.430	0	8	.14	1	0	.01	15.6	512	1,135	15.6
Nov.	.315	0	128	.09	1	0	.01	13.0	423	1,845	13.0
Dec.	.785	0	22	1.21	1	0	.04	114	509	1,204	19.0
Yearly	0.950	0		1.87		0	0.06	1,808	6,286	10,047	1,808

! And other days

09-5345.50 242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 3.7 meter Parshall flume located 31 meters upstream from confluence of East Main Canal Wasteway, 34 meters north of the southerly land boundary, and 2.3 kilometers 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 2002.
 REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona. This water is considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0.23	0.19	0.40	0.73	0	0	0
2	0	0	0	0	0	.23	.27	.68	.73	0	0	0
3	0	0	0	0	0	.23	.38	.83	.29	0	0	0
4	0	0	0	0	0	.25	.38	.83	0	0	0	0
5	0	0	0	0	0	.19	.39	.83	0	0	0	0
6	0	0	0	0	0	.18	.39	.83	0	0	0	0
7	0	0	0	0	0	.18	.39	.83	0	0	0	0
8	0	0	0	0	0	.18	.36	.82	0	0	0	0
9	0	0	0	0	0	.18	.57	.82	0	0	0	0
10	0	0	0	0	0	.19	.65	.83	0	0	0	0
11	0	0	0	0	0	.18	.67	.82	0	0	0	0
12	0	0	0	0	0	.18	.76	.83	0	0	0	0
13	0	0	0	0	0	.19	.65	.84	0	0	0	0
14	0	0	0	0	0	.29	.58	.84	0	0	0	0
15	0	0	0	0	0	.41	.58	.79	0	0	0	0
16	0	0	0	0	0	.41	.51	.76	0	0	0	0
17	0	0	0	0	0	.41	.55	.76	0	0	0	0
18	0	0	0	0	0	.42	.32	.76	0	0	0	0
19	0	0	0	0	0	.42	.19	.75	0	0	0	0
20	0	0	0	0	0	.43	.19	.75	0	0	0	0
21	0	0	0	0	0	.36	.19	.75	0	0	0	0
22	0	0	0	0	.05	.20	.11	.75	0	0	0	0
23	0	0	0	0	.22	.20	.44	.75	0	0	0	0
24	0	0	0	0	.22	.20	.85	.75	0	0	0	0
25	0	0	0	0	.22	.20	.85	.75	0	0	0	0
26	0	0	0	0	.22	.20	.85	.75	0	0	0	0
27	0	0	0	0	.22	.20	.85	.74	0	0	0	0
28	0	0	0	0	.22	.20	.85	.73	0	0	0	0
29	0	0	0	0	.23	.20	.87	.73	0	0	0	0
30	0	0	0	0	.23	.20	.59	.73	0	0	0	0
31	0	0	0	0	.23	.20	.42	.73	0	0	0	0
Sum	0.00	0	0	0	2.06	7.54	15.84	23.76	1.75	0	0	0

Current Year 2002

Period 1979-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0	0	1	0	1	0	0	0	725	3,406	0
Feb.	0	0	1	0	1	0	0	0	1,098	3,677	0
Mar.	0	0	1	0	1	0	0	0	1,115	4,717	0
April	0	0	1	0	1	0	0	0	1,296	4,265	0
May	.075	0	124	.23	1	0	.07	178	1,225	4,269	0
June	.150	.045	20	.57	24	.13	.25	651	1,165	4,272	0
July	.205	0	30	.89	22	0	.51	1,369	1,375	5,868	0
Aug.	.235	.110	7	1.06	1	.39	.77	2,053	1,421	4,988	0
Sept.	.185	0	1	.74	3	0	.06	151	1,143	3,397	0
Oct.	0	0	1	0	1	0	0	0	762	3,344	0
Nov.	0	0	1	0	1	0	0	0	324	2,101	0
Dec.	0	0	1	0	1	0	0	0	696	3,654	0
Yearly	0.235	0		1.06		0	0.14	4,402	12,345	38,461	201

! And other days

09-5348.00 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. The mean daily discharges are combined and rounded and the monthly volumes are obtained by adding the volumes of the four stations.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: February 23, 1971 through 2002; 242 Lateral from November 1978 through 2002.

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 on preceding pages of this bulletin.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.62	4.79	3.50	4.57	3.86	4.51	4.54	3.89	5.81	6.40	5.37	6.08
2	3.89	5.60	3.77	4.37	3.62	4.96	3.90	5.42	5.80	5.47	6.17	6.34
3	3.55	4.06	3.77	5.19	4.03	4.90	4.57	4.39	4.95	4.56	6.43	5.34
4	4.66	3.52	3.66	4.54	3.87	4.12	4.45	4.82	3.89	4.96	4.32	5.30
5	4.31	3.94	3.04	4.16	4.51	4.40	3.90	5.18	4.52	4.96	5.62	4.84
6	4.70	4.67	3.20	4.39	4.46	4.13	3.87	4.22	4.54	5.73	6.21	4.57
7	4.42	4.47	3.76	4.74	4.27	4.22	4.24	3.44	5.14	5.61	6.14	5.42
8	3.64	4.57	4.06	4.31	3.61	3.44	3.75	3.23	5.10	4.96	6.43	4.81
9	3.68	4.60	4.00	3.59	3.77	4.18	3.44	4.02	4.89	5.21	6.00	4.98
10	4.31	4.49	4.41	3.65	4.30	4.24	4.15	5.46	4.48	5.54	5.88	5.34
11	4.16	4.17	4.41	3.55	4.34	4.25	3.91	4.72	4.91	5.99	6.21	4.21
12	3.38	4.20	4.50	3.66	4.87	3.71	4.01	4.79	4.74	6.05	5.24	4.22
13	3.65	4.20	4.81	3.79	4.43	4.43	3.95	4.16	5.28	5.49	5.61	3.54
14	3.82	4.58	3.69	4.27	4.03	4.31	3.97	4.72	4.99	5.48	5.91	4.61
15	3.51	3.66	4.17	4.01	4.31	4.14	4.28	5.19	4.86	5.86	5.96	5.13
16	3.81	3.51	4.00	4.30	4.60	4.32	4.31	5.16	4.62	5.81	6.21	5.00
17	4.19	4.36	5.04	4.30	4.03	4.71	4.05	5.73	5.00	6.00	6.32	4.16
18	4.06	4.03	4.01	3.97	4.12	3.68	3.24	5.58	4.52	6.40	6.48	3.37
19	3.91	3.57	3.39	3.76	4.58	4.28	3.40	5.20	5.32	6.42	5.86	4.46
20	3.88	3.42	3.66	3.71	3.90	4.42	3.88	4.48	4.63	6.48	5.75	4.48
21	4.33	3.49	3.45	5.56	3.71	4.15	3.92	5.54	5.29	6.21	5.72	3.95
22	3.98	4.48	3.21	5.61	4.04	4.40	3.26	4.83	6.13	5.96	6.01	5.45
23	3.84	3.83	3.63	4.49	4.42	4.50	3.63	4.86	5.67	6.05	5.63	5.42
24	3.42	4.83	4.21	3.92	4.90	4.57	3.94	5.11	5.44	6.25	6.40	4.38
25	3.44	4.33	3.74	3.68	4.70	3.43	3.70	4.49	5.08	5.53	6.47	5.39
26	3.90	3.47	3.57	3.67	4.51	4.52	4.73	4.82	5.60	6.54	5.76	4.52
27	3.82	3.34	3.13	4.43	4.86	3.71	4.88	4.48	4.73	6.43	5.22	4.49
28	4.42	4.06	3.22	4.76	4.32	3.90	5.19	5.08	5.49	6.13	5.61	3.95
29	3.90		3.39	4.69	3.90	4.21	4.81	5.56	5.59	6.13	6.29	4.43
30	3.59		3.88	3.81	4.37	4.62	4.79	5.56	5.81	5.48	5.68	4.23
31	3.89		4.40		3.95		4.24	5.96		4.02		3.59
Sum	122.68	116.24	118.68	127.45	131.19	127.36	126.90	150.14	152.82	178.11	176.91	146.00

Current Year 2002

Period 1935-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			6	4.70	12	3.38	3.96	10,600	11,830	14,963	2,619
Feb.			2	5.60	27	3.34	4.15	10,043	11,599	15,998	2,495
Mar.			17	5.04	5	3.04	3.83	10,254	13,032	16,904	2,864
April			22	5.61	11	3.55	4.25	11,012	13,140	16,013	2,611
May			24	4.90	8	3.61	4.23	11,335	13,460	17,145	3,050
June			2	4.96	25	3.43	4.25	11,004	12,273	15,505	3,115
July			28	5.19	18	3.24	4.09	10,964	12,459	15,320	3,610
Aug.			31	5.96	8	3.23	4.84	12,972	12,576	15,612	3,687
Sept.			22	6.13	4	3.89	5.09	13,204	12,418	15,357	3,210
Oct.			26	6.54	31	4.02	5.75	15,389	13,698	17,143	4,248
Nov.			18	6.48	4	4.32	5.90	15,285	12,820	15,680	4,202
Dec.			2	6.34	18	3.37	4.71	12,614	12,550	14,863	3,562
Yearly				6.54		3.04	4.59	144,676	151,855	183,801	39,274

φ Mean daily

09-5222.00 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder was located in Mexico on the right bank of the river about 305 meters upstream from the southerly international boundary, 3.2 kilometers west of San Luis, Arizona, and 35 kilometers 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. Between January 19, 1983 and December 10, 1985, temporary gages were installed on the United States side and levels were established to ensure continuous record. On December 10, 1985, a permanent water-stage recorder was relocated on the left bank of the river about 24 meters upstream from the southerly international boundary. On January 30, 1998 a new gage was installed on the left bank of the river about 305 meters downstream from the southerly international boundary.

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 2002; continuous record of gage heights, January 1947 through 1993. During 1993, from January 1 to February 4 and May 1, 1993 to January 30, 1998, the gage was inoperable. Records of gage height and discharge were estimated from instantaneous observations and discharge measurements. 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 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. In September 2002, a dike was constructed in Mexico by CNA approximately 1 mile downstream of the boundary, to divert the water into a new channel. This construction has caused a backwater condition upstream.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 937 CMS on August 19, 1983; maximum gage height, 25.860 meters on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.73	1.78	0.74	19.7	0.44	3.84	0.94	0.05	0.16	0.59	0.21	1.20
2	1.84	4.55	.46	7.78	.36	4.41	.53	.04	.15	.41	.18	1.31
3	1.67	4.95	.51	5.49	.39	13.8	.64	.04	.15	.54	.17	1.51
4	1.29	4.79	.39	2.44	.30	1.44	1.23	.04	.15	.47	.16	1.48
5	1.92	3.77	3.06	1.76	.49	1.47	1.03	.04	.15	.57	.13	1.26
6	2.95	3.63	14.3	1.94	1.98	1.65	.47	.04	.15	.48	.13	1.14
7	6.11	3.93	15.1	2.91	.28	.58	.46	.03	.15	51.5	.15	1.13
8	2.64	3.78	19.0	21.9	.28	.16	.47	.03	.15	.54	.16	1.39
9	3.37	4.04	11.3	7.21	.22	.15	.31	.03	.15	.63	.20	1.47
10	9.75	3.87	8.59	3.28	.19	.16	.25	.03	.16	.61	.21	1.46
11	15.3	3.92	14.6	2.73	.17	.13	.25	.03	.16	.66	.25	1.29
12	4.71	1.98	8.17	2.47	.23	.10	.22	.03	.42	.61	.27	1.19
13	3.22	.89	4.09	2.48	5.51	.08	.43	.02	3.85	.62	.30	1.21
14	3.33	.69	5.98	2.31	9.09	.08	.30	0	4.20	.69	.36	1.01
15	2.76	.87	3.30	2.20	5.12	4.51	.32	0	2.68	.69	.45	.96
16	2.20	1.19	1.46	2.42	4.98	4.11	.73	0	1.85	.58	.59	.83
17	1.85	1.23	.85	2.43	5.10	16.0	.22	0	.93	.61	.82	.94
18	2.06	.89	3.41	1.98	5.23	5.07	.14	0	.54	.52	1.15	.97
19	2.29	.81	5.90	1.84	4.49	1.71	.17	0	.24	4.6	1.32	1.40
20	2.34	.91	7.75	1.72	4.34	1.34	.23	0	.25	.46	1.25	1.40
21	2.03	.73	2.98	1.58	5.05	1.24	3.58	0	.26	.39	1.13	1.49
22	1.78	1.06	2.22	1.30	4.87	.59	.70	0	.27	.34	1.06	.84
23	1.79	1.23	2.22	.49	5.02	.32	.17	0	.29	.33	1.17	.77
24	1.37	1.19	2.62	.11	5.30	.40	.06	0	.35	.29	1.15	.82
25	1.88	1.85	6.56	.12	5.08	.70	.02	0	1.71	.28	1.21	1.06
26	1.89	1.98	3.00	.17	4.82	.66	.02	.14	2.78	.26	1.26	1.26
27	1.88	1.71	.73	.17	5.14	.46	.10	.20	.76	.25	1.13	1.27
28	2.49	1.28	.31	.20	4.33	.61	.23	.19	.91	.23	1.10	1.53
29	2.70	.25	.20	.49	4.69	1.20	.24	.18	1.22	.21	1.05	1.55
30	2.38	.24	.33	3.23	1.41	.22	.17	1.54	.20	1.10	1.10	1.18
31	1.82	1.82	1.82	4.67	4.67	.08	.16	.16	.19	.19	.19	1.17
Sum		63.50		101.66		68.38		1.49		14.21		37.49
	95.34		151.91		101.39		14.36		26.73		19.82	

Month	Current Year 2002							Period 1935-2002			
	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	22.975	21.765	11	20.0	4	1.00	3.08	8,237	395,038	2,062,379	0
Feb.	22.490	21.115	3	5.69	14	.50	2.27	5,486	324,433	1,708,370	0
Mar.	23.065	21.880	8	23.2	30	.16	4.90	13,125	272,697	1,458,432	0
April	23.210	21.795	1	32.1	123	.07	3.39	8,783	177,385	947,722	0
May	22.645	21.830	14	12.4	12	.08	3.27	8,760	237,420	1,430,837	0
June	23.015	21.725	17	26.1	13	.04	2.28	5,908	202,437	1,455,506	0
July	22.455	21.650	21	6.66	125	.01	.46	1,241	174,315	1,821,962	0
Aug.	22.245	21.880	26	.59	114	0	.05	129	188,344	2,103,318	0
Sept.	22.940	21.960	125	6.18	2	.14	.89	2,309	217,929	1,956,768	0
Oct.	22.740	22.435	17	.90	31	.17	.46	1,228	255,346	2,144,909	0
Nov.	22.865	22.490	19	1.33	5	.12	.66	1,712	294,434	1,761,409	0
Dec.	22.770	22.530	28	1.80	123	.73	1.21	3,239	362,773	2,268,370	0
Yearly	23.210	21.115		32.1		0	1.91	60,157	3,102,551	15,656,495	0

! And other days

09-5222.01 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21.810	22.235	22.145	22.950	22.090	22.355	22.165	22.010	22.060	22.535	22.770	22.585
2	21.825	22.435	22.095	22.600	22.070	22.375	22.120	22.000	22.050	22.500	22.770	22.645
3	21.840	22.460	22.095	22.465	22.065	22.685	22.135	21.990	22.045	22.520	22.800	22.740
4	21.850	22.450	22.055	22.270	22.030	22.185	22.195	21.800	22.040	22.505	22.825	22.725
5	21.935	22.385	22.215	22.220	22.045	22.210	22.175	21.975	22.030	22.520	22.825	22.615
6	22.050	22.375	22.810	22.230	22.210	22.215	22.110	21.965	22.045	22.500	22.855	22.560
7	22.310	22.395	22.840	22.285	22.020	22.035	22.110	21.955	22.045	22.495	22.845	22.560
8	22.090	22.385	22.955	23.020	22.020	21.920	22.110	21.945	22.010	22.495	22.815	22.660
9	22.175	22.400	22.720	22.550	21.980	21.925	22.040	21.935	21.990	22.505	22.835	22.685
10	22.585	22.390	22.630	22.340	21.955	21.935	22.015	21.930	22.110	22.500	22.800	22.685
11	22.815	22.395	22.825	22.295	21.940	21.890	22.020	21.920	22.115	22.500	22.795	22.645
12	22.365	22.250	22.585	22.275	21.940	21.855	22.005	21.910	22.410	22.490	22.765	22.630
13	22.290	22.165	22.370	22.275	22.405	21.820	22.105	21.885	22.780	22.485	22.725	22.650
14	22.325	22.140	22.515	22.265	22.535	21.815	22.065	21.880	22.810	22.490	22.730	22.615
15	22.305	22.160	22.295	22.260	22.400	22.210	22.085	21.880	22.700	22.485	22.740	22.625
16	22.265	22.185	22.130	22.275	22.395	22.340	22.145	21.880	22.640	22.465	22.705	22.615
17	22.240	22.190	22.075	22.275	22.400	22.735	22.015	21.880	22.555	22.490	22.685	22.590
18	22.255	22.160	22.315	22.245	22.405	22.380	21.955	21.880	22.505	22.510	22.670	22.590
19	22.275	22.155	22.495	22.235	22.380	22.230	21.985	21.880	22.420	22.520	22.645	22.560
20	22.275	22.165	22.585	22.225	22.375	22.200	22.050	21.880	22.420	22.545	22.615	22.560
21	22.255	22.145	22.285	22.215	22.400	22.190	22.330	21.880	22.425	22.555	22.545	22.555
22	22.235	22.175	22.220	22.195	22.395	22.055	22.105	21.880	22.440	22.550	22.505	22.615
23	22.235	22.190	22.220	22.010	22.400	22.050	22.000	21.880	22.450	22.575	22.570	22.620
24	22.210	22.185	22.260	21.870	22.410	22.090	21.860	21.880	22.475	22.575	22.560	22.610
25	22.245	22.235	22.530	21.875	22.400	22.145	21.715	21.880	22.605	22.600	22.595	22.585
26	22.245	22.245	22.295	21.935	22.390	22.140	21.710	21.990	22.705	22.615	22.620	22.570
27	22.245	22.225	22.065	21.935	22.405	22.110	21.980	22.100	22.560	22.635	22.550	22.570
28	22.285	22.195	21.995	21.965	22.375	22.130	22.180	22.090	22.570	22.650	22.525	22.555
29	22.305		21.955	21.965	22.385	22.190	22.195	22.080	22.595	22.670	22.500	22.555
30	22.280		21.950	22.050	22.330	22.205	22.195	22.075	22.620	22.690	22.530	22.575
31	22.240		21.140		22.385		22.050	22.065		22.715		22.575
Avg.	22.215	22.265	22.310	22.250	22.255	22.155	22.060	21.945	22.375	22.545	22.690	22.610

09-5333.00 WELLTON-MOHAUK BYPASS DRAIN AT SOUTHERLY INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and Parshall flume located 24 meters upstream from the southerly land boundary, 168 meters east of the Colorado River, and 2.9 kilometers 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 2002.

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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.23	4.41	4.88	3.27	4.51	4.18	4.88	4.08	4.10	4.99	6.61	6.16
2	7.25	4.58	4.47	3.50	4.48	4.15	4.75	3.98	4.33	4.82	7.04	6.13
3	7.31	4.44	4.47	3.79	4.57	4.28	4.72	4.04	4.22	5.99	6.94	6.02
4	7.12	4.57	4.59	3.70	4.75	4.37	4.72	4.25	4.26	6.34	6.91	6.70
5	6.98	4.35	2.36	4.06	4.55	4.36	4.91	4.20	3.96	6.57	7.07	6.70
6	7.10	4.24	.53	4.33	4.54	4.37	4.82	4.26	4.20	7.11	6.91	6.19
7	6.79	4.38	.22	4.41	4.48	4.37	4.97	4.18	4.18	6.65	6.57	6.96
8	6.84	4.57	.15	4.24	4.52	4.38	4.93	4.33	4.13	6.51	6.76	6.79
9	6.98	4.71	.13	3.99	4.36	4.39	4.84	4.19	4.32	6.48	6.99	7.08
10	6.92	4.86	.14	3.97	4.37	4.39	4.94	4.28	4.18	5.22	7.12	6.68
11	7.24	4.82	.07	4.10	4.36	4.37	4.85	4.28	3.87	5.08	7.08	6.62
12	6.82	4.68	0	4.18	4.40	4.20	4.62	4.24	4.24	5.18	7.31	6.00
13	7.05	4.60	0	4.52	4.49	3.99	4.55	4.21	4.36	5.73	7.32	5.19
14	6.64	4.63	0	4.53	4.52	4.32	4.56	4.44	4.43	5.42	6.79	5.09
15	5.77	4.81	0	4.37	4.59	4.11	4.76	4.48	4.20	5.29	6.79	5.45
16	5.90	4.86	0	4.19	4.30	4.13	4.79	4.34	4.19	5.26	7.24	5.23
17	6.11	4.86	0	4.20	4.52	4.15	4.34	4.37	4.31	5.29	7.25	5.05
18	6.30	4.88	0	4.53	4.36	4.06	4.54	4.37	4.21	6.17	6.91	4.95
19	5.86	4.96	0	4.38	4.42	4.07	4.67	4.39	4.18	6.49	7.15	4.79
20	5.91	4.91	0	4.32	4.31	4.05	4.60	4.27	4.24	6.67	7.01	4.88
21	6.04	5.01	0	4.31	4.31	4.24	4.69	4.17	4.94	6.83	6.79	4.96
22	5.95	5.06	0	4.52	4.48	4.37	4.69	4.34	5.00	6.55	6.95	5.01
23	5.97	5.22	0	4.43	4.17	4.29	4.51	4.35	5.02	6.30	7.00	5.14
24	5.72	4.99	0	4.26	4.02	4.63	4.61	4.38	5.00	6.28	7.31	5.49
25	5.53	5.07	0	4.25	4.05	4.65	4.45	4.29	4.78	6.25	7.72	5.29
26	5.78	5.07	0	4.21	4.20	4.45	4.29	4.46	4.78	6.32	7.35	4.90
27	5.95	5.08	0	4.41	4.23	4.55	4.22	4.47	4.70	6.24	7.02	5.10
28	5.81	4.93	0	4.58	4.25	4.45	4.35	4.32	4.84	6.30	6.66	5.85
29	5.78		2.25	4.81	4.19	4.59	4.66	4.26	5.09	6.46	6.01	6.02
30	4.65		2.60	4.59	4.13	4.75	4.73	4.21	4.89	6.64	5.82	6.32
31	4.15		3.15		4.04		4.16	4.11		6.72		6.85
Sum	195.59	133.55	30.01	126.95	135.47	129.66	144.12	132.54	133.15	188.15	208.40	179.59

Current Year 2002

Period 1977-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume--Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	0.655	0.435	3	7.58	31	3.95	6.31	16,899	14,053	21,638	7,412
Feb.	.545	.455	23	5.51	7	4.17	4.77	11,539	13,312	18,374	8,506
Mar.	.535	0	1	5.25	112	0	.97	2,593	14,183	21,496	2,593
April	.525	.390	18	5.20	1	3.20	4.23	10,968	13,258	20,613	3,445
May	.505	.445	4	4.93	124	3.92	4.37	11,705	13,427	20,732	5,215
June	.480	.430	30	4.91	13	3.82	4.32	11,203	12,378	19,842	2,227
July	.495	.430	7	5.23	31	4.05	4.65	12,432	12,599	22,235	2,728
Aug.	.495	.420	15	4.67	2	3.88	4.28	11,451	12,557	22,444	3,656
Sept.	.550	.415	14	5.41	11	3.42	4.44	11,504	11,969	23,538	51.4
Oct.	.640	.480	6	7.32	2	4.60	6.07	16,256	12,997	23,600	23.9
Nov.	.665	.535	25	7.91	30	5.67	6.95	18,006	11,955	20,944	59.2
Dec.	.620	.400	9	7.19	2	3.59	5.79	15,517	13,109	22,518	138
Yearly	0.665	0		7.91		0	4.76	150,093	155,797	222,488	75,784

! And other days

09-5350.00 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, 1.0 kilometer downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 27 kilometers downstream from Morelos Dam, and 250 meters south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District 14 of the National Water Commission 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 2002.

REMARKS: The Colorado River Irrigation District 14 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 THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1964 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	4,830	11,144	85,761	0
February	1,616	6,151	50,898	0
March	3,111	8,937	72,049	0
April	1,113	13,072	85,372	0
May	1,394	12,786	99,576	0
June	1,212	10,627	61,705	0
July	1,882	10,963	56,912	0
August	545	16,180	132,183	0
September	9,181	14,836	83,943	0
October	1,705	13,494	136,198	0
November	13.0	12,568	122,170	0
December	870	11,044	86,607	0
Yearly	27,472	140,029	628,347	0

09-5365.00 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 1.3 kilometers upstream from the Sonora-Baja California railroad bridge, 5.9 kilometers downstream from the Miguel C. Rodriguez gaging station, and 45 kilometers downstream from the southerly international boundary.

RECORDS: The records are computed by the National Water Commission and are based upon gate openings. Records available: January 1964 through 2002.

REMARKS: The wasteway structure on the left bank of the Colorado River has two manually operated radial gates 3.0 meters wide. It discharges into a dirt canal 200 meters long with a total capacity of 13.0 CMS which discharges to the river.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1964 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	1,049	1,705	10,541	0
February	0	1,398	12,035	0
March	1,194	863	5,932	0
April	895	400	5,555	0
May	1,484	1,385	14,246	0
June	481	773	8,585	0
July	0	617	9,114	0
August	60.5	1,072	17,765	0
September	781	2,188	16,855	0
October	83.3	4,461	28,669	0
November	0	2,655	25,263	0
December	396	2,184	13,380	0
Yearly	6,424	19,267	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 million cubic meters. 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 MILLION CUBIC METERS

Month	LAKE MEAD (Capacity 32,266)		LAKE MOHAVE (Capacity 2,232)		HAVASU LAKE (Capacity 764)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 35,263)	
	2002	Average 1935-2002	2002	Average 1951-2002	2002	Average 1939-2002	2002	Estimated Average
Jan.	24,509.2	23,482.0	2,066.1	2,053.1	681.6	682.9	27,256.9	26,218.0
Feb.	24,277.4	23,345.3	2,024.1	2,063.9	691.4	686.5	26,992.9	26,095.7
Mar.	23,574.3	23,071.4	2,105.6	2,071.3	730.5	701.3	26,410.4	25,844.0
April	22,867.5	23,057.8	2,071.0	2,060.7	723.6	736.7	25,662.1	25,855.2
May	22,097.8	23,697.9	2,140.1	2,126.6	736.3	744.2	24,974.2	26,568.7
June	21,626.6	24,696.9	2,121.6	2,028.5	723.6	739.1	24,471.8	27,464.5
July	21,392.2	24,823.5	2,089.5	1,900.6	695.6	725.4	24,177.3	27,449.5
Aug.	21,227.0	24,634.0	2,090.7	1,856.2	706.7	711.6	24,024.4	27,201.8
Sept.	21,083.9	24,435.3	1,945.2	1,808.8	712.2	703.4	23,741.3	26,947.5
Oct.	21,008.6	24,233.6	1,831.7	1,792.8	721.5	699.6	23,561.8	26,726.0
Nov.	20,784.1	24,084.6	1,870.0	1,865.8	694.7	688.0	23,348.8	26,638.4
Dec.	20,621.3	23,922.4	2,067.3	1,978.9	677.4	687.9	23,366.0	26,589.2
Avg.	22,089.2	23,957.1	2,035.2	1,967.3	707.9	708.9	24,832.3	26,633.2
Max.	24,509.2	! 34,266.1	2,140.1	! 2,230.1	736.3	! 849.5	27,256.9	! 35,934.1
Min.	20,621.3	* 13,231.5	1,831.7	!!1,462.9	677.4	!! 94.9	23,348.8	!!16,112.5

! 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 - 2002

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.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

2002	Time	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent
Date	Std.	CMS		Date	Std.	CMS		Date	Std.	CMS	
Jan. 3	0915	44.8	0.0099	June 6	0835	50.7	0.0010	Nov. 7	0800	41.8	0.0036
10	0730	95.3	0.0019	13	0815	44.2	0.0021	13	0855	44.0	0.0043
17	0905	57.9	0.0081	20	0730	51.3	0.0026	21	0830	43.9	0.0042
25	0725	58.8	0.0063	27	0835	48.0	0.0018	27	0830	45.6	0.0044
31	0835	68.1	0.0081	July 3	0800	52.2	0.0048	Dec. 5	0855	52.8	0.0049
Feb. 7	0915	82.1	0.0131	11	0810	54.7	0.0032	12	0920	54.6	0.0019
13	0710	82.3	0.0069	18	0755	48.1	0.0017	19	0910	50.9	0.0031
21	0825	79.3	0.0103	25	0805	51.6	0.0033	26	1000	45.1	0.0034
27	0705	88.1	0.0088	31	0930	48.4	0.0015				
Mar. 7	0850	82.2	0.0074	Aug. 7	0800	53.8	0.0028				
13	0815	104	0.0045	14	0715	41.2	0.0008				
21	0840	85.6	0.0042	21	0650	38.2	0.0030				
28	0810	88.0	0.0052	28	0645	37.6	0.0008				
Apr. 4	0805	93.6	0.0036	Sept. 5	0815	39.2	0.0038				
11	0730	95.8	0.0020	12	0825	105	0.0068				
18	0825	88.9	0.0020	18	0750	37.4	0.0038				
25	0855	83.2	0.0041	27	0800	37.8	0.0035				
May 2	0850	55.0	0.0346	Oct. 2	0625	23.5	0.0036				
9	0810	39.1	0.0037	10	0810	25.2	0.0031				
16	0840	50.8	0.0007	17	0900	27.2	0.0026				
23	0810	37.0	0.0071	24	0845	26.8	0.0030				
30	0855	42.7	0.0013	Nov. 1	0820	37.7	0.0033				

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

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

2002	Monthly Weight Megagrams			Number of Samples	Gravimetric Percentages			* Silt Volume - Thousand Cubic Meters		
	Water	Silt	Average		Maximum Sample	Minimum Sample	Total 2002	Period 1952 - 2002		
								Average	Maximum	Minimum
Jan.	156,825,000	2,479	5	0.0016	0.0026	0.0005	1.82	11.4	62.6	0.30
Feb.	194,452,000	1,953	4	0.0010	0.0080	0.0000	1.43	12.7	127.8	0.91
Mar.	239,380,000	2,486	4	0.0010	0.0016	0.0005	1.83	50.2	605.2	1.10
April	230,973,000	845	4	0.0004	0.0008	0.0000	0.62	54.4	856.8	0.62
May	135,700,000	573	5	0.0004	0.0010	0.0000	0.42	19.5	318.2	0.42
June	135,337,000	710	4	0.0005	0.0008	0.0003	0.52	30.2	256.6	0.52
July	144,487,000	716	5	0.0005	0.0010	0.0002	0.53	37.5	189.8	0.53
Aug.	115,232,000	602	4	0.0005	0.0010	0.0002	0.44	34.4	166.9	0.44
Sept.	123,301,000	531	4	0.0004	0.0007	0.0003	0.39	15.8	72.8	0.39
Oct.	79,453,000	375	5	0.0005	0.0008	0.0003	0.28	8.70	124.0	0.28
Nov.	110,592,000	535	4	0.0005	0.0006	0.0003	0.39	8.74	165.2	0.30
Dec.	139,355,000	807	4	0.0006	0.0007	0.0004	0.59	8.73	54.4	0.59
Year	1,805,087,000	12,612	52	0.0007	0.0080	0.0000	9.26	292.1	2,706.5	21.8

* Volume calculated at 1.362 megagrams per cubic meter

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

2002	Time	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent		Time	Stream-flow, Momentary	Gravimetric Percent
Date	Std.	CMS		Date	Std.	CMS		Date	Std.	CMS	
Mar. 13	1350	3.97	0.0054								
Aug. 1	0920	0.05	0.0013								

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

CHEMICAL ANALYSES OF WATER SAMPLES
2002

The tables below are based on chemical analyses of samples from the Colorado River taken at the Northerly International Boundary by the United States Section of the Commission and analyzed under a contract with the U. S. Bureau of Reclamation.

Colorado River at Northerly International Boundary

2002	Time	Streamflow	Specific	pH	Hardness,	Hardness,	Calcium	Magnesium
Date	Standard	Momentary	Conductance		Total	Noncarbonate	ion (Ca),	ion (Mg),
		CMS	Microsiemens/ cm	Units	(as CaCO ₃)	(CaCO ₃)	Dissolved	Dissolved
					mg/L	mg/L	mg/L	mg/L
Jan. 7	0710	61.9	1,340	8.3	375.00	208.00	94.0	34.2
22	0800	64.1	1,370	8.6	375.00	203.00	96.0	32.9
Feb. 4	0800	78.7	1,340	8.1	362.00	192.00	90.0	33.3
19	1015	82.6	1,340	8.2	355.00	191.00	90.0	31.8
Mar. 4	0740	93.2	1,270	8.1	345.00	188.00	86.0	31.6
18	0800	95.6	1,240	8.0	336.00	179.00	81.0	32.4
April 1	0800	96.5	1,200	8.0	334.00	182.00	81.0	32.0
15	0800	88.1	1,260	8.2	338.00	179.00	84.0	31.3
May 6	0740	73.0	1,290	8.2	334.00	176.00	82.0	31.4
20	0800	45.6	1,540	8.1	372.00	192.00	90.0	35.9
June 3	0830	52.7	1,430	8.2	363.00	193.00	90.4	33.3
17	0645	63.7	1,320	8.2	358.00	196.00	90.0	32.4
July 1	0800	47.7	1,390	8.3	353.00	183.00	85.7	33.8
15	0800	57.2	1,310	8.2	341.00	176.00	85.4	31.2
Aug. 5	0800	48.8	1,300	8.2	358.00	192.00	90.1	32.3
19	0710	42.2	1,370	8.2	346.00	178.00	86.1	32.0
Sept. 9	0800	68.3	1,200	8.2	341.00	185.00	86.5	30.4
23	0800	42.4	1,320	8.2	361.00	195.00	90.4	33.0
Oct. 7	0700	28.1	1,390	8.2	385.00	216.00	96.6	35.0
21	0800	40.0	1,230	8.2	345.00	187.00	86.3	31.5
Nov. 4	0800	38.7	1,390	8.2	368.00	190.00	91.3	34.0
18	0800	42.6	1,320	8.2	376.00	208.00	95.2	33.7
Dec. 2	0920	61.9	1,350	8.2	377.00	200.00	95.2	34.0
16	0800	53.0	1,390	8.3	378.00	198.00	93.5	35.1

2002	Sodium	Potassium	Sulfate	Chloride	Carbonate	Bicarbonate	Nitrate	Total
Date	ion (Na), Dissolved	ion (K) Dissolved	ion (SO ₄) Dissolved	ion (Cl), Dissolved	(as CO ₃)	(as HCO ₃)	(as NO ₃)	Solids Dissolved (Calculated)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 7	154	1.0	310	142	0.31	203	1.4	848
22	145	4.0	313	150	5.42	199	1.6	853
Feb. 4	154	5.0	304	146	N.D.	207	2.0	848
19	146	4.0	299	148	N.D.	200	2.0	831
Mar. 4	140	5.0	287	131	N.D.	192	1.9	788
18	135	4.0	286	126	N.D.	192	2.0	771
April 1	135	5.0	277	122	N.D.	185	1.8	756
15	135	4.0	287	133	N.D.	194	1.9	782
May 6	137	4.0	297	140	N.D.	193	2.0	798
20	180	5.0	331	185	N.D.	220	N.D.	948
June 3	152	4.5	316	166	N.D.	207	N.D.	876
17	139	4.6	296	141	N.D.	198	N.D.	812
July 1	157	4.7	308	158	N.D.	207	N.D.	861
15	131	4.2	296	143	N.D.	201	N.D.	802
Aug. 5	133	4.3	296	140	N.D.	203	N.D.	807
19	138	4.3	311	151	N.D.	205	N.D.	836
Sept. 9	119	4.8	287	125	N.D.	190	N.D.	757
23	141	4.4	301	147	N.D.	203	N.D.	829
Oct. 7	150	4.6	319	158	N.D.	206	N.D.	877
21	129	4.6	287	123	N.D.	193	N.D.	768
Nov. 4	149	4.6	317	152	N.D.	217	N.D.	867
18	136	4.7	303	140	N.D.	205	N.D.	826
Dec. 2	157	5.0	309	140	N.D.	216	N.D.	860
16	168	4.9	312	152	2.59	214	N.D.	883

N.D. - Not Detected

SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following table shows specific conductance of individual water samples taken at the Colorado River station and in Mexican canals. Samples were taken at the Northerly International Boundary and at the Southerly International Boundary by the United States Section of the Commission. Determinations for the Northerly International Boundary were made by the Bureau of Reclamation and the United States Section of the Commission (jointly); and for the Southerly International Boundary, by the United States Section of the Commission. Samples for the Intake Canal at Morelos Dam were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	1,370	1,270	1,200	1,410	1,440	1,390	1,230	1,380	1,460	1,310	1,350
2	1,520	1,360	1,270	1,200	1,440	1,430	1,360	1,300	1,370	1,480	1,340	1,350
3	1,480	1,350	1,270	1,290	1,350	1,430	1,410	1,300	1,370	1,470	1,360	1,370
4	1,330	1,340	1,270	1,220	1,330	1,360	1,370	1,300	1,360	1,480	1,390	1,310
5	1,330	1,330	1,170	1,240	1,320	1,250	1,330	1,300	1,360	1,450	1,420	1,330
6	1,340	1,310	1,230	1,210	1,290	1,300	1,320	1,340	1,370	1,420	1,380	1,270
7	1,340	1,300	1,220	1,190	1,380	1,420	1,310	1,350	1,310	1,390	1,370	1,270
8	1,380	1,350	1,200	1,160	1,530	1,410	1,300	1,370	1,260	1,470	1,350	1,280
9	1,300	1,350	1,200	1,210	1,520	1,410	1,320	1,350	1,200	1,450	1,370	1,280
10	1,240	1,340	1,190	1,220	1,530	1,400	1,340	1,350	1,330	1,500	1,400	1,320
11	1,310	1,340	1,190	1,260	1,430	1,400	1,320	1,360	1,190	1,500	1,420	1,360
12	1,330	1,340	1,260	1,250	1,340	1,400	1,340	1,360	1,160	1,490	1,440	1,370
13	1,360	1,330	1,250	1,250	1,240	1,440	1,330	1,350	1,290	1,480	1,390	1,390
14	1,380	1,340	1,260	1,260	1,270	1,400	1,320	1,340	1,280	1,470	1,350	1,390
15	1,390	1,360	1,370	1,260	1,330	1,370	1,310	1,350	1,270	1,460	1,330	1,390
16	1,390	1,360	1,330	1,240	1,370	1,350	1,390	1,380	1,270	1,480	1,330	1,390
17	1,370	1,350	1,280	1,230	1,500	1,320	1,370	1,380	1,390	1,460	1,320	1,380
18	1,370	1,340	1,240	1,250	1,520	1,470	1,380	1,370	1,390	1,450	1,320	1,390
19	1,370	1,340	1,230	1,260	1,530	1,440	1,370	1,370	1,440	1,380	1,350	1,380
20	1,370	1,300	1,240	1,270	1,540	1,410	1,360	1,380	1,420	1,300	1,340	1,380
21	1,370	1,310	1,300	1,290	1,490	1,410	1,360	1,380	1,390	1,230	1,320	1,420
22	1,370	1,340	1,290	1,300	1,440	1,420	1,350	1,370	1,350	1,450	1,320	1,460
23	1,340	1,340	1,310	1,260	1,450	1,430	1,340	1,370	1,320	1,500	1,340	1,500
24	1,330	1,350	1,320	1,270	1,410	1,440	1,340	1,340	1,370	1,460	1,350	1,490
25	1,350	1,350	1,340	1,280	1,420	1,390	1,350	1,300	1,220	1,460	1,370	1,480
26	1,350	1,330	1,280	1,300	1,440	1,360	1,270	1,270	1,310	1,470	1,370	1,470
27	1,350	1,300	1,310	1,300	1,450	1,370	1,270	1,330	1,320	1,480	1,370	1,530
28	1,350	1,330	1,320	1,310	1,460	1,380	1,280	1,370	1,340	1,490	1,360	1,510
29	1,290		1,290	1,310	1,500	1,390	1,280	1,390	1,360	1,530	1,340	1,500
30	1,370		1,260	1,320	1,490	1,390	1,230	1,380	1,380	1,390	1,350	1,480
31	1,340		1,240		1,440		1,270	1,380		1,250		1,550

SPECIFIC CONDUCTANCE OF WATER SAMPLES

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,520	1,250	1,310	1,240	1,430	1,390	1,420	1,280	1,360	1,310	1,300	1,510
2	1,520	1,330	1,330	1,200	1,410	1,430	1,380	1,320	1,370	1,430	1,400	1,480
3	1,490	1,350	1,270	1,280	1,350	1,400	1,390	1,310	1,360	1,500	1,400	1,280
4	1,400	1,310	1,250	1,250	1,280	1,400	1,330	1,350	1,350	1,480	1,440	1,470
5	1,290	1,330	1,180	1,260	1,320	1,250	1,310	1,330	1,360	1,440	1,460	1,410
6	1,300	1,330	1,240	1,240	1,330	1,290	1,280	1,330	1,370	1,370	1,420	1,380
7	1,250	1,310	1,220	1,250	1,390	1,410	1,320	1,350	1,410	1,460	1,380	1,360
8	1,400	1,380	1,210	1,180	1,330	1,440	1,290	1,340	1,250	1,490	1,360	1,400
9	1,350	1,390	1,200	1,180	1,520	1,440	1,370	1,330	1,240	1,500	1,340	1,430
10	1,260	1,350	1,230	1,230	1,480	1,420	1,320	1,350	1,350	1,460	1,370	#
11	1,260	1,430	1,190	1,260	1,330	1,410	1,350	1,370	1,200	1,500	1,390	1,410
12	1,320	1,450	1,260	1,260	#	1,430	1,360	1,370	1,270	1,470	1,440	1,380
13	1,410	1,370	1,250	1,270	1,230	1,310	1,240	1,330	1,350	#	1,470	1,400
14	1,480	1,360	1,320	1,270	1,330	1,390	1,380	1,320	1,380	1,520	1,440	1,410
15	1,380	1,270	1,270	1,270	1,340	1,190	1,350	1,340	1,340	1,310	1,290	1,400
16	1,460	1,360	1,410	1,260	1,320	1,300	1,400	1,330	1,280	1,450	1,300	1,410
17	1,240	1,350	1,280	1,240	1,500	1,280	1,380	1,330	1,310	1,460	1,520	1,430
18	1,380	#	1,330	1,260	1,510	1,300	1,400	#	1,410	1,440	1,530	1,420
19	1,380	1,280	1,230	1,260	1,530	1,420	1,320	1,380	1,420	1,400	1,540	1,400
20	1,420	1,340	1,230	1,250	1,530	1,350	1,360	1,350	1,420	1,240	1,540	1,430
21	1,440	1,270	1,310	1,290	1,470	1,400	1,370	1,360	1,360	1,230	1,440	1,420
22	1,420	1,360	1,260	1,250	1,430	1,410	1,300	1,350	1,360	1,380	1,280	1,400
23	1,380	1,360	1,260	1,230	1,460	1,450	1,370	1,350	1,330	1,440	1,420	1,400
24	1,340	1,340	1,300	1,230	1,470	1,390	1,320	1,350	1,340	1,440	1,420	1,370
25	1,360	1,360	1,290	1,310	1,420	1,340	1,330	#	1,230	1,430	1,430	1,430
26	1,340	1,330	1,250	1,300	1,370	1,390	1,300	1,280	1,290	1,460	#	1,390
27	1,400	1,330	1,270	1,320	1,490	1,400	1,310	1,330	1,320	1,490	1,420	1,460
28	1,430	1,350	1,290	1,340	1,470	1,350	1,320	1,370	1,370	1,500	1,350	1,550
29	1,320		1,250	1,330	1,490	1,420	1,300	1,370	1,370	1,480	1,440	1,520
30	1,320		1,230	1,300	1,430	1,400	1,230	1,360	1,380	1,290	1,280	1,500
31	1,370		1,240		1,440		1,290	1,360		1,260		1,510

- Missing data

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 2002

January	March	May	July	September	November
2 1,520	1 1,780	1 1,770		3 1,660 18 1,690	6 1,520
February	April	June	August	October	December
12 1,570	4 1,310				4 1,500 17 1,590

RAINFALL ON THE COLORADO RIVER WATERSHED
IN MILLIMETERS

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 following page in this bulletin.

IN THE UNITED STATES

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	2002	Average 1931-2002	2002	Average 1931-2002	2002	Average 1931-2002	2002	Average 1931-2002	2002	Average 1978-2002
Jan.	0	10	0	10	0	12	#	10	T	28
Feb.	0	9	0	9	0	12	0	9	0	28
Mar.	0	7	T	6	2	10	0	7	0	25
April	0	2	0	2	0	3	0	7	0	5
May	0	1	0	0	0	1	0	1	0	2
June	0	0	0	0	0	1	0	1	0	0
July	#	1	0	2	0	5	0	6	T	8
Aug.	0	9	0	8	0	18	T	13	0	18
Sept.	5	8	2	7	14	10	T	11	3	10
Oct.	0	6	0	7	1	7	0	9	5	9
Nov.	4	4	7	4	1	6	0	5	9	11
Dec.	0	11	T	11	1	13	#	11	0	14
Yearly		68	9	66	19	98		90	17	158

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		El Centinela, Baja California		Delta, Baja California	
	2002	Average 1948-2002	2002	Average 1926-2002	2002	Average 1948-2002	2002	Average 1975-2002	2002	Average 1948-2002
Jan.	0	9	T	9	0	10	#	5	0	7
Feb.	0	5	0	8	0	6	#	7	0	6
Mar.	T	4	T	6	0	6	#	3	3	5
April	T	2	T	2	0	2	#	2	0	1
May	0	T	0	T	0	T	#	0	0	T
June	0	T	0	T	0	1	#	T	0	T
July	0	3	0	4	0	2	#	1	0	2
Aug.	0	8	0	9	0	5	#	4	0	6
Sept.	T	4	2	9	1	5	#	7	0	6
Oct.	0	6	T	8	0	6	#	5	0	7
Nov.	T	4	4	4	0	3	#	1	4	3
Dec.	T	8	1	17	0	7	#	7	0	10
Yearly	0	53	7	79	1	58		42	7	51

Month	San Felipe, Baja California		Riito, Sonora						
	2002	Average 1948-2002	2002	Average 1949-2002					
Jan.	0	6	0	6					
Feb.	0	5	0	6					
Mar.	0	3	0	5					
April	0	1	0	1					
May	0	1	0	T					
June	0	1	0	T					
July	0	3	0	2					
Aug.	0	9	0	5					
Sept.	3	17	0	9					
Oct.	0	8	0	8					
Nov.	27	5	2	4					
Dec.	0	9	0	10					
Yearly	30	72	2	58					

T Trace # Missing Record

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 2002.

IN THE UNITED STATES

NAME OF STATION	LATITUDE	LONGITUDE	@ ELEV. (Meters)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	81.69	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	30.48	1908	Agricultural Research Service
Bullhead City, Arizona	35° 07'	114° 36'	176.78	1980	Bullhead City Fire Department
El Centro, California	32° 46'	115° 34'	9.14	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	58.22	1923	University of Arizona Experimental Farm

IN MEXICO

NAME OF STATION	LATITUDE	LONGITUDE	@ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 34'	115° 00'	**20.12	1948	# S. A. R. H.
Delta, Baja California	32° 21'	115° 11'	**11.89	1948	S. A. R. H.
El Centinela, Baja California	32° 35'	115° 45'	49.99	1978	S. A. R. H.
Los Algodones, Baja California	32° 42'	114° 44'	35.05	1948	S. A. R. H.
Mexicali, Baja California	32° 40'	115° 28'	3.96	1926	S. A. R. H.
Riito, Sonora	32° 13'	115° 01'	13.11	1959	S. A. R. H.
San Felipe, Baja California	31° 01'	114° 51'	21.95	1969	S. A. R. H.

* Not shown on rainfall map

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

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

Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at one station in Arizona, at five stations in Baja, California, and at one station in Sonora. 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 1.22 meters diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," in this bulletin.

IN THE UNITED STATES

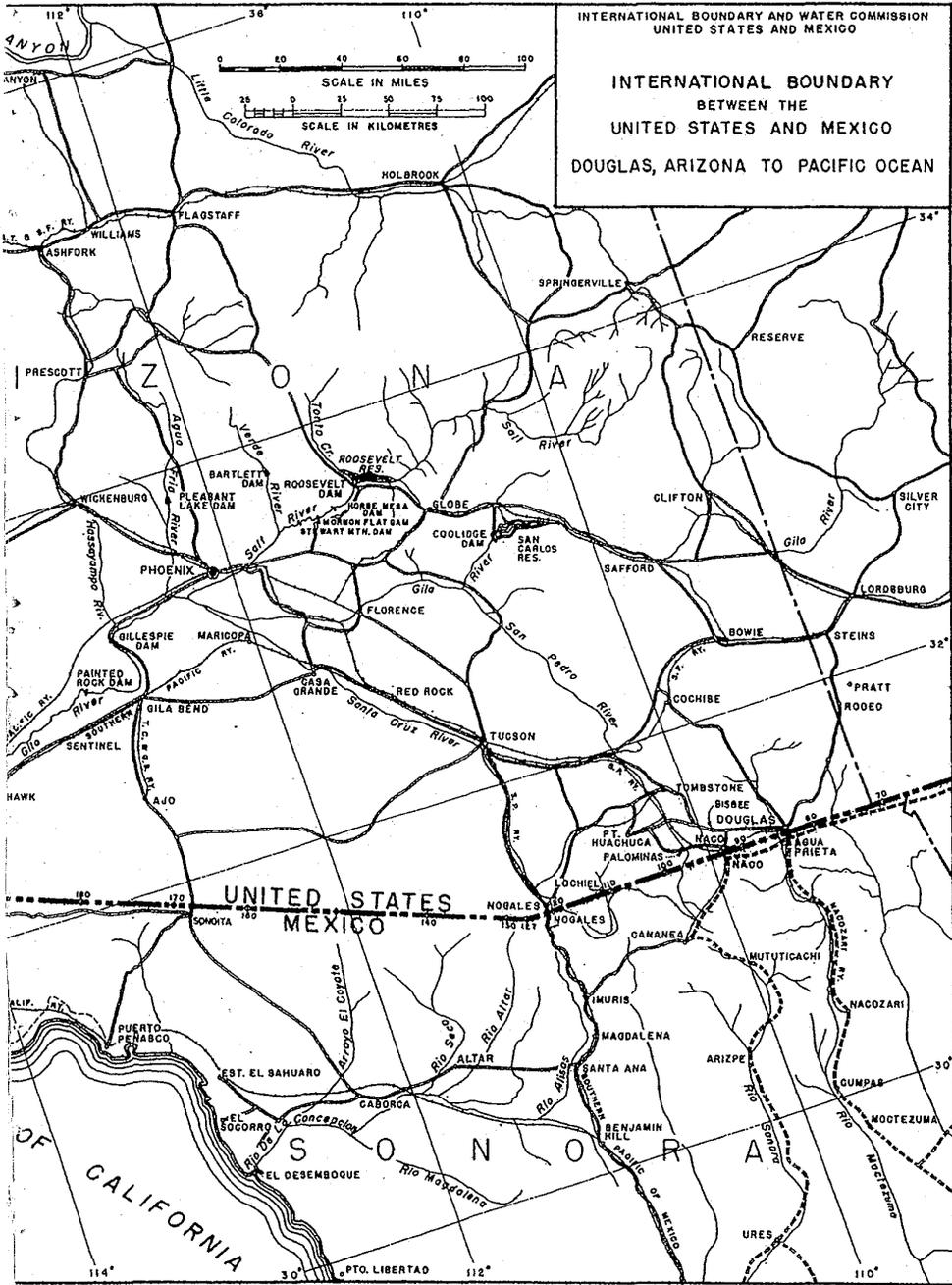
Month	Yuma Citrus Station, Arizona	
	2002	Average 1931-2002
Jan.	#	99
Feb.	#	120
Mar.	#	184
April	225	251
May	300	321
June	371	359
July	188	382
Aug.	269	335
Sept.	185	264
Oct.	222	190
Nov.	#	125
Dec.	#	94
Yearly		2,724

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		Riito, Sonora		San Felipe, Baja California	
	2002	Average 1948-2002	2002	Average 1926-2002	2002	Average 1948-2002	2002	Average 1949-2002	2002	Average 1948-2002
Jan.	115	105	56	63	90	83	#	76	#	120
Feb.	154	127	65	128	103	102	#	98	#	139
Mar.	206	179	123	145	#	150	#	146	#	169
April	214	248	151	195	#	206	#	187	#	198
May	308	310	220	264	#	269	#	256	#	243
June	299	334	255	290	#	305	#	286	#	258
July	356	343	263	296	50	283	#	315	#	276
Aug.	299	306	223	255	274	256	#	266	#	263
Sept.	242	255	164	202	241	211	#	215	#	230
Oct.	182	200	107	144	105	147	#	153	#	199
Nov.	140	132	77	85	149	112	#	95	#	149
Dec.	66	105	60	60	95	81	#	77	#	120
Yearly	2,581	2,648	1,764	2,072		2,638		2,246		2,417

Month	Delta, Baja California								
	2002	Average 1948-2002							
Jan.	90	85							
Feb.	114	107							
Mar.	175	152							
April	152	208							
May	204	255							
June	326	282							
July	119	285							
Aug.	242	265							
Sept.	171	221							
Oct.	109	156							
Nov.	81	105							
Dec.	66	147							
Yearly	1,849	2,057							

Missing record



TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES CELSIUS

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located approximately one meter 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," in this bulletin.

IN THE UNITED STATES

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	2002				2002				2002			
	Mean	Max.	Min.	Average 1931-02	Mean	Max.	Min.	Average 1931-02	Mean	Max.	Min.	Average 1931-02
Jan.	11.7	24.4	-1.7	11.6	#	#	#	11.9	12.7	26.1	-3.3	12.4
Feb.	15.3	28.9	-1.1	14.2	#	29.4	-1.1	14.1	14.4	29.4	-2.2	14.7
Mar.	16.8	35.6	-0.6	17.4	#	29.4	-1.7	16.9	16.7	32.8	-1.7	17.4
April	23.3	39.4	10.0	21.3	21.5	37.8	5.6	20.5	21.4	36.7	7.2	21.0
May	25.8	43.9	10.6	25.6	24.4	42.2	10.6	24.4	24.7	41.7	10.6	25.1
June	31.3	45.6	16.1	30.0	#	44.4	13.3	28.8	30.6	45.0	16.1	29.4
July	34.4	45.6	20.0	33.6	#	44.4	20.0	32.7	33.0	44.4	20.6	33.0
Aug.	32.8	45.6	18.3	32.9	#	45.0	17.8	32.5	32.7	46.1	18.9	33.0
Sept.	29.8	43.9	16.1	29.5	#	45.0	15.0	29.5	31.2	46.1	13.3	30.1
Oct.	22.5	37.8	8.3	22.9	#	37.8	9.4	23.1	22.9	41.1	9.4	23.9
Nov.	17.1	29.4	3.3	15.7	#	30.0	5.0	16.4	18.1	30.6	5.0	17.0
Dec.	11.1	22.8	-1.1	11.7	12.0	24.4	-1.7	12.4	12.9	25.0	0	12.7
Yearly	22.7	45.6	-1.7	22.2				21.9	22.6	46.1	-3.3	22.5

Month	El Centro, California				Bullhead City, Arizona							
	2002				2002							
	Mean	Max.	Min.	Average 1931-02	Mean	Max.	Min.	Average 1978-02				
Jan.	13.0	27.8	-0.6	12.5	12.3	24.4	-0.6	12.4				
Feb.	15.4	29.4	0.6	14.8	14.6	28.9	-1.1	14.9				
Mar.	17.4	33.3	2.2	17.5	17.7	33.9	0.6	18.0				
April	22.6	37.2	10.0	21.1	24.2	40.6	10.0	22.4				
May	25.8	42.2	11.7	25.3	27.3	46.7	12.8	27.4				
June	31.1	44.4	18.3	29.7	33.4	46.7	18.3	32.4				
July	33.7	44.4	21.1	33.2	37.2	48.9	24.4	35.2				
Aug.	32.6	45.6	19.4	32.9	34.6	47.8	20.6	34.8				
Sept.	30.7	43.9	17.2	29.9	31.5	45.6	16.1	30.8				
Oct.	23.3	38.3	10.0	23.9	22.8	38.3	8.9	23.9				
Nov.	19.1	30.6	7.2	17.0	18.0	27.8	6.1	16.7				
Dec.	13.8	25.6	2.2	12.8	11.7	21.7	0	12.0				
Yearly	23.2	45.6	-0.6	22.6	23.8	48.9	-1.1	23.4				

IN MEXICO

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	2002		1948-2002		2002		1926-2002		2002		1948-2002	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	27	2	31	-5	25	1	34	-7	28	1	45	-9
Feb.	30	2	35	-2	29	1	34	-5	#	#	37	-6
Mar.	36	4	38	0	34	4	38	-1	34	12	45	-4
April	36	10	43	3	39	11	41	1	35	16	48	-9
May	42	12	47	6	45	11	47	6	42	18	51	1
June	45	18	52	11	47	17	49	9	45	27	57	6
July	46	21	50	13	47	23	49	13	47	27	56	7
Aug.	46	20	49	16	45	23	49	12	47	27	54	8
Sept.	46	17	50	10	44	16	50	8	46	21	57	4
Oct.	39	11	44	0	37	13	44	0	38	15	48	0
Nov.	30	7	38	-3	29	10	40	-2	29	6	46	0
Dec.	25	2	32	-5	24	4	32	-5	23	0	36	-5
Yearly	46	2	52	-5	47	1	50	-7	47		57	-9

Missing Data

TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES CELSIUS

IN MEXICO

Month	Riito, Sonora				San Felipe, Baja California				El Centinela, Baja California			
	2002		1949-2002		2002		1948-2002		2002		1975-2002	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	28	2	30	-7	37	4	37	-1	#	#	30	1
Feb.	31	3	35	-6	39	5	39	0	#	#	35	-4
Mar.	32	5	38	-7	41	10	40	0	#	#	38	4
April	37	9	43	2	40	10	45	1	#	#	46	6
May	44	10	46	5	42	12	49	5	#	#	48	9
June	46	12	51	7	44	13	51	10	#	#	49	10
July	46	21	60	11	44	13	51	10	#	#	52	20
Aug.	47	18	50	8	46	12	57	5	#	#	50	18
Sept.	45	15	48	4	44	10	52	3	#	#	50	11
Oct.	41	10	46	-1	42	3	47	-5	#	#	46	3
Nov.	41	10	48	-3	45	5	48	-6	#	#	40	3
Dec.	29	2	30	-6	37	5	37	-2	#	#	30	-3
Yearly	47	2	60	-7	46	3	57	-6			52	-4

Month	Delta, Baja California											
	2002		1948-2002									
	Max.	Min.	Max.	Min.								
Jan.	26	-2	40	-4								
Feb.	31	-2	40	-2								
Mar.	37	2	45	-2								
April	39	7	48	0								
May	45	9	54	0								
June	49	12	56	2								
July	47	19	57	7								
Aug.	49	16	60	15								
Sept.	47	14	57	4								
Oct.	41	9	47	1								
Nov.	32	6	50	0								
Dec.	26	0	40	-5								
Yearly	49	-2	60	-5								

Missing Data

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

2002

The total drainage area within the Colorado River basin is about 637,000 square kilometers, of which 478,100 square kilometers lie above Imperial Dam and about 159,000 square kilometers, are below the dam. Of the area below Imperial Dam, 153,800 square kilometers are in the United States and about 5,180 square kilometers are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 150,700 square kilometers, of which about 2,850 square kilometers 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 U. S. Bureau of Reclamation; and 3) those within the Imperial Valley, California, the data for which are furnished by the U. S. Bureau of Reclamation. 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 Hectares
IN THE UNITED STATES:	
Imperial Dam	
Yuma Valley Division	21,567
Reservation Division	5,296
Yuma Mesa	7,451
Yuma Aux. Project Unit "B" (Yuma Mesa)	1,053
South Gila Valley	3,967
North Gila Valley	2,544
Wellton-Mohawk	25,007
Coachella Valley	30,943
Imperial Valley	201,297
Warren Act	41
Non-Project lands adjacent to Colorado River	4,686
Total in United States	303,852
IN MEXICO:	
San Luis Valley, R. C., Sonora	16,950
Mexicali Valley	116,163
Total in Mexico	133,113
Total in United States and Mexico	436,965

10-2545.80 ALAMO RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Staff gage located on the right bank of the river, about 11.3 kilometers east of Calexico, California, immediately downstream from the international land boundary between the United States and Mexico and approximately three meters upstream from a 1.22-meter Cipolletti weir in the throat of a twin-tube concrete culvert which carries the river flow under the All-American Canal. On November 18, 1992 continuous gage height recording equipment was installed at the site.

RECORDS: From June 1942 through November 18, 1992 flows 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. A continuous gage height record and mean daily discharge records are available November 19, 1992 through 2002. Records obtained and furnished by Imperial Irrigation District.

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. On September 28, 1995 the National Water Commission of Mexico completed the construction of a weir immediately upstream of the international boundary. The result is that all the Alamo River flow, or a portion thereof, is being diverted into the New River via the interconnected agricultural drainage system in Mexico. After September 28, 1995 the recorded flow at the gage is affected by this diversion.

EXTREMES: Maximum mean daily discharge, 7.31 CMS (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949 and numerous days after September 28, 1995. 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0	0.01	0.01
2	.03	.02	.02	.02	.02	.01	.01	.01	.01	0	.01	.01
3	.03	.02	.02	.02	.02	.01	.01	.01	.03	0	.01	.01
4	.02	.02	.02	.02	.02	.01	.01	.01	0	0	.01	.01
5	.02	.02	.02	.03	.02	.01	.01	.01	0	.01	.01	.01
6	.02	.02	.02	.03	.02	.01	.01	.01	0	.01	.01	.01
7	.02	.02	.02	.02	.02	.01	.01	.01	0	.01	.01	.01
8	.02	.02	.02	.02	.01	.01	.01	.01	0	.01	.01	.01
9	.02	.02	.02	.02	.01	.01	.01	.01	0	0	.01	.01
10	.02	.02	.01	.02	.01	.01	.01	.01	0	0	.01	.01
11	.02	.02	.01	.02	.01	.01	.01	.01	0	0	.01	.01
12	.02	.02	.01	.02	.01	.01	.01	.01	0	0	.02	.01
13	.02	.03	.01	.02	.02	.01	.01	.01	0	0	.02	.01
14	.01	.03	.01	.02	.02	.01	.01	.01	0	0	.02	.01
15	.01	.04	.01	.02	.02	.01	.01	.01	0	0	.01	.01
16	.01	.03	.01	.02	.02	.01	.01	.01	0	0	.01	.01
17	.02	.03	.01	.02	.01	.01	.01	.01	0	0	.01	.01
18	.02	.03	.02	.02	.01	.01	.01	.01	0	0	.01	.01
19	.02	.03	.02	.02	.01	.01	.01	.01	0	0	.01	.01
20	.02	.02	.02	.02	.01	.01	.01	.01	0	0	.01	.01
21	.02	.02	.02	.03	.01	.01	.01	.01	0	0	.01	.01
22	.02	.02	.02	.05	.01	.01	.01	.01	0	0	.01	.01
23	.02	.02	.02	.03	.02	.01	.01	.01	0	.01	.01	.01
24	.01	.02	.02	.02	.02	.01	.01	.01	.01	.01	.01	.01
25	.02	.02	.01	.02	.02	.01	.01	.01	.01	.01	.01	.01
26	.02	.02	.01	.02	.02	.01	.01	.01	.01	.01	.01	.01
27	.03	.02	.02	.02	.01	.01	.01	.01	0	0	.01	.01
28	.03	.02	.02	.02	.01	.01	.01	.01	0	0	.01	.01
29	.02	.02	.02	.02	.01	.01	.01	.01	0	0	.01	.01
30	.02	.02	.02	.02	.01	.01	.01	.01	0	.01	.01	.01
31	.02	.02	.02	.02	.01	.01	.01	.01	.01	.01	.01	.02
Sum	0.62	0.64	0.52	0.67	0.46	0.30	0.31	0.31	0.08	0.10	0.33	0.32

Current Year 2002

Period 1943-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High		Day		Total	Average	Maximum	Minimum
				Day	φ Low						
Jan.	0.075	0.045	! 2	0.03	! 14	0.01	0.02	53.6	324	3,441	0
Feb.	.080	.050	15	.04	! 1	.02	.02	55.3	297	3,481	0
Mar.	.060	.030	! 1	.02	! 10	.01	.02	44.9	338	3,890	0
April	.100	.050	22	.05	! 1	.02	.02	57.9	353	2,741	0
May	.060	.040	! 1	.02	! 8	.01	.01	39.7	291	2,219	0
June	.045	.025	! 1	.01	! 1	.01	.01	25.9	275	2,080	0
July	.045	.025	! 1	.01	! 1	.01	.01	26.8	260	2,112	26.8
Aug.	.045	.020	! 1	.01	! 1	.01	.01	26.8	297	2,062	26.8
Sept.	.030	0	3	.03	! 4	0	0	6.9	274	1,734	6.9
Oct.	.120	0	! 5	.07	! 1	0	0	8.6	288	2,276	0
Nov.	.055	.025	! 12	.02	! 1	.01	.01	28.5	302	2,566	6.0
Dec.	.050	.025	31	.02	! 1	.01	.01	27.6	292	2,080	0
Yearly	0.120	0		0.05		0	0.01	405	3,591	27,317	1,318

φ Mean daily ! And other days

10-2549.70 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, 427 meters 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 current meter measurements by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 2002.

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 43,172 TCM during any successive five-year period under the provisions of Minute No. 197 of the Commission. Gage heights shown are meters below mean sea level.

EXTREMES: Maximum mean daily discharge, 29.2 CMS on December 9, 1982; minimum mean daily discharge, 0.06 CMS 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.10	5.35	5.15	5.86	6.23	4.11	3.85	3.62	4.22	3.57	3.03	4.22
2	5.27	5.61	4.87	6.20	6.00	3.94	4.19	3.60	4.08	3.37	3.43	4.22
3	5.66	5.32	4.67	6.06	5.92	3.91	4.05	3.46	4.11	3.26	3.54	4.25
4	5.69	5.32	4.84	5.61	5.69	3.94	3.74	3.68	3.99	3.46	3.68	4.62
5	5.47	5.81	5.07	5.24	5.64	4.11	3.74	4.02	3.82	3.37	3.77	5.07
6	5.13	6.00	5.32	5.24	5.66	4.08	3.68	4.02	3.79	3.46	3.88	5.15
7	4.98	5.98	5.61	5.15	5.72	4.25	3.62	3.71	3.68	3.62	3.91	5.13
8	5.21	5.72	5.49	5.21	5.58	4.22	3.54	3.48	3.68	3.79	3.94	4.62
9	5.24	5.49	5.27	5.32	5.81	3.96	3.77	3.88	3.79	4.08	3.91	4.25
10	4.93	5.30	5.30	5.49	5.30	3.85	3.77	4.08	4.33	4.19	3.82	4.02
11	4.96	5.24	5.38	5.47	4.70	3.99	3.82	4.05	4.42	3.99	3.79	3.96
12	4.81	5.35	5.95	5.64	4.62	4.08	3.79	3.94	4.36	3.65	3.85	3.88
13	4.73	5.55	6.40	5.78	4.64	3.99	3.82	4.02	4.33	3.43	3.99	3.99
14	4.64	5.86	6.29	5.83	4.81	3.85	3.77	4.05	4.28	3.29	3.94	4.05
15	4.87	5.69	6.12	5.78	5.13	3.99	3.74	4.16	4.08	3.31	3.88	4.19
16	4.87	5.58	5.92	6.03	5.04	3.99	3.54	4.22	3.96	3.54	3.85	4.39
17	4.81	5.30	5.64	6.29	4.98	4.05	3.46	4.13	3.85	3.82	3.68	4.39
18	4.84	5.44	5.78	5.75	4.64	4.02	3.43	3.85	3.71	3.65	3.60	4.19
19	4.98	5.72	6.34	5.44	4.45	3.94	3.40	3.82	3.65	3.57	3.65	4.36
20	5.21	5.86	6.71	5.27	4.36	3.91	3.40	3.96	3.51	3.43	3.68	4.39
21	5.30	5.58	6.15	5.15	4.16	3.99	3.40	3.96	3.43	3.37	3.65	4.45
22	5.41	5.35	5.81	5.30	4.19	3.94	3.29	3.71	3.51	3.48	3.62	4.56
23	5.32	5.58	5.64	5.58	4.13	3.96	2.07	3.82	3.96	3.31	3.65	4.73
24	5.30	5.58	5.21	5.52	4.36	3.82	2.86	3.74	4.02	3.29	3.65	4.76
25	5.55	5.41	5.01	5.72	4.53	4.02	4.76	3.62	3.99	3.29	3.82	4.62
26	5.55	5.49	4.96	5.89	4.67	3.96	3.99	3.62	3.94	3.26	3.88	4.67
27	5.55	5.30	4.96	6.06	4.76	3.74	3.71	3.74	3.68	3.06	4.05	4.84
28	5.64	5.21	4.96	5.98	4.73	3.77	3.43	3.79	3.54	2.97	4.08	4.79
29	5.61		4.87	5.98	4.50	3.77	3.31	3.99	3.46	2.97	4.22	4.81
30	5.35		4.98	6.32	4.16	3.74	3.48	4.33	3.71	2.95	4.28	4.76
31	5.30		5.30	4.22	4.22		3.51	4.42		3.00		4.67
Sum	161.28	154.99	169.97	170.16	153.33	118.89	111.93	120.49	116.88	106.80	113.72	139.00

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.	12.500	12.645	4	5.69	14	4.64	5.20	13,935	13,335	27,387	2,160
Feb.	12.460	12.565	6	6.00	28	5.21	5.54	13,391	11,961	26,416	1,552
Mar.	12.340	12.635	20	6.71	3	4.67	5.48	14,685	13,720	31,213	1,243
April	12.410	12.715	30	6.32	! 7	5.15	5.67	14,702	13,755	34,066	1,715
May	12.425	12.575	1	6.23	23	4.13	4.95	13,248	12,604	29,740	776
June	12.700	12.775	7	4.25	! 27	3.74	3.96	10,272	10,542	25,024	1,341
July	12.630	13.060	25	4.76	23	2.07	3.61	9,671	10,981	28,368	1,008
Aug.	12.340	12.820	31	4.42	3	3.46	3.89	10,410	12,486	34,066	1,405
Sept.	12.355	12.520	11	4.42	21	3.43	3.90	10,098	11,686	29,251	2,214
Oct.	12.415	12.620	10	4.19	30	2.95	3.45	9,228	11,550	28,072	2,567
Nov.	12.395	12.590	30	4.28	1	3.03	3.79	9,825	10,961	25,310	3,063
Dec.	12.270	12.455	6	5.15	12	3.88	4.48	12,010	12,945	28,104	2,175
Yearly	12.270	13.060		6.71		2.07	4.49	141,475	146,526	330,444	30,310

φ Mean daily ! And other days

10-2549.60 WASTES FROM MEXICALI POTABLE WATER PLANT TO NEW RIVER IN MEXICO

DESCRIPTION: A 3.5-meter Parshall flume, installed by the State Commission of Public Services of Mexicali, is located 2.0 kilometers upstream of the pumping plant on the supply canal. Excess water discharges into an open channel, thence into a 91 centimeter diameter pipe that empties into Rivera Drain (Drain 134), which is 2.0 kilometers below the plant and 2.0 kilometers south of the international boundary. From this point the waste is carried by a closed concrete box conduit into New River.

RECORDS: During 2002 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 2002.

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 1.4 kilometers upstream of the international boundary.

EXTREMES: Maximum instantaneous discharge, 2.32 CMS on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 2002.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.04	0.03	0.03	0.03	0.06	0.05	0.05	0.02	0.01	0.01	0.01
2	.01	.04	.03	.03	.04	.05	.04	.05	.01	.01	.02	.01
3	.02	.03	.04	.03	.04	.04	.04	.04	.02	.01	.01	.01
4	.02	.03	.03	.04	.04	.03	.04	.03	.01	.01	.01	.02
5	.02	.03	.03	.04	.04	.05	.04	.05	.01	.01	.01	.01
6	.02	.04	.03	.04	.03	.05	.05	.04	.01	.01	.01	.01
7	.02	.04	.03	.04	.03	.05	.04	.05	.01	.01	.01	.01
8	.01	.05	.02	.03	.03	.05	.04	.05	.01	.01	.01	.01
9	.02	.05	.04	.03	.03	.05	.04	.05	.01	.01	.01	.01
10	.01	.03	.03	.03	.03	.04	.04	.04	.01	.01	.01	.01
11	.01	.04	.03	.03	.03	.05	.04	.05	.01	.02	.01	.01
12	.02	.04	.03	.03	.03	.05	.04	.05	.01	.01	.01	.01
13	.01	.04	.02	.03	.03	.04	.04	.04	.01	.01	.01	.01
14	.02	.03	.04	.03	.05	.04	.04	.04	.01	.01	.01	.01
15	.01	.03	.03	.03	.05	.04	.05	.04	.01	.01	.01	.01
16	.02	.04	.03	.03	.04	.04	.04	.05	.01	.01	.01	.01
17	.02	.02	.03	.02	.02	.04	.04	.04	.01	.01	.01	.01
18	.01	.04	.03	.03	.04	.05	.03	.02	.01	.01	.01	.01
19	.01	.04	.03	.03	.04	.05	.04	.05	.01	.01	.01	0
20	.02	.05	.03	.03	.04	.05	.04	.03	.01	.01	.01	0
21	.02	.05	.03	.03	.05	.04	.04	.04	.01	.01	.01	0
22	.01	.05	.03	.04	.03	.05	.04	.03	.01	.01	.01	0
23	.02	.04	.03	.03	.04	.04	.04	.03	.01	.01	.01	0
24	.02	.03	.03	.03	.05	.04	.05	.03	.01	.01	.01	0
25	.03	.05	.04	.03	.04	.05	.03	.03	.01	.01	.01	.01
26	.04	.04	.03	.04	.05	.05	.03	.03	.01	.01	.01	.01
27	.02	.04	.03	.04	.04	.04	.04	.03	.01	.01	.01	0
28	.02	.05	.04	.03	.03	.04	.03	.04	.01	.01	.01	0
29	.03	.04	.04	.03	.04	.05	.04	.04	.01	.01	.01	0
30	.04	.04	.04	.03	.05	.05	0	.03	.01	.01	.01	.01
31	.04		.04		.05		0	.03		.01		0
Sum	0.61	1.10	0.99	0.96	1.18	1.37	1.16	1.22	0.32	0.32	0.31	0.22

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High		Day		φ Low	Total	Average	Maximum	Minimum
				Day	φ							
Jan.			126	0.04	12	0.01	0.02	52.7	143	641	0	
Feb.			18	.05	17	.02	.04	95.0	98.4	384	0	
Mar.			3	.04	18	.02	.03	85.5	177	1,074	0	
April			4	.04	17	.02	.03	82.9	171	532	0	
May			14	.05	17	.02	.04	102	186	537	53.6	
June			1	.06	14	.03	.05	118	174	504	25.9	
July			1	.05	130	0	.04	100	207	651	0	
Aug.			1	.05	18	.02	.04	105	223	735	39.7	
Sept.			1	.02	12	.01	.01	27.6	208	677	27.6	
Oct.			11	.02	11	.01	.01	27.6	194	625	27.6	
Nov.			2	.02	11	.01	.01	26.8	171	622	26.8	
Dec.			4	.02	18	0	.01	19.0	158	737	8.6	
Yearly				0.06		0	0.03	842	2,110	6,610	550	

φ Mean daily ! And other days

10-2549.65 WASTE WATERS FROM MEXICAN SYSTEM OF CANALS
ENTERING THE UNITED STATES

DESCRIPTION: During 2002 the flow to the New River in Mexico included 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, and starting January 1988, the north irrigation district watershed is included.

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 2002.

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 previous page of this bulletin.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1956 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	52.7	970	10,803	7.8
February	95.0	801	8,981	7.8
March	85.5	719	5,506	26.8
April	82.9	586	3,940	19.9
May	102	417	3,174	11.2
June	118	423	6,994	0
July	101	639	12,644	0
August	103	644	5,103	0
September	30.3	492	3,966	25.9
October	30.4	616	4,285	10.4
November	26.3	617	4,668	0
December	19.3	741	10,720	0
Yearly	846	7,661	34,953	492

10-2540.05 SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 24.9 kilometers northwest of Westmorland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 21,652 square kilometers. Zero of the gage is 76.200 meters below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 2002. 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 35.4 kilometers 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 Westmorland, California." The elevation of the old station is at a datum of 0.305 meter 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 84.64 meters below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during 2002 was 69.405 meters below mean sea level. Minimum elevation during 2002 was 69.740 meters below mean sea level. Extremes for period of record: maximum elevation 59.710 below mean sea level February 10 to March 29, 1907; minimum elevation since 1906, 76.690 meters below mean sea level in November 1924.

MEAN DAILY GAGE HEIGHT IN METERS 2002

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	69.615	69.555	69.495	69.435	69.435	69.435	69.465	69.525	69.615	69.675	69.740	69.710
2	69.615	69.555	69.495	69.435	69.435	69.435	69.465	69.525	69.615	69.675	69.740	69.710
3	69.615	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
4	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
5	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
6	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
7	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
8	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
9	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
10	69.585	69.555	69.495	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
11	69.585	69.555	69.465	69.435	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
12	69.585	69.525	69.465	69.405	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
13	69.585	69.525	69.465	69.405	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
14	69.585	69.525	69.465	69.405	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
15	69.555	69.525	69.465	69.405	69.435	69.435	69.495	69.555	69.615	69.710	69.740	69.710
16	69.555	69.525	69.465	69.435	69.405	69.435	69.495	69.555	69.615	69.710	69.740	69.710
17	69.555	69.525	69.465	69.435	69.405	69.435	69.495	69.555	69.615	69.710	69.740	69.710
18	69.555	69.525	69.465	69.435	69.405	69.435	69.495	69.555	69.665	69.710	69.740	69.710
19	69.555	69.525	69.465	69.435	69.435	69.435	69.495	69.555	69.665	69.710	69.740	69.710
20	69.555	69.525	69.465	69.435	69.435	69.435	69.495	69.555	69.665	69.710	69.740	69.710
21	69.555	69.525	69.465	69.435	69.435	69.435	69.495	69.555	69.665	69.710	69.710	69.710
22	69.555	69.525	69.465	69.435	69.435	69.465	69.495	69.585	69.665	69.710	69.710	69.710
23	69.555	69.495	69.465	69.435	69.435	69.465	69.495	69.585	69.665	69.710	69.710	69.710
24	69.555	69.495	69.465	69.435	69.435	69.465	69.495	69.585	69.665	69.710	69.710	69.710
25	69.555	69.495	69.465	69.435	69.435	69.465	69.525	69.585	69.665	69.710	69.710	69.710
26	69.555	69.495	69.465	69.435	69.435	69.465	69.525	69.585	69.665	69.710	69.710	69.710
27	69.555	69.495	69.465	69.435	69.435	69.465	69.525	69.585	69.665	69.710	69.710	69.710
28	69.555	69.495	69.465	69.435	69.435	69.465	69.525	69.585	69.665	69.740	69.740	69.710
29	69.555		69.465	69.435	69.435	69.465	69.525	69.585	69.675	69.740	69.740	69.675
30	69.555		69.465	69.435	69.435	69.465	69.525	69.615	69.675	69.740	69.710	69.675
31	69.555		69.435				69.525	69.615		69.740		69.675
Avg.	69.570	69.530	69.475	69.430	69.430	69.445	69.500	69.565	69.630	69.710	69.730	69.705

Month	Current Year 2002		Period 1935-2002		
	Extreme Elevation Meters		Elevation Meters		
	High	Low	# Average	# Maximum	! Minimum
Jan.	69.555	69.615	71.345	69.280	75.990
Feb.	69.495	69.555	71.255	69.190	75.830
Mar.	69.435	69.495	71.175	69.130	75.770
April	69.405	69.435	71.120	69.100	75.800
May	69.405	69.435	71.110	69.100	75.740
June	69.435	69.465	71.155	69.160	75.830
July	69.465	69.525	71.205	69.220	75.930
Aug.	69.525	69.615	71.265	69.250	76.020
Sept.	69.615	69.675	71.325	69.280	76.020
Oct.	69.675	69.740	71.360	69.310	76.140
Nov.	69.710	69.740	71.370	69.340	76.200
Dec.	69.675	69.710	71.335	69.340	76.080
Yearly	69.405	69.740	71.250	69.100	76.200

Area and Capacity Table		
Elevation	Area	Capacity
Meters Below M.S.L.	Hectares	Million Cubic Meters
84.640	0	0
83.520	8,337	31.7
82.300	25,455	232.8
81.080	38,284	629.8
79.250	49,615	1,443.2
78.030	54,512	2,077.2
76.810	60,218	2,775.3
74.370	72,723	4,393.7
73.150	79,683	5,322.5
71.630	89,760	6,611.5
70.100	95,426	8,022.6
67.060	106,029	11,092.7
64.010	116,753	14,481.1
60.960	127,680	18,206.2

@ Mean daily

! Reading near first day of month

Mean monthly

CHEMICAL ANALYSIS OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the California Regional Water Quality Control Board - Colorado River Basin, Region-7. New River Samples prior to 1985 were collected and analyzed by the U.S. Geological Survey. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary.

NEW RIVER AT INTERNATIONAL BOUNDARY

2002 Date	Time Std.	*Streamflow Momentary CMS	Water Temperature Deg C	pH Units	Oxygen Dissolved (DO) mg/L	Specific Conductance Microsiemens/cm	Turbidity NTU
Jan. 28	0700	5.64	11.4	7.7	2.7		
Feb. 27	0700	5.30	17.8	7.7	1.2	3,400	13.9
Mar. 25	0700	5.01	16.2	7.6	1.4	3,910	22.0
Apr. 29	0700	5.98	22.4	7.6	0.8	3,420	18.0
May 28	0700	4.73	26.3	7.7	0.7	4,500	18.0
June 25	0700	4.02	28.9	7.5	0.2	4,540	38.0
July 29	0700	3.31	29.2	7.7	0.1	4,580	34.0
Aug. 28	0700	3.79	28.3	7.7	0.1	4,770	48.0
Sept. 24	0700	4.02	27.3	7.7	0.3	4,250	40.0
Oct. 28	0700	2.97	20.0	7.8	0.9	4,100	33.0
Nov. 19	0700	3.65	16.4	7.7	1.6	3,940	27.7
Dec. 16	0700	4.39	15.4	7.7	1.0	3,870	20.5
						3,930	2.5

* Flow provided by the Imperial Irrigation District (Mean Daily)
N.A. - Not Analyzed

NEW RIVER AT INTERNATIONAL BOUNDARY

SAMPLE TYPE	COMPOSITE		COMPOSITE		DETECTION LIMIT
	Jan. 28, 2002	Feb. 27, 2002	Mar. 25, 2002	Apr. 29, 2002	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	
Arsenic	3.00 ug/L	6.00 ug/L	9.60 ug/L	7.30 ug/L	2.0 ug/L
Boron	N.A.	N.A.	N.A.	N.A.	0.1 mg/L
Cadmium	N.D.	N.D.	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	64.0 ug/L	10.0 ug/L	N.D.	N.D.	10.0 ug/L
Lead	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Phenol	0.004mg/L	N.D.	N.D.	0.016 mg/L	0.002 mg/L
MBAS	3.65 mg/L	2.50 mg/L	4.70 mg/L	4.400 mg/L	0.025 mg/L
Zinc	81.0 ug/L	10.0 ug/L	18.0 ug/L	30.0 ug/L	50.0 ug/L
Total Cyanide	0.08 mg/L	N.D.	N.D.	N.D.	0.01 mg/L
Total Phosphate(P04-P)	2.34 mg/L	N.A.	N.A.	N.A.	0.01 mg/L
Nitrate (NO3-N)	0.34 mg/L	0.20 mg/L	N.D.	N.D.	0.20 mg/L
Nitrite (NO2-N)	0.08 mg/L	0.10 mg/L	N.D.	N.D.	0.03 mg/L
Ammonia (NH3-NH4-N)	8.16 mg/L	5.00 mg/L	6.80 mg/L	4.70 mg/L	0.05 mg/L
Total Dissolved Solids	2,480 mg/L	2,870 mg/L	3,100 mg/L	3,000 mg/L	10.0 mg/L
Total Suspended Solids	N.A.	16.0 mg/L	32.0 mg/L	38.0 mg/L	10.0 mg/L
Volatite Suspended Solids	N.A.	N.A.	N.A.	N.A.	10.0 mg/L

SAMPLE TYPE	COMPOSITE		COMPOSITE		DETECTION LIMIT
	May 28, 2002	June 25, 2002	July 29, 2002	Aug. 28, 2002	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	
Arsenic	10.00 ug/L	11.0 ug/L	13.0 ug/L	5.00 ug/L	2.0 ug/L
Boron	N.A.	N.A.	N.A.	N.A.	0.1 mg/L
Cadmium	N.D.	N.D.	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	N.D.	N.D.	10.0 ug/L	86.0 ug/L	10.0 ug/L
Lead	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Phenol	N.D.	N.D.	N.D.	N.D.	0.002 mg/L
MBAS	1.90 mg/L	3.40 mg/L	5.40 mg/L	0.065 mg/L	0.025 mg/L
Zinc	35.0 ug/L	39.0 ug/L	46.0 ug/L	126 ug/L	50.0 ug/L
Total Cyanide	N.D.	N.D.	N.D.	N.D.	0.01 mg/L
Total Phosphate(P04-P)	N.A.	N.A.	2.90 mg/L	1.97 mg/L	0.01 mg/L
Nitrate (NO3-N)	0.30 mg/L	N.D.	N.D.	N.D.	0.20 mg/L
Nitrite (NO2-N)	N.D.	N.D.	N.D.	N.D.	0.03 mg/L
Ammonia (NH3-NH4-N)	4.50 mg/L	6.70 mg/L	7.20 mg/L	4.60 mg/L	0.05 mg/L
Total Dissolved Solids	3,000 mg/L	2,900 mg/L	2,700 mg/L	2,530 mg/L	10.0 mg/L
Total Suspended Solids	48.0 mg/L	25.0 mg/L	81.0 mg/L	61.0 mg/L	10.0 mg/L
Volatite Suspended Solids	N.A.	N.A.	N.A.	N.A.	10.0 mg/L

N.A. - Not Analyzed
N.D. - Not Detected

CHEMICAL ANALYSIS OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the California Regional Water Quality Control Board - Colorado River Basin, Region-7. New River Samples prior to 1985 were collected and analyzed by the U.S. Geological Survey. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary.

NEW RIVER AT INTERNATIONAL BOUNDARY

SAMPLE TYPE	COMPOSITE	COMPOSITE	COMPOSITE	COMPOSITE	
DATE	Sep. 24, 2002	Oct. 28, 2002	Nov. 19, 2002	Dec. 16, 2002	
PARAMETER	CONCENTRATION	CONCENTRATION	CONCENTRATION	CONCENTRATION	DETECTION LIMIT
Arsenic	29.0 ug/L	4.00 ug/L	4.00 ug/L	2.00 ug/L	2.0 ug/L
Boron	N.A.	N.A.	N.A.	N.A.	0.1 mg/L
Cadmium	N.D.	N.D.	N.D.	N.D.	1.0 ug/L
Chromium	N.D.	N.D.	N.D.	N.D.	10.0 ug/L
Copper	N.D.	66.8 ug/L	N.D.	N.D.	10.0 ug/L
Lead	N.D.	27.2 ug/L	N.D.	N.D.	10.0 ug/L
Phenol	N.D.	0.004 mg/L	0.006 mg/L	0.010 mg/L	0.002 mg/L
MBAS	3.60 mg/L	6.00 mg/L	1.540 mg/L	0.530 mg/L	0.025 mg/L
Zinc	25.0 ug/L	200.0 ug/L	N.D.	110 ug/L	50.0 ug/L
Total Cyanide	N.D.	N.D.	N.D.	N.D.	0.01 mg/L
Total Phosphate(PO4-P)	N.A.	3.20 mg/L	3.00 mg/L	2.10 mg/L	0.01 mg/L
Nitrate (NO3-N)	N.D.	N.D.	N.D.	0.37 mg/L	0.20 mg/L
Nitrite (NO2-N)	N.D.	0.07 mg/L	0.08 mg/L	0.09 mg/L	0.03 mg/L
Ammonia (NH3-NH4-N)	8.00 mg/L	9.15 mg/L	9.80 mg/L	6.90 mg/L	0.05 mg/L
Total Dissolved Solids	2,400 mg/L	2,330 mg/L	2,508 mg/L	2,450 mg/L	10.0 mg/L
Total Suspended Solids	27.0 mg/L	53.3 mg/L	41.2 mg/L	20.4 mg/L	10.0 mg/L
Volatile Suspended Solids	N.A.	N.A.	N.A.	N.A.	

N.D.- None Detected
N.A.- Not Analyzed

SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following table shows specific conductance 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.

NEW RIVER AT THE INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 2002

January	March	May	July	September	November
7 4,700	4 4,900	6 5,400			11 4,800
14 4,900	11 5,500	13 4,800			18 4,800
21 4,900	18 4,800	20 4,200			25 4,900
28 4,700	25 5,500	27 5,100			
February	April	June	August	October	December
4 4,700	8 4,000	10 5,800	12 4,900		2 4,800
18 5,000	15 4,100	24 4,900			9 4,600
25 5,100	22 4,200				16 5,000
	29 5,200				23 4,400
					30 4,600

CHEMICAL ANALYSES OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the United States Section of the Commission.

Samples from the Alamo River are taken north of the international boundary upstream of the box culvert under the All-American Canal. Flow at this point includes drainage flows across the international boundary and flows from drain interceptors along the toe of the south bank of the All-American Canal. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary. Records of the sampling extend from April 1951 through 2002.

ALAMO RIVER

2002 Date	Time Std.	Water Temperature Deg C	pH Units	Oxygen Dissolved (DO) mg/L	Conductance Micro- siemens/cm	Coliform Fecal Colonies/ 100 mL	Flow CMS
Jan. 23	0730	10.4	7.7	9.9	4,230	33	0.03
Feb. 27	0730	14.7	7.9	8.7	4,190	210	0.07
Mar. 27	0735	17.0	7.6	7.4	4,300	200	0.07
Apr. 24	0830	21.8	7.7	6.5	4,230	150	0.04
May 29	0720	25.1	7.5	5.6	4,310	300	0.07
June 26	0900	27.4	7.6	5.5	4,620	130	0.04
July 24	0810	29.8	7.7	3.7	4,340	90	0.04
Aug. 21	0645	28.9	7.7	3.3	4,300	99	0.04
Sep. 25	0800	26.0	7.5	6.0	4,410	223	0.06
Oct. 23	0740	20.1	7.5	4.4	4,480	694	0.07
Nov. 26	0745	14.7	7.4	8.4	4,240	290	0.03

NEW RIVER

2002 Date	Time Std.	**Streamflow Momentary CMS	Water Temperature Deg C	pH Units	Oxygen Dissolved (DO) mg/L	Specific Conductance Microsiemens/cm	Fecal Coliform Colonies/ 100 mL
Jan. 09	0755	5.24	14.3	7.7	1.7	4,000	650,000
Jan. 23	0810	5.32	12.2	7.7	2.5	4,080	580,000
Feb. 14	0910	5.86	14.2	7.5	2.1	4,230	510,000
Feb. 27	0805	5.30	17.4	7.6	1.1	4,700	850,000
Mar. 13	0810	6.40	19.1	7.5	1.2	4,360	620,000
Mar. 27	0810	4.96	19.0	7.1	1.0	5,180	1,200,000
Apr. 11	0935	5.47	22.6	7.3	0.6	4,950	750,000
Apr. 24	0915	5.52	23.1	7.3	0.8	4,970	1,020,000
May 08	0820	5.58	23.0	7.6	0.9	4,710	860,000
May 29	0755	4.50	26.8	7.4	0.2	4,630	2,400,000
June 19	0740	3.94	27.6	7.2	0.2	4,470	2,475,000
June 26	1005	3.96	29.2	7.4	0.3	4,540	1,300,000
July 10	0800	3.77	30.0	7.5	0.2	4,560	1,000,000
July 24	0950	2.86	30.4	7.7	0.1	2,730	4,800,000
Aug. 06	0800	4.02	30.1	7.6	0.2	3,910	2,525,000
Aug. 21	0730	3.96	29.6	7.5	0.2	3,910	2,475,000
Sept. 19	0745	3.65	26.5	7.7	0.3	3,620	3,975,000
Sept. 25	0830	3.99	28.4	7.6	0.1	3,770	1,825,000
Oct. 09	0810	4.08	24.1	7.5	0.7	3,640	1,350,000
Oct. 23	0820	3.31	21.5	7.7	0.8	3,940	2,150,000
Nov. 13	0825	3.99	18.0	7.1	1.1	4,050	1,500,000
Nov. 26	0825	3.88	16.1	7.3	1.4	4,130	1,125,000
Dec. 11	0820	3.96	14.6	7.6	1.5	3,940	2,100,000

Note: Temperature, pH, D.O., and Specific Conductance - Data collected in the field
 ** Flow reported by Imperial Irrigation District

11-0100.00 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 2.9 kilometers upstream from the mouth of Hauser Creek, 13.7 kilometers upstream from Barrett Dam, and about 32.2 kilometers upstream from the international boundary. The zero of the gage is 878.555 meters 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 2002.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 2002 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 47.855 meters, gage datum. Reservoir capacity at spillway crest, 1948 survey, is 61,934 TCM. 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, 55,845 TCM, March 1983. Prior to 1937, maximum monthly inflow, 45,886 TCM, January 1916; minimum no flow during parts of many years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1937 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	104	1,188	20,362	0
February	88.6	2,542	41,407	9.9
March	46.1	3,442	55,845	23.8
April	136	2,023	28,530	4.1
May	256	1,019	18,642	0
June	230	578	10,173	0
July	230	361	7,651	0
August	124	273	8,916	0
September	78.8	188	6,331	0
October	45.2	163	4,817	0
November	0	268	5,633	0
December	22.4	725	9,472	5.4
Yearly	1,361	12,770	177,579	149

11-0105.00 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 1.3 kilometers 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 2002.

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, 55,615 TCM, March 1983. Prior to 1937, maximum monthly discharge, 26,397 TCM February 1916; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1937 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	16.1	297	2,583	0
February	6.4	985	19,644	0
March	0	1,915	55,615	0
April	0	1,451	28,159	0
May	0	805	18,100	0
June	0	613	9,260	0
July	0	382	6,236	0
August	0	367	7,937	0
September	0	405	7,253	0
October	0	257	4,639	0
November	0	286	5,071	0
December	0	508	9,099	0
Yearly	23.1	8,271	168,432	0

11-0110.00 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 13.7 kilometers downstream from Morena Dam, 1.6 kilometers downstream from the mouth of Pine Valley Creek, and about 19.3 kilometers upstream from the international boundary. Zero of gage is 440.775 meters 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 2002. 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 51.475 meters) is 55,205 TCM. Capacity at spillway crest (gage height 49.043 meters) is 46,811 TCM. Dead storage, 887 TCM below lowest outlet (gage height 17.945 meters) 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, 67,540 TCM, February 1980. Prior to 1937, maximum monthly discharge, 67,595 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1937 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	230	1,485	29,627	0
February	113	3,312	67,539	9.4
March	98.5	5,641	62,041	17.4
April	123	2,834	26,680	12.6
May	90.9	1,321	10,509	0
June	49.0	624	4,818	0
July	100	379	5,042	0
August	0	196	4,472	0
September	10.6	199	3,858	0
October	0	114	796	0
November	0	249	2,519	0
December	0	666	6,845	0
Yearly	815	17,020	141,024	159

11-0114.90 DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.8 kilometer downstream from Barrett Dam on right bank of Dulzura Conduit 15.2 meters 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 2002.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 2.4 kilometers 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 12.9 kilometers 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, 4.66 CMS on March 8, 1995; minimum discharge, no flow for long periods on many occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	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	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	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	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	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	0	0	0	0	0	0	0

Current Year 2002

Period 1937-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	0	! 1	0	0	610	2,899	0	
Feb.			! 1	0	! 1	0	0	584	2,883	0	
Mar.			! 1	0	! 1	0	0	848	7,639	0	
April			! 1	0	! 1	0	0	1,060	5,016	0	
May			! 1	0	! 1	0	0	1,198	3,750	0	
June			! 1	0	! 1	0	0	1,231	4,611	0	
July			! 1	0	! 1	0	0	1,118	4,914	0	
Aug.			! 1	0	! 1	0	0	1,042	4,741	0	
Sept.			! 1	0	! 1	0	0	832	2,862	0	
Oct.			! 1	0	! 1	0	0	715	3,235	0	
Nov.			! 1	0	! 1	0	0	750	3,404	0	
Dec.			! 1	0	! 1	0	0	651	2,843	0	
Yearly				0		0	0	10,639	40,526	0	

φ Mean daily

! And other days

11-0111.00 COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 4.0 kilometers downstream from Barrett Dam and 0.8 kilometer 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 305 meters (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, January to April 1993 and January to March 1995. 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 2002. 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, 111,775 TCM March 1983. Prior to 1937, maximum monthly discharge 47,366 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1937 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	0.1	411	10,114	0
February	0.1	2,128	86,736	0
March	0.1	4,346	111,775	0
April	0.1	2,186	45,417	0
May	0.1	979	28,287	0
June	0.1	451	13,503	0
July	0.1	232	5,311	0
August	0.1	149	4,206	0
September	0.1	55.0	1,554	0
October	0.1	46.0	1,530	0
November	0	144	5,100	0
December	0	188	6,058	0
Yearly	1.0	11,315	254,099	0

11-0120.00 COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 2.6 kilometers upstream from the international land boundary between the United States and Mexico, 1.3 kilometers upstream from the confluence with Tecate Creek, and 8.2 kilometers 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 213 meters downstream from the gage. Zero of the gage is 173.555 meters 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 2002.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 16.1 kilometers and 29.0 kilometers, respectively, upstream from this station.

EXTREMES: Maximum discharge 331 CMS February 21, 1980 (gage height 3.400 meters). Minimum discharge, no flow during part of each year.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	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	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	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	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	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	0	0	0	0	0	0	0

Current Year 2002								Period 1937-2002			
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	0	! 1	0	0	0	1,375	45,897	0
Feb.			! 1	0	! 1	0	0	0	3,487	85,134	0
Mar.			! 1	0	! 1	0	0	0	5,149	109,418	0
April			! 1	0	! 1	0	0	0	2,536	49,635	0
May			! 1	0	! 1	0	0	0	926	22,439	0
June			! 1	0	! 1	0	0	0	323	7,301	0
July			! 1	0	! 1	0	0	0	103	3,599	0
Aug.			! 1	0	! 1	0	0	0	79.9	1,850	0
Sept.			! 1	0	! 1	0	0	0	78.0	4,209	0
Oct.			! 1	0	! 1	0	0	0	88.3	291	0
Nov.			! 1	0	! 1	0	0	0	53.3	1,378	0
Dec.			! 1	0	! 1	0	0	0	174	3,169	0
Yearly				0		0	0	0	14,372	220,556	0

φ Mean daily

! And other days

11-0125.00 CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.8 kilometer upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 5.6 kilometers southwest of Campo, California. Zero of gage is 664.135 meters 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 from October 1936 through 2002.

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, 1.6 kilometers upstream, from August 1956 to February 20, 1980, when it was destroyed by a flood.

EXTREMES: Maximum discharge, 25.3 CMS, March 24, 1983 (gage height 1.640 meters present datum), from rating curve extended above 3.12 CMS 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 CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0.01	0.01	0	0	0	0	0	0	0	0	0
2	0	.01	.01	0	0	0	0	0	0	0	0	0
3	0	.01	.01	0	0	0	0	0	0	0	0	0
4	0	0	.01	.01	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	.01	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	.01	0	0	0	0	0	0	0	0	0	0
11	0	.01	0	0	0	0	0	0	0	0	0	0
12	0	.01	0	0	0	0	0	0	0	0	0	0
13	0	.01	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	.01	0	0	0	0	0	0	0	0	0
19	0	.01	.01	0	0	0	0	0	0	0	0	0
20	0	.01	0	0	0	0	0	0	0	0	0	0
21	0	.01	0	0	0	0	0	0	0	0	0	0
22	0	.01	0	0	0	0	0	0	0	0	0	0
23	0	.01	0	0	0	0	0	0	0	0	0	0
24	0	.01	.01	0	0	0	0	0	0	0	0	0
25	0	.01	0	0	0	0	0	0	0	0	0	0
26	0	.01	0	.01	0	0	0	0	0	0	0	0
27	0	.01	0	0	0	0	0	0	0	0	0	0
28	0	.01	.01	0	0	0	0	0	0	0	0	0
29	.01	0	0	0	0	0	0	0	0	0	0	0
30	.01	0	0	0	0	0	0	0	0	0	0	0
31	.01	0	0	0	0	0	0	0	0	0	0	0
Sum	0.03	0.17	0.08	0.03	0	0	0	0	0	0	0	0

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High		φ Low		Total	Average	Maximum	Minimum
				Day	φ						
Jan.			129	0.01	1 1	0	0	2.6	418	10,581	0
Feb.			1 1	.01	1 4	0	.01	14.7	539	5,288	0
Mar.			1 1	.01	1 5	0	0	6.9	862	11,587	0
April			1 4	.01	1 1	0	0	2.6	535	8,886	0
May			1 1	0	1 1	0	0	0	261	3,956	0
June			1 1	0	1 1	0	0	0	128	2,234	0
July			1 1	0	1 1	0	0	0	69.4	1,525	0
Aug.			1 1	0	1 1	0	0	0	63.4	2,008	0
Sept.			1 1	0	1 1	0	0	0	46.6	1,214	0
Oct.			1 1	0	1 1	0	0	0	58.2	1,084	0
Nov.			1 1	0	1 1	0	0	0	116	1,522	0
Dec.			1 1	0	1 1	0	0	0	198	1,953	0
Yearly				0.01		0	0	26.8	3,295	38,639	0

φ Mean daily ! And other days

11-0131.00 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 9.0 kilometers upstream from its confluence with Cottonwood Creek, 17.0 kilometers upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 16.0 kilometers southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall. 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 2002. 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 115.85 meters above mean sea level; at top of spillway gates 125.00 meters above mean sea level. Reservoir capacity at spillway crest 94 TCM; at top of spillway gates 137 TCM.

EXTREMES: Maximum monthly inflow, 237,657 TCM, January 1993; minimum, no flow during part of most years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1938 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	0	5,958	237,657	0
February	0	8,140	194,216	0
March	0	11,987	172,556	0
April	0	3,569	95,953	0
May	0	765	14,136	0
June	0	225	5,749	0
July	0	114	1,806	0
August	0	62.9	950	0
September	0	63.7	575	0
October	0	80.0	432	0
November	0	166	2,393	0
December	0	882	19,348	0
Yearly	0	32,013	412,673	0

11-0132.00 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 Presa) 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 1991 by the State of Baja California Commission of Public Services for Tijuana. Since 1992, the data have been obtained by the Baja California Regional Office of the National Water Commission. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 2002.

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, 36,018 ICM, March 1996; minimum, no flow on several occasions since March 1941.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

MONTH	CURRENT YEAR 2002	PERIOD 1938 - 2002		
		AVERAGE	MAXIMUM	MINIMUM
January	0	645	6,183	0
February	0	629	6,028	0
March	0	1,173	36,018	0
April	0.1	770	6,142	0
May	0.1	967	6,578	0
June	0.1	1,081	5,893	0
July	0.1	1,243	5,681	0
August	0.1	1,163	5,931	0
September	0.1	1,032	6,158	0
October	0.1	939	6,054	0
November	0.1	812	5,873	0
December	0.1	762	6,212	0
Yearly	0.9	11,215	94,980	0

11-0133.00 TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 1.1 kilometers downstream (north) from boundary, 1.8 kilometers upstream from the new Dairy Mart Road bridge, and 2.3 kilometers west of the international gate at San Ysidro, California. Zero of the gage is at mean sea level, U. S. C. & G. S. datum.
 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 2002.
 EXTREMES: Since May 1947: Maximum instantaneous discharge, 937 CMS, February 21, 1980; minimum discharge, no flow during many years since 1951.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	1.21
2	0	0	0	0	0	0	0	0	0	0	0	.69
3	.61	0	0	0	0	0	0	0	0	0	0	.37
4	.12	0	0	0	0	0	0	0	0	0	0	.01
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	.24	0	0	0	0	0	0	0	0
7	0	0	.06	.27	0	0	0	0	1.42	0	0	0
8	0	0	.78	0	0	0	0	0	.67	0	.38	0
9	0	0	.65	0	0	0	0	0	.15	0	2.57	0
10	0	0	.28	0	0	0	0	0	0	0	2.47	0
11	.06	0	0	0	0	0	0	0	0	0	1.86	.16
12	0	0	0	0	0	0	0	0	0	0	1.04	.09
13	.01	0	0	0	0	0	0	0	0	0	.63	0
14	.01	0	0	0	0	0	0	0	0	0	.40	0
15	0	0	0	0	0	0	0	0	0	0	.21	0
16	0	0	.71	0	0	0	0	0	0	0	.02	.41
17	.01	.24	.63	0	0	0	0	0	0	0	0	1.09
18	0	.63	1.39	0	0	0	0	0	0	0	0	.69
19	0	.28	.81	0	0	0	0	0	0	0	0	.78
20	0	0	.60	0	0	0	0	0	0	0	0	3.05
21	0	0	.07	0	0	0	0	0	0	0	0	1.65
22	0	0	.03	0	0	0	0	0	0	0	0	1.32
23	0	0	0	0	0	0	0	0	0	0	0	1.06
24	0	0	.08	.74	0	0	0	0	0	0	0	.99
25	0	0	0	.30	0	0	0	0	0	0	0	.96
26	0	0	0	1.42	0	0	0	0	0	0	0	.93
27	0	0	0	.79	0	0	0	0	0	0	0	.84
28	.42	0	0	.02	0	0	0	0	0	0	0	.55
29	.79	0	0	0	0	0	0	0	0	0	0	2.06
30	.67	0	0	0	0	0	0	0	0	0	.30	1.23
31	.26	0	0	0	0	0	0	0	0	0	1.01	.70
Sum	2.96	1.15	6.09	3.78	0	0	0	0	2.24	0	10.89	20.84

Current Year 2002									Period 1947-2002			
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Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	Low		Total	Average	Maximum	Minimum
Jan.	12.250	11.920	3	2.31	! 1	0	0.10	256	8,923	297,879	0
Feb.	12.050	11.920	17	1.13	! 1	0	.04	99.4	13,984	388,951	0
Mar.	12.185	11.920	18	2.89	! 1	0	.20	526	16,641	362,019	0
April	12.235	11.920	26	3.31	! 1	0	.13	327	4,308	77,633	0
May	11.920	11.920	! 1	0	! 1	0	0	0	2,071	52,545	0
June	11.920	11.920	! 1	0	! 1	0	0	0	724	11,960	0
July	11.920	11.920	! 1	0	! 1	0	0	0	523	11,400	0
Aug.	11.920	11.920	11	0	! 1	0	0	0	625	21,083	0
Sept.	12.350	11.920	7	4.41	! 1	0	.07	194	308	5,142	0
Oct.	11.920	11.920	! 1	0	! 1	0	0	0	395	6,859	0
Nov.	12.195	11.920	9	3.02	! 1	0	.36	941	610	5,399	0
Dec.	12.615	11.920	20	8.62	! 4	0	.67	1,801	1,081	8,270	0
Yearly	12.615	11.920		8.62		0	0.13	4,144	50,193	734,832	0

! 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 thousand cubic meters. 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.

The storage data for Morena and Barrett reservoirs are obtained and provided by the City of San Diego, California and the U.S. Geological Survey. The data for Rodriguez Dam were provided by the Secretariat of Hydraulic Resources in Mexico up to May 1961, from June 1961 to March 1966 the data were provided by the Potable Water and Sewerage Board for the Urban District of Tijuana, from April 1966 to December 1991, the data were provided by the State Public Service Commission of Tijuana, Baja California, and since 1992, by the National Water Commission of Mexico.

IN THOUSAND CUBIC METERS

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 61,933)		BARRETT RESERVOIR, CALIFORNIA (Capacity 55,211)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 138,000)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 255,147)	
	2002	Average 1937-2002	2002	Average 1937-2002	2002	Average 1937-2002	2002	Average 1937-2002
Jan.	7,383	24,882	9,426	18,831	12,642	40,941	29,451	84,654
Feb.	7,371	26,178	9,468	19,782	15,340	43,406	32,179	89,366
Mar.	7,295	27,579	9,486	21,999	17,000	48,784	33,781	98,362
April	7,264	27,732	9,539	22,666	17,680	49,671	34,483	100,069
May	7,180	27,517	9,518	22,454	17,060	48,830	33,758	98,801
June	6,979	26,823	9,405	21,674	16,520	46,947	32,904	95,444
July	6,722	26,033	9,244	20,771	15,900	45,100	31,866	91,904
Aug.	6,450	25,309	8,983	19,781	15,300	43,059	30,733	88,149
Sept.	6,172	24,611	8,847	19,049	14,760	41,475	29,779	85,135
Oct.	6,035	24,132	8,711	18,380	14,320	39,899	29,066	82,411
Nov.	5,896	23,928	8,634	17,871	13,972	39,122	28,502	80,921
Dec.	5,872	23,999	8,631	18,037	13,839	38,959	28,342	80,995
Avg.	6,718	25,727	9,158	20,108	15,361	44,352	31,237	89,684
Max.	7,383	#! 76,069	9,539	*! 56,641	17,680	! 138,486	34,483	! 263,471
Min.	5,872	!! 12	8,631	!! 131	12,642	!! 0	28,342	!! 1,559

- 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 MILLIMETERS

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 following rainfall data.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Sawday Ranch, California		Campo, California	
	2002	Average 1906-2002	2002	Average 1907-2002	2002	Average 1951-2002	2002	Average 1950-2002	2002	Average 1900-2002
Jan.	15	98	10	89	#	#	10	90	10	79
Feb.	8	98	4	88	#	#	5	83	3	82
Mar.	52	89	48	81	#	#	40	79	28	73
April	10	42	10	37	#	#	15	37	10	34
May	0	15	0	13	#	#	0	9	0	11
June	0	3	0	2	#	#	0	1	0	2
July	1	9	0	3	#	#	0	13	5	12
Aug.	0	14	0	6	#	#	0	20	0	13
Sept.	26	11	11	7	#	#	33	12	29	9
Oct.	5	21	3	17	#	#	3	13	1	16
Nov.	27	39	68	37	#	#	46	42	26	34
Dec.	79	75	59	67	#	#	77	57	47	60
Yearly	222	514	213	447			229	456	159	425

Month	Chula Vista, California		Lower Otay Dam, California						
	2002	Average 1930-2002	2002	Average 1906-2002					
Jan.	12	48	12	56					
Feb.	4	46	4	47					
Mar.	2	43	28	55					
April	13	20	12	26					
May	0	5	0	9					
June	0	1	0	3					
July	0	1	0	1					
Aug.	0	2	0	3					
Sept.	0	4	9	6					
Oct.	0	9	6	10					
Nov.	14	27	42	31					
Dec.	47	38	39	37					
Yearly	92	244	152	284					

T Trace

IN MEXICO

Month	El Pinal, Baja California		El Hongo, Baja California		Ignacio Zaragoza, Baja California		Tecate, Baja California		El Carrizo, Baja California	
	2002	Average 1964-2002	2002	Average 1980-2002	2002	Average 1965-2002	2002	Average 1946-2002	2002	Average 1980-2002
Jan.	#	84	12	63	7	61	6	76	15	43
Feb.	#	90	2	67	1	73	6	58	3	51
Mar.	#	94	35	64	28	64	#	66	19	54
April	#	37	9	20	2	24	10	28	14	19
May	#	9	0	5	0	5	T	7	0	3
June	#	1	0	2	0	2	0	3	0	2
July	#	18	0	12	#	3	0	4	0	3
Aug.	#	23	0	18	#	7	0	5	0	2
Sept.	#	18	31	8	#	9	14	5	13	5
Oct.	#	16	1	10	#	14	0	12	2	13
Nov.	#	46	40	28	#	38	40	35	26	28
Dec.	#	71	40	32	#	46	30	48	40	30
Yearly		494	170	325		352		345	132	260

Missing record

T Trace

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN MILLIMETERS

IN MEXICO

	Valle de Palmas, Baja California		Rodriguez Dam, Baja California			
	2002	Average 1948-2002	2002	Average 1938-2002		
Jan.	7	44	10	45		
Feb.	3	39	1	43		
Mar.	17	39	12	43		
April	7	15	17	19		
May	0	4	0	3		
June	0	1	0	1		
July	0	2	0	3		
Aug.	0	5	0	3		
Sept.	18	6	2	6		
Oct.	0	9	1	9		
Nov.	14	19	10	23		
Dec.	40	27	44	37		
Yearly	106	202	97	231		

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 2002.

IN THE UNITED STATES

NAME OF STATION	LATITUDE	LONGITUDE	Ⓐ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	494.69	1907	City of San Diego
Campo, California	32° 38'	116° 28'	801.62	1877	County of San Diego
Chula Vista, California	32° 36'	117° 06'	2.74	1930	Chula Vista Fire Department
Lower Otay Dam, California	32° 37'	116° 56'	164.59	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	167.64	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	937.26	1906	City of San Diego
Sawday Ranch, California	32° 45'	116° 29'	975.36	1950	Ben and Kelly Tulloch

IN MEXICO

NAME OF STATION	LATITUDE	LONGITUDE	Ⓐ ELEV. (Meters)	RECORD BEGAN	OBSERVER
Ignacio Zaragoza, Baja California	32° 12'	116° 29'	555.04	1965	** CNA
El Carrizo, Baja California	32° 29'	116° 42'	494.99	1980	CNA
El Hongo, Baja California	32° 31'	116° 18'	960.12	1981	CNA
El Pinal, Baja California	32° 11'	116° 17'	1350.00	1964	CNA
Rodriguez Dam, Baja California	32° 27'	116° 54'	120.09	1938	CNA
Tecate, Baja California	32° 33'	116° 41'	480.06	1946	CNA
Valle de Las Palmas, Baja California	32° 22'	116° 37'	280.11	1948	CNA

Ⓐ Elevation above mean sea level

" Estimated from topographic maps

** Baja California State Office of the National Water Commission

EVAPORATION IN THE TIJUANA RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at 3 stations in California and at 2 stations in Baja California, with averages for their periods of record. 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 on the Tijuana River Watershed" in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. October 1926 through 2002, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
2. Morena Reservoir: October 1915 through December 1921, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan and a land pan of the same dimensions. September 1926 through 2002, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
3. Lower Otay Dam: January 1950 through 2002, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam, California	
	2002	Average 1916-2002	2002	Average 1921-2002	2002	Average 1950-2002
Jan.	77	55	37	47	65	50
Feb.	83	53	66	53	89	58
Mar.	145	82	74	83	104	86
April	147	118	100	115	142	119
May	221	165	149	162	185	153
June	290	211	244	200	216	176
July	314	242	265	235	220	208
Aug.	290	225	244	221	195	195
Sept.	239	179	188	179	158	161
Oct.	142	125	94	125	119	118
Nov.	68	79	70	77	96	73
Dec.	63	57	30	48	58	55
Yearly	2,079	1,591	1,561	1,545	1,647	1,452

IN MEXICO

Month	Rodriguez Dam, Baja California		El Carrizo, Baja California	
	2002	Average 1939-2002	2002	Average 1980-2002
Jan.	66	99	118	132
Feb.	104	102	183	117
Mar.	114	110	174	139
April	118	139	178	181
May	158	132	245	221
June	181	190	278	273
July	189	213	301	295
Aug.	172	197	283	291
Sept.	148	164	269	242
Oct.	89	135	156	205
Nov.	101	107	191	154
Dec.	49	84	94	132
Yearly	1,489	1,686	2,470	2,365

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES CELSIUS

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 meters 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 on Tijuana River Watershed" in this bulletin.

IN THE UNITED STATES

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	2002			Average 1951- 2002	2002			Average 1951- 2002	2002			Average 1951- 2002
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	11.1	26.7	-5.0	9.8	8.4	28.3	-8.9	8.7	12.7	26.7	1.7	12.1
Feb.	12.2	29.4	-3.9	10.8	9.8	26.7	-5.6	9.3	#	26.7	1.1	12.9
Mar.	11.7	27.8	-1.1	12.1	9.8	31.1	-7.8	10.1	#	22.2	5.0	13.6
April	16.1	33.3	0	14.6	12.3	33.3	-3.9	12.3	14.5	22.8	6.1	15.0
May	17.8	33.3	5.0	17.2	14.8	36.1	-0.6	15.1	15.5	30.0	6.7	16.4
June	21.7	37.2	9.4	20.6	19.2	38.9	3.9	18.7	17.9	23.3	12.0	17.9
July	23.9	39.4	8.9	24.4	23.3	40.6	6.7	22.7	19.7	26.7	15.8	19.8
Aug.	24.4	41.1	10.6	24.7	22.1	40.6	5.0	22.9	20.1	28.3	13.9	20.8
Sept.	24.4	42.8	11.1	22.6	22.0	40.6	5.6	20.5	20.8	33.3	11.7	20.1
Oct.	17.8	40.0	4.4	18.1	14.1	33.3	-1.7	16.0	17.9	28.9	10.0	17.8
Nov.	13.3	28.9	1.7	13.5	12.3	28.9	-1.7	11.5	17.5	31.7	7.8	14.9
Dec.	10.6	29.4	-1.7	10.4	7.8	21.7	-5.6	8.7	13.3	25.0	0	12.8
Yearly	17.1	42.8	-5.0	16.6	14.7	40.6	-8.9	14.7		33.3	0	16.2

IN MEXICO

Month	Rodriguez Dam, Baja California				El Hongo, Baja California				Ignacio Zaragoza, Baja California			
	2002		1938-2002		2002		1981-2002		2002		1965-2002	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	27	1	32	-3	25	-3	26	-9	25	-11	34	-11
Feb.	32	1	34	0	22	-3	27	-3	30	-9	32	-9
Mar.	27	5	38	0	31	0	31	-2	24	-9	36	-9
April	28	7	40	2	30	2	34	-1	30	-2	38	-4
May	35	9	39	3	34	3	40	1	32	0	40	-2
June	32	8	42	8	39	8	47	2	36	0	43	-2
July	33	13	40	8	38	14	45	8	#	#	45	1
Aug.	35	14	41	10	39	12	41	3	#	#	45	3
Sept.	38	13	43	8	38	10	39	2	#	#	44	1
Oct.	32	10	42	1	30	5	37	0	#	#	40	-6
Nov.	34	8	37	-1	26	2	30	-2	#	#	34	-9
Dec.	25	4	34	-3	19	-3	27	-8	#	#	33	-9
Yearly	38	1	43	-3	39	-3	47	-9			45	-11

Month	Tecate, Baja California				El Carrizo, Baja California				Valle de Patmas, Baja California			
	2002		1946-2002		2002		1980-2002		2002		1948-2002	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	26	-4	38	-9	31	-2	32	-1	28	-4	37	-11
Feb.	31	-5	38	-8	34	4	34	-2	31	-4	37	-5
Mar.	#	#	36	-5	34	3	37	-4	32	1	38	-2
April	30	1	39	-2	28	6	41	3	37	4	41	-2
May	32	3	42	1	32	6	42	5	44	6	44	1
June	37	7	44	0	33	9	42	9	46	8	48	4
July	38	9	46	2	35	3	46	8	46	8	49	6
Aug.	39	8	47	1	40	10	45	5	47	8	48	5
Sept.	43	9	46	2	43	11	42	5	45	4	47	3
Oct.	35	5	41	-3	36	9	40	6	41	1	43	0
Nov.	34	3	37	-3	37	6	35	4	41	-3	38	-7
Dec.	24	-2	36	-5	25	2	34	-3	29	-4	35	-6
Yearly	43		47	-9	43	-2	46	-4	47	-4	49	-11

Missing Data

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

2002

The total area within the Tijuana River basin is 4,484 square kilometers, 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 Mr. Art Letter, General Manager, Tia Juana Valley County Water District, 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 2002 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Kilometers			Irrigated Areas-Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	295	0	295	0		0
Morena Dam to Barrett Dam	344	0	344	0		0
above Barrett Dam	640	0	640	0		0
below Barrett Dam and above Tecate Creek	168	0	168	0		0
above Tecate Creek	808	0	808	0		0
Campo Creek above International Boundary	220	10	230	0		0
Tecate Creek above International Boundary (not including Campo Creek)	49	166	215	0		0
Cottonwood Creek above International Boundary Station	1,070	176	1,246	0		0
Rio de las Palmas above Rodriguez Dam	18	2,541	2,559	0	(b)	0
Tijuana River above Nestor Gaging Station	1,186	3,279	4,465	49		49
above the Mouth	1,197	3,287	4,484	(a) 244		244

(a) Data from Otay Water District, leased areas from IBWC irrigation and private landowners.

(b) There was no irrigation in 2002 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



09-5375.00 WHITEWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 137 meters upstream from the Southern Pacific Railroad bridge, 2.4 kilometers upstream from the international boundary, and 3.2 kilometers west of Douglas, Arizona. Zero of gage is 1,191.505 meters above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 61 meters upstream from bridge with the datum 1.340 meters higher.

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by the U. S. Section of the Commission. Records fair. 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 2002 (July 1954 to March 1955, monthly discharge only). In August of 2002 operation of the gage was turned over to the U.S. Geological Survey.

REMARKS: Diversions above this station are mainly by pumping from ground water for irrigation. Records show flow at the international boundary into Mexico.

EXTREMES: Prior to 1936: Maximum recorded discharge, 97.7 CMS August 10, 1931 (gage height 3.700 meters); maximum estimated discharge, 115 CMS July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 143 CMS August 7, 1955; maximum gage height, 5.045 meters July 29, 1966; minimum daily discharge, no flow at times during most years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0			0	0
2	0	0	0	0	0	0	0	5.86			0	0
3	0	0	0	0	0	0	0	.20			0	0
4	0	0	0	0	0	0	0	.88			0	0
5	0	0	0	0	0	0	0	1.30			0	0
6	0	0	0	0	0	0	0	.04			0	0
7	0	0	0	0	0	0	0	.24			0	0
8	0	0	0	0	0	0	0	0			0	0
9	0	0	0	0	0	0	0	0			0	0
10	0	0	0	0	0	0	0	.07			0	0
11	0	0	0	0	0	0	0	.02			0	0
12	0	0	0	0	0	0	0	0			0	0
13	0	0	0	0	0	0	0	0			0	0
14	0	0	0	0	0	0	0	0			0	0
15	0	0	0	0	0	0	0	0			0	0
16	0	0	0	0	0	0	0	0			0	0
17	0	0	0	0	0	0	0	0			0	0
18	0	0	0	0	0	0	0	0			0	0
19	0	0	0	0	0	0	0	.11			0	0
20	0	0	0	0	0	0	0	.05			0	0
21	0	0	0	0	0	0	0	0			0	0
22	0	0	0	0	0	0	0	0			0	0
23	0	0	0	0	0	0	0	0			0	0
24	0	0	0	0	0	0	0	0			0	0
25	0	0	0	0	0	0	0	0			0	0
26	0	0	0	0	0	0	0	0			0	0
27	0	0	0	0	0	0	0	.72			0	0
28	0	0	0	0	0	0	0	0			0	0
29	0	0	0	0	0	0	0	0			0	0
30	0	0	0	0	0	0	0	0			0	0
31	0	0	0	0	0	0	0	0		0	0	0
Sum	0	0	0	0	0	0	0	0.72			0	0

Current Year 2002

Period 1936-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.	1.380	1.380	! 1	0	! 1	0	0	0	39.4	556	0
Feb.	1.380	1.380	! 1	0	! 1	0	0	0	18.4	163	0
Mar.	1.380	1.380	! 1	0	! 1	0	0	0	23.4	364	0
April	1.380	1.380	! 1	0	! 1	0	0	0	17.1	213	0
May	1.380	1.380	! 1	0	! 1	0	0	0	12.2	170	0
June	1.380	1.380	! 1	0	! 1	0	0	0	124	1,961	0
July	2.040	1.380	27	2.86	! 1	0	.02	62.2	1,803	10,004	0
Aug.									2,978	17,861	0
Sept.									778	3,910	0
Oct.									449	7,528	0
Nov.	1.380	1.380	! 1		! 1	0	0	0	57.6	765	0
Dec.	1.380	1.380	! 1		! 1	0	0	0	123	2,915	0
Yearly									6,423	27,533	0

! And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA
INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Parshall flume in the influent line of the older trickling filter unit and a Parshall flume in the influent line of the newer extended aeration unit. The treatment plant is located about 1.6 kilometers west of the Douglas-Agua Prieta Port of Entry immediately adjacent to the international boundary in Douglas, Cochise County, Arizona.

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 2002.

REMARKS: The older 4.9 thousand cubic meters per day trickling filter unit was constructed in 1947 by the International Boundary and Water Commission. Since April 8, 1968 all sewage from Agua Prieta has been retained and treated in Mexico to be used for irrigation along with the effluent from the Douglas International Treatment Plant. On July 1, 1973, ownership and operation of the plant was transferred from the International Boundary and Water Commission to the City of Douglas. In 1980 the plant was enlarged, with the addition of the extended aeration unit bringing the total capacity up to 9.8 thousand cubic meters per day. The effluent from the Douglas Treatment Plant is discharged through a conduit to Mexico.

Month	Total Monthly Flows			Mean Daily Flows—Thousand Cubic Meters Per Day					
	Thousand Cubic Meters			Current Year 2002			Period 1952-2002		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	236	0	236	9.8	5.7	7.6	18.8	1.6	4.6
Feb.	217	0	217	12.1	4.9	7.9	17.7	2.1	4.5
Mar.	255	0	255	14.4	5.3	7.9	14.4	2.2	4.5
April	249	0	249	12.1	4.2	8.3	18.1	1.4	4.5
May	253	0	253	13.6	3.4	8.3	15.0	1.9	4.6
June	242	0	242	13.6	3.0	9.1	15.0	2.1	4.7
July	290	0	290	14.8	4.9	10.2	14.8	1.8	4.9
Aug.	285	0	285	12.6	6.3	9.2	15.1	1.4	4.9
Sept.	310	0	310	13.6	7.9	10.6	13.6	1.8	4.8
Oct.	302	0	302	12.2	7.4	9.8	13.8	2.2	4.7
Nov.	288	0	288	12.8	7.3	9.6	12.8	1.2	4.7
Dec.	342	0	342	17.9	8.0	11.1	17.9	1.7	4.7
Yearly	3,269	0	3,269	17.9	3.0	9.1	18.8	1.2	4.7

09-4705.00 SAN PEDRO RIVER AT PALOMINAS, ARIZONA

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

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records available: May 1950 to October 1935, May 1935 to July 1941, and July 1950 through 2002. Records obtained and furnished by U. S. Geological Survey prior to October 1, 1981 and from October 1, 1995 through 2002, and by the United States Section of the Commission from October 1, 1981 through September 30, 1995.

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

EXTREMES: Maximum daily discharge, 623 CMS on August 14, 1940 (gage height 4.93 meters present datum), from rating curve extended above 159 CMS on basis of slope-area measurement of peak flow; no flow at time in most years. Greatest flood known occurred on September 28, 1926 (gage height, about 7.28 meters present datum), from flood marks; discharge not determined.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.11	0.12	0.12	0.06	0	0	0	0.07	0	0	0	0
2	.10	.13	.12	.06	0	0	0	8.23	0	0	0	0
3	.11	.15	.11	.06	0	0	0	1.28	0	0	0	0
4	.11	.16	.11	.05	0	0	0	3.37	0	0	0	0
5	.11	.15	.11	.05	0	0	0	3.22	0	0	0	0
6	.10	.13	.11	.05	.01	.01	0	17.3	0	0	0	0
7	.11	.13	.11	.05	.01	0	0	.09	0	0	0	0
8	.11	.13	.11	.04	.01	0	0	.06	0	0	0	0
9	.11	.12	.10	.04	.01	0	0	3.99	0	0	0	0
10	.11	.12	.11	.04	.01	0	0	3.71	.30	0	0	0
11	.12	.12	.10	.03	.01	0	0	5.00	.05	0	0	0
12	.11	.12	.10	.03	.01	0	0	.20	0	0	0	0
13	.11	.12	.10	.03	.01	0	0	0	0	0	0	0
14	.11	.12	.10	.03	0	0	0	.01	0	0	0	0
15	.11	.12	.10	.02	0	0	0	.06	0	0	0	0
16	.12	.12	.09	.02	0	0	0	0	0	0	0	0
17	.12	.12	.10	.02	0	0	0	0	0	0	0	0
18	.12	.11	.10	.02	0	0	0	0	0	0	0	0
19	.12	.11	.10	.02	0	0	.01	.97	0	0	0	0
20	.12	.11	.10	.02	0	0	.01	.12	0	0	0	0
21	.12	.11	.09	.01	0	0	.75	.01	0	0	0	0
22	.12	.12	.09	.01	0	0	.16	0	0	0	0	0
23	.12	.12	.09	.01	0	0	.16	0	0	0	0	0
24	.12	.12	.09	.01	0	0	.15	0	0	0	0	0
25	.12	.12	.09	.01	0	0	5.49	0	0	0	0	0
26	.12	.12	.09	.01	0	0	1.92	0	0	0	0	0
27	.12	.12	.08	.01	0	0	8.94	0	0	0	0	0
28	.13	.12	.08	.01	0	0	6.76	0	0	0	0	0
29	.14	.07	.01	.01	0	0	16.8	0	0	0	0	0
30	.13	.07	.01	.01	0	0	.29	0	0	0	0	0
31	.12	.07	.01	.01	0	0	.26	0	0	0	0	0
Sum	3.60	3.46	3.01	0.84	0.08	0.01	41.70	47.69	0.35	0	0	0

Current Year 2002

Period 1951-2002

Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.	0.630		29	0.15			0.12	311	2,278	35,987	3.2
Feb.	.635		4	.17			.12	299	966	8,343	3.7
Mar.	.630		10	.16			.10	260	837	9,129	16.4
April	.595		1	.07			.03	72.6	200	1,282	0
May	.590		10	.01			0	6.9	65.0	502	0
June	.590		6	.01			0	.9	207	3,631	0
July	3.010		29	111			1.35	3,603	5,382	21,263	0
Aug.	2.705		6	87.2			1.54	4,120	8,816	44,860	204
Sept.	1.165		10	5.24			.01	30.2	1,962	20,160	1.7
Oct.	.685		1	0			0	0	2,761	58,371	0
Nov.	.705		1	0			0	0	812	19,006	0
Dec.	.715		2	.01			0	0	1,885	31,428	0
Yearly	3.010			111			0.28	8,704	26,171	80,483	5,427

φ Mean daily

! And other days

09-4800.00 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, 4.0 kilometers northeast of Lochiel, Arizona, and 2.7 kilometers 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 1,408 meters.

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 2002.

REMARKS: There are small diversions by ground water pumping for irrigating about 80.9 hectares above this station.

EXTREMES: Maximum discharge, 362 CMS on August 15, 1984, (gage height 3.19 meters); minimum discharge, no flow for several days of many years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.02	0.02	0.02	0.01	0.01	0.01	0	0	0.01	0	0.01	0.01
2	.02	.02	.03	.01	.01	.01	0	0	.01	0	.01	.01
3	.02	.02	.03	.01	.01	.01	0	0	.01	0	.01	.01
4	.02	.02	.03	.01	.01	0	0	0	0	0	.01	.01
5	.01	.02	.02	.01	.01	0	0	0	0	0	.01	.01
6	.02	.02	.02	.01	.02	0	0	0	0	0	.01	.01
7	.02	.01	.02	.01	.02	0	0	0	0	0	.01	.01
8	.02	.02	.02	.01	.01	0	0	0	0	0	.01	.01
9	.02	.02	.02	.01	.01	0	0	0	0	0	.01	.01
10	.02	.02	.02	.01	.01	0	0	0	.01	0	.01	.01
11	.02	.01	.02	.01	.01	0	0	0	.01	0	.01	.01
12	.02	.02	.02	.01	.01	0	0	0	.01	0	.01	.01
13	.02	.02	.02	.01	.01	0	0	0	.01	0	.01	.01
14	.02	.02	.02	.01	.01	0	0	0	.01	0	.01	.01
15	.02	.01	.01	.01	.01	0	0	0	0	0	.01	.01
16	.02	.01	.01	.01	.01	0	0	0	.01	0	.01	.01
17	.02	.02	.01	.01	.01	0	0	0	.01	0	.01	.01
18	.01	.02	.01	.01	.01	0	0	.01	.01	0	.01	.01
19	.01	.02	.01	.01	.01	0	0	.01	.01	0	.01	.01
20	.01	.02	.01	.01	.01	0	0	.01	0	0	.01	.01
21	.01	.02	.01	0	.01	0	0	0	0	.01	.01	.01
22	.01	.02	.01	.01	.01	0	0	0	0	.01	.01	.01
23	.01	.02	.01	.01	.01	0	0	0	0	.01	.01	.01
24	.01	.03	.02	.01	.01	0	0	0	0	0	.01	.01
25	.01	.03	.02	.01	.01	0	0	0	0	0	.01	.01
26	.01	.03	.01	.01	.01	0	0	0	0	.01	.01	.01
27	.01	.03	.01	.02	.01	0	0	0	0	.01	.01	.01
28	.01	.03	.02	.02	.01	0	0	0	0	.01	.01	.01
29	.02	.02	.02	.01	.01	0	0	0	0	.01	.01	.01
30	.02	.02	.02	.01	.01	0	0	0	0	.01	.01	.01
31	.01	.02	.02	.01	.01	0	0	0	.01	0	.01	.01
Sum	0.49	0.57	0.54	0.31	0.33	0.03	0	0.03	0.12	0.09	0.30	0.31

Current Year 2002							Period 1949-2002				
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters			
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum
Jan.			! 1	0.02	! 5	0.01	0.02	42.3	344	8,822	1.6
Feb.			! 24	.03	! 7	.01	.02	49.2	124	1,233	2.2
Mar.			! 2	.03	! 15	.01	.02	46.7	137	2,594	.9
April			! 27	.02	! 21	0	.01	26.8	65.0	638	0
May			! 6	.02	! 1	.01	.01	28.5	34.0	210	0
June			! 1	.01	! 4	0	0	2.6	24.0	208	0
July			! 1	0	! 1	0	0	0	592	5,267	0
Aug.			! 18	.01	! 1	0	0	2.6	1,124	14,207	.1
Sept.			! 1	.01	! 4	0	0	10.4	346	3,249	0
Oct.			! 21	.01	! 1	0	0	7.8	355	5,837	0
Nov.			! 1	.01	! 1	.01	.01	25.9	93.0	1,185	0
Dec.			! 1	.01	! 1	.01	.01	26.8	140	1,348	0
Yearly				0.03		0	0.01	270	3,378	21,433	155

φ Mean daily ! And other days

09-4805.00 SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 8.9 kilometers east of Nogales, Arizona, 1.3 kilometers downstream from the international boundary and 9.7 kilometers upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 1,128.535 meters above mean sea level, U. S. C. & G. S. datum (Levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. 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 2002.

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 2002.

EXTREMES: Maximum discharge, 949 CMS on October 9, 1977 (gage height 4.725 meters); minimum discharge, no flow for several days of many years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 2002 --- ANNUAL AND PERIOD SUMMARY

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.03	0.01	0	0	0	0	0	0	0	0	0	0
2	.02	.01	0	0	0	0	0	0	0	0	0	0
3	.02	.01	0	0	0	0	0	0	0	0	0	0
4	.02	.01	0	0	0	0	0	.20	0	0	0	0
5	.02	.01	0	0	0	0	0	.77	0	0	0	0
6	.02	.01	0	0	0	0	0	1.70	0	0	0	0
7	.02	.02	0	0	0	0	0	.04	0	0	0	0
8	.02	.01	0	0	0	0	0	.03	0	0	0	0
9	.02	.02	0	0	0	0	0	.01	0	0	0	0
10	.02	.01	0	0	0	0	0	0	1.45	0	0	0
11	.02	.01	0	0	0	0	0	0	.12	0	0	0
12	.02	.01	0	0	0	0	0	0	.03	0	0	0
13	.02	.01	0	0	0	0	0	0	.02	0	0	0
14	.02	.01	0	0	0	0	0	0	.02	0	0	0
15	.02	.01	0	0	0	0	0	0	.01	0	0	0
16	.02	.01	0	0	0	0	0	.19	.01	0	0	0
17	.02	0	0	0	0	0	0	0	.01	0	0	0
18	.02	.01	0	0	0	0	0	2.36	0	0	0	0
19	.02	.01	0	0	0	0	0	.42	0	0	0	0
20	.03	.01	0	0	0	0	0	.06	0	0	0	0
21	.03	.01	0	0	0	0	0	.05	0	0	0	0
22	.03	.01	0	0	0	0	0	.05	0	0	0	0
23	.03	.01	0	0	0	0	0	.04	0	0	0	0
24	.03	.01	0	0	0	0	0	.05	0	0	0	0
25	.02	.01	0	0	0	0	0	.02	0	0	0	0
26	.01	.01	0	0	0	0	.38	0	0	0	0	0
27	.01	.01	0	0	0	0	.03	0	0	0	0	0
28	.01	0	0	0	0	0	0	0	0	0	0	0
29	.01	0	0	0	0	0	0	0	0	0	0	0
30	.01	0	0	0	0	0	0	0	0	0	0	0
31	.01	0	0	0	0	0	0	0	0	0	0	0
Sum	0.62	0.28	0	0	0	0	0.41	5.99	1.67	0	0	0
Current Year 2002									Period 1936-2002			
Month	Extreme Gage Meters		Extreme-Cubic Meters per Second				Average	Volume-Thousand Cubic Meters				
	High	Low	Day	φ High	Day	φ Low		Total	Average	Maximum	Minimum	
Jan.			! 1	0.03	! 26	0.01	0.02	53.6	2,852	37,352	0	
Feb.			! 7	.02	! 17	0	.01	24.2	2,118	25,344	0	
Mar.			! 1	0	! 1	0	0	0	1,834	24,145	0	
April			! 1	0	! 1	0	0	0	594	4,263	0	
May			! 1	0	! 1	0	0	0	134	1,272	0	
June			! 1	0	! 1	0	0	0	91.2	1,787	0	
July			26	.38	! 1	0	.01	35.4	2,851	19,255	0	
Aug.			18	2.36	! 1	0	.19	518	6,072	56,481	12.1	
Sept.			10	1.45	! 1	0	.06	144	1,702	111,633	0	
Oct.			! 1	0	! 1	0	0	0	2,357	72,806	0	
Nov.			! 1	0	! 1	0	0	0	761	12,180	0	
Dec.			! 1	0	! 1	0	0	0	2,748	41,405	0	
Yearly				2.36		0	0.02	775	24,114	108,071	775	

φ Mean daily

! And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: One 61-centimeter Parshall flume with a water-stage recorder is located at the international boundary for measuring raw wastewater from Nogales, Sonora. The plant influent and effluent flows are measured by flow meters and recorded on individual chart recorders and continuous totalizers. The Nogales Wash Pumping Plant flows are contaminated surface waters from Mexico captured in the U.S. and pumped into the international sewer trunk line downstream of the influent recorder. Flows determined by pump hour clocks. The Nogales International Treatment Plant is located adjacent to I-19, approximately 14.5 kilometers north of the international boundary, all within the City of Nogales, Santa Cruz County, Arizona.

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 2002.

REMARKS: Nogales International Treatment Plant treats combined sewage from both Nogales, Arizona and Nogales Sonora by means of aerated stabilization lagoons. In February 1991, a plant expansion was completed which increased the capacity to 65.1 thousand cubic meters per day. Ultraviolet disinfected effluent is discharged directly into the Santa Cruz River. Prior to the expansion, the plant capacity was 31.0 thousand cubic meters per day and chlorinated effluent was discharged directly to the Santa Cruz River. Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately 3.2 kilometers north of the international boundary.

Month	Total Monthly Flows Thousand Cubic Meters				Daily Flows—Thousand Cubic Meters Per Day					
	U.S.	Mexico	Plant*	Total	Current Year 2002			Period 1952–2002		
					Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	599	1,198	0	1,797	66.3	50.4	58.0	93.0	2.5	25.7
Feb.	606	1,092	0	1,698	71.5	56.6	60.7	80.4	2.5	26.4
Mar.	638	1,188	0	1,826	61.8	52.8	58.9	85.7	2.8	26.2
April	626	1,054	0	1,680	59.7	52.3	56.0	87.9	2.6	24.8
May	718	931	0	1,649	56.5	50.8	53.2	69.2	2.1	23.4
June	710	762	0	1,472	53.9	45.5	49.1	64.9	2.6	21.9
July	786	760	0	1,546	59.1	45.2	49.9	68.1	2.6	22.7
Aug.	695	1,086	0	1,781	68.9	50.7	57.5	75.6	2.8	24.5
Sept.	626	1,103	0	1,729	66.2	51.5	57.6	67.9	3.0	25.7
Oct.	571	1,192	0	1,763	59.0	53.2	56.8	87.2	2.6	26.0
Nov.	525	1,176	0	1,701	66.6	53.8	56.6	84.7	3.0	25.7
Dec.	570	1,189	0	1,759	68.2	49.3	56.8	75.9	1.3	25.8
Yearly	7,670	12,731	0	20,401	71.5	45.2	55.9	93.0	1.3	24.9

* Nogales Wash Pumping Plant

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED
IN MILLIMETERS

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 Plant 6N, Arizona		Brush Hill, Arizona	
	2002	Average 1973-2002	2002	Average 1930-2002	2002	Average 1930-2002	2002	Average 1953-2002	2002	Average 1994-2002
Jan.	22	41	15	32	9	33	8	29	22	20
Feb.	35	37	17	28	8	28	7	22	24	37
Mar.	0	32	0	23	0	24	0	23	1	20
April	0	14	0	11	0	11	0	10	0	19
May	0	8	0	4	0	5	0	6	0	6
June	0	15	0	19	0	12	0	12	0	27
July	133	117	96	104	113	109	59	111	112	94
Aug.	97	108	64	106	47	105	72	106	69	119
Sept.	36	56	50	44	43	44	25	39	23	45
Oct.	0	36	17	28	6	29	1	34	3	37
Nov.	22	24	2	21	11	21	13	17	13	29
Dec.	40	40	27	36	28	37	19	36	32	38
Yearly	385	528	288	456	265	458	204	445	299	491

LOCATION OF RAINFALL STATIONS ON THE SANTA CRUZ RIVER WATERSHED

The precipitation records of the stations listed alphabetically below begin on the date shown and extend through 2002

IN THE UNITED STATES

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (Meters)	RECORD BEGAN	OBSERVER
Brush Hill, Arizona	S	31° 29'	110° 42'	1,426	July 1994	Sonny & Nancy McCuiston
Canelo, Arizona	S	31° 33'	110° 32'	1,527	1930	R. E. Ewing
Nogales Sanitation Plant 6N, Arizona	S	31° 25'	110° 57'	1,085	June 1952	I. B. & W. C.
Patagonia, Arizona	S	31° 33'	110° 45'	1,277	1930	George R. Proctor
San Rafael #2, Arizona	S	31° 22'	110° 38'	1,481	Jan. 1973	I. B. & W. C.

S Standard 203 millimeter rain gage

TEMPERATURE IN THE SANTA CRUZ RIVER BASIN
IN DEGREES CELSIUS

Tabulated below are monthly records of temperature at the station located at the Nogales Sanitation Plant in Arizona 14.5 kilometers north of the international boundary. On December 18, 1971, the station was moved to correspond with a new Nogales Sanitation Plant. Prior to this date, the station was located 3.2 kilometers 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 - 9N consists of a standard 203-millimeter rain gage and maximum and minimum thermometer. The collection of data for mean relative humidity, evaporation, and mean wind speed was discontinued in 1984.

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

Month	Nogales Sanitation Plant - 9N		
	2002		
	Mean	Max.	Min.
Jan.	7.7	26.7	-8.9
Feb.	9.2	28.3	-8.9
Mar.	10.6	29.4	-10.0
April	17.3	33.3	-1.1
May	18.7	38.3	1.1
June	25.4	41.7	5.6
July	26.4	39.4	12.8
Aug.	25.7	38.3	9.4
Sept.	23.9	36.7	8.9
Oct.	16.4	32.2	-0.6
Nov.	12.4	29.4	-4.4
Dec.	7.1	23.3	-7.2
Yearly	16.7	41.7	-8.3

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

2002

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 Natural Resource Conservation Service at Douglas, Arizona and estimated from aerial photographs.

Designation of Areas	Drainage Basin-Square Kilometers			Irrigated Areas-Hectares		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River: Above Lochiel, Arizona Gaging Station	212	0	212	40	0	40
Above El Cajon, Mexico Gaging Station	464	324	788	40	952	992
Above Nogales, Arizona Gaging Station	479	901	1,380	40	1,091	1,131
San Pedro River: Above Palominas, Arizona Gaging Station	238	*1,621	1,859	578	1,400	1,978
Whitewater Draw: Above Douglas, Arizona Gaging Station	2,650	0	2,650	8,634	0	8,634

* An additional 122 square kilometers in Mexico is tributary to the San Pedro River downstream from this station.