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WESTERN WATER BULLETIN 1987

**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

1987

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FOREWORD

This bulletin is the twenty-eighth 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 1987.

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

COLORADO RIVER BELOW IMPERIAL DAM

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

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

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects; and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's scheduled deliveries of waters of the Colorado River, which in 1987 amounted to 1,700,000 acre-feet, in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 1987.

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

TIJUANA RIVER BASIN

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

WHITWATER DRAW NEAR DOUGLAS, ARIZONA

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

FOREWORD

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

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

SANTA CRUZ RIVER NEAR NOGALES AND LOCHIEL, ARIZONA

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

ACKNOWLEDGMENTS

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

UNITS OF MEASURE

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

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

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

GENERAL HYDROLOGIC CONDITIONS FOR 1987

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 1987. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1987 measured at 5 index stations was 1.81 inches, compared to an average of 2.80 inches during the last 29 years (1959 to 1987).

The flow of the Colorado River reaching Imperial Dam was 6,472,900 acre-feet, about 76% of the 53-year average (1935-1987) of 8,479,647 acre-feet. At the northerly international boundary, the total flow of the river during 1987 was 4,530,067 acre-feet, about 108% of the 1935-1987 average of 4,194,515 acre-feet. At the southerly international boundary, the flow during 1987 was 2,537,399 acre-feet, or about 83% of the 1935-1987 average of 3,073,284 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1987 amounted to 4,747,982 acre-feet, 101% of the 1935-1987 average of 4,721,673 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, 5) in the Wellton-Mohawk Bypass Drain at the southerly land boundary near San Luis, Arizona, and 6) the 242 Well Field near San Luis, Arizona.

During 1987, other waters arrived at the Mexican points of diversion and amounted to 119,274 acre-feet. These waters consisted mainly of excess waters released from reservoirs on the Colorado River. A maximum instantaneous flow of 19,000 second-feet occurred in the Colorado River at the northerly boundary station on January 1, 1987.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 26,616,100 acre-feet, 93% of the usable capacity of 28,588,400 acre-feet. The greater part (24,553,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1987 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1987 was 1,203,320 acres; 673,470 acres in the United States and 529,850 acres in Mexico. An estimated 33% of acreage in Mexico is served by pumping from ground water.

TIJUANA RIVER BASIN

During 1987, the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 61.2 degrees, 0.2 degree below the 57-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 4,429 feet), the recorded temperatures during the year averaged 54 degrees, equal to the long-term average; and at Rodriguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 63 degrees, 2 degrees below the normal for many years.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 18.88 inches, 106% of normal; and at Chula Vista near the lower end of the basin, it was about 9.17 inches, or 93% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico, was 21.77 inches, approximately 106% of the normal during the 24-year period; and at Rodriguez Dam in the lower portion of the basin in Mexico, 14.45 inches, 165% of the 50-year average.

Runoff above Barrett and Rodriguez Reservoirs during 1987 averaged more than 21% of normal. Above Morena Reservoir the runoff was 5,944 acre-feet, or about 55% of the 51-year 1937-1987 mean of 10,790 acre-feet. Above Barrett Reservoir the runoff was 2,021 acre-feet, or about 16% of the 51-year 1937-1987 mean of 12,410 acre-feet. At Rodriguez Reservoir, the runoff was 1,458 acre-feet, or about 6% of the 50-year mean of 23,648 acre-feet.

The flow of the Tijuana River at the international boundary was 15,235 acre-feet during 1987.

WHITewater DRAW

During 1987, the average annual temperature over the watershed was 0.4 degree below normal, while the annual precipitation was 106% of normal. Runoff for the year at the gaging station near Douglas, Arizona, of 2,181 acre-feet, was about 35% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1987

SAN PEDRO RIVER

During 1987, the average annual temperature was 0.6 degree below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 112% of the 1961-1987 mean of 21.26 inches. The stream flow at Palominas, Arizona, was 7,644 acre-feet, 33% of the 1951-1987 normal.

SANTA CRUZ RIVER

During 1987, the average annual temperature over the watershed was somewhat below normal, and the annual precipitation was about 123% of the 49-year 1939-1987 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 6,440 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 701 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 5,739 acre-feet from the loop of the river lying in Mexico, or approximately 89% of the flow reaching the Nogales station.

ALAMO AND NEW RIVERS

During 1987, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 73.4 degrees, 1.2 degrees above normal; and over the drainage area of the New River, as recorded at Mexicali, Baja California, it was 70 degrees, 2 degrees below the 62-year average.

At El Centro, the precipitation was 2.24 inches, about 82% of the 57-year average; and in Mexicali, the annual precipitation was 1.89 inches, 59% of the 62-year average. The total flow of the New River at the international boundary in 1987 was 250,858 acre-feet, which was about 234% of the 1943-1987 average.

SALTON SEA

During 1987, the average annual temperature around the Salton Sea was 0.6 degree below the long-term average, while the annual precipitation recorded at Brawley, California was approximately 87% of the long-term mean of 2.73 inches. The water surface of the Salton Sea remained more or less the same during the year. The maximum stage 227.1 feet below mean sea level, was recorded on May 4-18, 1987, inclusive. The minimum stage, 228.3 feet below mean sea level, was recorded on September 27-30, 1987, inclusive.

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

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

RECORDS: Based on current meter measurements and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	70	78	82	78	75	68	69	71	71	46	84	81
2	70	79	82	76	75	71	71	71	71	49	82	74
3	70	79	82	79	74	69	74	71	73	47	78	79
4	70	80	85	77	72	68	73	70	71	44	69	74
5	70	80	82	76	72	68	74	72	69	44	64	74
6	71	80	84	75	72	70	72	75	71	49	65	73
7	71	80	85	77	72	74	79	80	69	66	59	72
8	71	80	80	79	72	70	77	73	67	70	64	75
9	72	80	78	83	72	71	73	72	68	80	72	71
10	72	80	78	82	72	72	73	71	66	89	73	70
11	73	80	78	84	72	72	71	76	69	80	68	72
12	73	80	77	83	72	74	73	72	69	84	73	72
13	73	80	78	84	72	73	75	71	67	93	82	70
14	73	80	80	85	72	71	79	72	68	82	86	75
15	74	80	82	82	72	66	78	74	69	81	77	69
16	74	80	85	83	72	65	74	74	65	59	77	70
17	74	80	81	87	72	68	85	74	68	49	75	72
18	74	80	80	91	72	69	77	80	65	47	78	74
19	75	80	82	90	72	71	75	79	64	52	75	71
20	75	80	83	88	72	73	77	79	66	50	77	69
21	75	80	79	94	72	70	75	76	65	46	76	67
22	76	80	79	80	72	69	72	79	60	51	77	74
23	76	81	78	77	72	69	75	73	55	52	74	69
24	76	81	78	78	72	67	76	72	51	55	77	68
25	76	81	77	78	72	69	80	72	47	62	76	67
26	77	82	77	77	72	82	81	75	44	61	76	63
27	77	82	78	77	72	76	78	75	44	53	75	63
28	77	82	81	75	72	72	77	73	43	55	76	62
29	77	78	79	72	71	86	73	45	65	76	64	64
30	78	76	76	76	72	69	73	75	45	55	78	62
31	78	78	78	78	72	72	72	75	45	62	78	62
Sum	2,288	2,245	2,483	2,430	2,240	2,117	2,344	2,295	1,865	1,878	2,239	2,178
Current Year 1987										Period 1937-1987		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			130	78	1	1	70	74	4,538	3,216	4,780	877
Feb.			126	82	1	1	78	80	4,453	3,020	4,453	563
Mar.			1	85	30	76	80	80	4,925	3,737	5,250	1,240
Apr.			21	94	1	6	75	81	4,820	3,743	5,250	1,160
May			1	75	1	4	72	72	4,443	3,825	5,590	992
June			26	82	16	65	71	71	4,199	3,700	5,580	885
July			29	86	1	69	76	76	4,649	3,959	6,550	816
Aug.			1	80	4	70	74	74	4,552	3,964	6,810	861
Sept.			3	73	28	43	62	62	3,699	3,742	6,220	889
Oct.			13	93	1	4	44	61	3,725	3,810	5,740	1,040
Nov.			14	86	7	59	75	75	4,441	3,551	5,490	994
Dec.			1	81	128	62	70	70	4,320	3,422	4,960	966
Yearly				94		43	73		52,764	43,689	63,700	12,840
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				2.66		1.22	2.07		65,083	53,890	78,573	15,838

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

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	18	15	11	25	16	12	12	13	28	1,140	457
2	11	15	14	11	16	16	13	12	10	24	1,110	268
3	11	12	13	14	17	15	13	11	11	42	1,110	368
4	11	14	13	19	22	15	13	11	14	9.0	1,020	368
5	19	13	13	15	16	14	13	11	9.6	61	889	133
6	18	14	13	15	16	14	13	11	10	319	574	463
7	12	12	13	15	16	14	13	11	9.2	608	374	482
8	12	12	13	15	15	14	13	11	9.2	945	382	704
9	11	12	16	15	15	14	11	16	10	1,010	401	667
10	11	12	15	14	18	14	13	11	10	1,010	226	438
11	10	13	14	15	21	14	16	11	9.9	1,000	19	531
12	9.9	12	14	16	16	15	12	13	13	996	31	538
13	9.7	12	14	14	15	17	12	11	9.5	997	28	560
14	9.4	12	14	14	14	15	12	11	13	993	30	549
15	9.3	12	14	14	17	14	12	11	14	990	151	535
16	9.2	12	13	14	13	14	15	11	12	615	134	529
17	8.9	11	12	14	11	17	23	11	12	602	64	725
18	8.5	11	15	14	8.8	16	14	10	10	665	52	825
19	8.9	11	13	14	8.1	16	13	11	10	736	34	825
20	11	9.5	16	14	7.7	16	18	10	11	651	61	831
21	8.5	10	16	13	7.2	19	19	15	10	594	143	815
22	8.4	13	13	13	20	19	15	13	11	628	135	761
23	8.1	12	13	13	13	13	19	11	86	706	41	781
24	8.2	91	13	13	13	11	13	11	15	713	96	790
25	7.8	61	12	13	13	15	15	10	11	755	31	832
26	8.3	56	12	13	14	11	13	10	13	706	46	782
27	8.0	61	12	13	13	11	13	17	11	612	46	785
28	8.7	20	12	13	15	12	13	30	11	600	54	702
29	8.7		12	13	16	11	14	18	10	711	194	576
30	10		11	13	17	16	21	11	19	776	352	598
31	16		11		17		12	11		837		633
Sum	322.5	573.5	414	417	465.8	438	481	384	417.4	19,939.0	8,968	18,511
Current Year 1987										Period 1935-1987		
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			5	19	25	7.8	10	640	45,664	110,700	446	
Feb.			24	91	20	9.5	20	1,138	40,085	89,140	360	
Mar.			19	16	130	11	13	821	39,633	90,190	357	
Apr.			4	19	11	11	14	827	40,086	86,580	326	
May			1	25	21	7.2	15	924	47,988	88,280	333	
June			121	19	124	11	15	869	41,967	86,960	342	
July			17	23	9	11	14	875	39,223	91,220	369	
Aug.			28	30	118	10	12	762	39,769	89,890	369	
Sept.			23	86	1	9.2	14	828	43,545	83,660	357	
Oct.			19	1,010	4	9.0	643	39,548	41,068	90,050	567	
Nov.			1	1,140	11	19	299	17,788	40,699	101,500	715	
Dec.			25	832	4	68	597	36,716	45,067	108,800	462	
Yearly				1,140		7.2	141	101,736	504,794	1,042,850	6,669	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				32.3	0.20	3.99	125,489	622,653	1,286,335	8,226		

9 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, 1,000 feet (305 m) downstream from the mouth of the Yuma Main Canal Wasteway, 0.6 mile (1.0 km) downstream from the abandoned gaging station on the Colorado River at Yuma, 5.2 miles (8.4 km) downstream from the mouth of the Gila River; 19.6 miles (31.5 km) downstream from Imperial Dam, and 6.4 miles (10.3 km) upstream from the northerly international boundary. Zero of the gage is 101.99 feet (31.09 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1987. Records from January 1951 through September 1963 deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4" and "Yuma Main Canal Wasteway."

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12,100	11,300	7,600	1,780	1,780	1,140	1,310	1,330	2,190	2,020	2,720	1,220
2	11,800	10,700	5,610	1,770	1,750	1,140	1,310	1,300	2,190	2,030	2,700	908
3	11,900	8,030	4,830	1,800	1,740	1,160	1,280	1,360	2,270	1,990	2,760	1,060
4	12,500	7,870	4,190	1,770	1,740	1,150	1,300	1,300	2,230	1,730	2,510	801
5	12,200	7,120	3,310	1,750	1,730	1,170	1,280	1,300	2,130	1,920	2,310	983
6	12,200	6,420	2,670	1,750	1,720	1,150	1,270	1,300	2,090	1,920	1,960	1,290
7	12,200	5,810	2,400	1,760	1,650	1,190	1,280	1,300	2,100	1,820	1,580	1,240
8	11,600	6,470	2,780	1,800	1,650	1,150	1,260	1,320	2,180	2,040	1,630	1,460
9	11,900	5,480	2,630	1,800	1,530	1,230	1,240	1,300	2,110	2,320	1,700	1,560
10	11,800	4,540	1,800	1,780	1,470	1,240	1,270	1,290	2,020	2,020	1,520	1,250
11	12,500	4,610	1,930	1,790	1,330	1,240	1,280	1,270	2,090	2,010	1,360	1,320
12	12,000	4,220	2,220	1,790	1,380	1,240	1,260	1,330	2,160	2,040	1,370	1,340
13	11,700	3,950	1,940	1,770	1,350	1,250	1,320	1,750	2,340	2,790	1,360	1,370
14	12,000	4,870	1,970	1,760	1,270	1,250	1,350	3,040	2,290	2,570	1,270	1,370
15	11,600	4,600	2,420	1,770	1,270	1,250	1,270	3,290	2,190	2,730	1,320	1,360
16	11,500	3,970	1,870	1,770	1,270	1,270	1,230	2,970	2,200	2,350	1,150	1,380
17	11,700	3,660	1,700	1,780	1,250	1,290	1,200	1,660	2,220	2,120	1,130	1,610
18	11,600	3,710	1,890	1,780	1,250	1,280	1,240	1,500	2,230	2,190	1,190	1,720
19	11,800	3,680	1,930	1,780	1,240	1,260	1,280	1,370	2,160	2,270	1,180	1,720
20	11,500	3,530	1,920	1,780	1,250	1,260	1,260	1,300	2,270	2,220	1,220	1,710
21	10,900	3,730	1,940	1,780	1,250	1,260	1,270	1,370	2,270	2,060	1,050	1,670
22	11,200	3,890	1,980	1,790	1,260	1,250	1,270	1,430	2,270	2,350	987	1,630
23	11,800	3,510	1,910	1,850	1,250	1,250	1,290	1,420	2,340	2,220	907	1,590
24	11,600	3,750	1,810	1,790	1,250	1,250	1,250	1,510	2,050	2,200	1,140	1,620
25	11,900	3,580	1,800	1,790	1,330	1,250	1,230	1,560	2,070	2,310	1,060	1,720
26	11,400	3,790	1,790	1,810	1,250	1,050	1,200	1,440	2,140	2,310	1,090	1,650
27	10,900	5,420	1,840	1,780	1,240	963	1,250	1,460	2,110	2,160	1,040	1,620
28	10,400	5,060	1,800	1,790	1,250	802	1,350	1,450	2,060	2,070	978	1,580
29	10,600		1,770	1,780	912	1,110	1,360	2,240	2,160	2,240	1,140	1,450
30	11,200		1,760	1,780	1,020	1,290	1,380	2,210	2,170	2,320	1,410	1,390
31	11,000		1,770		1,180		1,310	2,240		2,490		1,450
Sum		147,270	77,789	53,470	42,812	35,805	39,650	50,910	65,300	67,830	44,742	44,042
	361,000											
Current Year 1987									Period 1951-1987			
Month	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet					
	High	Low	High	Low			Average	Maximum	Minimum			
Jan.	16.13	15.15	11	12,500	28	9,770	11,600	716,033	256,779	1,068,099	29,857	
Feb.	15.84	11.22	11	11,300	12	3,150	5,260	292,106	193,842	995,901	33,790	
Mar.	14.48	9.20	1	8,230	10	1,500	2,510	154,274	196,697	1,073,270	34,604	
Apr.	9.86	9.56	23	1,920	4	1,740	1,780	106,056	182,610	843,010	33,687	
May	9.72	7.87	1	1,830	30	597	1,380	84,916	193,484	863,860	45,872	
June	9.13	7.67	17	1,360	28	509	1,190	71,018	197,505	902,876	33,956	
July	9.34	8.88	129	1,430	17	1,150	1,280	78,645	229,706	1,632,595	34,413	
Aug.	12.76	9.04	15	4,150	4	1,250	1,640	100,978	234,055	1,681,388	33,610	
Sept.	11.08	10.28	23	2,520	124	1,950	2,180	129,521	206,145	1,353,719	43,182	
Oct.	11.79	9.92	13	3,180	8	1,590	2,190	134,539	177,063	1,451,107	34,965	
Nov.	11.35	8.64	3	2,840	22	783	1,490	88,744	179,450	1,047,471	34,832	
Dec.	10.08	8.46	117	1,820	3	725	1,420	87,356	209,937	1,114,550	33,023	
	16.13	7.67		12,500		509		2,820	2,457,273	10,592,467	513,755	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	4.92	2.34		354		14.4	79.9	2,521,463	3,030,997	13,065,596	633,707	

Ø Mean daily

! And other days

09-5211.00 COLORADO RIVER BELOW YUMA MAIN CANAL WASTEWAY
AT YUMA, ARIZONA - STAGES

(See Preceding Page For Description)

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.94	15.75	14.24	9.63	9.65	8.81	9.06	9.18	10.52	10.49	11.22	9.26
2	15.82	15.59	13.34	9.61	9.61	8.81	9.07	9.13	10.53	10.50	11.18	8.79
3	15.81	14.60	12.94	9.66	9.60	8.83	9.02	9.22	10.65	10.45	11.24	8.98
4	16.03	14.67	12.44	9.61	9.62	8.81	9.05	9.12	10.60	10.12	10.96	8.61
5	15.92	14.44	11.53	9.58	9.61	8.84	9.02	9.13	10.47	10.36	10.72	8.89
6	15.89	14.13	10.82	9.58	9.60	8.80	9.02	9.13	10.42	10.36	10.28	9.34
7	15.87	13.77	10.48	9.60	9.50	8.96	9.03	9.13	10.43	10.23	9.80	9.27
8	15.65	14.12	10.98	9.67	9.51	8.79	9.00	9.15	10.55	10.50	9.87	9.59
9	15.72	13.55	10.81	9.66	9.32	8.92	8.99	9.13	10.46	10.84	9.96	9.73
10	15.68	12.94	9.69	9.64	9.24	8.94	9.03	9.11	10.34	10.49	9.71	9.27
11	15.91	12.99	9.91	9.65	9.01	8.93	9.05	9.08	10.44	10.47	9.47	9.37
12	15.72	12.52	10.36	9.65	9.12	8.93	9.03	9.17	10.55	10.51	9.49	9.40
13	15.60	12.25	9.98	9.61	9.07	8.95	9.14	9.84	10.79	11.38	9.48	9.44
14	15.68	13.15	10.07	9.59	8.95	8.95	9.19	11.59	10.73	11.13	9.35	9.43
15	15.53	12.96	10.71	9.61	8.95	8.96	9.06	11.87	10.60	11.32	9.42	9.41
16	15.52	12.27	9.94	9.61	8.95	8.98	9.00	11.49	10.62	10.87	9.17	9.44
17	15.61	11.89	9.68	9.62	8.93	9.02	8.96	9.71	10.65	10.61	9.13	9.78
18	15.59	11.96	9.99	9.63	8.94	9.00	9.03	9.45	10.66	10.69	9.23	9.94
19	15.67	11.92	10.05	9.63	8.93	8.97	9.08	9.24	10.58	10.79	9.22	9.94
20	15.59	11.74	10.02	9.63	8.95	8.97	9.05	9.13	10.74	10.72	9.28	9.92
21	15.37	11.98	10.04	9.63	8.96	8.97	9.06	9.24	10.74	10.53	9.03	9.86
22	15.50	12.18	10.07	9.65	8.98	8.96	9.07	9.33	10.74	10.88	8.94	9.80
23	15.76	11.71	9.96	9.75	8.98	8.95	9.09	9.32	10.83	10.71	8.83	9.74
24	15.72	12.02	9.77	9.65	8.97	8.98	9.03	9.46	10.44	10.69	9.17	9.78
25	15.82	11.81	9.75	9.65	9.12	8.95	9.00	9.55	10.44	10.81	9.05	9.92
26	15.68	12.09	9.72	9.68	8.99	8.64	8.97	9.35	10.52	10.80	9.09	9.83
27	15.51	13.55	9.78	9.63	8.97	8.48	9.04	9.39	10.48	10.61	9.01	9.78
28	15.32	13.39	9.71	9.65	9.00	8.19	9.20	9.38	10.39	10.50	8.92	9.72
29	15.44		9.64	9.64	8.43	8.72	9.22	10.59	10.51	10.69	9.15	9.53
30	15.67		9.61	9.64	8.61	9.03	9.26	10.56	10.51	10.78	9.54	9.44
31	15.61		9.62		8.87		9.14	10.60		10.97		9.53
Avg.	15.68	13.07	10.50	9.63	9.13	8.87	9.06	9.64	10.56	10.67	9.63	9.51

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

DESCRIPTION: Venturi meter with recorder 0.3 mile (0.5 km) from outlet to Colorado River, 0.5 mile (0.8 km) west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 1.7 miles (2.7 km) downstream from the mouth of Yuma Main Canal Wasteway.
RECORDS: Records are furnished by U. S. Geological Survey. Monthly discharge July 1970 through 1987. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.
REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26	18	17	10	33	34	33	32	20	23	34	34
2	26	18	17	13	33	34	33	32	20	23	34	34
3	26	18	17	11	33	34	33	32	20	23	34	34
4	26	18	17	11	33	34	31	32	20	23	34	34
5	26	18	17	11	33	34	33	32	20	23	34	34
6	26	18	5.0	11	33	34	30	32	20	23	34	34
7	26	18	0	11	33	34	30	32	20	26	34	34
8	26	18	0	11	33	34	30	32	20	28	34	30
9	26	18	0	11	33	34	30	32	20	28	34	31
10	26	18	0	11	33	34	30	32	20	28	34	34
11	26	18	0	11	33	34	30	32	20	28	34	34
12	26	18	0	11	33	34	30	32	20	28	13	34
13	26	18	0	11	33	34	30	32	20	28	29	34
14	26	18	0	11	33	34	30	32	18	28	34	34
15	26	18	0	13	33	30	32	32	20	28	34	34
16	26	18	0	12	33	32	32	32	21	28	34	34
17	26	24	0	15	33	34	33	36	22	28	34	34
18	26	24	0	15	33	34	33	39	10	28	30	34
19	26	24	0	15	33	34	33	39	0	28	32	34
20	26	24	0	15	33	34	36	39	0	28	34	34
21	10	21	0	12	33	34	37	39	0	25	34	34
22	0	17	0	12	33	34	33	39	10	31	34	34
23	0	17	0	25	33	34	36	39	19	33	34	34
24	0	17	0	29	33	34	37	39	20	33	34	34
25	0	17	0	29	33	34	37	39	23	33	34	34
26	0	17	0	26	33	34	37	39	23	33	34	34
27	0	17	0	23	33	34	37	39	23	33	34	34
28	11	17	0	23	33	34	36	39	23	33	34	34
29	18	0	0	23	33	34	36	25	23	33	14	34
30	18	0	0	27	33	34	37	21	23	33	0	34
31	18	0	0	33	33	34	35	21	23	33	0	34

Sum	595	524	90.0	469	1,023	1,014	1,030	1,044	538	881	934	1,047
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Month	Current Year 1987						Period 1971-1987				
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.1	26	122	0	19	1,180	2,397	5,840	0		
Feb.	1.17	24	122	17	19	1,039	2,283	4,830	0		
Mar.	1.1	17	1.7	0	2.9	179	2,587	5,430	4.0		
Apr.	1.24	29	1	10	16	930	2,494	5,120	242		
May	1.1	33	1.1	33	33	2,029	2,503	4,933	0		
June	1.1	34	15	30	34	2,011	2,289	4,828	0		
July	1.21	37	1.6	30	33	2,043	2,582	5,510	692		
Aug.	1.18	39	130	21	34	2,071	2,805	6,000	180		
Sept.	1.23	33	1.1	23	18	1,067	2,787	5,880	0		
Oct.	1.1	34	30	0	28	1,747	2,753	5,360	157		
Nov.	1.1	34	8	30	31	1,853	2,810	5,290	313		
Dec.	1.1	34	8	30	34	2,077	2,952	5,970	0		
Yearly			39	0	25	18,226	31,242	58,680	1,753		
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
			1.10	0	0.71	22,481	38,536	72,381	2,162		

0 Mean daily 1 And other days

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

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

RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13	13	13	11	11	13	14	14	16	15	15	9.9
2	13	13	13	11	11	13	14	14	16	15	16	9.8
3	13	13	13	11	11	13	14	14	16	15	16	9.7
4	13	13	13	11	11	13	14	15	16	15	15	9.6
5	13	13	12	11	11	13	14	15	16	16	15	9.5
6	13	13	12	11	11	13	14	15	16	16	15	9.4
7	13	13	12	11	11	13	14	16	16	16	14	9.3
8	13	13	12	11	12	13	15	16	16	16	14	9.2
9	13	13	12	11	12	13	15	17	16	16	13	9.1
10	13	13	12	11	12	13	15	17	16	16	13	9.0
11	13	13	11	11	12	13	15	17	16	16	13	8.9
12	13	13	11	11	12	13	15	18	16	16	12	8.9
13	13	13	11	11	12	13	15	18	16	16	12	8.8
14	13	13	11	11	12	13	15	18	16	16	12	8.7
15	13	13	11	11	12	13	15	18	16	16	12	8.6
16	13	13	10	11	12	14	15	18	16	16	12	8.5
17	13	13	10	11	12	14	15	17	15	16	12	8.4
18	13	13	10	11	12	14	15	17	15	15	12	8.3
19	13	13	10	11	12	14	15	17	15	15	11	8.2
20	13	13	10	11	12	14	14	17	15	15	11	8.1
21	13	13	10	11	12	14	14	17	15	14	11	8.0
22	13	13	10	11	12	14	14	17	15	14	11	7.9
23	13	13	10	11	12	14	14	17	15	14	11	7.8
24	13	13	10	11	13	14	14	17	15	13	11	7.8
25	13	13	10	11	13	14	14	16	15	13	11	7.8
26	13	13	10	11	13	14	14	16	15	13	11	7.8
27	13	13	10	11	13	14	14	16	15	13	11	7.8
28	13	13	10	11	13	14	13	16	15	12	10	7.8
29	13	13	10	11	13	14	13	16	15	13	10	7.8
30	13	13	10	11	13	14	13	16	15	14	10	7.9
31	13	13	10	11	13	14	13	16	15	15	10	7.9
Sum	403	364	339	330	373	405	442	508	466	461	372	266.2
Current Year 1987										Period 1948-1987		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	1	1	1	13	1	13	13	799	343	899	39.3	
Feb.	1	1	1	13	1	13	13	722	298	746	40.5	
Mar.	1	1	1	13	1	16	10	672	353	853	62.7	
Apr.	1	1	1	11	1	11	11	655	364	1,000	66.8	
May	1	1	1	13	1	11	11	740	379	966	58.3	
June	1	1	1	14	1	13	14	803	397	1,030	67.4	
July	1	1	1	15	1	12	13	877	457	1,260	72.8	
Aug.	1	1	1	16	1	14	16	1,008	504	1,370	73.8	
Sept.	1	1	1	16	1	17	15	924	492	1,350	53.6	
Oct.	1	1	1	16	1	28	12	914	512	1,220	55.3	
Nov.	1	1	1	16	1	12	10	738	458	1,240	57.7	
Dec.	1	1	1	9.9	1	12.3	7.8	528	406	1,050	42.2	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.51		0.22	0.37	11,570	6,122	15,331	955	

0 Mean daily

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

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1987. 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 Rookwood gates.

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

EXTREMES: Maximum mean daily discharge, 9,930 second-feet (281 m³/sec) on December 6, 1985; minimum daily discharge, no flow during long periods.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,840	6,580	8,990	3,810	1,930	1,070	2,820	2,520	1,780	1,500	3,570	565
2	6,000	6,390	9,070	4,140	1,860	1,100	2,170	2,880	2,600	1,500	3,560	1,180
3	6,030	8,950	9,040	3,870	2,860	1,930	2,050	3,190	1,580	1,180	1,660	2,514
4	6,610	8,670	8,630	2,460	1,630	1,520	2,020	2,540	1,530	1,430	1,450	1,220
5	6,230	8,380	8,050	3,460	1,280	1,670	2,770	2,520	1,100	1,740	1,600	2,090
6	5,860	8,460	8,680	3,470	1,180	2,020	2,510	2,680	1,010	1,660	1,090	2,480
7	6,040	8,990	8,990	3,200	1,020	2,340	2,260	3,260	1,200	1,630	1,050	3,373
8	6,060	9,010	9,010	3,690	1,090	1,670	2,180	2,300	2,020	1,400	1,480	2,480
9	6,130	8,890	8,680	3,160	1,300	2,170	2,030	2,950	2,400	1,090	1,790	2,810
10	6,220	8,640	8,320	2,410	2,610	2,350	2,010	3,350	2,050	1,130	1,260	2,370
11	6,380	8,250	8,070	2,350	1,260	1,640	2,010	3,200	2,240	1,520	1,760	3,310
12	5,730	8,050	7,590	2,490	1,870	1,550	2,040	3,130	1,510	1,560	1,150	3,660
13	5,300	8,480	7,600	2,780	2,150	2,400	2,040	3,090	1,250	2,160	952	3,340
14	4,890	8,970	7,770	3,070	1,560	2,380	2,330	3,090	1,420	1,000	983	2,670
15	4,920	8,990	8,320	2,740	1,440	1,620	2,480	2,060	1,340	1,050	944	2,820
16	4,930	8,540	7,490	2,430	1,700	1,650	2,860	1,970	1,990	1,550	968	3,710
17	5,400	8,190	7,020	2,480	3,700	2,920	2,370	2,770	2,000	2,940	964	5,390
18	6,280	8,180	6,550	2,390	2,390	2,420	2,620	2,750	2,000	1,710	999	6,260
19	5,740	7,870	6,300	4,660	2,580	2,500	2,960	3,330	1,840	1,550	1,040	5,950
20	5,300	8,300	5,670	4,000	2,050	2,920	2,670	2,570	1,720	1,750	1,040	6,290
21	5,240	8,850	4,370	2,770	1,400	3,170	2,670	2,520	1,450	1,550	998	6,310
22	5,490	8,960	4,930	2,710	1,650	2,350	2,580	2,750	1,240	1,220	1,000	6,800
23	5,760	8,500	3,610	2,030	1,210	2,620	2,120	2,810	1,640	1,340	1,040	6,290
24	6,120	8,380	3,330	1,780	1,950	2,500	2,110	2,260	2,390	1,090	1,050	6,340
25	6,290	8,370	3,200	1,410	1,480	2,480	2,170	2,960	2,350	1,590	981	5,960
26	5,700	8,830	2,610	1,510	1,980	2,590	2,350	3,080	1,910	1,430	999	6,300
27	5,280	9,010	2,480	1,110	2,760	2,760	2,480	2,850	1,490	1,370	998	6,520
28	5,280	9,030	2,080	1,360	2,680	3,090	2,780	2,610	1,460	1,770	998	5,090
29	5,060		3,230	1,870	1,900	3,450	3,430	1,720	1,650	2,000	998	4,380
30	5,360		3,900	1,970	1,220	3,880	3,100	1,620	1,900	3,720	769	4,510
31	5,850		3,130		1,350		3,330	1,850		3,600		5,010
Sum		236,710		81,580		68,930	76,120	83,180	52,060	51,730	39,101	127,992
	178,320		196,710		57,070							
Current Year 1987												
Period 1944-1987												
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.			1	6,840	14	4,890	5,750	353,692	87,489	521,792	0	
Feb.			28	9,030	2	6,390	8,450	469,507	64,389	469,507	0	
Mar.			28	9,070	28	2,080	6,350	390,168	119,349	406,929	0	
Apr.			19	4,660	27	1,110	2,720	161,811	132,048	362,400	0	
May			17	3,700	7	1,020	1,840	113,197	63,753	368,438	0	
June			30	3,880	1	1,070	2,300	136,721	101,206	406,592	0	
July			29	3,430	110	2,010	2,460	150,982	145,327	415,398	0	
Aug.			10	3,350	30	1,620	2,680	164,985	148,023	404,370	0	
Sept.			2	2,600	6	1,010	1,740	103,259	90,401	479,683	0	
Oct.			30	3,720	14	1,000	1,670	102,605	64,852	500,429	0	
Nov.			1	3,570	30	769	1,300	77,556	61,612	493,884	0	
Dec.			22	6,800	1	565	4,130	253,868	97,175	568,225	0	
Yearly				9,070		565	3,420	2,478,351	1,175,624	4,864,696	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				257		16.0	96.9	3,056,996	1,450,109	6,000,505	0	

0 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 6.4 miles (10.3 km) downstream from Colorado River below Yuma Main Canal Wasteway, 5 miles (8.0 km) west of Yuma, Arizona, 1.1 miles (1.8 km) upstream from Morelos Diversion Structure, and about one mile (1.6 km) downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. Station is operated by the United States Section of the Commission.

RECORDS: Based on 345 current meter measurements during the year, 196 by the United States Section, 147 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 1,680 feet (512 m) upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1987; daily discharge records available January 1, 1950 through 1987.

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 1987 the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

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

Mean Daily Discharge in Second-Foot 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18,800	17,400	15,000	5,220	3,740	2,350	4,360	4,110	4,140	3,690	6,230	2,100
2	17,800	16,800	14,000	5,840	3,720	2,400	3,570	4,360	4,740	3,690	6,440	2,210
3	17,800	16,400	13,200	5,560	4,440	3,180	3,220	4,590	3,800	3,590	4,680	3,630
4	18,700	16,000	12,700	4,280	3,300	2,850	3,210	3,780	3,930	3,490	4,170	2,250
5	18,400	15,200	11,000	4,840	3,020	3,020	4,070	3,750	3,250	3,950	4,190	2,150
6	18,000	14,600	10,800	4,800	2,970	3,350	3,670	4,120	3,050	3,730	3,420	3,900
7	18,100	14,700	10,900	5,210	2,870	3,670	3,580	3,410	3,410	3,600	2,780	4,700
8	17,600	15,200	11,300	5,310	2,830	2,940	3,460	3,450	4,200	3,530	3,300	3,940
9	17,800	14,400	11,000	5,170	2,850	3,510	3,200	4,130	4,560	3,640	3,800	4,380
10	17,700	13,600	9,690	4,340	4,140	3,780	3,210	4,720	4,150	3,380	3,150	3,840
11	18,200	13,000	9,580	4,190	2,750	3,080	3,200	4,620	4,500	3,860	3,360	4,690
12	17,300	11,900	9,450	4,360	3,170	2,890	3,230	4,550	3,700	4,020	2,840	4,900
13	16,800	11,800	9,260	4,540	3,560	3,750	3,360	4,830	3,500	5,010	2,520	4,680
14	16,800	13,800	9,460	5,160	2,890	3,770	3,670	5,870	3,770	3,720	2,280	4,030
15	16,700	13,600	10,500	4,510	2,730	3,070	3,830	5,270	3,720	3,690	2,360	4,120
16	16,700	12,500	9,280	4,250	2,950	3,080	4,150	4,640	4,290	4,210	2,320	5,040
17	17,200	11,700	8,260	4,430	4,990	4,400	3,660	4,780	4,500	5,160	2,300	6,770
18	17,800	11,700	8,170	4,240	3,790	4,100	3,700	4,280	4,240	4,140	2,310	7,950
19	17,600	11,200	8,040	6,920	3,930	3,810	4,200	4,820	4,130	3,860	2,380	7,650
20	16,900	11,300	7,620	5,940	3,370	4,300	4,190	3,800	4,000	4,120	2,480	7,880
21	16,500	12,200	6,900	4,620	2,860	4,440	3,940	4,020	3,870	3,790	2,220	7,910
22	16,600	12,700	6,470	4,480	3,070	3,670	4,050	4,370	3,510	3,730	2,160	8,450
23	17,200	11,400	5,520	3,900	2,540	4,030	3,420	4,240	4,120	3,790	2,070	7,910
24	17,500	11,500	5,320	3,550	3,220	3,820	3,370	3,750	4,620	3,540	2,340	7,920
25	18,000	11,300	4,740	3,220	2,710	3,920	3,510	4,560	4,540	4,040	2,200	7,560
26	17,400	12,200	4,340	3,240	3,370	3,690	3,590	4,620	4,190	3,900	2,200	7,870
27	16,400	14,000	4,370	2,960	3,930	3,590	3,670	4,540	3,670	3,760	2,180	8,070
28	15,600	13,800	4,290	3,170	3,950	4,090	4,160	4,210	3,650	4,060	2,120	6,680
29	15,600		5,010	3,590	3,040	4,430	5,020	4,070	3,790	4,440	2,180	5,940
30	16,300		5,570	3,650	2,340	5,280	4,630	3,810	4,180	6,080	2,200	6,000
31	16,700		4,780		2,540		4,960	4,210		6,190		6,510
Sum	375,900	266,520	135,490	108,260	101,580	117,060	135,670	119,720	125,400	89,180	172,630	
536,500												

Month	Extreme Gage Feet		Current Year 1987				Period 1935-1987				
	High	Low	Extreme Second-Foot		Average Second-Foot	Total Acre-Feet	Acre-Feet				
			Day	Low			Average	Maximum	Minimum		
Jan.	109.63	108.47	1	19,000	28	15,000	17,300	1,064,132	443,832	1,644,000	31,900
Feb.	109.64	106.96	1	17,600	31	10,300	13,400	745,586	366,775	1,382,678	60,400
Mar.	109.54	106.17	1	15,300	31	3,820	8,600	528,634	380,267	1,259,702	19,400
Apr.	107.95	104.93	19	7,560	127	2,890	4,520	268,740	314,506	1,072,264	0
May	106.07	103.22	17	5,380	30	2,150	3,280	201,481	314,101	1,151,000	71,405
June	105.57	103.19	30	5,360	2	2,140	3,610	214,730	317,090	1,321,388	8,500
July	106.01	104.90	31	5,780	12	3,070	3,780	269,097	348,854	1,867,835	24,400
Aug.	105.98	104.79	14	6,010	8	2,960	4,380	237,461	307,856	2,015,207	43,800
Sept.	105.33	103.90	2	5,000	1	4,040	3,990	248,727	303,369	1,960,066	42,956
Oct.	104.73	103.23	30	6,790	4	3,140	4,050	176,888	246,822	1,532,231	41,403
Nov.	104.80	103.07	2	6,770	30	1,500	2,970	148,776	336,403	1,832,000	42,000
Dec.	105.72	103.11	22	8,520	1	1,640	5,570	342,406	425,130		
Yearly	109.64	103.07		19,000		1,500	6,260	4,530,065	4,194,515	15,430,412	722,100
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	33.42	31.42		538		42.5	177	5,587,745	5,173,850	19,033,104	890,696

! And other days

09-5220.00 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109.51	109.62	109.41	107.04	105.92	103.40	105.28	105.61	105.09	104.03	104.52	103.48
2	109.18	109.44	108.98	106.98	105.71	103.43	105.25	105.68	105.14	104.00	104.56	103.68
3	109.21	109.29	108.67	106.93	105.61	103.61	105.19	105.59	105.00	103.93	103.43	103.92
4	109.49	109.16	108.18	106.52	105.36	103.64	105.18	105.47	104.93	103.94	103.27	103.60
5	109.33	108.87	107.21	106.84	105.09	103.91	105.24	105.55	104.87	103.97	103.25	103.82
6	109.22	108.68	107.14	106.80	104.92	104.06	105.19	105.52	104.79	103.97	103.17	103.96
7	109.27	108.74	107.12	106.69	104.75	104.10	105.22	105.54	104.91	103.93	103.24	104.12
8	109.07	108.97	107.28	106.72	104.70	104.10	105.33	105.31	105.02	103.90	103.33	104.03
9	109.13	108.72	107.20	106.85	104.57	104.28	105.16	105.56	104.93	103.93	103.40	104.22
10	109.06	108.29	106.75	106.55	104.62	104.38	105.17	105.61	104.85	103.96	103.34	104.03
11	109.21	108.12	106.72	106.47	*104.42	104.42	105.16	105.63	104.86	104.01	103.54	104.24
12	108.90	107.82	106.68	106.58	*104.06	104.45	105.18	105.63	104.85	104.02	103.53	104.26
13	108.78	107.78	106.65	106.65	103.86	104.53	105.26	105.67	104.83	104.21	103.50	104.24
14	108.83	108.56	106.74	106.78	103.91	104.71	105.38	105.78	104.73	103.92	103.50	104.16
15	108.79	108.48	107.05	106.77	103.70	104.62	105.32	105.67	104.61	103.97	103.53	104.13
16	108.81	107.86	106.86	106.55	103.67	104.86	105.32	105.67	104.60	103.98	103.55	104.10
17	108.97	107.36	106.90	106.57	103.92	105.04	105.07	105.60	104.51	104.04	103.55	104.56
18	109.08	107.30	106.90	106.45	103.56	104.94	105.11	105.55	104.46	103.82	103.60	105.35
19	109.03	107.10	106.89	106.83	103.52	105.02	105.23	105.62	104.36	103.80	103.60	105.20
20	108.81	107.14	107.01	106.57	103.51	105.09	105.15	105.60	104.37	103.67	103.63	105.36
21	108.62	107.74	107.23	106.44	103.43	105.15	105.25	105.60	104.27	103.55	103.67	105.38
22	108.68	107.94	107.33	106.39	103.49	105.20	105.13	105.62	104.25	103.52	103.68	105.68
23	108.83	107.44	107.26	106.14	103.50	105.19	105.15	105.63	104.21	103.56	103.64	105.34
24	108.95	107.46	107.19	105.79	103.59	105.20	105.21	105.39	104.26	103.57	103.76	105.34
25	109.13	107.35	107.17	105.41	103.58	105.19	105.23	105.37	104.18	103.72	103.77	105.12
26	108.98	107.94	106.98	105.42	103.64	105.19	105.25	105.28	104.12	103.62	103.83	105.30
27	108.96	109.10	107.01	105.04	103.74	105.28	105.26	105.15	104.04	103.64	103.84	105.41
28	108.99	109.04	106.44	105.29	103.72	105.39	105.41	105.23	*104.06	103.70	103.71	104.59
29	109.01		106.65	105.83	103.49	105.45	105.43	105.22	*104.13	103.75	103.87	103.98
30	109.28		106.82	105.89	103.40	105.40	105.56	105.34	104.08	104.24	103.92	103.88
31	109.36		106.83		103.42		105.77	105.25		104.31		104.22
Avg.	109.05	108.26	107.20	106.39	104.14	104.64	105.26	105.51	104.58	103.88	103.62	104.47

* Partly estimated

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

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge March 1950 through 1987 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.4	4.0	6.3	0.1	0.7	0	3.8	3.2	1.9	1.7	4.7	3.6
2	.1	.2	.3	4.5	3.7	0	.4	.3	2.1	.5	.1	5.6
3	0	.1	.1	4.1	0	0	4.4	1.8	1.5	3.5	0	1.4
4	3.0	.1	0	.5	4.5	0	0	.1	1.3	1.9	0	.1
5	3.3	.4	0	.6	.3	0	0	0	3.3	4.1	0	7.8
6	2.6	3.1	0	.1	0	0	0	0	4.0	3.1	0	2.5
7	2.9	2.0	0	0	0	0	0	0	2.5	.7	0	0
8	3.3	5.1	7.2	0	0	4.6	0	0	4.3	.1	0	0
9	.8	7.1	1.5	0	0	3.7	0	7.7	1.7	.1	0	0
10	.5	.5	.1	0	0	8.3	8.2	0	1.5	2.8	.1	1.0
11	1.2	.8	4.7	4.2	0	0	3.0	0	0	7.0	.5	3.4
12	2.5	.3	.2	3.1	0	0	4.2	0	0	5.5	4.8	3.9
13	2.3	.2	.1	.1	0	3.8	0	0	2.7	5.0	0	5.2
14	5.6	.2	3.4	0	0	.8	0	0	0	1.8	0	5.9
15	7.5	6.8	6.6	2.3	0	0	0	0	2.4	3.0	3.4	1.4
16	4.2	.2	1.4	10.2	9.9	0	0	4.8	.5	.7	1.7	13.6
17	2.1	.1	.1	2.0	.3	0	.2	1.6	7.3	2.3	2.2	2.4
18	3.5	4.8	.1	.1	0	0	5.8	0	1.8	2.3	3.0	1.3
19	2.6	2.7	0	0	0	0	10.3	0	5.5	1.6	10.9	0
20	.1	3.5	.1	1.4	0	0	2.9	.5	2.1	.7	0	0
21	4.2	3.7	.9	2.9	0	0	1.8	0	0	1.9	0	0
22	4.6	1.6	6.9	.1	0	0	.1	0	1.8	.2	.1	0
23	2.2	2.2	.7	1.1	.6	2.7	0	0	2.7	7.8	6.3	0
24	2.6	2.2	0	.1	6.8	1.5	4.2	0	0	1.0	5.2	0
25	7.9	.1	1.3	.1	0	0	4.5	0	1.0	.5	.2	0
26	1.5	.8	2.7	.7	1.8	2.2	.1	1.0	0	1.6	2.1	0
27	.6	2.1	.1	0	3.4	.2	0	2.3	0	.2	1.3	.5
28	1.2	2.1	8.9	0	.8	0	0	4.9	0	.1	1.8	1.9
29	1.3	0	0	0	1.8	0	0	.9	0	2.2	2.2	1.7
30	.5	.1	.1	2.4	0	2.0	1.4	.7	3.3	2.4	3.5	5.2
31	1.4	.1	.1	0	0	0	1.0	.7	0	3.5	2.8	2.8
Sum	76.5	57.0	53.9	40.7	34.6	29.8	56.4	30.5	55.2	69.8	54.1	71.2

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1935-1987		
	High	Low	High		Low	Acre-Feet					
			Day	Day		Average	Maximum	Minimum			
Jan.	1.42	0	6	24.0	1	2	2.5	152	154	914	0
Feb.	1.55	0	18	27.4	5	0	2.0	113	135	400	6.0
Mar.	1.98	.01	28	39.7	13	0	1.7	107	145	517	0
Apr.	1.82	0	2	35.0	18	0	1.4	80.7	149	425	16.7
May	2.03	0	1	41.3	13	0	1.1	68.6	148	440	31.7
June	1.52	0	8	26.6	11	0	1.0	59.1	135	595	22.6
July	2.14	0	110	44.7	14	0	1.8	112	129	516	0
Aug.	1.57	0	4	28.0	13	0	1.0	60.5	99.2	617	0
Sept.	1.74	.01	20	32.7	12	0	1.8	109	103	462	0
Oct.	2.60	0	11	60.0	11	0	2.3	138	129	490	0
Nov.	2.69	0	19	63.2	12	0	1.8	107	147	462	9.0
Dec.	2.30	0	2	49.8	11	0	2.3	141	165	592	13.7
Yearly	2.69	0		63.2		0	1.7	1,248	1,638	4,500	638
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.82	0		1.79		0	0.05	1,539	2,020	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, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1987.

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

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

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	108.63	108.60	108.43	106.56	105.61	103.12	104.92	105.25	104.76	103.64	103.74	103.25
2	108.27	108.40	108.01	106.46	105.41	103.15	104.99	105.31	104.69	103.58	103.81	103.44
3	108.30	108.20	107.64	106.46	105.25	103.25	104.95	105.22	104.66	103.54	102.76	103.54
4	108.50	108.10	107.12	106.14	105.05	103.35	104.95	105.15	104.59	103.54	102.66	103.38
5	108.37	107.84	106.07	106.40	104.82	103.61	104.95	105.22	104.59	103.51	102.62	103.51
6	108.23	107.68	105.97	106.33	104.63	103.74	104.92	105.18	104.53	103.54	102.69	103.54
7	108.23	107.78	105.87	106.27	104.46	103.74	104.95	105.18	104.63	103.51	102.85	103.58
8	108.01	107.94	106.07	106.27	104.43	103.81	105.05	104.99	104.66	103.51	102.89	103.61
9	108.10	107.68	106.00	106.43	104.30	103.97	104.89	105.18	104.49	103.51	102.85	103.74
10	108.01	107.15	105.74	106.17	104.20	104.04	104.89	105.22	104.46	103.61	102.92	103.64
11	108.14	106.96	105.74	106.10	104.00	104.13	104.89	105.22	104.43	103.61	103.08	103.74
12	107.81	106.59	105.71	106.20	103.67	104.20	104.92	105.22	104.49	103.58	103.15	103.71
13	107.74	106.53	105.77	106.23	103.44	104.20	104.99	105.25	104.49	103.64	103.15	103.71
14	107.84	107.38	105.84	106.36	103.61	104.40	105.05	105.28	104.36	103.51	103.18	103.71
15	107.81	107.32	105.94	106.40	103.41	104.36	104.99	105.22	104.23	103.58	103.22	103.64
16	107.74	106.66	105.97	106.17	103.35	104.63	104.95	105.25	104.17	103.48	103.25	103.48
17	107.84	106.10	106.23	106.23	103.25	104.72	104.76	105.22	104.04	103.31	103.25	103.81
18	107.97	106.00	106.23	106.10	103.12	104.63	104.79	105.22	104.00	103.25	103.28	104.56
19	108.01	105.74	106.23	106.33	103.05	104.72	104.89	105.25	103.90	103.18	103.31	104.40
20	107.81	105.84	106.46	106.17	103.12	104.79	104.79	105.28	103.97	103.12	103.31	104.56
21	107.68	106.53	106.76	106.17	103.08	104.82	104.92	105.28	103.87	103.02	103.38	104.59
22	107.71	106.73	106.82	106.10	103.12	104.95	104.79	105.28	103.87	102.99	103.41	104.86
23	107.94	106.14	106.82	105.87	103.22	104.92	104.86	105.25	103.77	103.02	103.38	104.53
24	108.07	106.17	106.69	105.54	103.22	104.92	104.92	105.09	103.77	103.08	103.51	104.53
25	108.20	106.07	106.76	105.15	103.22	104.92	104.92	105.02	103.67	103.15	103.51	104.30
26	107.97	106.82	106.56	105.15	103.25	104.95	104.92	104.92	103.64	103.08	103.58	104.43
27	107.94	108.17	106.59	104.72	103.25	105.02	104.95	104.79	103.64	103.15	103.61	104.53
28	107.94	108.10	106.07	104.99	103.25	105.12	105.05	104.89	103.71	103.15	103.44	103.74
29	107.97		106.20	105.51	103.15	105.09	105.02	104.92	103.71	103.15	103.61	103.12
30	108.23		106.33	105.58	103.12	104.99	105.18	105.05	103.61	103.44	103.67	102.95
31	108.33		106.40		103.12		105.38	104.92		103.58		103.25
Avg.	108.04	107.12	106.43	106.00	103.77	104.33	104.95	105.15	104.17	103.38	103.25	103.84

09-5220.30 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet (61.0 m) downstream from the intake at Morelos Dam, 1,350 feet (410 m) upstream from the point where it joins the old Alamo Canal, 2.2 miles (3.5 km) upstream from Matamoros Check, and about one mile (1.6 km) south of the northerly international boundary. The zero of the gage is 0.15 foot (0.05 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limtrophe 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 1987. 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 1987, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 6,600 second-feet (187 m³/sec), July 12 and 14, 1983; maximum mean daily gage height, 107.32 (32.71 m) March 30 and 31, 1985, and March 1, 1986. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.					
1	2,060	2,610	2,910	4,520	3,850	1,770	3,390	3,740	3,270	2,370	1,690	1,900					
2	2,060	2,640	2,950	4,520	3,670	1,790	3,400	3,810	3,250	2,330	1,580	2,080					
3	2,080	2,660	2,990	4,590	3,470	1,880	3,350	3,640	3,170	2,280	1,620	2,180					
4	2,150	2,650	3,060	4,410	3,230	1,940	3,320	3,640	3,120	2,320	1,570	2,030					
5	2,150	2,670	3,230	4,380	2,960	2,120	3,310	3,740	3,050	2,280	1,510	2,190					
6	2,200	2,740	3,670	4,630	2,900	2,210	3,270	3,710	3,020	2,310	1,600	2,270					
7	2,230	2,740	3,740	4,590	2,790	2,240	3,320	3,710	3,110	2,290	1,770	2,310					
8	2,340	2,780	3,740	4,630	2,620	2,320	3,390	3,570	3,150	2,290	1,780	2,330					
9	2,360	2,790	3,710	4,660	2,500	2,450	3,250	3,670	3,040	2,320	1,780	2,480					
10	2,430	2,760	3,640	4,410	2,500	2,490	3,230	3,670	3,020	2,380	1,810	2,370					
11	2,440	2,800	3,570	4,170	2,310	2,530	3,330	3,780	2,990	2,430	2,030	2,480					
12	2,410	2,850	3,600	4,240	1,990	2,600	3,270	3,850	3,030	2,450	2,110	2,440					
13	2,270	3,000	3,670	4,380	1,830	2,630	3,310	3,850	3,030	2,490	2,090	2,440					
14	2,450	3,110	3,810	4,630	2,070	2,790	3,410	3,850	2,930	2,410	2,100	2,420					
15	2,580	3,140	3,960	4,630	1,940	2,840	3,350	3,810	2,870	2,420	2,080	2,390					
16	2,730	3,200	3,990	4,380	1,860	2,990	3,370	3,810	2,830	2,340	2,090	2,260					
17	2,760	3,310	4,030	4,310	1,770	3,020	3,280	3,780	2,720	2,260	2,080	2,030					
18	2,640	3,370	4,130	4,270	1,680	3,020	3,350	3,740	2,690	2,200	2,100	1,830					
19	2,490	3,470	4,200	4,520	1,610	3,100	3,360	3,850	2,850	2,130	2,080	1,750					
20	2,500	3,640	4,310	4,270	1,660	3,130	3,280	3,810	2,690	2,000	2,140	1,730					
21	2,420	3,670	4,520	4,240	1,670	3,210	3,300	3,850	2,620	1,940	2,210	1,670					
22	2,450	3,710	4,660	4,200	1,700	3,310	3,200	3,780	2,640	1,920	2,190	1,600					
23	2,370	3,810	4,630	3,850	1,780	3,280	3,350	3,780	2,670	1,940	2,130	1,620					
24	2,400	3,810	4,520	3,530	1,800	3,290	3,340	3,600	2,570	2,010	2,180	1,640					
25	2,460	3,740	4,480	3,160	1,810	3,270	3,350	3,410	2,520	2,080	2,200	1,610					
26	2,460	3,390	4,380	3,180	1,790	3,310	3,370	3,270	2,490	2,010	2,250	1,620					
27	2,470	2,750	4,270	2,880	1,820	3,410	3,440	3,270	2,470	2,060	2,300	1,620					
28	2,470	2,720	4,130	3,180	1,820	3,500	3,600	3,440	2,510	2,070	2,220	1,620					
29	2,460		4,240	3,570	1,760	3,500	3,640	3,430	2,530	2,050	2,320	1,640					
30	2,500		4,450	3,920	1,730	3,400	3,740	3,600	2,420	2,130	2,290	1,730					
31	2,570		4,450		1,760		3,880	3,500		1,970	2,290	1,800					
Sum	74,360	86,530	121,640	124,850	68,650	83,340	104,750	113,960	84,970	68,480	59,900	62,080					
Current Year 1987																	
Period 1950-1987																	
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet								
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum						
Jan.	104.92	103.77	17	2,760	1	2,060	2,400	147,467	86,587	223,193	966						
Feb.	105.77	104.27	123	3,810	1	2,610	3,090	171,653	83,850	203,958	9,232						
Mar.	106.96	104.59	22	4,660	1	2,910	3,920	241,292	188,020	352,959	97,902						
Apr.	107.35	104.49	9	4,660	27	2,880	4,160	247,618	212,950	328,093	153,792						
May	105.58	102.72	1	3,850	19	1,610	2,210	136,168	112,409	232,004	66,207						
June	105.05	102.76	29	3,500	1	1,770	2,780	165,307	163,441	269,632	95,177						
July	105.61	104.46	31	3,880	22	3,200	3,380	207,867	227,396	356,040	125,745						
Aug.	105.45	104.10	12	3,850	126	3,270	3,680	226,092	224,463	341,044	130,298						
Sept.	104.79	103.31	1	3,270	30	2,420	2,830	168,550	135,289	273,177	53,633						
Oct.	103.64	102.56	13	2,490	22	1,920	2,210	135,853	71,444	227,661	10,453						
Nov.	103.67	102.40	29	2,320	5	1,510	2,000	118,846	60,127	209,478	7,516						
Dec.	103.74	102.40	8	2,480	22	1,600	2,000	123,105	90,217	200,974	8,825						
Yearly	107.35	102.40		4,660		1,510	2,890	2,089,818	1,659,156	2,798,192	1,272,332						
Meters		Cubic Meters per Second				Thousands of Cubic Meters											
32.72		31.21		132		42.8		81.7		2,577,763		2,046,546		3,451,533		1,569,404	

† 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 FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103.81	104.40	104.66	106.50	105.45	102.99	104.79	105.12	104.56	103.44	102.62	103.08
2	103.84	104.36	104.69	106.40	105.25	103.02	104.79	105.18	104.53	103.38	102.53	103.28
3	103.87	104.40	104.76	106.40	105.12	103.12	104.72	105.09	104.46	103.31	102.59	103.38
4	103.94	104.40	104.82	106.04	104.92	103.18	104.76	104.99	104.43	103.35	102.53	103.18
5	104.00	104.36	105.12	106.30	104.69	103.44	104.76	105.09	104.36	103.28	102.46	103.31
6	104.07	104.53	105.77	106.30	104.53	103.61	104.72	105.05	104.30	103.28	102.53	103.38
7	104.07	104.56	105.68	106.20	104.36	103.61	104.76	105.02	104.40	103.31	102.69	103.38
8	104.23	104.63	105.84	106.17	104.30	103.64	104.86	104.82	104.43	103.31	102.72	103.41
9	104.33	104.49	105.68	106.33	104.17	103.81	104.69	105.02	104.30	103.31	102.72	103.58
10	104.49	104.49	105.64	106.04	104.10	103.87	104.72	105.09	104.27	103.38	102.76	103.48
11	104.53	104.59	105.64	105.97	103.87	104.00	104.72	105.12	104.23	103.41	102.95	103.61
12	104.46	104.63	105.64	106.10	103.54	104.04	104.72	105.12	104.30	103.41	103.02	103.54
13	104.49	104.86	105.68	106.20	103.28	104.00	104.82	105.15	104.30	103.44	103.02	103.54
14	104.46	104.95	105.77	106.27	103.41	104.20	104.92	105.15	104.17	103.31	103.05	103.54
15	104.72	104.92	105.84	106.27	103.22	104.17	104.82	105.09	104.07	103.35	103.05	103.48
16	104.86	104.99	105.87	106.07	103.15	104.43	104.82	105.15	103.97	103.28	103.12	103.35
17	104.89	105.05	106.10	106.10	103.02	104.49	104.59	105.09	103.87	103.18	103.12	103.12
18	104.79	105.12	106.10	105.97	102.95	104.43	104.63	105.05	103.84	103.15	103.12	102.85
19	104.59	105.28	106.14	106.23	102.89	104.56	104.72	105.09	103.74	103.05	103.15	102.76
20	104.46	105.45	106.33	106.04	102.92	104.59	104.66	105.12	103.77	102.92	103.18	102.69
21	104.43	105.41	106.59	106.00	102.92	104.66	104.76	105.12	103.71	102.85	103.25	102.62
22	104.46	105.48	106.66	105.91	102.95	104.76	104.63	105.12	103.67	102.82	103.25	102.49
23	104.40	105.61	106.73	105.71	103.05	104.72	104.66	105.12	103.58	102.85	103.22	102.49
24	104.33	105.61	106.69	105.38	103.05	104.72	104.72	104.92	103.54	102.95	103.35	102.49
25	104.27	105.48	106.66	104.99	103.05	104.72	104.76	104.86	103.48	103.02	103.35	102.46
26	104.30	105.15	106.53	104.95	103.08	104.72	104.76	104.72	103.48	102.92	103.41	102.49
27	104.27	104.53	106.56	104.59	103.12	104.82	104.79	104.46	103.48	102.99	103.44	102.49
28	104.30	104.49	106.04	104.82	103.12	104.92	104.92	104.72	103.51	102.95	103.28	102.49
29	104.36		106.14	105.38	103.02	104.95	104.89	104.72	103.51	102.95	103.44	102.53
30	104.33		106.27	105.41	102.99	104.86	105.05	104.86	103.41	103.08	103.51	102.62
31	104.43		106.33		102.99		105.25	104.72		102.92		102.72
Avg.	104.36	104.86	105.91	105.91	103.64	104.17	104.79	104.99	104.00	103.18	103.02	103.02

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, 1.1 miles (1.8 km) downstream from the northerly international boundary, and about 7.5 miles (12.1 km) downstream from the Colorado River below Yuma Main Canal Wasteway. Since April 17, 1969, zero of the gage is at mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was 0.16 foot (0.05 m) below mean sea level.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1987.

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

EXTREMES: Maximum mean daily gage height, 113.98 feet (34.74 m) on August 18, 1983; minimum mean gage height, 97.47 feet (29.71 m) on April 27 and 28, 1987.

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	108.50	108.10	107.19	100.03	97.51	99.67	99.90	98.49	99.80	100.98	103.71	98.03
2	108.17	107.64	106.89	100.52	97.87	99.74	98.36	99.02	101.18	101.02	103.77	98.23
3	107.20	107.64	106.66	100.10	100.49	100.66	97.93	100.16	99.93	100.72	102.23	100.46
4	108.43	107.51	106.30	98.00	98.43	100.13	98.06	98.72	99.64	100.62	101.90	98.26
5	108.27	107.19	105.45	98.69	97.93	99.90	99.67	98.43	98.43	101.28	101.94	99.77
6	108.10	107.05	105.15	99.54	98.46	100.39	99.54	98.95	98.06	101.25	101.15	100.75
7	108.10	107.25	105.25	99.25	97.80	100.82	98.62	100.10	98.72	101.05	100.46	101.57
8	107.91	107.38	105.35	100.20	98.20	99.70	97.97	98.36	100.36	100.95	100.82	100.95
9	107.97	107.09	105.38	99.18	99.21	108.23	97.90	99.05	100.92	100.85	101.21	101.21
10	107.87	106.59	104.56	98.06	101.05	100.43	97.90	100.07	100.52	100.52	100.49	100.59
11	108.01	106.40	104.36	98.03	99.41	99.21	97.87	99.67	100.85	100.95	100.62	101.38
12	107.68	106.07	104.33	98.03	100.72	98.88	97.87	99.57	99.87	101.08	99.90	101.71
13	107.55	106.04	104.17	98.52	101.25	100.33	97.87	99.97	99.61	102.20	99.54	101.51
14	107.48	106.69	104.20	99.25	100.30	100.00	98.59	101.54	100.07	101.02	99.21	100.82
15	107.35	106.66	104.82	98.36	100.20	98.65	99.11	100.75	100.16	100.98	99.18	101.02
16	107.38	106.07	104.04	97.83	100.79	98.13	99.74	100.13	101.12	101.64	98.95	101.90
17	107.55	105.58	103.31	97.80	102.72	100.66	99.15	99.61	101.25	102.69	98.88	103.58
18	107.68	105.51	103.08	97.77	101.71	100.33	99.02	98.85	101.28	101.64	99.02	104.49
19	107.58	105.25	102.82	101.25	101.80	99.87	100.00	100.00	101.15	101.67	99.11	104.33
20	107.35	105.31	102.33	100.95	101.12	100.43	99.70	98.39	101.08	102.03	99.11	104.49
21	107.25	105.87	100.82	99.02	100.52	100.52	99.44	98.39	100.95	101.74	98.46	104.53
22	107.28	106.00	100.89	98.95	100.72	99.21	99.67	99.28	100.72	101.64	98.49	104.79
23	107.35	105.51	100.30	97.64	100.13	99.74	98.26	99.31	101.35	101.61	98.29	104.46
24	107.48	105.45	99.87	97.57	101.02	99.48	98.00	98.29	101.87	101.21	98.69	104.43
25	107.71	105.45	99.61	97.54	100.56	99.51	97.97	100.33	101.94	101.74	98.10	104.23
26	107.51	106.00	98.65	97.51	100.98	99.18	98.39	100.39	101.54	101.64	98.03	104.36
27	107.15	106.99	98.26	97.47	101.77	99.08	98.98	100.46	100.95	101.35	98.03	104.46
28	107.09	106.96	98.13	97.47	101.77	99.02	99.54	99.61	100.79	101.74	98.00	103.64
29	107.28		99.02	97.51	100.66	100.26	100.66	99.28	101.21	102.10	98.00	103.02
30	107.48		100.23	97.51	99.93	101.35	99.93	98.72	101.57	103.58	98.16	102.89
31	107.58		99.08		100.10		100.10	99.84		103.58		103.15
Avg.	107.68	106.46	102.92	98.65	100.16	99.84	98.88	99.48	100.56	101.51	99.77	102.23

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, 1.1 miles (1.8 km) downstream from the northerly international boundary. The elevation of the zero of the gage has not been determined.

RECORDS: Based on discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1987.

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

Mean Daily Discharge in Second-Feet 1987 — 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	24.0	0	0	0	0
3	0	0	0	0	0	0	0	23.3	0	0	0	0
4	0	0	0	0	0	0	0	.4	0	0	0	0
5	0	0	0	0	0	0	0	.3	0	0	0	0
6	0	0	0	0	0	0	0	.2	0	0	0	0
7	0	0	0	0	0	0	0	.1	0	0	0	0
8	0	0	0	0	0	0	0	.1	0	0	0	0
9	0	0	0	0	0	0	0	.1	0	0	0	0
10	0	0	0	0	0	0	0	.1	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	.1	0	0	0	0
14	0	0	0	0	0	0	0	.1	0	0	0	0
15	0	0	0	0	0	0	0	.1	0	0	0	0
16	0	0	0	0	0	0	0	.1	0	0	0	0
17	0	0	0	0	0	0	0	.2	0	0	0	0
18	0	0	0	0	0	0	0	.1	0	0	0	0
19	0	0	0	0	0	0	0	.1	0	0	0	0
20	0	0	0	0	0	0	0	.5	0	0	.2	0
21	0	0	0	0	0	0	0	.2	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	50.1	0	0	0.2	0
Current Year 1987									Period 1966-1987			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	0	0		0		0	0	8,823	18,718	0		
Feb.	0	0		0		0	0	6,868	16,992	0		
Mar.	0	0		0		0	0	4,794	18,506	0		
Apr.	0	0		0		0	0	3,994	18,061	0		
May	0	0		0		0	0	6,540	19,091	0		
June	0	0		0		0	0	5,146	18,756	0		
July	0	0		0		0	0	4,728	18,946	0		
Aug.	2.15	0	2	165	11	1.6	99.4	4,808	19,188	0		
Sept.	0	0		0		0	0	6,754	18,474	0		
Oct.	0	0		0		0	0	9,508	19,200	0		
Nov.	.07	0	20	.7	11	0	0	9,014	18,478	0		
Dec.	0	0		0		0	0	8,186	19,121	0		
Yearly	2.15	0		165		0	10.1	99.8	79,163	214,781	0	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	0.66	0		4.67		0	0	122	97,646	264,928	0	

1 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, 4.3 miles (6.9 km) downstream from the northerly international boundary and 3.2 miles (5.1 km) downstream from Morelos Diversion Dam. It is the largest of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limnотropic section of the Colorado River. Since June 1986, zero of the gage is 111.72 feet 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 1987, obtained by the United States Section; monthly discharge, January 1924 through 1950 by Bureau of Reclamation.

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.6	62.1	42.4	0	1.8	1.3	0.6	1.0	0.1	0.3	48.7	2.4
2	1.0	42.5	29.9	.6	2.8	1.4	1.2	.4	.3	2.7	35.6	1.8
3	.2	8.2	6.3	0	0	6.9	2.9	.1	.1	19.7	6.8	1.0
4	10.2	3.8	4.4	0	4.7	1.8	.8	0	1.3	.2	4.6	1.4
5	12.0	.7	1.8	21.4	1.3	1.2	2.9	1.5	.8	3.1	0	1.0
6	5.0	2.5	3.7	23.9	1.4	.5	2.9	2.1	4.0	.7	2.3	25.6
7	2.6	.2	4.3	6.4	6.6	3.9	1.9	.7	.1	2.2	2.7	11.9
8	1.7	.1	4.3	9.7	.8	1.6	2.4	.2	.1	1.4	6.3	5.0
9	3.1	1.0	4.4	.5	0	2.6	.5	.4	2.1	2.8	5.8	4.0
10	1.0	.6	.7	.1	.4	2.2	0	.4	2.4	2.5	1.3	1.9
11	0	9.1	3.0	.4	1.1	2.3	.7	.3	.2	1.1	3.6	4.8
12	1.0	6.1	2.4	.2	.9	1.0	9.7	.2	2.0	7.1	6.7	2.0
13	5.0	13.0	2.2	0	1.8	1.5	0	.1	5.7	4.9	4.3	1.7
14	2.5	.7	3.5	0	.4	2.8	.3	0	6.5	3.4	2.5	.1
15	4.4	6.8	2.7	.6	.4	.7	.9	0	1.6	2.6	.1	3.6
16	1.1	16.1	2.4	.6	.8	4.0	1.8	.3	19.7	.8	2.5	4.1
17	4.9	3.9	.6	.1	1.5	5.2	.2	.4	2.4	.3	5.7	11.5
18	1.4	5.6	.3	3.2	38.5	2.2	.4	.9	2.3	2.1	3.5	.4
19	1.6	6.7	1.3	.8	2.3	2.3	.4	.8	1.2	2.5	.1	0
20	3.1	5.3	1.8	2.2	5.6	2.1	1.3	2.0	7.1	2.9	.9	0
21	5.6	.9	1.1	5.4	5.0	.8	.1	1.4	18.4	5.0	3.7	0
22	15.4	.5	.1	3.0	1.8	7.1	.8	2.5	3.5	7.6	.6	20.8
23	4.5	1.2	.4	.5	0	1.0	.6	.2	1.0	1.6	6.7	35.4
24	12.4	3.4	.1	.2	0	2.0	.3	0	.1	4.1	3.7	1.1
25	.7	1.0	2.4	.4	.2	0	0	.4	2.1	.7	3.9	0
26	2.4	8.5	4.7	4.0	.4	0	14.7	2.4	2.7	4.8	37.7	0
27	7.0	2.9	1.4	2.8	.4	0	7.4	2.0	5.8	3.6	12.1	0
28	6.5	6.9	1.1	.5	.7	.3	3.9	3.0	12.0	6.4	2.8	.6
29	4.6		.8	1.6	.1	.1	2.6	1.7	1.8	14.0	1.3	5.3
30	4.2		.8	3.4	1.2	.1	.8	.4	1.3	6.3	1.3	10.2
31	5.1		.1		0		1.6	.3		26.4		3.0
Sum	130.8	220.3	135.4	92.5	82.9	58.9	64.6	26.1	108.7	143.8	216.6	160.6

Month	Current Year 1987						Period 1935-1987					
	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Average	Maximum	Minimum		
Jan.	0.89	0	22	44.7	111	0	4.2	259	2,540	9,570	0	
Feb.	7.10	0	1	663	10	0	7.9	437	2,083	8,430	14.5	
Mar.	4.06	0	1	275	19	0	4.4	269	1,958	6,230	59.1	
Apr.	3.18	0	5	188	1	0	3.1	183	1,811	6,300	0	
May	3.50	0	18	218	13	0	2.7	164	2,140	9,320	8.3	
June	1.70	0	22	79.4	1	0	2.0	117	2,038	7,440	10.5	
July	2.81	0	26	154	1	0	2.1	128	2,042	8,320	9.1	
Aug.	.34	0	28	6.3	2	0	.8	51.8	1,771	9,740	51.8	
Sept.	1.06	0	20	63.3	1	0	3.6	216	1,281	6,140	6.0	
Oct.	1.41	0	29	70.4	1	0	4.6	285	1,745	5,680	11.9	
Nov.	4.22	.01	1	293	1	0	7.2	430	2,117	8,220	18.8	
Dec.	3.26	0	6	195	13	0	5.2	319	2,773	9,430	61.9	
Yearly	7.10	0		663		0	3.9	2,859	24,299	82,900	943	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	2.16	0		18.8		0	0.11	3,527	29,972	102,255	1,163	

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

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1987; 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 lintrophe section of the river.

EXTREMES: Since November 1947, maximum mean daily gage height, 108.77 feet (33.15 m) on June 28, 1983; minimum mean daily gage height, 94.95 feet (28.94 m) on June 22, 1968, and November 29, 1987.

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104.90	104.13	103.70	97.14	95.22	96.37	96.75	95.36	95.95	97.12	100.16	95.09
2	104.66	104.12	103.46	97.65	95.27	96.25	95.50	95.48	97.34	97.10	100.28	95.08
3	104.59	104.02	103.18	97.34	97.11	97.25	95.44	96.68	96.28	96.95	98.82	97.23
4	104.69	103.95	102.82	95.99	95.90	96.81	95.16	95.50	95.96	96.67	98.44	95.26
5	104.54	103.79	102.05	96.42	95.46	96.52	96.12	95.22	95.25	97.43	98.53	96.28
6	104.43	103.69	101.76	97.03	95.56	96.95	96.03	95.33	95.37	97.41	97.73	97.37
7	104.50	103.75	101.88	96.58	95.44	97.37	95.70	96.55	95.26	97.22	96.91	98.23
8	104.42	103.89	101.97	97.19	95.38	96.53	95.21	95.37	96.57	97.10	97.32	97.67
9	104.50	103.72	102.01	96.49	96.08	96.74	95.07	95.67	97.25	97.08	97.87	97.84
10	104.43	103.27	101.26	95.57	97.46	97.22	94.94	96.55	96.75	96.67	97.10	97.22
11	104.46	103.00	101.12	95.53	96.37	96.20	94.99	96.17	97.15	96.95	97.29	97.98
12	104.16	102.69	101.05	95.50	97.24	95.60	95.25	96.10	96.32	97.27	96.49	98.40
13	103.96	102.52	100.90	95.77	97.87	96.90	95.13	96.34	95.68	98.53	96.11	98.25
14	103.97	103.19	100.87	96.17	96.97	96.65	95.29	97.99	96.22	97.31	95.93	97.61
15	103.92	103.15	101.47	95.71	96.82	95.83	95.68	97.30	96.18	97.11	95.72	97.65
16	103.95	102.67	100.82	95.44	97.27	95.34	96.16	96.47	97.41	97.71	95.83	98.60
17	104.16	102.21	100.16	95.40	99.18	96.91	95.84	96.19	97.56	98.74	95.84	100.03
18	104.32	102.15	100.02	95.46	98.40	96.95	95.56	95.44	97.53	97.75	95.74	100.97
19	104.28	101.96	99.84	97.95	98.44	96.41	96.19	96.40	97.53	97.77	95.58	100.86
20	104.02	102.00	99.42	97.82	97.90	96.92	96.50	95.45	97.09	98.13	95.74	101.00
21	103.94	102.50	97.87	96.05	97.18	97.29	95.81	95.22	97.23	97.87	95.68	101.02
22	104.03	102.62	97.85	96.06	97.38	95.91	96.05	95.54	96.74	97.80	95.43	101.30
23	104.11	102.17	97.31	95.36	96.74	96.32	95.35	95.65	97.48	97.81	95.66	101.06
24	104.04	102.16	96.94	95.28	97.50	95.98	95.15	95.08	97.97	97.35	95.54	101.01
25	104.14	102.09	96.79	95.25	97.16	96.11	95.07	96.61	98.03	97.81	95.47	100.85
26	103.96	102.56	96.34	95.30	97.59	95.76	95.29	96.77	97.78	97.90	95.81	100.99
27	103.80	103.52	96.01	95.25	98.19	95.66	95.55	96.73	97.07	97.49	95.26	101.09
28	103.68	103.50	95.95	95.20	98.38	95.60	95.95	95.88	96.90	97.93	95.12	100.47
29	103.68		96.63	95.22	97.45	96.69	97.09	95.99	97.12	98.26	94.95	99.90
30	103.89		97.67	95.24	96.62	97.83	96.46	95.31	97.79	99.56	95.06	99.73
31	103.92		96.54		96.72		96.40	96.11		99.91		100.02
Avg.	104.20	103.04	99.86	96.08	96.98	96.50	95.70	96.01	96.83	97.67	96.58	98.91

* Partly estimated

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 200 feet (61 m) downstream from present site on west side of levee. This wasteway is located in Arizona, 18.5 miles (29.8 km) downstream from the northerly international boundary, 17.4 miles (28.0 km) downstream from Morelos Diversion Dam, and 2.2 miles (3.5 km) upstream from the southerly international boundary. It is the farthest downstream of the two wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. The elevation of the zero of the gage at the new location has not been determined.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1987, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.0	34.4	0	0	0.2	0.1	0.1	0	0.2	0	28.0	10.5
2	16.0	29.0	9.2	0	.2	0	0	.3	.1	0	25.0	.8
3	11.9	6.1	3.0	0	.2	0	0	.3	.1	0	2.8	.5
4	1.5	.8	.9	0	0	0	.1	.5	.1	.6	5.6	.9
5	3.3	.3	.2	7.0	0	0	.2	6.7	.4	16.7	.7	.9
6	3.8	.7	.1	14.0	0	0	.1	4.1	12.5	.9	.6	.8
7	2.3	3.6	.3	1.5	0	0	0	2.4	0	.3	7.9	.5
8	8.1	6.2	7.3	.1	.1	0	0	1.6	.3	.1	12.8	0
9	16.7	.2	1.0	0	.1	1.1	.2	.2	.3	.2	17.4	0
10	7.6	3.0	8.5	0	.1	.3	.1	.2	0	.2	13.9	2.4
11	7.8	6.1	3.2	0	.2	.3	.2	.2	.2	1.2	7.0	5.4
12	2.8	.2	6.0	0	.5	.1	.2	.2	.3	9.6	1.8	.2
13	4.2	1.5	2.1	0	.1	.2	.1	.2	.3	11.8	.4	.5
14	12.1	0	3.1	0	.1	.3	.2	.6	.3	1.3	9.2	.4
15	10.0	0	.8	0	6.7	0	.2	.8	.2	.9	8.8	.8
16	11.6	0	5.3	0	12.1	.1	.4	.6	.5	.9	12.2	.9
17	8.6	0	3.1	0	9.9	.1	.2	.2	.4	.6	18.9	.6
18	8.7	0	1.5	0	19.2	0	.2	.4	.5	.6	9.9	.7
19	5.2	0	.4	2.4	1.3	.1	.1	.3	.3	2.3	4.6	.6
20	.7	0	.2	7.8	.1	.1	.3	.3	.3	3.3	3.4	.5
21	.1	0	.1	10.4	0	.1	.2	.3	.4	3.2	2.1	.5
22	.1	0	.2	1.9	0	.3	.2	.3	.4	2.4	1.6	.8
23	1.5	0	.2	.2	.3	0	.2	.4	.2	8.9	5.2	.5
24	3.4	0	.2	.1	2.0	.1	0	.5	.1	12.7	.3	.4
25	15.0	0	.1	3.3	0	.6	0	.1	.2	7.9	5.8	.4
26	7.2	0	.1	.1	.1	.3	.2	0	.2	7.0	18.2	.4
27	11.7	0	.1	0	0	.5	.1	.1	.1	8.8	22.2	.3
28	13.0	0	.1	0	0	.3	0	.1	.4	11.6	11.9	.3
29	7.7	0	.1	0	0	.2	0	.1	.8	13.0	6.4	.7
30	6.0	0	.1	.1	0	.4	0	.1	0	12.3	11.9	.9
31	33.0	0	0	0	.1	0	0	.3	0	25.9	0	.2
Sum	257.6	92.1	57.5	48.9	53.6	5.6	3.8	22.4	20.1	165.2	276.5	32.7

Current Year 1987

Period 1939-1987

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.08	0	31	52.3	14	0	8.3	511	626	2,860	0
Feb.	1.79	0	1	43.3	16	0	3.3	183	542	2,510	0
Mar.	1.62	0	2	35.0	11	0	1.9	114	492	1,660	0
Apr.	1.40	0	6	27.6	11	0	1.6	97.0	528	1,940	0
May	1.62	0	18	35.0	11	0	1.7	106	642	2,470	0
June	.78	0	9	9.9	11	0	.2	11.1	566	2,350	0
July	.13	0	16	.6	11	0	.1	489	489	1,950	0
Aug.	1.03	0	5	16.9	11	0	.7	7.5	511	2,530	0
Sept.	1.46	.01	6	29.6	13	0	.7	39.9	455	2,180	0
Oct.	2.76	0	5	82.5	11	0	5.3	328	559	2,100	0
Nov.	2.43	.05	20	67.2	5	.1	9.2	548	676	2,380	0
Dec.	1.28	0	11	23.9	18	0	1.1	64.9	721	2,680	0
Yearly	2.76	0		82.5		0	2.8	2,055	6,807	24,370	0
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.84	0		2.34		0	0.08	2,535	8,396	30,060	0

1 And other days

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

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

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1987. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	2.6	0.4	3.1	3.6	2.0	13.2	8.0	3.1	7.6	0.9	17.4
2	3.1	.2	0	.6	6.7	.5	8.8	17.1	4.4	1.0	4.7	6.3
3	1.1	.2	0	1.7	2.7	.4	7.5	15.3	10.2	4.1	3.0	6.6
4	1.6	.3	.6	3.2	.1	4.9	2.4	5.3	14.9	3.6	1.6	8.4
5	9.0	5.1	.1	.2	0	.3	.5	3.2	11.2	2.7	1.0	3.9
6	7.0	8.2	2.2	4.3	.5	1.2	3.0	3.2	17.3	3.0	.2	5.3
7	5.3	.5	6.3	3.5	.1	11.4	3.0	0	20.5	1.7	.1	4.9
8	9.6	.1	5.5	1.5	3.1	7.2	.5	1.8	13.5	.5	4.4	11.6
9	12.4	0	4.0	1.2	2.3	6.2	0	4.1	8.0	6.8	4.2	16.4
10	12.4	0	1.9	.1	1.5	5.2	6.7	14.1	7.2	1.7	.1	17.3
11	3.6	0	4.4	5.4	.7	4.3	.2	2.3	9.6	.5	.8	16.5
12	13.5	0	.1	11.0	4.2	.3	0	1.7	18.1	10.0	1.0	4.6
13	2.2	3.6	3.9	4.5	4.5	.1	0	1.8	7.3	9.2	.1	3.8
14	3.2	.3	.3	.3	7.9	4.0	0	7.2	6.6	3.9	3.9	4.0
15	4.7	4.0	0	1.6	8.2	1.8	0	4.8	2.1	1.7	2.2	2.2
16	.7	2.0	3.0	.9	10.3	4.5	2.3	6.1	1.3	7.6	.5	2.3
17	1.1	13.4	.2	6.0	12.2	8.2	.9	3.0	2.1	1.9	4.1	13.2
18	13.0	10.4	1.2	2.3	11.2	7.1	8.0	15.0	2.3	1.6	.7	10.3
19	12.9	3.4	1.1	17.0	2.0	6.7	0	7.9	6.9	7.7	.1	7.1
20	13.5	1.8	.6	10.6	.4	1.7	0	1.1	26.0	2.4	7.4	15.4
21	2.4	.2	2.7	.4	.1	6.1	.4	2.6	8.3	6.2	11.8	6.7
22	6.1	.3	.1	0	.1	4.3	2.8	1.8	8.7	6.8	18.5	7.1
23	2.2	3.8	4.9	0	.6	2.8	2.5	6.9	3.2	2.2	13.1	7.9
24	10.9	7.0	4.4	0	.6	5.9	16.0	18.0	6.4	.3	9.4	4.3
25	3.8	3.3	2.2	.9	.1	4.6	8.4	8.5	7.8	13.9	5.6	14.7
26	13.0	2.9	7.8	.3	2.3	3.2	15.3	8.4	15.0	9.3	5.8	2.0
27	9.5	16.5	2.1	4.7	14.1	.5	5.6	12.8	14.6	3.6	3.0	9.1
28	1.9	2.7	2.8	2.2	8.3	7.0	3.4	1.2	7.6	15.4	.8	12.9
29	.6	0	1.3	14.7	4.8	8.4	6.6	.7	4	10.8	7.1	8.0
30	.9	0	4.1	8.3	.2	5.9	5.9	15.1	8.5	8.1	16.8	5.9
31	.9	0	3.3	0	5.4	0	2.1	8.7	0	3.0	0	8.1
Sum	184.8	92.8	71.5	110.5	118.8	126.7	126.0	207.7	273.1	158.8	132.9	264.2
Current Year 1987									Period 1935-1987			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	High	Day	Low	Average			Maximum	Minimum		
Jan.	1.14	0.02	9	44.4	31	0.1	6.0	367	980	3,360	90.0	
Feb.	1.03	0	1	37.1	19	0	3.3	184	822	3,170	133	
Mar.	.95	0	6	32.1	11	0	2.3	142	943	2,920	142	
Apr.	.93	0	19	30.9	6	0	3.7	219	923	3,170	175	
May	1.04	0	31	37.7	4	0	3.8	236	1,025	3,660	228	
June	.91	0	28	29.8	3	0	4.2	251	870	3,660	161	
July	1.13	0	10	43.7	18	0	4.1	250	932	3,590	170	
Aug.	.98	0	9	34.0	6	0	6.7	412	956	3,960	159	
Sept.	.94	.02	20	31.5	30	.1	9.1	582	919	3,170	159	
Oct.	.78	0	28	22.6	18	0	5.1	315	954	3,280	307	
Nov.	1.15	0	24	45.1	113	0	4.4	264	1,032	3,570	241	
Dec.	.97	.03	27	33.3	27	.2	8.5	524	998	3,080	247	
Yearly	1.15	0		45.1		0	5.1	3,706	11,354	38,310	3,026	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.35	0		1.28		0	0.14	4,571	14,005	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 200 feet (61 m) north of the international boundary near San Luis, Arizona, 1.3 miles (2.1 km) east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 (3.05) to 12 feet (3.66 m) at the pumping plant. Prior to April 1, 1969, discharges were computed from pump ratings and the differential head measured by the two gages. Beginning April 1, 1969 discharges were computed from flow meter charts. Pump ratings and flow meter discharges are checked by current meter measurements. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges, June 1919 through 1951; daily discharges January 1952 through 1987.

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

Mean Daily Discharge in Second-Foot 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	140	152	144	117	139	139	112	136	139	142	194	155
2	137	137	148	138	154	131	108	139	144	132	161	152
3	132	141	137	149	147	133	107	133	138	151	158	147
4	131	134	133	146	138	121	111	134	143	155	160	149
5	143	141	130	143	145	124	111	128	133	165	162	156
6	140	140	137	140	142	134	111	132	119	174	154	153
7	142	145	139	138	124	134	109	137	121	157	170	147
8	145	162	150	134	145	128	108	126	143	169	174	142
9	146	141	143	138	137	134	117	130	146	155	161	141
10	142	137	148	144	153	129	119	128	139	163	152	142
11	132	133	139	140	140	130	120	124	138	166	190	154
12	130	134	125	157	132	134	129	124	129	160	149	143
13	135	143	109	150	132	134	118	122	128	158	170	139
14	137	136	129	131	130	138	136	143	131	157	159	142
15	141	142	148	132	134	122	131	132	134	155	168	138
16	134	141	148	144	147	145	139	113	149	149	170	153
17	134	142	132	154	172	144	143	118	140	173	158	166
18	136	149	133	152	137	143	144	129	138	181	166	173
19	141	159	144	180	129	144	156	127	136	178	149	148
20	141	159	157	162	128	147	134	131	143	183	170	142
21	138	139	137	130	123	148	140	136	138	170	164	131
22	149	139	147	131	122	159	138	138	141	180	157	124
23	141	144	139	133	119	152	138	126	107	180	157	121
24	144	142	141	135	127	152	137	120	136	184	160	124
25	143	134	139	137	138	151	143	126	141	185	161	120
26	145	149	138	148	133	157	143	128	137	181	155	123
27	141	163	144	148	119	149	144	130	140	187	157	122
28	134	162	150	140	127	147	141	127	147	183	146	117
29	147		124	141	130	152	137	121	151	199	159	124
30	134		105	133	131	140	124	115	148	188	172	131
31	135		134		143		119	120		149		138
Sum	4,310	4,040	4,271	4,265	4,217	4,195	3,967	3,973	4,117	5,209	4,883	4,357
Current Year 1987										Period 1935-1987		
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.			22	149	12	130	139	8,549	7,606	11,203	1,780	
Feb.			27	163	11	133	144	8,013	7,443	11,988	1,640	
Mar.			20	157	30	105	138	8,471	8,549	12,430	1,940	
Apr.			19	180	1	117	142	8,459	8,422	11,890	1,920	
May			2	154	123	119	136	8,364	8,609	13,140	1,950	
June			22	159	4	121	140	8,321	8,010	12,040	2,290	
July			19	156	3	107	128	7,868	7,958	11,830	2,530	
Aug.			14	143	16	113	128	7,880	7,944	11,960	2,560	
Sept.			29	151	23	107	137	8,166	7,927	11,568	2,280	
Oct.			29	199	2	132	168	10,332	8,875	12,385	2,940	
Nov.			1	194	28	146	163	9,685	8,466	12,010	2,800	
Dec.			18	173	28	117	141	8,642	8,087	11,480	2,450	
Yearly				199		105	142	102,750	97,896	139,380	27,040	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				5.64		2.97	4.02	126,740	120,753	171,922	33,353	

0 Mean daily

! And other days

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

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

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements. Records available: February 23, 1971 through 1987.

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.2	0	22.9	1.1	10.2	5.6	8.4	0.1	10.4	3.6	0	2.0
2	0	0	27.8	2.7	5.5	11.1	2.8	1.2	4.5	2.0	0	3.6
3	0	0	1.7	6.9	9.4	4.4	3.5	6.0	2.4	2.7	0	3.6
4	0	0	0	1.7	1.3	1.6	6.9	.9	4.4	6.9	0	4.6
5	3.2	0	0	6.9	3.6	3.3	4.2	4.4	2.0	12.0	0	4.4
6	2.2	0	.1	6.4	5.3	3.4	7.2	.7	.8	5.4	0	3.2
7	.2	1.8	1.8	1.3	2.3	3.6	3.5	.1	2.8	7.8	1.9	17.8
8	2.3	3.4	.9	.4	1.2	8.2	3.3	3.2	7.5	4.1	1.2	1.8
9	1.8	0	0	.2	2.2	11.1	6.4	3.3	11.7	8.1	0	.3
10	0	0	0	.8	4.1	8.4	9.7	12.8	2.4	3.0	.3	.1
11	0	0	0	.6	5.8	5.6	17.8	9.2	1.4	17.2	.7	3.9
12	0	.7	0	.4	5.2	6.1	15.0	7.0	1.6	7.5	.7	6.3
13	.3	1.6	0	.5	1.7	3.9	3.4	6.0	7.2	2.4	2.6	16.6
14	.7	4.2	0	1.6	4.7	8.9	3.7	5.7	9.8	3.0	.6	11.2
15	.6	4.0	.3	7.4	4.5	2.7	4.5	4.2	3.0	18.1	.4	10.2
16	2.7	5.8	.2	5.2	2.0	4.4	11.9	3.2	11.6	11.7	0	11.6
17	.1	3.2	.2	9.0	.6	4.5	6.0	7.6	5.3	17.7	0	14.8
18	0	5.2	2.1	8.1	2.5	2.0	2.8	7.1	2.5	22.4	.2	15.0
19	0	5.4	0	6.1	.2	1.6	1.3	6.2	1.5	18.4	2.1	14.8
20	0	9.1	3.7	.5	0	2.3	3.3	8.9	1.0	4.7	8.5	15.9
21	0	7.8	6.9	.7	0	1.1	.1	9.1	1.7	.1	11.6	13.8
22	0	8.2	6.8	.2	0	12.2	1.1	7.3	7.4	4.0	8.5	10.2
23	0	3.9	4.9	1.6	0	4.0	.7	11.9	3.6	.5	3.5	13.7
24	2.2	12.0	2.5	4.1	.8	2.1	1.3	11.7	3.0	.2	.1	11.6
25	.6	4.8	4.2	1.6	.9	4.8	.9	6.8	2.2	1.5	1.7	12.5
26	0	21.7	2.1	18.0	8.9	7.5	7.5	4.7	2.5	.5	2.8	10.3
27	0	13.4	4.1	7.6	7.1	6.3	6.5	7.1	1.2	0	2.3	9.5
28	0	5.4	4.2	4.3	4.0	3.4	2.1	9.9	3.0	0	4.3	6.7
29	.6		3.7	12.0	5.3	8.5	.3	8.2	2.0	1.8	1.7	8.6
30	.6		6.2	3.4	1.3	13.5	1.9	10.4	3.7	.1	2.1	7.5
31	1.6		2.8		2.2		3.7	13.4		0		5.7
Sum	19.9	121.6	110.1	121.3	102.8	166.1	151.7	198.3	124.1	187.4	57.8	271.8
Current Year 1987										Period 1935-1987		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.	1.32	0	31	18.2	1.2	0	0.6	39.5	333	565	39.5	
Feb.	1.74	0	26	31.6	1.1	0	4.3	241	402	681	159	
Mar.	2.10	0	2	46.0	1.3	0	3.6	218	439	939	203	
Apr.	1.85	0	16	35.7	1.21	0	4.0	241	344	664	164	
May	1.79	0	26	33.4	1.20	0	3.3	204	298	434	148	
June	1.69	.01	7	29.8	1.4	0	5.5	329	281	480	45.2	
July	1.87	.01	10	36.5	1.21	0	4.9	301	280	556	62.7	
Aug.	1.86	.03	10	36.1	1.2	0	6.4	393	297	536	98.0	
Sept.	1.64	0	16	28.0	1.12	0	4.1	246	363	768	190	
Oct.	1.75	0	15	31.9	1.4	0	6.0	372	359	728	133	
Nov.	1.69	0	20	29.8	1.1	0	1.9	115	321	541	26.2	
Dec.	1.90	0	7	37.7	1.10	0	8.8	539	351	610	35.3	
Yearly	2.10	0		46.0		0	4.5	3,238	4,068	6,229	2,577	
Meters										Thousands of Cubic Meters		
Cubic Meters per Second										Thousands of Cubic Meters		
0.64										0		
1.30										0		
0.13										3,994		
										5,018		
										7,683		
										3,179		

† And other days

09-5345.50 242 WELL FIELD NEAR SAN LUIS, ARIZONA

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

RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1987.

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

Mean Daily Discharge in Second-Foot 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	1.2	3.0	5.4	4.8	24.3	7.4	9.0	0.1	0
2	0	0	0	3.1	3.5	5.0	4.9	24.8	5.0	9.7	0	0
3	0	0	0	3.3	3.6	4.1	4.2	26.2	6.0	10.5	0	0
4	0	0	1.2	.2	2.0	4.8	4.1	28.0	6.9	11.4	0	0
5	0	0	2.2	0	2.2	3.6	4.1	28.0	10.8	10.4	0	0
6	0	0	0	2.5	2.3	3.4	5.1	14.6	12.0	9.7	0	0
7	3.1	0	0	4.1	4.8	4.8	3.5	4.5	11.5	10.6	0	.9
8	5.1	0	0	5.3	3.5	3.9	4.4	6.7	10.3	9.5	0	2.1
9	.2	0	1.1	4.2	5.7	3.9	3.6	8.2	11.1	9.7	0	2.8
10	0	0	6.4	.1	4.7	4.3	3.1	7.9	11.4	11.9	0	2.1
11	0	0	4.8	1.5	3.9	4.7	3.3	4.7	10.9	8.5	0	2.3
12	0	.9	.2	3.9	6.4	5.3	3.1	4.7	12.5	11.4	0	2.3
13	0	5.9	0	9.6	5.0	8.5	3.8	8.9	12.6	9.2	0	3.0
14	0	6.3	.9	10.5	3.9	3.7	3.4	7.5	10.7	10.1	0	5.3
15	0	5.4	5.0	14.9	5.0	3.6	3.2	4.2	11.4	12.9	0	2.7
16	.1	.4	5.7	13.8	3.4	3.8	3.8	5.4	11.7	11.5	0	3.0
17	0	0	5.6	5.0	3.3	3.8	3.7	3.4	11.5	11.9	0	4.4
18	0	0	1.1	5.7	5.3	4.3	3.3	3.5	13.0	10.7	0	3.8
19	0	.5	6.4	1.4	6.9	3.3	3.2	3.9	12.3	10.5	0	0
20	0	4.3	4.1	.2	5.6	3.6	5.6	6.0	11.0	10.3	0	0
21	0	7.4	1.5	.9	4.1	3.3	5.6	4.6	11.7	9.2	0	0
22	0	5.7	5.0	5.0	3.5	4.4	4.6	5.3	7.8	10.4	0	0
23	0	2.0	7.3	4.8	3.6	4.6	4.4	4.2	9.7	10.2	0	0
24	0	.3	3.0	4.6	8.8	4.6	4.5	15.5	10.5	13.6	0	0
25	0	0	7.9	5.3	7.3	3.8	3.4	27.2	12.2	10.7	0	0
26	0	2.2	6.4	5.5	4.4	4.2	4.7	27.9	9.0	9.8	0	0
27	0	4.3	7.9	4.5	4.2	3.4	4.3	14.3	8.9	10.9	0	0
28	0	.1	7.8	4.8	4.2	7.3	4.3	4.5	9.6	14.6	0	0
29	0	0	7.7	3.3	3.3	7.6	3.7	4.5	9.8	10.6	0	0
30	0	0	5.0	2.2	3.8	4.9	17.6	7.4	10.3	.3	0	0
31	0	0	.1		4.3		24.5	5.9		0	0	0
Sum	8.5	45.7	104.3	131.4	135.5	135.9	159.8	346.7	309.5	309.7	0.1	34.7

Month	Current Year 1987						Period 1979-1987				
	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	0.31		17	7.8	11	0	0.3	16.9	396	2,761	0
Feb.	.33	0	26	8.6	11	0	1.6	90.6	463	2,257	0
Mar.	.34	0	23	9.0	11	0	3.4	207	389	2,132	0
Apr.	.61	0	116	21.8	11	0	4.4	261	452	2,681	0
May	.37	.06	112	10.2	8	.5	4.4	269	771	2,750	11.3
June	.43	.14	11	12.8	21	2.3	4.5	270	735	2,800	21.4
July	.74	.13	30	29.2	8	2.1	5.2	317	773	3,020	16.3
Aug.	.85	.07	24	36.0	127	.7	11.2	688	618	2,073	0
Sept.	.49	.14	17	15.6	22	2.3	10.3	614	736	2,326	0
Oct.	.48	0	116	15.1	130	0	10.0	614	605	2,711	0
Nov.	.03	0	1	.1	11	0	0	.2	201	1,011	0
Dec.	.31	0	17	7.8	11	0	1.1	68.8	490	2,962	0
Yearly	0.85	0		36.0		0	4.7	3,417	6,629	23,566	163
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.26	0		1.02		0	0.13	4,215	8,177	29,068	201

0 Mean daily

1 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 1987; 242 Lateral from November 1978 through 1987.

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 Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	143	155	167	122	156	152	138	168	160	162	195	174
2	140	137	176	144	170	148	124	182	158	145	166	162
3	133	141	139	161	163	142	122	180	157	168	161	157
4	133	134	135	151	141	132	124	168	169	177	162	162
5	155	146	132	150	151	131	120	164	157	190	163	164
6	149	148	139	153	150	142	126	150	149	192	154	162
7	151	147	147	147	131	154	119	142	156	177	172	171
8	162	166	156	141	153	147	116	138	174	183	180	158
9	160	141	148	144	147	155	127	146	177	180	165	160
10	154	137	156	145	163	147	138	163	160	180	152	162
11	136	133	148	148	150	145	141	140	160	192	192	177
12	144	136	125	172	148	146	147	137	161	189	151	156
13	138	154	113	165	143	146	125	139	155	179	173	162
14	141	147	130	143	146	155	143	163	158	174	164	162
15	146	155	153	156	152	130	139	145	150	188	171	153
16	138	149	157	164	163	158	157	128	174	180	170	170
17	135	159	138	174	188	160	154	132	159	204	162	198
18	149	165	137	168	156	156	158	155	156	216	167	202
19	154	168	152	204	138	156	160	145	157	215	151	170
20	154	174	165	173	134	155	143	147	181	200	186	173
21	140	154	148	132	127	158	146	152	160	186	187	152
22	155	153	159	136	126	180	146	152	165	201	184	141
23	143	154	156	139	123	163	146	149	124	193	174	143
24	157	161	151	144	137	165	159	165	156	198	170	140
25	147	142	153	145	146	164	156	168	163	211	168	147
26	158	176	154	172	149	172	170	169	164	201	164	135
27	150	197	158	165	144	159	160	164	165	202	162	141
28	136	170	165	151	144	165	151	143	167	213	151	137
29	148		137	171	143	176	148	134	163	222	168	141
30	136		120	147	136	164	149	148	170	196	191	144
31	138		140		155		149	148		152		152
Sum	4,523	4,299	4,554	4,627	4,573	4,623	4,401	4,724	4,825	5,866	5,076	4,928
Current Year 1987										Period 1935-1987		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			8	162	1	133	146	8,972	9,315	12,131	* 2,123	
Feb.			27	197	11	133	154	8,529	9,130	12,970	* 2,023	
Mar.			2	176	13	113	147	9,038	10,320	13,704	* 2,322	
Apr.			19	204	1	122	154	9,180	10,111	12,982	* 2,117	
May			17	188	23	123	148	9,073	10,703	13,900	2,473	
June			22	180	15	130	154	9,171	9,896	12,570	2,525	
July			26	170	8	116	142	8,736	9,943	12,420	2,927	
Aug.			2	182	16	128	152	9,373	9,815	12,657	2,989	
Sept.			20	181	23	124	161	9,568	9,945	12,450	2,602	
Oct.			29	222	2	145	189	11,633	10,793	13,898	3,444	
Nov.			1	195	112	151	169	10,064	10,020	12,712	3,407	
Dec.			18	202	26	135	159	9,774	9,926	12,050	2,888	
Yearly				222		113	156	113,111	119,947	149,010	31,840	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				6.29		3.20	4.42	139,520	147,952	183,801	39,274	

‡ Mean daily † And other days * Partly estimated

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 1,000 feet (305 m) upstream from the southerly international boundary, 2 miles (3.2 km) west of San Luis, Arizona, and 21.9 miles (35.2 km) downstream from Morelos Dam. The zero of the gage was at mean sea level, U. S. C. & G. S. datum. This gage was destroyed on January 19, 1983. 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 80 feet (24.4 m) upstream 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 1987; continuous record of gage heights, January 1947 through 1987. Monthly flows for this station have been derived for the period January 1935 through 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

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

EXTREMES: Since January 1950: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec) on August 19, 1983; maximum gage height, 84.84 feet (25.86 m) on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17,000	15,000	11,700	532	102	801	1,480	470	526	1,360	4,080	137
2	16,200	14,700	11,300	1,170	104	602	367	133	1,040	1,120	4,690	117
3	15,800	14,400	10,200	1,170	278	1,060	165	688	1,360	1,220	3,860	662
4	16,300	13,500	9,730	560	548	1,280	122	590	671	777	2,980	590
5	16,400	13,000	8,210	168	176	730	134	180	414	1,240	2,990	279
6	15,600	12,300	7,310	940	158	934	558	160	108	1,430	2,380	858
7	15,900	12,500	7,900	547	205	1,180	307	492	75.3	1,320	1,220	1,980
8	15,700	12,800	7,900	727	171	1,220	136	567	461	1,290	1,240	2,140
9	15,500	12,600	8,630	792	312	606	94.1	103	1,180	1,340	1,910	1,700
10	15,700	11,200	7,110	199	643	1,430	82.2	533	1,480	995	1,720	1,910
11	16,900	10,600	6,680	145	1,540	895	76.5	420	1,270	1,000	1,500	1,890
12	15,800	10,300	6,840	136	840	362	71.4	481	1,360	1,660	1,060	2,060
13	14,900	11,800	6,810	152	1,810	715	69.0	541	435	2,350	720	2,110
14	14,400	11,800	6,390	254	1,350	945	61.6	1,420	622	2,820	574	1,890
15	14,200	11,400	7,420	205	878	650	327	2,530	748	1,190	484	1,520
16	13,500	10,300	7,640	127	962	176	367	944	1,250	1,690	442	2,110
17	14,200	8,730	4,660	117	2,740	358	582	879	1,880	3,630	395	3,940
18	15,100	8,450	4,270	113	3,330	1,190	293	388	1,690	3,900	371	5,290
19	15,600	8,360	3,980	598	2,430	759	335	593	2,230	2,350	423	5,730
20	15,100	8,540	3,420	2,370	2,180	794	1,050	533	1,190	2,580	485	5,420
21	14,700	10,400	2,200	655	1,380	1,200	389	115	1,820	2,650	351	6,020
22	14,300	10,600	1,820	275	1,320	759	606	195	1,010	2,220	237	6,510
23	14,700	9,450	1,710	175	960	515	372	392	1,400	2,220	205	6,280
24	14,700	8,770	1,030	120	1,070	463	177	288	1,670	1,930	206	5,970
25	15,500	8,890	755	111	1,370	544	140	373	2,280	1,800	245	5,820
26	15,000	9,600	495	106	1,390	418	129	1,000	2,550	2,790	157	5,800
27	14,300	11,700	243	105	1,780	347	231	1,160	1,570	1,810	160	6,040
28	13,700	11,800	217	103	2,830	304	370	667	1,320	2,210	138	5,760
29	13,600		204	100	2,140	466	690	599	1,250	2,560	128	4,680
30	14,100		1,290	99.8	1,010	1,150	911	248	1,960	3,130	119	4,290
31	14,200		815		830		690	431		3,830		4,290
Sum	468,600	313,490	158,879	12,871.8	36,837	22,853	11,382.8	18,113	36,820.3	62,412	35,470	103,793

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Average			Maximum	Minimum	
	Day	Day	Day	Day	Day	Day	Day	Day	Day		
Jan.	79.05	78.22	1	17,500	116	13,000	15,100	929,454	386,905	1,672,000	0
Feb.	78.65	77.05	1	15,300	19	8,090	11,200	621,798	314,562	1,385,000	0
Mar.	77.90	72.99	1	12,200	29	198	5,130	315,132	232,578	1,127,000	798
Apr.	75.26	72.16	20	3,150	30	98.7	429	25,531	167,379	758,203	0
May	75.76	72.11	17	4,960	1	101	1,190	73,065	236,932	1,160,000	0
June	74.49	72.09	10	1,720	17	130	762	45,328	206,933	1,180,000	0
July	74.56	71.68	1	1,720	14	57.3	367	179,724	1,477,091	0	0
Aug.	74.88	71.87	15	2,990	25	71.3	584	35,927	192,806	1,705,190	0
Sept.	75.18	71.36	26	2,700	8	70.5	1,230	73,032	215,956	1,586,380	0
Oct.	76.72	73.70	18	5,210	4	667	2,010	123,792	256,489	1,738,909	0
Nov.	77.06	72.03	2	4,960	30	118	1,180	297,968	1,428,000	0	0
Dec.	77.72	72.00	22	6,730	3	111	3,350	205,870	365,052	1,839,000	0
Yearly	79.05	71.36		17,500		57.3	3,511	2,541,860	3,073,284	12,692,946	9,570
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	24.09	21.75		496		1.62	99.4	3,135,333	3,790,834	15,656,495	11,804

! And other days * Estimated * Partly estimated

09-5222.00 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

MEAN DAILY GAGE HEIGHT IN FEET 1987

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	78.99	78.60	77.81	73.46	72.17	73.60	74.37	72.98	73.03	74.49	76.72	72.18
2	78.89	78.56	77.78	74.14	72.15	73.29	72.92	72.14	73.61	74.28	76.98	72.04
3	78.84	78.48	77.62	74.14	72.84	73.84	72.22	73.24	73.91	74.35	76.25	73.21
4	78.90	78.32	77.56	73.47	73.57	74.08	71.99	73.20	73.22	73.85	75.58	73.48
5	78.93	78.21	77.25	72.65	72.51	73.49	72.08	72.30	72.83	74.33	75.53	72.72
6	78.82	78.06	77.07	73.87	72.32	73.73	73.49	72.21	72.13	74.47	75.20	73.99
7	78.88	78.06	77.26	73.51	72.47	73.98	72.95	72.94	71.92	74.37	74.40	74.91
8	78.84	78.06	77.30	73.71	72.20	74.03	72.20	73.16	72.75	74.31	74.37	74.98
9	78.81	78.00	77.53	73.78	72.62	73.28	71.94	72.05	73.80	74.34	74.79	74.64
10	78.79	77.74	77.18	72.80	73.20	74.20	71.86	73.07	74.05	74.01	74.60	74.66
11	78.91	77.61	77.09	72.51	74.03	73.70	71.82	72.90	73.88	74.00	74.45	74.52
12	78.75	77.56	77.15	72.45	73.29	72.77	71.80	73.01	73.96	74.51	74.06	75.23
13	78.55	77.83	77.17	72.54	74.28	73.34	71.80	73.14	72.91	74.79	73.64	75.26
14	78.46	77.83	77.08	72.92	74.01	73.76	71.74	74.01	73.16	75.05	73.39	74.88
15	78.42	77.76	77.40	72.83	73.66	73.36	72.59	74.68	73.34	74.14	73.20	74.49
16	78.30	77.55	77.47	72.39	73.81	72.35	72.76	73.67	73.88	74.54	73.10	75.01
17	78.41	77.22	76.54	72.31	74.83	72.79	73.27	73.61	74.41	75.36	72.97	76.06
18	78.56	77.14	76.41	72.28	75.25	74.01	72.55	72.78	74.34	75.46	72.89	76.90
19	78.65	77.12	76.30	73.10	74.91	73.54	72.71	73.11	74.69	74.91	73.01	77.17
20	78.61	77.16	76.05	74.88	74.78	73.58	73.85	73.09	74.02	75.01	73.13	76.98
21	78.56	77.56	75.27	73.58	74.24	74.03	72.80	72.11	74.53	75.05	72.83	77.33
22	78.51	77.62	75.00	73.05	74.20	73.48	73.30	72.33	73.93	74.85	72.48	77.61
23	78.58	77.37	74.87	72.67	73.85	73.16	72.74	72.82	74.30	74.85	72.38	77.48
24	78.57	77.21	74.22	72.33	73.93	73.06	72.09	72.56	74.54	74.68	72.41	77.31
25	78.69	77.24	73.97	72.27	74.18	73.26	71.88	72.64	74.94	74.62	72.60	77.22
26	78.62	77.40	73.68	72.23	74.21	73.01	71.80	73.73	75.12	75.12	72.21	77.21
27	78.51	77.81	73.23	72.22	74.49	72.83	72.27	73.88	74.59	74.64	72.24	77.35
28	78.45	77.84	73.11	72.20	75.02	72.72	72.74	73.33	74.45	74.85	72.14	77.19
29	78.40		73.03	72.18	74.67	73.09	73.33	73.19	74.42	75.02	72.08	76.50
30	78.48		74.49	72.17	73.86	74.06	73.73	72.45	74.91	75.74	72.04	76.22
31	78.49		73.99		73.64		73.42	72.81		76.54		76.22
Avg.	78.65	77.75	76.06	72.95	73.72	73.45	72.61	73.00	73.85	74.73	73.72	75.51

* Partly Estimated

#Estimated

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

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

RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1987.

REMARKS: Pursuant to Minute No. 282 of the Commission, a bypass drain of the Wellton-Mohawk extension channel was constructed from Morelos Dam to the Santa Clara Slough in Mexico along the left bank of the Colorado River.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	215	215	197	191	191	159	212	207	0.4	0.3	1.5	225
2	215	217	196	199	180	157	213	201	1.6	.2	2.0	166
3	217	219	195	200	171	156	212	163	2.2	.2	1.3	95.1
4	217	217	191	197	171	164	211	210	2.3	.1	1.2	89.3
5	216	209	195	195	176	164	209	215	2.3	.2	1.1	100
6	213	206	195	195	175	164	217	217	2.2	.1	.6	99.0
7	211	209	193	193	174	161	221	210	.5	.1	.3	99.5
8	211	208	195	193	174	161	220	211	.2	.1	.2	96.9
9	208	208	195	193	166	163	218	205	1.3	.3	.2	101
10	208	208	197	197	157	162	219	204	.4	.3	.3	104
11	208	209	200	199	155	176	219	207	.1	.2	.3	104
12	208	208	201	196	154	188	219	208	.1	.3	.3	104
13	209	209	202	194	155	188	218	209	.1	.2	.3	99.6
14	208	206	202	195	162	188	219	218	.1	.2	.3	98.7
15	211	209	202	189	166	188	215	210	.1	.3	.3	99.2
16	213	209	201	191	166	191	214	204	2.0	.2	.3	97.6
17	212	208	200	196	166	191	217	205	.5	.2	.3	105
18	209	208	196	198	167	190	219	201	.3	.2	.3	104
19	211	205	195	196	166	189	216	202	.2	.2	.2	97.8
20	210	202	194	195	167	188	213	199	.2	.2	.1	92.4
21	195	202	198	195	168	187	211	101	.2	.4	.2	93.7
22	155	202	198	200	170	193	216	35.6	.3	.4	.3	97.2
23	151	201	198	204	163	202	219	29.6	.2	.6	.3	99.1
24	153	199	199	205	155	232	220	29.7	.1	.6	.3	101
25	190	199	201	202	153	231	224	30.2	.1	.5	1.8	97.9
26	211	193	201	203	143	218	231	19.4	1.6	.4	.7	96.5
27	211	191	202	202	140	213	230	6.5	.5	.3	.5	109
28	213	191	201	200	147	209	229	3.0	.2	.3	.9	99.5
29	206	202	202	199	159	210	223	1.3	.2	.3	1.1	99.7
30	208	197	178	161	161	208	220	1.2	.5	.8	6.7	98.6
31	213	208	186	160	160	211	211	.5		1.1		95.7
Sum	6,336	5,767	6,125	5,890	5,078	5,591	6,755	4,364.0	21.0	9.8	24.2	3,266.0

Month	Current Year 1987							Period 1977-1987			
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
							High	Low			
Jan.	1.92	1.51	1 5	217	22	146	204	12,567	12,727	17,542	9,241
Feb.	1.94	1.77	1 3	220	126	190	206	11,439	11,540	14,896	6,896
Mar.	1.87	1.73	29	208	31	183	198	12,149	13,211	17,427	9,478
Apr.	1.87	1.66	24	208	30	171	196	11,683	12,902	16,711	7,914
May	1.80	1.49	1	195	126	140	164	10,072	12,835	16,808	4,228
June	2.09	1.57	124	245	3	153	186	11,090	12,394	16,086	9,281
July	2.01	1.87	26	234	21	208	218	13,398	12,992	18,026	8,333
Aug.	1.94	.04	6	220	31	.2	141	8,656	12,939	18,196	8,656
Sept.	.16	.02	2	3.7	1 8	.1	.7	41.7	11,260	19,083	41.7
Oct.	.10	.02	31	1.7	1 2	.1	.3	19.4	11,920	19,133	19.4
Nov.	1.41	.02	30	131	1 9	.1	.8	48.0	11,072	16,980	48.0
Dec.	2.09	1.07	1	249	4	83.2	105	6,478	11,934	18,256	6,216
Yearly	2.09	0.02		249		0.1	135	97,641	147,726	180,374	97,641
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	0.64	0.01		7.05		0	3.82	120,438	182,217	222,488	120,438

! And other days * Estimated * Partly estimated

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, 0.6 mile (1.0 km) downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 16.8 miles (27.0 km) downstream from Morelos Dam, and 820 feet (250 m) south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Agriculture and Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1987.

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1956-1987		
		Average	Maximum	Minimum
January	0	10,592	69,527	0
February	0	4,931	41,264	0
March	0	7,582	58,411	0
April	0	13,132	69,212	0
May	0	12,323	80,727	0
June	0	10,533	50,025	0
July	425	12,114	46,139	0
August	4,712	16,303	107,162	0
September	10,525	13,438	68,053	0
October	6,441	12,247	110,417	0
November	7,193	11,487	99,044	0
December	10,979	10,260	70,213	0
Yearly	40,276	130,107	509,407	0
	Thousands of Cubic Meters			
	49,680	160,485	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 0.8 mile (1.3 km) upstream from the Sonora-Baja California railroad bridge, 3.7 miles (5.9 km) downstream from the Miguel C. Rodriguez gaging station, and 28.1 miles (45.3 km) downstream from the southerly international boundary.

RECORDS: The records are computed by the Ministry of Agriculture and Hydraulic Resources and based upon gate openings. Records available: January 1964 through 1987.

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1964-1987		
		Average	Maximum	Minimum
January	6,824	1,865	8,546	0
February	2,886	1,475	9,757	0
March	1,922	772	4,809	0
April	669	411	4,503	0
May	4,983	1,524	11,549	0
June	1,815	878	6,960	0
July	917	736	7,389	0
August	2,202	1,193	14,402	0
September	6,969	2,321	13,665	0
October	13,450	4,765	23,242	0
November	8,079	2,969	20,481	0
December	4,657	2,460	10,847	0
Yearly	55,372	21,370	83,688	0
	Thousands of Cubic Meters			
	68,301	26,359	103,228	0

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

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

IN THOUSANDS OF ACRE-FEET

Month	LAKE MEAD (Capacity 26,159.0)		LAKE MOHAVE (Capacity 1,810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28,588.4)	
	1987	Average 1935-1987	1987	Average 1951-1987	1987	Average 1939-1987	1987	Estimated Average
Jan.	24,432	18,140	1,718	1,660	551.7	553.8	26,701.7	20,353.8
Feb.	24,485	17,963	1,711	1,674	547.2	555.9	26,743.2	20,192.9
Mar.	24,181	17,710	1,765	1,677	553.0	569.9	26,499.0	19,956.9
Apr.	24,046	17,782	1,728	1,670	579.8	599.7	26,353.8	20,051.7
May	23,795	18,539	1,766	1,728	613.6	602.8	26,174.6	20,869.8
June	23,886	19,640	1,634	1,632	613.4	600.7	26,133.4	21,872.7
July	24,066	19,805	1,438	1,511	582.1	590.2	26,086.1	21,906.2
Aug.	24,330	19,615	1,405	1,460	573.9	574.3	26,308.9	21,649.3
Sept.	24,365	19,386	1,436	1,432	570.7	569.8	26,371.7	21,387.8
Oct.	24,199	19,166	1,451	1,443	577.5	569.2	26,227.5	21,178.2
Nov.	24,404	19,000	1,573	1,513	537.5	559.5	26,514.5	21,072.5
Dec.	24,553	18,813	1,496	1,594	567.1	557.5	26,616.1	20,964.5
Avg.	24,229	18,797	1,593	1,583	572.3	575.3	26,394.3	20,955.3
Max.	24,553	! 27,780	1,766	! 1,808	613.6	! 688.7	26,743.2	! 29,132.3
Min.	23,795	* 10,727	1,405	!! 1,186	537.5	!! 76.9	26,086.1	!! 13,062.6

! Maximum end of month storage for period of record

* Minimum end of month storage since 1940

!! Minimum end of month storage for period of record

SUSPENDED SILT - 1987

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

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

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

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

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

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent	Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent	Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent
Jan. 7	0812	18,200	0.0164	May 6	0726	3,090	0.0093	Sep. 1	0722	4,110	0.0030
14	0810	16,700	0.0475	14	0729	3,070	0.0017	9	0728	4,560	0.0028
21	0822	16,400	0.0475	20	0731	3,400	0.0018	16	0730	4,390	0.0058
28	0842	15,900	0.0436	27	0730	3,770	0.0027	23	0737	4,160	0.0341
Feb. 4	0811	15,900	0.0317	June 10	0721	3,890	0.0023	30	0755	4,440	0.0052
11	0807	13,100	0.0266	17	0746	4,390	0.0037	7	0722	3,720	0.0055
18	0840	11,600	0.0629	24	0731	3,690	0.0020	15	0730	3,550	0.0054
25	0813	11,300	0.0145	July 2	0740	3,550	0.0024	21	0905	3,700	0.0024
Mar. 5	0831	10,940	0.0082	8	1000	3,480	0.0152	28	0735	4,030	0.0042
11	0837	9,460	0.0051	15	0725	3,770	0.0041	Nov. 4	0740	4,180	0.0075
18	0855	8,230	0.0026	23	0745	3,100	0.0038	13	0855	2,530	0.0009
27	1200	4,630	0.0019	29	0720	4,980	0.0041	18	0827	2,370	0.0023
31	0818	4,350	0.0016	Aug. 5	0730	3,740	0.0024	25	0826	2,170	0.0016
Apr. 7	0816	5,070	0.0030	13	0726	6,160	0.0018	Dec. 2	0837	2,020	0.0016
15	0831	4,510	0.0022	19	0735	4,740	0.0034	9	0831	4,610	0.0030
22	0741	4,460	0.0021	26	0728	4,630	0.0023	16	0830	4,790	0.0029
29	0758	3,470	0.0090					23	0820	7,840	0.0083
								30	0905	5,910	0.0087

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

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons/Ac.Ft.	1952-1987 Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	200,407,000	27,343	4	0.0136	0.0189	0.0042	14.8	9.0	50.8	0.2
Feb.	233,277,000	15,420	4	0.0066	0.0094	0.0029	8.4	9.7	59.8	.9
Mar.	327,916,000	13,499	4	0.0041	0.0109	0.0022	7.3	41.2	154	5.3
Apr.	336,512,000	16,265	5	0.0048	0.0086	0.0023	8.8	40.9	237	7.5
May	185,053,000	12,826	4	0.0069	0.0126	0.0030	6.9	12.2	61.8	1.5
June	224,652,000	8,213	4	0.0037	0.0050	0.0025	4.4	27.2	109	2.3
July	282,491,000	11,129	5	0.0039	0.0046	0.0029	6.0	37.6	156	3.9
Aug.	307,260,000	9,424	4	0.0031	0.0040	0.0026	5.1	35.9	135	3.8
Sept.	229,059,000	20,018	5	0.0087	0.0247	0.0025	10.8	16.0	64.7	1.9
Oct.	184,624,000	11,283	4	0.0061	0.0075	0.0042	6.1	5.4	48.2	.3
Nov.	161,512,000	6,693	4	0.0041	0.0052	0.0025	3.6	4.9	54.9	.2
Dec.	167,299,000	9,332	5	0.0056	0.0085	0.0032	5.0	7.3	23.7	1.1
Yearly	2,840,063,000	161,445	52	0.0059	0.0247	0.0022	87.2	247.3	809.0	51.4

Samples and analyses by Mexican Section, Method B

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent	Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent	Date	Time Std.	Stream-flow, Momentary Sec.-Ft.	Gravimetric Percent
Jan. 8	1130	16,100	0.0638	May 12	1150	854	0.0048	Aug. 14	1140	1,290	0.0102
Feb. 24	1125	8,450	0.0629	July 1	1030	1,710	0.0092	Oct. 13	1011	2,310	0.0138
Mar. 24	1148	1,090	0.0018	28	1030	243	0.0030	Nov. 10	1203	1,780	0.0083

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

CHEMICAL ANALYSES OF WATER SAMPLES

1987

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

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

1987 Date	Time Std.	Streamflow Sec.-Ft.	Specific Conductance Micromhos	pH Units	Hardness, Total (as CaCO ₃) mg/L	Hardness Noncarbonate (as CaCO ₃) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg) Dissolved mg/L
Jan. 5	0830	18,300	924	8.0	300	158	78	26
Jan. 20	0830	16,900	933	8.1	290	150	75	25
Feb. 17	0830	11,800	974	8.2	297	149	76	26
Mar. 2	0830	14,100	970	8.1	302	156	78	26
Mar. 16	0830	9,510	994	8.0	300	148	77	26
Apr. 6	0830	4,760	1,100	8.1	330	174	85	29
Apr. 20	0830	6,110	1,060	8.1	325	171	83	29
May 4	0730	3,550	1,160	7.9	340	184	87	30
May 18	0730	3,750	1,210	8.1	315	159	66	37
June 1	0730	2,430	1,280	8.2	359	193	92	32
June 15	0730	3,220	1,160	8.3	342	192	88	30
July 6	0905	3,400	1,110	8.3	336	183	84	31
July 20	0800	4,720	1,050	8.3	315	167	78	29
Aug. 3	0800	4,810	1,040	8.3	313	169	77	29
Aug. 17	0730	4,950	1,040	8.3	314	172	77	30
Aug. 31	0730	4,130	1,210	8.4	334	182	83	31
Sep. 8	0730	4,180	1,200	8.3	331	179	81	31
Sep. 14	0730	3,860	1,200	8.3	331	179	80	32
Sep. 21	0730	3,890	1,230	8.3	323	170	78	32
Sep. 28	0800	3,650	1,260	8.3	360	204	88	34
Oct. 5	0730	3,920	1,250	8.3	347	193	83	34
Oct. 13	0730	5,250	1,170	8.2	339	190	81	33
Oct. 19	0730	3,890	1,240	8.3	336	180	81	33
Oct. 26	0730	4,110	1,280	8.3	352	194	85	34
Nov. 2	0730	6,750	1,210	8.3	337	182	83	32
Nov. 9	0800	3,890	1,450	8.4	381	207	96	35
Nov. 16	0830	2,320	1,480	8.3	387	214	97	35
Nov. 23	0800	2,000	1,390	8.3	379	208	91	37
Nov. 30	0830	2,350	1,490	8.3	384	211	95	36
Dec. 7	0800	4,880	1,160	8.3	330	178	79	32
Dec. 21	0800	7,740	1,020	8.3	309	169	77	28

1987 Date	Sodium ion (Na) Dissolved mg/L	Potassium ion (K) Dissolved mg/L	Sulfate ion (SO ₄) Dissolved mg/L	Chloride ion (Cl) Dissolved mg/L	Carbonate (as CO ₃) mg/L	Bicarbonate (as HCO ₃) mg/L	Nitrate (as NO ₃) mg/L	Solids Dissolved (Calculated)
Jan. 5	81	4	218	69	0	173	1.6	571
Jan. 20	84	4	221	67	0	171	1.5	572
Feb. 17	89	4	233	82	0	181	1.3	610
Mar. 2	86	4	235	80	0	178	1.5	610
Mar. 16	89	4	223	87	0	185	1.6	609
Apr. 6	100	4	254	98	0	190	1.6	676
Apr. 20	97	4	245	87	0	188	1.5	649
May 4	108	4	266	117	0	190	1.4	719
May 18	129	6	298	103	0	190	1.4	744
June 1	129	5	293	138	0	203	1.2	804
June 15	113	5	264	115	0	183	1.2	724
July 6	114	6	269	96	0	186	0.5	704
July 20	103	6	256	89	0	180	0.8	662
Aug. 3	100	6	256	94	0	176	1.3	661
Aug. 17	99	5	252	91	0	173	0.8	652
Aug. 31	129	6	284	142	0	185	1.5	780
Sep. 8	126	6	284	125	0	185	1.1	758
Sep. 14	128	6	281	124	0	185	0.8	755
Sep. 21	125	6	284	130	0	186	1.1	759
Sep. 28	140	6	292	139	0	190	1.2	806
Oct. 5	136	7	287	130	0	188	1.2	784
Oct. 13	128	6	274	120	0	182	1.1	745
Oct. 19	131	6	289	133	0	190	1.1	780
Oct. 26	141	6	297	136	0	193	1.2	808
Nov. 2	136	6	302	122	0	189	1.0	787
Nov. 9	161	7	335	160	1.0	212	1.2	913
Nov. 16	169	7	326	175	0	211	1.4	929
Nov. 23	162	6	316	157	0	208	1.3	887
Nov. 30	184	4	334	173	0	211	1.4	945
Dec. 7	120	4	277	114	0	185	0.9	730
Dec. 21	102	4	254	86	0	171	1.0	648

SPECIFIC CONDUCTANCE OF WATER SAMPLES

The following tables show specific conductance of individual water samples taken at Colorado River stations and in Mexican canals. Samples were taken at the northerly international boundary by both Sections of the Commission and at the southerly international boundary by the United States Section. Determinations for the northerly international boundary were made by the Bureau of Reclamation; and for the southerly international boundary, by the United States Section of the Commission. Samples for the Intake Canal at Morelos Dam were taken by the Mexican Section of the Commission, and determinations were made by the Ministry of Agriculture and Hydraulic Resources of Mexico. No samples were taken at the Miguel C. Rodriguez gaging station.

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	943	924	970	1,060	1,110	1,280	1,030	1,020	1,230	1,250	1,200	1,260
2	948	922	970	1,070	1,110	1,300	1,070	1,030	1,150	1,250	1,210	1,290
3	940	948	951	1,060	1,120	1,180	1,080	1,040	1,170	1,250	1,270	1,180
4	932	937	965	1,080	1,160	1,180	1,090	1,050	1,210	1,250	1,260	1,350
5	924	953	1,010	1,090	1,190	1,170	1,100	1,070	1,210	1,250	1,320	1,290
6	942	958	1,010	1,100	1,180	1,170	1,110	1,050	1,200	1,210	1,350	1,230
7	922	957	1,000	1,090	1,170	1,170	1,090	1,030	1,200	1,180	1,370	1,160
8	924	955	990	1,060	1,200	1,190	1,080	1,050	1,200	1,220	1,400	1,200
9	916	953	981	1,060	1,200	1,190	1,100	1,060	1,150	1,230	1,450	1,150
10	925	956	990	1,100	1,170	1,110	1,090	1,070	1,150	1,220	1,430	1,190
11	934	960	1,020	1,100	1,200	1,120	1,100	1,040	1,180	1,210	1,380	1,140
12	940	968	984	1,110	1,190	1,180	1,100	1,040	1,180	1,200	1,340	1,140
13	924	975	1,000	1,120	1,110	1,180	1,110	1,030	1,190	1,170	1,420	1,150
14	920	972	998	1,050	1,120	1,170	1,090	1,000	1,200	1,180	1,420	1,150
15	916	973	996	1,070	1,180	1,160	1,070	1,020	1,260	1,320	1,470	1,150
16	930	974	994	1,090	1,180	1,160	1,050	1,030	1,170	1,250	1,480	1,110
17	931	974	1,020	1,100	1,180	1,050	1,080	1,040	1,140	1,250	1,470	1,040
18	931	981	1,030	1,080	1,210	1,040	1,070	1,100	1,170	1,240	1,470	1,010
19	932	975	1,020	1,050	1,140	1,060	1,060	1,040	1,190	1,240	1,400	1,010
20	933	980	1,030	1,060	1,130	1,070	1,050	1,070	1,210	1,270	1,400	1,020
21	953	974	1,050	1,070	1,200	1,080	1,060	1,050	1,230	1,280	1,400	1,020
22	937	969	1,070	1,070	1,210	1,140	1,050	1,120	1,240	1,270	1,410	1,010
23	929	964	1,090	1,150	1,200	1,090	1,110	1,200	1,150	1,280	1,390	1,050
24	928	961	1,080	1,110	1,190	1,100	1,090	1,270	1,180	1,280	1,330	1,030
25	927	974	1,070	1,030	1,190	1,070	1,100	1,170	1,210	1,280	1,410	1,030
26	927	969	1,090	1,150	1,180	1,070	1,110	1,200	1,230	1,280	1,360	1,030
27	932	962	1,100	1,180	1,160	1,080	1,100	1,180	1,240	1,310	1,360	1,030
28	936	970	1,090	1,210	1,110	1,070	1,050	1,220	1,260	1,260	1,400	1,030
29	929		1,080	1,110	1,220	1,070	1,030	1,220	1,250	1,220	1,430	1,100
30	927		1,070	1,080	1,240	1,020	1,020	1,220	1,170	1,160	1,490	1,070
31	925		1,090		1,250		1,010	1,210		1,180		1,040

* Estimated

SPECIFIC CONDUCTANCE OF WATER SAMPLES

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 840	973	967	1,070	1,240	1,250	1,110	1,030	1,270	1,220	1,260	1,660
2	830	951	959	995	1,150	1,110	1,160	1,140	1,110	1,260	1,120	1,600
3	840	929	944	1,020	1,170	1,190	1,170	1,120	1,110	1,310	1,250	1,400
4	* 840	924	946	1,100	1,210	1,090	1,180	1,160	1,380	1,250	1,240	1,700
5	* 840	932	998	1,050	1,230	1,130	1,150	1,140	1,330	1,320	1,262	1,400
6	840	940	988	1,090	1,240	1,100	1,110	*1,150	1,320	1,250	1,325	1,400
7	820	939	983	1,080	1,240	1,140	1,110	*1,170	1,390	1,270	1,400	1,300
8	870	938	975	1,050	1,190	1,190	1,110	1,180	1,260	1,300	1,383	1,350
9	870	945	976	1,000	1,120	1,160	1,170	1,180	1,150	1,270	1,253	#
10	870	942	967	1,030	1,220	1,150	1,150	1,100	1,230	1,290	1,430	#
11	870	956	1,000	1,060	1,240	1,110	1,180	1,100	1,250	1,350	1,550	#
12	880	920	962	1,230	1,220	1,210	1,170	1,100	1,240	1,330	1,273	#
13	900	951	* 986	1,120	1,180	1,150	1,170	1,040	1,280	1,130	1,268	1,250
14	880	948	1,010	1,070	1,140	1,110	1,040	*1,060	1,280	1,200	1,237	1,300
15	880	964	1,010	1,070	1,140	1,180	1,030	1,090	1,290	1,250	1,364	1,350
16	900	958	983	1,000	1,170	1,200	1,110	1,090	1,200	1,260	1,373	1,150
17	900	949	995	1,140	1,180	*1,100	1,100	1,120	1,200	1,130	1,570	1,200
18	920	955	1,000	1,130	1,190	1,010	1,110	1,100	1,240	1,240	1,600	1,200
19	900	946	1,010	1,110	1,150	1,040	1,100	1,130	1,310	1,300	1,420	1,150
20	900	974	1,020	1,110	1,140	1,070	1,080	1,250	1,310	1,260	1,370	1,200
21	920	973	1,050	1,140	1,170	1,080	1,100	1,260	1,370	1,140	1,348	1,200
22	926	* 965	1,150	1,160	1,150	1,160	1,100	1,260	1,310	1,250	1,247	1,150
23	917	957	1,170	1,190	1,240	1,130	1,200	1,250	1,210	1,160	1,470	1,125
24	930	952	1,090	1,190	1,200	1,110	1,200	1,250	1,260	1,230	1,401	1,150
25	927	961	1,130	1,130	1,270	1,110	1,180	1,250	1,300	1,230	1,379	1,150
26	938	956	1,070	1,190	1,200	1,140	1,200	1,220	1,270	1,230	1,449	#
27	941	951	1,100	1,220	1,140	1,150	1,200	1,380	1,270	1,200	1,410	1,100
28	946	961	1,140	1,270	1,040	1,140	1,180	1,300	1,300	1,277	1,430	#
29	922	1,230	1,190	1,120	1,140	1,140	1,020	1,300	1,320	1,110	1,530	1,200
30	873	1,080	1,220	1,210	1,080	1,130	1,130	1,260	1,300	1,090	1,534	1,200
31	926	1,080	1,200	1,200	1,200	1,130	1,130	1,280	1,090	1,090	#	#

* Estimated # Missing record

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	February	April	June	July	September	November
5 993	24 992	6 1,180	2 1,290	28 1,220	8 1,340	2 1,150
22 936	March	22 1,140	July	August	30 1,340	December
February	10 1,010	May	6 1,200	3 1,170	October	1 1,460
10 972	27 1,160	4 1,220		25 1,330	5 1,370	16 1,180

RAINFALL ON THE COLORADO RIVER WATERSHED
IN INCHES

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

IN THE UNITED STATES

Month	Brawley, California		El Centro, California		Blythe, California		Yuma Citrus Station, Arizona		Bullhead City, Arizona	
	1987	Average 1931-1987	1987	Average 1931-1987	1987	Average 1931-1987	1987	Average 1931-1987	1987	Average 1978-1987
Jan.	0.06	0.35	0.05	0.36	0.11	0.43	0.10	0.40	0.78	1.07
Feb.	.11	.34	.22	.35	.12	.42	.35	.35	.25	.78
Mar.	T	.24	0	.22	T	.40	.02	.26	.09	1.12
Apr.	0	.09	0	.09	.05	.12	0	.11	.08	.14
May	0	.02	.03	.01	T	.03	.08	.02	.11	.15
June	0	.01	0	.01	0	.04	0	.02	.06	.01
July	0	.06	0	.10	.59	.19	0	.19	.13	.53
Aug.	0	.38	0	.36	T	.78	.49	.57	.21	1.05
Sep.	.05	.33	0	.29	0	.40	.11	.35	1.15	.64
Oct.	1.02	.28	1.53	.30	.36	.30	.44	.39	1.08	.43
Nov.	.73	.19	.04	.19	1.32	.29	1.07	.20	1.49	.78
Dec.	.41	.44	.37	.46	.80	.54	.66	.44	.81	1.00
Yearly	2.38	2.73	2.24	2.74	3.35	3.94	3.32	3.30	6.24	7.70

IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1987	Average 1948-1987	1987	Average 1926-1987	1987	Average 1948-1987	1987	Average 1949-1987	1987	Average 1948-1987
Jan.	0.08	0.39	0.04	0.35	0.04	0.35	0	0.31	0	0.35
Feb.	.08	.24	.16	.31	.08	.20	.08	.28	.55	.28
Mar.	0	.16	0	.24	0	.16	0	.24	0	.16
Apr.	0	.08	0	.08	0	.12	0	.04	0	.08
May	0	T	0	T	0	T	0	.04	0	T
June	0	T	0	T	0	.04	0	.04	0	T
July	0	.12	#	-	0	.08	0	.24	0	.08
Aug.	0	.39	.04	.39	0	.24	0	.43	0	.24
Sept.	0	.20	.16	.39	0	.16	.08	.28	0	.24
Oct.	0	.28	1.10	.31	1.02	.28	.35	.35	.47	.31
Nov.	0	.16	.04	.16	T	.16	0	.39	0	.12
Dec.	#	.39	.35	.75	.43	.28	1.18	.63	.35	.43
Yearly		2.44			1.57	1.97	1.69	2.87	1.38	2.17

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California		Riito, Sonora		San Felipe, Baja California		El Centinela, Baja California	
	1987	Average 1952-1987	1987	Average 1975-1987	1987	Average 1959-1987	1987	Average 1969-1987	1987	Average 1978-1987
Jan.	0.16	0.47	0	0.28	0.20	0.28	0	0.31	0	-
Feb.	.39	.31	.87	.39	.20	.28	0	.16	.08	-
Mar.	#	-	0	.08	0	.16	0	.12	0	-
Apr.	#	-	0	.08	0	.04	0	.04	0	-
May	#	-	0	.04	0	T	0	.04	0	-
June	#	-	0	0	0	.04	#	-	0	0
July	0	.20	0	.16	0	.12	#	-	0	T
Aug.	.39	.35	0	.63	0	.28	0	.47	0	.35
Sept.	0	.28	.12	.63	0	.47	#	-	0	.04
Oct.	.87	.43	.08	.28	.16	.39	.04	.24	.08	.31
Nov.	.35	.24	#	#	0	.20	0	.20	0	.08
Dec.	2.56	.43	.08	.79	.63	.43	.67	.43	.04	.47
Yearly					1.18					

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 1987.

IN THE UNITED STATES

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

IN MEXICO

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

* Not shown on map

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

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

Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN
IN INCHES

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

IN THE UNITED STATES

Month	Yuma Citrus Station, Arizona	
	1987	Average 1931-1987
Jan.	* 4.18	3.87
Feb.	4.89	4.77
Mar.	6.82	7.39
Apr.	10.20	10.05
May	11.34	12.95
June	13.27	14.23
July	13.46	15.23
Aug.	12.11	13.41
Sept.	9.09	10.59
Oct.	6.03	7.47
Nov.	3.93	4.89
Dec.	3.08	3.63
Yearly	98.40	108.48

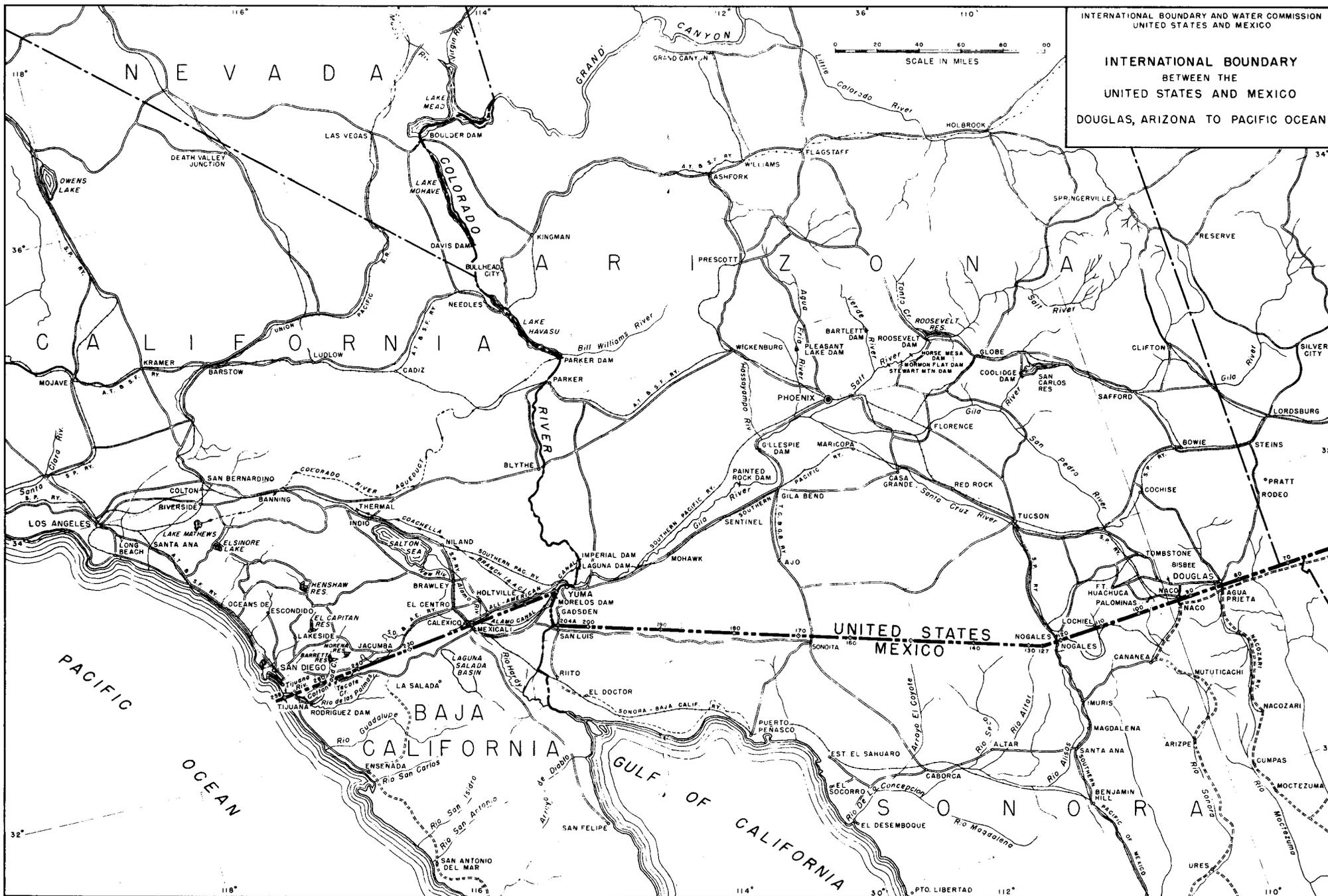
IN MEXICO

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis R. C. Sonora		Delta, Baja California	
	1987	Average 1948-1987	1987	Average 1926-1987	1987	Average 1948-1987	1987	Average 1953-1987	1987	Average 1948-1987
Jan.	4.06	4.45	#	-	3.70	3.78	3.15	-	2.72	3.35
Feb.	5.28	5.24	#	-	4.06	4.61	3.43	-	3.27	4.29
Mar.	6.30	7.48	#	-	6.14	6.85	#	-	5.24	6.10
Apr.	11.65	10.31	#	-	8.43	8.70	#	-	4.96	8.07
May	12.13	12.87	#	-	9.49	11.46	#	-	5.87	10.16
June	13.07	13.94	#	-	11.61	12.95	#	-	7.44	10.87
July	15.94	13.90	#	-	10.91	12.80	#	-	7.52	11.50
Aug.	14.72	12.48	#	-	9.69	11.06	7.64	12.09	7.95	10.51
Sept.	12.24	10.31	#	-	7.64	9.13	5.20	9.25	7.64	8.54
Oct.	9.02	8.15	#	-	5.00	6.42	4.45	6.30	5.98	6.06
Nov.	5.08	5.28	#	-	3.82	4.80	4.37	4.25	4.41	4.25
Dec.	#	4.25	-	-	2.72	3.43	-	-	6.06	3.46
Yearly		109.65			83.19	95.98			69.05	78.50

Month	Colonia Juarez, Baja California		Laguna Salada, Baja California	
	1987	Average 1970-1987	1987	Average 1975-1987
Jan.	3.43	3.70	#	-
Feb.	5.59	4.49	#	-
Mar.	#	-	#	-
Apr.	#	-	#	-
May	#	-	#	-
June	#	-	#	-
July	#	12.76	#	-
Aug.	7.60	10.94	#	-
Sept.	7.17	9.45	#	-
Oct.	5.43	7.28	#	-
Nov.	5.31	4.88	#	-
Dec.	#	3.35	#	-
Yearly				

* Estimated

Missing record





TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES FAHRENHEIT

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

IN THE UNITED STATES

Month	Blythe, California				Yuma Citrus Station, Arizona				Brawley, California			
	1987			Average 1931-87	1987			Average 1931-87	1987			Average 1931-87
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	51.1	80	25	52.7	52.1	79	26	53.3	52.9	83	27	54.0
Feb.	58.3	82	32	57.4	57.2	81	32	57.0	57.9	83	35	58.2
Mar.	61.6	88	38	62.9	60.4	86	38	62.1	61.5	84	37	63.2
Apr.	74.4	106	47	70.1	72.8	98	44	68.7	73.0	100	45	69.8
May	79.0	105	52	77.6	76.5	101	50	75.8	76.4	106	52	77.2
June	88.3	113	64	85.6	85.3	110	63	83.7	85.5	112	60	85.1
July	89.8	115	65	92.4	87.3	111	64	90.9	87.5	113	60	91.7
Aug.	91.9	112	65	91.0	88.9	108	64	90.2	89.7	110	62	91.3
Sept.	84.7	113	63	84.8	84.0	110	58	84.8	84.9	112	58	86.0
Oct.	76.2	110	54	73.0	77.3	104	54	73.4	78.1	107	54	74.9
Nov.	60.3	81	34	60.1	60.1	81	36	61.2	62.0	85	35	62.4
Dec.	50.2	75	25	53.2	50.6	74	25	54.5	51.9	77	24	55.1
Yearly	72.2	115	25	71.7	71.0	111	25	71.3	71.8	113	24	72.4

Month	El Centro, California				Bullhead City, Arizona							
	1987			Average 1931-87	1987			Average 1978-87				
	Mean	Max.	Min.		Mean	Max.	Min.					
Jan.	55.1	80	28	54.1	52.6	76	31	53.8				
Feb.	59.5	82	37	58.1	58.9	79	36	58.1				
Mar.	63.2	83	41	63.0	62.3	85	38	63.1				
Apr.	74.9	102	48	69.6	76.0	105	43	71.5				
May	78.2	108	52	77.2	81.5	105	56	80.6				
June	87.8	114	65	85.2	91.3	116	68	90.3				
July	89.4	113	64	91.7	92.2	118	64	94.6				
Aug.	90.7	110	64	91.0	94.1	114	63	93.5				
Sept.	86.6	111	62	85.6	86.4	114	64	86.2				
Oct.	79.1	106	55	78.5	77.3	106	53	73.9				
Nov.	63.0	85	42	62.2	61.7	79	28	61.1				
Dec.	53.2	78	28	54.8	50.3	71	27	53.0				
Yearly	73.4	114	28	72.2	73.7	118	27	73.3				

IN MEXICO

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1987		1948-1987		1987		1926-1987		1987		1948-1987	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	30	88	23	72	28	93	19	81	27	113	16
Feb.	86	32	95	28	82	43	93	23	82	34	99	21
Mar.	97	34	100	32	81	41	100	30	86	39	113	25
Apr.	99	41	109	37	100	52	106	34	100	43	118	16
May	104	48	117	43	100	54	117	43	104	50	124	34
June	111	63	126	52	115	57	120	48	111	59	135	43
July	115	72	118	61	#	#	118	55	113	61	133	45
Aug.	111	68	120	61	111	72	120	54	113	61	129	46
Sept.	102	63	122	50	108	64	122	48	111	57	135	39
Oct.	95	48	111	32	104	61	111	32	109	54	118	32
Nov.	91	43	100	27	79	43	104	28	84	36	115	32
Dec.	#	#	90	23	73	27	90	23	77	25	97	25
Yearly			126	23	115	0	122	19	113	25	135	16

Blythe FAA Airport # Missing record

TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES FAHRENHEIT

IN MEXICO

Month	Riito, Sonora				San Felipe, Baja California				San Luis, R. C., Sonora			
	1987		1949-1987		1987		1969-1987		1987		1949-1987	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	79	25	91	19	66	41	99	30	82	32	100	19
Feb.	84	34	95	21	64	45	102	32	84	37	109	27
Mar.	81	37	100	25	64	48	104	32	86	41	108	28
Apr.	97	45	109	36	86	50	113	34	108	45	115	37
May	100	50	115	41	100	50	120	41	106	54	115	41
June	109	54	124	45	#	#	124	50	113	59	126	45
July	113	61	140	52	#	#	124	50	115	50	126	50
Aug.	111	63	122	46	117	66	135	41	118	64	126	55
Sept.	118	57	118	39	#	#	126	37	118	59	118	50
Oct.	109	55	115	30	113	50	117	23	117	50	118	32
Nov.	84	36	118	27	99	48	118	21	104	37	113	28
Dec.	84	25	86	21	81	32	97	28	82	37	102	23
Yearly	118	25	140	19	117	32	135	21	118	32	126	19

Month	Delta, Baja California				Colonia Juarez, Baja California				Laguna Salada, Baja California			
	1987		1948-1987		1987		1964-1987		1987		1975-1987	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	84	34	104	27	79	25	91	19	79	37	84	18
Feb.	86	34	104	28	86	34	102	21	82	39	95	27
Mar.	90	36	113	28	#	#	97	25	82	36	95	32
Apr.	102	39	118	32	#	#	115	30	#	#	100	36
May	111	50	129	32	#	#	117	36	108	63	115	39
June	117	50	133	36	#	#	122	39	113	66	120	50
July	118	66	135	45	113	61	122	45	118	59	122	54
Aug.	118	59	140	52	113	61	118	50	117	63	118	52
Sept.	118	54	135	39	#	#	122	39	115	66	118	48
Oct.	104	59	117	34	#	#	108	36	97	45	118	36
Nov.	82	43	120	32	#	#	104	25	#	#	95	28
Dec.	77	28	104	27	#	#	97	19	#	#	86	19
Yearly	118	28	140	27			122	19	118	36	122	18

Month	El Centinela, Baja California											
	1987		1977-1987									
	Max.	Min.	Max.	Min.								
Jan.	84	36	84	34								
Feb.	82	41	90	25								
Mar.	88	46	91	41								
Apr.	102	52	106	46								
May	109	61	113	52								
June	113	70	118	50								
July	115	68	120	68								
Aug.	111	70	115	64								
Sept.	111	66	115	52								
Oct.	111	59	111	50								
Nov.	86	46	93	39								
Dec.	81	28	82	30								
Yearly	115	28	120	25								

Missing record

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1987

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

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

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	45,061
Reservation Division	11,495
Yuma Mesa	13,839
Yuma Aux. Project Unit "B" (Yuma Mesa)	2,534
South Gila Valley	9,655
North Gila Valley	6,128
Wellton-Mohawk	59,021
Coachella Valley	57,379
Imperial Valley	455,718
Warren Act	80
Non-Project lands adjacent to Colorado River	12,560
Total in United States	673,470
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 529,850
Total in United States and Mexico	1,203,320

* An estimated 33% of total acreage is served by pumping from ground water in Mexicali Valley

10-2545.80 ALAMO RIVER AT INTERNATIONAL BOUNDARY

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

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. Records available: June 1942 through 1987.

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

EXTREMES: Maximum mean daily discharge, 256 second-feet (7.31 m³/sec) (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.13	4.62	3.10	2.96	3.38	3.24	2.13	2.34	2.34	1.92	5.03	2.65
2	1.92	2.75	2.75	3.24	3.24	2.75	2.13	3.38	2.75	1.74	3.65	2.65
3	2.65	2.54	2.54	3.10	2.96	2.96	1.92	2.65	3.38	1.92	2.96	2.65
4	4.07	2.23	2.65	2.96	3.24	2.13	2.13	2.65	4.07	1.92	2.44	2.86
5	3.65	2.44	2.75	2.96	3.52	2.23	1.92	2.54	2.34	1.74	2.96	3.65
6	3.65	3.79	3.24	2.96	2.75	2.75	2.13	2.44	1.92	1.74	2.75	2.96
7	3.24	3.24	2.44	3.24	3.24	2.02	2.23	2.54	1.92	1.92	2.86	2.96
8	2.44	3.24	2.44	4.35	5.72	2.13	2.13	3.24	1.92	1.92	2.96	3.38
9	2.23	3.38	2.44	4.35	6.55	2.75	2.23	4.07	1.92	1.92	2.34	3.65
10	2.44	2.54	2.96	3.52	3.79	2.44	2.96	2.75	1.74	1.74	2.34	3.38
11	2.44	2.75	3.24	3.65	3.65	2.75	3.38	2.65	1.92	1.74	2.34	3.24
12	2.23	3.65	3.52	2.65	2.65	2.65	2.96	2.54	1.83	2.75	2.13	4.07
13	4.62	2.54	4.07	2.65	3.38	2.75	5.17	2.75	2.23	2.23	2.13	3.24
14	2.34	2.96	2.75	3.24	2.65	2.13	2.78	1.92	1.46	1.92	2.96	3.24
15	2.34	4.07	3.24	2.96	2.96	2.34	2.54	2.23	1.92	1.74	2.96	2.96
16	2.54	2.75	3.79	3.38	2.75	1.92	2.54	2.23	1.92	1.74	2.54	4.62
17	2.65	3.38	3.38	3.65	2.96	2.54	2.78	2.54	1.92	2.13	2.96	4.90
18	2.44	2.75	2.96	3.93	3.24	2.65	1.74	4.76	1.74	2.54	3.38	4.76
19	2.44	2.75	2.75	3.65	3.52	3.79	1.74	3.24	1.74	2.34	2.34	4.76
20	2.54	2.96	3.38	2.96	3.52	3.10	1.92	4.90	1.55	2.13	3.24	4.90
21	2.44	4.62	3.65	3.24	3.52	2.96	1.92	2.44	1.55	1.92	2.96	3.38
22	2.54	2.96	3.65	4.07	3.52	4.62	1.74	2.13	1.46	2.54	3.79	3.24
23	2.54	2.96	3.38	3.52	3.24	2.75	1.92	2.34	2.02	2.13	4.07	3.24
24	3.52	2.96	2.96	3.38	2.96	3.24	1.74	2.54	2.44	3.38	3.65	3.24
25	3.10	2.54	2.96	3.24	3.52	3.24	1.92	2.65	2.65	2.13	4.76	3.52
26	2.96	3.65	2.75	2.96	3.24	3.79	3.24	2.13	1.74	3.38	3.38	3.52
27	2.65	2.96	2.75	2.96	2.96	2.54	2.75	1.83	1.92	2.13	3.24	3.24
28	2.65	2.96	2.65	2.96	1.92	2.38	3.24	2.23	1.92	2.44	2.96	2.75
29	2.44		2.65	3.10	2.44	2.13	2.54	2.02	1.74	2.75	2.96	2.96
30	2.96		2.96	3.24	2.96	2.75	2.44	2.13	1.74	2.75	2.54	2.96
31	3.24		3.24		2.96		1.92	2.42		4.07		2.96
Sum	86.04	86.94	93.99	99.03	102.91	82.38	74.83	83.24	61.71	69.36	91.58	106.49
Current Year 1987										Period 1943-1987		
Month	# Extreme Gage Feet		# Extreme Second-Feet				Average Second-Feet	Total Acrc-Feet	Acrc-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.52	0.30	13	4.62	2	1.92	2.78	171	303	2,790	99.0	
Feb.	.52	.33	11	4.62	4	2.23	3.11	172	275	2,822	90.2	
Mar.	.48	.35	13	4.07	17	2.44	3.03	186	313	3,154	87.1	
Apr.	.50	.37	18	4.35	112	2.65	3.30	196	351	2,222	97.0	
May	.65	.30	9	6.55	28	1.92	3.32	204	263	1,799	73.0	
June	.52	.30	22	4.62	16	1.92	2.75	163	254	1,686	61.0	
July	.56	.28	13	5.17	118	1.74	2.41	148	235	1,712	59.0	
Aug.	.54	.29	20	4.90	27	1.83	2.69	165	277	1,672	65.7	
Sept.	.48	.25	4	4.07	114	1.46	2.06	122	260	1,406	83.5	
Oct.	.48	.28	31	4.07	12	1.74	2.24	138	274	1,845	61.6	
Nov.	.55	.32	1	5.03	112	2.13	3.05	182	284	2,080	62.4	
Dec.	.54	.37	117	4.90	11	2.65	3.44	211	270	1,686	80.0	
Yearly	0.65	0.25		6.55		1.46	2.84	2,058	3,339	22,146	1,071	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	0.20	0.08		0.19		0.04	0.08	2,539	4,119	27,317	1,321	

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, 1,400 feet (427 m) downstream (north) from the international land boundary between the United States and Mexico. Measurements are made from a foot bridge at the gage.

RECORDS: Based on a continuous record of gage heights and current meter measurements by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	364	352	443	358	355	313	288	308	401	314	479	365
2	392	375	423	365	378	317	272	312	398	301	523	368
3	385	405	429	361	383	312	262	316	366	294	498	363
4	354	385	416	344	394	286	263	351	331	311	444	347
5	334	375	381	371	405	287	269	360	307	323	393	329
6	336	364	352	387	399	259	279	341	293	346	352	340
7	347	332	352	388	400	242	282	336	299	330	343	374
8	326	328	366	367	409	251	308	374	300	289	316	376
9	321	321	409	359	406	256	311	366	296	284	304	368
10	305	339	462	359	410	257	311	359	299	287	303	347
11	323	332	435	361	417	245	315	356	311	301	307	343
12	359	364	400	351	402	245	321	349	307	352	302	315
13	405	380	371	354	402	255	332	333	296	439	306	321
14	377	354	341	359	388	268	325	320	295	431	287	337
15	352	337	340	353	364	270	333	332	314	395	291	365
16	348	330	347	343	327	263	323	328	343	379	306	395
17	352	345	365	346	347	259	316	368	374	373	330	403
18	378	360	348	359	347	251	318	359	393	362	338	430
19	406	352	335	387	364	261	333	346	395	354	313	491
20	408	328	312	422	354	255	329	334	382	337	307	472
21	380	321	306	430	327	272	327	358	350	311	335	446
22	349	323	322	399	304	277	324	356	353	302	330	421
23	348	327	344	385	292	291	317	367	366	290	307	407
24	341	383	383	359	284	290	306	395	368	300	330	363
25	344	443	398	345	294	287	315	418	378	304	347	323
26	359	474	396	359	326	275	308	442	374	319	312	327
27	371	518	389	365	335	267	304	406	379	341	302	343
28	380	493	402	382	335	274	315	347	358	369	316	336
29	398		391	394	331	289	323	335	335	378	316	311
30	392		375	359	323	285	322	338	356	346	326	300
31	360		361		307		306	378		399		296
Sum	11,194	10,340	11,694	11,071	11,109	8,159	9,557	10,988	10,317	10,461	10,263	11,322
Current Year 1987									Period 1943-1987			
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	39.11	40.10	20	408	10	305	361	22,203	9,459	22,203	1,751	
Feb.	38.08	39.95	27	518	19	321	369	20,509	8,439	21,416	1,258	
Mar.	38.61	40.09	10	462	21	306	377	23,195	9,470	25,305	1,008	
Apr.	38.91	39.74	21	430	16	343	369	21,959	9,834	27,618	1,390	
May	39.03	40.31	11	417	24	284	358	22,034	8,926	24,111	629	
June	39.99	40.71	2	317	7	242	272	16,183	7,557	20,287	1,087	
July	39.83	40.52	115	333	3	262	308	18,956	8,103	22,998	817	
Aug.	38.80	40.07	26	442	1	308	354	21,794	9,244	27,618	1,139	
Sept.	39.17	40.22	1	401	6	293	344	20,463	8,902	23,714	1,795	
Oct.	38.83	40.31	13	439	9	284	337	20,749	8,922	22,758	2,081	
Nov.	38.04	40.28	2	523	14	287	342	20,356	8,413	20,519	2,483	
Dec.	38.33	40.19	19	491	31	296	365	22,457	9,530	22,784	1,763	
Yearly	38.04	40.71		523		242	347	250,858	106,799	267,896	24,573	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	11.59	12.41		14.8		6.85	9.83	309,428	131,734	330,444	30,310	

0 Mean daily † And other days ** Feet below mean sea level

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

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

RECORDS: During 1987 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 1987.

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

EXTREMES: Maximum instantaneous discharge, 81.9 second-feet (2.32 m³/sec) on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 1987.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	0.7	1.1	1.8	0	1.8	1.8	1.8	1.4	1.4	1.4	1.4
2	1.1	1.1	1.8	1.8	2.5	1.8	1.8	1.8	1.4	1.4	1.4	1.4
3	1.1	1.1	1.8	1.8	2.1	.7	1.8	1.8	1.4	1.4	1.4	1.4
4	.7	1.1	1.8	1.1	0	0	0	1.8	1.4	1.4	1.4	1.4
5	2.1	1.1	1.8	0	2.1	1.1	1.8	1.8	1.4	1.4	1.4	1.4
6	1.8	1.1	1.8	1.8	1.8	0	1.8	1.8	1.4	1.4	1.4	1.4
7	1.1	1.1	1.8	1.1	1.8	1.8	1.8	1.8	1.4	1.4	1.4	1.4
8	1.4	1.1	1.8	0	1.8	1.8	1.8	1.8	1.4	1.4	1.4	1.4
9	.7	1.1	1.8	0	2.5	0	1.8	1.8	1.4	1.4	1.4	1.4
10	1.1	1.8	1.8	1.8	2.1	1.8	1.8	1.8	1.4	1.4	1.4	1.4
11	1.1	1.8	1.8	1.8	1.8	0	1.8	1.8	1.4	1.4	1.4	1.4
12	1.1	1.4	1.8	1.8	1.8	2.1	1.8	1.1	1.4	1.4	1.4	1.4
13	1.1	.7	1.8	1.8	1.8	0	1.1	1.8	1.4	1.4	1.4	1.4
14	.7	0	1.8	0	1.1	1.8	1.1	1.8	1.4	1.4	1.4	1.4
15	.7	1.4	1.8	2.5	1.8	1.8	1.8	1.8	1.4	1.4	1.4	1.4
16	1.1	1.1	0	.7	1.8	1.1	.7	1.8	1.4	1.4	1.4	1.8
17	0	1.8	1.8	0	1.8	1.8	1.8	0	1.4	1.4	1.4	1.8
18	1.1	1.8	0	0	1.8	1.8	1.8	1.1	1.4	1.4	1.4	1.8
19	1.1	1.1	0	1.1	1.8	1.8	1.8	1.8	1.4	1.4	1.4	1.8
20	.7	1.4	1.4	.7	1.8	.7	1.8	1.8	1.4	1.4	1.4	1.8
21	1.1	1.4	1.1	2.1	1.1	2.5	1.1	1.1	1.4	1.4	1.1	1.8
22	1.1	2.1	1.4	1.8	.7	.7	1.1	.7	1.4	1.4	1.1	1.8
23	1.1	1.8	1.4	1.1	1.8	1.8	1.8	1.8	1.4	1.4	1.1	1.8
24	1.1	1.8	1.8	0	1.8	1.8	1.8	1.8	1.4	1.4	1.1	1.8
25	1.1	1.8	1.8	0	.7	1.8	1.8	1.4	1.4	1.4	1.1	1.8
26	1.1	1.8	1.4	1.1	1.8	1.4	.7	1.4	1.4	1.8	1.1	1.8
27	1.1	1.8	1.4	1.8	1.1	1.4	1.4	1.4	1.8	1.8	1.1	1.8
28	1.8	1.8	0	1.8	1.8	1.4	.7	1.4	1.8	1.8	1.1	1.8
29	1.1	0	1.4	1.8	1.4	1.4	1.4	1.4	1.8	1.8	.7	1.8
30	.7	1.1	1.8	1.8	1.4	1.4	1.4	1.4	1.1	1.8	.7	1.8
31	.7	1.8	1.8	1.4	1.4	1.4	1.4	1.4	1.8	1.8	1.8	1.8
Sum	32.9	38.1	43.1	34.9	49.0	38.6	47.0	47.6	43.3	45.8	38.2	49.8
Current Year 1987										Period 1968-1987		
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.			5	2.1	17	0	1.1	63.7	163	520	0	
Feb.			22	2.1	14	0	1.4	74.3	101	311	0	
Mar.			2	1.8	116	0	1.4	84.3	205	871	33.6	
Apr.			15	2.5	15	0	1.1	68.1	195	431	68.1	
May			2	2.5	11	0	1.4	95.7	208	435	46.2	
June			21	2.5	14	0	1.4	75.4	186	409	21.0	
July			1	1.8	4	0	1.4	91.6	235	528	0	
Aug.			1	1.8	17	0	1.4	93.2	258	596	77.7	
Sept.			1	1.4	30	1.1	1.4	85.9	242	549	67.2	
Oct.			126	1.8	1	1.4	1.4	90.8	226	507	90.8	
Nov.			1	1.4	129	.7	1.4	98.1	199	504	86.7	
Dec.			116	1.8	1	1.4	1.8	75.4	186	597	32.9	
Yearly				2.5		0	1.4	996	2,448	5,359	940	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
				0.07		0	0.04	1,229	3,020	6,610	1,160	

0 Mean daily

! And other days

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

DESCRIPTION: During 1987 the only flow to the New River in Mexico was waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Yochimilco.

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 1987.

REMARKS: To obtain data for Sifon and Pueblo Nuevo Wasteways, see bulletins 1 to 6 (1960-1965); and for Wisteria Wasteway, bulletins 1 to 16 (1960-1975). For data on wastes from Potable Water Plant, see page 51 of this bulletin.

MEAN DAILY GAGE HEIGHT IN FEET 1987

Month	Current Year 1987	Period 1956-1987		
		Average	Maximum	Minimum
January	63.7	955	8,758	6.3
February	74.3	684	7,281	6.3
March	84.3	482	2,610	21.7
April	68.1	432	3,194	16.1
May	95.7	298	1,176	9.1
June	75.4	386	5,670	0
July	91.6	580	10,251	0
August	93.2	516	4,137	0
September	85.9	427	3,215	21.0
October	90.8	565	3,474	8.4
November	98.1	589	3,784	0
December	75.4	922	8,691	0
Yearly	996	6,838	27,430	399
	Thousands of Cubic Meters			
	1,229	8,435	33,835	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, 15.5 miles (24.9 km) northwest of Westmorland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 8,360 square miles (21,652 km²). Zero of the gage is 250.00 feet (76.2 m) below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1987. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 22 miles (35.4 km) northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmorland, California." The elevation of the old station is at a datum of one foot (0.30 m) higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

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

EXTREMES: Maximum elevation during year, 227.1 feet (69.2 m) below mean sea level. Minimum elevation during year, 228.3 feet (69.6 m) below mean sea level. Extremes for period of record, maximum elevation 195.9 feet (59.7 m) below mean sea level, February 10 to March 29, 1907; minimum elevation since 1906, 251.6 feet (76.7 m) below mean sea level in November 1924.

MEAN DAILY WATER SURFACE ELEVATION IN FEET BELOW MEAN SEA LEVEL - 1987

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	227.8	227.6	227.4	227.3	227.2	227.3	227.5	227.8	228.0	228.2	228.1	228.1
2	227.8	227.6	227.4	227.3	227.2	227.3	227.5	227.8	228.0	228.2	228.1	228.1
3	227.8	227.6	227.4	227.3	227.2	227.3	227.5	227.8	228.1	228.2	228.1	228.1
4	227.7	227.6	227.4	227.3	227.1	227.3	227.5	227.8	228.1	228.2	228.1	228.1
5	227.7	227.6	227.4	227.3	227.1	227.3	227.6	227.8	228.1	228.2	228.1	228.1
6	227.7	227.6	227.4	227.3	227.1	227.3	227.6	227.8	228.1	228.2	228.1	228.1
7	227.7	227.6	227.4	227.3	227.1	227.3	227.6	227.8	228.1	228.2	228.1	228.0
8	227.7	227.5	227.4	227.2	227.1	227.3	227.6	227.8	228.1	228.2	228.1	228.0
9	227.7	227.5	227.4	227.2	227.1	227.3	227.6	227.8	228.1	228.2	228.1	228.0
10	227.7	227.5	227.3	227.2	227.1	227.3	227.6	227.8	228.2	228.2	228.1	228.0
11	227.7	227.5	227.3	227.2	227.1	227.3	227.6	227.8	228.2	228.2	228.1	228.0
12	227.7	227.5	227.3	227.2	227.1	227.3	227.6	227.8	228.2	228.2	228.1	227.9
13	227.7	227.5	227.3	227.2	227.1	227.3	227.6	227.9	228.2	228.2	228.1	227.8
14	227.7	227.5	227.3	227.2	227.1	227.3	227.6	227.9	228.2	228.2	228.1	228.0
15	227.7	227.5	227.3	227.2	227.1	227.4	227.6	227.9	228.2	228.2	228.1	228.0
16	227.7	227.5	227.3	227.2	227.1	227.4	227.7	228.0	228.2	228.2	228.1	228.1
17	227.7	227.5	227.3	227.2	227.1	227.4	227.7	228.0	228.2	228.2	228.1	228.0
18	227.7	227.5	227.3	227.2	227.1	227.4	227.7	228.0	228.2	228.2	228.1	228.0
19	227.7	227.5	227.3	227.2	227.2	227.4	227.7	228.0	228.2	228.2	228.1	228.0
20	227.7	227.5	227.3	227.2	227.2	227.4	227.7	228.0	228.2	228.2	228.1	228.0
21	227.7	227.5	227.3	227.2	227.2	227.4	227.8	228.0	228.2	228.2	228.1	228.0
22	227.7	227.5	227.3	227.2	227.2	227.4	227.8	228.0	228.2	228.2	228.1	228.0
23	227.7	227.5	227.3	227.2	227.2	227.4	227.8	228.0	228.2	228.2	228.1	228.0
24	227.7	227.5	227.3	227.2	227.2	227.4	227.8	228.0	228.2	228.2	228.0	227.9
25	227.7	227.5	227.3	227.2	227.3	227.4	227.8	228.0	228.2	228.2	228.0	227.9
26	227.7	227.5	227.3	227.2	227.3	227.4	227.8	228.0	228.2	228.2	228.1	228.0
27	227.7	227.5	227.3	227.2	227.3	227.5	227.8	228.0	228.3	228.2	228.1	228.0
28	227.6	227.5	227.3	227.2	227.3	227.5	227.8	228.0	228.3	228.2	228.1	228.0
29	227.6		227.3	227.2	227.3	227.5	227.8	228.0	228.3	228.2	228.1	228.0
30	227.6		227.3	227.2	227.3	227.5	227.8	228.0	228.3	228.2	228.1	228.0
31	227.6		227.3		227.3		227.8	228.0		228.1		228.0
Avg.	227.7	227.5	227.3	227.2	227.2	227.4	227.7	227.9	228.2	228.2	228.1	228.0

Month	Current Year 1987		Period 1935-1987		
	Extreme Elevation Feet		Elevation Feet		
	High	Low	# Average	# Maximum	! Minimum
Jan.	227.6	227.8	235.80	227.4	249.3
Feb.	227.5	227.6	235.49	227.2	248.8
Mar.	227.3	227.4	235.22	227.0	248.6
Apr.	227.2	227.3	235.04	226.9	248.7
May	227.1	227.3	235.02	226.8	248.5
June	227.3	227.5	235.17	227.0	248.8
July	227.5	227.8	235.34	227.1	249.1
Aug.	227.8	228.0	235.52	227.2	249.4
Sept.	228.0	228.3	235.72	227.3	249.4
Oct.	228.1	228.2	235.79	227.4	249.8
Nov.	228.0	228.1	235.81	227.5	250.0
Dec.	227.8	228.1	235.69	227.5	249.6
Yearly	227.1	228.3	235.47	227.1	250.0

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

§ Mean daily # Mean monthly ! Reading near first day of month

CHEMICAL ANALYSES OF WATER SAMPLES

The tables below are based on samples collected and analyzed by the State of California Department of Water Resources. New River samples prior to 1985 collected and analyzed by the U. S. Geological Survey. Beginning December 1971, not all constituents analyzed.

Samples from the Alamo River are taken north of the international boundary at upstream end of box culvert under the All-American Canal. Flow at this point includes drainage flows across international boundary and flows from drain intercepts along toe of south bank of All-American Canal. Samples from New River are taken from the right bank at road bridge 450 feet north of international boundary. Records of sampling extend from April 1951 through 1987.

ALAMO RIVER

1987	Time	Streamflow	Specific	pH	Hardness,	Sulfate	Chloride	Solids
Date	Std.	*Sec.-Ft.	Conductance	Units	Total (as CaCO ₃)	ion (SO ₄) Dissolved	ion (Cl) Dissolved	Dissolved (Calculated)
			Micromhos		mg/L	mg/L	mg/L	
Mar. 17	1125	7.00	5,450	8.0	1,050	1,140	1,120	3,850
June 16	1105	5.00	5,230	7.9	986	1,000	1,130	3,660
Sep. 22	1110	6.00	2,480	8.0	827	816	826	2,820
Dec. 9	1125	7.00	3,850	7.7	832	758	772	2,780

*Estimated

NEW RIVER

1987	Time	Streamflow	Specific	pH	Hardness,	Sulfate	Chloride	Solids
Date	Std.	Sec.-Ft.	Conductance	Units	Total (as CaCO ₃)	ion (SO ₄) Dissolved	ion (Cl) Dissolved	Dissolved (Calculated)
			Micromhos		mg/L	mg/L	mg/L	mg/L
Mar. 17	1010	357	4,780	7.8	943	700	1,110	3,070
June 16	0950	369	4,510	8.0	903	690	1,120	3,150
Sep. 22	1030	353	2,290	7.2	735	568	784	2,320
Dec. 9	1040	377	3,380	7.8	701	553	771	2,330

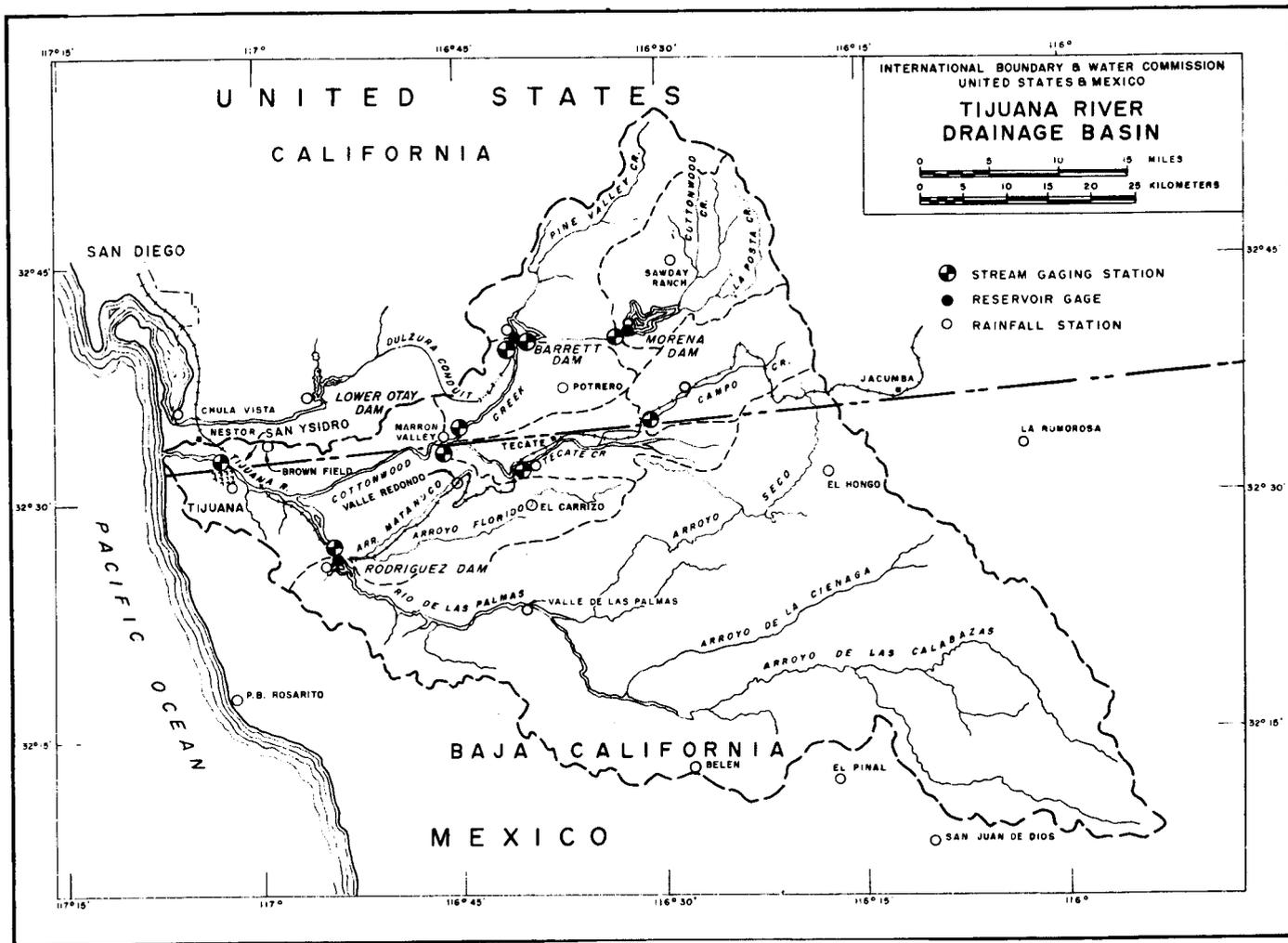
SPECIFIC CONDUCTANCE OF WATER SAMPLES

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 INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1987

January	March	April	June	August	September	November
7 3,200	4 2,250	29 5,100	10 5,000	5 4,670	23 3,940	11 4,840
14 3,000	11 3,690	May	17 4,980	12 4,220	30 4,360	18 5,800
21 3,200	18 5,070	6 5,580	24 4,690	19 4,080	October	25 4,290
28 3,250	25 5,090	13 4,080	July	26 3,930	7 4,000	December
February	April	20 4,920	1 4,470	September	14 3,970	2 3,960
3 1,630	1 5,110	27 5,060	8 4,880	2 3,730	21 3,910	9 3,740
11 1,860	8 5,030	June	15 4,380	9 4,460	28 6,020	16 3,830
18 3,730	15 5,770	3 4,650	23 4,460	15 4,430	November	23 3,790
25 1,740	22 3,060		29 4,620		4 5,590	31 4,200



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 1.8 miles (2.9 km) upstream from the mouth of Hauser Creek, 8.5 miles (13.7 km) upstream from Barrett Dam, and about 20 miles (32.2 km) upstream from the international boundary. The zero of the gage is 2,882.4 feet (878.56 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the city of San Diego, California. Records April 1911 through 1987.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1987 computed on basis of area-capacity curves determined from 1948 resurvey. Various changes have been made to the spillway section since construction of the dam. Elevation of the present crest of ungated spillway is 157.00 feet (47.85 m), gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet (61,934,000 m³). The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the city of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1937-1987		
		Average	Maximum	Minimum
January	715	697	7,472	0
February	612	2,082	33,569	8.0
March	1,457	3,088	45,274	19.3
April	766	1,733	23,130	3.3
May	295	877	15,113	0
June	185	449	8,247	0
July	221	303	6,203	0
August	249	260	7,228	0
September	222	176	5,133	0
October	532	161	3,905	0
November	365	267	4,567	0
December	325	697	7,679	4.4
Yearly	5,944	10,790	143,966	121
	Thousands of Cubic Meters			
	7,332	13,309	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 0.8 mile (1.3 km) downstream from the dam. Discharge measurements made at the cableway include leakage, controlled releases, and spillway discharges.

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the city of San Diego, California. Records available: January 1911 through 1987.

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

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1937-1987		
		Average	Maximum	Minimum
January	583	196	2,094	0
February	583	894	15,926	0
March	597	1,742	45,088	0
April	577	1,368	22,829	0
May	214	703	14,674	0
June	250	505	7,507	0
July	298	313	5,056	0
August	298	296	6,435	0
September	273	341	5,880	0
October	273	186	3,761	0
November	273	213	4,111	0
December	238	424	7,377	0
Yearly	4,457	7,181	136,550	0
	Thousands of Cubic Meters			
	5,498	8,858	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 8.5 miles (13.7 km) downstream from Morena Dam, 1 mile (1.6 km) downstream from the mouth of Pine Valley Creek, and about 12 miles (19.3 km) upstream from the international boundary. Zero of gage is 1,446.12 feet (440.78 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases, and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall furnished by the city of San Diego, California. Records available: January 1921 through 1987. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

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

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1937-1987		
		Average	Maximum	Minimum
January	433	779	4,926	5.2
February	157	2,744	54,755	7.6
March	383	4,346	45,700	14.1
April	120	2,036	21,630	10.2
May	54.0	841	8,311	0
June	65.0	364	3,906	0
July	28.0	198	1,687	0
August	82.0	122	596	0
September	67.0	127	759	0
October	273	102	645	.1
November	142	190	1,241	0
December	217	561	5,549	1.7
Yearly	2,021	12,410	114,330	129
	Thousands of Cubic Meters			
	2,493	15,307	141,024	159

11-0114.90 DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

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

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the city of San Diego, California. Records available: January 1909 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	25.1	23.9	16.2	16.7	16.0	15.3	2.8	18.0	22.1	22.1	19.5	17.3
2	24.9	23.5	16.2	16.7	16.0	15.3	2.8	18.0	22.1	22.1	19.3	17.3
3	24.9	23.3	0	16.7	15.8	15.1	2.8	18.0	22.1	22.1	19.3	17.1
4	24.9	23.1	0	16.6	15.8	15.1	2.8	18.2	21.9	22.1	18.9	17.1
5	24.9	23.1	0	16.6	15.8	15.1	2.8	18.0	21.9	21.9	19.1	17.1
6	24.9	23.1	0	16.6	15.8	15.1	2.8	18.0	21.6	21.8	18.7	17.1
7	24.9	0	0	16.6	15.7	15.5	2.8	18.0	21.6	21.8	18.7	17.1
8	24.9	0	0	16.6	15.7	15.5	2.8	18.0	21.6	21.8	18.7	17.3
9	24.9	0	0	16.4	15.7	15.7	2.8	18.0	21.6	21.4	18.5	17.5
10	24.9	0	0	16.2	15.3	15.5	2.8	18.0	21.6	21.4	18.5	17.5
11	24.9	0	6.2	16.2	15.3	15.5	2.8	18.0	21.6	21.4	18.4	17.5
12	25.1	0	6.2	16.2	15.3	15.4	2.8	18.0	21.6	21.2	18.2	17.5
13	24.9	0	10.1	15.8	15.3	15.3	2.8	18.2	21.6	21.6	18.2	17.5
14	24.9	0	17.6	16.2	15.3	15.3	2.8	18.0	21.6	21.4	18.2	17.5
15	24.9	0	17.6	16.2	15.3	15.1	2.8	18.0	21.4	21.4	18.2	17.3
16	24.9	0	17.6	16.2	15.1	15.1	2.8	17.5	21.6	21.4	18.2	17.3
17	24.9	0	17.6	16.4	15.1	0	2.8	17.6	21.6	20.8	18.0	17.5
18	24.9	0	17.3	16.2	15.1	0	2.8	17.6	21.6	20.8	18.0	17.5
19	24.9	5.8	17.3	16.2	15.0	0	11.9	17.8	21.6	20.6	18.0	17.6
20	24.7	11.4	17.3	16.2	15.1	2.8	12.2	18.2	21.6	20.6	17.8	17.8
21	24.7	11.3	17.2	16.2	15.1	2.8	12.2	18.5	21.6	20.2	17.8	17.5
22	24.7	11.3	17.2	15.3	15.1	2.8	18.2	18.7	21.4	20.2	17.8	17.5
23	24.7	11.1	17.1	0	15.1	2.8	17.8	18.9	21.4	20.2	17.8	17.3
24	24.7	16.2	17.1	0	15.1	2.8	17.6	18.9	21.4	20.2	17.5	17.3
25	24.7	16.4	17.1	0	15.1	2.8	17.6	19.1	21.4	20.2	17.5	17.3
26	24.7	16.4	17.1	10.1	15.1	2.8	17.6	19.1	21.4	20.2	17.5	17.3
27	24.3	16.4	17.1	10.1	15.3	2.8	17.6	17.5	21.6	20.0	17.5	17.3
28	24.3	16.4	17.1	10.1	15.3	2.8	17.6	16.7	21.6	19.8	17.5	17.1
29	23.9	17.1	17.1	10.1	15.3	2.8	17.5	10.5	21.8	19.8	17.5	17.3
30	23.9	17.1	17.1	16.2	15.3	2.8	17.6	22.1	21.9	19.8	17.3	17.3
31	23.9	17.1	17.1	16.2	15.3	2.8	17.6	22.1	21.9	19.8	17.3	17.5
Sum	766.7	272.7	365.5	415.6	476.6	275.7	263.4	561.2	649.4	649.9	546.1	538.1
Current Year 1987									Period 1937-1987			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	25.1	129	23.9	24.7	1,521	403	2,350	0	
Feb.			1	23.9	17	0	9.7	541	427	2,130	0	
Mar.			114	17.6	13	0	11.8	725	548	2,330	0	
Apr.			1	16.7	123	0	13.9	824	797	2,860	0	
May			1	16.0	19	15.0	15.4	945	935	3,040	0	
June			9	15.7	117	0	9.2	547	964	2,920	0	
July			22	18.2	1	2.8	8.5	522	844	2,920	0	
Aug.			130	22.1	29	10.5	18.1	1,113	802	2,820	0	
Sept.			1	22.1	115	21.4	21.6	1,288	642	2,320	0	
Oct.			1	22.1	128	19.8	21.0	1,289	531	2,450	0	
Nov.			1	19.5	30	17.3	18.2	1,083	559	2,760	0	
Dec.			20	17.8	13	17.1	17.4	1,067	503	2,305	0	
Yearly				25.1		0	15.8	11,465	7,955	27,170	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.71		0	0.45	14,142	9,812	33,514	0	

‡ Mean daily

! And other days

11-0111.00 COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

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

RECORDS: Data furnished by the city of San Diego, California. Prior to January 1953, the records were furnished by the city of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. Spillway discharges have occurred in May 1943, March, April 1979, January to May of 1980, April, December 1982, and the entire year of 1983. Spillway discharges included in the period record below were computed by the city of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1987. Storage began in Barrett Reservoir in January 1921.

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

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1937-1987		
		Average	Maximum	Minimum
January	0	198	6,048	0
February	0	1,856	70,318	0
March	0	3,560	90,618	0
April	0	2,029	36,820	0
May	0	860	22,933	0
June	0	392	10,947	0
July	0	145	4,306	0
August	0	98.2	3,410	0
September	0	8.9	298	0
October	0	3.9	123	0
November	0	82.1	4,135	0
December	0	126	4,911	0
Yearly	0	9,359	206,002	0
	Thousands of Cubic Meters			
	0	11,544	254,099	0

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

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

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.47	0.22	2.2	0.50	0.16	0	0	0	0	0	0	0.26
2	.50	.21	2.0	.48	.13	0	0	0	0	0	0	.26
3	.50	.21	1.7	.62	.11	0	0	0	0	0	.13	.25
4	1.4	.21	1.4	1.5	.08	0	0	0	0	0	.27	.31
5	3.6	.19	1.3	1.4	.05	0	0	0	0	0	3.9	.86
6	.70	.16	1.6	1.1	0	0	0	0	0	0	4.8	.37
7	.83	.13	1.5	.91	0	0	0	0	0	0	2.3	.26
8	.55	.15	1.4	.74	0	0	0	0	0	0	1.5	.22
9	.47	.20	1.1	.62	.06	0	0	0	0	0	1.1	.21
10	.42	.28	1.0	.53	.05	0	0	0	0	0	.77	.19
11	.40	.23	.89	.49	.04	0	0	0	0	0	.57	.18
12	.35	.22	.78	.47	.02	0	0	0	0	0	.43	.18
13	.32	.22	.70	.40	0	0	0	0	0	0	.39	.15
14	.33	.26	.65	.31	0	0	0	0	0	0	.50	.15
15	.34	.25	1.8	.27	0	0	0	0	0	0	.35	.17
16	.31	.24	2.2	.23	0	0	0	0	0	0	.31	1.4
17	.29	.19	1.8	.21	0	0	0	0	0	0	.31	6.4
18	.28	.18	1.3	.23	0	0	0	0	0	0	.43	4.1
19	.30	.18	1.1	.22	0	0	0	0	0	0	.28	3.3
20	.28	.17	.90	.18	0	0	0	0	0	0	.26	4.7
21	.26	.17	1.1	.13	0	0	0	0	0	0	.32	3.3
22	.26	.19	2.3	.11	0	0	0	0	0	0	.34	2.8
23	.27	.42	2.2	.09	0	0	0	0	0	0	.32	2.4
24	.26	1.6	1.8	.09	0	0	0	0	0	0	.30	2.1
25	.25	2.7	1.5	.09	0	0	0	0	0	0	.31	1.8
26	.24	4.6	1.2	.11	.08	0	0	0	0	0	.24	1.5
27	.23	3.8	1.0	.13	.14	0	0	0	0	0	.22	1.3
28	.25	2.7	.89	.12	.14	0	0	0	0	0	.23	1.2
29	.25	.76	.14	.12	.12	0	0	0	0	0	.25	1.2
30	.24	.61	.17	.08	.08	0	0	0	0	0	.26	1.4
31	.24	.53		.01	.01	0	0	0	0	0		1.1
Sum	15.39	20.28	41.21	12.59	1.27	0	0	0	0	0	21.39	44.02
Current Year 1987										Period 1937-1987		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			5	3.6	27	0.23	0.50	30.5	498	11,918	0	
Feb.			26	4.6	7	.13	.72	40.2	2,414	69,019	0	
Mar.			22	2.3	31	.53	1.3	81.7	3,891	88,707	0	
Apr.			4	1.5	123	.09	.42	25.0	2,334	40,240	0	
May			1	.16	16	0	.04	2.5	842	18,192	0	
June				0	0	0	0	0	279	5,919	0	
July				0	0	0	0	0	74.7	2,918	0	
Aug.				0	0	0	0	0	58.8	1,500	0	
Sept.				0	0	0	0	0	14.9	645	0	
Oct.				0	0	0	0	0	8.0	236	0	
Nov.			6	4.8	11	0	.71	42.4	43.5	1,117	0	
Dec.			17	6.4	113	.15	1.4	87.3	172	2,569	0	
Yearly				6.4		0	0.43	310	10,630	178,808	0	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.18		0	0.01	382	13,112	220,556	0	

0 Mean daily

! And other days

11-0130.00 COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

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

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.8	4.0	8.4	3.6	1.7	0.74	0.58	0.59	0.40	1.3	44	1.2
2	7.2	3.7	7.2	3.4	1.6	.67	.60	.41	.40	.81	2.4	1.2
3	7.5	4.1	7.1	3.5	1.5	.72	.63	.31	.40	.61	.71	1.4
4	10	4.3	7.0	5.9	1.4	.73	.64	.31	.40	.50	1.1	2.5
5	23	3.9	7.2	3.9	1.3	.72	.65	.31	.42	.11	74	7.0
6	15	3.6	8.3	3.3	1.2	.72	.61	.35	.40	.21	92	3.2
7	15	3.2	8.2	3.1	1.4	.71	.67	.36	.40	.48	40	2.2
8	9.1	3.2	7.5	2.9	1.5	.68	.63	.39	.40	.61	18	2.9
9	5.8	3.3	6.9	2.5	1.5	.69	.65	.38	.40	.57	7.5	4.3
10	5.2	3.7	7.0	2.3	1.5	.70	.71	.22	.40	.39	6.2	4.5
11	4.9	3.7	6.6	2.1	1.3	.69	.75	.23	.45	1.2	3.0	4.4
12	5.0	3.6	6.4	2.0	1.4	.73	.66	.31	.50	.37	2.1	4.0
13	5.1	3.7	6.5	1.6	1.4	.63	.59	.42	.55	1.3	1.5	3.4
14	4.9	3.7	6.3	1.9	1.5	.48	.63	.42	.50	1.6	2.5	2.4
15	4.4	3.6	9.4	2.0	1.5	.34	.71	.39	.45	1.1	2.1	4.7
16	4.2	3.4	15	1.8	1.4	.36	.76	.36	.45	.77	1.4	10
17	4.3	3.3	7.9	1.8	1.3	.34	.80	.37	.45	.78	1.1	89
18	4.1	3.3	6.7	1.9	1.3	.25	.67	.36	.45	.54	1.3	51
19	4.1	3.2	5.9	1.9	1.4	.21	.57	.37	.45	.36	.84	34
20	4.0	3.7	5.4	1.3	1.5	.26	.54	.40	.45	.12	.86	43
21	3.8	3.2	5.4	1.3	1.6	.26	.58	.40	.45	.25	.91	24
22	4.0	3.0	17	1.3	1.5	.31	.60	.42	.65	.19	.93	19
23	4.0	3.4	7.7	1.4	1.5	.35	.55	.46	.60	.79	.77	18
24	4.0	7.9	6.2	1.6	1.5	.43	.59	.47	.60	1.0	.95	16
25	3.8	16	4.8	1.6	1.5	.48	.58	.48	.55	1.1	1.2	10
26	3.7	28	4.3	1.7	1.5	.49	.57	.46	.55	.21	1.4	5.9
27	4.1	14	4.3	1.6	1.5	.48	.50	.45	.55	.13	1.4	5.1
28	4.3	10	4.0	1.7	1.5	.47	.53	.42	.55	.12	1.8	4.9
29	4.1		3.7	1.8	1.3	.41	.60	.40	.70	.70	1.7	7.9
30	4.2		3.5	1.8	1.3	.48	.64	.45	1.1	1.5	1.0	12
31	4.3		3.4		.99		.63	.40		10		9.0
Sum	193.9	157.7	215.2	68.5	44.29	15.53	19.42	12.07	15.02	29.72	314.67	408.1

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day		Low	Average			Maximum	Minimum	
			Day	Day							
Jan.			5	23	26	3.7	6.3	385	997	20,792	0
Feb.			26	28	22	3.0	5.6	313	4,510	143,486	0
Mar.			22	17	31	3.4	6.9	427	6,761	133,180	0
Apr.			4	5.9	120	1.3	2.3	136	3,221	51,060	0
May			1	1.7	31	.99	1.4	87.8	1,094	20,955	0
June			1	.74	19	.21	.52	30.8	385	8,428	0
July			17	.80	27	.50	.63	38.5	154	3,497	0
Aug.			1	.59	10	.22	.39	23.9	157	5,494	0
Sept.			30	1.1	1	.40	.50	29.8	47.9	1,144	0
Oct.			31	10	5	.11	.96	58.9	76.2	1,626	0
Nov.			6	92	3	.71	10	624	200	3,568	0
Dec.			17	89	1	1.2	13	809	573	5,839	0
Yearly				92		0.11	4.1	2,964	18,176	288,517	0
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				2.61		0	0.12	3,656	22,420	355,880	0

0 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 5.6 miles (9.0 km) upstream from its confluence with Cottonwood Creek, 10.6 miles (17.0 km) upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 9.9 miles (16.0 km) southeast of Tijuana, Baja California.

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, 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 1987. Storage began in Rodriguez Reservoir on September 22, 1936.

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1938-1987		
		Average	Maximum	Minimum
January	335	2,124	54,820	0
February	291	6,084	157,453	5.8
March	122	10,388	139,893	4.2
April	190	3,261	77,790	0
May	126	639	11,460	0
June	128	207	4,661	0
July	72.3	98.1	1,464	0
August	2.8	57.8	770	0
September	52.2	59.3	466	0
October	350	81.9	350	0
November	80.8	171	1,940	0
December	400	910	15,686	8.4
Yearly	2,151	24,083	309,298	254
	Thousands of Cubic Meters			
	2,653	29,706	381,515	313

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 Alocantillado del Distrito Urbano de Tijuana; and from April 1966 through 1987 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 1987.

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

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

MONTHLY DISCHARGE IN ACRE-FEET

Month	Current Year 1987	Period 1937-1987		
		Average	Maximum	Minimum
January	1,596	362	1,596	1.5
February	1,429	366	1,429	0.8
March	1,613	426	1,613	0
April	1,533	522	1,602	0
May	1,564	655	1,676	1.8
June	1,521	728	1,857	1.9
July	1,583	770	1,963	1.9
August	1,610	713	1,859	0
September	1,507	618	1,527	1.9
October	1,487	559	1,618	1.9
November	1,450	469	1,563	1.9
December	1,424	439	1,596	0
Yearly	18,319	6,627	18,319	29.3
	Thousands of Cubic Meters			
	22,596	8,174	22,596	36.2

11-0133.00 TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 0.7 mile (1.1 km) downstream (north) from boundary, 1.1 miles (1.8 km) upstream from the new Dairy Mart Road bridge, and 1.4 miles (2.3 km) west of the international gate at San Ysidro, California. Zero of the gage is 38.04 feet (11.59 m) above mean sea level, U. S. C. & G. S. datum.
 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 1987.
 EXTREMES: Since May 1947: Maximum instantaneous discharge, 33,100 second-feet (937 m³/sec), February 21, 1980; minimum discharge, no flow during many years since 1951.

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.6	6.5	12.2	6.9	2.6	5.4	8.1	5.2	6.5	3.9	54.1	6.0
2	6.2	6.5	11.6	6.3	2.4	5.8	7.7	4.7	7.4	3.9	28.3	5.5
3	6.6	6.4	10.3	16.4	2.4	6.1	8.5	4.4	6.3	3.6	9.7	5.5
4	161	6.6	9.8	56.8	2.4	6.5	8.5	5.1	6.3	3.5	165	55.8
5	105	7.6	10.8	16.8	2.4	6.5	8.5	6.6	6.3	3.2	305	116
6	22.3	7.7	21.7	11.6	2.4	6.5	9.0	5.9	6.0	2.8	31.3	15.0
7	85.0	7.9	13.3	10.2	2.4	6.1	10.2	5.0	5.7	2.4	21.0	12.7
8	15.1	7.7	15.2	9.6	2.4	6.8	9.7	4.2	5.0	2.7	16.0	8.6
9	11.8	9.5	12.7	8.3	2.4	8.4	12.2	3.2	4.5	2.9	11.7	8.9
10	9.2	7.7	11.7	4.9	2.4	8.1	13.5	3.5	6.3	3.1	10.8	8.9
11	8.9	6.5	10.9	4.1	2.9	8.1	11.4	5.1	4.5	280	10.8	9.0
12	9.4	6.3	11.1	4.5	2.9	7.3	9.5	4.8	4.9	263	10.8	10.1
13	9.8	5.7	8.9	4.5	2.9	6.7	12.3	4.8	6.2	70.0	12.0	10.1
14	8.9	10.2	8.9	4.5	2.9	6.7	10.5	4.1	6.3	8.8	16.6	9.8
15	8.9	11.2	57.4	4.5	3.2	6.6	7.3	5.4	5.8	6.7	22.4	9.4
16	8.0	9.6	22.9	4.5	3.3	7.3	6.6	5.0	5.8	6.7	9.8	8.9
17	8.1	7.5	18.0	4.4	3.1	8.3	6.3	5.8	5.8	6.3	6.1	883
18	8.1	7.3	13.9	3.9	2.7	8.2	6.5	6.3	5.3	5.8	5.4	357
19	8.1	7.8	11.7	3.9	2.4	7.6	6.4	5.0	5.2	5.4	6.2	81.2
20	7.4	7.3	10.5	3.9	2.4	7.5	6.8	3.7	5.7	5.5	5.7	158
21	7.3	7.3	43.7	3.6	2.4	7.3	7.8	5.6	5.7	5.9	5.8	57.8
22	7.3	8.2	19.1	3.4	2.4	7.6	5.9	4.2	81.4	152	5.8	27.0
23	8.0	15.3	15.4	3.9	2.7	8.5	4.6	4.6	55.2	40.2	6.7	19.9
24	7.5	10.4	14.2	3.4	3.5	8.4	4.7	4.5	5.0	10.3	7.2	19.2
25	6.3	61.4	12.7	3.4	4.5	7.9	4.8	7.0	3.9	6.0	7.2	15.6
26	7.0	32.4	10.8	3.1	5.7	8.1	5.1	4.7	3.6	5.5	9.5	15.7
27	6.6	26.3	10.0	2.9	5.2	8.1	5.2	5.7	3.9	8.0	9.8	17.5
28	6.5	13.7	9.5	2.9	5.2	7.8	5.5	5.5	4.2	11.5	9.6	17.5
29	6.2		8.2	2.5	5.2	8.0	5.2	8.2	3.9	126	8.5	10.6
30	6.6		8.9	2.4	6.2	8.5	4.7	6.4	3.6	11.3	7.0	8.1
31	7.0		7.9		5.2		5.1	6.9		301		3.9
Sum	590.7	713.7	463.9	222.0	101.1	220.7	238.1	161.1	286.2	1,367.9	1,322.7	1,992.2

Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Period 1947-1987				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
												High
Jan.	41.37	39.17	4	1,210	1	5.8	19.1	1,172	2,751	72,441	0	
Feb.	42.20	39.19	26	2,050	113	5.2	25.5	1,416	9,406	315,328	0	
Mar.	40.32	39.22	15	354	31	6.5	15.0	920	12,735	293,494	0	
Apr.	40.10	39.13	4	238	129	2.4	7.4	440	3,294	62,938	0	
May	39.18	39.12	30	6.5	1	2.4	3.3	201	1,810	42,599	0	
June	39.21	39.16	1	8.9	1	5.2	7.4	438	491	9,696	0	
July	39.27	39.13	11	17.2	123	3.9	7.7	472	359	9,242	0	
Aug.	39.35	39.07	29	23.7	114	0	5.2	320	512	17,092	0	
Sept.	40.74	39.06	23	611	1	8	0	9.5	568	105	978	0
Oct.	42.26	39.16	12	2,240	1	2.4	44.1	2,713	182	2,713	0	
Nov.	41.67	39.18	1	1,500	30	4.5	44.1	2,624	426	4,377	0	
Dec.	42.21	39.16	17	2,200	31	3.4	64.3	3,951	739	6,705	0	
Yearly	42.26	39.06		2,240		0		15,235	32,810	595,739	0	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	12.88	11.91		63.4		0	0.59	18,792	40,470	734,832	0	

! And other days # Estimated * Partly estimated

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

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

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

IN ACRE-FEET

Month	MORENA RESERVOIR, CALIFORNIA (Capacity 50,210)		BARRETT RESERVOIR, CALIFORNIA (Capacity 44,760)		RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 111,880)		TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 206,850)	
	1987	Average 1937-1987	1987	Average 1937-1987	1987	Average 1937-1987	1987	Average 1937-1987
Jan.	35,457	18,590	19,105	13,574	27,940	33,722	82,502	65,886
Feb.	35,445	19,674	19,052	14,851	26,624	35,012	81,121	69,537
Mar.	36,053	20,865	19,170	16,736	24,921	39,153	80,144	76,754
Apr.	35,718	20,979	18,593	17,194	23,269	39,325	77,580	77,498
May	34,992	20,813	17,575	16,712	21,583	38,807	74,150	76,332
June	34,094	20,328	16,919	15,948	19,872	37,712	70,885	73,988
July	33,117	19,833	16,300	15,159	18,043	36,286	67,460	71,278
Aug.	32,244	19,354	15,294	14,379	16,156	34,886	63,694	68,619
Sept.	31,538	18,837	14,143	13,934	14,495	33,906	60,176	66,677
Oct.	31,381	18,532	13,268	13,511	13,101	32,831	57,750	64,874
Nov.	31,294	18,441	12,531	13,170	11,609	32,514	55,434	64,125
Dec.	31,261	18,613	11,861	13,443	10,542	32,798	53,664	64,854
Average	33,550	19,572	16,151	14,884	19,013	35,580	68,714	70,036
Maximum	36,053	!# 61,670	19,170	!# 45,920	27,940	! 112,272	82,502	! 213,600
Minimum	31,261	!! 10	11,861	!! 106	10,542	!! 0	53,664	!! 1,264

March 31, 1941 - Prior to removal of spillway gates

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

! Maximum end of month storage for period of record

!! Minimum end of month storage for period of record

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN INCHES

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

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Sawday Ranch, California		Campo, California	
	1987	Average 1906-1987	1987	Average 1907-1987	1987	Average 1951-1987	1987	Average 1950-1987	1987	Average 1900-1987
Jan.	2.60	3.72	2.42	3.37	*0.94	2.77	2.41	3.28	! 1.66	2.99
Feb.	2.80	3.74	2.86	3.40	0	2.12	3.20	2.99	! 2.55	3.21
Mar.	2.50	3.51	2.43	3.19	0	2.86	2.76	3.36	! 2.58	2.83
Apr.	.50	1.67	.42	1.52	0	1.20	.40	1.50	! .31	1.37
May	0	.60	.41	.54	0	.35	.52	.41	! .08	.49
June	0	.12	.06	.06	0	.05	0	.05	! .01	.07
July	0	.38	0	.13	0	.04	.05	.57	! 0	.51
Aug.	1.00	.55	.02	.24	* .11	.13	1.71	.79	! .65	.54
Sept.	1.50	.41	.45	.27	* .19	.28	1.37	.48	! .48	.36
Oct.	4.20	.92	3.05	.73	* .30	.43	3.71	.63	3.13	.67
Nov.	3.20	1.65	3.57	1.52	*1.33	1.45	2.92	1.90	2.48	1.43
Dec.	2.80	3.17	3.19	2.84	*2.14	2.32	2.85	2.52	1.82	2.47
Yearly	21.10	20.44	18.88	17.81	5.01	14.00	21.90	18.48	15.75	16.94

Month	Chula Vista, California		Lower Otay Dam, California		Brown Field, California					
	1987	Average 1930-1987	1987	Average 1906-1987	1987	Average 1964-1987				
Jan.	1.26	1.81	1.56	2.06	0.96	1.67				
Feb.	1.76	1.71	1.97	1.54	1.90	1.47				
Mar.	1.07	1.72	1.24	2.17	1.00	2.10				
Apr.	.64	.81	.72	1.03	.73	.96				
May	#	.23	.21	.43	.10	.19				
June	0	.05	0	.07	0	.06				
July	.04	.02	0	.04	.01	.05				
Aug.	.07	.09	.19	.12	.06	.12				
Sept.	.69	.19	.66	.24	.35	.19				
Oct.	#	.39	2.24	.40	2.59	.44				
Nov.	1.10	1.21	2.37	1.42	1.96	1.65				
Dec.	1.92	1.64	2.47	1.60	2.39	1.77				
Yearly		9.87	13.63	11.12	12.05	10.67				

IN MEXICO

Month	La Rumorosa, Baja California		Valle Redondo, Baja California		Tecate, Baja California		Rodriguez Dam, Baja California		Valle de las Palmas, Baja California	
	1987	Average 1945-1987	1987	Average 1971-1987	1987	Average 1946-1959 1961-1987	1987	Average 1938-1987	1987	Average 1948-1987
Jan.	1.50	0.98	0	2.24	1.61	2.60	1.54	1.57	0.94	1.61
Feb.	2.56	.59	2.20	2.36	2.76	1.93	2.05	1.46	1.89	1.22
Mar.	2.68	.79	1.77	2.60	2.05	2.48	1.10	1.65	1.06	1.50
Apr.	.59	.31	.79	.87	1.06	1.06	.51	.71	.55	.59
May	T	.08	.28	.28	.20	.31	T	.12	.04	.12
June	0	.04	0	.04	0	.12	0	.04	.04	.04
July	0	.39	0	.08	0	.16	0	.04	0	.08
Aug.	.39	.75	0	.20	.20	.24	.08	.12	0	.24
Sept.	.31	.35	.59	.35	.98	.16	.98	.24	.79	.24
Oct.	0	.39	3.54	.79	3.98	.51	3.86	.39	4.13	.35
Nov.	.98	.63	2.01	1.85	2.60	1.50	1.42	1.02	1.57	.91
Dec.	.24	.79	2.28	1.73	2.91	2.13	2.91	1.57	2.72	1.14
Yearly	9.25	5.91	13.46	13.31	18.35	13.90	14.45	8.90	13.74	7.87

* Estimated
T Trace

! U. S. Weather Service data

Missing Data

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN INCHES

IN MEXICO

Month	P. B. Rosarito, Baja California		El Pinal, Baja California		El Hongo, Baja California		El Carrizo, Baja California		Belen, Baja California	
	1987	Average 1967-1987	1987	Average 1964-1987	1987	Average 1980-1987	1987	Average 1980-1987	1987	Average 1965-1987
Jan.	1.30	1.77	2.24	2.95	1.46	1.57	1.06	1.73	1.50	2.40
Feb.	2.05	1.81	4.29	3.50	2.64	2.17	2.60	2.20	3.23	2.68
Mar.	.47	1.77	2.13	3.74	2.28	3.07	1.14	2.76	1.61	2.87
Apr.	.12	.67	.75	1.61	.39	.75	.59	.75	.39	1.02
May	T	.24	.16	.35	.08	.16	.16	.16	.08	.20
June	0	.04	.47	.04	0	.04	0	.04	0	.08
July	0	.04	0	.79	.51	.91	0	.16	0	.16
Aug.	.08	.08	.08	.91	.87	1.26	.12	.16	0	.31
Sept.	.08	.24	1.73	.79	.35	.35	.63	.24	.39	.43
Oct.	1.69	.47	5.20	.67	2.80	.75	4.49	.94	3.94	.71
Nov.	#	1.30	1.57	2.13	2.09	2.05	3.39	1.97	3.78	1.81
Dec.	#	1.34	3.07	2.95	.91	1.42	2.52	1.97	2.48	2.13
Yearly		9.92	21.69	20.47	14.37	15.04	16.69	12.99	17.40	15.28

Missing record

T Trace

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 1987.

IN THE UNITED STATES

NAME OF STATION	LATI- TUDE	LONGI- TUDE	8 ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,623	1907	City of San Diego
Brown Field, California	32° 34'	116° 59'	515	1964	City of San Diego
Campo, California	32° 38'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Lower Otay Dam, California	32° 37'	116° 56'	540	1906	City of San Diego
Marron Valley, California	32° 34'	116° 46'	550	1951	County of San Diego
Morena Dam, California	32° 41'	116° 31'	3,075	1906	City of San Diego
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

IN MEXICO

NAME OF STATION	LATI- TUDE	LONGI- TUDE	8 ELEV. (FT.)	RECORD BEGAN	OBSERVER
Belen, Baja California	32° 12'	116° 29'	1,821	1965	* S. A. R. H.
El Carrizo, Baja California	32° 29'	116° 42'	1,624	1980	S. A. R. H.
El Hongo, Baja California	32° 31'	116° 18'	3,150	1980	S. A. R. H.
El Pinal, Baja California	# 32° 11'	116° 17'	# 4,429	1964	S. A. R. H.
La Rumorosa, Baja California	32° 33'	116° 03'	4,042	1945	S. A. R. H.
P. B. Rosarito, Baja California	32° 19'	117° 02'	72	1967	S. A. R. H.
Rodriguez Dam, Baja California	32° 27'	116° 54'	394	1938	S. A. R. H.
Tecate, Baja California	32° 33'	116° 41'	1,575	1946	S. A. R. H.
Valle de Las Palmas, Baja California	32° 22'	116° 37'	919	1948	S. A. R. H.
Valle Redondo, Baja California	32° 31'	116° 45'	794	1971	S. A. R. H.

8 Elevation above mean sea level

Ministry of Agriculture and Hydraulic Resources

Estimated from topographic maps

EVAPORATION IN THE TIJUANA RIVER BASIN
IN INCHES

Tabulated below are records of evaporation observed at three stations in California and three 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," in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1987, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
2. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1987, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.
3. Lower Otay Dam: January 1950 through 1987, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

IN THE UNITED STATES

Month	Morena Dam, California		Barrett Dam, California		Lower Otay Dam, California			
	1987	Average 1916-1987	1987	Average 1921-1987	1987	Average 1950-1987		
Jan.	1.80	2.11	1.57	1.88	1.67	1.92		
Feb.	.41	2.12	1.72	2.17	2.34	2.27		
Mar.	2.51	3.27	1.71	3.36	2.86	3.30		
Apr.	5.49	4.65	3.66	4.70	4.68	4.62		
May	7.15	6.51	3.76	6.64	5.37	6.11		
June	8.61	8.38	5.16	8.18	7.64	6.98		
July	9.47	9.61	5.71	9.68	8.16	8.44		
Aug.	8.82	8.92	5.19	9.08	7.74	7.92		
Sept.	7.09	7.08	4.46	7.39	5.92	6.46		
Oct.	4.52	4.95	3.01	5.18	3.40	4.65		
Nov.	1.95	3.21	1.24	3.22	2.03	2.80		
Dec.	1.31	2.30	1.04	1.99	1.59	2.11		
Yearly	59.13	63.11	38.23	63.47	53.40	57.58		

IN MEXICO

Month	Rodriguez Dam, Baja California		Valle de las Palmas Baja California		El Carrizo, Baja California			
	1987	Average 1939-1942 1946-1987	1987	Average 1952-1987	1987	Average 1980-1987		
Jan.	2.68	4.25	2.52	3.23	4.72	5.00		
Feb.	3.23	4.41	3.27	3.11	4.21	4.41		
Mar.	4.21	4.53	4.88	4.06	4.88	5.28		
Apr.	4.53	5.59	6.50	5.87	9.33	7.36		
May	2.24	5.00	7.64	5.12	8.19	8.31		
June	4.53	7.64	9.84	9.69	9.72	10.87		
July	7.40	8.66	9.88	10.31	9.92	11.18		
Aug.	6.46	7.95	9.02	9.65	9.84	10.87		
Sept.	5.63	6.69	8.03	7.52	10.55	9.06		
Oct.	4.72	5.55	5.12	5.20	6.97	7.64		
Nov.	2.87	4.49	3.46	3.58	5.08	5.31		
Dec.	1.77	3.46	1.89	2.72	2.76	4.09		
Yearly	50.28	68.23	72.05	70.04	86.18	89.37		

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT

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

IN THE UNITED STATES

Month	Barrett Dam, California				Campo, California				Chula Vista, California			
	1987			Average 1931- 1987	1987			Average 1951- 1987	1987			Average 1931- 1987
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	48.6	82	24	49.1	46.0	75	17	47.4	55.0	80	31	53.3
Feb.	50.4	78	30	50.7	47.6	78	21	48.4	57.6	81	40	54.5
Mar.	52.9	79	32	53.2	50.1	76	27	49.7	58.3	84	36	55.7
Apr.	60.9	91	38	57.7	59.0	91	31	53.5	62.9	90	46	58.3
May	63.8	94	41	62.7	62.5	93	31	58.7	*	*	*	60.8
June	71.0	98	48	68.5	67.8	100	37	65.3	65.9	77	57	63.4
July	70.4	97	47	76.1	67.9	100	35	73.1	67.0	76	55	67.2
Aug.	74.2	103	49	76.2	71.9	101	37	73.2	69.6	82	57	68.8
Sept.	72.3	104	48	72.4	68.2	99	36	68.7	69.7	87	55	67.6
Oct.	68.8	99	47	64.2	63.8	96	33	60.6	*	*	*	63.3
Nov.	53.4	79	32	55.8	52.1	79	27	52.5	61.8	84	43	58.4
Dec.	47.3	78	22	50.5	44.3	83	15	47.9	53.1	76	28	54.5
Yearly	61.2	104	22	61.4	58.4	101	15	58.3		90	28	60.5

IN MEXICO

Month	La Rumorosa, Baja California				Tecate, Baja California				Rodriguez Dam, Baja California			
	1987		1945-1987		1987		1946-1987		1987		1938-1987	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	66	19	81	5	88	21	100	16	86	30	90	27
Feb.	72	23	82	10	77	27	100	18	82	39	93	32
Mar.	77	25	88	16	82	30	97	23	88	39	90	32
Apr.	81	34	91	23	93	34	100	28	93	45	93	36
May	86	39	97	27	95	39	108	36	90	50	100	37
June	91	46	113	34	97	45	108	32	90	54	108	46
July	88	55	104	39	100	46	115	36	88	54	104	46
Aug.	97	45	102	46	100	46	117	34	95	54	106	50
Sept.	100	54	104	34	100	45	115	36	95	52	109	46
Oct.	99	45	99	39	102	43	106	27	104	48	108	34
Nov.	73	30	95	14	82	34	97	27	82	39	99	30
Dec.	75	14	84	10	81	27	97	23	79	28	93	27
Yearly	100	14	113	5	102	21	117	16	104	28	109	27

Month	Valle de las Palmas, Baja California				P. B. Rosarito, Baja California				El Pinal, Baja California			
	1987		1948-1987		1987		1967-1987		1987		1964-1987	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	90	21	91	12	72	37	93	36	59	25	77	3
Feb.	84	28	99	23	90	43	90	36	66	19	81	14
Mar.	86	32	100	28	75	45	90	34	72	23	84	19
Apr.	100	36	104	28	82	50	88	36	79	34	84	18
May	97	39	111	36	75	54	104	43	81	39	91	25
June	97	43	118	39	79	57	104	43	86	41	99	25
July	108	46	120	45	84	50	90	50	86	39	102	32
Aug.	108	46	118	41	82	50	93	50	90	43	104	32
Sept.	108	39	117	43	86	50	108	48	93	39	102	25
Oct.	106	46	109	32	82	55	100	43	82	39	95	23
Nov.	82	30	100	19	79	50	97	32	70	32	88	14
Dec.	82	23	95	21	75	41	90	36	68	12	79	10
Yearly	108	21	120	12	90	37	108	32	93	12	104	3

* Missing data

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

1987

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

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the Tijuana River Valley Association or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1987 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek above Morena Dam	114	0	114	0	0	0
Morena Dam to Barrett Dam	133	0	133	0	0	0
above Barrett Dam	247	0	247	0	0	0
below Barrett Dam and above Tecate Creek	65	0	65	0	0	0
above Tecate Creek	312	0	312	0	0	0
Campo Creek above International Boundary	82	4	86	0	0	0
Tecate Creek above International Boundary (not including Campo Creek)	19	64	83	0	0	0
Cottonwood Creek above International Boundary Station	413	68	481	100	0	100
Rio de las Palmas above Rodriguez Dam	7	981	988	0	(b) 0	0
Tijuana River above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	(a) 661	(c) 0	661

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

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

(c) There was no irrigation in 1987 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 450 feet (137 m) upstream from the Southern Pacific Railroad bridge, 1.5 miles (2.4 km) upstream from the international boundary, and 2 miles (3.2 km) west of Douglas, Arizona. Zero of gage is 3,909.14 feet (1,191.51 m) above mean sea level, U. S. C. & G. S. datum of 1929. Location April 26, 1972 to April 10, 1974 was 200 feet (61.0 m) upstream from bridge. Datum 4.80 feet (1.34 m) 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 1987 (July 1954 to March 1955, monthly discharge only).

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

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

Mean Daily Discharge in Second-Foot 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.1	0	0	0	0	0	0	2.0	0	1.1	0.3	# 0
2	.1	0	0	0	0	0	0	3.4	0	.2	.6	# 0
3	.1	0	0	0	0	0	0	3.4	0	1.1	.1	# 0
4	.1	0	0	0	0	0	0	56.9	0	.2	0	# 0
5	.1	0	0	0	0	0	0	281	0	.1	0	# 0
6	.1	.1	0	0	0	0	0	181	62.5	.1	0	# 0
7	.1	.1	0	0	0	0	0	.9	13.1	0	0	# 0
8	.1	.1	0	0	0	53.4	0	.1	.1	0	0	# 0
9	.1	.1	0	0	0	1.9	0	.5	0	0	0	# 0
10	.1	.1	0	0	0	0	0	20.9	0	0	0	# 0
11	0	.1	0	0	0	0	0	21.9	0	0	0	# 0
12	0	.1	0	0	0	0	0	1.4	0	0	0	# 0
13	0	.1	0	0	0	0	0	.2	0	0	0	# 0
14	.1	.1	0	0	0	0	0	.2	0	0	0	# 0
15	.1	.1	0	0	0	0	0	.1	0	.2	0	# 0
16	.1	.1	0	0	0	0	0	0	0	.1	0	# 0
17	.1	0	0	0	0	0	0	0	0	.1	0	# 0
18	.1	0	0	0	0	0	0	0	0	.1	0	# 144
19	.1	0	0	0	0	0	0	0	0	0	0	# 2.2
20	.1	0	0	0	0	0	0	0	0	0	0	# 0
21	.1	.1	0	0	0	0	0	0	0	0	0	# 0
22	.1	.1	0	0	0	0	0	0	0	0	0	# 0
23	.1	.1	0	0	0	0	0	0	80.8	0	0	# 0
24	.1	.1	0	0	0	0	0	0	31.8	0	0	# 0
25	.1	.1	0	0	0	0	0	0	7.0	0	0	# 0
26	.1	.1	0	0	0	0	0	0	6.4	0	0	# 0
27	.1	.1	0	0	0	0	0	0	.3	0	0	# 0
28	.1	.1	0	28.1	0	0	0	0	.1	0	# 0	# 0
29	.1	.1	0	.9	0	0	0	20.5	11.6	.1	0	# 0
30	.1	0	0	0	0	0	0	41.9	2.0	.2	0	# 0
31	0	0	0	0	0	0	8.4	0	0	0	0	# 0
Sum	2.7	1.9	0	29.0	0	55.3	70.8	587.6	202.4	3.2	1.0	146.2

Month	Current Year 1987						Period 1936-1987				
	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	4.71	4.68	1	0.1	11	0	0.1	5.4	34.5	451	0
Feb.	4.75	4.68	1	.1	1	0	.1	3.8	17.5	132	0
Mar.	4.69	4.69	1	0	1	0	0	0	24.3	295	0
Apr.	6.56	4.60	28	101	1	0	1.0	57.5	17.9	173	0
May	4.60	4.60	1	0	1	0	0	0	12.1	138	0
June	6.64	4.58	8	117	1	0	1.8	110	116	1,590	0
July	6.67	4.56	29	123	1	0	2.3	140	1,814	8,110	0
Aug.	7.98	4.50	5	381	1	0	19.0	1,165	2,930	14,480	0
Sept.	6.79	4.48	6	152	1	0	6.7	401	763	3,170	0
Oct.	5.26	4.48	1	3.2	1	0	.1	6.1	357	6,103	0
Nov.	5.32	4.54	1	3.8	1	0	0	2.0	32.9	352	0
Dec.	7.88	4.54	18	596	1	0	4.7	290	114	2,363	0
Yearly	7.98	4.48		596		0	3.0	2,181	6,233	22,321	235
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	2.43	1.37		16.9		0	0.08	2,690	7,688	27,533	290

! And other days # Estimated * Partly estimated

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 one mile (1.6 km) 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 1987.

REMARKS: The older 1.3 mgd 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 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 2.6 mgd. The effluent from the Douglas Treatment Plant is discharged through a closed conduit to Mexico.

Month	Total Monthly Flows			Mean Daily Flows—Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1987			Period 1952-1987		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	41.115	0	41.115	1.952	0.805	1.326	2.157	0.416	1.098
Feb.	36.950	0	36.950	1.469	1.212	1.321	1.784	.543	1.101
Mar.	41.590	0	41.590	1.425	1.141	1.342	1.932	.590	1.102
Apr.	38.061	0	38.061	1.825	.824	1.269	2.047	.380	1.104
May	41.593	0	41.593	1.549	1.155	1.314	1.850	.510	1.106
June	40.448	0	40.448	1.544	1.158	1.348	2.060	.555	1.159
July	42.122	0	42.122	1.648	1.132	1.358	3.209	.483	1.208
Aug.	42.440	0	42.440	1.571	1.179	1.369	2.681	.365	1.224
Sept.	40.625	0	40.625	2.107	.629	1.354	2.107	.470	1.182
Oct.	41.801	0	41.801	2.154	.621	1.349	2.154	.603	1.145
Nov.	40.615	0	40.615	2.390	.320	1.354	2.390	.320	1.124
Dec.	41.842	0	41.842	1.529	1.175	1.350	3.330	.500	1.121
Yearly	489.202	0	489.202	2.390	0.320	1.340	3.330	0.320	1.140

SEWAGE INFLUENT, AGUA PRIETA, SONORA
INTERNATIONAL OXIDATION PONDS

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

RECORDS: Discharges are computed from daily 11:00 a.m. readings of the staff gage by applying an index for that hour, determined from 7 days of hourly measurements from which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Mean daily flows from April 8, 1968 through 1984.

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

DATA NOT AVAILABLE

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, 0.7 mile (1.1 km) east of Palominas, 2.5 miles (4.0 km) upstream from Green Brush Draw, 4.5 miles (7.2 km) downstream from international boundary, and 12 miles (19 km) southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet (1,276.39 m) above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1987. Records obtained and furnished by U. S. Geological Survey to September 30, 1981; thereafter by the United States Section of the Commission.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.4	12.1	14.8	4.6	2.4	0	0	0	10.5	3.5	0.8	8.1
2	13.2	12.1	11.1	4.1	1.8	0	0	0	8.2	2.8	.1	7.9
3	13.0	10.0	9.6	4.0	1.5	0	0	2.5	7.5	1.4	0	7.8
4	12.8	10.0	9.0	4.3	1.4	0	0	117	8.2	.5	0	7.5
5	12.4	11.4	9.2	4.4	1.1	0	0	43.5	39.0	.1	0	7.2
6	11.7	10.0	8.7	4.5	1.1	0	0	5.5	30.8	0	0	6.4
7	11.4	9.4	8.6	4.1	1.4	0	0	10.2	8.2	0	0	7.0
8	11.7	9.4	9.0	4.0	1.6	0	0	49.9	7.5	0	0	7.1
9	11.7	9.4	8.3	3.8	4.4	0	0	143	7.1	0	0	5.4
10	10.6	9.4	8.4	3.8	3.5	0	0	191	6.8	0	0	5.7
11	10.9	9.4	7.9	3.7	3.8	0	0	172	6.4	0	0	6.6
12	10.7	9.4	7.7	3.5	3.9	0	0	69.7	6.0	0	0	6.9
13	11.1	9.4	7.7	3.3	3.7	0	0	141	5.6	0	0	7.5
14	12.1	9.4	7.2	3.2	4.2	0	0	21.8	5.2	0	0	7.5
15	9.0	8.7	6.4	3.0	3.5	0	0	9.0	4.9	0	.9	8.1
16	9.8	9.4	7.0	2.7	2.6	0	0	7.0	4.9	.1	2.5	8.5
17	10.7	8.7	7.5	2.4	1.9	0	0	6.4	4.5	.1	3.5	9.2
18	10.5	8.7	7.2	2.2	1.1	0	0	5.4	4.4	.1	3.6	102
19	10.9	9.4	6.7	3.4	.7	0	0	15.0	4.0	.2	.4	44.4
20	11.9	9.4	6.5	3.7	1.4	0	0	42.0	3.8	.2	0	20.9
21	11.1	11.4	7.1	3.3	1.8	0	0	13.5	3.4	.3	0	12.9
22	10.5	11.4	6.8	3.9	1.0	0	0	224	3.0	.3	0	9.9
23	11.3	11.4	7.3	3.4	.4	0	0	22.8	265	.3	0	7.2
24	10.2	10.7	6.0	2.7	.1	0	0	5.7	50.0	.4	.9	5.8
25	8.8	12.1	5.8	2.8	0	0	0	15.9	82.0	.4	.1	7.2
26	8.7	14.4	6.8	3.1	0	0	0	185	51.0	.3	0	6.1
27	7.9	16.0	6.0	23.5	0	0	0	99.9	25.0	.3	1.4	5.7
28	7.3	13.8	5.6	14.7	0	0	0	27.0	12.5	.2	4.4	6.3
29	7.7		5.6	4.8	0	0	0	21.8	6.2	.3	7.4	5.2
30	9.4		5.5	3.8	0	0	0	18.0	4.1	.4	8.1	4.4
31	12.1		4.9		0	0	0	14.2		.6		3.8
Sum	334.5	296.3	235.9	138.7	50.3	0	0	1,699.7	685.7	12.8	34.1	366.2

Month	Current Year 1987						Period 1951-1987					
	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.	3.01	2.91	1	13.6	127	6.1	10.8	663	1,592	27,763	2.6	
Feb.	3.12	2.98	28	16.8	115	8.7	10.6	588	816	6,764	3.0	
Mar.	3.12	2.98	1	16.8	130	3.9	7.6	468	727	7,401	13.3	
Apr.	4.10	2.92	27	186	117	1.5	4.6	275	185	1,039	0	
May	3.04	2.86	9	5.5	124	0	1.6	99.8	68.2	407	0	
June	2.84	2.84	1	0	1	0	0	0	150	1,391	0	
July	2.79	2.79	1	0	1	0	0	0	5,351	17,238	0	
Aug.	2.79	2.85	10	956	1	0	54.8	3,371	8,345	36,369	165	
Sept.	6.13	3.34	23	989	22	3.0	22.9	1,360	1,904	16,344	11.3	
Oct.	3.37	2.81	1	3.5	1.4	0	.4	25.4	1,966	47,322	0	
Nov.	3.37	2.78	28	12.9	1.1	0	1.1	67.6	267	2,563	0	
Dec.	4.56	3.15	18	189	31	2.7	11.8	726	1,754	25,479	6.2	
Yearly	6.14	2.78		989		0	10.6	7,644	23,125	62,788	4,400	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	1.87	0.85		28.0		0	0.30	9,429	28,524	77,448	5,427	

! And other days # Estimated * Partly estimated

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, 2.5 miles (4.0 km) northeast of Lochiel, Arizona, and 1.7 miles (2.7 km) upstream from the international land boundary. The elevation of the zero of the gage has not been determined, but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet (1,408 m).

RECORDS: Based on current meter measurements, 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 1987.

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

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	1.4	1.4	1.2	0.76	0.59	0.29	0.13	0.78	0.54	0.74	0.62
2	1.4	1.4	1.3	1.1	.79	.61	.32	.14	.79	.53	.71	.62
3	1.4	1.4	1.3	1.2	.78	.58	.35	.16	.83	.53	.71	.62
4	1.4	1.3	1.3	1.2	.80	.53	.35	.25	1.2	.53	.71	.57
5	1.4	1.2	1.4	1.1	.85	.40	.33	.16	.93	.51	.71	.56
6	1.4	1.2	1.4	1.1	.80	.37	.32	.13	.88	.52	.71	.60
7	1.4	1.2	1.4	1.1	.77	.35	.30	.13	.83	.53	.71	.63
8	1.4	1.3	1.4	1.1	.78	.34	.26	.14	.81	.53	.71	.65
9	1.4	1.4	1.3	1.0	.70	.40	.27	.13	.79	.53	.71	.67
10	1.4	1.3	1.3	1.1	.68	.54	.19	.41	.79	.51	.71	.67
11	1.4	1.3	1.3	1.1	.67	.54	.22	2.4	.78	.52	.71	.66
12	1.4	1.3	1.3	1.1	.69	.53	.16	1.1	.78	.53	.71	.67
13	1.4	1.3	1.3	1.1	.69	.53	.12	.93	.79	.53	.71	.67
14	1.4	1.4	1.3	1.1	.71	.53	.14	.87	.79	.60	.70	.64
15	1.4	1.4	1.3	1.1	.69	.57	.20	.86	.80	.58	.65	.59
16	1.4	1.4	1.3	1.1	.65	.57	.21	.86	.80	.58	.63	.61
17	1.4	1.4	1.3	1.1	.66	.53	.19	.84	.84	.58	.64	.78
18	1.4	1.4	1.3	1.1	.69	.52	.17	.79	.83	.58	.64	.81
19	1.4	1.4	1.3	1.1	.62	.57	.17	.78	.78	.59	.61	.71
20	1.4	1.5	1.3	1.1	.53	.55	.16	.77	.70	.59	.58	.71
21	1.4	1.5	1.3	1.0	.47	.52	.17	2.0	.73	.61	.58	.71
22	1.4	1.5	1.2	.90	.45	.47	.17	.97	2.0	.62	.58	.71
23	1.4	1.5	1.2	.75	.45	.40	.16	.80	2.7	.67	.58	.74
24	1.4	1.5	1.2	.68	.47	.38	.16	.78	10	.62	.58	.76
25	1.4	1.9	1.2	.67	.53	.40	.17	.89	4.1	.62	.60	.79
26	1.4	1.9	1.2	.62	.53	.38	.17	1.0	.68	.63	.63	.76
27	1.4	1.4	1.2	.62	.54	.38	.17	.81	.59	.62	.63	.76
28	1.4	1.4	1.2	.64	.60	.27	.12	.79	.56	.62	.63	.76
29	1.4	1.1	1.1	.70	.62	.27	.08	.88	.54	.65	.63	.76
30	1.4	1.1	1.1	.76	.58	.33	.09	.80	.54	.66	.64	.78
31	1.4	1.1	1.1		.58		.12	.79		.66		.80
Sum	43.4	39.5	39.5	29.54	20.13	13.95	6.30	63.08	38.96	17.92	19.79	21.39
Current Year 1987									Period 1949-1987			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	1.4	1	1.4	1.4	86.1	166	2,895	1.3	
Feb.			125	1.9	1	1.2	1.4	78.3	94.7	1,000	1.8	
Mar.			1	1.4	129	1.1	1.3	78.3	116	2,103	.7	
Apr.			1	1.2	126	.62	.98	58.6	43.7	308	0	
May			5	.85	122	.45	.65	39.9	23.3	170	0	
June			2	.61	128	.46	.46	27.7	17.7	169	0	
July			1	.35	29	.08	.20	12.5	531	4,270	1.6	
Aug.			10	.41	1	.13	2.0	125	1,102	11,518	.1	
Sept.			24	.10	129	.54	1.3	77.3	330	2,634	0	
Oct.			23	.67	1	.51	.58	35.5	326	4,732	0	
Nov.			1	.74	120	.58	.66	39.3	64.1	403	0	
Dec.			18	.81	5	.56	.69	42.4	116	1,093	0	
Yearly				41		0.08	0.97	701	2,931	17,376	126	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.16		0	0.03	865	3,615	21,433	155	

0 Mean daily

1 And other days

09-4805.00 SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

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

RECORDS: Based on current meter measurements, 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 1987.

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 1987.

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

Mean Daily Discharge in Second-Feet 1987 — Annual and Period Summary

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	5.6	24	15	2.3	0	0	48	0.45	15	0.67	0.35
2	9.9	5.9	24	14	3.1	0	0	34	.39	.29	.47	.35
3	9.9	6.0	24	13	2.6	0	0	18	.42	.25	.42	.35
4	9.9	5.8	24	12	1.9	0	0	191	.80	.24	.40	.35
5	9.3	5.6	25	11	1.4	0	0	36	1.4	.25	.39	.40
6	9.4	5.6	25	10	.88	0	0	26	.80	.25	.41	.42
7	9.1	5.6	26	11	.52	0	0	16	.43	.25	.42	.47
8	9.1	5.6	26	11	1.6	0	0	5.9	.36	.22	.42	.49
9	9.1	5.2	25	10	1.6	0	0	26	.31	.25	.39	.49
10	8.5	5.4	25	9.6	.39	0	0	555	.28	.25	.39	.49
11	8.2	5.6	25	9.2	.27	0	0	343	.25	.28	.41	.49
12	7.6	6.0	23	8.3	.17	.04	0	60	.20	.29	.42	.49
13	7.6	6.2	23	8.0	.04	.03	0	29	.22	.28	.42	.49
14	7.6	6.2	23	7.2	.09	.01	.85	14	.24	.33	.42	.49
15	7.6	6.5	20	6.6	.20	0	.13	7.8	.20	.36	.42	.49
16	7.2	6.9	21	6.2	.02	.02	0	5.5	.19	.34	.42	.49
17	6.9	7.5	20	5.9	.01	0	0	4.6	.26	.32	.46	.49
18	6.9	8.0	19	5.7	0	0	0	3.8	.31	.32	.47	#225
19	6.9	8.9	18	5.9	0	0	0	3.3	.31	.33	.44	#17
20	6.9	9.9	16	5.5	.18	0	.16	3.0	.32	.33	.42	#2.6
21	6.5	11	17	5.3	.13	0	0	3.0	.37	.36	.44	#2.6
22	6.6	11	17	4.8	0	0	0	3.6	2.2	.42	.39	#2.6
23	6.9	11	16	3.7	0	.01	0	3.7	1.0	.42	.35	#2.6
24	6.9	12	16	3.3	0	.06	0	3.7	.95	.39	.40	#2.6
25	6.8	19	16	3.8	0	.06	0	12	1.2	.40	.36	#23
26	6.4	38	16	3.7	0	.06	0	9.3	1.5	.39	.40	#2.6
27	6.0	33	16	4.3	0	.07	0	3.1	.57	.38	.44	#2.6
28	6.0	31	16	4.0	0	.04	1.1	2.3	.36	.38	.37	#2.6
29	6.1	16	16	3.9	0	.03	1.9	1.9	.29	.42	.35	#2.6
30	5.9	15	15	3.8	0	.02	2.1	1.4	.26	.42	.34	#2.6
31	5.6		15		0		2.3	.83		.47		#2.6
Sum	238.3	294.0	632	225.7	17.40	0.45	8.54	1,474.73	16.84	24.88	12.52	301.19

Month	Extreme Gage Feet		Current Year 1987				Average Second-Feet	Total Acre-Feet	Period 1936-1987		
	High	Low	Extreme Second-Feet		Acre-Feet						
			Day	High	Day	Low			Average	Maximum	Minimum
Jan.			1	11	31	5.6	7.7	473	2,186	30,282	0
Feb.			26	38	9	5.2	11	583	1,738	20,547	0
Mar.			17	26	130	15	20	1,254	1,484	19,575	0
Apr.			1	15	28	3.3	7.5	448	397	2,955	0
May			2	3.1	118	0	.56	34.5	120	1,031	0
June			27	.07	1	0	.09	89.3	1,449	0	0
July			10	2.3	1	0	.28	16.9	2,775	15,610	16.9
Aug.			31	555	31	.83	48	2,925	5,770	45,790	91.0
Sept.			22	2.2	16	.19	.56	33.4	1,526	9,431	0
Oct.			1	15	8	.22	.80	49.3	1,983	59,025	0
Nov.			1	.67	30	.34	.42	24.8	548	7,384	0
Dec.			18	225	1	.35	9.7	597	2,592	33,568	0
Yearly				555		0	8.9	6,440	21,168	87,615	2,234
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				15.7		0	0.25	7,944	26,110	108,071	2,756

0 Mean daily ! And other days # Estimated

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Three 24-inch (61.0 cm) Parshall flumes, each with a water-stage recorder and continuous totalizer, one located at the international boundary for measuring effluent from Nogales, Sonora, one located at the head of the treatment plant, and one in the plant effluent line. Nogales International Treatment Plant is located adjacent to I-19, approximately 9 miles (14.5 km) 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 1987.

REMARKS: Prior to December 18, 1971 the plant was located along the right bank of Nogales Wash, approximately two miles (3.2 km) north of the international boundary. Nogales International Treatment Plant treats combined sewage from both Nogales, Arizona and Nogales, Sonora by means of aerated stabilization lagoons with a capacity of 8.2 mgd. Chlorinated plant effluent is discharged directly to the Santa Cruz River.

Month	Total Monthly Flows			Mean Daily Flows—Millions of Gallons Per Day					
	Millions of Gallons			Current Year 1987			Period 1952-1987		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	88.862	169.167	258.029	8.942	7.592	8.324	12.455	0.650	3.861
Feb.	77.735	175.929	253.664	14.706	7.792	9.059	14.706	.650	4.050
Mar.	96.812	207.661	304.473	10.535	9.307	9.822	18.861	.750	4.027
Apr.	107.094	180.774	287.868	10.406	8.531	9.596	11.335	.700	3.833
May	100.247	155.953	256.200	9.565	7.239	8.265	9.565	.550	3.627
June	95.779	119.052	214.831	8.208	6.269	7.161	9.006	.700	3.422
July	92.360	111.681	204.041	7.303	5.494	6.582	13.667	.700	3.622
Aug.	99.599	122.474	222.073	10.082	5.752	7.164	13.120	.750	3.976
Sept.	117.563	135.017	252.580	10.341	6.786	8.419	12.312	.800	4.216
Oct.	109.296	139.537	248.833	8.919	7.368	8.027	13.055	.700	4.104
Nov.	95.009	136.889	231.898	8.596	7.174	7.730	10.352	.800	3.963
Dec.	96.429	163.390	259.819	11.052	6.786	8.381	15.605	.350	3.995
Yearly	1,176.785	1,817.524	2,994.309	14.706	5.494	8.211	18.861	0.350	3.891

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED
IN INCHES

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

IN THE UNITED STATES

Month	San Rafael #2, Arizona		Canelo, Arizona		Patagonia, Arizona		Nogales Sanitation Plant 9N, Arizona			
	1987	Average 1973-1987	1987	Average 1930-1987	1987	Average 1930-1987	1987	Average 1953-1987		
Jan.	1.53	1.58	0.51	1.20	0.46	1.26	1.19	1.14		
Feb.	1.77	1.36	1.59	1.08	2.77	1.09	2.14	.79		
Mar.	1.25	1.34	.64	.87	.48	.93	.26	.89		
Apr.	.79	.50	1.74	.40	2.28	.39	1.11	.26		
May	.85	.20	.64	.15	.87	.18	.66	.24		
June	#	.59	.22	.78	T	.48	.33	.41		
July	2.43	5.11	1.16	4.16	2.21	4.38	2.29	4.78		
Aug.	9.09	3.66	4.33	4.27	5.99	4.07	5.84	3.89		
Sept.	2.63	2.35	2.02	1.80	1.47	1.82	1.81	1.73		
Oct.	.53	1.27	.34	1.01	.50	1.06	.10	1.30		
Nov.	0	.96	.42	.81	.42	.81	.56	.65		
Dec.	.66	1.45	2.43	1.42	1.99	1.43	2.89	1.48		
Yearly		20.37	16.04	17.95	19.44	17.90	19.18	17.56		

T Trace

Missing record

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 1987.

IN THE UNITED STATES

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

S Standard 8" rain gage

TEMPERATURE IN THE SANTA CRUZ RIVER BASIN
IN DEGREES FAHRENHEIT

Tabulated below are monthly records of temperature at the station located at the Nogales Sanitation Plant in Arizona 9 miles (14.5 km) 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 2 miles (3.2 km) north of the international boundary at the old Nogales Sanitation Plant. This station is operated and maintained by the United States Section of the Commission. The equipment at the Nogales Sanitation Plant - 9N consists of a standard 8-inch (203 mm) 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		
	1987		
	Mean	Max.	Min.
Jan.	43.7	83	13
Feb.	47.0	77	21
Mar.	50.3	82	21
Apr.	61.2	91	29
May	64.7	90	36
June	75.4	103	43
July	77.7	103	47
Aug.	76.3	96	53
Sept.	70.8	96	43
Oct.	66.0	95	39
Nov.	51.1	82	18
Dec.	44.1	81	12
Yearly	60.7	103	12

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

1987

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

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

Designation of Areas	Drainage Basin - Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	100	0	100
Above El Cajon, Mexico Gaging Station	179	125	304	100	2,352	2,452
Above Nogales, Arizona Gaging Station	185	348	533	100	2,696	2,796
San Pedro River:						
Above Palominas, Arizona Gaging Station	92	649*	741	2,000	3,459	5,459
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	22,000	0	22,000

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