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WESTERN WATER BULLETIN 1997

**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

1997

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FOREWORD

This bulletin is the thirty-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 1997.

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

COLORADO RIVER BELOW IMPERIAL DAM

Below Imperial Dam, the Colorado River flows southward 16 kilometers to the mouth of the Gila River, thence westward 18 kilometers to Pilot Knob Mountain, and south 1.6 kilometers to the point where the northerly international land boundary, between California and Baja California, intersects the river. From this point the river continues to flow southward and forms the boundary between the United States and Mexico for a distance of about 35 kilometers to the point where the southerly international land boundary between Arizona and Sonora intersects the river. From this point the river continues to flow southward about 145 kilometers to discharge into the Gulf of California.

The ordinary flows of Colorado River below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 28,200 square kilometers along the river from Hoover Dam to the mouth of the Gila River. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River, draining about 1,857 square kilometers below Alamo Dam and Lake, completed in 1963; and from the Gila River, draining about 18,900 square kilometers below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects; and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions of the 1944 Water Treaty, there may be diverted to the All-American Canal at Imperial Dam for delivery to Mexico in the Alamo Canal, or substitute canal, at the northerly boundary, a portion of Mexico's scheduled deliveries of waters of the Colorado River, which in 1997 amounted to 2,096,931 thousand cubic meters, in accordance with Article 10 of the 1944 Water Treaty. No diversions were made to a substitute canal in 1997.

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

In the limitrophe section of the river, 1.8 kilometers downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date, almost all Colorado River waters diverted by Mexico (except emergency deliveries to Tijuana from August 1972 to August 1980) have been diverted to the Alamo Canal at Morelos Dam.

TIJUANA RIVER BASIN

The total drainage area of the Tijuana River basin is 4,483 square kilometers, of which 27 percent lies in the United States and 73 percent in Mexico. This river is formed by the principal tributaries, Cottonwood Creek, which rises in the United States and Rio de las Palmas, which rises in Mexico. Cottonwood Creek crosses the international land boundary 34 kilometers from the Pacific Ocean to join the Rio de las Palmas in Mexico. From the confluence of these tributaries, the Tijuana River flows northwesterly 8 kilometers to cross the land boundary into the United States near San Ysidro, California and Tijuana, Baja California, and then flows westerly 10 kilometers to discharge into the Pacific Ocean 3 kilometers north of the boundary. The flow of Cottonwood Creek is partially controlled by Barrett and Morena Reservoirs in the United States, and the flow of the Rio de las Palmas is partially controlled by Rodriguez Reservoir in Mexico.

WHITewater DRAW NEAR DOUGLAS, ARIZONA

Whitewater Draw rises in the United States and flows south into Mexico, crossing the international boundary near Douglas, Arizona, eventually discharging into the Gulf of California through the Yaqui River in Mexico. The total drainage area above the Douglas Gaging Station is 2,650 square kilometers. A number of mountain streams in the upper reaches of the basin are diverted for irrigation, but they would normally sink or go to ground water before reaching the main water course.

FOREWORD

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

The San Pedro River rises in Mexico and flows north into the United States, crossing the boundary near Palominas, Arizona and thence northwesterly into the Gila River. The river in the vicinity of the international boundary drains an area of 1,919 square kilometers, of which 1,681 square kilometers are in Mexico.

SANTA CRUZ RIVER NEAR NOGALES AND LOCHIEL, ARIZONA

The Santa Cruz River rises in the United States and flows south into Mexico, crossing the international boundary near Lochiel, Arizona and returning to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 1,380 square kilometers. Of this amount, 901 square kilometers lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

ACKNOWLEDGMENTS

Other agencies which have contributed to the data published herein include the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the National Weather Service, Department of Commerce; the Yuma County Water Users' Association; the Imperial Irrigation District; the city of San Diego, California; the Otay Municipal Water District; and the 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

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

METRIC TO ENGLISH CONVERSION CONSTANTS

| METRIC UNITS | | | ENGLISH UNITS | |
|--------------|------------------|---|---------------|----------------------|
| LENGTH | | | | |
| 1 | Millimeter | x | 0.03937 | = Inch |
| 1 | Meter | x | 3.28084 | = Feet |
| 1 | Kilometer | x | 0.62137 | = Mile |
| AREA | | | | |
| 1 | Square Meter | x | 10.76391 | = Square Feet |
| 1 | Hectare | x | 2.47105 | = Acre |
| 1 | Square Kilometer | x | 0.38610 | = Square Mile |
| VOLUME | | | | |
| 1 | Cubic Meter | x | 35.31467 | = Cubic Feet |
| 1,000 | Cubic Meters | x | 0.81071 | = Acre-Feet |
| WEIGHT | | | | |
| 1 | Kilogram | x | 2.20462 | = Pounds |
| 1 | Megagram | x | 1.10231 | = Tons (2,000 lbs.) |
| TEMPERATURE | | | | |
| | Degrees Celsius | x | 1.8 + 32 | = Degrees Fahrenheit |

GENERAL HYDROLOGIC CONDITIONS FOR 1997

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 1997. In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation during 1997 measured at 3 index stations was 53 millimeters, compared to an average of 53 millimeters during the last 39 years (1959 to 1997).

The flow of the Colorado River reaching Imperial Dam was 9,035,982 thousand cubic meters, about 91% of the 63-year average (1935-1997) of 9,958,401 thousand cubic meters. At the Northerly International Boundary, the total flow of the river during 1997 was 3,399,269 thousand cubic meters, about 72% of the 1935-1997 average of 4,746,602 thousand cubic meters. At the Southerly International Boundary, the flow during 1997 was 781,584 thousand cubic meters, about 24% of the 1935-1997 average of 3,277,106 thousand cubic meters.

The total of all flows of the Colorado River entering Mexico in 1997 amounted to 3,653,110 thousand cubic meters, 68% of the 1935-1997 average of 5,340,754 thousand cubic meters, as measured 1) in the Colorado River at the Northerly International Boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, 4) in the canal which discharges waste and drainage waters from the Yuma Project across the southerly land boundary into Mexico near San Luis, Arizona, 5) in the Wellton-Mohawk Bypass Drain at the southerly land boundary near San Luis, Arizona, and 6) from the 242 Well Field near San Luis, Arizona.

During 1997, other waters arrived at the Mexican points of diversion and amounted to 1,446,208 thousand cubic meters. These waters consisted mainly of excess waters released from reservoirs on the Colorado River. A maximum instantaneous flow of 265 cubic meters per second occurred in the Colorado River at the Northerly International Boundary station on January 1, 1997.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 33,792.5 million cubic meters, 96% of the usable capacity of 35,263.2 million cubic meters. The greater part (30,966.5 million cubic meters) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1997 due to drought or accident to the irrigation system.

The total reported area irrigated from waters of the Colorado River below Imperial Dam in 1997 was 462,214 hectares; 277,925 hectares in the United States and 184,289 hectares in Mexico. An estimated 33% of the total area irrigated in Mexico is served by pumping from ground water.

TIJUANA RIVER BASIN

During 1997, the temperatures at Barrett Dam, California (elevation 533.40 meters) in the upper portion of the basin in the United States averaged 17.4 degrees Celsius, 0.9 degree Celsius above the 67-year mean. In the extreme upper portion of the basin in Mexico at El Pinal, Baja California (elevation 1349.96 meters), the recorded temperatures during the year could not be determined due to incomplete records. At Rodriguez Dam, Baja California (elevation 139.90 meters), the recorded temperatures averaged 22 degrees Celsius, about 1 degree Celsius above the normal for many years.

At Barrett Dam, in the upper portion of the basin in the United States, the recorded precipitation was 362 millimeters, 80% of normal; and at Lower Otay Dam near the lower end of the basin, 248 millimeters, or 87% of normal. The recorded precipitation at El Pinal in the upper portion of the basin in Mexico could not be determined due to incomplete records. At Rodriguez Dam, in the lower portion of the basin in Mexico, the recorded precipitation was 236 millimeters, 102% of the 59-year average.

Runoff above Barrett and Rodriguez Reservoirs during 1997 averaged more than 11% of normal. Above Morena Reservoir, the runoff was 2,394 thousand cubic meters, or about 18% of the 61-year 1937-1997 mean of 13,077 thousand cubic meters. Above Barrett Reservoir, the runoff was 5,247 thousand cubic meters, or about 31% of the 61-year 1937-1997 mean of 17,052 thousand cubic meters. At Rodriguez Reservoir, the runoff was 14.4 thousand cubic meters, or 0.05 percent of the 60-year mean of 30,956 thousand cubic meters.

The flow of the Tijuana River at the international boundary was 14,997 thousand cubic meters during 1997.

WHITEWATER DRAW

During 1997, the average annual temperature over the watershed was 0.8 degree Celsius above normal, while the annual precipitation was 93% of normal. Runoff for the year at the gaging station near Douglas, Arizona, was 1,739 thousand cubic meters, or about 26% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1997

SAN PEDRO RIVER

During 1997, the average annual temperature was normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 96% of the 1961-1997 mean of 528 millimeters. The stream flow at the international boundary was 9,215 thousand cubic meters, 35% of the 1951-1997 average.

SANTA CRUZ

During 1997, the average annual temperature over the watershed was about normal, and the annual precipitation was about 103% of the 59-year 1939-1997 mean. Runoff measured at the Nogales gaging station, where the stream re-enters the United States, was 1,662 thousand cubic meters. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States, was 2,101 thousand cubic meters. Therefore, neglecting stream flow depletions in Mexico, the records indicate no contribution from the loop of the river lying in Mexico for 1997.

ALAMO AND NEW RIVERS

During 1997, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, was 23.5 degrees Celsius, 1.0 degree Celsius above normal; and over the drainage area of the New River as recorded at Mexicali, Baja California, it was 25 degrees Celsius, 3 degrees Celsius above the 72-year average.

At El Centro, the precipitation was 98 millimeters, about 138% of the 67-year average; and in Mexicali, the annual precipitation was 127 millimeters, 153% of the 72-year average. The total flow of the New River at the international boundary in 1997 was 198,322 thousand cubic meters, which was about 139% of the 1943-1997 average.

SALTON SEA

During 1997, the average annual temperature around the Salton Sea was .7 degree Celsius above the long-term average, while the annual precipitation recorded at Brawley, California was approximately 73% of the long-term mean of 71 millimeters. The water surface of the Salton Sea dropped slightly during the year. The maximum stage, 69.220 meters below mean sea level, was recorded on May 18 through May 20, 1997, inclusive. The minimum stage, 69.525 meters below mean sea level, was recorded on October 21 through November 5 and December 1 through December 31, 1997, inclusive.

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

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

RECORDS: Based on current meter measurements and a continuous record of gage heights. Records are computed and furnished by the U. S. Geological Survey. Records available: Monthly discharge, January 1913 to April 1920, October 1921 to March 1925, and January 1934 to September 1947; daily and monthly discharge, October 1947 through 1997.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | |
|-------------------|---------------------|-------|---------------------------------|--------|-------|-------|---------|------------------------------|---------|---------|---------|------------------|--|
| 1 | 2.18 | 2.27 | 2.12 | 2.10 | 2.41 | 2.24 | 2.07 | 1.98 | 2.15 | 2.27 | 3.23 | 2.35 | |
| 2 | 2.04 | 2.72 | 2.44 | 2.07 | 2.46 | 2.27 | 2.07 | 2.01 | 2.15 | 2.27 | 3.03 | 2.32 | |
| 3 | 1.87 | 2.44 | 2.52 | 2.10 | 2.44 | 2.38 | 2.04 | 2.01 | 2.15 | 2.27 | 2.04 | 2.35 | |
| 4 | 1.84 | 2.04 | 2.32 | 2.21 | 2.35 | 2.41 | 1.98 | 2.04 | 2.18 | 2.27 | 2.29 | 2.38 | |
| 5 | 1.84 | 1.87 | 2.32 | 2.21 | 2.35 | 2.44 | 1.98 | 2.07 | 2.18 | 2.27 | 2.52 | 2.32 | |
| 6 | 1.93 | 1.84 | 2.18 | 2.38 | 2.35 | 2.38 | 1.93 | 2.10 | 2.18 | 2.27 | 2.29 | 2.38 | |
| 7 | 1.87 | 1.93 | 2.07 | 2.24 | 2.44 | 2.41 | 1.93 | 2.46 | 2.18 | 2.27 | 2.24 | 2.52 | |
| 8 | 1.81 | 2.27 | 2.10 | 2.10 | 2.41 | 2.38 | 1.95 | 2.72 | 2.15 | 2.29 | 2.12 | 2.52 | |
| 9 | 1.90 | 2.61 | 2.18 | 2.07 | 2.38 | 2.27 | 1.90 | 2.52 | 2.18 | 2.41 | 2.21 | 2.52 | |
| 10 | 2.18 | 2.44 | 2.12 | 2.07 | 2.38 | 2.24 | 1.84 | 2.21 | 2.58 | 2.63 | 2.24 | 2.38 | |
| 11 | 1.95 | 2.15 | 2.07 | 2.10 | 2.24 | 2.58 | 1.84 | 2.15 | 2.27 | 2.46 | 2.27 | 2.24 | |
| 12 | 1.84 | 1.95 | 2.04 | 2.12 | 2.32 | 2.27 | 1.87 | 2.12 | 2.27 | 2.75 | 2.52 | 2.18 | |
| 13 | 1.98 | 1.95 | 2.07 | 2.18 | 2.38 | 2.32 | 1.93 | 2.10 | 2.27 | 3.31 | 2.41 | 2.10 | |
| 14 | 2.69 | 1.98 | 2.07 | 2.18 | 2.35 | 2.32 | 1.90 | 2.07 | 2.27 | 4.22 | 2.63 | 2.15 | |
| 15 | 2.12 | 2.15 | 2.12 | 2.18 | 2.35 | 2.27 | 1.95 | 2.07 | 2.27 | 4.08 | 2.41 | 2.27 | |
| 16 | 1.90 | 2.35 | 2.27 | 2.21 | 2.38 | 2.27 | 1.98 | 2.10 | 2.27 | 3.34 | 2.41 | 2.38 | |
| 17 | 1.90 | 2.15 | 2.35 | 2.21 | 2.41 | 2.24 | 1.90 | 2.12 | 2.27 | 2.78 | 2.38 | 2.15 | |
| 18 | 1.84 | 2.01 | 2.27 | 2.21 | 2.35 | 2.21 | 1.95 | 2.12 | 2.27 | 2.61 | 2.32 | 2.04 | |
| 19 | 2.01 | 2.01 | 2.24 | 2.21 | 2.29 | 2.24 | 1.90 | 2.12 | 2.27 | 2.58 | 2.38 | 2.04 | |
| 20 | 2.04 | 2.01 | 2.07 | 2.24 | 2.32 | 2.24 | 1.90 | 2.12 | 2.27 | 2.72 | 2.46 | 2.12 | |
| 21 | 1.90 | 2.01 | 1.95 | 2.24 | 2.35 | 2.21 | 1.98 | 2.10 | 2.27 | 2.68 | 2.41 | 2.15 | |
| 22 | 1.90 | 2.04 | 2.01 | 2.24 | 2.41 | 2.21 | 1.98 | 2.12 | 2.27 | 2.58 | 2.46 | 2.49 | |
| 23 | 1.84 | 2.12 | 2.10 | 2.24 | 2.32 | 2.15 | 1.95 | 2.12 | 2.27 | 2.63 | 2.38 | 2.55 | |
| 24 | 1.87 | 2.07 | 2.10 | 2.44 | 2.49 | 2.12 | 1.95 | 2.12 | 2.27 | 2.72 | 2.41 | 2.66 | |
| 25 | 2.24 | 2.04 | 2.01 | 2.46 | 2.63 | 2.15 | 1.95 | 2.12 | 2.27 | 2.69 | 2.38 | 3.09 | |
| 26 | 2.27 | 2.07 | 1.98 | 2.29 | 2.83 | 2.15 | 1.95 | 2.12 | 2.27 | 2.78 | 2.58 | 2.66 | |
| 27 | 2.27 | 2.12 | 1.98 | 2.24 | 2.35 | 2.15 | 1.98 | 2.12 | 2.27 | 3.09 | 2.61 | 2.46 | |
| 28 | 2.21 | 2.12 | 2.04 | 2.27 | 2.32 | 2.12 | 2.01 | 2.12 | 2.27 | 3.20 | 2.66 | 2.41 | |
| 29 | 2.29 | 2.10 | 2.10 | 2.38 | 2.38 | 2.10 | 1.95 | 2.15 | 2.27 | 3.17 | 2.58 | 2.38 | |
| 30 | 2.35 | 2.18 | 2.18 | 2.41 | 2.38 | 2.10 | 1.95 | 2.15 | 2.27 | 3.09 | 2.41 | 2.61 | |
| 31 | 2.12 | 2.01 | 2.21 | 2.21 | 2.35 | 2.10 | 1.98 | 2.15 | 2.27 | 3.17 | 2.41 | 2.27 | |
| Sum | 62.99 | 59.73 | 66.60 | 66.60 | 74.17 | 67.84 | 60.44 | 66.60 | 67.48 | 85.85 | 73.28 | 73.44 | |
| Current Year 1997 | | | | | | | | | | | | Period 1937-1997 | |
| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | | | |
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum | | |
| Jan. | | | 14 | 2.69 | 8 | 1.81 | 2.03 | 5,442 | 4,124 | 5,896 | 711 | | |
| Feb. | | | 2 | 2.72 | 6 | 1.84 | 2.13 | 5,161 | 3,827 | 5,493 | 456 | | |
| Mar. | | | 3 | 2.52 | 21 | 1.95 | 2.15 | 5,754 | 4,715 | 6,617 | 1,005 | | |
| April | | | 25 | 2.46 | 12 | 2.07 | 2.22 | 5,754 | 4,722 | 6,476 | 940 | | |
| May | | | 26 | 2.83 | 11 | 2.24 | 2.39 | 6,408 | 4,893 | 6,895 | 804 | | |
| June | | | 11 | 2.58 | 129 | 2.10 | 2.26 | 5,861 | 4,708 | 6,883 | 717 | | |
| July | | | ! | 2.07 | 111 | 1.84 | 1.95 | 5,222 | 4,978 | 8,079 | 662 | | |
| Aug. | | | 8 | 2.72 | 1 | 1.98 | 2.15 | 5,754 | 4,982 | 8,400 | 698 | | |
| Sept. | | | 10 | 2.58 | ! | 2.15 | 2.25 | 5,830 | 4,726 | 7,672 | 721 | | |
| Oct. | | | 14 | 4.22 | ! | 2.27 | 2.77 | 7,417 | 4,978 | 7,417 | 843 | | |
| Nov. | | | 1 | 3.23 | 3 | 2.04 | 2.44 | 6,331 | 4,673 | 6,794 | 806 | | |
| Dec. | | | 25 | 3.09 | 118 | 2.04 | 2.37 | 6,345 | 4,458 | 6,345 | 783 | | |
| Yearly | | | | 4.22 | | 1.81 | 2.26 | 71,279 | 55,784 | 78,573 | 10,410 | | |

φ Mean daily

! And other days

09-5250.00 YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 501 meters upstream from the intake of the Colorado River siphon, and 5.1 kilometers downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 305 meters upstream from Colorado River below Yuma Main Canal Wasteway, and 10.5 kilometers upstream from the northerly international land boundary.

RECORDS: Discharge is computed as the difference between the measured discharge of the Yuma Main Canal at the Siphon Drop Power Plant upstream and that of the same canal below the Colorado River siphon, with deductions for small irrigation diversions from the canal between the two gaging stations. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|--------|--------|--------|--------|--------|--------|-------|--------|-------|--------|--------|--------|
| 1 | 5.86 | 16.2 | 11.7 | 10.7 | 6.06 | 15.3 | 3.48 | 3.51 | 16.8 | 19.5 | 24.9 | 4.02 |
| 2 | 5.58 | 19.1 | 19.4 | 8.72 | 5.35 | 17.4 | 1.84 | 3.43 | 17.8 | 16.3 | 21.1 | 3.37 |
| 3 | 3.03 | 17.8 | 21.4 | 11.9 | 7.00 | 10.7 | 2.35 | 3.37 | 16.8 | 4.16 | 3.65 | 3.60 |
| 4 | 1.76 | 15.5 | 19.3 | 17.9 | 10.6 | 6.94 | 2.21 | 3.14 | 16.0 | 3.57 | 3.71 | 4.19 |
| 5 | 2.72 | 13.5 | 19.2 | 18.3 | 10.6 | 7.11 | 2.63 | 3.14 | 16.0 | 1.47 | 3.17 | 4.59 |
| 6 | 4.64 | 12.6 | 13.6 | 18.6 | 6.63 | 6.91 | 2.72 | 5.61 | 16.3 | 4.45 | 2.75 | 5.18 |
| 7 | 2.10 | 13.1 | 9.06 | 13.8 | 6.94 | 7.56 | 2.95 | 11.4 | 18.9 | 7.99 | 2.80 | 7.25 |
| 8 | 1.13 | 16.2 | 9.52 | 8.13 | 6.54 | 7.82 | 1.61 | 13.8 | 18.2 | 9.09 | 3.14 | 7.48 |
| 9 | .65 | 19.3 | 12.4 | 5.35 | 5.83 | 6.49 | 2.55 | 15.8 | 18.3 | 13.1 | 3.60 | 6.66 |
| 10 | .51 | 17.2 | 9.29 | 4.67 | 10.1 | 3.23 | 2.49 | 17.0 | 16.3 | 16.8 | 3.48 | 4.84 |
| 11 | .48 | 14.0 | 7.70 | 4.93 | 14.6 | 2.44 | 2.32 | 16.6 | 15.7 | 13.7 | 3.17 | 3.34 |
| 12 | 1.64 | 12.4 | 5.30 | 8.64 | 9.66 | 1.90 | 2.01 | 16.6 | 16.2 | 6.32 | 3.12 | 3.40 |
| 13 | 3.54 | 12.3 | 8.01 | 14.9 | 5.21 | 2.18 | 2.27 | 14.6 | 16.3 | 7.70 | 3.14 | 3.14 |
| 14 | 3.71 | 15.6 | 9.29 | 13.2 | 4.70 | 1.42 | 1.95 | 12.6 | 19.5 | 22.7 | 3.23 | 5.52 |
| 15 | 2.41 | 15.0 | 10.6 | 8.13 | 5.75 | 3.03 | 1.36 | 14.6 | 21.2 | 21.6 | 3.17 | 2.15 |
| 16 | 1.70 | 15.5 | 17.4 | 6.12 | 6.06 | 3.09 | 1.73 | 17.4 | 20.0 | 20.0 | 3.17 | 1.42 |
| 17 | 2.41 | 14.9 | 20.2 | 7.90 | 7.70 | 1.19 | 1.70 | 20.1 | 19.8 | 17.7 | 2.46 | 1.70 |
| 18 | 2.27 | 11.7 | 18.1 | 6.60 | 11.3 | 3.14 | 2.58 | 20.4 | 19.7 | 17.8 | 2.80 | 1.36 |
| 19 | 9.20 | 9.63 | 18.8 | 8.27 | 12.9 | 3.82 | 4.67 | 17.6 | 19.1 | 16.6 | 3.37 | 1.08 |
| 20 | 19.2 | 8.61 | 10.8 | 9.91 | 8.07 | 3.79 | .31 | 15.5 | 16.5 | 12.5 | 2.52 | 1.81 |
| 21 | 5.58 | 8.55 | 6.71 | 8.16 | 8.67 | 3.51 | 0 | 14.5 | 16.4 | 12.5 | 1.73 | 2.15 |
| 22 | 5.78 | 9.20 | 7.79 | 4.30 | 11.7 | 3.57 | 0 | 14.5 | 16.7 | 15.4 | 4.19 | 4.81 |
| 23 | 15.8 | 12.4 | 11.0 | 3.03 | 13.0 | 3.37 | 0 | 15.7 | 14.6 | 16.6 | 4.30 | 6.49 |
| 24 | 15.5 | 9.09 | 10.9 | 2.97 | 18.1 | 3.23 | .11 | 17.3 | 15.1 | 17.6 | 4.08 | 6.06 |
| 25 | 16.0 | 8.52 | 6.88 | 3.48 | 21.0 | 2.75 | 2.38 | 17.4 | 22.8 | 18.4 | 3.68 | 6.34 |
| 26 | 20.5 | 10.0 | 5.72 | 7.22 | 18.2 | 3.31 | 2.32 | 15.6 | 19.2 | 18.7 | 4.42 | 5.66 |
| 27 | 22.0 | 11.6 | 4.02 | 10.9 | 13.3 | 6.46 | 2.61 | 11.9 | 21.1 | 23.0 | 4.11 | 4.50 |
| 28 | 17.9 | 8.86 | 8.67 | 9.94 | 10.8 | 3.20 | 3.03 | 11.1 | 22.8 | 23.1 | 3.60 | 4.11 |
| 29 | 15.1 | | 12.2 | 6.40 | 10.3 | 3.17 | 2.55 | 13.5 | 22.4 | 21.8 | 3.88 | 4.70 |
| 30 | 15.1 | | 17.3 | 4.87 | 10.4 | 3.17 | 2.61 | 14.5 | 21.1 | 22.5 | 3.17 | 7.25 |
| 31 | 14.0 | | 17.4 | 10.4 | 13.8 | 3.77 | 3.77 | 16.9 | | 24.6 | | 10.1 |
| Sum | 237.80 | 368.36 | 379.66 | 267.94 | 310.87 | 151.20 | 65.11 | 409.10 | 547.3 | 467.25 | 139.61 | 138.27 |

| Month | Current Year 1997 | | | | | | | Period 1935-1997 | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|-----------|---------|
| | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| Jan. | | | 27 | 22.0 | 11 | 0.48 | 7.67 | 20,546 | 54,124 | 136,546 | 550 |
| Feb. | | | 9 | 19.3 | 25 | 8.52 | 13.2 | 31,826 | 45,149 | 109,952 | 444 |
| Mar. | | | 3 | 21.4 | 27 | 4.02 | 12.2 | 32,803 | 44,754 | 111,248 | 440 |
| April | | | 6 | 18.6 | 24 | 2.97 | 8.93 | 23,150 | 44,493 | 106,795 | 402 |
| May | | | 25 | 21.0 | 14 | 4.70 | 10.0 | 26,859 | 52,929 | 108,892 | 411 |
| June | | | 2 | 17.4 | 17 | 1.19 | 5.04 | 13,064 | 46,376 | 107,263 | 422 |
| July | | | 19 | 4.67 | 121 | 0 | 2.10 | 5,626 | 43,193 | 112,518 | 455 |
| Aug. | | | 18 | 20.4 | 14 | 3.14 | 13.2 | 35,346 | 46,381 | 110,878 | 455 |
| Sept. | | | 125 | 22.8 | 23 | 14.6 | 18.2 | 47,287 | 51,447 | 103,193 | 440 |
| Oct. | | | 31 | 24.6 | 5 | 1.47 | 15.1 | 40,370 | 46,076 | 111,075 | 699 |
| Nov. | | | 1 | 24.9 | 21 | 1.73 | 4.65 | 12,062 | 46,349 | 125,218 | 882 |
| Dec. | | | 31 | 10.1 | 19 | 1.08 | 4.46 | 11,947 | 53,420 | 134,203 | 570 |
| Yearly | | | | 24.9 | | 0 | 9.54 | 300,886 | 574,691 | 1,286,335 | 8,226 |

φ Mean daily

! And other days

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

DESCRIPTION: Water-stage recorder located in California on the right bank of the river, 305 meters downstream from the mouth of the Yuma Main Canal Wasteway, 1.0 kilometers downstream from the abandoned gaging station on the Colorado River at Yuma, 8.4 kilometers downstream from the mouth of the Gila River, 31.5 kilometers downstream from Imperial Dam, and 10.3 kilometers upstream from the northerly international boundary. Zero of the gage is 31.09 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by U. S. Geological Survey. Records available: October 1963 through 1997. Records from January 1951 through September 1963 deduced from "Colorado River at Yuma" plus flows from "Reservation Main Drain No. 4" and "Yuma Main Canal Wasteway."

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|-------|-------|-------|-------|-------|--------|---------|---------|---------|-------|-------|
| 1 | 23.2 | 37.4 | 30.3 | 28.6 | 26.6 | 35.7 | 19.4 | 15.3 | 33.7 | 47.6 | 40.8 | 19.9 |
| 2 | 22.7 | 43.0 | 39.1 | 26.3 | 26.0 | 34.6 | 19.9 | 22.0 | 36.2 | 40.8 | 37.7 | 18.9 |
| 3 | 20.3 | 39.4 | 40.5 | 28.3 | 26.9 | 29.2 | 20.5 | 22.4 | 35.4 | 29.2 | 22.5 | 17.1 |
| 4 | 19.3 | 34.3 | 36.2 | 34.0 | 31.4 | 24.2 | 21.2 | 25.0 | 35.1 | 27.2 | 28.1 | 17.4 |
| 5 | 20.0 | 31.4 | 35.4 | 34.8 | 31.7 | 24.5 | 21.1 | 26.0 | 31.4 | 24.2 | 29.7 | 17.2 |
| 6 | 21.9 | 31.7 | 30.0 | 37.1 | 27.0 | 24.2 | 21.3 | 24.4 | 32.0 | 27.3 | 23.7 | 18.2 |
| 7 | 20.7 | 32.3 | 25.2 | 36.2 | 26.9 | 24.9 | 20.9 | 41.3 | 36.5 | 36.8 | 22.2 | 20.9 |
| 8 | 19.6 | 37.1 | 26.5 | 27.6 | 26.2 | 25.3 | 19.7 | 48.1 | 45.3 | 30.9 | 20.2 | 21.7 |
| 9 | 21.6 | 40.8 | 32.0 | 24.4 | 26.2 | 31.4 | 20.6 | 44.7 | 52.4 | 32.0 | 20.1 | 22.6 |
| 10 | 23.6 | 38.2 | 28.6 | 23.0 | 30.9 | 39.4 | 23.1 | 39.1 | 62.9 | 36.0 | 22.1 | 21.1 |
| 11 | 18.5 | 35.4 | 25.9 | 23.2 | 35.7 | 45.0 | 22.4 | 34.8 | 86.4 | 34.6 | 20.2 | 18.8 |
| 12 | 16.1 | 32.3 | 24.6 | 25.7 | 32.6 | 31.7 | 19.7 | 34.0 | 103 | 39.9 | 25.8 | 15.8 |
| 13 | 17.6 | 31.2 | 25.9 | 31.7 | 28.9 | 22.2 | 19.1 | 32.3 | 103 | 43.9 | 24.4 | 14.8 |
| 14 | 26.5 | 32.6 | 26.4 | 30.0 | 26.3 | 21.4 | 20.0 | 27.5 | 107 | 48.7 | 27.0 | 14.9 |
| 15 | 18.7 | 35.7 | 28.6 | 27.2 | 26.5 | 22.3 | 19.3 | 29.2 | 132 | 47.3 | 22.7 | 16.8 |
| 16 | 14.6 | 37.7 | 34.8 | 31.2 | 26.5 | 21.6 | 19.2 | 32.3 | 150 | 43.3 | 22.2 | 22.1 |
| 17 | 15.2 | 34.6 | 39.1 | 31.4 | 27.6 | 20.7 | 13.6 | 37.1 | 153 | 37.7 | 23.6 | 17.4 |
| 18 | 15.2 | 30.0 | 36.8 | 35.1 | 30.9 | 21.0 | 17.1 | 37.1 | 148 | 35.4 | 23.0 | 14.1 |
| 19 | 20.3 | 27.8 | 35.7 | 35.1 | 32.3 | 22.0 | 22.7 | 36.5 | 144 | 34.0 | 22.7 | 15.1 |
| 20 | 28.3 | 26.8 | 27.7 | 30.3 | 26.8 | 21.8 | 13.3 | 35.4 | 111 | 37.7 | 22.8 | 16.2 |
| 21 | 20.1 | 27.2 | 22.1 | 35.7 | 27.3 | 22.2 | 6.26 | 31.4 | 59.8 | 36.0 | 22.3 | 16.7 |
| 22 | 18.7 | 28.9 | 24.4 | 32.6 | 29.7 | 22.1 | 6.43 | 33.1 | 54.1 | 32.9 | 23.4 | 22.8 |
| 23 | 26.1 | 32.0 | 28.6 | 39.4 | 32.9 | 20.5 | 5.95 | 37.1 | 46.4 | 33.1 | 22.9 | 24.7 |
| 24 | 28.3 | 29.5 | 28.3 | 43.3 | 40.5 | 20.8 | 14.2 | 40.2 | 39.4 | 33.7 | 22.5 | 27.4 |
| 25 | 35.7 | 27.7 | 24.9 | 43.3 | 42.8 | 20.7 | 20.2 | 39.1 | 57.5 | 33.7 | 21.9 | 33.1 |
| 26 | 44.5 | 28.2 | 22.8 | 37.4 | 48.1 | 21.2 | 11.6 | 36.0 | 67.1 | 34.3 | 22.9 | 28.2 |
| 27 | 45.6 | 30.0 | 22.7 | 34.0 | 36.0 | 25.6 | 21.7 | 32.3 | 44.7 | 40.5 | 23.0 | 24.9 |
| 28 | 35.1 | 30.0 | 25.5 | 32.9 | 30.3 | 21.0 | 24.4 | 30.6 | 38.8 | 41.3 | 25.1 | 23.4 |
| 29 | 37.4 | | 28.6 | 27.9 | 28.6 | 20.9 | 15.8 | 35.7 | 48.1 | 40.8 | 23.7 | 23.7 |
| 30 | 38.8 | | 34.0 | 26.4 | 28.6 | 21.1 | 9.60 | 35.1 | 56.1 | 39.9 | 21.6 | 31.2 |
| 31 | 35.4 | | 34.6 | | 31.2 | | 16.8 | 35.1 | | 40.5 | | 37.4 |
| Sum | 769.6 | 923.2 | 925.8 | 954.1 | 949.9 | 759.2 | 547.04 | 1,030.2 | 2,150.3 | 1,141.2 | 730.8 | 654.5 |

Current Year 1997

Period 1951-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|------|-------|-------|---------|------------------------------|-----------|------------|---------|
| | High | Low | φ High | | φ Low | Total | | Average | Maximum | Minimum | |
| | | | Day | Day | | | | | | | |
| Jan. | | | 27 | 45.6 | 16 | 14.6 | 24.8 | 66,493 | 272,268 | 1,317,479 | 36,828 |
| Feb. | | | 2 | 43.0 | 20 | 26.8 | 33.0 | 79,764 | 216,718 | 1,228,424 | 41,083 |
| Mar. | | | 3 | 40.5 | 21 | 22.1 | 29.9 | 79,989 | 241,482 | 1,610,496 | 42,683 |
| April | | | 24 | 43.3 | 10 | 23.0 | 31.8 | 82,434 | 218,709 | 1,119,312 | 41,552 |
| May | | | 26 | 48.1 | 2 | 26.0 | 30.6 | 82,071 | 220,608 | 1,065,554 | 43,373 |
| June | | | 11 | 45.0 | 23 | 20.5 | 25.3 | 65,595 | 216,217 | 1,113,679 | 36,996 |
| July | | | 28 | 24.4 | 23 | 5.95 | 17.6 | 47,264 | 244,544 | 2,013,773 | 37,956 |
| Aug. | | | 8 | 48.1 | 1 | 15.3 | 33.2 | 89,009 | 249,286 | 2,073,958 | 41,457 |
| Sept. | | | 17 | 153 | 5 | 31.4 | 71.7 | 185,786 | 224,357 | 1,669,785 | 53,264 |
| Oct. | | | 14 | 48.7 | 5 | 24.2 | 36.8 | 98,600 | 191,387 | 1,789,911 | 43,129 |
| Nov. | | | 1 | 40.8 | 9 | 20.1 | 24.4 | 63,141 | 193,062 | 1,292,035 | 42,965 |
| Dec. | | | 31 | 37.4 | 18 | 14.1 | 21.1 | 56,549 | 224,040 | 1,374,776 | 40,733 |
| Yearly | | | | 153 | | 5.95 | 31.6 | 996,695 | 2,712,678 | 13,065,596 | 633,707 |

φ Mean daily

! And other days

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

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 3.690 | 4.155 | 3.885 | 3.805 | 3.750 | 3.930 | 3.640 | 3.580 | 3.940 | 4.280 | 3.980 | 3.640 |
| 2 | 3.675 | 4.290 | 4.035 | 3.765 | 3.735 | 3.915 | 3.650 | 3.740 | 3.980 | 4.025 | 3.925 | 3.620 |
| 3 | 3.620 | 4.195 | 4.050 | 3.800 | 3.755 | 3.820 | 3.665 | 3.750 | 3.970 | 3.805 | 3.660 | 3.585 |
| 4 | 3.605 | 4.065 | 3.975 | 3.895 | 3.835 | 3.730 | 3.680 | 3.805 | 3.970 | 3.770 | 3.735 | 3.595 |
| 5 | 3.615 | 3.995 | 3.960 | 3.910 | 3.845 | 3.735 | 3.680 | 3.820 | 3.945 | 3.710 | 3.800 | 3.590 |
| 6 | 3.650 | 3.995 | 3.870 | 3.945 | 3.760 | 3.730 | 3.680 | 3.790 | 3.980 | 3.765 | 3.690 | 3.610 |
| 7 | 3.625 | 4.005 | 3.780 | 3.930 | 3.760 | 3.745 | 3.675 | 3.995 | 4.080 | 3.930 | 3.660 | 3.665 |
| 8 | 3.605 | 4.125 | 3.805 | 3.785 | 3.745 | 3.750 | 3.650 | 4.390 | 4.245 | 3.830 | 3.620 | 3.680 |
| 9 | 3.645 | 4.220 | 3.900 | 3.720 | 3.750 | 3.860 | 3.670 | 4.290 | 4.370 | 3.850 | 3.620 | 3.695 |
| 10 | 3.705 | 4.150 | 3.835 | 3.695 | 3.830 | 3.995 | 3.720 | 4.035 | 4.530 | 3.915 | 3.660 | 3.665 |
| 11 | 3.625 | 4.070 | 3.785 | 3.695 | 3.910 | 4.080 | 3.710 | 3.995 | 4.855 | 3.890 | 3.625 | 3.620 |
| 12 | 3.600 | 3.985 | 3.760 | 3.745 | 3.865 | 3.865 | 3.660 | 3.960 | 5.055 | 3.985 | 3.735 | 3.555 |
| 13 | 3.655 | 3.950 | 3.785 | 3.855 | 3.800 | 3.690 | 3.645 | 3.930 | 5.090 | 4.145 | 3.710 | 3.535 |
| 14 | 3.850 | 3.990 | 3.795 | 3.820 | 3.750 | 3.675 | 3.670 | 3.845 | 5.150 | 4.370 | 3.760 | 3.535 |
| 15 | 3.730 | 4.065 | 3.830 | 3.770 | 3.760 | 3.695 | 3.660 | 3.875 | 5.420 | 4.330 | 3.675 | 3.575 |
| 16 | 3.650 | 4.115 | 3.940 | 3.835 | 3.760 | 3.680 | 3.655 | 3.930 | 5.590 | 4.120 | 3.665 | 3.680 |
| 17 | 3.650 | 4.030 | 4.000 | 3.845 | 3.780 | 3.665 | 3.505 | 4.005 | 5.615 | 3.935 | 3.695 | 3.585 |
| 18 | 3.640 | 3.900 | 3.960 | 3.905 | 3.840 | 3.670 | 3.595 | 4.005 | 5.570 | 3.900 | 3.685 | 3.515 |
| 19 | 3.770 | 3.835 | 3.945 | 3.905 | 3.860 | 3.690 | 3.730 | 3.995 | 5.535 | 3.875 | 3.680 | 3.540 |
| 20 | 3.980 | 3.805 | 3.805 | 3.825 | 3.765 | 3.685 | 3.490 | 3.980 | 5.160 | 3.940 | 3.685 | 3.565 |
| 21 | 3.750 | 3.820 | 3.695 | 3.910 | 3.775 | 3.695 | 3.310 | 3.910 | 4.435 | 3.905 | 3.675 | 3.570 |
| 22 | 3.720 | 3.860 | 3.745 | 3.860 | 3.820 | 3.690 | 3.315 | 3.940 | 4.320 | 3.855 | 3.700 | 3.690 |
| 23 | 3.905 | 3.930 | 3.820 | 3.970 | 3.875 | 3.655 | 3.300 | 4.000 | 4.155 | 3.860 | 3.690 | 3.730 |
| 24 | 3.960 | 3.875 | 3.815 | 4.035 | 4.000 | 3.670 | 3.530 | 4.050 | 4.040 | 3.870 | 3.680 | 3.780 |
| 25 | 4.140 | 3.830 | 3.745 | 4.030 | 4.035 | 3.665 | 3.690 | 4.035 | 4.465 | 3.870 | 3.675 | 3.910 |
| 26 | 4.330 | 3.840 | 3.705 | 3.935 | 4.115 | 3.675 | 3.470 | 3.985 | 4.765 | 3.875 | 3.690 | 3.790 |
| 27 | 4.355 | 3.880 | 3.700 | 3.885 | 3.930 | 3.760 | 3.725 | 3.925 | 4.290 | 3.975 | 3.695 | 3.720 |
| 28 | 4.115 | 3.880 | 3.755 | 3.860 | 3.835 | 3.675 | 3.775 | 3.890 | 4.220 | 3.995 | 3.735 | 3.710 |
| 29 | 4.165 | | 3.810 | 3.775 | 3.810 | 3.670 | 3.580 | 3.975 | 4.390 | 3.985 | 3.710 | 3.705 |
| 30 | 4.195 | | 3.900 | 3.745 | 3.805 | 3.675 | 3.425 | 3.970 | 4.540 | 3.970 | 3.670 | 3.870 |
| 31 | 4.110 | | 3.910 | | 3.855 | | 3.625 | 3.965 | | 3.985 | | 3.990 |
| Avg. | 3.815 | 3.995 | 3.850 | 3.850 | 3.830 | 3.750 | 3.605 | 3.945 | 4.590 | 3.950 | 3.705 | 3.660 |

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

DESCRIPTION: Venturi meter with recorder 0.5 kilometer from outlet to Colorado River, 0.8 kilometer west of Joe Henry Memorial Park in Yuma, Arizona. Outlet is 2.7 kilometers downstream from the mouth of Yuma Main Canal Westway.
RECORDS: Records are furnished by U. S. Geological Survey. Records available: July 1970 through 1997. Prior to July 21, 1972, records furnished by U. S. Bureau of Reclamation.
REMARKS: Records show water pumped from wells on the Yuma Mesa and conveyed by underground conduit to Colorado River.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 0.96 | 1.22 | 1.02 | 1.44 | 1.36 | 1.36 | 1.25 | 1.27 | 1.33 | 0.79 | 0.99 | 1.56 |
| 2 | .96 | 1.22 | 1.02 | 1.47 | 1.36 | 1.36 | 1.25 | 1.27 | 1.33 | .65 | .91 | 1.53 |
| 3 | .96 | 1.22 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.27 | 1.33 | .48 | .91 | 1.47 |
| 4 | .96 | 1.22 | 1.02 | 1.42 | 1.36 | 1.36 | 1.25 | .79 | 1.33 | .48 | .91 | 1.42 |
| 5 | .96 | 1.22 | 1.05 | 1.36 | 1.36 | 1.36 | 1.25 | .40 | 1.33 | .48 | .91 | 1.42 |
| 6 | .96 | 1.30 | 1.10 | 1.27 | 1.36 | 1.27 | 1.25 | .91 | 1.33 | .54 | .91 | 1.42 |
| 7 | .99 | 1.39 | 1.22 | 1.27 | 1.36 | 1.13 | 1.25 | 1.27 | 1.33 | .85 | .96 | 1.42 |
| 8 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.13 | 1.25 | 1.27 | 1.33 | 1.10 | 1.05 | 1.42 |
| 9 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.13 | 1.25 | 1.27 | 1.33 | 1.10 | 1.05 | 1.42 |
| 10 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.13 | 1.25 | 1.27 | 1.25 | 1.10 | 1.05 | 1.42 |
| 11 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.19 | 1.25 | 1.27 | 1.33 | 1.10 | 1.05 | 1.42 |
| 12 | 1.08 | 1.39 | 1.19 | 1.36 | 1.36 | 1.25 | 1.25 | 1.27 | 1.33 | 1.10 | 1.05 | 1.42 |
| 13 | 1.08 | 1.39 | 1.05 | 1.36 | 1.36 | 1.25 | 1.25 | 1.27 | 1.33 | 1.10 | 1.22 | 1.42 |
| 14 | 1.08 | 1.39 | 1.13 | 1.36 | 1.36 | 1.25 | 1.25 | 1.27 | 1.19 | 1.10 | 1.36 | 1.42 |
| 15 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.25 | 1.25 | 1.36 | .31 | 1.10 | 1.36 | 1.42 |
| 16 | 1.08 | 1.39 | 1.27 | 1.36 | 1.33 | 1.25 | 1.25 | 1.42 | .31 | 1.10 | 1.36 | 1.42 |
| 17 | 1.08 | 1.39 | 1.27 | 1.36 | 1.36 | 1.25 | 1.25 | 1.42 | .40 | 1.10 | 1.30 | 1.47 |
| 18 | 1.08 | 1.39 | 1.27 | 1.33 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.27 | 1.56 |
| 19 | 1.08 | 1.39 | 1.42 | 1.25 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.36 | 1.56 |
| 20 | 1.08 | 1.39 | 1.50 | 1.25 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.47 | 1.56 |
| 21 | 1.08 | 1.19 | 1.50 | 1.25 | 1.33 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.56 | 1.56 |
| 22 | 1.08 | 1.02 | 1.50 | 1.25 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.56 | 1.47 |
| 23 | 1.08 | 1.02 | 1.50 | 1.30 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.56 | 1.42 |
| 24 | 1.08 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.25 | 1.42 | .48 | 1.10 | 1.56 | 1.42 |
| 25 | 1.08 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.19 | 1.42 | .71 | 1.10 | 1.56 | 1.42 |
| 26 | 1.08 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.10 | 1.42 | .79 | 1.10 | 1.56 | 1.42 |
| 27 | 1.08 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.10 | 1.39 | .79 | 1.10 | 1.56 | 1.42 |
| 28 | 1.08 | 1.02 | 1.50 | 1.36 | 1.36 | 1.25 | 1.19 | 1.33 | .79 | 1.10 | 1.56 | 1.42 |
| 29 | 1.08 | 1.50 | 1.36 | 1.36 | 1.36 | 1.25 | 1.25 | 1.33 | .79 | 1.16 | 1.56 | 1.42 |
| 30 | 1.08 | 1.50 | 1.36 | 1.36 | 1.36 | 1.25 | 1.27 | 1.33 | .79 | 1.22 | 1.56 | 1.42 |
| 31 | 1.08 | 1.50 | 1.36 | 1.36 | 1.36 | 1.25 | 1.36 | 1.33 | 1.22 | 1.22 | 1.56 | 1.42 |
| Sum | 32.67 | 35.19 | 40.40 | 40.48 | 42.10 | 37.53 | 38.46 | 39.76 | 27.44 | 30.97 | 38.05 | 44.98 |

Current Year 1997

Period 1971-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|------|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| Jan. | | | ! 8 | 1.08 | ! 1 | 0.96 | 1.05 | 2,823 | 2,756 | 7,204 | 0 |
| Feb. | | | ! 7 | 1.39 | ! 22 | 1.02 | 1.26 | 3,040 | 2,645 | 5,958 | 0 |
| Mar. | | | ! 20 | 1.50 | ! 1 | 1.02 | 1.30 | 3,491 | 3,027 | 6,698 | 4.9 |
| April | | | ! 3 | 1.50 | ! 19 | 1.25 | 1.35 | 3,497 | 2,917 | 6,315 | 299 |
| May | | | ! 1 | 1.36 | ! 16 | 1.33 | 1.36 | 3,637 | 2,859 | 6,085 | 0 |
| June | | | ! 1 | 1.36 | ! 7 | 1.13 | 1.25 | 3,243 | 2,611 | 5,955 | 0 |
| July | | | ! 31 | 1.36 | ! 26 | 1.10 | 1.24 | 3,323 | 2,855 | 6,796 | 613 |
| Aug. | | | ! 16 | 1.42 | ! 5 | .40 | 1.28 | 3,435 | 2,978 | 7,401 | 222 |
| Sept. | | | ! 1 | 1.33 | ! 15 | .31 | .91 | 2,371 | 2,938 | 7,253 | 0 |
| Oct. | | | ! 30 | 1.22 | ! 3 | .48 | 1.00 | 2,676 | 2,962 | 6,611 | 194 |
| Nov. | | | ! 21 | 1.56 | ! 2 | .91 | 1.27 | 3,288 | 3,066 | 6,525 | 386 |
| Dec. | | | ! 1 | 1.56 | ! 4 | 1.42 | 1.45 | 3,886 | 3,276 | 7,364 | 0 |
| Yearly | | | | 1.56 | | 0.31 | 1.23 | 38,710 | 34,890 | 72,381 | 2,162 |

φ Mean daily

! And other days

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

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

RECORDS: Records are furnished by the U. S. Geological Survey from current meter measurements during the year. Records available: May 1948 through 1997.

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

EXTREMES: Mean daily discharge: Maximum, 0.76 CMS on November 12, 1992; minimum no flow several days in February 1966.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|-------|-------|------|------|------|------|-------|-------|-------|-------|
| 1 | 0.27 | 0.28 | 0.31 | 0.31 | 0.34 | 0.28 | 0.28 | 0.28 | 0.37 | 0.51 | 0.45 | 0.37 |
| 2 | .27 | .28 | .31 | .34 | .34 | .28 | .28 | .28 | .37 | .51 | .42 | .37 |
| 3 | .27 | .28 | .31 | .34 | .34 | .28 | .28 | .28 | .40 | .51 | .42 | .34 |
| 4 | .28 | .28 | .31 | .34 | .31 | .28 | .28 | .28 | .40 | .54 | .42 | .34 |
| 5 | .28 | .28 | .31 | .34 | .31 | .28 | .28 | .28 | .40 | .54 | .42 | .37 |
| 6 | .28 | .28 | .31 | .31 | .31 | .28 | .28 | .28 | .40 | .54 | .42 | .37 |
| 7 | .28 | .31 | .34 | .31 | .31 | .28 | .28 | .28 | .40 | .68 | .42 | .37 |
| 8 | .28 | .31 | .34 | .28 | .31 | .28 | .28 | .28 | .40 | .65 | .42 | .37 |
| 9 | .28 | .31 | .34 | .27 | .31 | .28 | .28 | .31 | .40 | .65 | .42 | .37 |
| 10 | .28 | .34 | .37 | .26 | .31 | .27 | .28 | .31 | .40 | .65 | .42 | .37 |
| 11 | .28 | .34 | .37 | .26 | .31 | .27 | .28 | .31 | .40 | .62 | .45 | .37 |
| 12 | .28 | .34 | .37 | .27 | .31 | .27 | .28 | .31 | .40 | .62 | .45 | .37 |
| 13 | .28 | .34 | .40 | .27 | .31 | .27 | .28 | .31 | .42 | .62 | .45 | .37 |
| 14 | .28 | .34 | .37 | .28 | .31 | .27 | .28 | .31 | .42 | .59 | .45 | .37 |
| 15 | .28 | .31 | .37 | .28 | .31 | .27 | .28 | .31 | .42 | .59 | .45 | .37 |
| 16 | .28 | .31 | .37 | .28 | .31 | .26 | .28 | .31 | .42 | .57 | .48 | .37 |
| 17 | .28 | .31 | .34 | .28 | .31 | .27 | .28 | .31 | .42 | .57 | .48 | .37 |
| 18 | .28 | .31 | .34 | .28 | .31 | .26 | .28 | .31 | .42 | .57 | .48 | .34 |
| 19 | .28 | .31 | .34 | .28 | .31 | .26 | .28 | .31 | .42 | .54 | .48 | .34 |
| 20 | .28 | .31 | .31 | .31 | .31 | .26 | .28 | .31 | .42 | .54 | .51 | .31 |
| 21 | .28 | .31 | .31 | .31 | .31 | .26 | .28 | .31 | .42 | .54 | .48 | .31 |
| 22 | .28 | .31 | .31 | .31 | .31 | .26 | .28 | .31 | .42 | .51 | .48 | .31 |
| 23 | .27 | .31 | .28 | .31 | .31 | .25 | .28 | .31 | .42 | .51 | .45 | .28 |
| 24 | .27 | .31 | .28 | .31 | .31 | .26 | .28 | .31 | .45 | .51 | .45 | .28 |
| 25 | .27 | .31 | .28 | .31 | .31 | .26 | .28 | .31 | .45 | .48 | .45 | .28 |
| 26 | .27 | .31 | .28 | .31 | .31 | .27 | .28 | .31 | .45 | .48 | .42 | .27 |
| 27 | .27 | .31 | .28 | .31 | .31 | .27 | .28 | .31 | .48 | .48 | .42 | .26 |
| 28 | .27 | .31 | .31 | .34 | .28 | .27 | .28 | .31 | .48 | .45 | .40 | .25 |
| 29 | .28 | .31 | .31 | .34 | .28 | .27 | .28 | .31 | .48 | .45 | .40 | .24 |
| 30 | .28 | .31 | .31 | .34 | .28 | .28 | .28 | .34 | .48 | .45 | .40 | .23 |
| 31 | .28 | .31 | .31 | .28 | .28 | .28 | .28 | .34 | .48 | .45 | .40 | .23 |
| Sum | 8.59 | 8.65 | 10.12 | 9.11 | 9.58 | 8.10 | 8.68 | 9.43 | 12.63 | 16.92 | 13.26 | 10.16 |

Current Year 1997

Period 1948-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|------|---------|------------------------------|-------|---------|---------|---------|
| | High | Low | Day | φ High | | Day | | φ Low | Total | Average | Maximum | Minimum |
| | | | | Day | φ | | | | | | | |
| Jan. | | | 14 | 0.28 | 11 | 0.27 | 0.28 | 742 | 467 | 1,109 | 48.5 | |
| Feb. | | | 110 | .34 | 11 | .28 | .31 | 747 | 402 | 920 | 50.0 | |
| Mar. | | | 13 | .40 | 123 | .28 | .33 | 874 | 476 | 1,052 | 77.3 | |
| April | | | 12 | .34 | 110 | .26 | .30 | 787 | 479 | 1,233 | 82.4 | |
| May | | | 11 | .34 | 128 | .28 | .31 | 828 | 500 | 1,192 | 71.9 | |
| June | | | 11 | .28 | 23 | .25 | .27 | 700 | 505 | 1,270 | 83.1 | |
| July | | | 11 | .28 | 11 | .28 | .28 | 750 | 571 | 1,554 | 89.8 | |
| Aug. | | | 130 | .34 | 11 | .28 | .30 | 815 | 630 | 1,665 | 91.0 | |
| Sept. | | | 7 | .48 | 11 | .37 | .42 | 1,091 | 641 | 1,690 | 66.1 | |
| Oct. | | | 7 | .68 | 128 | .45 | .55 | 1,462 | 704 | 1,505 | 68.2 | |
| Nov. | | | 20 | .51 | 128 | .40 | .44 | 1,146 | 651 | 1,530 | 71.2 | |
| Dec. | | | 11 | .37 | 130 | .23 | .33 | 878 | 550 | 12,295 | 52.1 | |
| Yearly | | | | 0.68 | | 0.23 | 0.34 | 10,820 | 6,576 | 15,331 | 955 | |

φ Mean daily

! And other days

09-5270.00 PILOT KNOB POWER PLANT AND WASTEWAY
NEAR PILOT KNOB, CALIFORNIA

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

RECORDS: Daily discharge is computed from flowmeter equipment and head and openings on wasteway gates or from head and gate opening on wicket and wasteway gates. Records furnished by the U. S. Geological Survey. Records available: July 1944 through 1997. The wasteway was operated for the purpose of diverting Colorado River water to the Alamo Canal for use in Mexico from July 1944 to November 8, 1950 in accordance with arrangements between the United States and Mexico for emergency use of the All-American Canal facilities. Records since 1950 show water released through Pilot Knob Power Plant and Wasteway from the All-American Canal and returned to the Colorado River through Rockwood gates.

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

EXTREMES: Maximum mean daily discharge, 281 CMS on October 6, 1985; minimum daily discharge, no flow during long periods.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|---------|-------|---------|---------|---------|---------|---------|---------|---------|-------|-------|---------|
| 1 | 30.9 | 184 | 164 | 81.3 | 51.3 | 38.2 | 64.3 | 64.0 | 123 | 138 | 0 | 30.0 |
| 2 | 31.2 | 196 | 181 | 89.5 | 54.4 | 29.5 | 68.0 | 100 | 133 | 64.6 | 0 | 25.9 |
| 3 | 32.0 | 169 | 149 | 85.5 | 53.8 | 29.5 | 66.3 | 140 | 130 | 28.6 | 29.2 | 28.0 |
| 4 | 32.0 | 156 | 149 | 113 | 47.3 | 35.7 | 64.3 | 121 | 125 | 26.9 | 29.7 | 27.8 |
| 5 | 29.2 | 156 | 138 | 108 | 44.5 | 35.4 | 64.3 | 111 | 118 | 23.9 | 28.9 | 27.2 |
| 6 | 28.6 | 150 | 133 | 107 | 49.6 | 33.7 | 64.3 | 117 | 149 | 25.1 | 26.2 | 37.4 |
| 7 | 33.7 | 162 | 137 | 80.7 | 52.7 | 33.7 | 65.7 | 131 | 139 | 0 | 22.2 | 42.2 |
| 8 | 33.1 | 180 | 147 | 89.8 | 53.0 | 33.7 | 66.3 | 135 | 108 | 0 | 24.1 | 56.6 |
| 9 | 33.4 | 198 | 179 | 73.6 | 54.4 | 31.7 | 65.7 | 119 | 125 | 0 | 24.0 | 34.3 |
| 10 | 29.2 | 178 | 135 | 60.9 | 48.4 | 28.6 | 62.6 | 141 | 114 | 0 | 22.3 | 23.4 |
| 11 | 34.6 | 175 | 104 | 70.2 | 42.5 | 22.2 | 63.2 | 107 | 101 | 0 | 22.3 | 27.2 |
| 12 | 31.2 | 161 | 114 | 75.3 | 45.0 | 28.1 | 66.0 | 101 | 99.7 | 0 | 22.3 | 29.2 |
| 13 | 28.2 | 161 | 101 | 43.9 | 47.3 | 28.2 | 66.3 | 95.2 | 73.3 | 0 | 22.2 | 30.6 |
| 14 | 37.7 | 170 | 94.6 | 45.9 | 53.8 | 42.2 | 66.3 | 127 | 71.4 | 0 | 25.0 | 30.9 |
| 15 | 49.0 | 183 | 118 | 51.0 | 54.4 | 41.9 | 66.3 | 117 | 89.2 | 0 | 28.3 | 26.5 |
| 16 | 28.9 | 191 | 140 | 42.2 | 54.4 | 47.9 | 68.3 | 145 | 93.7 | 0 | 28.5 | 23.0 |
| 17 | 22.2 | 157 | 102 | 42.8 | 52.4 | 48.7 | 66.6 | 133 | 73.3 | 0 | 29.2 | 24.3 |
| 18 | 23.3 | 130 | 88.4 | 38.2 | 46.4 | 48.7 | 66.3 | 92.0 | 58.6 | 0 | 29.5 | 27.6 |
| 19 | 40.5 | 123 | 79.9 | 38.5 | 50.7 | 48.7 | 66.3 | 114 | 70.0 | 0 | 29.7 | 27.2 |
| 20 | 37.7 | 128 | 55.2 | 42.8 | 55.8 | 48.7 | 67.4 | 126 | 98.6 | 0 | 30.6 | 25.8 |
| 21 | 22.1 | 145 | 63.4 | 39.4 | 56.4 | 48.7 | 70.2 | 122 | 133 | 0 | 32.3 | 26.4 |
| 22 | 25.2 | 157 | 84.1 | 43.9 | 54.4 | 45.6 | 70.0 | 136 | 135 | 0 | 34.8 | 46.4 |
| 23 | 67.7 | 174 | 103 | 39.6 | 51.0 | 51.0 | 78.4 | 155 | 125 | 0 | 33.1 | 62.0 |
| 24 | 148 | 133 | 79.9 | 38.2 | 43.3 | 52.7 | 74.8 | 150 | 112 | 0 | 41.3 | 95.4 |
| 25 | 176 | 132 | 100 | 35.7 | 44.7 | 52.7 | 66.3 | 126 | 177 | 0 | 40.5 | 67.1 |
| 26 | 204 | 143 | 88.6 | 38.2 | 36.0 | 54.4 | 66.3 | 142 | 105 | 0 | 37.1 | 61.5 |
| 27 | 184 | 155 | 78.7 | 44.5 | 48.4 | 49.0 | 64.3 | 138 | 28.3 | 0 | 36.5 | 34.6 |
| 28 | 169 | 162 | 77.0 | 45.6 | 54.7 | 52.7 | 59.8 | 140 | 73.3 | 0 | 34.3 | 26.8 |
| 29 | 192 | 112 | 50.4 | 53.5 | 52.7 | 63.4 | 151 | 173 | 0 | 0 | 36.2 | 22.2 |
| 30 | 182 | 141 | 54.4 | 54.4 | 54.4 | 54.4 | 66.3 | 137 | 180 | 0 | 41.3 | 18.3 |
| 31 | 169 | 96.3 | | 51.3 | | | 64.6 | 132 | | 0 | | 0 |
| Sum | 2,185.6 | 4,509 | 3,535.1 | 1,810.0 | 1,560.2 | 1,260.9 | 2,059.2 | 3,865.2 | 3,334.4 | 307.1 | 841.6 | 1,065.8 |

Current Year 1997

Period 1944-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|-----------|-----------|---------|---|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum | |
| | | | | | | | | | | | | |
| Jan. | | | 26 | 204 | 21 | 22.1 | 70.5 | 188,836 | 103,558 | 643,620 | 0 | |
| Feb. | | | 9 | 198 | 19 | 123 | 161 | 389,578 | 86,357 | 579,127 | 0 | |
| Mar. | | | 2 | 181 | 20 | 55.2 | 114 | 305,433 | 145,361 | 501,939 | 0 | |
| April | | | 4 | 113 | 25 | 35.7 | 60.3 | 156,384 | 153,830 | 447,013 | 0 | |
| May | | | 21 | 56.4 | 26 | 36.0 | 50.3 | 134,801 | 74,109 | 454,461 | 0 | |
| June | | | 126 | 54.4 | 11 | 22.2 | 42.0 | 108,942 | 115,213 | 501,523 | 0 | |
| July | | | 23 | 78.4 | 28 | 59.8 | 66.4 | 177,915 | 164,927 | 512,385 | 0 | |
| Aug. | | | 23 | 155 | 1 | 64.0 | 125 | 333,953 | 166,051 | 498,782 | 0 | |
| Sept. | | | 30 | 180 | 27 | 28.3 | 111 | 288,092 | 96,638 | 591,679 | 0 | |
| Oct. | | | 1 | 138 | 1 | 7 | 0 | 26,533 | 65,790 | 617,269 | 0 | |
| Nov. | | | 124 | 41.3 | 1 | 1 | 0 | 28.1 | 72,714 | 64,448 | 609,196 | 0 |
| Dec. | | | 24 | 95.4 | 31 | 0 | 34.4 | 92,085 | 101,148 | 700,894 | 0 | |
| Yearly | | | | 204 | | 0 | 72.1 | 2,275,266 | 1,337,430 | 6,000,505 | 0 | |

φ Mean daily

! And other days

09-5220.00 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank and cableway at the point where the northerly international land boundary (California-Baja California) intersects the Colorado River, about 10.3 kilometers downstream from Colorado River below Yuma Main Canal Wasteway, 8.0 kilometers west of Yuma, Arizona, 1.8 kilometers upstream from Morelos Diversion Structure, and about 1.6 kilometers downstream from Rockwood Gate. Zero of the gage is at mean sea level, U. S. C. & G. S. datum. On May 1, 1988, the gage was relocated 52 meters upstream of the old gage on the left bank. Zero of the new gage is at mean sea level, U. S. C. & G. S. datum. Elevation of the new gage is equal to that of the old gage. Station is operated by the United States Section of the Commission.

RECORDS: Based on 211 current meter measurements during the year, 118 by the United States Section, 92 by the Mexican Section of the Commission, 1 by the U. S. Geological Survey, and a continuous record of gage heights. Discharges are computed on the basis of a water-stage recorder 512 meters upstream from the northerly international boundary where the remains of an old weir serve as a partial controlling section. A continuous gage height record is available November 15, 1948 through 1997; daily discharge records available January 1, 1950 through 1997.

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 1997 the flow at this point represented the total amount of the Colorado River water which crossed the northerly international boundary.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|---------|-------|---------|---------|---------|---------|---------|---------|-------|---------|---------|---------|
| 1 | 54.9 | 213 | 200 | 120 | 79.3 | 79.1 | 82.8 | 94.5 | 166 | 193 | 52.0 | 57.1 |
| 2 | 56.5 | 229 | 221 | 120 | 81.1 | 70.9 | 86.3 | 123 | 169 | 114 | 49.8 | 49.3 |
| 3 | 56.6 | 215 | 208 | 117 | 81.6 | 66.8 | 85.7 | 155 | 170 | 70.8 | 59.9 | 49.4 |
| 4 | 56.7 | 195 | 193 | 156 | 81.6 | 66.1 | 84.8 | 149 | 171 | 65.6 | 65.1 | 49.6 |
| 5 | 55.0 | 183 | 184 | 149 | 80.4 | 67.4 | 84.8 | 142 | 167 | 57.0 | 66.7 | 48.5 |
| 6 | 52.9 | 180 | 175 | 145 | 79.1 | 65.5 | 84.6 | 142 | 175 | 55.1 | 58.9 | 63.5 |
| 7 | 55.8 | 185 | 171 | 126 | 80.6 | 66.1 | 85.3 | 153 | 180 | 49.9 | 52.7 | 88.3 |
| 8 | 55.7 | 206 | 177 | 125 | 80.4 | 66.4 | 85.3 | 179 | 169 | 43.7 | 52.2 | 104 |
| 9 | 56.2 | 217 | 211 | 105 | 80.4 | 68.7 | 85.1 | 155 | 181 | 42.9 | 51.7 | 105 |
| 10 | 55.6 | 218 | 182 | 91.9 | 81.2 | 72.8 | 84.8 | 157 | 178 | 48.1 | 53.2 | 48.2 |
| 11 | 55.6 | 214 | 152 | 98.6 | 80.7 | 70.7 | 84.8 | 146 | 190 | 45.5 | 51.2 | 49.1 |
| 12 | 52.8 | 200 | 149 | 106 | 81.3 | 68.1 | 85.0 | 141 | 193 | 49.6 | 57.3 | 48.3 |
| 13 | 51.8 | 192 | 141 | 86.4 | 79.1 | 68.3 | 85.0 | 135 | 190 | 51.0 | 56.1 | 48.5 |
| 14 | 67.2 | 201 | 131 | 85.3 | 79.8 | 67.6 | 85.0 | 149 | 181 | 60.8 | 61.2 | 49.0 |
| 15 | 77.9 | 215 | 149 | 87.1 | 80.3 | 68.3 | 84.7 | 151 | 213 | 59.9 | 60.7 | 45.4 |
| 16 | 52.2 | 223 | 174 | 84.1 | 80.5 | 71.9 | 85.5 | 159 | 229 | 52.4 | 60.9 | 47.3 |
| 17 | 46.0 | 199 | 158 | 84.1 | 80.2 | 71.9 | 84.7 | 161 | 226 | 48.3 | 60.9 | 44.8 |
| 18 | 46.4 | 167 | 134 | 83.6 | 79.2 | 71.7 | 84.7 | 150 | 208 | 46.9 | 60.4 | 44.6 |
| 19 | 64.9 | 146 | 126 | 83.6 | 83.1 | 72.7 | 86.1 | 152 | 213 | 44.9 | 59.7 | 45.0 |
| 20 | 80.8 | 145 | 92.7 | 83.1 | 84.0 | 72.5 | 86.2 | 159 | 218 | 48.4 | 60.4 | 44.5 |
| 21 | 52.8 | 155 | 91.7 | 83.6 | 83.9 | 72.8 | 85.6 | 157 | 199 | 46.7 | 60.5 | 45.3 |
| 22 | 50.4 | 172 | 114 | 84.4 | 84.6 | 70.5 | 85.6 | 159 | 197 | 43.8 | 65.5 | 74.2 |
| 23 | 98.5 | 194 | 134 | 87.0 | 84.6 | 72.7 | 91.8 | 177 | 178 | 44.3 | 63.8 | 77.9 |
| 24 | 172 | 173 | 114 | 89.7 | 84.5 | 73.6 | 92.2 | 185 | 171 | 44.8 | 69.5 | 107 |
| 25 | 217 | 158 | 127 | 87.5 | 87.6 | 74.5 | 85.4 | 163 | 216 | 44.7 | 71.0 | 94.4 |
| 26 | 248 | 170 | 110 | 84.6 | 87.8 | 75.8 | 84.1 | 165 | 223 | 44.9 | 68.4 | 88.7 |
| 27 | 240 | 187 | 99.8 | 84.7 | 87.0 | 75.9 | 85.2 | 164 | 119 | 49.8 | 68.2 | 67.3 |
| 28 | 202 | 193 | 99.8 | 84.4 | 86.4 | 74.1 | 84.7 | 163 | 123 | 50.1 | 68.1 | 53.2 |
| 29 | 221 | 135 | 84.2 | 84.2 | 84.2 | 73.9 | 83.7 | 172 | 216 | 50.1 | 67.3 | 47.5 |
| 30 | 228 | 167 | 85.6 | 84.5 | 84.5 | 74.7 | 84.2 | 165 | 232 | 49.9 | 68.1 | 54.7 |
| 31 | 206 | 144 | 144 | 84.6 | 84.6 | 83.2 | 83.2 | 161 | 161 | 50.0 | 48.8 | 48.8 |
| Sum | 3,087.2 | 5,345 | 4,665.0 | 2,992.5 | 2,553.6 | 2,132.0 | 2,646.9 | 4,783.5 | 5,661 | 1,766.9 | 1,821.4 | 1,888.4 |

Current Year 1997 Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|--------|---------------------------------|------|-----|-------|---------|------------------------------|-----------|------------|---------|
| | High | Low | High | | Low | Total | | Average | Maximum | Minimum | |
| | | | Day | Day | | | | | | | |
| Jan. | 35.245 | 31.430 | 26 | 265 | 1 | 26.5 | 99.6 | 266,734 | 492,571 | 2,027,841 | 39,348 |
| Feb. | 35.015 | 33.350 | 1 2 | 234 | 119 | 139 | 191 | 461,808 | 420,954 | 1,705,506 | 74,502 |
| Mar. | 34.500 | 32.140 | 3 | 232 | 20 | 84.9 | 150 | 403,056 | 455,358 | 1,642,378 | 23,930 |
| April | 33.365 | 31.920 | 4 | 162 | 13 | 79.6 | 99.8 | 258,552 | 376,912 | 1,322,616 | 0 |
| May | 32.115 | 31.935 | 26 | 90.3 | 1 6 | 76.8 | 82.4 | 220,631 | 360,280 | 1,419,735 | 88,077 |
| June | 32.030 | 31.765 | 1 | 82.7 | 1 3 | 64.7 | 71.1 | 184,205 | 359,919 | 1,629,906 | 10,485 |
| July | 32.215 | 31.940 | 24 | 99.2 | 1 | 75.0 | 85.4 | 228,692 | 382,025 | 2,303,937 | 30,097 |
| Aug. | 34.615 | 31.990 | 123 | 191 | 1 | 92.2 | 154 | 413,294 | 394,356 | 2,485,718 | 54,026 |
| Sept. | 35.565 | 33.640 | 125 | 244 | 28 | 84.6 | 189 | 489,110 | 344,439 | 2,286,076 | 66,424 |
| Oct. | 35.200 | 31.510 | 1 | 220 | 8 | 39.6 | 57.0 | 152,660 | 331,475 | 2,417,702 | 52,985 |
| Nov. | 31.935 | 31.520 | 24 | 75.1 | 2 | 39.5 | 60.7 | 157,369 | 367,095 | 1,889,976 | 51,070 |
| Dec. | 34.215 | 31.610 | 9 | 165 | 31 | 40.0 | 60.9 | 163,158 | 461,218 | 2,259,735 | 51,806 |
| Yearly | 35.565 | 31.430 | | 265 | | 26.5 | 108 | 3,399,269 | 4,746,602 | 19,033,105 | 890,696 |

! And other days

09-5220.01 COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY -- STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 31.800 | 34.760 | 34.050 | 32.490 | 31.970 | 31.975 | 32.035 | 32.020 | 34.120 | 34.935 | 31.645 | 31.745 |
| 2 | 31.855 | 34.950 | 34.335 | 32.480 | 31.995 | 31.865 | 32.075 | 32.620 | 34.280 | 34.100 | 31.620 | 31.660 |
| 3 | 31.865 | 34.790 | 34.170 | 32.420 | 32.005 | 31.805 | 32.070 | 33.720 | 34.285 | 33.000 | 31.715 | 31.665 |
| 4 | 31.860 | 34.555 | 33.970 | 33.225 | 32.005 | 31.795 | 32.060 | 33.750 | 34.345 | 32.755 | 31.785 | 31.670 |
| 5 | 31.830 | 34.410 | 33.840 | 33.045 | 31.990 | 31.815 | 32.055 | 33.415 | 34.195 | 32.275 | 31.835 | 31.665 |
| 6 | 31.830 | 34.375 | 33.695 | 32.940 | 31.970 | 31.785 | 32.045 | 33.405 | 34.440 | 32.135 | 31.725 | 31.815 |
| 7 | 31.880 | 34.440 | 33.590 | 32.550 | 31.990 | 31.795 | 32.055 | 33.880 | 34.580 | 31.735 | 31.650 | 32.165 |
| 8 | 31.885 | 34.685 | 33.700 | 32.540 | 31.990 | 31.800 | 32.060 | 34.170 | 34.250 | 31.560 | 31.645 | 32.290 |
| 9 | 31.900 | 34.805 | 34.195 | 32.280 | 31.985 | 31.835 | 32.055 | 33.995 | 34.585 | 31.545 | 31.645 | 32.355 |
| 10 | 31.895 | 34.665 | 33.745 | 32.105 | 31.995 | 31.895 | 32.050 | 34.030 | 34.525 | 31.605 | 31.660 | 31.650 |
| 11 | 31.900 | 34.565 | 33.125 | 32.195 | 31.990 | 31.870 | 32.055 | 33.580 | 34.710 | 31.575 | 31.645 | 31.660 |
| 12 | 31.860 | 34.365 | 33.055 | 32.290 | 31.995 | 31.835 | 32.060 | 33.380 | 34.760 | 31.635 | 31.700 | 31.655 |
| 13 | 31.850 | 34.265 | 32.860 | 32.025 | 31.965 | 31.830 | 32.065 | 33.145 | 34.720 | 31.710 | 31.695 | 31.660 |
| 14 | 32.050 | 34.375 | 32.610 | 32.010 | 31.975 | 31.820 | 32.065 | 33.695 | 34.595 | 32.445 | 31.765 | 31.670 |
| 15 | 32.190 | 34.560 | 33.015 | 32.035 | 31.980 | 31.830 | 32.055 | 33.805 | 35.040 | 32.415 | 31.765 | 31.635 |
| 16 | 31.865 | 34.665 | 33.605 | 31.990 | 31.985 | 31.880 | 32.050 | 34.130 | 35.285 | 31.840 | 31.770 | 31.660 |
| 17 | 31.760 | 34.360 | 33.260 | 31.985 | 31.980 | 31.880 | 32.060 | 34.250 | 35.245 | 31.595 | 31.770 | 31.635 |
| 18 | 31.765 | 33.915 | 32.650 | 31.975 | 31.970 | 31.880 | 32.045 | 33.780 | 34.980 | 31.575 | 31.765 | 31.630 |
| 19 | 32.000 | 33.540 | 32.555 | 31.980 | 32.020 | 31.895 | 32.055 | 33.855 | 35.040 | 31.550 | 31.755 | 31.635 |
| 20 | 32.220 | 33.510 | 32.220 | 31.970 | 32.035 | 31.895 | 32.060 | 34.145 | 35.125 | 31.600 | 31.760 | 31.635 |
| 21 | 31.865 | 33.660 | 32.200 | 31.980 | 32.030 | 31.905 | 32.060 | 34.090 | 34.835 | 31.580 | 31.765 | 31.645 |
| 22 | 31.815 | 33.910 | 32.425 | 31.990 | 32.040 | 31.875 | 32.060 | 34.175 | 34.820 | 31.545 | 31.815 | 32.440 |
| 23 | 32.755 | 34.160 | 32.660 | 32.030 | 32.045 | 31.905 | 32.130 | 34.510 | 34.545 | 31.555 | 31.800 | 33.420 |
| 24 | 34.300 | 33.805 | 32.450 | 32.065 | 32.040 | 31.915 | 32.130 | 34.575 | 34.350 | 31.560 | 31.860 | 34.115 |
| 25 | 34.790 | 33.515 | 32.575 | 32.035 | 32.080 | 31.925 | 32.045 | 34.325 | 35.100 | 31.560 | 31.890 | 33.840 |
| 26 | 35.090 | 33.640 | 32.395 | 31.995 | 32.085 | 31.945 | 32.030 | 34.400 | 35.245 | 31.560 | 31.860 | 33.705 |
| 27 | 35.010 | 33.880 | 32.290 | 32.000 | 32.070 | 31.945 | 32.060 | 34.380 | 33.980 | 31.625 | 31.855 | 33.170 |
| 28 | 34.630 | 33.960 | 32.285 | 31.990 | 32.065 | 31.920 | 32.055 | 34.330 | 34.010 | 31.640 | 31.855 | 32.765 |
| 29 | 34.815 | | 32.725 | 31.985 | 32.030 | 31.920 | 32.040 | 34.475 | 35.090 | 31.645 | 31.845 | 32.565 |
| 30 | 34.880 | | 33.490 | 32.000 | 32.040 | 31.935 | 32.040 | 34.380 | 35.335 | 31.630 | 31.855 | 32.815 |
| 31 | 34.675 | | 32.980 | 32.045 | 32.045 | | 32.030 | 34.270 | | 31.630 | | 32.630 |
| Avg. | 32.665 | 34.250 | 33.120 | 32.220 | 32.010 | 31.870 | 32.060 | 33.890 | 34.680 | 31.970 | 31.755 | 32.200 |

09-5318.50 COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

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

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge March 1950 through 1977 obtained by the United States Section; monthly discharge, January 1934 through 1950 by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge 1,127 TCM in January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 2.25 CMS on June 19, 1965, at a maximum gage height of 34.785 meters (old datum); minimum instantaneous discharge, zero during parts of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 0.01 | 0.23 | 0.08 | 0.01 | 0.15 | 0.07 | 0.01 | 0.02 | 0.12 | 0.14 | 0.21 | 0 |
| 2 | .04 | .07 | .07 | .08 | .01 | .04 | .11 | .03 | .03 | .09 | .23 | 0 |
| 3 | .09 | .04 | .01 | .12 | 0 | .01 | .13 | .01 | .01 | .14 | .04 | 0 |
| 4 | .03 | .18 | 0 | .12 | 0 | .01 | .02 | .02 | .01 | .19 | 0 | 0 |
| 5 | .15 | .03 | 0 | .03 | 0 | .05 | .01 | .01 | .01 | .27 | 0 | .15 |
| 6 | .01 | 0 | .02 | 0 | .07 | .04 | 0 | .01 | .09 | .35 | .12 | .07 |
| 7 | .01 | .08 | .14 | .01 | .02 | .10 | .08 | .01 | .12 | .19 | .15 | 0 |
| 8 | .04 | .03 | .05 | 0 | .01 | .01 | .10 | .01 | .04 | .22 | .29 | 0 |
| 9 | .16 | 0 | .07 | 0 | .11 | 0 | .04 | .01 | .01 | .27 | .24 | 0 |
| 10 | .03 | 0 | 0 | 0 | .03 | 0 | .04 | .01 | 0 | .14 | .17 | .15 |
| 11 | .01 | .01 | 0 | 0 | .01 | .01 | .01 | .01 | 0 | .12 | .24 | .05 |
| 12 | .01 | .01 | 0 | 0 | 0 | .01 | .06 | 0 | 0 | .16 | .12 | .01 |
| 13 | .01 | .01 | .04 | 0 | .01 | .15 | .01 | .04 | 0 | .16 | 0 | .25 |
| 14 | 0 | .16 | .12 | 0 | .01 | .05 | .01 | .13 | 0 | .02 | 0 | .09 |
| 15 | 0 | .04 | .10 | 0 | .38 | .01 | .03 | .09 | 0 | .01 | 0 | 0 |
| 16 | 0 | .06 | .15 | .06 | .01 | .01 | .09 | .23 | .02 | .04 | 0 | .42 |
| 17 | .02 | 0 | .14 | .03 | .01 | .03 | .03 | .10 | .01 | .01 | 0 | .08 |
| 18 | .01 | .04 | .02 | .01 | .01 | .04 | .01 | .03 | .01 | .01 | 0 | .08 |
| 19 | 0 | .04 | .03 | .01 | .12 | 0 | .04 | .05 | .12 | .01 | 0 | .03 |
| 20 | .09 | .04 | .04 | .04 | .08 | 0 | .04 | .07 | .12 | .08 | .03 | .06 |
| 21 | .22 | .04 | 0 | .02 | 0 | .07 | .03 | 0 | .01 | .10 | .14 | .07 |
| 22 | .21 | .25 | .10 | .01 | 0 | .06 | .03 | 0 | 0 | .21 | .09 | .05 |
| 23 | .03 | .16 | .01 | .01 | .08 | .02 | .03 | .01 | .09 | .09 | .08 | .02 |
| 24 | .03 | .11 | .02 | .07 | 0 | .01 | .03 | .01 | .12 | .01 | .02 | .06 |
| 25 | .09 | .07 | 0 | .13 | 0 | 0 | .02 | .17 | .22 | .31 | .02 | .05 |
| 26 | .03 | .06 | 0 | 0 | 0 | 0 | .01 | .02 | .01 | .32 | 0 | .06 |
| 27 | .01 | .07 | 0 | .01 | .12 | 0 | .04 | .02 | .10 | .34 | 0 | .03 |
| 28 | .07 | .11 | .04 | 0 | .09 | .07 | .04 | .03 | .02 | .29 | 0 | .03 |
| 29 | .11 | .11 | .19 | 0 | 0 | .07 | .05 | 0 | .07 | .36 | .12 | .03 |
| 30 | .18 | .04 | .09 | .09 | .01 | .01 | .04 | 0 | .22 | .05 | .01 | .03 |
| 31 | .09 | .02 | .02 | .19 | .19 | .05 | .05 | 0 | .04 | .04 | .01 | .01 |
| Sum | 1.79 | 1.94 | 1.50 | 0.86 | 1.53 | 0.95 | 1.24 | 1.15 | 1.58 | 4.74 | 2.32 | 1.88 |

| Month | Current Year 1997 | | | | | | | Period 1935-1997 | | | |
|--------|---------------------|-----|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| Jan. | 0.655 | 0 | 9 | 1.27 | 1 | 0 | 0.06 | 155 | 184 | 1,127 | 0 |
| Feb. | .480 | 0 | 14 | .79 | 1 | 0 | .07 | 168 | 165 | 493 | 7.4 |
| Mar. | .620 | 0 | 29 | 1.18 | 1 | 0 | .05 | 130 | 174 | 638 | 0 |
| April | .555 | 0 | 3 | 1.00 | 1 | 0 | .03 | 74.3 | 171 | 524 | 20.6 |
| May | .655 | 0 | 15 | 1.28 | 1 | 0 | .05 | 132 | 172 | 543 | 39.1 |
| June | .480 | 0 | 28 | .80 | 1 | 0 | .03 | 82.1 | 153 | 734 | 22.5 |
| July | .545 | 0 | 12 | .96 | 1 | 0 | .04 | 107 | 145 | 636 | 0 |
| Aug. | .605 | 0 | 20 | 1.13 | 1 | 0 | .04 | 99.4 | 120 | 761 | 0 |
| Sept. | .750 | 0 | 25 | 1.56 | 1 | 0 | .05 | 137 | 127 | 570 | 0 |
| Oct. | .835 | 0 | 28 | 1.85 | 1 | 0 | .15 | 410 | 169 | 604 | 0 |
| Nov. | .750 | 0 | 6 | 1.57 | 1 | 0 | .08 | 200 | 184 | 570 | 11.1 |
| Dec. | .735 | 0 | 16 | 1.51 | 1 | 0 | .06 | 162 | 204 | 730 | 16.9 |
| Yearly | 0.835 | 0 | | 1.85 | | 0 | 0.06 | 1,857 | 1,968 | 5,551 | 787 |

1 And other days

09-5220.21 COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

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

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage height records November 8, 1950 to June 3, 1951; a continuous record of gage heights June 4, 1951 through 1997.

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

EXTREMES: Since November 8, 1950: Maximum mean daily elevation above mean sea level, 35.28 meters on September 30, 1997; minimum mean daily elevation above mean sea level, 30.94 meters on February 17, 1957.

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 31.160 | 34.690 | 33.940 | 32.030 | 31.490 | 31.520 | 31.510 | 31.440 | 34.050 | 34.870 | 31.560 | 31.520 |
| 2 | 31.240 | 34.880 | 34.230 | 31.950 | 31.510 | 31.420 | 31.580 | 32.210 | 34.190 | 34.030 | 31.560 | 31.350 |
| 3 | 31.190 | 34.710 | 34.060 | 31.940 | 31.490 | 31.330 | 31.590 | 33.550 | 34.210 | 32.950 | 31.590 | 31.330 |
| 4 | 31.140 | 34.480 | 33.850 | 33.100 | 31.490 | 31.260 | 31.570 | 33.600 | 34.570 | 32.690 | 31.680 | 31.350 |
| 5 | 31.070 | 34.350 | 33.720 | 32.850 | 31.480 | 31.250 | 31.520 | 33.290 | 34.120 | 32.180 | 31.760 | 31.340 |
| 6 | 30.990 | 34.310 | 33.560 | 32.710 | 31.480 | 31.220 | 31.480 | 33.310 | 34.390 | 31.990 | 31.580 | 31.500 |
| 7 | 31.010 | 34.370 | 33.450 | 32.010 | 31.560 | 31.210 | 31.480 | 33.800 | 34.500 | 31.690 | 31.490 | 31.820 |
| 8 | 31.070 | 34.600 | 33.580 | 32.120 | 31.580 | 31.210 | 31.500 | 34.070 | 34.190 | 31.680 | 31.490 | 31.980 |
| 9 | 31.070 | 34.720 | 34.100 | 31.770 | 31.540 | 31.250 | 31.500 | 33.880 | 34.510 | 31.620 | 31.560 | 32.070 |
| 10 | 31.110 | 34.580 | 33.590 | 31.600 | 31.550 | 31.400 | 31.490 | 33.930 | 34.490 | 31.770 | 31.600 | 31.100 |
| 11 | 31.180 | 34.460 | 32.880 | 31.670 | 31.520 | 31.450 | 31.490 | 33.480 | 34.650 | 31.720 | 31.590 | 31.130 |
| 12 | 31.220 | 34.280 | 32.730 | 31.820 | 31.550 | 31.410 | 31.480 | 33.270 | 34.720 | 31.720 | 31.600 | 31.170 |
| 13 | 31.170 | 34.180 | 32.360 | 31.520 | 31.470 | 31.330 | 31.470 | 33.030 | 34.610 | 31.890 | 31.570 | 31.210 |
| 14 | 31.230 | 34.290 | 31.950 | 31.360 | 31.400 | 31.260 | 31.460 | 33.610 | 34.590 | 32.440 | 31.660 | 31.270 |
| 15 | 31.390 | 34.470 | 32.730 | 31.400 | 31.400 | 31.260 | 31.450 | 33.700 | 35.010 | 32.250 | 31.620 | 31.240 |
| 16 | 31.170 | 34.580 | 33.520 | 31.350 | 31.410 | 31.310 | 31.460 | 34.060 | 35.240 | 31.640 | 31.570 | 31.220 |
| 17 | 31.030 | 34.260 | 32.930 | 31.330 | 31.400 | 31.320 | 31.450 | 34.170 | 35.180 | 31.270 | 31.660 | 31.220 |
| 18 | 30.960 | 33.810 | 32.020 | 31.320 | 31.400 | 31.320 | 31.460 | 33.680 | 34.930 | 31.250 | 31.690 | 31.120 |
| 19 | 31.150 | 33.420 | 31.930 | 31.320 | 31.470 | 31.360 | 31.480 | 33.810 | 35.000 | 31.320 | 31.660 | 31.070 |
| 20 | 31.470 | 33.360 | 31.630 | 31.320 | 31.530 | 31.380 | 31.500 | 34.080 | 35.070 | 31.510 | 31.650 | 31.060 |
| 21 | 31.200 | 33.530 | 31.610 | 31.360 | 31.520 | 31.350 | 31.520 | 34.010 | 34.800 | 31.510 | 31.650 | 31.070 |
| 22 | 31.080 | 33.800 | 31.810 | 31.390 | 31.530 | 31.300 | 31.540 | 34.120 | 34.780 | 31.510 | 31.710 | 32.190 |
| 23 | 32.040 | 34.050 | 32.080 | 31.480 | 31.530 | 31.300 | 31.610 | 34.440 | 34.510 | 31.460 | 31.770 | 33.410 |
| 24 | 33.870 | 33.670 | 31.890 | 31.550 | 31.540 | 31.320 | 31.630 | 34.500 | 34.330 | 31.460 | 31.820 | 34.080 |
| 25 | 34.270 | 33.370 | 32.100 | 31.520 | 31.590 | 31.340 | 31.510 | 34.260 | 35.080 | 31.510 | 31.860 | 33.820 |
| 26 | 34.560 | 33.510 | 31.820 | 31.440 | 31.570 | 31.400 | 31.470 | 34.330 | 35.170 | 31.510 | 31.730 | 33.700 |
| 27 | 34.730 | 33.750 | 31.730 | 31.430 | 31.480 | 31.490 | 31.480 | 34.500 | 33.940 | 31.600 | 31.640 | 33.150 |
| 28 | 34.560 | 33.840 | 31.740 | 31.430 | 31.460 | 31.460 | 31.530 | 34.250 | 34.030 | 31.580 | 31.630 | 32.730 |
| 29 | 34.750 | | 32.330 | 31.440 | 31.460 | 31.450 | 31.550 | 34.400 | 35.050 | 31.570 | 31.620 | 32.550 |
| 30 | 34.810 | | 33.360 | 31.490 | 31.510 | 31.440 | 31.510 | 31.310 | 35.280 | 31.490 | 31.630 | 32.790 |
| 31 | 34.600 | | 32.740 | | 31.580 | | 31.470 | 34.190 | | 31.550 | | 32.590 |
| Avg. | 32.050 | 34.155 | 32.775 | 31.700 | 31.500 | 31.345 | 31.510 | 33.680 | 34.640 | 31.910 | 31.640 | 31.910 |

09-5220.30 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 61 meters downstream from the intake at Morelos Dam, 410 meters upstream from the point where it joins the old Alamo Canal, 3.5 kilometers upstream from Matamoros Check, and about 1.6 kilometers south of the northerly international boundary. The zero of the gage is 0.05 meter below mean sea level, U. S. C. & G. S. datum.

RECORDS: The records are deduced from the flows arriving in the limitrophe section of the Colorado River at the northerly international boundary, the flows that pass downstream from the structure, and leakage through the structure. Records available: November 8, 1950 through 1997. 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 1997, and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Mexico occasionally pumps water from the Colorado River at other points below Morelos Dam when water is available in the channel.

EXTREMES: Maximum mean daily discharge, 187 CMS, July 12 and 14, 1983; maximum mean daily gage height, 32.96 meters October 30, 1993 and other days. Minimum daily discharge, no flow on various occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|---------|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1 | 54.9 | 107 | 141 | 115 | 79.4 | 79.2 | 82.8 | 83.8 | 85.5 | 45.6 | 52.2 | 57.1 |
| 2 | 56.5 | 108 | 147 | 116 | 81.1 | 70.9 | 86.4 | 103 | 87.7 | 45.5 | 50.0 | 49.3 |
| 3 | 56.7 | 105 | 131 | 113 | 81.6 | 66.8 | 85.8 | 113 | 78.2 | 47.0 | 59.9 | 49.4 |
| 4 | 56.7 | 103 | 138 | 124 | 81.6 | 66.1 | 84.8 | 107 | 74.7 | 47.8 | 65.1 | 49.6 |
| 5 | 55.2 | 103 | 135 | 133 | 80.4 | 67.4 | 84.8 | 106 | 72.3 | 49.6 | 66.7 | 48.7 |
| 6 | 52.9 | 103 | 136 | 136 | 79.2 | 65.5 | 84.6 | 109 | 75.9 | 55.3 | 59.0 | 63.6 |
| 7 | 55.8 | 105 | 131 | 122 | 80.6 | 66.2 | 85.6 | 112 | 77.0 | 50.1 | 52.9 | 84.0 |
| 8 | 55.7 | 111 | 136 | 122 | 80.4 | 66.4 | 85.4 | 119 | 75.4 | 43.9 | 52.5 | 94.4 |
| 9 | 56.4 | 119 | 149 | 105 | 80.5 | 68.7 | 85.1 | 105 | 75.3 | 43.2 | 51.9 | 92.1 |
| 10 | 55.6 | 120 | 138 | 91.9 | 81.2 | 72.8 | 84.8 | 104 | 75.2 | 48.2 | 53.4 | 48.4 |
| 11 | 55.6 | 121 | 136 | 98.6 | 80.7 | 70.7 | 84.8 | 104 | 73.7 | 45.6 | 51.4 | 49.2 |
| 12 | 52.8 | 122 | 136 | 106 | 81.3 | 68.1 | 85.1 | 106 | 74.0 | 49.8 | 57.4 | 48.3 |
| 13 | 51.8 | 122 | 132 | 86.4 | 79.1 | 68.4 | 85.0 | 102 | 73.1 | 51.2 | 56.1 | 48.8 |
| 14 | 67.2 | 120 | 131 | 85.4 | 79.8 | 67.6 | 85.0 | 96.1 | 70.1 | 55.5 | 61.2 | 49.1 |
| 15 | 77.9 | 121 | 131 | 87.1 | 80.7 | 68.3 | 84.7 | 100 | 70.4 | 58.6 | 60.7 | 45.4 |
| 16 | 52.2 | 121 | 140 | 84.2 | 80.5 | 71.9 | 85.6 | 88.6 | 68.6 | 52.4 | 60.9 | 47.7 |
| 17 | 46.0 | 125 | 132 | 84.1 | 80.2 | 71.9 | 84.7 | 76.2 | 68.4 | 48.3 | 60.9 | 44.9 |
| 18 | 46.4 | 125 | 132 | 83.6 | 79.2 | 71.7 | 84.7 | 88.3 | 65.5 | 46.9 | 60.4 | 44.7 |
| 19 | 64.9 | 125 | 126 | 83.6 | 83.2 | 72.7 | 86.1 | 85.7 | 66.0 | 44.9 | 59.7 | 45.0 |
| 20 | 80.9 | 130 | 92.7 | 83.1 | 84.1 | 72.5 | 86.2 | 98.9 | 62.0 | 48.5 | 60.4 | 44.6 |
| 21 | 53.0 | 133 | 91.7 | 83.6 | 83.9 | 72.9 | 85.6 | 92.6 | 62.9 | 46.8 | 60.6 | 45.4 |
| 22 | 50.6 | 134 | 114 | 84.4 | 84.6 | 70.6 | 85.6 | 90.3 | 61.7 | 44.0 | 65.6 | 24.7 |
| 23 | 87.0 | 135 | 134 | 87.0 | 84.7 | 72.7 | 91.8 | 90.1 | 62.8 | 44.4 | 63.9 | 27.0 |
| 24 | 98.6 | 134 | 114 | 89.8 | 84.5 | 73.6 | 92.2 | 88.7 | 62.3 | 44.8 | 69.5 | 37.2 |
| 25 | 101 | 132 | 126 | 87.6 | 87.6 | 74.5 | 85.4 | 85.4 | 57.0 | 45.0 | 71.0 | 32.0 |
| 26 | 104 | 133 | 110 | 84.6 | 87.8 | 75.8 | 84.1 | 84.1 | 40.7 | 45.2 | 68.4 | 32.5 |
| 27 | 107 | 134 | 99.8 | 84.7 | 87.1 | 75.9 | 85.2 | 84.8 | 33.1 | 50.1 | 68.2 | 29.3 |
| 28 | 109 | 134 | 99.8 | 84.4 | 86.5 | 74.2 | 84.7 | 82.7 | 36.9 | 50.4 | 68.1 | 31.2 |
| 29 | 106 | | 128 | 84.2 | 84.2 | 74.0 | 83.8 | 101 | 43.5 | 50.5 | 67.4 | 27.1 |
| 30 | 105 | | 133 | 85.7 | 84.5 | 74.7 | 84.2 | 83.8 | 44.8 | 50.0 | 68.1 | 32.5 |
| 31 | 106 | | 122 | | 84.5 | | 83.2 | 82.1 | | 50.0 | | 34.9 |
| Sum | 2,179.3 | 3,385 | 3,943.0 | 2,916.0 | 2,555.0 | 2,132.7 | 2,647.8 | 2,973.2 | 1,974.7 | 1,499.1 | 1,823.5 | 1,458.1 |

| | | | | | | | | | | | | |
|-------------------|--|--|--|--|--|--|--|--|------------------|--|--|--|
| Current Year 1997 | | | | | | | | | Period 1950-1997 | | | |
|-------------------|--|--|--|--|--|--|--|--|------------------|--|--|--|

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|------|-----|------|---------|------------------------------|-----------|-----------|-----------|
| | High | Low | Day | High | Day | Low | Average | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 28 | 109 | 17 | 46.0 | 70.3 | 188,292 | 112,584 | 275,305 | 1,192 |
| Feb. | | | 23 | 135 | 4 | 103 | 121 | 292,464 | 119,402 | 292,464 | 11,387 |
| Mar. | | | 9 | 149 | 21 | 91.7 | 127 | 340,675 | 235,024 | 435,370 | 120,761 |
| April | | | 6 | 136 | 20 | 83.1 | 97.2 | 251,942 | 255,310 | 404,698 | 189,700 |
| May | | | 26 | 87.8 | 13 | 79.1 | 82.4 | 220,752 | 144,414 | 286,174 | 81,665 |
| June | | | 1 | 79.2 | 6 | 65.5 | 71.1 | 184,265 | 196,314 | 332,588 | 117,400 |
| July | | | 24 | 92.2 | 1 | 82.8 | 85.4 | 228,770 | 263,605 | 439,171 | 155,105 |
| Aug. | | | 8 | 119 | 17 | 76.2 | 95.9 | 256,884 | 256,422 | 420,673 | 113,219 |
| Sept. | | | 2 | 87.7 | 27 | 33.1 | 65.8 | 170,614 | 156,493 | 336,960 | 66,156 |
| Oct. | | | 15 | 58.6 | 9 | 43.2 | 48.4 | 129,522 | 89,318 | 280,817 | 12,894 |
| Nov. | | | 25 | 71.0 | 2 | 50.0 | 60.8 | 157,550 | 81,317 | 258,388 | 9,271 |
| Dec. | | | 8 | 94.4 | 22 | 24.7 | 47.0 | 125,980 | 112,914 | 247,899 | 10,886 |
| Yearly | | | | 149 | | 24.7 | 80.8 | 2,547,710 | 2,027,248 | 3,451,533 | 1,569,404 |

09-5220.31 INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 31.120 | 31.370 | 31.740 | 31.780 | 31.330 | 31.420 | 31.410 | 31.340 | 31.380 | 31.020 | 31.090 | 31.020 |
| 2 | 31.190 | 31.400 | 31.750 | 31.810 | 31.340 | 31.320 | 31.480 | 31.570 | 31.410 | 30.970 | 31.100 | 30.850 |
| 3 | 31.150 | 31.340 | 31.740 | 31.750 | 31.340 | 31.230 | 31.490 | 31.640 | 31.320 | 31.000 | 31.130 | 30.830 |
| 4 | 31.100 | 31.340 | 31.730 | 31.820 | 31.330 | 31.160 | 31.470 | 31.660 | 31.260 | 31.010 | 31.230 | 30.850 |
| 5 | 31.030 | 31.470 | 31.730 | 31.840 | 31.310 | 31.170 | 31.420 | 31.600 | 31.260 | 30.980 | 31.300 | 30.830 |
| 6 | 30.940 | 31.480 | 31.720 | 31.850 | 31.310 | 31.120 | 31.380 | 31.610 | 31.310 | 31.080 | 31.120 | 31.020 |
| 7 | 31.930 | 31.510 | 31.710 | 31.770 | 31.410 | 31.110 | 31.390 | 31.650 | 31.270 | 30.940 | 31.040 | 31.280 |
| 8 | 31.010 | 31.350 | 31.730 | 31.820 | 31.420 | 31.120 | 31.410 | 31.620 | 31.300 | 30.930 | 31.040 | 31.240 |
| 9 | 30.990 | 31.600 | 31.740 | 31.620 | 31.370 | 31.160 | 31.410 | 31.610 | 31.270 | 30.870 | 31.100 | 31.150 |
| 10 | 31.020 | 31.600 | 31.710 | 31.400 | 31.370 | 31.310 | 31.400 | 31.630 | 31.300 | 31.030 | 31.140 | 31.000 |
| 11 | 31.090 | 31.600 | 31.700 | 31.510 | 31.330 | 31.360 | 31.390 | 31.610 | 31.250 | 30.960 | 31.140 | 31.020 |
| 12 | 31.130 | 31.600 | 31.760 | 31.680 | 31.360 | 31.300 | 31.390 | 31.590 | 31.360 | 30.960 | 31.140 | 31.070 |
| 13 | 31.080 | 31.600 | 31.760 | 31.370 | 31.350 | 31.220 | 31.340 | 31.550 | 31.320 | 31.130 | 31.120 | 31.110 |
| 14 | 31.120 | 31.610 | 31.750 | 31.280 | 31.290 | 31.160 | 31.360 | 31.550 | 31.260 | 31.110 | 31.210 | 31.170 |
| 15 | 31.230 | 31.640 | 31.870 | 31.350 | 31.300 | 31.160 | 31.350 | 31.520 | 31.340 | 31.090 | 31.170 | 31.140 |
| 16 | 31.080 | 31.660 | 31.840 | 31.300 | 31.300 | 31.220 | 31.360 | 31.490 | 31.200 | 31.070 | 31.100 | 31.120 |
| 17 | 30.940 | 31.650 | 31.820 | 31.270 | 31.290 | 31.230 | 31.360 | 31.460 | 31.190 | 30.810 | 31.200 | 31.120 |
| 18 | 30.870 | 31.620 | 31.840 | 31.260 | 31.290 | 31.220 | 31.360 | 31.400 | 31.150 | 30.790 | 31.220 | 31.010 |
| 19 | 31.010 | 31.640 | 31.760 | 31.270 | 31.370 | 31.270 | 31.350 | 31.390 | 31.170 | 30.860 | 31.180 | 30.960 |
| 20 | 31.370 | 31.660 | 31.320 | 31.270 | 31.420 | 31.270 | 31.410 | 31.400 | 31.170 | 31.060 | 31.170 | 30.960 |
| 21 | 31.100 | 31.720 | 31.260 | 31.300 | 31.420 | 31.250 | 31.430 | 31.400 | 31.230 | 31.040 | 31.160 | 30.960 |
| 22 | 31.000 | 31.690 | 31.600 | 31.320 | 31.430 | 31.210 | 31.450 | 31.400 | 31.120 | 31.060 | 31.240 | 31.050 |
| 23 | 31.320 | 31.730 | 31.910 | 31.420 | 31.430 | 31.210 | 31.520 | 31.380 | 31.200 | 30.940 | 31.290 | 30.870 |
| 24 | 31.340 | 31.740 | 31.740 | 31.470 | 31.450 | 31.230 | 31.530 | 31.400 | 31.160 | 30.990 | 31.340 | 30.880 |
| 25 | 31.360 | 31.750 | 31.820 | 31.410 | 31.500 | 31.250 | 31.410 | 31.350 | 31.060 | 31.050 | 31.370 | 30.870 |
| 26 | 31.350 | 31.770 | 31.630 | 31.310 | 31.480 | 31.320 | 31.370 | 31.360 | 30.930 | 31.040 | 31.230 | 30.860 |
| 27 | 31.360 | 31.760 | 31.560 | 31.310 | 31.390 | 31.390 | 31.390 | 31.380 | 30.890 | 31.140 | 31.140 | 30.850 |
| 28 | 31.390 | 31.760 | 31.580 | 31.310 | 31.370 | 31.360 | 31.440 | 31.370 | 30.910 | 31.110 | 31.130 | 30.850 |
| 29 | 31.380 | | 31.890 | 31.310 | 31.360 | 31.360 | 31.440 | 31.390 | 31.070 | 31.100 | 31.120 | 30.870 |
| 30 | 31.380 | | 31.900 | 31.360 | 31.420 | 31.340 | 31.400 | 31.400 | 30.960 | 31.030 | 31.130 | 30.820 |
| 31 | 31.370 | | 31.830 | 31.490 | 31.490 | | 31.370 | 31.370 | | 31.080 | | 30.810 |
| Avg. | 31.185 | 31.595 | 31.725 | 31.485 | 31.375 | 31.250 | 31.410 | 31.485 | 31.200 | 31.005 | 31.170 | 30.980 |

09-5220.41 COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

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

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; continuous record of gage heights June 7, 1966 through 1997.

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, 34.74 meters on August 18, 1993; minimum mean gage height, 29.06 meters from October 3 to December 31, 1996.

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 29.060 | 33.660 | 32.910 | 30.960 | 30.500 | 30.540 | 30.540 | 30.520 | 33.080 | 33.890 | 30.450 | 30.450 |
| 2 | 29.060 | 33.840 | 33.200 | 30.890 | 30.510 | 30.450 | 30.580 | 31.250 | 33.240 | 33.040 | 30.450 | 30.450 |
| 3 | 29.060 | 33.670 | 33.020 | 30.850 | 30.510 | 30.410 | 30.580 | 32.620 | 33.250 | 31.950 | 30.450 | 30.450 |
| 4 | 29.060 | 33.440 | 32.820 | 32.010 | 30.520 | 30.400 | 30.570 | 32.630 | 33.310 | 31.650 | 30.450 | 30.450 |
| 5 | 29.060 | 33.300 | 32.690 | 31.780 | 30.510 | 30.420 | 30.550 | 32.290 | 33.160 | 31.080 | 30.450 | 30.450 |
| 6 | 29.060 | 33.260 | 32.530 | 31.630 | 30.500 | 30.400 | 30.540 | 32.330 | 33.430 | 30.930 | 30.450 | 30.450 |
| 7 | 29.060 | 33.330 | 32.410 | 30.960 | 30.530 | 30.400 | 30.540 | 32.820 | 33.540 | 30.530 | 30.450 | 30.500 |
| 8 | 29.060 | 33.550 | 32.530 | 31.050 | 30.530 | 30.410 | 30.540 | 33.090 | 33.220 | 30.450 | 30.450 | 31.310 |
| 9 | 29.060 | 33.680 | 33.040 | 30.690 | 30.510 | 30.430 | 30.540 | 32.840 | 33.560 | 30.450 | 30.450 | 31.590 |
| 10 | 29.060 | 33.520 | 32.600 | 30.550 | 30.520 | 30.470 | 30.540 | 32.980 | 33.500 | 30.450 | 30.450 | 30.260 |
| 11 | 29.060 | 33.410 | 31.840 | 30.620 | 30.510 | 30.460 | 30.540 | 32.430 | 33.680 | 30.450 | 30.450 | 30.260 |
| 12 | 29.060 | 33.230 | 31.680 | 30.750 | 30.520 | 30.430 | 30.540 | 32.310 | 33.740 | 30.450 | 30.450 | 30.260 |
| 13 | 29.060 | 33.130 | 31.320 | 30.520 | 30.500 | 30.420 | 30.540 | 32.050 | 33.680 | 30.450 | 30.450 | 30.260 |
| 14 | 29.590 | 33.250 | 30.930 | 30.500 | 30.500 | 30.410 | 30.540 | 32.650 | 33.590 | 31.270 | 30.450 | 30.260 |
| 15 | 29.970 | 33.430 | 31.680 | 30.520 | 30.500 | 30.420 | 30.540 | 32.740 | 34.020 | 31.270 | 30.450 | 30.260 |
| 16 | 29.770 | 33.530 | 32.460 | 30.490 | 30.500 | 30.450 | 30.540 | 33.110 | 34.250 | 30.620 | 30.450 | 30.260 |
| 17 | 29.700 | 33.200 | 31.940 | 30.500 | 30.500 | 30.460 | 30.540 | 33.210 | 34.214 | 30.450 | 30.450 | 30.260 |
| 18 | 29.710 | 32.740 | 30.960 | 30.500 | 30.500 | 30.460 | 30.540 | 32.710 | 33.950 | 30.450 | 30.450 | 30.260 |
| 19 | 29.890 | 32.370 | 30.880 | 30.500 | 30.540 | 30.470 | 30.550 | 32.830 | 34.010 | 30.450 | 30.450 | 30.260 |
| 20 | 30.000 | 32.320 | 30.570 | 30.500 | 30.560 | 30.470 | 30.550 | 33.110 | 34.090 | 30.450 | 30.450 | 30.260 |
| 21 | 29.770 | 32.500 | 30.550 | 30.510 | 30.550 | 30.470 | 30.560 | 33.040 | 33.810 | 30.450 | 30.450 | 30.260 |
| 22 | 29.750 | 32.740 | 30.750 | 30.520 | 30.560 | 30.450 | 30.560 | 33.150 | 33.790 | 30.450 | 30.450 | 31.660 |
| 23 | 31.070 | 33.020 | 31.020 | 30.550 | 30.560 | 30.460 | 30.620 | 33.490 | 33.520 | 30.450 | 30.450 | 33.300 |
| 24 | 33.050 | 32.610 | 30.830 | 30.580 | 30.570 | 30.470 | 30.620 | 33.530 | 33.330 | 30.450 | 30.450 | 33.980 |
| 25 | 33.690 | 32.330 | 31.050 | 30.550 | 30.610 | 30.470 | 30.550 | 33.290 | 34.130 | 30.450 | 30.450 | 33.720 |
| 26 | 33.990 | 32.460 | 30.760 | 30.510 | 30.600 | 30.490 | 30.530 | 33.370 | 34.130 | 30.450 | 30.450 | 33.590 |
| 27 | 33.890 | 32.720 | 30.680 | 30.510 | 30.560 | 30.510 | 30.540 | 33.340 | 32.910 | 30.450 | 30.450 | 33.050 |
| 28 | 33.520 | 32.810 | 30.680 | 30.510 | 30.560 | 30.490 | 30.550 | 33.290 | 33.090 | 30.450 | 30.450 | 32.630 |
| 29 | 33.710 | | 31.280 | 30.510 | 30.540 | 30.480 | 30.550 | 33.440 | 34.090 | 30.450 | 30.450 | 32.440 |
| 30 | 33.770 | | 32.290 | 30.520 | 30.560 | 30.480 | 30.530 | 33.340 | 34.300 | 30.450 | 30.450 | 32.690 |
| 31 | 33.560 | | 31.670 | | 30.590 | | 30.520 | 33.220 | | 30.450 | | 32.500 |
| Avg. | 30.520 | 33.110 | 31.730 | 30.735 | 30.535 | 30.450 | 30.550 | 32.805 | 33.655 | 30.830 | 30.450 | 31.250 |

09-5319.00 WELLTON-MOHAWK DRAINAGE WATER DISCHARGED
TO COLORADO RIVER BELOW MORELOS DAM

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

RECORDS: Based on discharge measurements and a continuous record of gage heights. Station is operated by the United States Section of the Commission. Records available: November 16, 1965 through 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

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

Current Year 1997

Period 1966-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| Jan. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 7,576 | 23,088 | 0 |
| Feb. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 5,824 | 20,959 | 0 |
| Mar. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 4,109 | 22,827 | 0 |
| April | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 3,681 | 22,944 | 0 |
| May | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 5,548 | 23,548 | 0 |
| June | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 4,367 | 23,135 | 0 |
| July | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 4,010 | 23,370 | 0 |
| Aug. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 4,077 | 23,668 | 0 |
| Sept. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 5,730 | 22,787 | 0 |
| Oct. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 8,064 | 23,683 | 0 |
| Nov. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 7,645 | 22,792 | 0 |
| Dec. | 0 | 0 | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 7,031 | 23,585 | 0 |
| Yearly | 0 | 0 | | 0 | | 0 | 0 | 0 | 67,662 | 264,928 | 0 |

! And other days

09-5325.00 ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona, 6.9 kilometers downstream from the northerly international boundary and 5.1 kilometers downstream from Morelos Diversion Dam. It is the largest of three wasteways discharging waste water from the Valley Division of the Yuma Project in the United States into the limitrophe section of the Colorado River. Since June 1986, zero of the gage is 34.05 meters above mean sea level, U. S. C. & G. S. datum; prior to that date, zero of the gage was mean sea level, U. S. C. & G. S. datum.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1997, obtained by the United States Section; monthly discharge, January 1924 through 1950 by Bureau of Reclamation.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 0.69 | 0.01 | 0 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.12 | 0.22 | 0.14 | 0.01 |
| 2 | .23 | 0 | 0 | .01 | .01 | .01 | .01 | .25 | .41 | .01 | .30 | .01 |
| 3 | .01 | .01 | .01 | .18 | .01 | .03 | .01 | .01 | .01 | .19 | .29 | .01 |
| 4 | .02 | .01 | 0 | .21 | .01 | .01 | 0 | .01 | .01 | .01 | .02 | .01 |
| 5 | .02 | 0 | .01 | .01 | .02 | .01 | 0 | .01 | .01 | .01 | .32 | .05 |
| 6 | .07 | 0 | .01 | .10 | .01 | .02 | 0 | .01 | .01 | .15 | .01 | .29 |
| 7 | .01 | .01 | .01 | .01 | .01 | .19 | 0 | .01 | .14 | .14 | .01 | .02 |
| 8 | .01 | 0 | 0 | .02 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .02 |
| 9 | .01 | 0 | .01 | .01 | .01 | .01 | 0 | .01 | .01 | .26 | .07 | .01 |
| 10 | .01 | 0 | .01 | .01 | .01 | .01 | 0 | .15 | .01 | .27 | .50 | .01 |
| 11 | .01 | 0 | 0 | .02 | .01 | .01 | 0 | .01 | .01 | .01 | .27 | .01 |
| 12 | .01 | 0 | 0 | .01 | .01 | .01 | 0 | .01 | .01 | .02 | .39 | .01 |
| 13 | .29 | 0 | .01 | .27 | .01 | .01 | 0 | .01 | .01 | .33 | .18 | .01 |
| 14 | .02 | .01 | 0 | .01 | .01 | .01 | 0 | .09 | .33 | .02 | .01 | .32 |
| 15 | .01 | 0 | .05 | .01 | .01 | .01 | 0 | .01 | .01 | .08 | .02 | .22 |
| 16 | .02 | 0 | .59 | .01 | .02 | .01 | 0 | .01 | .01 | .59 | .28 | .02 |
| 17 | .01 | 0 | .01 | .01 | .01 | .01 | 0 | .01 | .01 | .02 | .31 | .02 |
| 18 | .01 | 0 | .01 | .01 | .01 | .01 | 0 | .05 | .01 | .13 | .02 | .01 |
| 19 | .01 | 0 | .01 | .01 | .01 | .01 | 0 | .01 | .01 | .18 | .01 | .01 |
| 20 | .01 | 0 | .01 | .01 | .01 | .01 | .24 | .01 | .01 | .45 | .01 | .01 |
| 21 | .01 | 0 | .01 | .01 | .02 | .01 | .17 | .01 | .02 | .67 | .26 | .26 |
| 22 | .01 | 0 | .01 | .01 | .01 | .01 | .15 | .01 | .01 | .93 | .29 | 1.68 |
| 23 | .01 | 0 | .01 | .01 | .01 | .01 | .04 | .01 | .01 | .60 | .52 | .01 |
| 24 | .01 | 0 | .01 | .02 | .01 | .01 | .01 | .06 | .01 | .01 | .01 | .01 |
| 25 | .01 | 0 | .01 | .17 | .04 | .01 | 0 | .43 | .19 | .01 | .04 | .01 |
| 26 | .01 | .15 | .01 | .01 | .01 | .01 | 0 | .47 | .24 | .55 | .58 | .01 |
| 27 | .01 | .01 | .01 | .01 | .04 | .01 | 0 | .01 | .01 | .20 | .02 | .01 |
| 28 | .01 | 0 | .01 | .01 | .04 | .01 | 0 | .01 | .01 | .01 | .03 | .27 |
| 29 | .26 | .01 | .01 | .01 | .01 | .01 | 0 | .01 | .01 | .01 | .01 | .28 |
| 30 | .01 | .01 | .01 | .01 | .01 | .01 | 0 | .02 | .01 | .01 | .01 | .49 |
| 31 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .06 | .01 | .01 | .01 | .71 |
| Sum | 1.84 | 0.21 | 0.86 | 1.21 | 0.43 | 0.51 | 0.66 | 1.80 | 1.68 | 6.11 | 4.94 | 4.82 |

Current Year 1997

Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|------|-----|-------|---------|------------------------------|---------|---------|------|
| | High | Low | Day | High | Low | Total | | Average | Maximum | Minimum | |
| | | | | Day | Day | | | | | | |
| Jan. | 0.780 | 0.010 | 29 | 3.79 | 1 | 0.01 | 0.06 | 159 | 2,711 | 11,804 | 0 |
| Feb. | .630 | 0 | 26 | 2.70 | 1 | 0 | .01 | 18.1 | 2,220 | 10,398 | 17.9 |
| Mar. | .355 | .005 | 16 | 1.89 | 1 | 0 | .03 | 74.3 | 2,092 | 7,685 | 51.8 |
| April | .340 | .010 | 25 | 1.80 | 1 | .01 | .04 | 105 | 1,926 | 7,771 | 0 |
| May | .100 | .010 | 27 | .16 | 1 | .01 | .01 | 37.2 | 2,271 | 11,496 | 10.2 |
| June | .510 | .010 | 7 | 2.16 | 1 | .01 | .02 | 44.1 | 2,154 | 9,177 | 13.0 |
| July | .215 | 0 | 20 | .86 | 1 | 0 | .02 | 57.0 | 2,185 | 10,263 | 11.2 |
| Aug. | .445 | .005 | 10 | 2.03 | 1 | 0 | .06 | 156 | 1,887 | 12,014 | 18.1 |
| Sept. | .790 | .010 | 14 | 3.84 | 1 | .01 | .06 | 145 | 1,364 | 7,574 | 7.4 |
| Oct. | .850 | .015 | 16 | 4.32 | 1 | .01 | .20 | 528 | 1,874 | 7,006 | 14.7 |
| Nov. | .710 | .010 | 1 | 3.24 | 1 | .01 | .16 | 427 | 2,280 | 10,139 | 23.2 |
| Dec. | .460 | .010 | 22 | 2.06 | 1 | .01 | .16 | 416 | 2,959 | 11,632 | 51.8 |
| Yearly | 0.850 | 0 | | 4.32 | | 0 | 0.07 | 2,167 | 25,923 | 102,255 | 707 |

! And other days

09-5221.00 COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

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

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through 1997; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

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

EXTREMES: Since November 1947, maximum mean daily gage height, 33.155 meters on June 28, 1983; minimum mean daily gage height, 28.645 meters on September 13, 1988 and other days since that time.

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 29.995 | 32.715 | 32.040 | 30.210 | 29.840 | 29.840 | 29.850 | 30.005 | 32.160 | 32.980 | 29.945 | 29.955 |
| 2 | 29.910 | 32.910 | 32.285 | 30.035 | 29.840 | 29.825 | 29.895 | 30.340 | 32.300 | 32.295 | 29.950 | 29.930 |
| 3 | 29.935 | 32.805 | 32.215 | 30.030 | 29.835 | 29.825 | 29.905 | 31.550 | 32.300 | 31.180 | 29.960 | 29.930 |
| 4 | 29.965 | 32.565 | 31.905 | 30.890 | 29.835 | 29.840 | 29.915 | 31.755 | 32.375 | 30.865 | 29.965 | 29.930 |
| 5 | 29.970 | 32.405 | 31.795 | 30.960 | 29.860 | 29.810 | 29.900 | 31.430 | 32.245 | 30.520 | 30.005 | 29.930 |
| 6 | 29.985 | 32.405 | 31.620 | 30.740 | 29.840 | 29.815 | 29.880 | 31.320 | 32.405 | 30.395 | 29.950 | 29.965 |
| 7 | 29.975 | 32.460 | 31.440 | 30.340 | 29.825 | 29.860 | 29.870 | 31.765 | 32.625 | 30.175 | 29.925 | 30.280 |
| 8 | 29.975 | 32.710 | 31.500 | 30.240 | 29.820 | 29.815 | 29.875 | 32.125 | 32.315 | 30.035 | 29.935 | 30.260 |
| 9 | 29.980 | 32.775 | 32.065 | 30.005 | 29.815 | 29.810 | 29.850 | 32.050 | 32.560 | 30.030 | 29.975 | 30.825 |
| 10 | 29.980 | 32.700 | 31.775 | 29.935 | 29.835 | 29.810 | 29.845 | 31.955 | 32.540 | 30.035 | 30.005 | 30.365 |
| 11 | 29.985 | 32.565 | 30.955 | 29.940 | 29.805 | 29.815 | 29.840 | 31.655 | 32.730 | 29.995 | 29.955 | 30.285 |
| 12 | 29.990 | 32.400 | 30.605 | 29.995 | 29.820 | 29.815 | 29.840 | 30.650 | 32.735 | 30.000 | 29.970 | 30.210 |
| 13 | 29.990 | 32.285 | 30.515 | 29.980 | 29.820 | 29.805 | 29.840 | 30.115 | 32.750 | 30.040 | 29.960 | 30.135 |
| 14 | 29.790 | 32.360 | 30.040 | 29.910 | 29.795 | 29.800 | 29.850 | 30.555 | 32.570 | 30.540 | 29.960 | 30.090 |
| 15 | 29.970 | 32.575 | 30.445 | 29.915 | 29.800 | 29.800 | 29.850 | 30.800 | 32.990 | 30.570 | 29.960 | 30.015 |
| 16 | 29.955 | 32.680 | 31.425 | 29.905 | 29.805 | 29.800 | 29.870 | 31.010 | 33.220 | 30.255 | 29.985 | 29.955 |
| 17 | 29.945 | 32.470 | 31.330 | 29.900 | 29.805 | 29.815 | 29.895 | 31.235 | 33.245 | 30.000 | 30.000 | 29.950 |
| 18 | 29.955 | 31.980 | 30.125 | 29.900 | 29.810 | 29.810 | 29.905 | 30.840 | 32.995 | 29.995 | 29.970 | 29.950 |
| 19 | 29.970 | 31.430 | 30.025 | 29.895 | 29.810 | 29.820 | 29.920 | 31.315 | 33.045 | 29.985 | 29.970 | 29.950 |
| 20 | 30.000 | 31.415 | 29.970 | 29.890 | 29.820 | 29.815 | 29.975 | 32.105 | 33.155 | 30.020 | 29.970 | 29.945 |
| 21 | 29.990 | 31.500 | 29.950 | 29.885 | 29.830 | 29.820 | 29.970 | 32.100 | 32.880 | 30.025 | 29.985 | 29.945 |
| 22 | 29.985 | 31.845 | 29.945 | 29.885 | 29.830 | 29.820 | 29.975 | 32.125 | 32.865 | 30.035 | 29.995 | 30.225 |
| 23 | 30.300 | 32.105 | 30.015 | 29.890 | 29.830 | 29.825 | 29.970 | 32.465 | 32.600 | 29.985 | 30.015 | 30.920 |
| 24 | 31.960 | 31.865 | 30.010 | 29.900 | 29.835 | 29.825 | 30.035 | 32.595 | 32.405 | 29.920 | 29.995 | 31.250 |
| 25 | 32.715 | 31.395 | 30.065 | 29.910 | 29.850 | 29.825 | 29.975 | 32.390 | 32.990 | 29.920 | 30.020 | 31.270 |
| 26 | 32.990 | 31.500 | 30.010 | 29.875 | 29.855 | 29.830 | 29.955 | 32.415 | 33.345 | 29.960 | 30.030 | 31.205 |
| 27 | 33.010 | 31.780 | 29.965 | 29.865 | 29.855 | 29.830 | 29.960 | 32.625 | 32.185 | 29.955 | 29.990 | 30.715 |
| 28 | 32.625 | 31.920 | 29.945 | 29.860 | 28.855 | 29.830 | 29.990 | 32.355 | 31.955 | 29.940 | 29.995 | 30.300 |
| 29 | 32.780 | | 30.170 | 29.855 | 29.830 | 29.835 | 30.015 | 32.470 | 33.000 | 29.935 | 29.980 | 30.340 |
| 30 | 32.870 | | 31.185 | 29.850 | 29.830 | 29.835 | 30.005 | 32.435 | 33.295 | 29.925 | 29.980 | 30.460 |
| 31 | 32.690 | | 31.005 | | 29.845 | | 30.035 | 32.305 | | 29.930 | | 30.180 |
| Avg. | 30.680 | 32.235 | 30.850 | 30.045 | 29.795 | 29.820 | 29.920 | 31.635 | 32.695 | 30.305 | 29.975 | 30.280 |

09-5330.00 TWENTY-ONE MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

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

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through 1997, obtained by the United States Section; monthly discharge, March 1939 through 1950, by Bureau of Reclamation.

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

EXTREMES: Prior to January 1951, maximum monthly discharge 3,528 TCM in January 1946; minimum monthly discharge, 150 TCM in September 1950. Since January 1, 1951, maximum instantaneous discharge, 2.89 CMS on January 24, 1954, at a maximum gage height of 29.095 meters (old datum); minimum instantaneous discharge, zero during a part of most months.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- 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 | 0.05 | 0 | 0.32 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.40 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .52 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .18 | 0 |
| | | | | | | | | | | | .54 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .48 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .51 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .34 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .33 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .33 | 0 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .32 | 0 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .28 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .25 | 0 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .48 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .34 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .21 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .19 | .30 |
| 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .44 | .50 |
| 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .28 | .50 |
| 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .27 | .58 |
| 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .31 | 0 | .28 | .24 |
| 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .35 | 0 | .11 | .09 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .18 | 0 | .10 | .72 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .10 | 0 | .30 | .61 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .08 | 0 | .24 | .49 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .69 |
| Sum | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.02 | 0.05 | 7.72 | 5.04 |

Current Year 1997

Period 1939-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| Jan. | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 651 | 3,528 | 0 |
| Feb. | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 559 | 3,096 | 0 |
| Mar. | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 509 | 2,048 | 0 |
| April | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 544 | 2,393 | 0 |
| May | .070 | 0 | 8 | .04 | 11 | 0 | 0 | 0 | 659 | 3,047 | 0 |
| June | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 580 | 2,899 | 0 |
| July | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 503 | 2,405 | 0 |
| Aug. | 0 | 0 | 11 | 0 | 11 | 0 | 0 | 0 | 525 | 3,121 | 0 |
| Sept. | .395 | 0 | 27 | .35 | 11 | 0 | .03 | 88.1 | 469 | 2,689 | 0 |
| Oct. | .105 | 0 | 1 | .08 | 11 | 0 | 0 | 4.3 | 587 | 2,590 | 0 |
| Nov. | .545 | 0 | 14 | 1.15 | 11 | 0 | .26 | 667 | 716 | 2,936 | 0 |
| Dec. | .510 | 0 | 29 | 1.05 | 11 | 0 | .16 | 435 | 748 | 3,306 | 0 |
| Yearly | 0.545 | 0 | | 1.15 | | 0 | 0.04 | 1,194 | 7,050 | 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 91 meters north of the international boundary near San Luis, Arizona and 2.4 kilometers east of the Colorado River. From September 28, 1977 to April 6, 1978, recorder was moved west 31 meters to a temporary bypass channel. On April 7, 1978, recorder was moved back to original site. On August 17, 1992, flow ceased through the wasteway due to construction upstream of the gage. The gage was relocated 20 meters west of the original site providing continuous record since December 21, 1992.

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning November 1, 1953, from head on control weir as measured by water-stage recorder and weir ratings as determined by current meter measurements. Records available: October 1946 through 1997. Records of monthly discharges also are available for the periods January 1924 through June 1928, January 1932 through 1933, and April 1935 through September 1946.

REMARKS: Wasteway discharges from the East Main Canal comprise regulatory waste and drainage waters from the eastern half of the Valley Division of the Yuma Project and are considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|------|------|-------|-------|------|------|------|-------|-------|------|------|
| 1 | 0.88 | 0.57 | 0.54 | 0.01 | 0.47 | 0.12 | 0.37 | 0.13 | 0.61 | 0.61 | 0.13 | 0.09 |
| 2 | .91 | .43 | .44 | .22 | .45 | .17 | .09 | .36 | .24 | .44 | .58 | .03 |
| 3 | .15 | .16 | .24 | .47 | .30 | .04 | .17 | .32 | .47 | .64 | .70 | .10 |
| 4 | .55 | .14 | .21 | .63 | .08 | 0 | .14 | .20 | .48 | .03 | .30 | .16 |
| 5 | .73 | .10 | .20 | .51 | .29 | .29 | .10 | .27 | .24 | .35 | .59 | .35 |
| 6 | .58 | .39 | .16 | .33 | .21 | .15 | .10 | .03 | .06 | .25 | .24 | .57 |
| 7 | .22 | .45 | .40 | .14 | .48 | .28 | .12 | .15 | .15 | .01 | .08 | .54 |
| 8 | .46 | .15 | .27 | .46 | .50 | .20 | .01 | .47 | .21 | .12 | .12 | 0 |
| 9 | .33 | .20 | .27 | .49 | .51 | .60 | .21 | .17 | .22 | .55 | .35 | 0 |
| 10 | .47 | .05 | .34 | .66 | .15 | .25 | .33 | .08 | .24 | .66 | .16 | 0 |
| 11 | .10 | .27 | .50 | .32 | .74 | .55 | .08 | .47 | .14 | .50 | .34 | 0 |
| 12 | .70 | .29 | .53 | .23 | .50 | .33 | .22 | .41 | .14 | .42 | .38 | .03 |
| 13 | .18 | .26 | .19 | .10 | .51 | .29 | .15 | .10 | .06 | .54 | .37 | .44 |
| 14 | .07 | .21 | .22 | .08 | .47 | .22 | .12 | .26 | .02 | .24 | .39 | .35 |
| 15 | .17 | .27 | .06 | .01 | .61 | .13 | .07 | .40 | .30 | .16 | .28 | .65 |
| 16 | .67 | .02 | .14 | .22 | .26 | .17 | .32 | .18 | .31 | .26 | .41 | .51 |
| 17 | .55 | .09 | .58 | .31 | .19 | .15 | .28 | .45 | .22 | .32 | .53 | .29 |
| 18 | .22 | .05 | .12 | .56 | .11 | .38 | .17 | .78 | .12 | .64 | .10 | .25 |
| 19 | .37 | .07 | .19 | .28 | .04 | .14 | .07 | .56 | .01 | .52 | .19 | .05 |
| 20 | .33 | .16 | .34 | .85 | .23 | .05 | .01 | .19 | .02 | .34 | .57 | .21 |
| 21 | .20 | .11 | .17 | .43 | .41 | .18 | 0 | .28 | .07 | .61 | .53 | .43 |
| 22 | .13 | .12 | .36 | .30 | .62 | .40 | .06 | .34 | .35 | .26 | .30 | .80 |
| 23 | .39 | .45 | .18 | .44 | .29 | .17 | .13 | .25 | .22 | .70 | .24 | .23 |
| 24 | .13 | .59 | .64 | .39 | .12 | .07 | .12 | .01 | .31 | .40 | .79 | .53 |
| 25 | .46 | .45 | .57 | .29 | .09 | .16 | .47 | .12 | .64 | .54 | .07 | .20 |
| 26 | .09 | .58 | .32 | .35 | .22 | .20 | .27 | .05 | .31 | .51 | .17 | .12 |
| 27 | .35 | .11 | .24 | .65 | .53 | .31 | .42 | .06 | .40 | .33 | .16 | .42 |
| 28 | .35 | .08 | .28 | .59 | .26 | .41 | .05 | .11 | .54 | .08 | .09 | .43 |
| 29 | .09 | .09 | .62 | .12 | .27 | .36 | .12 | .40 | .55 | .30 | .16 | .62 |
| 30 | .31 | .28 | .68 | .25 | .54 | .10 | .10 | .39 | .33 | .14 | .13 | .47 |
| 31 | .64 | .15 | .28 | .02 | .02 | .01 | .62 | .62 | .62 | .08 | .46 | .46 |
| Sum | 11.78 | 6.82 | 9.22 | 11.62 | 10.18 | 7.31 | 4.88 | 8.61 | 7.98 | 11.55 | 9.45 | 9.13 |

Current Year 1997

Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | | | Total | Average | Maximum | Minimum |
| | | | | | Low | Low | | | | | |
| Jan. | 0.390 | 0.005 | 2 | 1.06 | 14 | 0 | 0.38 | 1,018 | 1,136 | 4,144 | 111 |
| Feb. | .340 | .010 | 26 | .88 | 15 | .01 | .24 | 589 | 946 | 3,910 | 164 |
| Mar. | .375 | .010 | 11 | 1.01 | 16 | .01 | .30 | 797 | 1,078 | 3,602 | 175 |
| April | .370 | .005 | 20 | .99 | 11 | 0 | .39 | 1,004 | 1,053 | 3,910 | 165 |
| May | .345 | 0 | 11 | .90 | 124 | 0 | .33 | 880 | 1,187 | 3,750 | 281 |
| June | .345 | 0 | 18 | .75 | 11 | 0 | .24 | 632 | 983 | 4,515 | 157 |
| July | .305 | 0 | 114 | .75 | 12 | 0 | .16 | 422 | 1,050 | 4,428 | 210 |
| Aug. | .345 | .005 | 18 | .91 | 16 | 0 | .28 | 744 | 1,091 | 4,885 | 196 |
| Sept. | .360 | 0 | 25 | .95 | 110 | 0 | .27 | 689 | 1,036 | 3,910 | 0 |
| Oct. | .340 | .005 | 21 | .88 | 15 | 0 | .37 | 998 | 1,085 | 4,046 | 0 |
| Nov. | .645 | 0 | 24 | 2.19 | 116 | 0 | .32 | 816 | 1,177 | 4,404 | 0 |
| Dec. | .375 | 0 | 22 | 1.02 | 11 | 0 | .29 | 789 | 1,155 | 3,799 | 51.0 |
| Yearly | 0.645 | 0 | | 2.19 | | 0 | 0.30 | 9,378 | 12,977 | 47,255 | 3,733 |

! And other days

09-5340.00 YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

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

RECORDS: Main Drain discharges are lifted 3.05 to 3.66 meters at the pumping plant. Prior to April 1, 1969, discharges were computed from flow ratings and the differential head measured by the two gages. Beginning April 1, 1969 discharges were computed from pump 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 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 3.55 | 3.59 | 3.63 | 3.82 | 4.07 | 3.63 | 3.55 | 3.57 | 3.59 | 3.61 | 5.53 | 4.68 |
| 2 | 3.20 | 3.58 | 3.95 | 4.07 | 4.40 | 3.70 | 3.44 | 3.58 | 3.90 | 3.59 | 5.74 | 3.94 |
| 3 | 3.35 | 3.35 | 3.56 | 4.37 | 4.44 | 3.81 | 3.54 | 3.37 | 3.67 | 3.58 | 5.06 | 3.78 |
| 4 | 3.32 | 3.52 | 3.39 | 3.70 | 4.48 | 3.62 | 3.46 | 3.40 | 3.65 | 3.60 | 5.05 | 3.78 |
| 5 | 3.85 | 3.27 | 3.12 | 3.77 | 4.69 | 3.99 | 3.50 | 3.15 | 3.21 | 3.57 | 5.07 | 4.37 |
| 6 | 3.64 | 3.32 | 3.33 | 4.19 | 4.09 | 4.03 | 3.30 | 3.46 | 3.23 | 3.55 | 5.49 | 4.81 |
| 7 | 3.40 | 3.84 | 3.73 | 4.17 | 3.74 | 3.92 | 3.41 | 3.19 | 3.35 | 3.65 | 5.94 | 4.72 |
| 8 | 3.45 | 3.71 | 4.05 | 3.89 | 4.33 | 3.70 | 3.22 | 3.31 | 3.49 | 3.64 | 5.25 | 4.55 |
| 9 | 3.12 | 3.36 | 3.62 | 4.12 | 4.32 | 3.53 | 3.40 | 3.36 | 3.12 | 3.63 | 5.50 | 5.14 |
| 10 | 3.00 | 3.22 | 3.71 | 4.14 | 4.21 | 3.38 | 3.18 | 3.68 | 2.96 | 3.55 | 4.89 | 4.43 |
| 11 | 3.48 | 3.49 | 3.42 | 4.21 | 4.57 | 3.70 | 3.22 | 3.60 | 2.61 | 3.50 | 4.85 | 3.78 |
| 12 | 3.64 | 3.40 | 3.54 | 4.38 | 4.17 | 3.59 | 3.18 | 3.21 | 2.92 | 3.53 | 5.21 | 4.26 |
| 13 | 3.35 | 3.90 | 3.28 | 4.37 | 4.21 | 3.46 | 3.22 | 3.30 | 3.13 | 3.54 | 4.99 | 5.09 |
| 14 | 3.06 | 3.36 | 3.69 | 4.18 | 4.23 | 3.69 | 3.38 | 3.28 | 3.25 | 3.56 | 5.30 | 4.59 |
| 15 | 3.20 | 3.42 | 3.51 | 3.39 | 4.25 | 3.80 | 3.26 | 3.32 | 3.71 | 3.61 | 5.43 | 4.88 |
| 16 | 3.62 | 3.45 | 4.28 | 4.05 | 4.56 | 3.50 | 3.33 | 3.44 | 3.01 | 4.63 | 5.35 | 4.68 |
| 17 | 3.28 | 3.47 | 3.67 | 3.89 | 4.21 | 3.42 | 3.36 | 3.14 | 3.15 | 4.98 | 5.79 | 4.50 |
| 18 | 2.92 | 3.44 | 3.64 | 3.67 | 4.49 | 3.51 | 3.25 | 3.11 | 2.90 | 4.97 | 5.03 | 4.24 |
| 19 | 3.26 | 3.44 | 3.40 | 4.13 | 4.37 | 3.44 | 3.57 | 3.21 | 3.01 | 5.20 | 4.73 | 3.99 |
| 20 | 2.93 | 3.34 | 3.32 | 4.13 | 4.10 | 3.61 | 4.09 | 3.26 | 2.69 | 5.57 | 4.90 | 4.38 |
| 21 | 2.99 | 3.33 | 3.47 | 4.05 | 4.04 | 3.55 | 3.59 | 3.34 | 2.82 | 5.34 | 4.99 | 4.46 |
| 22 | 3.01 | 3.59 | 3.55 | 4.07 | 3.91 | 3.82 | 3.40 | 3.39 | 2.83 | 4.99 | 4.67 | 5.39 |
| 23 | 2.95 | 3.44 | 3.83 | 4.15 | 4.25 | 3.84 | 3.34 | 3.20 | 2.96 | 5.34 | 5.09 | 4.54 |
| 24 | 3.03 | 3.61 | 3.98 | 4.41 | 4.15 | 3.30 | 2.97 | 3.35 | 3.25 | 5.16 | 5.20 | 3.94 |
| 25 | 3.17 | 4.00 | 3.86 | 4.18 | 3.84 | 3.58 | 3.11 | 3.32 | 4.79 | 5.51 | 4.99 | 3.60 |
| 26 | 3.67 | 4.03 | 3.81 | 4.16 | 3.94 | 3.27 | 3.30 | 3.24 | 4.77 | 5.34 | 4.78 | 3.23 |
| 27 | 3.43 | 3.75 | 3.57 | 4.12 | 3.88 | 3.55 | 3.42 | 3.15 | 3.95 | 5.53 | 4.58 | 3.46 |
| 28 | 2.71 | 3.54 | 3.82 | 4.31 | 3.79 | 3.83 | 3.40 | 3.14 | 3.77 | 5.40 | 4.85 | 3.88 |
| 29 | 2.89 | | 4.10 | 4.34 | 4.09 | 3.44 | 3.54 | 3.32 | 3.48 | 5.03 | 4.77 | 3.70 |
| 30 | 3.16 | | 4.15 | 3.98 | 3.84 | 3.26 | 3.30 | 3.30 | 3.60 | 5.32 | 4.36 | 3.44 |
| 31 | 3.07 | | 3.83 | | 3.79 | | 3.56 | 3.48 | | 5.25 | | 3.55 |

| | | | | | | | | | | | | |
|-----|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Sum | 100.70 | 98.76 | 113.81 | 122.41 | 129.45 | 108.47 | 104.79 | 103.17 | 100.77 | 137.27 | 153.38 | 131.78 |
|-----|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|

Current Year 1997

Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|--------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum | |
| | | | | | | | | | | | | |
| Jan. | | | 5 | 3.85 | 28 | 2.71 | 3.25 | 8,700 | 9,319 | 13,819 | 2,146 | |
| Feb. | | | 26 | 4.03 | 10 | 3.22 | 3.53 | 8,533 | 8,990 | 14,787 | 2,023 | |
| Mar. | | | 16 | 4.28 | 5 | 3.12 | 3.67 | 9,833 | 10,325 | 15,332 | 2,393 | |
| April | | | 24 | 4.41 | 15 | 3.39 | 4.08 | 10,576 | 10,249 | 14,666 | 2,368 | |
| May | | | 5 | 4.69 | 7 | 3.74 | 4.18 | 11,184 | 10,526 | 16,208 | 2,405 | |
| June | | | 6 | 4.03 | 30 | 3.26 | 3.62 | 9,372 | 9,684 | 14,851 | 2,825 | |
| July | | | 20 | 4.09 | 24 | 2.97 | 3.38 | 9,054 | 9,583 | 14,715 | 3,121 | |
| Aug. | | | 10 | 3.68 | 18 | 3.11 | 3.33 | 8,914 | 9,578 | 14,752 | 3,158 | |
| Sept. | | | 25 | 4.79 | 11 | 2.61 | 3.36 | 8,707 | 9,639 | 14,269 | 2,812 | |
| Oct. | | | 20 | 5.57 | 11 | 3.50 | 4.43 | 11,860 | 11,155 | 15,277 | 3,626 | |
| Nov. | | | 7 | 5.94 | 30 | 4.36 | 5.11 | 13,252 | 10,700 | 14,814 | 3,454 | |
| Dec. | | | 22 | 5.39 | 26 | 3.23 | 4.25 | 11,386 | 10,069 | 14,160 | 3,022 | |
| Yearly | | | | | | 5.94 | 2.61 | 3.85 | 121,371 | 119,817 | 171,922 | 33,353 |

φ Mean daily

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

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

RECORDS: Wasteway discharges computed by United States Section of the Commission beginning February 23, 1971, from water-stage recorder and ratings as determined by current meter measurements. Records available: February 23, 1971 through 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|-------|------|------|
| 1 | 0.13 | 0.26 | 0.14 | 0.18 | 0.13 | 0.20 | 0.47 | 0.10 | 0.08 | 0.01 | 0.37 | 0.15 |
| 2 | .06 | .38 | .20 | .01 | .22 | .17 | .26 | .54 | .02 | .08 | .35 | .44 |
| 3 | .02 | .52 | .27 | .44 | .09 | .25 | .43 | .37 | .13 | .58 | .33 | .36 |
| 4 | .02 | .01 | .10 | .38 | .44 | .27 | .40 | .08 | .02 | .36 | .12 | .15 |
| 5 | .12 | .24 | .14 | .30 | .23 | .19 | .35 | .37 | .28 | .50 | .62 | .31 |
| 6 | .33 | .62 | .30 | .12 | .04 | .21 | .34 | .29 | .36 | .41 | .40 | .28 |
| 7 | .05 | .39 | .05 | .35 | .03 | .50 | .33 | .49 | .40 | .31 | .34 | .52 |
| 8 | .24 | .20 | .11 | .17 | .30 | .31 | .21 | .19 | .12 | .20 | .04 | .59 |
| 9 | .31 | .35 | .17 | .10 | .06 | .32 | .48 | .12 | .21 | .38 | .12 | .08 |
| 10 | .44 | .06 | .19 | .03 | .02 | .14 | .37 | .17 | .06 | .35 | .04 | .02 |
| 11 | .04 | .17 | .09 | .48 | .07 | .33 | .28 | .02 | .48 | .04 | .04 | .20 |
| 12 | .61 | .40 | .38 | .48 | 0 | .41 | .11 | .12 | .33 | .58 | .03 | .45 |
| 13 | .56 | .78 | .32 | .57 | 0 | .14 | .27 | .12 | .40 | .57 | .03 | .08 |
| 14 | .43 | .52 | .25 | .21 | 0 | .04 | .29 | .15 | .42 | .50 | .08 | .37 |
| 15 | .18 | .46 | .34 | .28 | .03 | .17 | .37 | .19 | .23 | .30 | .04 | .32 |
| 16 | .24 | .40 | .24 | .13 | .08 | .27 | .39 | .10 | .18 | .36 | .07 | .08 |
| 17 | .21 | .15 | .21 | .04 | .14 | .29 | .09 | .18 | .26 | .43 | .10 | .15 |
| 18 | .03 | .09 | .09 | .25 | .29 | .19 | .11 | .21 | .03 | .72 | .16 | .62 |
| 19 | .06 | .18 | .06 | .01 | .15 | .14 | .18 | .15 | .07 | .52 | 0 | .22 |
| 20 | .21 | .17 | .25 | .48 | .26 | .29 | .28 | .05 | .11 | .61 | .01 | .36 |
| 21 | .46 | .01 | .23 | .29 | .21 | .34 | .11 | .31 | .38 | .60 | .07 | .45 |
| 22 | .01 | .05 | .04 | .35 | .14 | .25 | .15 | .05 | .29 | .12 | .03 | .82 |
| 23 | .16 | .14 | .06 | .31 | .07 | .30 | .13 | .10 | .12 | .42 | .02 | .02 |
| 24 | .04 | .01 | .36 | .28 | .28 | .38 | .21 | .22 | .33 | .24 | .17 | .01 |
| 25 | .11 | .06 | .41 | .50 | .11 | .40 | .23 | .47 | .51 | .54 | .02 | .02 |
| 26 | .01 | .06 | .30 | .37 | .31 | .11 | .31 | .27 | .04 | .96 | .03 | .01 |
| 27 | .03 | .18 | .29 | .37 | .22 | .24 | .39 | .01 | 0 | .71 | .09 | 0 |
| 28 | .12 | .10 | .32 | .54 | .34 | .33 | .11 | .16 | 0 | .23 | .08 | 0 |
| 29 | .23 | .19 | .29 | .19 | .25 | .21 | .15 | .36 | 0 | .54 | .05 | 0 |
| 30 | .08 | .20 | .21 | .21 | .38 | .15 | .09 | .35 | 0 | .61 | .01 | .02 |
| 31 | .26 | .10 | .10 | .26 | .26 | .26 | .26 | .28 | .38 | .36 | .02 | .02 |
| Sum | 5.80 | 6.96 | 6.50 | 8.42 | 5.15 | 7.54 | 8.15 | 6.59 | 5.86 | 13.14 | 3.86 | 7.12 |

Current Year 1997

Period 1971-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|------|------|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 0.845 | 0.015 | 12 | 1.43 | 1 3 | 0 | 0.19 | 501 | 562 | 1,376 | 48.7 |
| Feb. | .825 | .010 | 13 | 1.36 | 1 4 | 0 | .25 | 601 | 523 | 840 | 196 |
| Mar. | .720 | .015 | 3 | 1.00 | 1 2 | 0 | .21 | 562 | 556 | 1,158 | 250 |
| April | .750 | .005 | 25 | 1.09 | 1 2 | 0 | .28 | 727 | 514 | 1,280 | 202 |
| May | .730 | 0 | 24 | 1.04 | 1 6 | 0 | .17 | 445 | 26 | 447 | 183 |
| June | .740 | .015 | 25 | 1.06 | 1 10 | 0 | .25 | 651 | 418 | 725 | 699 |
| July | .800 | .010 | 9 | 1.28 | 1 2 | 0 | .26 | 704 | 435 | 763 | 55.8 |
| Aug. | .750 | .025 | 2 | 1.09 | 1 1 | 0 | .21 | 569 | 474 | 950 | 77.3 |
| Sept. | .710 | 0 | 113 | .96 | 1 16 | 0 | .20 | 506 | 498 | 947 | 121 |
| Oct. | .830 | .015 | 27 | 1.37 | 1 1 | 0 | .42 | 1,135 | 525 | 1,135 | 234 |
| Nov. | .755 | .010 | 5 | 1.12 | 1 4 | 0 | .13 | 334 | 455 | 845 | 164 |
| Dec. | .800 | 0 | 22 | 1.27 | 1 1 | 0 | .23 | 615 | 551 | 1,204 | 32.3 |
| Yearly | 0.845 | 0 | | 1.43 | | 0 | 0.23 | 7,350 | 5,958 | 8,934 | 43.5 |

! And other days

09-5345.50 242 WELL FIELD NEAR SAN LUIS, ARIZONA

DESCRIPTION: Water-stage recorder and 3.7-meter Parshall flume located 31 meters upstream from confluence of East Main Canal Wasteway, 34 meters north of the southerly land boundary, and 2.3 kilometers east of the Colorado River.
 RECORDS: Based on current meter measurements and a continuous record of gage heights. The station is operated by the United States Section of the Commission. Records available: October 18, 1978 through 1997.
 REMARKS: Records show the pumping of ground water from the 242 well field east of San Luis, Arizona. This water is considered as part of the volumes arriving at the land boundary at San Luis.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|-----|------|------|------|-------|------|------|------|
| 1 | 0 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | .26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | .24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | .20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | 0 | 0 | 0 | .21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | 0 | 0 | 0 | .14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | .03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | .14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | .14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | .16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | .17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | 0 | 0 | .18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 0 | .19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 0 | 0 | .22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | 0 | 0 | .26 | 0 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | 0 |
| 26 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | .01 | 0 | 0 | 0 |
| 27 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | 0 | 0 | .25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sum | 0 | 0 | 2.99 | 3.40 | 0 | 0 | 0 | 0 | 0.03 | 0 | 0 | 0 |

Current Year 1997

Period 1979-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 0.005 | 0 | 1 | 0.01 | 1 | 0 | 0 | 0 | 859 | 3,406 | 0 |
| Feb. | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1,305 | 3,677 | 0 |
| Mar. | .115 | 0 | 31 | .28 | 1 | 0 | .10 | 258 | 1,326 | 4,717 | 0 |
| April | .125 | 0 | 8 | .34 | 17 | 0 | .11 | 294 | 1,485 | 4,265 | 0 |
| May | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1,396 | 4,269 | 0 |
| June | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1,348 | 4,272 | 0 |
| July | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1,562 | 5,868 | 0 |
| Aug. | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1,589 | 4,988 | 0 |
| Sept. | .045 | 0 | 25 | .07 | 1 | 0 | 0 | 2.6 | 1,336 | 3,397 | 0 |
| Oct. | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 911 | 3,344 | 0 |
| Nov. | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 382 | 2,101 | 0 |
| Dec. | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 848 | 3,654 | 0 |
| Yearly | 0.125 | 0 | | 0.34 | | 0 | 0.02 | 555 | 14,347 | 38,461 | 201 |

! And other days

09-5348.00 TOTAL FLOWS CROSSING INTERNATIONAL BOUNDARY INTO MEXICO NEAR SAN LUIS, SONORA

DESCRIPTION: The tabulated data below are the combined flows of the East Main Canal Wasteway, West Main Canal Wasteway, 242 Lateral, and the Yuma Main Drain and represent the total water crossing the international land boundary into the Sanchez Mejorada Canal near San Luis, Arizona. The mean daily discharges are combined and rounded and the monthly volumes are obtained by adding the volumes of the four stations.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: February 23, 1971 through 1997; 242 Lateral from November 1978 through 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 4.56 | 4.42 | 4.31 | 4.26 | 4.67 | 3.95 | 4.39 | 3.80 | 4.28 | 4.23 | 6.03 | 4.92 |
| 2 | 4.17 | 4.39 | 4.59 | 4.56 | 5.07 | 4.04 | 3.79 | 4.48 | 4.16 | 4.11 | 6.67 | 4.41 |
| 3 | 3.52 | 4.03 | 4.07 | 5.52 | 4.83 | 4.10 | 4.14 | 4.06 | 4.27 | 4.80 | 6.09 | 4.24 |
| 4 | 3.89 | 3.67 | 3.70 | 4.92 | 5.00 | 3.89 | 4.00 | 3.68 | 4.15 | 3.99 | 5.47 | 4.09 |
| 5 | 4.70 | 3.61 | 3.46 | 4.79 | 5.21 | 4.47 | 3.95 | 3.79 | 3.73 | 4.42 | 6.28 | 5.03 |
| 6 | 4.55 | 4.33 | 3.79 | 4.85 | 4.34 | 4.39 | 3.74 | 3.78 | 3.65 | 4.21 | 6.13 | 5.66 |
| 7 | 3.67 | 4.68 | 4.18 | 4.87 | 4.25 | 4.70 | 3.86 | 3.83 | 3.90 | 3.97 | 6.36 | 5.78 |
| 8 | 4.15 | 4.06 | 4.43 | 4.73 | 5.13 | 4.21 | 3.44 | 3.97 | 3.82 | 3.96 | 5.41 | 5.14 |
| 9 | 3.76 | 3.91 | 4.06 | 4.91 | 4.89 | 4.45 | 4.09 | 3.65 | 3.55 | 4.56 | 5.97 | 5.22 |
| 10 | 3.91 | 3.33 | 4.24 | 5.04 | 4.38 | 3.77 | 3.88 | 3.93 | 3.26 | 4.56 | 5.09 | 4.45 |
| 11 | 3.62 | 3.93 | 4.01 | 5.22 | 5.38 | 4.58 | 3.58 | 4.09 | 3.23 | 4.04 | 5.23 | 3.98 |
| 12 | 4.95 | 4.09 | 4.45 | 5.30 | 4.67 | 4.33 | 3.51 | 3.74 | 3.39 | 4.53 | 5.62 | 4.74 |
| 13 | 4.09 | 4.94 | 3.79 | 5.25 | 4.72 | 3.89 | 3.64 | 3.52 | 3.59 | 4.65 | 5.39 | 5.61 |
| 14 | 3.56 | 4.09 | 4.16 | 4.68 | 4.70 | 3.95 | 3.79 | 3.69 | 3.69 | 4.30 | 5.77 | 5.31 |
| 15 | 3.53 | 4.15 | 3.91 | 3.89 | 4.89 | 4.10 | 3.70 | 3.91 | 4.24 | 4.07 | 5.75 | 5.85 |
| 16 | 4.53 | 3.87 | 4.66 | 4.54 | 4.90 | 3.94 | 4.04 | 3.72 | 3.50 | 5.25 | 5.83 | 5.27 |
| 17 | 4.04 | 3.71 | 4.49 | 4.24 | 4.54 | 3.86 | 3.73 | 3.77 | 3.63 | 5.73 | 6.42 | 4.94 |
| 18 | 3.17 | 3.58 | 3.99 | 4.48 | 4.89 | 4.08 | 3.53 | 4.10 | 3.05 | 6.33 | 5.29 | 5.11 |
| 19 | 3.69 | 3.69 | 3.79 | 4.42 | 4.56 | 3.72 | 3.82 | 3.92 | 3.09 | 6.24 | 4.92 | 4.26 |
| 20 | 3.47 | 3.67 | 4.07 | 5.46 | 4.59 | 3.95 | 4.38 | 3.50 | 2.82 | 6.52 | 5.48 | 4.95 |
| 21 | 3.68 | 3.45 | 4.04 | 4.77 | 4.66 | 4.07 | 3.70 | 3.93 | 3.25 | 6.55 | 5.59 | 5.34 |
| 22 | 3.12 | 3.76 | 4.13 | 4.72 | 4.67 | 4.47 | 3.61 | 3.78 | 3.49 | 5.37 | 5.00 | 7.01 |
| 23 | 3.50 | 4.03 | 4.26 | 4.90 | 4.61 | 4.31 | 3.60 | 3.55 | 3.30 | 6.46 | 5.35 | 4.79 |
| 24 | 3.20 | 4.21 | 5.20 | 5.08 | 4.55 | 3.75 | 3.30 | 3.58 | 3.89 | 5.80 | 6.16 | 4.28 |
| 25 | 3.74 | 4.51 | 5.10 | 4.97 | 4.04 | 4.14 | 3.81 | 3.91 | 5.96 | 6.59 | 5.08 | 3.82 |
| 26 | 3.77 | 4.67 | 4.68 | 4.88 | 4.47 | 3.58 | 3.88 | 3.56 | 5.13 | 6.81 | 4.98 | 3.36 |
| 27 | 3.81 | 4.04 | 4.35 | 5.14 | 4.63 | 4.10 | 4.23 | 3.22 | 4.35 | 6.57 | 4.83 | 3.88 |
| 28 | 3.18 | 3.72 | 4.67 | 5.44 | 4.39 | 4.57 | 3.56 | 3.41 | 4.31 | 5.71 | 5.02 | 4.31 |
| 29 | 3.21 | | 4.73 | 5.15 | 4.61 | 4.01 | 3.81 | 4.08 | 4.03 | 5.87 | 4.98 | 4.32 |
| 30 | 3.55 | | 4.88 | 4.87 | 4.47 | 3.95 | 3.49 | 4.04 | 3.93 | 6.07 | 4.50 | 3.93 |
| 31 | 3.97 | | 4.33 | | 4.07 | | 3.83 | 4.38 | | 5.69 | | 4.03 |
| Sum | 118.28 | 112.54 | 132.52 | 145.85 | 144.78 | 123.32 | 117.82 | 118.37 | 114.64 | 161.96 | 166.69 | 148.03 |

Current Year 1997

Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 12 | 4.95 | 22 | 3.12 | 3.82 | 10,219 | 11,876 | 14,963 | 2,619 |
| Feb. | | | 13 | 4.94 | 10 | 3.33 | 4.02 | 9,723 | 11,764 | 15,998 | 2,495 |
| Mar. | | | 24 | 5.20 | 5 | 3.46 | 4.27 | 11,450 | 13,285 | 16,904 | 2,864 |
| April | | | 3 | 5.52 | 15 | 3.89 | 4.86 | 12,601 | 13,301 | 16,013 | 2,611 |
| May | | | 11 | 5.38 | 25 | 4.04 | 4.67 | 12,509 | 13,556 | 17,145 | 3,050 |
| June | | | 7 | 4.70 | 26 | 3.58 | 4.11 | 10,655 | 12,433 | 15,505 | 3,115 |
| July | | | 1 | 4.39 | 24 | 3.30 | 3.80 | 10,180 | 12,630 | 15,320 | 3,610 |
| Aug. | | | 2 | 4.48 | 27 | 3.22 | 3.82 | 10,227 | 12,732 | 15,612 | 3,687 |
| Sept. | | | 25 | 5.96 | 20 | 2.82 | 3.82 | 9,905 | 12,509 | 15,357 | 3,210 |
| Oct. | | | 26 | 6.81 | 8 | 3.96 | 5.22 | 13,993 | 13,676 | 17,143 | 4,248 |
| Nov. | | | 2 | 6.67 | 30 | 4.50 | 5.56 | 14,402 | 12,714 | 15,680 | 4,202 |
| Dec. | | | 22 | 7.01 | 26 | 3.36 | 4.78 | 12,790 | 12,623 | 14,863 | 3,562 |
| Yearly | | | | 7.01 | | 2.82 | 4.40 | 138,654 | 153,099 | 183,801 | 39,274 |

φ Mean daily

! And other days

09-5222.00 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder was located in Mexico on the right bank of the river about 305 meters upstream from the southerly international boundary, 3.2 kilometers west of San Luis, Arizona, and 35 kilometers downstream from Morelos Dam. The zero of the gage was at mean sea level, U. S. C. & G. S. datum. This gage was destroyed on January 19, 1983. Between January 19, 1983 and December 10, 1985, temporary gages were installed on the United States side and levels were established to ensure continuous record. On December 10, 1985 a permanent water-stage recorder was relocated on the left bank of the river about 24 meters upstream from the southerly international boundary.

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 1997; continuous record of gage heights, January 1947 through 1993. During 1993, from January 1 to February 4 and May 1, 1993 to December 31, 1994, the gage was inoperable. Records of gage height and discharge were estimated from instantaneous observations and discharge measurements. Monthly flows for this station have been derived for the period January 1935 through 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|--------|---------|----------|-------|-----|------|------|----------|---------|--------|-------|--------|
| 1 | 0 | 83.7 | 102 | 11.7 | 0 | 0 | 0 | 0 | 74.8 | 174 | 0.34 | 0.37 |
| 2 | 0 | 100 | 111 | 2.85 | 0 | 0 | 0 | 0 | 64.6 | 121 | .55 | .37 |
| 3 | 0 | 114 | 130 | 1.85 | 0 | 0 | 0 | 0 | 72.6 | 61.6 | .45 | .40 |
| 4 | 0 | 98.3 | 105 | 1.80 | 0 | 0 | 0 | 1.92 | 73.3 | 15.6 | .42 | .46 |
| 5 | 0 | 77.2 | 89.6 | 14.4 | 0 | 0 | 0 | 18.5 | 78.7 | 7.73 | .36 | .40 |
| 6 | 0 | 55.3 | 72.2 | 11.9 | 0 | 0 | 0 | 23.7 | 86.0 | 6.37 | .40 | .48 |
| 7 | 0 | 55.7 | 51.5 | 6.37 | 0 | 0 | 0 | 17.4 | 86.9 | 6.63 | .36 | 1.20 |
| 8 | 0 | 58.1 | 49.1 | 1.62 | 0 | 0 | 0 | 13.8 | 81.2 | 2.70 | .36 | 2.83 |
| 9 | 0 | 94.4 | 62.3 | .06 | 0 | 0 | 0 | 26.9 | 77.3 | 1.67 | .36 | 3.05 |
| 10 | 0 | 101 | 99.1 | 0 | 0 | 0 | 0 | 41.9 | 87.4 | 1.12 | .43 | 5.82 |
| 11 | 0 | 95.1 | 44.6 | 0 | 0 | 0 | 0 | 36.8 | 89.7 | 1.58 | .38 | 2.08 |
| 12 | 0 | 79.5 | 14.7 | 0 | 0 | 0 | 0 | 29.0 | 96.5 | 1.06 | .35 | 1.31 |
| 13 | 0 | 62.1 | 8.60 | 0 | 0 | 0 | 0 | 26.2 | 101 | 1.33 | .39 | 1.11 |
| 14 | 0 | 52.2 | 2.03 | 0 | 0 | 0 | 0 | 24.7 | 99.9 | 1.81 | .37 | 1.29 |
| 15 | 0 | 60.7 | .23 | 0 | 0 | 0 | 0 | 22.5 | 122 | 9.94 | .39 | 1.65 |
| 16 | 0 | 89.6 | 11.4 | 0 | 0 | 0 | 0 | 27.2 | 140 | 3.06 | .37 | 1.46 |
| 17 | 0 | 104 | 28.1 | 0 | 0 | 0 | 0 | 29.8 | 159 | .87 | .40 | 1.50 |
| 18 | 0 | 79.6 | 30.7 | 0 | 0 | 0 | 0 | 49.5 | 145 | 1.26 | .37 | 1.53 |
| 19 | 0 | 25.1 | 8.33 | 0 | 0 | 0 | 0 | 66.8 | 137 | 1.43 | .33 | 1.49 |
| 20 | 0 | 21.7 | 1.78 | 0 | 0 | 0 | 0 | 52.7 | 144 | 1.45 | .34 | 1.45 |
| 21 | 0 | 23.0 | .12 | 0 | 0 | 0 | 0 | 76.1 | 137 | 1.60 | .36 | 1.43 |
| 22 | 0 | 49.5 | .03 | 0 | 0 | 0 | 0 | 87.5 | 130 | 1.77 | .39 | 1.52 |
| 23 | 0 | 74.4 | 0 | 0 | 0 | 0 | 0 | 76.9 | 121 | 1.66 | .34 | 11.4 |
| 24 | 1.03 | 90.2 | 0 | 0 | 0 | 0 | 0 | 82.7 | 105 | 1.49 | .36 | 38.8 |
| 25 | 34.5 | 50.1 | 0 | 0 | 0 | 0 | 0 | 88.2 | 141 | 1.28 | .33 | 50.8 |
| 26 | 81.2 | 30.0 | 0 | 0 | 0 | 0 | 0 | 72.5 | 165 | 1.26 | .36 | 42.0 |
| 27 | 118 | 50.6 | 0 | 0 | 0 | 0 | 0 | 77.2 | 78.3 | 1.27 | .40 | 34.0 |
| 28 | 100 | 68.6 | 0 | 0 | 0 | 0 | 0 | 82.6 | 71.4 | 1.25 | .35 | 24.1 |
| 29 | 83.5 | 0 | 0 | 0 | 0 | 0 | 0 | 74.1 | 137 | 1.43 | .35 | 20.3 |
| 30 | 101 | 0 | .46 | 0 | 0 | 0 | 0 | 71.2 | 174 | 1.04 | .35 | 19.4 |
| 31 | 99.2 | 0 | 15.5 | 0 | 0 | 0 | 0 | 78.0 | 0 | .67 | 0 | 17.9 |
| Sum | 618.43 | 1,943.7 | 1,038.38 | 52.55 | 0 | 0 | 0 | 1,376.32 | 3,276.6 | 436.93 | 11.31 | 291.90 |

Current Year 1997

Period 1935-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|--------|---------------------------------|------|-----|-------|---------|------------------------------|-----------|------------|-----|
| | High | Low | Day | High | Low | Total | | Average | Maximum | Minimum | |
| | | | | | | | | | | | Day |
| Jan. | 24.205 | 21.840 | 27 | 133 | 1 | 0 | 19.9 | 53,432 | 411,416 | 2,062,379 | 0 |
| Feb. | 24.095 | 22.835 | 3 | 118 | 19 | 18.2 | 69.4 | 167,936 | 338,924 | 1,708,370 | 0 |
| Mar. | 24.035 | 21.695 | 3 | 133 | 123 | 0 | 33.5 | 89,716 | 286,808 | 1,458,432 | 0 |
| April | 22.835 | 21.785 | 1 | 18.6 | 19 | 0 | 1.75 | 4,540 | 189,360 | 947,722 | 0 |
| May | 21.785 | 21.785 | 1 | 0 | 1 | 0 | 0 | 0 | 255,126 | 1,430,837 | 0 |
| June | 21.785 | 21.785 | 1 | 0 | 1 | 0 | 0 | 0 | 218,006 | 1,455,506 | 0 |
| July | 21.785 | 21.785 | 1 | 0 | 1 | 0 | 0 | 0 | 187,621 | 1,821,962 | 0 |
| Aug. | 24.000 | 21.785 | 25 | 92.6 | 1 | 0 | 44.4 | 118,914 | 202,905 | 2,103,318 | 0 |
| Sept. | 24.685 | 23.510 | 30 | 187 | 2 | 64.6 | 109 | 283,098 | 229,484 | 1,956,768 | 0 |
| Oct. | 24.680 | 22.295 | 1 | 174 | 31 | .67 | 14.1 | 37,751 | 267,931 | 2,144,909 | 0 |
| Nov. | 22.320 | 22.245 | 2 | .55 | 119 | .33 | .38 | 977 | 309,845 | 1,761,409 | 0 |
| Dec. | 23.630 | 22.255 | 25 | 50.8 | 1 | .37 | 9.42 | 25,220 | 379,680 | 2,268,370 | 0 |
| Yearly | 24.685 | 21.695 | | 187 | | 0 | 24.8 | 781,584 | 3,277,106 | 15,656,495 | 0 |

! And other days

09-5222.01 COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page for Description)

MEAN DAILY GAGE HEIGHT IN METERS 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 21.840 | 23.830 | 23.735 | 22.520 | 21.785 | 21.785 | 21.785 | 21.785 | 23.790 | 24.500 | 22.255 | 22.265 |
| 2 | 21.840 | 23.955 | 23.820 | 22.195 | 21.785 | 21.785 | 21.785 | 21.785 | 23.665 | 24.030 | 22.295 | 22.265 |
| 3 | 21.840 | 24.055 | 24.000 | 22.155 | 21.785 | 21.785 | 21.785 | 21.785 | 23.765 | 23.655 | 22.280 | 22.275 |
| 4 | 21.840 | 23.940 | 23.755 | 22.160 | 21.785 | 21.785 | 21.785 | 22.035 | 23.775 | 23.040 | 22.280 | 22.285 |
| 5 | 21.840 | 23.780 | 23.605 | 22.710 | 21.785 | 21.785 | 21.785 | 22.825 | 23.840 | 22.760 | 22.265 | 22.275 |
| 6 | 21.840 | 23.615 | 23.435 | 22.650 | 21.785 | 21.785 | 21.785 | 22.970 | 23.920 | 22.710 | 22.275 | 22.285 |
| 7 | 21.840 | 23.615 | 23.235 | 22.450 | 21.785 | 21.785 | 21.785 | 22.800 | 23.930 | 22.720 | 22.265 | 22.365 |
| 8 | 21.840 | 23.635 | 23.210 | 22.230 | 21.785 | 21.785 | 21.785 | 22.690 | 23.865 | 22.570 | 22.265 | 22.570 |
| 9 | 21.840 | 23.910 | 23.340 | 21.910 | 21.785 | 21.785 | 21.785 | 23.060 | 23.820 | 22.525 | 22.265 | 22.560 |
| 10 | 21.840 | 23.960 | 23.700 | 21.785 | 21.785 | 21.785 | 21.785 | 23.390 | 23.935 | 22.505 | 22.280 | 22.690 |
| 11 | 21.840 | 23.905 | 23.145 | 21.785 | 21.785 | 21.785 | 21.785 | 23.300 | 23.960 | 22.520 | 22.270 | 22.485 |
| 12 | 21.840 | 23.770 | 22.610 | 21.785 | 21.785 | 21.785 | 21.785 | 23.115 | 24.050 | 22.500 | 22.260 | 22.370 |
| 13 | 21.840 | 23.610 | 22.420 | 21.785 | 21.785 | 21.785 | 21.785 | 23.030 | 24.110 | 22.510 | 22.275 | 22.340 |
| 14 | 21.840 | 23.510 | 22.150 | 21.785 | 21.785 | 21.785 | 21.785 | 22.990 | 24.095 | 22.530 | 22.270 | 22.370 |
| 15 | 21.840 | 23.555 | 22.005 | 21.785 | 21.785 | 21.785 | 21.785 | 22.940 | 24.305 | 22.840 | 22.260 | 22.425 |
| 16 | 21.840 | 23.775 | 22.485 | 21.785 | 21.785 | 21.785 | 21.785 | 23.065 | 24.395 | 22.580 | 22.270 | 22.395 |
| 17 | 21.840 | 23.880 | 22.935 | 21.785 | 21.785 | 21.785 | 21.785 | 23.135 | 24.590 | 22.475 | 22.275 | 22.400 |
| 18 | 21.840 | 23.650 | 22.955 | 21.785 | 21.785 | 21.785 | 21.785 | 23.485 | 24.440 | 22.375 | 22.265 | 22.405 |
| 19 | 21.840 | 22.995 | 22.410 | 21.785 | 21.785 | 21.785 | 21.785 | 23.690 | 24.360 | 22.390 | 22.255 | 22.400 |
| 20 | 21.840 | 22.925 | 22.140 | 21.785 | 21.785 | 21.785 | 21.785 | 23.530 | 24.430 | 22.390 | 22.260 | 22.390 |
| 21 | 21.840 | 22.930 | 21.930 | 21.785 | 21.785 | 21.785 | 21.785 | 23.805 | 24.360 | 22.415 | 22.265 | 22.390 |
| 22 | 21.840 | 23.280 | 21.795 | 21.785 | 21.785 | 21.785 | 21.785 | 23.935 | 24.295 | 22.445 | 22.270 | 22.405 |
| 23 | 21.840 | 23.500 | 21.705 | 21.785 | 21.785 | 21.785 | 21.785 | 23.815 | 24.195 | 22.425 | 22.255 | 22.835 |
| 24 | 22.075 | 23.630 | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.885 | 24.025 | 22.400 | 22.265 | 23.510 |
| 25 | 23.260 | 23.210 | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.945 | 24.410 | 22.365 | 22.255 | 23.620 |
| 26 | 23.810 | 22.970 | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.760 | 24.645 | 22.365 | 22.265 | 23.550 |
| 27 | 24.095 | 23.220 | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.820 | 23.740 | 22.365 | 22.275 | 23.470 |
| 28 | 23.955 | 23.395 | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.885 | 23.665 | 22.360 | 22.260 | 23.290 |
| 29 | 23.825 | | 21.695 | 21.785 | 21.785 | 21.785 | 21.785 | 23.785 | 24.250 | 22.390 | 22.260 | 23.200 |
| 30 | 23.960 | | 21.935 | 21.785 | 21.785 | 21.785 | 21.785 | 23.745 | 24.505 | 22.340 | 22.260 | 23.170 |
| 31 | 23.950 | | 22.630 | 21.785 | 21.785 | 21.785 | 21.785 | 23.830 | | 22.310 | | 23.120 |
| Avg. | 22.300 | 23.570 | 22.620 | 21.950 | 21.785 | 21.785 | 21.785 | 23.215 | 24.105 | 22.655 | 22.265 | 22.655 |

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

DESCRIPTION: Water-stage recorder and Parshall flume located 24 meters upstream from the southerly land boundary, 168 meters east of the Colorado River, and 2.9 kilometers west of San Luis, Arizona. The zero of the gage has not been determined.

RECORDS: Based on current meter measurements and a continuous record of gage heights. Station is operated by United States Section of the Commission. Records available: June 23, 1977 through 1997.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|
| 1 | 2.75 | 4.41 | 4.31 | 4.17 | 3.85 | 5.03 | 5.38 | 2.57 | 0.11 | 2.23 | 3.10 | 3.76 |
| 2 | 2.79 | 4.37 | 4.44 | 4.12 | 4.11 | 5.13 | 5.26 | 2.60 | .12 | 2.14 | 3.11 | 4.31 |
| 3 | 2.82 | 4.37 | 5.18 | 4.18 | 4.54 | 5.12 | 5.31 | 2.71 | .10 | 2.04 | 3.12 | 4.18 |
| 4 | 3.00 | 4.33 | 5.81 | 4.32 | 4.79 | 4.32 | 5.30 | 2.76 | .10 | 2.13 | 3.03 | 4.59 |
| 5 | 2.89 | 4.34 | 5.65 | 4.09 | 5.57 | 4.36 | 5.27 | 2.70 | .09 | 2.31 | 3.33 | 4.59 |
| 6 | 2.83 | 4.28 | 5.56 | 4.06 | 5.64 | 4.84 | 5.36 | 2.94 | .10 | 2.35 | 3.19 | 4.55 |
| 7 | 2.74 | 4.25 | 5.89 | 4.10 | 5.81 | 5.11 | 5.08 | 2.88 | .09 | 2.24 | 3.27 | 4.41 |
| 8 | 2.78 | 4.29 | 5.98 | 4.10 | 5.52 | 4.77 | 3.55 | 2.84 | .13 | 2.44 | 3.40 | 4.30 |
| 9 | 2.89 | 4.22 | 6.05 | 4.17 | 5.43 | 4.77 | 3.36 | 2.69 | .24 | 2.60 | 3.09 | 4.29 |
| 10 | 2.85 | 4.19 | 5.95 | 4.06 | 5.05 | 4.81 | 3.40 | 2.65 | .14 | 2.68 | 3.29 | 4.26 |
| 11 | 2.78 | 4.22 | 4.97 | 3.95 | 5.11 | 4.83 | 3.43 | 2.61 | .17 | 2.93 | 3.06 | 4.35 |
| 12 | 2.75 | 4.18 | 4.27 | 3.95 | 5.08 | 4.91 | 3.39 | 2.65 | .18 | 3.09 | 2.94 | 4.45 |
| 13 | 2.86 | 4.21 | 4.30 | 3.84 | 5.28 | 5.00 | 3.33 | 4.36 | .15 | 3.07 | 2.77 | 4.46 |
| 14 | 2.94 | 4.06 | 4.47 | 3.96 | 5.09 | 5.06 | 3.30 | 4.40 | .17 | 3.00 | 2.61 | 4.58 |
| 15 | 2.96 | 4.11 | 4.38 | 3.92 | 3.99 | 5.09 | 3.38 | 4.63 | .28 | 2.66 | .42 | 4.70 |
| 16 | 3.00 | 4.19 | 4.34 | 3.89 | 3.91 | 5.14 | 3.42 | 4.82 | .13 | 2.87 | .18 | 4.75 |
| 17 | 2.76 | 4.22 | 4.24 | 3.96 | 3.99 | 5.20 | 3.39 | 4.69 | .68 | 2.80 | 4.92 | 4.45 |
| 18 | 2.90 | 4.12 | 4.24 | 3.87 | 4.28 | 5.19 | 3.38 | 4.16 | 1.23 | 2.80 | .14 | 4.61 |
| 19 | 2.85 | 4.10 | 4.24 | 3.90 | 4.75 | 5.11 | 3.45 | 3.82 | .85 | 2.82 | .12 | 4.88 |
| 20 | 2.93 | 4.20 | 4.26 | 3.94 | 4.77 | 4.81 | 3.42 | 3.19 | .80 | 2.75 | .10 | 4.94 |
| 21 | 2.97 | 4.09 | 4.29 | 3.96 | 5.06 | 4.42 | 3.44 | 3.11 | .92 | 2.82 | .11 | 5.03 |
| 22 | 3.01 | 4.07 | 4.48 | 3.96 | 5.10 | 4.44 | 3.39 | 2.76 | .86 | 2.76 | .10 | 4.30 |
| 23 | 3.28 | 4.28 | 4.31 | 4.01 | 5.03 | 4.59 | 3.33 | 2.40 | .92 | 2.83 | .09 | 4.31 |
| 24 | 3.35 | 4.13 | 4.17 | 3.98 | 4.98 | 4.73 | 3.26 | 2.46 | 2.70 | 2.59 | .09 | 4.57 |
| 25 | 3.34 | 4.09 | 4.17 | 3.94 | 4.99 | 4.57 | 3.15 | 2.50 | 1.22 | 2.56 | .09 | 4.67 |
| 26 | 3.76 | 4.18 | 4.10 | 4.05 | 5.06 | 4.69 | 3.13 | 1.99 | .21 | 2.56 | .08 | 4.65 |
| 27 | 3.76 | 4.32 | 4.09 | 4.02 | 5.11 | 4.76 | 3.16 | 2.41 | 1.24 | 2.61 | .07 | 4.73 |
| 28 | 4.04 | 4.31 | 4.20 | 3.89 | 4.88 | 4.97 | 3.19 | .65 | 2.28 | 2.52 | .06 | 4.85 |
| 29 | 4.16 | | 4.20 | 3.83 | 4.74 | 5.05 | 3.15 | .16 | 2.00 | 3.33 | .06 | 4.91 |
| 30 | 4.45 | | 4.22 | 3.76 | 4.59 | 5.13 | 3.11 | .30 | 2.31 | 2.91 | 3.32 | 4.96 |
| 31 | 4.31 | | 4.28 | | 4.63 | | 2.96 | .14 | | 3.00 | | 5.08 |
| Sum | 97.50 | 118.13 | 145.04 | 119.95 | 150.73 | 145.95 | 116.43 | 85.65 | 20.52 | 82.44 | 48.53 | 141.94 |

Current Year 1997

Period 1977-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|------|-----|------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | Average | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 0.520 | 0.340 | 28 | 5.07 | 27 | 2.55 | 3.15 | 8,424 | 14,266 | 21,638 | 7,412 |
| Feb. | .485 | .450 | 1 | 4.51 | 14 | 4.01 | 4.22 | 10,206 | 13,829 | 18,374 | 8,506 |
| Mar. | .590 | .465 | 3 | 6.11 | 27 | 4.02 | 4.68 | 12,531 | 15,267 | 21,496 | 11,420 |
| April | .490 | .440 | 4 | 4.42 | 30 | 3.75 | 4.00 | 10,364 | 14,041 | 20,613 | 3,445 |
| May | .610 | .430 | 5 | 6.49 | 15 | 3.68 | 4.86 | 13,023 | 14,281 | 20,732 | 5,215 |
| June | .540 | .450 | 30 | 5.41 | 4 | 4.02 | 4.87 | 12,610 | 12,923 | 19,842 | 2,227 |
| July | .540 | .350 | 1 | 5.46 | 9 | 2.67 | 3.76 | 10,060 | 13,473 | 22,235 | 3,718 |
| Aug. | .520 | .065 | 16 | 4.87 | 29 | .09 | 2.76 | 7,400 | 13,396 | 22,444 | 3,656 |
| Sept. | .440 | .055 | 24 | 3.61 | 26 | .06 | .68 | 1,773 | 12,451 | 23,538 | 51.4 |
| Oct. | .435 | .280 | 29 | 3.79 | 28 | 1.83 | 2.66 | 7,123 | 13,300 | 23,600 | 23.9 |
| Nov. | .515 | .065 | 30 | 4.41 | 28 | .04 | 1.62 | 4,193 | 12,017 | 20,944 | 59.2 |
| Dec. | .545 | .425 | 31 | 5.17 | 1 | 3.35 | 4.58 | 12,264 | 12,981 | 22,518 | 138 |
| Yearly | 0.610 | 0.055 | | 6.49 | | 0.04 | 3.49 | 109,971 | 162,225 | 222,488 | 75,784 |

09-5350.00 WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the canal wasteway immediately upstream from where it discharges into the Colorado River, 1.0 kilometer downstream from the wasteway gates on the Central Feeder Canal on the right bank of the Colorado River, 27 kilometers downstream from Morelos Dam, and 250 meters south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District 14 of the National Water Commission and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. Records available: April 1956 through 1997.

REMARKS: The Colorado River Irrigation District 14 transports water for irrigation of land on the left bank of the Colorado River by the Central Feeder Canal to a point called Kilometer 27. At this point, flows may be returned to the river through the wasteway or diverted to the Bacanora-Monumentos Canal system through the Sanchez Mejorada Siphon, which was placed in operation on June 28, 1963. As part of the rehabilitation works, started in 1968, of the Colorado River Irrigation District, the Canal de Conexion was enlarged and lined, and is now known as the Central Feeder Canal.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1956 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 14,125 | 11,323 | 85,761 | 0 |
| February | 18,663 | 5,953 | 50,898 | 0 |
| March | 17,313 | 8,379 | 72,049 | 0 |
| April | 5,319 | 13,693 | 85,372 | 0 |
| May | 852 | 13,164 | 99,576 | 0 |
| June | 0 | 11,612 | 61,705 | 0 |
| July | 378 | 12,060 | 56,912 | 0 |
| August | 8,931 | 17,856 | 132,183 | 0 |
| September | 20,909 | 14,412 | 83,943 | 0 |
| October | 8,249 | 12,791 | 136,198 | 0 |
| November | 78.6 | 12,479 | 122,170 | 0 |
| December | 1,476 | 10,956 | 86,607 | 0 |
| Yearly | 96,293 | 146,271 | 628,347 | 0 |

09-5365.00 WASTEWAY TO COLORADO RIVER AT KILOMETER 38 IN MEXICO

DESCRIPTION: Wasteway to the Colorado River on the left bank of new Barrote Canal at old dam and bridge at Kilometer 18+251 (old Kilometer 38+000). The wasteway is located in the Colonia Bojorquez 1.3 kilometers upstream from the Sonora-Baja California railroad bridge, 5.9 kilometers downstream from the Miguel C. Rodriguez gaging station, and 45 kilometers downstream from the southerly international boundary.

RECORDS: The records are computed by the National Water Commission and are based upon gate openings. Records available: January 1964 through 1997.

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

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1964 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 0 | 1,832 | 10,541 | 0 |
| February | 855 | 1,394 | 12,035 | 0 |
| March | 1,138 | 750 | 5,932 | 0 |
| April | 320 | 380 | 5,555 | 0 |
| May | 0 | 1,370 | 14,246 | 0 |
| June | 0 | 813 | 8,585 | 0 |
| July | 0 | 681 | 9,114 | 0 |
| August | 1,499 | 1,152 | 17,765 | 0 |
| September | 3,292 | 2,250 | 16,855 | 0 |
| October | 4,778 | 4,558 | 28,669 | 0 |
| November | 324 | 2,756 | 25,263 | 0 |
| December | 847 | 2,302 | 13,380 | 0 |
| Yearly | 13,053 | 19,154 | 103,228 | 0 |

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

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

IN MILLION CUBIC METERS

| Month | LAKE MEAD (Capacity 32,267) | | LAKE MOHAVE (Capacity 2,233) | | HAVASU LAKE (Capacity 764) | | TOTAL IN UNITED STATES RESERVOIRS (Capacity 35,263) | |
|-------|--------------------------------|----------------------|---------------------------------|----------------------|-------------------------------|----------------------|--|----------------------|
| | 1997 | Average 1935-1997 | 1997 | Average 1951-1997 | 1997 | Average 1939-1997 | 1997 | Estimated Average |
| Jan. | 27,491.8 | 23,048.2 | 2,062.6 | 2,052.6 | 695.6 | 683.5 | 30,250.0 | 25,784.3 |
| Feb. | 27,647.2 | 22,907.3 | 2,076.4 | 2,066.2 | 723.3 | 686.3 | 30,446.9 | 25,659.8 |
| Mar. | 28,106.1 | 22,639.6 | 2,130.4 | 2,070.5 | 678.0 | 702.0 | 30,914.1 | 25,412.1 |
| April | 28,267.7 | 22,667.8 | 2,113.9 | 2,056.3 | 715.7 | 737.9 | 31,097.3 | 25,462.0 |
| May | 28,259.0 | 23,391.2 | 2,150.1 | 2,127.0 | 750.9 | 744.5 | 31,160.0 | 26,262.7 |
| June | 28,683.3 | 24,500.6 | 2,100.7 | 2,021.4 | 731.5 | 740.3 | 31,515.5 | 27,262.3 |
| July | 28,895.5 | 24,654.5 | 2,088.3 | 1,882.5 | 726.4 | 726.4 | 31,710.2 | 27,263.4 |
| Aug. | 29,081.8 | 24,454.1 | 2,018.1 | 1,831.1 | 712.8 | 710.3 | 31,812.7 | 26,995.5 |
| Sept. | 29,318.6 | 24,238.0 | 2,065.0 | 1,792.6 | 715.2 | 703.1 | 32,098.8 | 26,733.7 |
| Oct. | 30,026.6 | 24,016.1 | 1,839.4 | 1,790.7 | 680.8 | 699.3 | 32,546.8 | 26,506.1 |
| Nov. | 30,617.4 | 23,863.0 | 1,818.0 | 1,865.0 | 694.2 | 688.3 | 33,129.6 | 26,416.3 |
| Dec. | 30,966.5 | 23,693.7 | 2,087.9 | 1,978.1 | 738.1 | 687.6 | 33,792.5 | 26,359.4 |
| Avg. | 28,946.8 | 23,672.8 | 2,045.9 | 1,961.2 | 713.5 | 709.1 | 31,706.2 | 26,343.1 |
| Max. | 30,966.5 | 134,266.1 | 2,150.1 | 12,230.1 | 750.9 | 1 849.5 | 33,792.5 | 1 35,934.1 |
| Min. | 27,491.8 | *13,231.5 | 1,818.0 | 111,462.9 | 678.0 | !! 94.9 | 30,250.0 | !!16,112.5 |

! Maximum end of month storage for period of record

!! Minimum end of month storage for period of record

* Minimum end of month storage since 1940

SUSPENDED SILT - 1997

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

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

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

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

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

| Date | Time | Stream-flow, Momentary | Gravimetric Percent | Date | Time | Stream-flow, Momentary | Gravimetric Percent | Date | Time | Stream-flow, Momentary | Gravimetric Percent |
|--------|------|------------------------|---------------------|---------|------|------------------------|---------------------|--------|------|------------------------|---------------------|
| | | | | | | | | | | | |
| Jan. 3 | 0915 | 57.0 | 0.0228 | June 5 | 0745 | 67.4 | 0.0062 | Oct. 9 | 1015 | 40.6 | 0.0108 |
| 9 | 0845 | 56.5 | 0.0150 | 12 | 0855 | 69.0 | 0.0068 | 17 | 0900 | 48.9 | 0.0074 |
| 16 | 0950 | 58.8 | 0.0125 | 19 | 0815 | 72.8 | 0.0065 | 23 | 0805 | 45.2 | 0.0134 |
| 22 | 0915 | 47.4 | 0.0102 | 26 | 0800 | 76.8 | 0.0036 | 31 | 0920 | 50.1 | 0.0204 |
| 30 | 1105 | 232 | 0.0063 | July 3 | 0725 | 84.9 | 0.0048 | Nov. 6 | 0755 | 60.7 | 0.0091 |
| Feb. 6 | 0900 | 184 | 0.0033 | 10 | 0855 | 86.1 | 0.0049 | 14 | 0905 | 70.4 | 0.0093 |
| 13 | 0825 | 196 | 0.0044 | 17 | 0745 | 85.6 | 0.0049 | 20 | 0835 | 61.3 | 0.0092 |
| 20 | 0830 | 122 | 0.0061 | 24 | 0920 | 99.3 | 0.0083 | 26 | 0835 | 67.2 | 0.0107 |
| 27 | 0815 | 187 | 0.0042 | 31 | 0820 | 83.3 | 0.0389 | Dec. 4 | 0740 | 50.9 | 0.0078 |
| Mar. 6 | 1005 | 175 | 0.0042 | Aug. 7 | 0845 | 156 | 0.0024 | 18 | 0830 | 44.6 | 0.0028 |
| 12 | 0938 | 149 | 0.0082 | 14 | 0850 | 154 | 0.0018 | 24 | 1005 | 128 | 0.0080 |
| 20 | 0820 | 102.7 | 0.0106 | 21 | 0830 | 174 | 0.0018 | 31 | 0825 | 50.7 | 0.0084 |
| 27 | 0900 | 117 | 0.0101 | 28 | 0745 | 170 | 0.0020 | | | | |
| Apr. 3 | 1010 | 117 | 0.0101 | Sept. 4 | 0745 | 172 | 0.0017 | | | | |
| 10 | 1045 | 91.9 | 0.0073 | 11 | 0740 | 184 | 0.0021 | | | | |
| 17 | 1025 | 84.1 | 0.0238 | 12 | 0920 | 193 | 0.0050 | | | | |
| 24 | 0805 | 88.7 | 0.0076 | 18 | 0720 | 207 | 0.0033 | | | | |
| May 1 | 0830 | 79.3 | 0.0065 | 19 | 1115 | 212 | 0.0029 | | | | |
| 8 | 0840 | 80.4 | 0.0057 | 23 | 0715 | 177 | 0.0019 | | | | |
| 15 | 0845 | 81.5 | 0.0244 | 26 | 0920 | 231 | 0.0038 | | | | |
| 22 | 0810 | 86.9 | 0.0084 | 30 | 0725 | 239 | 0.0042 | | | | |
| 29 | 0815 | 88.4 | 0.0064 | Oct. 2 | 0745 | 124 | 0.0020 | | | | |

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

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

| Month | Monthly Weight Megagrams | | Number of Samples | Gravimetric Percentages | | | * Silt Volume - Thousand Cubic Meters | | | |
|-------|--------------------------|--------|-------------------|-------------------------|----------------|----------------|---------------------------------------|--------------------|---------|---------|
| | Water | Silt | | Average | Maximum Sample | Minimum Sample | Total 1997 | Period 1952 - 1997 | | |
| | | | | | | | | Average | Maximum | Minimum |
| Jan. | 188,292,000 | 4,363 | 5 | 0.0023 | 0.0061 | 0.0009 | 3.20 | 1.21 | 62.6 | 0.30 |
| Feb. | 292,464,000 | 24,068 | 4 | 0.0082 | 0.0131 | 0.0009 | 17.7 | 1.39 | 127.8 | 1.10 |
| Mar. | 340,675,000 | 9,310 | 4 | 0.0027 | 0.0055 | 0.0010 | 6.84 | 5.64 | 605.2 | 3.32 |
| Apr. | 251,942,000 | 5,608 | 5 | 0.0022 | 0.0037 | 0.0003 | 4.12 | 6.06 | 856.8 | 4.49 |
| May | 220,752,000 | 6,765 | 4 | 0.0031 | 0.0053 | 0.0011 | 4.97 | 2.00 | 318.2 | 1.36 |
| June | 184,265,000 | 6,290 | 4 | 0.0034 | 0.0060 | 0.0010 | 4.62 | 3.36 | 256.6 | 2.53 |
| July | 228,770,000 | 3,812 | 5 | 0.0017 | 0.0028 | 0.0010 | 2.80 | 4.46 | 192.3 | 4.14 |
| Aug. | 256,884,000 | 4,697 | 3 | 0.0018 | 0.0025 | 0.0013 | 3.45 | 3.87 | 166.9 | 4.02 |
| Sept. | 170,614,000 | 9,206 | 5 | 0.0054 | 0.0149 | 0.0010 | 6.76 | 1.80 | 79.8 | 1.78 |
| Oct. | 129,557,000 | 7,567 | 5 | 0.0058 | 0.0102 | 0.0031 | 5.56 | 0.95 | 124.0 | 0.40 |
| Nov. | 157,550,000 | 10,854 | 4 | 0.0056 | 0.0097 | 0.0045 | 6.43 | 0.96 | 165.2 | 0.30 |
| Dec. | 125,980,000 | 3,532 | 4 | 0.0028 | 0.0057 | 0.0010 | 2.60 | 0.96 | 54.4 | 0.84 |
| Year | 2,547,745,000 | 96,072 | 52 | 0.0038 | 0.0149 | 0.0003 | 69.0 | 32.7 | 2,706.5 | 40.2 |

* Volume calculated at 1.362 megagrams per cubic meter

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

| Date | Time | Stream-flow, Momentary | Gravimetric Percent | Date | Time | Stream-flow, Momentary | Gravimetric Percent | Date | Time | Stream-flow, Momentary | Gravimetric Percent |
|---------|------|------------------------|---------------------|---------|------|------------------------|---------------------|------|------|------------------------|---------------------|
| | | | | | | | | | | | |
| Jan. 28 | 1330 | 97.1 | 0.0036 | Sept. 9 | 1300 | 73.7 | 0.0019 | | | | |
| Feb. 25 | 1130 | 34.2 | 0.0020 | 30 | 1155 | 172 | 0.0071 | | | | |
| Aug. 5 | 1220 | 18.8 | 0.0024 | Oct. 7 | 1350 | 253 | 0.0054 | | | | |

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

CHEMICAL ANALYSES OF WATER SAMPLES
1997

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

Colorado River at Northerly International Boundary

| 1997 | Time | Streamflow | Specific | | Hardness, | Hardness, | Calcium | Magnesium |
|---------|----------|------------|---------------------|-------|-------------------------|----------------------|-----------|-----------|
| Date | Standard | Momentary | Conductance | pH | Total | Noncarbonate | ion (Ca), | ion (Mg), |
| | | CMS | Microsiemens/ cm | Units | (as CaCO ₃) | (CaCO ₃) | Dissolved | Dissolved |
| | | | | | mg/L | mg/L | mg/L | mg/L |
| Jan. 6 | 0815 | 51.4 | 1,580 | 8.2 | 367.03 | 196.03 | 93.8 | 31.9 |
| 21 | 0830 | 55.7 | 1,500 | 8.2 | 372.58 | 205.58 | 95.7 | 32.1 |
| Feb. 3 | 0830 | 218 | 1,200 | 8.2 | 332.14 | 191.14 | 83.0 | 30.0 |
| 18 | 1030 | 178 | 1,180 | 8.3 | 326.50 | 182.50 | 81.9 | 29.3 |
| Mar. 3 | 0930 | 200 | 1,190 | 8.3 | 328.34 | 184.34 | 83.3 | 28.9 |
| 17 | 0930 | 175 | 1,220 | 8.2 | 332.30 | 188.30 | 83.4 | 29.8 |
| April 7 | 0930 | 115 | 1,240 | 8.3 | 310.33 | 164.33 | 79.9 | 26.6 |
| 21 | 0900 | 84.2 | 1,260 | 8.3 | 320.88 | 167.88 | 82.3 | 27.7 |
| May 5 | 0830 | 81.3 | 1,260 | 8.3 | 297.67 | 146.67 | 76.5 | 25.6 |
| 19 | 0745 | 83.4 | 1,260 | 8.2 | 320.29 | 169.29 | 82.4 | 27.5 |
| June 2 | 0830 | 70.9 | 1,300 | 8.3 | 327.20 | 175.20 | 86.8 | 26.5 |
| 16 | 0900 | 74.4 | 1,270 | 8.3 | 340.59 | 185.59 | 85.9 | 30.3 |
| July 7 | 1030 | 90.1 | 1,190 | 8.2 | 338.93 | 190.93 | 83.1 | 31.6 |
| 21 | 0730 | 85.7 | 1,200 | 8.3 | 337.19 | 188.19 | 82.9 | 31.3 |
| Aug. 4 | 0820 | 154 | 1,140 | 8.3 | 315.83 | 175.83 | 78.0 | 29.1 |
| 18 | 0800 | 145 | 1,160 | 8.3 | 310.49 | 167.49 | 76.7 | 28.6 |
| Sept. 2 | 0800 | 179 | 1,130 | 8.3 | 324.35 | 180.35 | 79.1 | 30.5 |
| 15 | 0800 | 154 | 1,120 | 8.2 | 309.29 | 166.29 | 75.4 | 29.1 |
| Oct. 6 | 0815 | 62.8 | 1,460 | 8.3 | 379.45 | 205.45 | 96.3 | 33.4 |
| 20 | 0800 | 50.4 | 1,520 | 8.3 | 371.20 | 194.20 | 94.5 | 32.5 |
| Nov. 3 | 0900 | 59.9 | 1,470 | 8.3 | 374.42 | 203.42 | 94.8 | 33.1 |
| 17 | 0800 | 62.7 | 1,620 | 8.3 | 427.23 | 245.23 | 99.6 | 43.0 |
| Dec. 1 | 0830 | 65.7 | 1,390 | 8.2 | 425.89 | 258.89 | 99.7 | 42.6 |
| 15 | 0800 | 48.6 | 1,530 | 8.3 | 416.61 | 234.61 | 106.0 | 36.5 |

| 1997 | Sodium | Potassium | Sulfate | Chloride | Carbonate | Bicarbonate | Nitrate | Total |
|---------|-----------|-----------|------------------------|-----------|-----------------------|------------------------|-----------------------|--------------|
| Date | ion (Na), | ion (K) | ion (SO ₄) | ion (Cl), | (as CO ₃) | (as HCO ₃) | (as NO ₃) | Solids |
| | Dissolved | Dissolved | Dissolved | Dissolved | (as CO ₃) | (as HCO ₃) | (as NO ₃) | Dissolved |
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | (Calculated) |
| | | | | | | | | mg/L |
| Jan. 6 | 187 | 4.6 | 344 | 195 | N.R. | 209 | 1.9 | 973 |
| 21 | 170 | 4.8 | 331 | 181 | N.R. | 204 | 1.8 | 929 |
| Feb. 3 | 122 | 5.0 | 283 | 120 | N.R. | 172 | 0.7 | 738 |
| 18 | 116 | 4.8 | 272 | 122 | N.R. | 176 | 1.6 | 724 |
| Mar. 3 | 117 | 5.4 | 267 | 126 | N.R. | 176 | 1.5 | 725 |
| 17 | 123 | 5.0 | 281 | 124 | N.R. | 176 | 1.4 | 744 |
| April 7 | 132 | 5.2 | 286 | 134 | N.R. | 178 | 1.5 | 762 |
| 21 | 129 | 4.2 | 291 | 136 | N.R. | 187 | 1.5 | 773 |
| May 5 | 132 | 4.0 | 293 | 126 | N.R. | 184 | 1.9 | 759 |
| 19 | 134 | 4.4 | 293 | 120 | N.R. | 184 | 1.8 | 764 |
| June 2 | 136 | 4.5 | 297 | 131 | N.R. | 185 | 1.7 | 784 |
| 16 | 142 | 4.3 | 295 | 126 | N.R. | 189 | 1.4 | 789 |
| July 7 | 133 | 5.1 | 284 | 130 | N.R. | 181 | 1.4 | 768 |
| 21 | 125 | 4.3 | 277 | 120 | N.R. | 182 | 1.2 | 742 |
| Aug. 4 | 118 | 5.1 | 267 | 108 | N.R. | 171 | 1.1 | 701 |
| 18 | 139 | 5.2 | 271 | 100 | N.R. | 174 | 1.1 | 717 |
| Sept. 2 | 123 | 4.4 | 276 | 105 | N.R. | 176 | 1.9 | 717 |
| 15 | 105 | 5.4 | 258 | 98 | N.R. | 174 | 1.1 | 668 |
| Oct. 6 | 160 | 4.9 | 331 | 156 | N.R. | 212 | 1.2 | 901 |
| 20 | 160 | 5.0 | 317 | 164 | N.R. | 216 | 1.5 | 894 |
| Nov. 3 | 157 | 4.5 | 320 | 159 | N.R. | 208 | 1.5 | 886 |
| 17 | 179 | 4.5 | 343 | 172 | N.R. | 222 | 1.9 | 966 |
| Dec. 1 | 150 | 4.5 | 314 | 137 | N.R. | 204 | 1.2 | 894 |
| 15 | 168 | 4.5 | 345 | 168 | N.R. | 222 | 1.2 | 1,030 |

N.R. - Not Reported

SPECIFIC CONDUCTANCE OF WATER SAMPLES

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

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 1,710* | 1,190* | 1,180* | 1,230 | 1,280 | 1,280* | 1,210 | 1,210 | 1,130* | 1,200 | 1,460* | 1,390 |
| 2 | 1,610 | 1,200* | 1,180* | 1,220 | 1,280 | 1,300 | 1,210 | 1,190* | 1,130 | 1,240 | 1,470* | 1,390 |
| 3 | 1,610 | 1,200 | 1,190 | 1,260 | 1,270* | 1,280 | 1,200 | 1,160* | 1,170 | 1,410 | 1,470 | 1,440 |
| 4 | 1,600* | 1,180 | 1,180 | 1,220 | 1,270* | 1,280 | 1,200* | 1,140 | 1,150 | 1,430* | 1,380 | 1,430 |
| 5 | 1,590* | 1,180 | 1,180 | 1,230* | 1,260 | 1,280 | 1,200* | 1,170 | 1,170 | 1,440* | 1,360 | 1,360 |
| 6 | 1,580 | 1,210 | 1,170 | 1,230* | 1,250 | 1,280 | 1,190* | 1,160 | 1,170* | 1,460 | 1,360 | 1,360* |
| 7 | 1,600 | 1,190 | 1,190 | 1,240 | 1,260 | 1,290* | 1,190 | 1,160 | 1,180* | 1,530 | 1,420 | 1,350* |
| 8 | 1,490 | 1,190* | 1,200* | 1,230 | 1,260 | 1,290* | 1,210 | 1,140 | 1,180 | 1,470 | 1,420* | 1,350 |
| 9 | 1,490 | 1,180* | 1,210* | 1,240 | 1,250 | 1,300 | 1,230 | 1,150* | 1,160 | 1,530 | 1,420* | 1,510 |
| 10 | 1,580 | 1,180 | 1,220 | 1,280 | 1,250* | 1,240 | 1,220 | 1,150* | 1,150 | 1,430 | 1,420 | 1,460 |
| 11 | 1,540* | 1,180 | 1,220 | 1,260 | 1,260* | 1,240 | 1,200 | 1,160 | 1,130 | 1,400* | 1,430* | 1,510 |
| 12 | 1,510* | 1,200 | 1,220 | 1,270* | 1,260 | 1,260 | 1,200* | 1,160 | 1,140 | 1,360* | 1,450 | 1,540 |
| 13 | 1,470 | 1,190 | 1,220 | 1,270* | 1,270 | 1,280 | 1,210* | 1,110 | 1,130* | 1,330* | 1,380 | 1,550* |
| 14 | 1,580 | 1,200 | 1,240 | 1,280 | 1,270 | 1,280* | 1,210 | 1,100 | 1,130* | 1,300 | 1,390 | 1,550* |
| 15 | 1,350 | 1,200* | 1,230* | 1,270 | 1,250 | 1,270* | 1,200 | 1,150 | 1,120 | 1,320 | 1,460* | 1,530 |
| 16 | 1,430 | 1,190* | 1,230* | 1,290 | 1,270 | 1,270 | 1,240 | 1,150* | 1,140 | 1,330 | 1,550* | 1,540 |
| 17 | 1,560 | 1,180* | 1,220 | 1,290 | 1,270* | 1,270 | 1,190 | 1,160* | 1,140 | 1,400 | 1,620 | 1,480 |
| 18 | 1,540* | 1,180 | 1,230 | 1,250 | 1,260* | 1,280 | 1,200 | 1,160 | 1,190 | 1,440* | 1,530 | 1,430 |
| 19 | 1,530* | 1,200 | 1,250 | 1,260* | 1,260 | 1,270 | 1,200* | 1,140 | 1,160 | 1,480* | 1,570 | 1,480 |
| 20 | 1,520* | 1,190 | 1,300 | 1,270* | 1,250 | 1,270 | 1,200* | 1,130 | 1,170* | 1,520 | 1,500 | 1,480* |
| 21 | 1,500 | 1,190 | 1,330 | 1,260 | 1,240 | 1,270* | 1,200 | 1,130 | 1,170* | 1,470 | 1,550 | 1,460* |
| 22 | 1,590 | 1,190* | 1,290* | 1,310 | 1,230 | 1,280* | 1,210 | 1,150 | 1,180* | 1,470 | 1,540* | 1,440 |
| 23 | 1,450 | 1,200* | 1,250* | 1,220 | 1,250 | 1,280 | 1,220 | 1,140* | 1,180 | 1,500 | 1,530* | 1,410 |
| 24 | 1,200 | 1,200 | 1,210 | 1,230 | 1,250* | 1,240 | 1,200 | 1,140* | 1,250 | 1,490 | 1,520 | 1,280 |
| 25 | 1,190* | 1,210 | 1,210 | 1,240 | 1,240* | 1,250 | 1,210 | 1,130 | 1,200 | 1,490* | 1,450 | 1,340* |
| 26 | 1,190* | 1,190 | 1,250 | 1,230* | 1,240* | 1,220 | 1,230* | 1,130 | 1,200 | 1,500* | 1,420 | 1,410* |
| 27 | 1,180 | 1,190 | 1,250 | 1,230* | 1,240 | 1,260 | 1,230* | 1,130 | 1,240* | 1,500 | 1,480* | 1,480* |
| 28 | 1,180 | 1,170 | 1,260 | 1,220 | 1,230 | 1,250* | 1,250 | 1,140 | 1,270* | 1,490 | 1,550 | 1,540* |
| 29 | 1,180 | | 1,240* | 1,280 | 1,260 | 1,250* | 1,230 | 1,130 | 1,300 | 1,470 | 1,500* | 1,610 |
| 30 | 1,180 | | 1,210* | 1,280 | 1,230 | 1,240 | 1,220 | 1,130* | 1,160 | 1,450 | 1,430* | 1,660 |
| 31 | 1,190 | | 1,190 | | 1,250* | | 1,230 | 1,130* | | 1,460 | | 1,520 |

* - ESTIMATED

SPECIFIC CONDUCTANCE OF WATER SAMPLES

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 2,200 | 1,200 | 1,220 | 1,340 | 1,440 | 1,350 | 1,300 | 1,310 | 1,210 | 1,210 | 1,490 | 1,680 |
| 2 | 1,900 | 1,210 | 1,230 | 1,300 | 1,420 | 1,370 | 1,230 | 1,210 | 1,130 | 1,270 | 1,540 | 1,470 |
| 3 | 1,930 | 1,220 | 1,220 | 1,330 | 1,460 | 1,390 | 1,260 | 1,210 | 1,170 | 1,420 | 1,710 | 1,490 |
| 4 | 1,940 | 1,210 | 1,220 | 1,240 | 1,420 | 1,400 | 1,290 | 1,150 | 1,170 | 1,530 | 1,430 | 1,550 |
| 5 | 1,900 | 1,250 | 1,210 | 1,280 | 1,400 | 1,380 | 1,290 | 1,200 | 1,170 | 1,530 | 1,390 | 1,520 |
| 6 | 1,880 | 1,290 | 1,210 | 1,310 | 1,400 | 1,380 | 1,390 | 1,190 | 1,170 | 1,540 | 1,410 | 1,540 |
| 7 | 1,850 | 1,220 | 1,220 | 1,360 | 1,420 | 1,390 | 1,300 | 1,190 | 1,260 | 1,560 | 1,470 | 1,550 |
| 8 | 1,830 | 1,210 | 1,230 | 1,300 | 1,410 | 1,400 | 1,290 | 1,180 | 1,210 | 1,520 | 1,490 | 1,580 |
| 9 | 1,820 | 1,200 | 1,230 | 1,300 | 1,420 | 1,400 | 1,290 | 1,180 | 1,140 | 1,610 | 1,550 | 1,480 |
| 10 | 1,820 | 1,220 | 1,270 | 1,380 | 1,420 | 1,320 | 1,300 | 1,190 | 1,130 | 1,500 | 1,710 | 1,570 |
| 11 | 1,810 | 1,220 | 1,310 | 1,360 | 1,390 | 1,300 | 1,240 | 1,210 | 1,110 | 1,520 | 1,490 | 1,570 |
| 12 | 1,810 | 1,240 | 1,290 | 1,350 | 1,380 | 1,320 | 1,270 | 1,190 | 1,140 | 1,490 | 1,510 | 1,540 |
| 13 | 1,800 | 1,250 | 1,320 | 1,440 | 1,370 | 1,380 | 1,310 | 1,220 | 1,180 | 1,350 | 1,440 | 1,510 |
| 14 | 1,820 | 1,230 | 1,300 | 1,400 | 1,380 | 1,390 | 1,320 | 1,190 | 1,230 | 1,340 | 1,420 | 1,690 |
| 15 | 1,550 | 1,210 | 1,300 | 1,290 | 1,390 | 1,430 | 1,290 | 1,180 | 1,170 | 1,360 | 1,430 | 1,760 |
| 16 | 1,710 | 1,210 | 1,240 | 1,460 | 1,410 | 1,420 | 1,270 | 1,130 | 1,140 | 1,410 | 1,610 | 1,580 |
| 17 | 1,810 | 1,250 | 1,280 | 1,400 | 1,420 | 1,390 | 1,280 | 1,210 | 1,150 | 1,490 | 1,840 | 1,490 |
| 18 | 1,780 | 1,240 | 1,320 | 1,390 | 1,380 | 1,390 | 1,280 | 1,210 | 1,160 | 1,510 | 1,550 | 1,480 |
| 19 | 1,720 | 1,280 | 1,300 | 1,370 | 1,410 | 1,410 | 1,290 | 1,190 | 1,170 | 1,600 | 1,550 | 1,480 |
| 20 | 1,670 | 1,260 | 1,420 | 1,410 | 1,400 | 1,390 | 1,290 | 1,140 | 1,160 | 1,570 | 1,540 | 1,500 |
| 21 | 1,640 | 1,240 | 1,430 | 1,380 | 1,370 | 1,380 | 1,300 | 1,130 | 1,230 | 1,510 | 1,530 | 1,670 |
| 22 | 1,820 | 1,230 | 1,380 | 1,390 | 1,340 | 1,390 | 1,290 | 1,130 | 1,180 | 1,500 | 1,480 | 1,540 |
| 23 | 1,600 | 1,240 | 1,320 | 1,360 | 1,340 | 1,380 | 1,290 | 1,140 | 1,180 | 1,550 | 1,740 | 1,310 |
| 24 | 1,300 | 1,260 | 1,350 | 1,340 | 1,320 | 1,380 | 1,290 | 1,190 | 1,280 | 1,530 | 1,780 | 1,280 |
| 25 | 1,220 | 1,220 | 1,360 | 1,340 | 1,370 | 1,350 | 1,290 | 1,150 | 1,220 | 1,520 | 1,410 | 1,310 |
| 26 | 1,230 | 1,220 | 1,360 | 1,390 | 1,380 | 1,320 | 1,320 | 1,130 | 1,220 | 1,570 | 1,490 | 1,300 |
| 27 | 1,220 | 1,220 | 1,370 | 1,320 | 1,330 | 1,310 | 1,320 | 1,130 | 1,260 | 1,580 | 1,550 | 1,420 |
| 28 | 1,210 | 1,230 | 1,370 | 1,390 | 1,330 | 1,320 | 1,310 | 1,110 | 1,290 | 1,510 | 1,580 | 1,600 |
| 29 | 1,210 | | 1,310 | 1,400 | 1,380 | 1,330 | 1,290 | 1,130 | 1,290 | 1,520 | 1,610 | 1,690 |
| 30 | | | 1,250 | 1,460 | 1,350 | 1,430 | 1,280 | 1,140 | 1,170 | 1,490 | 1,720 | 1,600 |
| 31 | | | 1,300 | | 1,350 | | 1,270 | 1,190 | | 1,480 | | 1,590 |

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROSIEMENS/CM @ 25 DEG C - 1997

| January | | March | | May | | July | | September | | November | |
|----------|-------|-------|-------|------|-------|--------|-------|-----------|-------|----------|-------|
| 2 | 3,780 | 5 | 3,990 | 1 | 3,920 | 1 | 4,100 | 2 | 2,360 | 3 | 4,100 |
| 14 | 3,610 | 18 | 3,960 | 13 | 4,170 | 15 | 4,020 | 16 | 2,200 | 10 | 3,980 |
| 21 | 3,570 | | | | | | | | | 18 | 3,070 |
| February | | April | | June | | August | | October | | December | |
| 3 | 3,920 | 1 | 3,960 | 3 | 4,110 | 1 | 3,860 | 1 | 2,550 | 1 | 3,770 |
| 20 | 3,940 | 15 | 3,940 | 17 | 4,250 | 12 | 3,820 | 14 | 3,770 | 8 | 3,280 |
| 25 | 3,980 | | | | | 19 | 3,970 | 21 | 3,960 | 16 | 3,510 |
| | | | | | | | | 28 | 3,720 | 23 | 3,550 |

RAINFALL ON THE COLORADO RIVER WATERSHED
IN MILLIMETERS

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

IN THE UNITED STATES

| Month | Brawley, California | | El Centro, California | | Blythe, California | | Yuma Citrus Station, Arizona | | Bullhead City, Arizona | |
|--------|---------------------|-------------------|-----------------------|-------------------|--------------------|-------------------|------------------------------|-------------------|------------------------|-------------------|
| | 1997 | Average 1931-1997 | 1997 | Average 1931-1997 | 1997 | Average 1931-1997 | 1997 | Average 1931-1997 | 1996 | Average 1978-1997 |
| Jan. | 11 | 10 | 11 | 11 | 23 | 13 | 11 | 11 | 51 | 32 |
| Feb. | 0 | 9 | 1 | 9 | 1 | 11 | 0 | 9 | 10 | 25 |
| Mar. | 0 | 7 | 0 | 6 | 0 | 10 | 2 | 7 | 0 | 29 |
| April | 1 | 2 | 0 | 2 | # | 3 | 6 | 7 | T | 5 |
| May | 0 | 1 | 0 | 0 | 0 | 1 | T | 1 | 0 | 3 |
| June | T | 0 | 1 | 0 | 0 | 1 | T | 1 | T | 0 |
| July | 0 | 1 | 0 | 2 | 14 | 5 | 8 | 6 | 6 | 10 |
| Aug. | T | 9 | 2 | 9 | 0 | 19 | 0 | 14 | 3 | 20 |
| Sept. | 0 | 8 | 62 | 8 | 71 | 10 | 129 | 10 | 38 | 11 |
| Oct. | 0 | 6 | 0 | 7 | # | 7 | 0 | 9 | T | 11 |
| Nov. | 0 | 5 | 0 | 5 | 0 | 7 | 0 | 5 | 4 | 14 |
| Dec. | 40 | 11 | 21 | 12 | 38 | 14 | 51 | 12 | 3 | 17 |
| Yearly | 52 | 69 | 98 | 71 | | 101 | 211 | 92 | 115 | 177 |

IN MEXICO

| Month | Los Algodones, Baja California | | Mexicali, Baja California | | Bataques, Baja California | | El Centinela, Baja California | | Delta, Baja California | |
|--------|--------------------------------|-------------------|---------------------------|--------------------|---------------------------|--------------------|-------------------------------|--------------------|------------------------|--------------------|
| | 1997 | Average 1948-1997 | 1997 | Averages 1926-1997 | 1997 | Averages 1948-1997 | 1997 | Averages 1975-1997 | 1997 | Averages 1948-1997 |
| Jan. | 5 | 9 | 9 | 9 | 0 | 10 | 0 | 5 | 5 | 8 |
| Feb. | 1 | 5 | 2 | 8 | 0 | 5 | 3 | 5 | 1 | 6 |
| Mar. | 0 | 4 | 0 | 6 | 0 | 5 | T | 3 | 0 | 5 |
| April | 1 | 2 | 2 | 2 | 3 | 3 | 0 | 2 | 4 | 2 |
| May | 0 | T | T | T | 0 | T | T | 0 | 0 | T |
| June | 1 | T | T | T | 0 | T | 3 | T | 0 | T |
| July | 1 | 3 | 13 | 3 | 0 | 2 | 0 | T | 8 | 2 |
| Aug. | 0 | 9 | T | 10 | 0 | 6 | 0 | 5 | T | 7 |
| Sept. | 8 | 4 | 76 | 10 | 46 | 5 | 0 | 1 | 70 | 7 |
| Oct. | 0 | 6 | 0 | 9 | 0 | 6 | 0 | 6 | 0 | 7 |
| Nov. | T | 4 | T | 4 | 1 | 3 | 0 | T | 0 | 3 |
| Dec. | 3 | 9 | 25 | 18 | 27 | 8 | 0 | 8 | 31 | 11 |
| Yearly | 20 | 57 | 127 | 83 | 77 | 50 | 6 | 35 | 119 | 54 |

| Month | San Felipe, Baja California | | Riito, Sonora | | | | | |
|--------|-----------------------------|-------------------|---------------|--------------------|--|--|--|--|
| | 1997 | Average 1948-1997 | 1997 | Averages 1949-1997 | | | | |
| Jan. | 0 | 7 | 0 | 6 | | | | |
| Feb. | 1 | 5 | 0 | 5 | | | | |
| Mar. | 0 | 3 | 0 | 3 | | | | |
| April | 2 | 1 | 0 | 1 | | | | |
| May | 0 | 1 | 0 | T | | | | |
| June | 0 | 1 | 0 | T | | | | |
| July | 2 | 3 | 0 | 2 | | | | |
| Aug. | 4 | 10 | 0 | 6 | | | | |
| Sept. | 410 | 18 | 9 | 10 | | | | |
| Oct. | 0 | 5 | 0 | 8 | | | | |
| Nov. | 0 | 5 | 0 | 4 | | | | |
| Dec. | 0 | 10 | 12 | 10 | | | | |
| Yearly | 419 | 73 | 21 | 60 | | | | |

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 1997.

IN THE UNITED STATES

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

IN MEXICO

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

* Not shown on rainfall map

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

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

Ministry of Agriculture and Hydraulic Resources

EVAPORATION IN THE COLORADO RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at one station in Arizona, at five stations in Baja California, and at one station in Sonora. The station in the United States is operated by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Agriculture and Hydraulic Resources. The type of pan used at all these stations was the National Weather Service standard pan of 1.22 meters diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," in this bulletin.

IN THE UNITED STATES

| Month | Yuma Citrus Station, Arizona | |
|--------|---------------------------------|----------------------|
| | 1997 | Average 1931-1997 |
| Jan. | 113 | 99 |
| Feb. | 142 | 120 |
| Mar. | 224 | 184 |
| April | 242 | 253 |
| May | 350 | 324 |
| June | 353 | 359 |
| July | 400 | 384 |
| Aug. | 366 | 338 |
| Sept. | 275 | 267 |
| Oct. | 197 | 190 |
| Nov. | 116 | 124 |
| Dec. | 96 | 93 |
| Yearly | 2,876 | 2,735 |

IN MEXICO

| Month | Los Algodones, Baja California | | Mexicali, Baja California | | Bataques, Baja California | | Riito, Sonora | | San Felipe, Baja California | |
|--------|-----------------------------------|----------------------|------------------------------|----------------------|------------------------------|----------------------|------------------|----------------------|--------------------------------|----------------------|
| | 1997 | Average 1949-1997 | 1997 | Average 1926-1997 | 1997 | Average 1959-1997 | 1997 | Average 1962-1997 | 1997 | Average 1952-1997 |
| Jan. | # | 107 | 61 | 64 | # | 83 | # | 76 | # | 120 |
| Feb. | # | 130 | 83 | 133 | # | 101 | # | 98 | # | 139 |
| Mar. | # | 183 | 136 | 148 | # | 150 | # | 146 | # | 169 |
| April | # | 253 | 171 | 198 | # | 205 | # | 187 | # | 196 |
| May | # | 316 | 250 | 268 | # | 269 | # | 256 | # | 240 |
| June | # | 343 | 267 | 293 | # | 305 | # | 286 | # | 256 |
| July | # | 353 | 260 | 298 | # | 290 | # | 315 | # | 285 |
| Aug. | 97 | 310 | 258 | 257 | # | 251 | # | 266 | # | 270 |
| Sept. | 158 | 257 | 162 | 204 | # | 206 | # | 215 | # | 237 |
| Oct. | 156 | 204 | 139 | 146 | # | 147 | # | 153 | # | 206 |
| Nov. | 86 | 132 | 79 | 86 | # | 109 | # | 95 | # | 152 |
| Dec. | 82 | 108 | 54 | 60 | # | 78 | # | 77 | # | 122 |
| Yearly | | 2,683 | 1,920 | 2,122 | | 2,226 | | 2,246 | | 2,538 |

| Month | Delta, Baja California | | | | | | | |
|--------|---------------------------|----------------------|--|--|--|--|--|--|
| | 1997 | Average 1948-1997 | | | | | | |
| Jan. | 80 | 86 | | | | | | |
| Feb. | 127 | 109 | | | | | | |
| Mar. | 159 | 154 | | | | | | |
| April | 504 | 209 | | | | | | |
| May | 205 | 254 | | | | | | |
| June | 328 | 278 | | | | | | |
| July | 319 | 289 | | | | | | |
| Aug. | 297 | 262 | | | | | | |
| Sept. | # | 222 | | | | | | |
| Oct. | 193 | 156 | | | | | | |
| Nov. | 130 | 104 | | | | | | |
| Dec. | 47 | 158 | | | | | | |
| Yearly | | 2,046 | | | | | | |

Missing record

TEMPERATURE IN THE COLORADO RIVER BASIN
IN DEGREES CELSIUS

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

IN THE UNITED STATES

| Month | Blythe, California | | | | Yuma Citrus Station, Arizona | | | | Brawley, California | | | |
|--------|--------------------|------|------|-----------------|------------------------------|------|------|-----------------|---------------------|------|------|-----------------|
| | 1997 | | | | 1997 | | | | 1997 | | | |
| | Mean | Max. | Min. | Average 1931-97 | Mean | Max. | Min. | Average 1931-97 | Mean | Max. | Min. | Average 1931-97 |
| Jan. | # | 25.6 | 1.7 | 11.5 | 13.6 | 26.7 | 0.6 | 11.9 | 14.4 | 27.8 | 1.7 | 12.3 |
| Feb. | 14.2 | 28.3 | 1.7 | 14.2 | 14.7 | 28.9 | 0.6 | 14.1 | 14.6 | 28.9 | 0.6 | 14.7 |
| Mar. | 19.0 | 33.3 | 4.4 | 17.4 | 19.3 | 36.1 | 1.1 | 16.9 | 19.4 | 36.1 | 1.7 | 17.4 |
| April | 21.3 | 37.8 | 8.3 | 21.4 | 20.7 | 37.2 | 6.7 | 20.5 | 21.5 | 37.2 | 5.6 | 21.1 |
| May | 29.4 | 43.9 | 15.6 | 25.5 | 28.5 | 42.8 | 15.0 | 24.5 | 28.2 | 42.2 | 15.6 | 25.1 |
| June | 30.0 | 42.8 | 15.6 | 29.9 | 28.4 | 42.2 | 13.9 | 28.8 | 28.7 | 42.2 | 15.0 | 29.4 |
| July | 32.9 | 45.6 | 18.3 | 33.6 | 32.5 | 45.6 | 17.8 | 32.7 | 31.6 | 44.4 | 17.8 | 33.1 |
| Aug. | 34.7 | 46.7 | 18.9 | 32.9 | 34.5 | 45.6 | 25.0 | 32.5 | 34.6 | 45.0 | 23.3 | 32.9 |
| Sept. | 31.6 | 43.3 | 16.7 | 29.5 | 31.2 | 41.7 | 18.3 | 29.5 | 31.8 | 43.9 | 18.3 | 30.1 |
| Oct. | # | # | # | 22.9 | 22.9 | 40.0 | 8.3 | 23.1 | 23.2 | 40.6 | 8.3 | 23.9 |
| Nov. | 16.4 | 35.0 | 3.9 | 15.7 | 18.0 | 32.8 | 4.4 | 16.3 | 18.7 | 35.0 | 5.6 | 16.9 |
| Dec. | 10.3 | 22.2 | -0.6 | 11.7 | 11.3 | 22.2 | 0.0 | 12.4 | 11.9 | 22.8 | -1.7 | 12.7 |
| Yearly | # | # | # | 22.2 | 23.0 | 45.6 | 0.0 | 21.9 | 23.2 | 45.0 | -1.7 | 22.5 |

| Month | El Centro, California | | | | Bullhead City, Arizona | | | | | | | |
|--------|-----------------------|------|------|-----------------|------------------------|------|------|-----------------|--|--|--|--|
| | 1997 | | | | 1997 | | | | | | | |
| | Mean | Max. | Min. | Average 1931-97 | Mean | Max. | Min. | Average 1978-97 | | | | |
| Jan. | 14.9 | 27.2 | 3.3 | 12.4 | 13.3 | 26.1 | 2.2 | 12.2 | | | | |
| Feb. | 15.3 | 28.9 | 3.3 | 14.7 | 14.8 | 27.8 | 2.8 | 14.9 | | | | |
| Mar. | 20.4 | 35.6 | 4.4 | 17.5 | 20.6 | 37.2 | 3.3 | 17.9 | | | | |
| April | 21.9 | 37.2 | 7.2 | 21.1 | 22.8 | 38.3 | 9.4 | 22.5 | | | | |
| May | 29.0 | 42.2 | 15.6 | 25.2 | 31.1 | 45.0 | 15.6 | 27.3 | | | | |
| June | 28.8 | 41.7 | 15.0 | 29.6 | 32.2 | 45.6 | 19.4 | 32.4 | | | | |
| July | 31.9 | 44.4 | 19.4 | 33.1 | 34.4 | 48.3 | 19.4 | 35.1 | | | | |
| Aug. | 33.9 | 45.6 | 21.7 | 32.9 | 35.9 | 46.7 | 25.0 | 34.6 | | | | |
| Sept. | 31.1 | 43.3 | 19.4 | 29.9 | 32.0 | 43.9 | 20.0 | 30.6 | | | | |
| Oct. | 23.5 | 39.4 | 9.4 | 23.8 | 23.8 | 40.6 | 7.8 | 23.9 | | | | |
| Nov. | 18.9 | 35.0 | 7.2 | 16.9 | 17.2 | 30.6 | 4.4 | 16.6 | | | | |
| Dec. | 12.4 | 25.0 | 0.6 | 12.7 | 11.9 | 22.8 | 2.2 | 11.8 | | | | |
| Yearly | 23.5 | 45.6 | 0.6 | 22.5 | 24.2 | 48.3 | 2.2 | 23.3 | | | | |

IN MEXICO

| Month | Los Algodones, Baja California | | | | Mexicali, Baja California | | | | Bataques, Baja California | | | |
|--------|--------------------------------|------|-----------|------|---------------------------|------|-----------|------|---------------------------|------|-----------|------|
| | 1997 | | 1948-1997 | | 1997 | | 1926-1997 | | 1997 | | 1948-1997 | |
| | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| Jan. | 27 | 2 | 31 | -5 | 28 | 5 | 34 | -7 | 35 | 0 | 45 | -9 |
| Feb. | 28 | 3 | 35 | -2 | 29 | 5 | 34 | -5 | 36 | -1 | 37 | -6 |
| Mar. | 38 | 6 | 38 | 0 | 36 | 6 | 38 | -1 | 45 | 4 | 45 | -4 |
| April | 38 | 8 | 43 | 3 | 41 | 7 | 41 | 1 | 45 | 4 | 48 | -9 |
| May | 44 | 17 | 47 | 6 | 45 | 17 | 47 | 6 | 47 | 12 | 51 | 1 |
| June | 44 | 14 | 52 | 11 | 45 | 16 | 49 | 9 | 46 | 14 | 57 | 6 |
| July | 47 | 19 | 50 | 13 | 48 | 20 | 48 | 13 | 45 | 17 | 56 | 7 |
| Aug. | 48 | 25 | 49 | 16 | 48 | 25 | 49 | 12 | 47 | 20 | 47 | 8 |
| Sept. | 46 | 20 | 50 | 10 | 44 | 21 | 50 | 8 | 45 | 18 | 45 | 4 |
| Oct. | 42 | 9 | 44 | 0 | 39 | 11 | 44 | 0 | 46 | 7 | 46 | 0 |
| Nov. | 35 | 6 | 38 | -3 | 34 | 8 | 40 | -2 | 41 | 1 | 41 | 0 |
| Dec. | 23 | 2 | 32 | -5 | 22 | -1 | 32 | -5 | 29 | -5 | 29 | -4 |
| Yearly | 48 | 2 | 52 | -5 | 48 | -1 | 50 | -7 | 47 | -5 | 57 | -9 |

Missing Data

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1997

The total drainage area within the Colorado River basin is about 637,100 square kilometers, of which 478,100 square kilometers lie above Imperial Dam and about 159,000 square kilometers, are below the dam. Of the area below Imperial Dam, 153,800 square kilometers are in the United States and about 5,180 square kilometers are in Mexico. The area below Imperial Dam includes the Gila River watershed with a total area of about 150,700 square kilometers, of which about 2,850 square kilometers are in Mexico.

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

| Point of Diversion from Colorado River and Designation of Areas | Total Irrigated Areas Hectares |
|---|--------------------------------|
| IN THE UNITED STATES: | |
| Imperial Dam | |
| Yuma Valley Division | 18,289 |
| Reservation Division | 5,397 |
| Yuma Mesa | 6,932 |
| Yuma Aux. Project Unit "B" (Yuma Mesa) | 895 |
| South Gila Valley | 3,902 |
| North Gila Valley | 2,544 |
| Wellton-Mohawk | 23,643 |
| Coachella Valley | 24,601 |
| Imperial Valley | 186,548 |
| Warren Act | 91 |
| Non-Project lands adjacent to Colorado River | 5,083 |
| Total in United States | 277,925 |
| IN MEXICO: | |
| San Luis Valley, R. C., Sonora | 29,100 |
| Mexicali Valley | 155,189 |
| Total in Mexico | 184,289 |
| Total in United States and Mexico | 462,214 |

10-2545.80 ALAMO RIVER AT INTERNATIONAL BOUNDARY

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

RECORDS: From June 1942 through November 18, 1992 flows computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. A continuous gage height record and mean daily discharge records are available November 19, 1992 through 1997. Records obtained and furnished by Imperial Irrigation District.

REMARKS: The flow at this station normally comprises seepage from the All-American Canal and drainage water from the Mexicali Valley which enters the United States. On September 28, 1995 the National Water Commission of Mexico completed the construction of a weir immediately upstream of the international boundary. The result is that all the Alamo River flow, or a portion thereof, is being diverted into the New River via the interconnected agricultural drainage system in Mexico. After September 28, 1995 the recorded flow at the gage is affected by this diversion.

EXTREMES: Maximum mean daily discharge, 7.31 CMS (estimated), April 13, 1946; minimum discharge, no flow July 22-23, 29-30, 1949 and numerous days after September 28, 1995. Prior to the period of record, and since 1900, considerably higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a part of its flow passed through the Alamo River channel.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 0.06 | 0.06 | 0.06 | 0.06 | 0.08 | 0.07 | 0.06 | 0.07 | 0.06 | 0.08 | 0.09 | 0.09 |
| 2 | .06 | .06 | .06 | .06 | .08 | .03 | .06 | .07 | .06 | .08 | .09 | .09 |
| 3 | .06 | .06 | .06 | .06 | .08 | .04 | .06 | .07 | .06 | .08 | .08 | .08 |
| 4 | .06 | .06 | .06 | .06 | .10 | .02 | .06 | .07 | .06 | .07 | .08 | .08 |
| 5 | .06 | .06 | .06 | .06 | .13 | .03 | .06 | .09 | .06 | .07 | .07 | .07 |
| 6 | .06 | .06 | .06 | .06 | .13 | .05 | .06 | .09 | .06 | .07 | .07 | .07 |
| 7 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .07 | .07 |
| 8 | .06 | .06 | .06 | .06 | .30 | .03 | .06 | .07 | .06 | .07 | .07 | .07 |
| 9 | .06 | .06 | .06 | .06 | .30 | .02 | .06 | .06 | .06 | .07 | .07 | .07 |
| 10 | .06 | .06 | .06 | .06 | .30 | .04 | .06 | .07 | .06 | .07 | .07 | .07 |
| 11 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .07 | .07 |
| 12 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .07 | .07 |
| 13 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .07 | .07 |
| 14 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .08 | .08 |
| 15 | .06 | .06 | .06 | .06 | .30 | .06 | .06 | .07 | .06 | .07 | .08 | .08 |
| 16 | .06 | .06 | .06 | .06 | .07 | .06 | .06 | .08 | .06 | .07 | .08 | .08 |
| 17 | .06 | .06 | .06 | .06 | .06 | .06 | .06 | .09 | .06 | .07 | .07 | .07 |
| 18 | .06 | .06 | .06 | .06 | .01 | .07 | .06 | .08 | .06 | .07 | .07 | .07 |
| 19 | .06 | .06 | .06 | .06 | .01 | .06 | .06 | .06 | .06 | .07 | .08 | .08 |
| 20 | .06 | .06 | .06 | .06 | .01 | .08 | .06 | .06 | .06 | .07 | .08 | .08 |
| 21 | .06 | .06 | .06 | .06 | .01 | .10 | .06 | .05 | .06 | .07 | .08 | .08 |
| 22 | .06 | .06 | .06 | .06 | .01 | .10 | .06 | .06 | .06 | .07 | .09 | .09 |
| 23 | .06 | .06 | .06 | .06 | .16 | .13 | .06 | .06 | .06 | .07 | .09 | .09 |
| 24 | .06 | .06 | .06 | .06 | .08 | .13 | .06 | .06 | .06 | .07 | .08 | .08 |
| 25 | .06 | .06 | .06 | .06 | .06 | .13 | .06 | .06 | .06 | .07 | .08 | .08 |
| 26 | .06 | .06 | .06 | .10 | .12 | .06 | .06 | .06 | .06 | .07 | .07 | .07 |
| 27 | .06 | .06 | .06 | .11 | .10 | .06 | .06 | .06 | .06 | .07 | .06 | .06 |
| 28 | .06 | .06 | .06 | .13 | .09 | .06 | .06 | .06 | .06 | .07 | .05 | .05 |
| 29 | .06 | .06 | .06 | .07 | .15 | .06 | .06 | .06 | .06 | .07 | .04 | .04 |
| 30 | .06 | .06 | .06 | .07 | .11 | .06 | .06 | .06 | .06 | .07 | .04 | .04 |
| 31 | .06 | .06 | .06 | .06 | .09 | .06 | .06 | .06 | .06 | .08 | .07 | .07 |
| Sum | 1.86 | 1.68 | 1.86 | 1.69 | 4.23 | 1.59 | 1.86 | 2.10 | 1.80 | 2.21 | 2.19 | 2.26 |

Current Year 1997

Period 1943-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 0.110 | 0.110 | ! 1 | 0.06 | ! 1 | 0.06 | 0.06 | 161 | 338 | 3,441 | 0 |
| Feb. | .110 | .110 | ! 1 | .06 | ! 1 | .06 | .06 | 145 | 309 | 3,481 | 0 |
| Mar. | .110 | .110 | ! 1 | .06 | ! 1 | .06 | .06 | 161 | 353 | 3,890 | 0 |
| April | .110 | .110 | 23 | .16 | 118 | .01 | .06 | 146 | 370 | 2,741 | 0 |
| May | .110 | .110 | ! 7 | .30 | 117 | .06 | .14 | 365 | 303 | 2,219 | 0 |
| June | .110 | .110 | ! 1 | .07 | ! 4 | .02 | .05 | 137 | 287 | 2,080 | 0 |
| July | .110 | .110 | ! 1 | .06 | ! 1 | .06 | .06 | 161 | 270 | 2,112 | 72.8 |
| Aug. | .110 | .110 | ! 5 | .09 | 21 | .05 | .07 | 181 | 313 | 2,062 | 81.0 |
| Sept. | .110 | .110 | ! 1 | .06 | ! 1 | .06 | .06 | 156 | 290 | 1,734 | 103 |
| Oct. | .145 | .120 | ! 1 | .08 | ! 4 | .07 | .07 | 191 | 304 | 2,276 | 0 |
| Nov. | .150 | .080 | ! 1 | .09 | 129 | .04 | .07 | 189 | 317 | 2,566 | 6.0 |
| Dec. | .115 | .080 | ! 1 | .09 | 129 | .04 | .07 | 195 | 305 | 2,080 | 0 |
| Yearly | 0.150 | 0.080 | | 0.30 | | 0.01 | 0.07 | 2,188 | 3,759 | 27,317 | 1,318 |

φ Mean daily

! And other days

10-2549.70 NEW RIVER AT INTERNATIONAL BOUNDARY

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

RECORDS: Based on a continuous record of gage heights and current meter measurements by the Imperial Irrigation District. Records computed and furnished by the District. Records available: June 1942 through 1997.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 2.41 | 7.53 | 8.84 | 6.46 | 6.40 | 5.13 | 4.39 | 5.15 | 6.03 | 7.16 | 6.03 | 5.47 |
| 2 | 2.52 | 6.97 | 8.86 | 6.46 | 6.40 | 5.01 | 4.76 | 5.15 | 6.74 | 6.71 | 5.64 | 5.66 |
| 3 | 2.66 | 6.68 | 8.44 | 6.09 | 6.20 | 5.21 | 4.36 | 5.18 | 6.77 | 6.03 | 6.03 | 6.03 |
| 4 | 2.69 | 6.20 | 8.24 | 6.23 | 6.46 | 5.61 | 4.11 | 5.41 | 6.57 | 5.52 | 6.60 | 6.15 |
| 5 | 3.03 | 6.23 | 7.70 | 6.54 | 6.29 | 5.69 | 4.05 | 5.58 | 6.49 | 5.38 | 6.77 | 5.98 |
| 6 | 3.03 | 5.92 | 7.53 | 7.11 | 6.88 | 5.69 | 3.99 | 5.75 | 6.51 | 5.35 | 6.91 | 6.09 |
| 7 | 2.95 | 5.64 | 8.78 | 7.99 | 7.22 | 6.15 | 4.39 | 5.69 | 6.37 | 5.15 | 7.22 | 6.03 |
| 8 | 2.83 | 5.07 | 8.78 | 8.33 | 6.91 | 6.49 | 4.25 | 5.49 | 5.78 | 5.24 | 7.05 | 7.82 |
| 9 | 2.92 | 4.62 | 8.67 | 8.27 | 6.74 | 6.46 | 4.13 | 5.41 | 6.00 | 5.10 | 6.68 | 10.4 |
| 10 | 3.26 | 4.87 | 8.41 | 8.07 | 6.77 | 6.74 | 4.22 | 5.83 | 6.32 | 4.87 | 6.60 | 11.0 |
| 11 | 3.29 | 4.84 | 8.44 | 7.79 | 6.32 | 6.74 | 4.05 | 6.32 | 6.15 | 4.76 | 6.37 | 10.7 |
| 12 | 3.31 | 4.84 | 8.81 | 8.01 | 5.69 | 6.09 | 3.96 | 6.09 | 5.95 | 4.70 | 5.98 | 9.88 |
| 13 | 4.19 | 5.04 | 8.47 | 7.96 | 5.58 | 5.41 | 3.88 | 6.37 | 5.78 | 4.73 | 5.98 | 9.29 |
| 14 | 4.47 | 5.24 | 7.70 | 7.73 | 5.78 | 5.47 | 4.05 | 6.57 | 6.20 | 4.93 | 5.55 | 9.52 |
| 15 | 5.27 | 5.04 | 7.22 | 7.42 | 6.09 | 5.55 | 3.85 | 6.77 | 7.14 | 5.13 | 5.78 | 9.29 |
| 16 | 5.83 | 4.93 | 6.80 | 7.05 | 6.43 | 5.44 | 4.05 | 6.85 | 8.89 | 5.27 | 5.52 | 8.44 |
| 17 | 6.40 | 5.13 | 6.51 | 7.02 | 6.34 | 5.52 | 4.16 | 6.71 | 8.89 | 5.69 | 5.44 | 8.21 |
| 18 | 6.40 | 5.86 | 6.49 | 7.82 | 6.12 | 6.03 | 4.11 | 6.43 | 8.84 | 5.92 | 5.32 | 8.21 |
| 19 | 6.43 | 6.40 | 6.57 | 7.62 | 5.83 | 5.89 | 3.91 | 6.23 | 8.10 | 6.17 | 5.04 | 8.07 |
| 20 | 6.43 | 5.92 | 6.57 | 7.28 | 5.78 | 5.72 | 3.79 | 6.40 | 7.14 | 6.49 | 4.84 | 8.07 |
| 21 | 6.23 | 5.66 | 7.28 | 7.50 | 5.72 | 5.49 | 4.62 | 6.34 | 6.37 | 6.43 | 5.04 | 8.84 |
| 22 | 6.74 | 5.69 | 7.08 | 7.56 | 5.44 | 4.81 | 6.37 | 6.32 | 6.09 | 6.32 | 4.96 | 9.80 |
| 23 | 7.08 | 5.69 | 6.60 | 7.48 | 5.66 | 4.28 | 6.37 | 6.32 | 5.98 | 6.51 | 4.81 | 8.78 |
| 24 | 6.88 | 5.75 | 6.46 | 6.74 | 5.78 | 4.13 | 5.72 | 6.32 | 6.23 | 5.95 | 4.39 | 10.5 |
| 25 | 6.40 | 5.98 | 7.48 | 6.06 | 5.75 | 4.33 | 6.26 | 6.23 | 15.5 | 6.06 | 4.45 | 10.8 |
| 26 | 6.34 | 6.94 | 7.53 | 5.44 | 5.64 | 4.45 | 6.51 | 6.29 | 12.0 | 6.03 | 4.53 | 11.0 |
| 27 | 6.80 | 7.48 | 7.11 | 5.58 | 5.75 | 4.47 | 6.57 | 6.43 | 10.1 | 5.95 | 4.67 | 10.7 |
| 28 | 7.67 | 7.36 | 6.49 | 6.43 | 5.89 | 4.25 | 7.31 | 6.46 | 9.40 | 5.86 | 4.90 | 10.1 |
| 29 | 8.47 | | 6.23 | 6.32 | 5.38 | 4.16 | 7.25 | 6.40 | 8.30 | 5.98 | 5.27 | 9.35 |
| 30 | 8.41 | | 5.89 | 6.66 | 5.98 | 4.28 | 7.00 | 5.95 | 7.67 | 5.83 | 5.18 | 8.41 |
| 31 | 8.04 | | 5.92 | | 5.69 | | 5.61 | 5.83 | | 6.32 | | 7.67 |
| Sum | 159.38 | 163.52 | 231.90 | 213.02 | 188.91 | 160.69 | 152.05 | 188.27 | 224.30 | 177.54 | 169.55 | 266.26 |

Current Year 1997

Period 1943-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|--------|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 12.260 | 12.885 | 29 | 8.47 | 1 | 2.41 | 5.14 | 13,770 | 12,923 | 27,387 | 2,160 |
| Feb. | 12.340 | 12.650 | 1 | 7.53 | 9 | 4.62 | 5.84 | 14,128 | 11,498 | 26,416 | 1,552 |
| Mar. | 12.200 | 12.510 | 2 | 8.86 | 30 | 5.89 | 7.48 | 20,036 | 13,109 | 31,213 | 1,243 |
| April | 12.255 | 12.560 | 8 | 8.33 | 26 | 5.44 | 7.10 | 18,405 | 13,285 | 34,066 | 1,715 |
| May | 12.370 | 12.565 | 7 | 7.22 | 29 | 5.38 | 6.09 | 16,322 | 12,258 | 29,740 | 776 |
| June | 12.420 | 12.700 | 110 | 6.74 | 24 | 4.13 | 5.36 | 13,884 | 10,220 | 25,024 | 1,341 |
| July | 12.365 | 12.740 | 28 | 7.31 | 20 | 3.79 | 4.90 | 13,137 | 10,667 | 28,368 | 1,008 |
| Aug. | 12.410 | 12.590 | 16 | 6.85 | 1 | 5.15 | 6.07 | 16,267 | 12,221 | 34,066 | 1,405 |
| Sept. | 11.435 | 12.525 | 25 | 15.5 | 13 | 5.78 | 7.48 | 19,380 | 11,573 | 29,251 | 2,214 |
| Oct. | 12.310 | 12.635 | 1 | 7.16 | 12 | 4.70 | 5.73 | 15,339 | 11,390 | 28,072 | 2,567 |
| Nov. | 12.310 | 12.675 | 7 | 7.22 | 24 | 4.39 | 5.65 | 14,649 | 10,718 | 25,310 | 3,063 |
| Dec. | 11.885 | 12.530 | 110 | 11.0 | 1 | 5.47 | 8.59 | 23,005 | 12,710 | 28,104 | 2,175 |
| Yearly | 11.435 | 12.885 | | 15.5 | | 2.41 | 6.29 | 198,322 | 142,572 | 330,444 | 30,310 |

φ Mean daily

! And other days

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

RECORDS: During 1997 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 1997.

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

EXTREMES: Maximum instantaneous discharge, 2.32 CMS on March 26, 1969; minimum instantaneous discharge, zero during several days in the years 1977 through 1997.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.03 | 0.01 | 0.02 | 0.03 | 0.02 | 0 | 0.01 |
| 2 | .02 | .01 | .01 | .03 | .04 | .02 | .02 | .02 | .02 | .02 | .02 | .01 |
| 3 | .01 | .01 | .02 | .03 | .04 | .02 | .02 | .02 | .02 | .02 | .02 | .01 |
| 4 | .01 | .01 | .02 | .04 | .01 | .02 | .02 | .02 | .02 | .02 | .03 | .03 |
| 5 | .01 | .01 | .01 | .02 | .01 | .02 | .02 | .02 | .02 | .02 | .02 | .01 |
| 6 | .02 | .01 | .02 | .03 | .03 | .02 | .02 | .03 | .02 | .02 | .02 | 0 |
| 7 | 0 | .02 | .03 | .03 | .03 | .02 | .02 | .02 | .02 | .02 | .02 | .01 |
| 8 | 0 | 0 | .03 | .04 | .02 | .02 | .02 | .02 | .02 | .02 | .02 | .03 |
| 9 | .02 | .01 | .02 | .03 | .03 | .02 | .02 | .02 | .02 | .02 | 0 | 0 |
| 10 | .01 | .01 | .02 | .03 | .04 | .02 | .02 | .03 | .02 | .02 | .02 | .01 |
| 11 | .02 | 0 | .02 | .03 | .04 | .02 | .02 | .02 | .02 | .01 | .03 | .03 |
| 12 | .01 | .02 | .02 | .02 | .01 | .01 | .02 | .02 | .02 | .02 | .02 | .02 |
| 13 | .03 | .01 | .04 | .03 | .04 | .02 | .01 | .03 | .02 | .02 | .02 | .02 |
| 14 | .04 | .01 | 0 | .02 | .04 | .02 | .02 | .02 | .02 | .02 | .01 | .02 |
| 15 | .02 | .01 | .03 | .04 | .03 | .02 | .02 | .02 | .03 | .02 | .01 | .02 |
| 16 | .01 | .01 | .03 | .04 | .03 | .02 | .02 | .03 | .02 | .02 | .01 | .01 |
| 17 | .04 | .02 | 0 | .04 | .03 | .02 | .02 | .02 | .02 | .02 | .01 | .02 |
| 18 | .02 | .02 | .04 | .02 | .01 | .02 | .02 | .03 | .02 | .02 | 0 | .01 |
| 19 | .01 | .02 | .02 | .03 | .01 | .02 | .01 | .03 | .02 | .02 | .01 | .02 |
| 20 | .02 | .03 | .02 | .02 | .02 | .02 | .02 | .03 | .02 | .02 | .01 | .03 |
| 21 | .01 | .03 | 0 | .04 | .02 | .02 | .02 | .02 | .02 | .02 | .02 | .01 |
| 22 | .01 | .03 | .03 | .02 | .03 | .02 | .01 | .02 | .02 | .02 | .02 | .03 |
| 23 | .02 | .01 | .03 | .02 | .03 | .02 | .02 | .02 | .03 | .02 | .02 | .01 |
| 24 | 0 | .02 | .02 | .04 | .02 | .02 | .02 | .03 | .02 | .02 | .01 | 0 |
| 25 | 0 | .03 | .02 | .04 | .01 | .03 | .02 | .03 | .02 | .02 | .01 | .02 |
| 26 | .02 | .02 | .02 | .03 | .04 | .02 | .02 | .02 | .02 | .02 | .01 | .02 |
| 27 | .02 | .02 | .01 | .02 | .02 | .02 | .02 | .03 | .01 | .02 | .02 | .03 |
| 28 | .02 | .02 | .01 | .04 | .02 | .04 | .02 | .02 | .02 | .02 | .02 | .02 |
| 29 | .02 | .03 | .02 | .03 | .02 | .02 | .02 | .02 | .02 | .02 | 0 | 0 |
| 30 | .02 | .02 | .02 | .04 | .02 | .02 | .02 | .02 | .02 | .02 | .01 | 0 |
| 31 | .02 | | .04 | | .02 | | .02 | .02 | | .02 | | 0 |
| Sum | 0.50 | 0.44 | 0.64 | 0.89 | 0.78 | 0.63 | 0.58 | 0.72 | 0.62 | 0.61 | 0.44 | 0.46 |

Current Year 1997

Period 1968-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 114 | 0.04 | 1 7 | 0 | 0.02 | 43.2 | 155 | 641 | 0 |
| Feb. | | | 120 | .03 | 1 8 | 0 | .02 | 38.0 | 103 | 384 | 0 |
| Mar. | | | 113 | .04 | 114 | 0 | .02 | 55.3 | 193 | 1,074 | 0 |
| April | | | 1 4 | .04 | 1 | .01 | .03 | 76.9 | 186 | 532 | 0 |
| May | | | 2 | .04 | 1 1 | .01 | .03 | 67.4 | 201 | 537 | 53.6 |
| June | | | 28 | .04 | 12 | .01 | .02 | 54.4 | 185 | 504 | 25.9 |
| July | | | 1 2 | .02 | 1 1 | .01 | .02 | 50.1 | 225 | 651 | 0 |
| Aug. | | | 6 | .03 | 1 1 | .02 | .02 | 62.2 | 243 | 735 | 48.4 |
| Sept. | | | 1 1 | .03 | 27 | .01 | .02 | 53.6 | 229 | 677 | 44.1 |
| Oct. | | | 1 2 | .02 | 11 | .01 | .02 | 52.7 | 214 | 625 | 46.7 |
| Nov. | | | 4 | .03 | 1 1 | 0 | .01 | 38.0 | 188 | 622 | 32.8 |
| Dec. | | | 1 4 | .03 | 1 6 | 0 | .01 | 39.7 | 174 | 737 | 8.6 |
| Yearly | | | | 0.04 | | 0 | 0.02 | 632 | 2,296 | 6,610 | 550 |

φ Mean daily

! And other days

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

DESCRIPTION: During 1997 the flow to the New River in Mexico included waste from the City of Mexicali Potable Water Plant, which discharges into Rivera Drain and then to New River, and drainage water coming from the Colorado River District system of canals that enter the New River below Laguna Xochimilco, and starting January 1988, the north irrigation district watershed is included.

RECORDS: Records of the Potable Water Plant are based on flows measured on a Parshall flume less pumping to the city. Records obtained and furnished by the State Commission of Public Services of Mexicali. Records available: Wisteria Wasteway, January 1951 through 1975; Sifon Wasteway, January 1952 to April 30, 1964; Pueblo Nuevo Wasteway, January 1956 through 1965; and the Potable Water Plant, January 1968 through December 1997.

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

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1956 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 98.9 | 1,038 | 10,803 | 7.8 |
| February | 1,060 | 800 | 8,981 | 7.8 |
| March | 1,549 | 674 | 5,506 | 26.8 |
| April | 461 | 562 | 3,940 | 19.9 |
| May | 120 | 428 | 3,174 | 11.2 |
| June | 54.4 | 457 | 6,994 | 0 |
| July | 188 | 541 | 12,644 | 0 |
| August | 63.1 | 638 | 5,103 | 0 |
| September | 371 | 522 | 3,966 | 25.9 |
| October | 1,940 | 638 | 4,285 | 10.4 |
| November | 2,399 | 651 | 4,668 | 0 |
| December | 6,936 | 775 | 10,720 | 0 |
| Yearly | 15,240 | 8,283 | 34,953 | 492 |

10-2540.05 SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 24.9 kilometers northwest of Westmorland, Imperial County, California. The Salton Sea is the sink of a closed basin which has a drainage area of 21,652 square kilometers. Zero of the gage is 76.20 meters below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through 1997. From January 1925 to October 22, 1951, once monthly records of elevations were collected by Imperial Irrigation District from a bench mark at Figtree John's Spring, about 35.4 kilometers northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmorland, California." The elevation of the old station is at a datum of 0.305 meter higher than that of the present station. The elevation of the old station is at a datum of 0.305 meter higher than that of the present station. All records reported below and the area and capacity table are adjusted to the datum of the present station.

REMARKS: Runoff from the basin, irrigation drainage and waste water from Imperial and Coachella Valleys in the United States, and drainage and waste water from part of the Mexicali Valley in Mexico discharge into the Salton Sea. Water from Mexico enters the United States in the Alamo and New River channels. The bottom of the sea is 84.64 meters below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during 1997 was 69.22 meters below mean sea level. Minimum elevation during 1997 was 69.53 meters below mean sea level. Extremes for period of record: maximum elevation 59.71 below mean sea level February 10 to March 29, 1907; minimum elevation since 1906, 76.69 meters below mean sea level in November 1924.

MEAN DAILY WATER SURFACE ELEVATIONS IN METERS BELOW MEAN SEA LEVEL - 1997

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1 | 69.495 | 69.435 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.525 |
| 2 | 69.495 | 69.435 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.525 |
| 3 | 69.495 | 69.435 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.525 |
| 4 | 69.495 | 69.435 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.525 |
| 5 | 69.495 | 69.435 | 69.370 | 69.310 | 69.250 | 69.280 | 69.370 | 69.405 | 69.435 | 69.465 | 69.525 | 69.525 |
| 6 | 69.495 | 69.405 | 69.370 | 69.310 | 69.250 | 69.280 | 69.370 | 69.405 | 69.435 | 69.465 | 69.495 | 69.525 |
| 7 | 69.495 | 69.405 | 69.370 | 69.310 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.465 | 69.495 | 69.525 |
| 8 | 69.495 | 69.405 | 69.370 | 69.310 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.465 | 69.495 | 69.525 |
| 9 | 69.495 | 69.405 | 69.340 | 69.310 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.465 | 69.495 | 69.525 |
| 10 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 11 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 12 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 13 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.280 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 14 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.310 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 15 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.310 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 16 | 69.495 | 69.405 | 69.340 | 69.280 | 69.250 | 69.310 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 17 | 69.495 | 69.405 | 69.310 | 69.280 | 69.220 | 69.310 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 18 | 69.495 | 69.405 | 69.310 | 69.280 | 69.220 | 69.310 | 69.370 | 69.405 | 69.465 | 69.495 | 69.495 | 69.525 |
| 19 | 69.495 | 69.405 | 69.310 | 69.280 | 69.220 | 69.310 | 69.370 | 69.435 | 69.465 | 69.495 | 69.495 | 69.525 |
| 20 | 69.495 | 69.405 | 69.310 | 69.250 | 69.220 | 69.310 | 69.370 | 69.435 | 69.465 | 69.495 | 69.495 | 69.525 |
| 21 | 69.495 | 69.405 | 69.310 | 69.250 | 69.250 | 69.310 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 22 | 69.495 | 69.405 | 69.310 | 69.250 | 69.250 | 69.310 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 23 | 69.465 | 69.405 | 69.310 | 69.250 | 69.250 | 69.310 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 24 | 69.465 | 69.405 | 69.310 | 69.250 | 69.250 | 69.310 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 25 | 69.465 | 69.405 | 69.310 | 69.250 | 69.250 | 69.310 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 26 | 69.465 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.495 | 69.525 | 69.495 | 69.525 |
| 27 | 69.465 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.495 | 69.525 |
| 28 | 69.465 | 69.370 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.495 | 69.525 |
| 29 | 69.465 | 69.310 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.495 | 69.525 |
| 30 | 69.435 | 69.310 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.495 | 69.525 |
| 31 | 69.435 | 69.310 | 69.310 | 69.250 | 69.250 | 69.340 | 69.370 | 69.435 | 69.465 | 69.525 | 69.495 | 69.525 |
| Avg. | 69.485 | 69.405 | 69.335 | 69.280 | 69.245 | 69.300 | 69.365 | 69.415 | 69.465 | 69.495 | 69.500 | 69.525 |

| Current Year 1997 | | | Period 1935-1997 | | |
|-------------------|--------------------------|--------|------------------|-----------|-----------|
| Month | Extreme Elevation Meters | | Elevation Meters | | |
| | High | Low | # Average | # Maximum | ! Minimum |
| Jan. | 69.435 | 69.495 | 71.495 | 69.280 | 75.990 |
| Feb. | 69.370 | 69.435 | 71.400 | 69.190 | 75.830 |
| Mar. | 69.310 | 69.370 | 71.320 | 69.130 | 75.770 |
| April | 69.250 | 69.310 | 71.260 | 69.100 | 75.800 |
| May | 69.220 | 69.250 | 71.255 | 69.100 | 75.740 |
| June | 69.250 | 69.340 | 71.300 | 69.160 | 75.830 |
| July | 69.340 | 69.370 | 71.355 | 69.220 | 75.930 |
| Aug. | 69.370 | 69.435 | 71.410 | 69.250 | 76.020 |
| Sept. | 69.435 | 69.495 | 71.470 | 69.280 | 76.020 |
| Oct. | 69.465 | 69.525 | 71.500 | 69.310 | 76.140 |
| Nov. | 69.495 | 69.525 | 71.510 | 69.340 | 76.200 |
| Dec. | 69.525 | 69.525 | 71.475 | 69.340 | 76.080 |
| Yearly | 69.220 | 69.525 | 71.395 | 69.100 | 76.200 |

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

φ Mean daily

! Reading near first day of month

Mean monthly

CHEMICAL ANALYSIS OF WATER SAMPLES

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

NEW RIVER AT INTERNATIONAL BOUNDARY

| 1997 Date | Time Std. | *Streamflow Momentary CMS | Water Temperature Deg C | PH Units | Oxygen Dissolved (DO) mg/L | Specific Conductance Microsiemens/cm | Turbidity NTU |
|--------------|--------------|---------------------------------|-------------------------------|-------------|-------------------------------------|--|------------------|
| Jan. 07 | 0700 | 4.64 | 24.1 | 7.5 | 0.7 | 4,740 | 25.8 |
| Mar. 18 | 0700 | 4.70 | 24.2 | 7.5 | 0.4 | 4,580 | 21.0 |
| May 06 | 0700 | 4.81 | 24.1 | 7.5 | 0.4 | 4,560 | 14.3 |
| June 03 | 0700 | 4.81 | 24.1 | 7.5 | 0.4 | 4,560 | 13.4 |

* Flow provided by the California Regional Water Quality Control Board

NEW RIVER AT INTERNATIONAL BOUNDARY

| SAMPLE TYPE | COMPOSITE | COMPOSITE | COMPOSITE | COMPOSITE | |
|---------------------------|---------------|---------------|---------------|---------------|-----------------|
| DATE | Jan. 7, 1997 | Mar. 18, 1997 | May 6, 1997 | Jun. 3, 1997 | |
| PARAMETER | CONCENTRATION | CONCENTRATION | CONCENTRATION | CONCENTRATION | DETECTION LIMIT |
| Arsenic | 5.00 ug/L | 6.0 ug/L | 8.0 ug/L | 8.0 ug/L | 2.0 ug/L |
| Boron | N.A. | N.A. | N.D. | N.A. | 0.1 mg/L |
| Cadmium | N.D. | N.D. | N.D. | N.D. | 1.0 ug/L |
| Chromium | N.D. | N.D. | N.D. | N.D. | 10.0 ug/L |
| Copper | N.D. | 10.0 ug/L | N.D. | N.D. | 10.0 ug/L |
| Lead | N.D. | N.D. | N.D. | N.D. | 10.0 ug/L |
| Phenol | 0.01 mg/L | 0.003 mg/L | 0.009 mg/L | 0.024 mg/L | 0.002 mg/L |
| MBAS | 2.65 mg/L | 1.16 mg/L | 0.608 mg/L | 1.95 mg/L | 0.025 mg/L |
| Zinc | N.D. | N.D. | N.D. | 52.0 ug/L | 50.0 ug/L |
| Total Cyanide | 0.01 mg/L | N.D. | 0.01 mg/L | N.D. | 0.01 mg/L |
| Total Phosphate(P04-P) | 4.30 mg/L | 2.3 mg/L | 1.93 mg/L | 2.06 mg/L | 0.01 mg/L |
| Nitrate (NO3-N) | N.D. | 1.5 mg/L | 0.20 mg/L | N.D. | 0.20 mg/L |
| Nitrite (NO2-N) | N.D. | 0.2 mg/L | N.D. | N.D. | 0.03 mg/L |
| Ammonia (NH3-NH4-N) | 10.6 mg/L | 7.2 mg/L | 4.90 mg/L | 4.30 mg/L | 0.05 mg/L |
| Total Dissolved Solids | 3,480 mg/L | 2,770 mg/L | 2,980 mg/L | 2,960 mg/L | --- |
| Total Suspended Solids | 20.0 mg/L | 51.0 mg/L | 57.0 mg/L | 17.0 mg/L | --- |
| Volatile Suspended Solids | N.A. | N.A. | N.A. | N.A. | --- |

| SAMPLE TYPE | COMPOSITE | COMPOSITE | |
|---------------------------|----------------|---------------|-----------------|
| DATE | Sept. 16, 1997 | Dec. 08, 1997 | |
| PARAMETER | CONCENTRATION | CONCENTRATION | DETECTION LIMIT |
| Arsenic | 10.00 ug/L | 6.00 ug/L | 2.0 ug/L |
| Boron | N.A. | N.A. | 0.1 mg/L |
| Cadmium | N.D. | N.D. | 1.0 ug/L |
| Chromium | N.D. | N.D. | 10.0 ug/L |
| Copper | 13.0 ug/L | 11.0 ug/L | 10.0 ug/L |
| Lead | N.D. | 14.0 ug/L | 10.0 ug/L |
| Phenol | 0.002 mg/L | 0.005 mg/L | 0.002 mg/L |
| MBAS | 1.69 mg/L | 0.089 mg/L | 0.025 mg/L |
| Zinc | 55.00 ug/L | 70.0 ug/L | 50.0 ug/L |
| Total Cyanide | N.D. | N.D. | 0.01 mg/L |
| Total Phosphate(P04-P) | 1.66 mg/L | 1.78 mg/L | 0.01 mg/L |
| Nitrate (NO3-N) | N.D. | 0.5 mg/L | 0.20 mg/L |
| Nitrite (NO2-N) | N.D. | 0.1 mg/L | 0.03 mg/L |
| Ammonia (NH3-NH4-N) | 4.40 mg/L | 5.20 mg/L | 0.05 mg/L |
| Total Dissolved Solids | 2,580 mg/L | 2,280 mg/L | 10.0 mg/L |
| Total Suspended Solids | 155.0 mg/L | 73.0 mg/L | 10.0 mg/L |
| Volatile Suspended Solids | N.A. | N.A. | --- |

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

CHEMICAL ANALYSES OF WATER SAMPLES

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

Samples from the Alamo River are taken north of the international boundary upstream of the box culvert under the All-American Canal. Flow at this point includes drainage flows across the international boundary and flows from drain interceptors along the toe of the south bank of the All-American Canal. Samples from the New River are taken from the right bank at the road bridge, 137 meters north of the international boundary. Records of the sampling extend from April 1951 through 1997.

ALAMO RIVER

| 1997 Date | Time Std. | Water Temperature Deg C | pH Units | Oxygen Dissolved (DO) mg/L | Conductance Micro- siemens/cm | Coliform Fecal Colonies/ 100 mL | Flow CMS |
|--------------|--------------|-------------------------------|-------------|-------------------------------------|-------------------------------------|--|-------------|
| Jan. 23 | 0845 | 12.3 | 8.0 | 6.6 | 5,060 | 667 | 0.11 |
| Feb. 26 | 0820 | 13.2 | 7.6 | 3.3 | 4,860 | 390 | 0.14 |
| Mar. 26 | 0730 | 18.8 | 7.8 | 5.3 | 4,780 | 2,100 | 0.11 |
| April 24 | 0930 | 20.8 | 7.7 | 7.0 | 4,870 | 667 | 0.08 |
| May 21 | 0820 | 25.8 | 7.6 | 6.3 | 5,200 | # | 0.28 |
| June 25 | 0740 | 25.0 | 7.6 | 4.9 | 4,550 | 350 | 0.11 |
| July 29 | 0815 | 28.3 | 7.6 | 6.3 | 4,120 | 570 | 0.06 |
| Aug. 20 | 0845 | 27.8 | 7.5 | 3.2 | 3,960 | 1,000 | 0.06 |
| Sept. 24 | 0830 | 25.5 | 7.8 | 4.9 | 4,280 | 700 | 0.04 |
| Oct. 22 | 0810 | 19.9 | 7.3 | 5.5 | 5,830 | 170 | 0.42 |
| Nov. 25 | 0745 | 14.5 | 7.8 | 8.0 | 4,570 | 1,200 | 0.06 |
| Dec. 29 | NST | | | | | | |

#-Missing data

NST - No Sample Taken

NEW RIVER

| 1997 Date | Time Std. | **Streamflow Momentary CMS | Water Temperature Deg C | pH Units | Oxygen Dissolved (DO) mg/L | Specific Conductance Microsiemens/cm | Fecal Coliform Colonies/ 100 mL |
|--------------|--------------|----------------------------------|-------------------------------|-------------|-------------------------------------|--|--|
| Jan. 9 | 0830 | 2.92 | 12.0 | 7.8 | 1.5 | 5,350 | 2,300,000 |
| Jan. 23 | 0845 | 6.77 | 14.0 | 7.5 | 1.7 | 4,260 | 600,000 |
| Feb. 13 | 0920 | 5.04 | 13.9 | 7.6 | 1.0 | 4,700 | 855,000 |
| Feb. 26 | 0900 | 6.66 | 14.6 | 7.5 | 0.6 | 4,830 | 1,000,000 |
| Mar. 13 | 0830 | 8.50 | 19.2 | 7.4 | 0.4 | 3,830 | 1,250,000 |
| Mar. 26 | 0825 | 7.31 | 20.1 | 7.5 | 0.6 | 4,180 | 1,450,000 |
| April 9 | 0850 | 5.41 | 19.8 | 7.5 | 0.8 | 4,630 | 480,000 |
| April 24 | 1030 | 6.97 | 21.5 | 7.6 | 1.5 | 4,740 | 460,000 |
| May 8 | 0900 | 5.83 | 24.8 | 7.6 | 0.8 | 4,820 | 750,000 |
| May 21 | 0930 | 5.83 | 27.2 | 7.5 | 0.6 | 4,680 | 800,000 |
| Jun. 10 | 0900 | 6.68 | 26.0 | 7.5 | 1.5 | 4,200 | 610,000 |
| Jun. 25 | 0830 | 4.36 | 26.7 | 7.4 | 0.7 | 4,620 | 1,400,000 |
| July 16 | 0830 | 4.02 | 28.9 | 7.4 | 0.2 | 5,040 | 1,350,000 |
| July 29 | 0900 | 7.36 | 28.7 | 7.4 | 0.7 | 3,870 | 2,650,000 |
| Aug. 7 | 0810 | 5.58 | 31.7 | 7.5 | 0.1 | 4,290 | 1,350,000 |
| Aug. 20 | 0930 | 6.29 | 29.2 | 7.5 | 0.4 | 4,050 | 1,200,000 |
| Sept. 10 | 0900 | 6.63 | 32.0 | * | * | * | 1,700,000 |
| Sept. 24 | 0910 | 5.89 | 27.6 | 7.6 | 0.3 | 3,530 | 2,250,000 |
| Oct. 8 | 0815 | 5.04 | 22.5 | 7.6 | 0.7 | 4,380 | 2,250,000 |
| Oct. 22 | 0905 | 6.88 | 20.8 | 7.2 | 0.9 | 3,200 | 2,000,000 |
| Nov. 12 | 0830 | 6.32 | 18.1 | 7.7 | 0.7 | 3,480 | 1,600,000 |
| Nov. 25 | 0820 | 4.19 | 16.7 | 7.8 | 0.5 | 4,490 | 2,400,000 |
| Dec. 9 | 0815 | 10.8 *** | 13.0 | 7.7 | 4.8 | 3,520 | 720,000 |
| Dec. 29 | 0950 | 9.97 | 9.6 | 7.6 | 6.3 | 2,890 | 370,000 |

Note: Temperature, pH, D.O., and Specific Conductance - Data collected in field

* - Equipment Malfunction

** Flow reported by Imperial Irrigation District

*** - High flows in Colorado River

11-0100.00 COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 2.9 kilometers upstream from the mouth of Hauser Creek, 13.7 kilometers upstream from Barrett Dam, and about 32.2 kilometers upstream from the international boundary. The zero of the gage is 878.555 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Reservoir inflows shown below were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall, by the International Boundary and Water Commission, United States Section. They represent all water reaching Morena Reservoir, including rainfall on reservoir water surface. Basic data were furnished by the City of San Diego, California. Records April 1911 through 1997.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1997 computed on basis of area-capacity curves determined from 1948 resurvey. Various changes have been made to the spillway section since construction of the dam. Elevation of the present crest of ungated spillway is 47.855 meters, gage datum. Reservoir capacity at spillway crest, 1948 survey, is 61,934 TCM. The entire capacity of Morena Reservoir is used to furnish a part of the water supply of the City of San Diego, California. Water is released from Morena Reservoir down Cottonwood Creek to Barrett Reservoir as required.

EXTREMES: Maximum monthly inflow since 1937, 55,845 TCM, March 1983. Prior to 1937, maximum monthly inflow, 45,886 TCM, January 1916; minimum no flow during parts of many years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1937 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 761 | 1,193 | 20,362 | 0 |
| February | 531 | 2,626 | 41,407 | 9.9 |
| March | 329 | 3,608 | 55,845 | 23.8 |
| April | 182 | 1,995 | 28,530 | 4.1 |
| May | 127 | 1,010 | 18,642 | 0 |
| June | 0 | 576 | 10,173 | 0 |
| July | 39.0 | 355 | 7,651 | 0 |
| August | 0 | 283 | 8,916 | 0 |
| September | 380 | 199 | 6,331 | 0 |
| October | 0 | 173 | 4,817 | 0 |
| November | 45.0 | 285 | 5,633 | 0 |
| December | 0 | 774 | 9,472 | 5.4 |
| Yearly | 2,394 | 13,077 | 177,579 | 149 |

11-0105.00 COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

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

RECORDS: Monthly records shown below represent the water available immediately below Morena Dam, consisting of spillway waste, draft, and leakage from the dam. They are computed by the International Boundary and Water Commission, United States Section, from basic data furnished by the City of San Diego, California. Records available: January 1911 through 1997.

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

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

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1937 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 481 | 299 | 2,583 | 0 |
| February | 435 | 1,046 | 19,644 | 0 |
| March | 367 | 2,048 | 55,615 | 0 |
| April | 356 | 1,545 | 28,159 | 0 |
| May | 367 | 853 | 18,100 | 0 |
| June | 456 | 644 | 9,260 | 0 |
| July | 471 | 391 | 6,236 | 0 |
| August | 471 | 375 | 7,937 | 0 |
| September | 456 | 419 | 7,253 | 0 |
| October | 387 | 259 | 4,639 | 0 |
| November | 384 | 292 | 5,071 | 0 |
| December | 397 | 532 | 9,099 | 0 |
| Yearly | 5,028 | 8,703 | 168,432 | 0 |

11-0110.00 COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 13.7 kilometers downstream from Morena Dam, 1.6 kilometers downstream from the mouth of Pine Valley Creek, and about 19.3 kilometers upstream from the international boundary. Zero of gage is 440.775 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Records reported below represent all water reaching Barrett Dam from the sub-basin below Morena Dam, including rainfall on the reservoir water surface. Leakage, releases, and spills from Morena Reservoir are not included. The inflows were computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall furnished by the City of San Diego, California. Records available: January 1921 through 1997. Records of stream flow for a station at the dam site are also available for the periods 1906-1915 and 1917-1920.

REMARKS: Storage began at Barrett Reservoir in January 1921. The area-capacity-elevation curves used in the inflow calculations are dated 1948, 1951, and 1955 and were furnished by the City of San Diego, California. Capacity of reservoir at top of flash gates on spillway (gage height 51.475 meters) is 55,205 TCM. Capacity at spillway crest (gage height 49.035 meters) is 46,811 TCM. Dead storage, 887 TCM below lowest outlet (gage height 17.945 meters) is included in these capacities. The entire capacity of Barrett Reservoir is used to furnish a part of the water supply of the City of San Diego, California.

EXTREMES: Maximum monthly discharge since 1937, 67,540 TCM, February 1980. Prior to 1937, maximum monthly discharge, 67,595 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1937 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 1,074 | 1,563 | 29,627 | 6.4 |
| February | 587 | 3,326 | 67,539 | 9.4 |
| March | 0 | 5,888 | 62,041 | 17.4 |
| April | 0 | 2,655 | 26,680 | 12.6 |
| May | 104 | 1,222 | 10,509 | 0 |
| June | 0 | 551 | 4,818 | 0 |
| July | 750 | 336 | 5,042 | 0 |
| August | 0 | 205 | 4,472 | 0 |
| September | 858 | 213 | 3,858 | 0 |
| October | 0 | 121 | 796 | 0 |
| November | 0 | 262 | 2,519 | 0 |
| December | 1,874 | 710 | 6,845 | 2.1 |
| Yearly | 5,247 | 17,052 | 141,024 | 159 |

11-0114.90 DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.8 kilometer downstream from Barrett Dam on right bank of Dulzura Conduit 15.2 meters upstream from road crossing to Barrett Dam. Elevation of gage has not been determined.

RECORDS: Computed on basis of head on control section of flume, as measured by water-stage recorder, and rating curve determined from current meter measurements. Records obtained and furnished by the City of San Diego, California. Records available: January 1909 through 1997.

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

EXTREMES: Since 1937: Maximum mean daily discharge, 4.66 CMS on March 8, 1995; minimum discharge, no flow for long periods on many occasions.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 0 | 1.40 | 1.51 | 1.40 | 1.17 | 1.30 | 1.17 | 0.99 | 1.09 | 0.60 | 1.14 | 0.99 |
| 2 | 0 | 1.40 | 1.47 | 1.40 | 1.14 | 1.30 | 1.14 | .99 | 1.07 | .60 | 1.14 | .99 |
| 3 | 0 | 1.40 | 1.47 | 1.40 | 1.14 | 1.28 | 1.17 | .98 | 1.07 | 1.44 | 1.14 | .99 |
| 4 | 0 | 1.44 | 1.47 | 1.40 | 1.21 | 1.25 | 1.11 | .99 | 1.04 | 1.44 | 1.12 | .99 |
| 5 | 0 | 1.42 | 1.47 | 1.40 | 1.16 | 1.28 | 1.11 | .97 | 1.05 | 1.41 | 1.12 | .99 |
| 6 | 0 | 1.42 | 1.44 | 1.40 | 1.16 | 1.25 | 1.11 | .97 | 1.02 | 1.44 | 1.12 | 0 |
| 7 | 0 | 1.42 | 1.44 | 1.40 | 1.12 | 1.28 | 1.11 | .97 | 1.02 | 1.33 | 1.12 | 0 |
| 8 | 0 | 1.42 | 1.44 | 1.40 | 1.12 | 1.28 | 1.09 | .99 | 1.02 | 1.33 | 1.12 | 0 |
| 9 | 0 | 1.42 | 1.44 | 1.40 | 1.12 | 1.28 | 1.09 | .97 | .99 | 1.33 | 1.12 | 0 |
| 10 | 0 | 1.42 | 1.44 | 0 | 1.12 | 1.25 | 1.09 | .97 | .97 | 1.25 | 1.11 | 0 |
| 11 | 0 | 1.42 | 1.44 | 0 | 1.14 | 1.25 | 1.11 | .99 | .97 | 1.25 | 1.09 | 0 |
| 12 | 0 | 1.42 | 1.44 | 0 | 1.13 | 1.25 | 1.12 | .97 | .99 | 1.22 | 1.09 | 0 |
| 13 | 0 | 1.40 | 1.44 | 0 | 1.13 | 1.22 | 1.09 | .97 | .98 | 1.22 | 1.09 | 0 |
| 14 | 0 | 1.36 | 1.44 | 0 | 1.12 | 1.22 | 1.11 | .89 | .98 | 1.25 | 1.09 | 0 |
| 15 | 0 | 1.34 | 1.44 | 0 | 1.12 | 1.22 | 1.08 | .85 | .95 | 1.25 | 1.09 | 0 |
| 16 | 0 | .12 | 1.44 | 0 | .27 | 1.22 | 1.07 | 1.30 | 1.05 | 1.25 | 1.07 | .56 |
| 17 | 0 | 0 | 1.44 | 0 | .27 | 1.24 | 1.09 | 1.25 | 1.28 | 1.25 | 1.07 | .61 |
| 18 | 0 | 0 | 1.44 | 0 | .30 | 1.24 | 1.07 | 1.25 | 1.28 | 1.22 | 1.07 | 1.04 |
| 19 | 0 | 0 | 1.44 | 0 | .38 | 1.20 | 1.07 | 1.25 | 1.25 | 1.22 | 1.07 | 1.05 |
| 20 | 0 | 0 | 1.44 | 0 | 0 | 1.22 | 1.07 | 1.25 | 1.24 | 1.21 | 1.07 | 1.05 |
| 21 | 0 | 0 | 1.44 | 0 | 1.00 | 1.22 | 1.07 | 1.25 | 1.22 | 1.21 | 1.07 | 1.07 |
| 22 | 0 | 0 | 1.44 | 0 | 1.17 | 1.20 | 1.05 | 1.22 | 1.18 | 1.20 | 1.04 | 1.07 |
| 23 | 0 | 0 | 1.44 | 0 | 1.17 | 1.20 | 1.07 | 1.20 | 1.17 | 1.20 | 1.04 | 1.07 |
| 24 | 0 | 0 | 1.44 | 0 | 1.17 | 1.18 | 1.07 | 1.18 | 1.17 | 1.18 | 1.04 | 1.05 |
| 25 | .10 | .26 | 1.40 | 0 | 1.18 | 1.17 | 1.02 | 1.18 | 1.17 | 1.20 | 1.04 | 1.07 |
| 26 | .95 | 1.40 | 1.40 | 0 | 1.16 | 1.17 | 1.04 | 1.18 | 0 | 1.20 | 1.04 | 1.07 |
| 27 | .95 | 1.44 | 1.40 | 0 | 1.17 | 1.17 | 1.02 | 1.16 | .62 | 1.20 | 1.04 | 1.08 |
| 28 | .96 | 1.47 | 1.40 | 0 | 1.22 | 1.17 | 1.00 | 1.16 | .62 | 1.17 | 1.03 | 1.04 |
| 29 | 1.25 | 1.40 | 0 | 0 | 1.30 | 1.17 | 1.00 | 1.16 | .62 | 1.16 | 1.02 | 1.07 |
| 30 | 1.26 | 1.40 | 0 | 0 | 1.30 | 1.16 | 1.00 | 1.12 | .61 | 1.04 | 1.02 | 1.04 |
| 31 | 1.40 | 1.40 | 0 | 0 | 1.30 | 1.16 | .99 | 1.11 | 1.17 | 1.17 | 1.04 | 1.07 |
| Sum | | 25.79 | | 12.60 | | 36.84 | | 33.68 | | 37.44 | | 20.96 |
| | 6.87 | | 44.55 | | 31.46 | | 33.40 | | 29.69 | | 32.43 | |

Current Year 1997

Period 1937-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 31 | 1.40 | 1 | 0 | 0.22 | 594 | 511 | 2,899 | 0 |
| Feb. | | | 28 | 1.47 | 117 | 0 | .92 | 2,228 | 561 | 2,883 | 0 |
| Mar. | | | 1 | 1.51 | 125 | 1.40 | 1.44 | 3,849 | 824 | 7,639 | 0 |
| April | | | 1 | 1.40 | 110 | 0 | .42 | 1,089 | 1,028 | 5,016 | 0 |
| May | | | 129 | 1.30 | 20 | 0 | 1.01 | 2,718 | 1,145 | 3,750 | 0 |
| June | | | 1 | 1.30 | 30 | 1.16 | 1.23 | 3,183 | 1,204 | 4,611 | 0 |
| July | | | 1 | 1.17 | 31 | .99 | 1.08 | 2,886 | 1,066 | 4,914 | 0 |
| Aug. | | | 16 | 1.30 | 15 | .85 | 1.09 | 2,910 | 1,000 | 4,741 | 0 |
| Sept. | | | 117 | 1.28 | 26 | 0 | .99 | 2,565 | 809 | 2,862 | 0 |
| Oct. | | | 1 | 1.44 | 1 | .60 | 1.21 | 3,235 | 660 | 3,235 | 0 |
| Nov. | | | 1 | 1.14 | 129 | 1.02 | 1.08 | 2,802 | 696 | 3,404 | 0 |
| Dec. | | | 27 | 1.08 | 6 | 0 | .68 | 1,811 | 623 | 2,843 | 0 |
| Yearly | | | | 1.51 | | 0 | 0.95 | 29,870 | 10,127 | 40,526 | 0 |

φ Mean daily

! And other days

11-0111.00 COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 4.0 kilometers downstream from Barrett Dam and 0.8 kilometer upstream from Rattlesnake Canyon for measuring Barrett Dam spills; and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 305 meters (from topographic map).

RECORDS: Data furnished by the City of San Diego, California. Prior to January 1953, the records were furnished by the City of San Diego and reviewed and revised by the United States Section of the Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. Spillway discharges have occurred in May 1943, March, April 1979, January to May of 1980, April, December 1982, and the entire year of 1983, January to April 1993 and January to March 1995. Spillway discharges included in the period record below were computed by the City of San Diego from the head on the spillway crest, read on the reservoir gage, and applied to a broad-crested weir formula. Records available: January 1921 through 1997. Storage began in Barrett Reservoir in January 1921.

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

EXTREMES: Maximum monthly discharge since 1937, 111,775 TCM March 1983. Prior to 1937, maximum monthly discharge 47,366 TCM February 1927; minimum, no flow during several months of various years.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1937 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 0 | 444 | 10,114 | 0 |
| February | 0 | 2,303 | 86,736 | 0 |
| March | 0 | 4,702 | 111,775 | 0 |
| April | 0 | 2,325 | 45,417 | 0 |
| May | 0 | 1,060 | 28,287 | 0 |
| June | 0 | 488 | 13,503 | 0 |
| July | 0 | 250 | 5,311 | 0 |
| August | 0 | 161 | 4,206 | 0 |
| September | 0 | 59.4 | 1,554 | 0 |
| October | 0 | 50.2 | 1,530 | 0 |
| November | 0 | 156 | 5,100 | 0 |
| December | 0 | 203 | 6,058 | 0 |
| Yearly | 0 | 12,202 | 254,099 | 0 |

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

DESCRIPTION: Water-stage recorder and cableway located 2.6 kilometers upstream from the international land boundary between the United States and Mexico, 1.3 kilometers upstream from the confluence with Tecate Creek, and 8.2 kilometers south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway, which is located 213 meters downstream from the gage. Zero of the gage is 173.555 meters above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on a continuous record of gage heights and current meter measurements or observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through 1997.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|-----|------|------|------|-------|------|------|------|
| 1 | 0 | 0.09 | 0.11 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | 0 | .08 | .05 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | .01 | .05 | .04 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | .01 | .05 | .04 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | .01 | .05 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | .01 | .04 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 7 | .01 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | .01 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 9 | .01 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 10 | .01 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 11 | .01 | .07 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 12 | .16 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 13 | 1.61 | .04 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 14 | .42 | .03 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | .16 | .03 | .02 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | .13 | .03 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | .07 | .03 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | .04 | .06 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | .03 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | .02 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | .02 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .05 |
| 22 | .02 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .07 |
| 23 | .05 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .02 |
| 24 | .04 | .03 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .02 |
| 25 | .03 | .02 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .02 |
| 26 | .34 | .02 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 27 | .40 | .05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 28 | .25 | .19 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 29 | .17 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 30 | .11 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 31 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| Sum | 4.24 | 1.31 | 0.66 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.31 |

Current Year 1997

Period 1937-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 13 | 1.61 | 1 | 0 | 0.14 | 366 | 1,484 | 45,897 | 0 |
| Feb. | | | 28 | .19 | 25 | .02 | .05 | 113 | 3,650 | 85,134 | 0 |
| Mar. | | | 1 | .11 | 27 | 0 | .02 | 57.0 | 5,500 | 109,418 | 0 |
| April | | | 1 | .01 | 7 | 0 | 0 | 6.0 | 2,625 | 49,635 | 0 |
| May | | | 1 | 0 | 1 | 0 | 0 | 0 | 975 | 22,439 | 0 |
| June | | | 1 | 0 | 1 | 0 | 0 | 0 | 343 | 7,301 | 0 |
| July | | | 1 | 0 | 1 | 0 | 0 | 0 | 111 | 3,599 | 0 |
| Aug. | | | 1 | 0 | 1 | 0 | 0 | 0 | 86.5 | 1,850 | 0 |
| Sept. | | | 1 | 0 | 1 | 0 | 0 | 0 | 84.4 | 4,209 | 0 |
| Oct. | | | 1 | 0 | 1 | 0 | 0 | 0 | 95.6 | 291 | 0 |
| Nov. | | | 1 | 0 | 1 | 0 | 0 | 0 | 57.4 | 1,378 | 0 |
| Dec. | | | 22 | .07 | 1 | 0 | .01 | 26.8 | 187 | 3,169 | 0 |
| Yearly | | | | 1.61 | | 0 | 0.02 | 569 | 15,199 | 220,556 | 0 |

φ Mean daily

! And other days

11-0125.00 CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.8 kilometer upstream from the international land boundary between the United States and Mexico, just upstream from the bridge on California State Highway 94, 5.6 kilometers southwest of Campo, California. Zero of gage is 664.135 meters above mean sea level, U. S. C. & G. S. datum.
 RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey from October 1936 through 1997.

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

EXTREMES: Maximum discharge, 25.3 CMS, March 24, 1983 (gage height 1.640 meters present datum), from rating curve extended above 3.12 CMS on basis of velocity-depth relation and cross section area at the control. Minimum discharge, no flow during part of most years.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|------|-------|------|------|------|
| 1 | 0.07 | 0.14 | 0.28 | 0.06 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 |
| 2 | .09 | .14 | .16 | .07 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 3 | .12 | .14 | .14 | .07 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 4 | .11 | .13 | .13 | .10 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 5 | .09 | .14 | .11 | .10 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 6 | .10 | .13 | .09 | .09 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 7 | .08 | .12 | .09 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 8 | .07 | .12 | .10 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 9 | .07 | .12 | .09 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 10 | .07 | .12 | .09 | .07 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 11 | .08 | .13 | .08 | .06 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 12 | .16 | .13 | .08 | .06 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 13 | 1.87 | .13 | .08 | .04 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 14 | .71 | .11 | .08 | .02 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 15 | .31 | .10 | .08 | .02 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 |
| 16 | .24 | .11 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 17 | .17 | .11 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 18 | .13 | .26 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 19 | .12 | .18 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 20 | .12 | .13 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 21 | .12 | .12 | .06 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 22 | .12 | .11 | .06 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 23 | .25 | .10 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 24 | .34 | .11 | .08 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 25 | .18 | .11 | .07 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 26 | .68 | .11 | .06 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| 27 | .48 | .15 | .06 | .01 | .01 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| 28 | .28 | .54 | .06 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| 29 | .20 | .05 | .05 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| 30 | .16 | .05 | .05 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| 31 | .14 | .05 | .05 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .01 |
| Sum | 7.73 | 4.04 | 2.73 | 1.13 | 0.27 | 0.08 | 0 | 0 | 0 | 0 | 0.04 | 0.31 |

Current Year 1997

Period 1937-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|---|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum | |
| | | | | | | | | | | | | |
| Jan. | | | 13 | 1.87 | 1 | 1 | 0.07 | 0.25 | 668 | 443 | 10,581 | 0 |
| Feb. | | | 28 | .54 | 115 | | .10 | .14 | 349 | 544 | 5,288 | 0 |
| Mar. | | | 1 | .28 | 129 | | .05 | .09 | 236 | 901 | 11,587 | 0 |
| April | | | 4 | .10 | 116 | | .01 | .04 | 97.6 | 542 | 8,886 | 0 |
| May | | | 1 | .01 | 128 | | 0 | .01 | 23.3 | 263 | 3,956 | 0 |
| June | | | 5 | .01 | 1 | 1 | 0 | 0 | 6.9 | 132 | 2,234 | 0 |
| July | | | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 72.4 | 1,525 | 0 |
| Aug. | | | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 67.6 | 2,008 | 0 |
| Sept. | | | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 49.6 | 1,214 | 0 |
| Oct. | | | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 62.1 | 1,084 | 0 |
| Nov. | | | 126 | .01 | 1 | 1 | 0 | 0 | 3.5 | 123 | 1,522 | 0 |
| Dec. | | | 1 | .01 | 1 | 1 | .01 | .01 | 26.8 | 207 | 1,953 | 0 |
| Yearly | | | | 1.87 | | | 0 | 0.04 | 1,411 | 3,407 | 38,639 | 0 |

φ Mean daily † And other days

11-0131.00 INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

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

RECORDS: Computed from monthly reservoir records of storage, releases, spills, leakage, evaporation, and rainfall. Records obtained by the Ministry of Agriculture and Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Services for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1997. Storage began in Rodriguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodriguez Reservoir, including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 115.85 meters above mean sea level; at top of spillway gates 125.00 meters above mean sea level. Reservoir capacity at spillway crest 92,370 TCM; at top of spillway gates 138 TCM.

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

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1938 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 7.5 | 4,688 | 237,657 | 0 |
| February | 4.7 | 7,583 | 194,216 | 4.7 |
| March | 0 | 12,555 | 174,556 | 0 |
| April | 0 | 3,722 | 95,953 | 0 |
| May | 0 | 727 | 14,136 | 0 |
| June | 0 | 216 | 5,749 | 0 |
| July | 0 | 115 | 1,806 | 0 |
| August | 0 | 68 | 950 | 0 |
| September | 0 | 69 | 575 | 0 |
| October | 0 | 87 | 432 | 0 |
| November | 0 | 179 | 2,393 | 0 |
| December | 2.2 | 947 | 19,348 | 0 |
| Yearly | 14.4 | 30,956 | 412,673 | 14.4 |

11-0132.00 DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

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

RECORDS: Direct recording by Sparling flow meter. Records through May 1961 were obtained by the Ministry of Agriculture and Hydraulic Resources; from June 1961 to March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano de Tijuana; and from April 1966 through 1991 by the State of Baja California Commission of Public Services for Tijuana. Since 1992, the data have been obtained by the National Water Commission. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through 1997.

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

EXTREMES: Maximum monthly diversion, 36,018 TCM, March 1996; minimum, no flow on several occasions since March 1941.

MONTHLY DISCHARGE IN THOUSAND CUBIC METERS

| MONTH | CURRENT YEAR 1997 | PERIOD 1938 - 1997 | | |
|-----------|-------------------|--------------------|---------|---------|
| | | AVERAGE | MAXIMUM | MINIMUM |
| January | 1,951 | 661 | 6,183 | 0 |
| February | 1,324 | 642 | 6,028 | 0 |
| March | 1,350 | 1,231 | 36,018 | 0 |
| April | 1,053 | 802 | 6,142 | 0 |
| May | 499 | 958 | 6,578 | 0 |
| June | 370 | 1,074 | 5,893 | 0 |
| July | 594 | 1,148 | 5,681 | 0 |
| August | 551 | 1,118 | 5,931 | 0 |
| September | 516 | 993 | 6,158 | 0 |
| October | 535 | 930 | 6,054 | 0 |
| November | 51 | 821 | 5,873 | 0 |
| December | 15 | 781 | 6,212 | 0 |
| Yearly | 8,809 | 11,159 | 94,980 | 0 |

11-0133.00 TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on top of north levee about 1.1 kilometers downstream (north) from boundary, 1.8 kilometers upstream from the new Dairy Mart Road bridge, and 2.3 kilometers west of the international gate at San Ysidro, California. Zero of the gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements, staff gage readings and record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through 1997.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 937 CMS, February 21, 1980; minimum discharge, no flow during many years since 1951.

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|-------|-------|-------|-------|-----|------|------|------|-------|------|-------|-------|
| 1 | 0 | 1.23 | 1.53 | 0 | 0 | 0 | 0 | 0 | 0.20 | 0.01 | 0.05 | 1.67 |
| 2 | 0 | 1.20 | 1.20 | .51 | 0 | 0 | 0 | 0 | .06 | 0 | .04 | 1.12 |
| 3 | .80 | 1.17 | .88 | .89 | 0 | 0 | 0 | 0 | 0 | .15 | .04 | 1.00 |
| 4 | .69 | .86 | .53 | .45 | 0 | .01 | 0 | 0 | .02 | .66 | .05 | .96 |
| 5 | 1.17 | .90 | .42 | .28 | 0 | 0 | 0 | 0 | .18 | .36 | .05 | .93 |
| 6 | 1.07 | 1.13 | .20 | .31 | 0 | 0 | 0 | 0 | .14 | 0 | .05 | 4.79 |
| 7 | .78 | .99 | .37 | .26 | 0 | 0 | 0 | 0 | .14 | 0 | .04 | 5.37 |
| 8 | .15 | .98 | .34 | .09 | 0 | 0 | 0 | 0 | .09 | 0 | .07 | 3.94 |
| 9 | .09 | 1.09 | .22 | 0 | 0 | 0 | 0 | 1.09 | .17 | 0 | .08 | 1.85 |
| 10 | .03 | 1.15 | .08 | .26 | 0 | 0 | 0 | 0 | .22 | 0 | .38 | .78 |
| 11 | .27 | 1.46 | .31 | .01 | 0 | 0 | 0 | 0 | .28 | .39 | 1.29 | 1.04 |
| 12 | 2.07 | 1.19 | .92 | .27 | 0 | 0 | 0 | 0 | .03 | .24 | .47 | .88 |
| 13 | 3.39 | 1.12 | .93 | .02 | 0 | 0 | 0 | 0 | 0 | .30 | .04 | 1.72 |
| 14 | 1.34 | 1.11 | .94 | 0 | 0 | 0 | 0 | 0 | 0 | .24 | .05 | 1.40 |
| 15 | 2.10 | .87 | .96 | 0 | 0 | 0 | 0 | 0 | .54 | 0 | 1.47 | .50 |
| 16 | 2.91 | .72 | .91 | 0 | 0 | 0 | 0 | 0 | 1.09 | 0 | .96 | .60 |
| 17 | 1.52 | .61 | .92 | 0 | 0 | 0 | 0 | 0 | .75 | .05 | 1.20 | .70 |
| 18 | 1.31 | .83 | .90 | 0 | 0 | 0 | 0 | 0 | .19 | .10 | .18 | .80 |
| 19 | 1.19 | .79 | .89 | .12 | 0 | 0 | 0 | 0 | .28 | .07 | .45 | 1.63 |
| 20 | 1.12 | .61 | .53 | .39 | 0 | 0 | 0 | 0 | .24 | .06 | .82 | .46 |
| 21 | 1.12 | .60 | .25 | .27 | 0 | 0 | 0 | 0 | .18 | .08 | .68 | 3.73 |
| 22 | 1.01 | .63 | .35 | .02 | 0 | 0 | 0 | 0 | .11 | .07 | 1.74 | 1.97 |
| 23 | 1.32 | .63 | .01 | 0 | 0 | 0 | 0 | .02 | 0 | .05 | 1.64 | .74 |
| 24 | 1.43 | .48 | .07 | .03 | 0 | 0 | 0 | .16 | .30 | .05 | 1.76 | .49 |
| 25 | 1.27 | .58 | .21 | 0 | 0 | 0 | 0 | 0 | 3.50 | .09 | 2.09 | .37 |
| 26 | 3.99 | .60 | .18 | 0 | 0 | 0 | 0 | 0 | 1.64 | .09 | 3.79 | .33 |
| 27 | 2.42 | 1.25 | .02 | 0 | 0 | 0 | 0 | 0 | 1.51 | .07 | 1.48 | .31 |
| 28 | 1.69 | 1.90 | .01 | 0 | 0 | 0 | 0 | .12 | 1.50 | .06 | .90 | .28 |
| 29 | 1.45 | | .02 | 0 | 0 | 0 | 0 | .10 | 1.40 | .06 | .88 | .28 |
| 30 | 1.36 | | 0 | 0 | 0 | 0 | 0 | .04 | 1.30 | .05 | 1.38 | .48 |
| 31 | 1.25 | | 0 | 0 | 0 | 0 | 0 | .22 | | .05 | | .78 |
| Sum | 40.31 | 26.68 | 15.10 | 4.18 | 0 | 0.01 | 0 | 0.66 | 16.60 | 2.90 | 27.15 | 39.98 |

Current Year 1997

Period 1947-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|--------|---------------------------------|------|-----|-----|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 12.515 | 11.650 | 13 | 8.41 | 1 | 0 | 1.30 | 3,483 | 9,459 | 297,879 | 0 |
| Feb. | 12.205 | 11.800 | 10 | 3.55 | 25 | .13 | .95 | 2,305 | 14,851 | 388,951 | 0 |
| Mar. | 12.090 | 11.650 | 1 | 1.98 | 16 | 0 | .49 | 1,305 | 17,710 | 362,019 | 0 |
| April | 12.165 | 11.650 | 3 | 2.98 | 1 | 1 | .14 | 361 | 4,048 | 77,633 | 0 |
| May | 11.650 | 11.650 | 1 | 0 | 1 | 1 | 0 | 0 | 2,160 | 52,545 | 0 |
| June | 11.715 | 11.650 | 1 | 0 | 1 | 1 | 0 | 0 | 734 | 11,960 | 0 |
| July | 11.650 | 11.650 | 1 | 0 | 1 | 1 | 0 | 0 | 536 | 11,400 | 0 |
| Aug. | 11.985 | 11.650 | 24 | .80 | 1 | 1 | .02 | 57.0 | 660 | 21,083 | 0 |
| Sept. | 12.445 | 11.650 | 25 | 7.25 | 2 | 0 | .55 | 1,434 | 315 | 5,142 | 0 |
| Oct. | 12.015 | 11.650 | 4 | 1.12 | 1 | 1 | .09 | 251 | 407 | 6,859 | 0 |
| Nov. | 12.585 | 11.705 | 26 | 9.61 | 2 | 0 | .91 | 2,346 | 614 | 5,399 | 0 |
| Dec. | 12.580 | 11.910 | 21 | 9.52 | 128 | .27 | 1.29 | 3,454 | 1,102 | 8,270 | 0 |
| Yearly | 12.585 | 11.650 | | 9.61 | | 0 | 0.48 | 14,997 | 52,596 | 734,832 | 0 |

! And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

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

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

IN THOUSAND CUBIC METERS

| Month | MORENA RESERVOIR, CALIFORNIA (Capacity 61,933) | | BARRETT RESERVOIR, CALIFORNIA (Capacity 55,211) | | RODRIGUEZ RESERVOIR, BAJA CALIFORNIA (Capacity 138,003) | | TOTAL IN TIJUANA RIVER BASIN RESERVOIRS (Capacity 255,147) | |
|-------|--|----------------------|---|----------------------|---|----------------------|--|----------------------|
| | 1997 | Average 1937-1997 | 1997 | Average 1937-1997 | 1997 | Average 1937-1997 | 1997 | Average 1937-1997 |
| Jan. | 44,087 | 24,488 | 39,734 | 18,797 | 16,860 | 42,285 | 100,681 | 85,570 |
| Feb. | 44,204 | 25,956 | 38,363 | 19,889 | 15,520 | 43,963 | 98,087 | 89,808 |
| Mar. | 43,764 | 27,413 | 35,402 | 22,072 | 14,010 | 49,508 | 93,176 | 98,993 |
| April | 43,060 | 27,558 | 32,370 | 22,661 | 12,718 | 49,866 | 88,148 | 100,085 |
| May | 41,997 | 27,278 | 29,500 | 22,182 | 11,960 | 49,067 | 83,457 | 98,527 |
| June | 40,722 | 26,597 | 26,169 | 21,300 | 11,314 | 47,535 | 78,205 | 95,432 |
| July | 39,385 | 25,857 | 23,111 | 20,342 | 10,404 | 45,609 | 72,900 | 91,808 |
| Aug. | 37,995 | 25,188 | 20,118 | 19,368 | 9,648 | 43,695 | 67,761 | 88,251 |
| Sept. | 37,086 | 24,500 | 17,677 | 18,714 | 8,976 | 42,260 | 63,739 | 85,474 |
| Oct. | 35,928 | 24,044 | 14,373 | 18,086 | 8,220 | 40,728 | 58,521 | 82,858 |
| Nov. | 35,619 | 23,873 | 11,698 | 17,651 | 8,262 | 40,020 | 55,579 | 81,544 |
| Dec. | 33,690 | 23,975 | 12,083 | 17,933 | 8,528 | 39,966 | 54,301 | 81,874 |
| Avg. | 39,795 | 25,561 | 25,050 | 19,916 | 11,368 | 44,542 | 76,213 | 90,019 |
| Max. | 44,204 | #1 76,069 | 39,734 | *1 56,641 | 16,860 | ! 138,486 | 100,681 | ! 263,471 |
| Min. | 33,690 | !! 12 | 11,698 | !! 131 | 8,220 | !! 0 | 54,301 | !! 1,559 |

- March 31, 1941 - Prior to removal of spillway gates

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

! - Maximum end of month storage for period of record

!! - Minimum end of month storage for period of record

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN MILLIMETERS

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

IN THE UNITED STATES

| Month | Morena Dam, California | | Barrett Dam, California | | Marron Valley, California | | Sawday Ranch, California | | Campo, California | |
|--------|------------------------|-------------------|-------------------------|-------------------|---------------------------|-------------------|--------------------------|-------------------|-------------------|-------------------|
| | 1997 | Average 1906-1997 | 1997 | Average 1907-1997 | 1997 | Average 1951-1997 | 1997 | Average 1950-1997 | 1997 | Average 1900-1997 |
| Jan. | 199 | 100 | 136 | 92 | # | # | 160 | 95 | 110 | 81 |
| Feb. | 60 | 96 | 40 | 87 | # | # | 44 | 79 | 39 | 81 |
| Mar. | 7 | 91 | 0 | 83 | # | # | 6 | 81 | 1 | 74 |
| April | 5 | 40 | 5 | 37 | # | # | 6 | 35 | 6 | 34 |
| May | 1 | 15 | 0 | 13 | # | # | 0 | 9 | 0 | 12 |
| June | 12 | 3 | 1 | 2 | # | # | 6 | 1 | 0 | 2 |
| July | 1 | 9 | 3 | 3 | # | # | 1 | 14 | 0 | 12 |
| Aug. | 4 | 14 | 12 | 6 | # | # | 9 | 21 | 2 | 14 |
| Sept. | 55 | 11 | 28 | 6 | # | # | 56 | 12 | 49 | 9 |
| Oct. | 4 | 22 | 2 | 18 | # | # | 0 | 14 | 4 | 16 |
| Nov. | 65 | 40 | 37 | 37 | # | # | 66 | 43 | 44 | 34 |
| Dec. | 120 | 77 | 98 | 69 | # | # | 107 | 60 | 107 | 61 |
| Yearly | 533 | 518 | 362 | 453 | # | # | 461 | 464 | 362 | 430 |

| Month | Chula Vista, California | | Lower Otay Dam, California | | | | | |
|--------|-------------------------|-------------------|----------------------------|-------------------|--|--|--|--|
| | 1997 | Average 1930-1997 | 1997 | Average 1906-1997 | | | | |
| Jan. | 87 | 49 | 87 | 57 | | | | |
| Feb. | 10 | 44 | 19 | 43 | | | | |
| Mar. | 0 | 45 | 0 | 56 | | | | |
| April | 15 | 20 | 13 | 25 | | | | |
| May | 0 | 5 | 0 | 10 | | | | |
| June | 0 | 2 | 0 | 3 | | | | |
| July | 0 | 0 | 0 | 1 | | | | |
| Aug. | 0 | 2 | 0 | 3 | | | | |
| Sept. | 34 | 9 | 31 | 6 | | | | |
| Oct. | 0 | 9 | 5 | 10 | | | | |
| Nov. | 37 | 29 | 22 | 32 | | | | |
| Dec. | 51 | 40 | 71 | 38 | | | | |
| Yearly | 234 | 250 | 248 | 284 | | | | |

T Trace

IN MEXICO

| Month | El Pinal, Baja California | | El Hongo, Baja California | | Ignacio Zaragoza, Baja California | | Tecate, Baja California | | El Carrizo, Baja California | |
|--------|---------------------------|-------------------|---------------------------|-------------------|-----------------------------------|-------------------|-------------------------|-------------------|-----------------------------|-------------------|
| | 1997 | Average 1964-1997 | 1997 | Average 1980-1997 | 1997 | Average 1965-1997 | 1997 | Average 1946-1997 | 1997 | Average 1980-1997 |
| Jan. | # | 84 | 85 | 73 | 126 | 65 | 134 | 79 | 70 | 47 |
| Feb. | # | 90 | 13 | 65 | 32 | 69 | 39 | 53 | 26 | 43 |
| Mar. | # | 94 | 0 | 71 | 0 | 68 | 0 | 66 | 0 | 62 |
| April | # | 37 | 4 | 16 | 15 | 26 | 9 | 26 | 5 | 17 |
| May | # | 9 | 0 | 5 | 0 | 5 | 0 | 7 | 0 | 3 |
| June | # | 1 | 4 | 2 | 6 | 1 | 5 | 3 | 4 | 2 |
| July | # | 18 | 0 | 13 | 0 | 3 | 0 | 4 | 0 | 4 |
| Aug. | # | 23 | 0 | 19 | 0 | 7 | 0 | 6 | 0 | 2 |
| Sept. | # | 18 | 19 | 7 | 39 | 10 | 38 | 5 | 19 | 5 |
| Oct. | # | 16 | 2 | 12 | 1 | 14 | 7 | 12 | 2 | 15 |
| Nov. | # | 46 | 25 | 31 | 53 | 39 | 53 | 35 | 25 | 33 |
| Dec. | # | 71 | 96 | 34 | 98 | 49 | 100 | 51 | 25 | 35 |
| Yearly | | 494 | 248 | 351 | 370 | 362 | 385 | 347 | 176 | 281 |

Missing record

T Trace

RAINFALL ON THE TIJUANA RIVER WATERSHED
IN MILLIMETERS

IN MEXICO

| | Valle de Palmas, Baja California | | Rodriguez Dam, Baja California | | | |
|--------|-------------------------------------|----------------------|-----------------------------------|----------------------|--|--|
| | 1997 | Average 1948-1997 | 1997 | Average 1938-1997 | | |
| Jan. | 88 | 45 | 73 | 46 | | |
| Feb. | 15 | 36 | 15 | 40 | | |
| Mar. | 0 | 40 | T | 44 | | |
| April | 5 | 15 | 5 | 18 | | |
| May | 0 | 3 | 0 | 3 | | |
| June | 4 | T | T | T | | |
| July | 2 | 2 | 0 | T | | |
| Aug. | 0 | 5 | 0 | 2 | | |
| Sept. | 24 | 6 | 30 | 6 | | |
| Oct. | T | 9 | T | 9 | | |
| Nov. | 26 | 21 | 25 | 24 | | |
| Dec. | 90 | 29 | 88 | 39 | | |
| Yearly | 254 | 202 | 236 | 231 | | |

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 1997.

IN THE UNITED STATES

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

IN MEXICO

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

@ Elevation above mean sea level

" Estimated from topographic maps

** Baja California State Office of the National Water Commission

EVAPORATION IN THE TIJUANA RIVER BASIN
IN MILLIMETERS

Tabulated below are records of evaporation observed at 3 stations in California and at 2 stations in Baja California, with averages for their periods of record. The stations in California are observed by Western Salt Company, City of San Diego, California, and the United States Section of the Commission; those in Baja California are observed by the Ministry of Agriculture and Hydraulic Resources of Mexico. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations on the Tijuana River Watershed" in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. October 1926 through 1997, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
2. Morena Reservoir: October 1915 through December 1921, square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 0.91-meter by 0.91-meter by 0.46-meter deep floating pan and a land pan of the same dimensions. September 1926 through 1997, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.
3. Lower Otay Dam: January 1950 through 1997, square 0.91-meter by 0.91-meter by 0.46-meter deep land pan set 0.38-meter in ground.

IN THE UNITED STATES

| Month | Morena Dam, California | | Barrett Dam, California | | Lower Otay Dam California | |
|--------|---------------------------|----------------------|----------------------------|----------------------|------------------------------|----------------------|
| | 1997 | Average 1916-1997 | 1997 | Average 1921-1997 | 1997 | Average 1950-1997 |
| Jan. | 87 | 55 | 31 | 48 | 47 | 50 |
| Feb. | 56 | 53 | 49 | 54 | 72 | 58 |
| Mar. | 90 | 82 | 87 | 84 | 119 | 86 |
| April | 116 | 118 | 107 | 117 | 150 | 119 |
| May | 174 | 164 | 152 | 163 | 184 | 154 |
| June | 157 | 211 | 152 | 201 | 196 | 176 |
| July | 200 | 242 | 180 | 237 | 220 | 210 |
| Aug. | 191 | 224 | 186 | 223 | 187 | 197 |
| Sept. | 149 | 179 | 142 | 181 | 161 | 163 |
| Oct. | 107 | 125 | 103 | 127 | 124 | 118 |
| Nov. | 58 | 80 | 49 | 79 | 70 | 72 |
| Dec. | 41 | 57 | 26 | 49 | 45 | 54 |
| Yearly | 1,426 | 1,590 | 1,264 | 1,563 | 1,575 | 1,457 |

IN MEXICO

| Month | Rodriguez Dam, Baja California | | El Carrizo, Baja California | |
|--------|-----------------------------------|----------------------|--------------------------------|----------------------|
| | 1997 | Average 1938-1997 | 1997 | Average 1980-1997 |
| Jan. | 64 | 102 | * | 140 |
| Feb. | 77 | 105 | * | 118 |
| Mar. | 143 | 111 | * | 144 |
| April | 160 | 141 | * | 185 |
| May | 204 | 130 | * | 223 |
| June | 197 | 191 | * | 277 |
| July | 195 | 215 | * | 299 |
| Aug. | 179 | 199 | * | 292 |
| Sept. | 152 | 166 | * | 248 |
| Oct. | 139 | 137 | * | 209 |
| Nov. | 63 | 109 | * | 159 |
| Dec. | 61 | 85 | * | 134 |
| Yearly | 1,634 | 1,711 | * | 2,417 |

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES CELSIUS

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

IN THE UNITED STATES

| Month | Barrett Dam, California | | | | Campo, California | | | | Chula Vista, California | | | |
|--------|-------------------------|------|------|--------------------------|-------------------|------|------|--------------------------|-------------------------|------|------|--------------------------|
| | 1997 | | | Average 1931- 1997 | 1997 | | | Average 1951- 1997 | 1997 | | | Average 1931- 1997 |
| | Mean | Max. | Min. | | Mean | Max. | Min. | | Mean | Max. | Min. | |
| Jan. | 8.6 | 23.3 | 1.1 | 9.7 | 9.2 | 23.3 | -3.9 | 8.7 | 14.6 | 28.3 | 2.2 | 12.1 |
| Feb. | 11.9 | 25.6 | 2.8 | 10.7 | 8.5 | 25.0 | -4.4 | 9.3 | 14.5 | 29.4 | 5.6 | 12.8 |
| Mar. | 15.6 | 31.7 | 1.7 | 12.1 | 12.6 | 33.3 | -3.3 | 10.1 | 17.2 | 33.9 | 4.4 | 13.5 |
| April | 15.4 | 31.7 | 2.2 | 14.6 | 13.3 | 31.7 | -1.7 | 12.3 | 17.3 | 27.2 | 5.6 | 15.0 |
| May | 21.6 | 37.2 | 8.3 | 17.2 | 19.3 | 36.1 | 3.3 | 15.1 | 20.2 | 31.7 | 12.8 | 16.3 |
| June | 19.7 | 35.0 | 10.6 | 20.5 | # | # | # | 18.6 | 20.1 | 25.0 | 14.4 | 17.7 |
| July | 22.9 | 39.4 | 10.6 | 24.5 | # | # | # | 22.7 | 21.1 | 27.8 | 14.4 | 19.8 |
| Aug. | 25.4 | 39.4 | 13.3 | 24.7 | 24.0 | 40.6 | 6.1 | 22.9 | 23.4 | 32.8 | 16.1 | 20.7 |
| Sept. | 25.2 | 37.8 | 11.1 | 22.6 | 22.6 | 39.4 | 5.0 | 20.5 | 24.4 | 33.9 | 15.6 | 20.1 |
| Oct. | 18.4 | 34.4 | 4.4 | 18.1 | 14.9 | 32.8 | -2.8 | 16.0 | 20.7 | 35.6 | 10.0 | 17.7 |
| Nov. | 14.9 | 33.9 | 2.8 | 13.4 | 11.9 | 32.2 | -2.2 | 11.5 | 17.6 | 35.6 | 7.2 | 14.9 |
| Dec. | 9.1 | 25.0 | -2.2 | 10.3 | 7.8 | 22.8 | -4.4 | 8.8 | 14.2 | 27.2 | 1.7 | 12.7 |
| Yearly | 17.4 | 39.4 | -2.2 | 16.5 | | | | 14.7 | 18.8 | 35.6 | 1.7 | 16.1 |

IN MEXICO

| Month | El Pinal, Baja California | | | | El Hongo, Baja California | | | | Ignacio Zaragoza, Baja California | | | |
|--------|---------------------------|------|-----------|------|---------------------------|------|-----------|------|-----------------------------------|------|-----------|------|
| | 1997 | | 1964-1997 | | 1997 | | 1981-1997 | | 1997 | | 1965-1997 | |
| | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| Jan. | # | # | 29 | -16 | 21 | -1 | 25 | -9 | 22 | -6 | 34 | -6 |
| Feb. | # | # | 31 | -10 | 22 | 1 | 27 | -1 | 24 | -4 | 32 | -6 |
| Mar. | # | # | 29 | -7 | 29 | 3 | 29 | -2 | 32 | -7 | 36 | -4 |
| April | # | # | 33 | -8 | 31 | 1 | 33 | -1 | 29 | -4 | 38 | -3 |
| May | # | # | 34 | -4 | 37 | 7 | 38 | 1 | 34 | 2 | 40 | 0 |
| June | # | # | 43 | -4 | 37 | 7 | 41 | 2 | 32 | 2 | 43 | 3 |
| July | # | # | 44 | 0 | 39 | 10 | 42 | 8 | 38 | 3 | 45 | 4 |
| Aug. | # | # | 44 | 0 | 38 | 10 | 41 | 3 | 40 | 7 | 45 | 5 |
| Sept. | # | # | 45 | -4 | 35 | 12 | 39 | 2 | 36 | 7 | 44 | 1 |
| Oct. | # | # | 40 | -5 | 31 | 3 | 37 | 0 | 33 | 1 | 40 | -6 |
| Nov. | # | # | 35 | -5 | 30 | 2 | 30 | -2 | 32 | -5 | 34 | -4 |
| Dec. | # | # | 29 | -10 | 21 | -2 | 27 | -8 | 19 | -7 | 33 | -7 |
| Yearly | # | # | 45 | -16 | 39 | -2 | 42 | -9 | 40 | -7 | 45 | -7 |

| Month | Tecate, Baja California | | | | El Carrizo, Baja California | | | | Valle de Palmas, Baja California | | | |
|--------|-------------------------|------|-----------|------|-----------------------------|------|-----------|------|----------------------------------|------|-----------|------|
| | 1997 | | 1946-1997 | | 1997 | | 1980-1997 | | 1997 | | 1948-1997 | |
| | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| Jan. | 25 | 0 | 38 | -9 | 25 | 3 | 32 | -1 | 27 | 1 | 33 | -11 |
| Feb. | 27 | -1 | 38 | -8 | 27 | 5 | 34 | -2 | 27 | 0 | 37 | -5 |
| Mar. | 36 | -1 | 36 | -5 | 37 | 4 | 37 | -4 | 35 | 0 | 38 | -2 |
| April | 32 | 1 | 39 | -2 | 33 | 3 | 41 | 3 | 33 | 2 | 41 | -2 |
| May | 38 | 6 | 42 | 1 | 37 | 12 | 42 | 5 | 40 | 5 | 44 | 2 |
| June | 39 | 7 | 44 | 0 | 36 | 11 | 42 | 9 | 38 | 7 | 48 | 4 |
| July | 41 | 7 | 46 | 2 | 37 | 11 | 46 | 8 | 42 | 7 | 49 | 7 |
| Aug. | 44 | 8 | 47 | 1 | 39 | 11 | 45 | 5 | 47 | 10 | 48 | 5 |
| Sept. | 41 | 9 | 46 | 2 | 40 | 5 | 42 | 5 | 41 | 8 | 47 | 4 |
| Oct. | 36 | 5 | 41 | -3 | 37 | 9 | 38 | 6 | 39 | 2 | 43 | 0 |
| Nov. | 36 | 2 | 36 | -3 | 35 | 7 | 35 | 4 | 37 | 1 | 38 | -7 |
| Dec. | 27 | 0 | 36 | -5 | 23 | 3 | 32 | -3 | 30 | 0 | 35 | -6 |
| Yearly | 44 | -1 | 47 | -9 | 40 | 3 | 46 | -4 | 47 | 0 | 49 | -11 |

Missing Data

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

1997

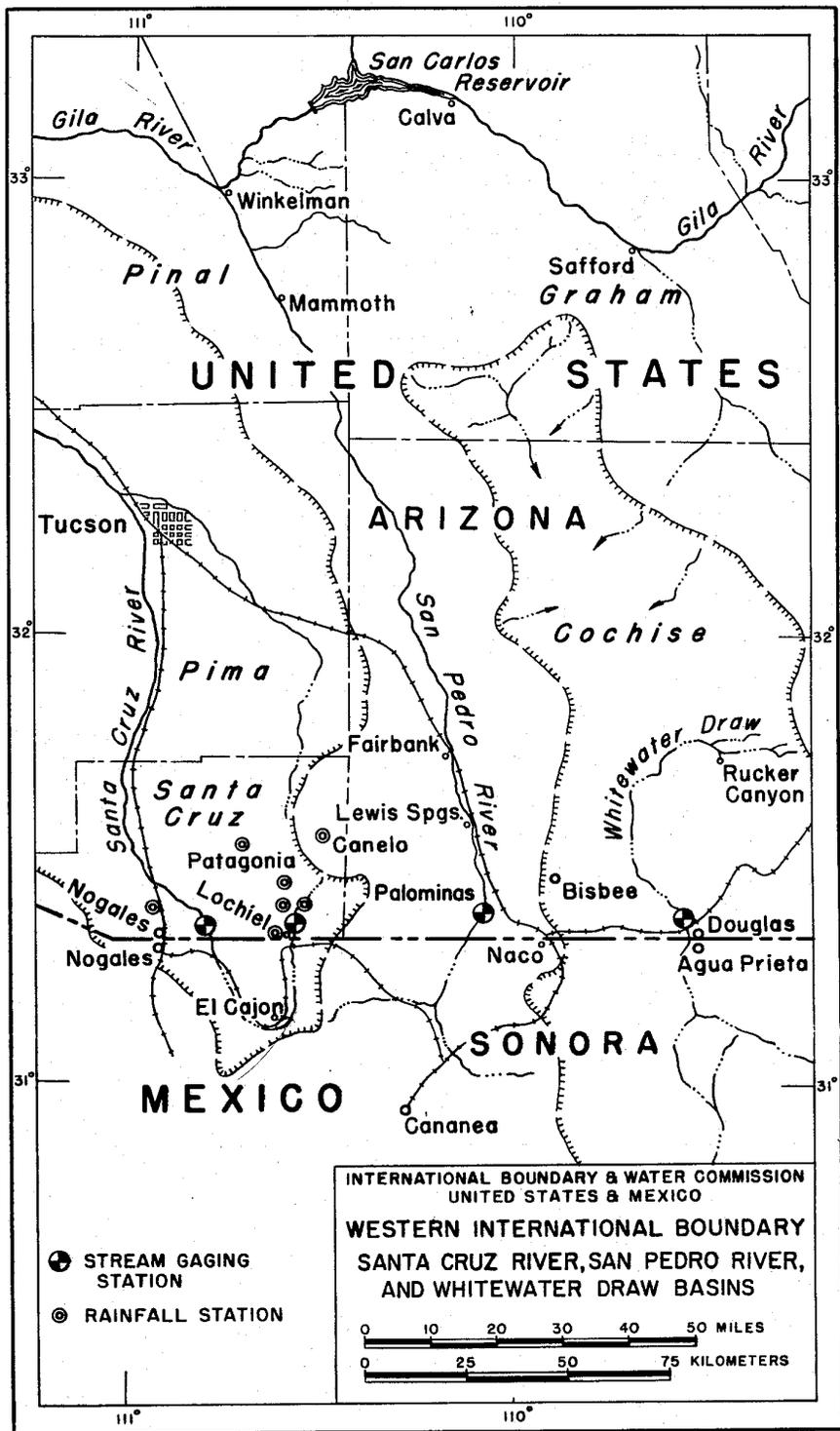
The total area within the Tijuana River basin is 4,484 square kilometers, as determined from the best available maps from both the United States and Mexico. The drainage areas shown below are tabulated according to their downstream sequence.

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by Mr. Art Letter, General Manager, Tia Juana Valley County Water District, or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Agriculture and Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana River basin in 1997 was by pumping from ground water.

| Designation of Areas | Drainage Basin-Square Kilometers | | | Irrigated Areas-Hectares | | |
|---|----------------------------------|--------|-------|--------------------------|--------|-------|
| | United States | Mexico | Total | United States | Mexico | Total |
| Cottonwood Creek above Morena Dam | 295 | 0 | 295 | 0 | | 0 |
| Morena Dam to Barrett Dam | 344 | 0 | 344 | 0 | | 0 |
| above Barrett Dam | 640 | 0 | 640 | 0 | | 0 |
| below Barrett Dam and above Tecate Creek | 168 | 0 | 168 | 0 | | 0 |
| above Tecate Creek | 808 | 0 | 808 | 0 | | 0 |
| Campo Creek above International Boundary | 220 | 10 | 230 | 0 | | 0 |
| Tecate Creek above International Boundary (not including Campo Creek) | 49 | 166 | 215 | 0 | | 0 |
| Cottonwood Creek above International Boundary Station | 1,070 | 176 | 1,246 | 0 | | 0 |
| Rio de las Palmas above Rodriguez Dam | 18 | 2,541 | 2,559 | 0 | (b) | 0 |
| Tijuana River above Nestor Gaging Station | 1,186 | 3,279 | 4,465 | 49 | | 49 |
| above the Mouth | 1,197 | 3,287 | 4,484 | (a) 289 | | 289 |

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

(b) There was no irrigation in 1997 in the Tijuana Irrigation District, Tijuana Valley, Baja California Mexico, from the Rodriguez Reservoir.



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

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Computations by shifting control methods. Records obtained and furnished by the U. S. Section of the Commission. Records fair. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), July 1930 to December 1933, May 1935 to July 1947, October 1947 through 1997 (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.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|-----|------|------|------|-------|------|------|------|
| 1 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 | 0.01 | 0 | 0 | 0 |
| 2 | .12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .31 | 0 | 0 |
| 3 | .12 | 0 | 0 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | 0 | 0 |
| 4 | .13 | 0 | 0 | 0 | 0 | 0 | 0 | 1.06 | 0 | 0 | 0 | 0 |
| 5 | .13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | .13 | 0 | 0 | 0 | 0 | 0 | 0 | 1.92 | 0 | 0 | 0 | 0 |
| 7 | .14 | 0 | 0 | 0 | 0 | 0 | 0 | 2.52 | 0 | .45 | 0 | 0 |
| 8 | .10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.76 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .98 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .08 | 2.95 | 0 | .02 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .80 | 1.16 | 0 | .05 | 0 |
| 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .12 | 0 | 0 | 0 | 0 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.03 | 0 | 0 | 0 | 0 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03 | .56 | 0 | 0 | 0 |
| 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .18 | 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 | .01 | 0 | 0 | 0 | 0 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | .02 | .08 | 0 | 0 | 0 | 0 |
| Sum | 0.99 | 0 | 0 | 0 | 0 | 0 | 0.02 | 7.68 | 4.86 | 6.50 | 0.07 | 0 |

Current Year 1997

Period 1936-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | 1.585 | 1.435 | 8 | 0.14 | 19 | 0 | 0.03 | 85.5 | 42.5 | 556 | 0 |
| Feb. | 1.435 | 1.435 | 11 | 0 | 11 | 0 | 0 | 0 | 19.9 | 163 | 0 |
| Mar. | 1.435 | 1.435 | 11 | 0 | 11 | 0 | 0 | 0 | 25.2 | 364 | 0 |
| April | 1.435 | 1.435 | 11 | 0 | 11 | 0 | 0 | 0 | 18.5 | 213 | 0 |
| May | 1.435 | 1.435 | 11 | 0 | 11 | 0 | 0 | 0 | 13.2 | 170 | 0 |
| June | 1.435 | 1.435 | 11 | 0 | 11 | 0 | 0 | 0 | 125 | 1,961 | 0 |
| July | 1.610 | 1.435 | 31 | .17 | 11 | 0 | 0 | 1.7 | 1,900 | 10,004 | 0 |
| Aug. | 2.375 | 1.380 | 7 | 4.79 | 11 | 0 | .25 | 664 | 3,096 | 17,861 | 0 |
| Sept. | 2.430 | 1.380 | 14 | 6.80 | 11 | 0 | .16 | 420 | 818 | 3,910 | 0 |
| Oct. | 2.415 | 1.380 | 8 | 7.16 | 11 | 0 | .21 | 562 | 389 | 7,528 | 0 |
| Nov. | 1.610 | 1.380 | 113 | .22 | 11 | 0 | 0 | 6.0 | 49.9 | 434 | 0 |
| Dec. | 1.380 | 1.380 | 11 | 0 | 11 | 0 | 0 | 0 | 132 | 2,915 | 0 |
| Yearly | 2.430 | 1.380 | | 7.16 | | 0 | 0.06 | 1,739 | 6,629 | 27,533 | 0 |

φ Mean daily

! And other days

SEWAGE INFLUENT, DOUGLAS, ARIZONA
INTERNATIONAL TREATMENT PLANT

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

RECORDS: Continuous monthly records since March 1948; daily records from March 18, 1948 through 1950 and from January 1952 through 1997.

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

| Month | Total Monthly Flows | | | Mean Daily Flows—Thousand Cubic Meters Per Day | | | | | |
|--------|-----------------------|--------|-------|--|---------|------|------------------|---------|------|
| | Thousand Cubic Meters | | | Current Year 1997 | | | Period 1952-1997 | | |
| | U.S. | Mexico | Total | Maximum | Minimum | Mean | Maximum | Minimum | Mean |
| Jan. | 128 | 0 | 128 | 5.7 | 3.4 | 4.1 | 9.6 | 1.6 | 4.4 |
| Feb. | 120 | 0 | 120 | 6.8 | 3.3 | 4.3 | 17.7 | 2.1 | 4.4 |
| Mar. | 136 | 0 | 136 | 6.7 | 3.4 | 4.4 | 13.9 | 2.2 | 4.4 |
| April | 135 | 0 | 135 | 6.1 | 3.3 | 4.5 | 12.9 | 1.4 | 4.4 |
| May | 139 | 0 | 139 | 6.3 | 3.1 | 4.5 | 12.2 | 1.9 | 4.4 |
| June | 133 | 0 | 133 | 6.8 | 2.2 | 4.4 | 9.5 | 2.1 | 4.5 |
| July | 142 | 0 | 142 | 6.6 | 2.7 | 4.6 | 14.1 | 1.8 | 4.7 |
| Aug. | 157 | 0 | 157 | 10.0 | 3.0 | 5.1 | 10.2 | 1.4 | 4.7 |
| Sept. | 138 | 0 | 138 | 5.9 | 3.5 | 4.6 | 9.6 | 1.8 | 4.6 |
| Oct. | 136 | 0 | 136 | 7.9 | 3.0 | 4.4 | 12.0 | 2.3 | 4.5 |
| Nov. | 128 | 0 | 128 | 7.7 | 2.3 | 4.3 | 10.9 | 1.2 | 4.5 |
| Dec. | 142 | 0 | 142 | 5.2 | 3.2 | 4.6 | 12.6 | 1.9 | 4.5 |
| Yearly | 1,634 | 0 | 1,634 | 10.0 | 2.2 | 4.5 | 17.7 | 1.2 | 4.5 |

09-4705.00 SAN PEDRO RIVER AT PALOMINAS, ARIZONA

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

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through 1997. Records obtained and furnished by U. S. Geological Survey prior to October 1, 1981 and from October 1, 1995 through 1997, and by the United States Section of the Commission from October 1, 1981 through September 30, 1995.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|-----|------|------|------|-------|-------|------|------|
| 1 | 0.05 | 0.07 | 0.10 | 0.07 | 0 | 0 | 0 | 0.01 | 0 | 0 | 0 | 0.01 |
| 2 | .05 | .07 | .10 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 3 | .05 | .07 | .10 | .06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 4 | .05 | .07 | .10 | .07 | 0 | 0 | 0 | .71 | 0 | 0 | 0 | .01 |
| 5 | .05 | .07 | .09 | .07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 |
| 6 | .06 | .07 | .09 | .06 | 0 | 0 | 0 | .01 | 0 | 0 | 0 | .01 |
| 7 | .06 | .07 | .09 | .05 | 0 | 0 | 0 | 0 | 0 | 30.6 | 0 | .59 |
| 8 | .05 | .07 | .09 | .05 | 0 | 0 | 0 | .93 | 0 | 24.6 | 0 | .59 |
| 9 | .05 | .07 | .08 | .03 | 0 | 0 | 0 | .59 | 0 | 1.47 | 0 | .13 |
| 10 | .06 | .07 | .08 | .03 | 0 | 0 | 0 | .03 | .12 | .82 | 0 | .09 |
| 11 | .06 | .07 | .08 | .03 | 0 | 0 | 0 | 0 | .01 | .57 | 0 | .06 |
| 12 | .06 | .08 | .08 | .03 | 0 | 0 | 0 | 0 | 0 | .40 | 0 | .05 |
| 13 | .06 | .08 | .08 | .03 | 0 | 0 | 0 | 0 | .04 | .28 | 0 | .04 |
| 14 | .06 | .08 | .08 | .02 | 0 | 0 | 0 | .18 | 0 | .20 | .01 | .03 |
| 15 | .06 | .08 | .08 | .02 | 0 | 0 | 0 | .02 | 0 | .13 | .04 | .03 |
| 16 | .06 | .08 | .08 | .02 | 0 | 0 | 0 | 0 | 0 | .08 | .01 | .03 |
| 17 | .06 | .08 | .08 | .02 | 0 | 0 | 0 | 0 | 0 | .05 | .01 | .03 |
| 18 | .06 | .08 | .08 | .02 | 0 | 0 | 0 | 1.22 | 0 | .04 | 0 | .03 |
| 19 | .06 | .08 | .07 | .01 | 0 | 0 | 0 | .48 | 0 | .03 | 0 | .03 |
| 20 | .06 | .08 | .07 | .01 | 0 | 0 | 0 | .02 | .06 | .02 | 0 | .05 |
| 21 | .06 | .08 | .07 | .01 | 0 | 0 | 0 | 0 | 13.7 | .01 | 0 | .04 |
| 22 | .06 | .08 | .07 | .01 | 0 | 0 | 0 | 0 | 14.2 | .01 | 0 | 2.01 |
| 23 | .06 | .08 | .07 | 0 | 0 | 0 | 0 | .37 | .28 | .01 | 0 | 1.30 |
| 24 | .07 | .08 | .06 | .01 | 0 | 0 | 0 | .45 | .08 | .01 | 0 | .24 |
| 25 | .07 | .08 | .06 | .01 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | .16 |
| 26 | .07 | .08 | .06 | .01 | 0 | 0 | 0 | 0 | .01 | 0 | 0 | .14 |
| 27 | .07 | .09 | .07 | .01 | 0 | 0 | 0 | 0 | .01 | 0 | 0 | .12 |
| 28 | .07 | .10 | .06 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .10 |
| 29 | .07 | .06 | .06 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .09 |
| 30 | .07 | .05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .01 | .07 |
| 31 | .07 | .06 | .06 | 0 | 0 | 0 | .23 | 0 | 0 | 0 | 0 | .07 |
| Sum | 1.87 | 2.16 | 2.39 | 0.84 | 0 | 0 | 0.23 | 5.02 | 28.53 | 59.33 | 0.10 | 6.18 |

Current Year 1997

Period 1951-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-------|---------------------------------|------|-----|------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | High | Day | Low | | Total | Average | Maximum | Minimum |
| Jan. | 0.820 | 0.810 | 1 6 | 0.07 | 1 1 | 0.05 | 0.06 | 162 | 2,479 | 35,987 | 3.2 |
| Feb. | .835 | .815 | 28 | .11 | 1 1 | .07 | .08 | 187 | 1,027 | 8,343 | 3.7 |
| Mar. | .835 | .795 | 2 | .11 | 30 | .05 | .08 | 206 | 898 | 9,129 | 16.4 |
| April | .815 | .745 | 4 | .07 | 30 | .01 | .03 | 72.6 | 206 | 1,282 | 0 |
| May | .745 | .665 | 1 1 | 0 | 1 1 | 0 | 0 | 0 | 68.8 | 502 | 0 |
| June | .665 | .650 | 1 1 | 0 | 1 1 | 0 | 0 | 0 | 146 | 1,716 | 0 |
| July | 1.210 | .645 | 31 | 3.40 | 1 1 | 0 | .01 | 19.9 | 5,500 | 21,263 | 0 |
| Aug. | 1.440 | .575 | 8 | 7.79 | 1 2 | 0 | .16 | 434 | 8,842 | 44,860 | 204 |
| Sept. | 3.015 | .725 | 22 | 98.8 | 1 1 | 0 | .95 | 2,465 | 2,134 | 20,160 | 13.9 |
| Oct. | 3.675 | .595 | 8 | 172 | 1 1 | 0 | 1.91 | 5,126 | 2,108 | 58,371 | 0 |
| Nov. | .800 | .595 | 14 | .18 | 1 1 | 0 | 0 | 8.6 | 689 | 19,006 | 0 |
| Dec. | 1.355 | .700 | 22 | 5.86 | 1 1 | .01 | .20 | 534 | 2,051 | 31,428 | 7.6 |
| Yearly | 3.675 | 0.575 | | 172 | | 0 | 0.29 | 9,215 | 26,149 | 77,448 | 5,427 |

! And other days

09-4800.00 SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

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

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through 1997.

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

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|------|------|------|-------|-------|------|------|------|
| 1 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0 | 0 | 0.05 | 0.05 | 0.01 | 0.06 |
| 2 | .02 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | .04 | .03 | .01 | .05 |
| 3 | .01 | .02 | .01 | .03 | .01 | .01 | 0 | 0 | .03 | .01 | .01 | .05 |
| 4 | .01 | .02 | .01 | .03 | .01 | .01 | 0 | 0 | .04 | .01 | .01 | .05 |
| 5 | .02 | .02 | .01 | .03 | .01 | .01 | 0 | 0 | .04 | .01 | .01 | .05 |
| 6 | .02 | .02 | .01 | .03 | 0 | .01 | 0 | 0 | .07 | .01 | .01 | .05 |
| 7 | .02 | .02 | .01 | .02 | 0 | .01 | 0 | 0 | .05 | .01 | .01 | .07 |
| 8 | .02 | .02 | .01 | .01 | 0 | .01 | 0 | 0 | .05 | .01 | .01 | .05 |
| 9 | .02 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | .04 | .01 | .01 | .05 |
| 10 | .02 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | .05 | .01 | .01 | .05 |
| 11 | .02 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | 4.96 | .01 | .02 | .05 |
| 12 | .02 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | 1.95 | .01 | .02 | .05 |
| 13 | .02 | .01 | .01 | .02 | .01 | .01 | 0 | .01 | .10 | .01 | .03 | .05 |
| 14 | .02 | .01 | .01 | .02 | .01 | .01 | 0 | .01 | .08 | .01 | .02 | .05 |
| 15 | .02 | .01 | .01 | .02 | 0 | .01 | 0 | .02 | .07 | .01 | .02 | .05 |
| 16 | .02 | .01 | .02 | .02 | 0 | .01 | 0 | .03 | .06 | .01 | .02 | .05 |
| 17 | .02 | .01 | .03 | .01 | 0 | .01 | 0 | .02 | .05 | 0 | .02 | .04 |
| 18 | .02 | .01 | .02 | .01 | .01 | 0 | 0 | 1.25 | .03 | 0 | .02 | .03 |
| 19 | .02 | .01 | .01 | .01 | .01 | 0 | .51 | .27 | .01 | 0 | .02 | .04 |
| 20 | .02 | .01 | .01 | .01 | .01 | 0 | .10 | .03 | .02 | .01 | .02 | .03 |
| 21 | .02 | .01 | .01 | .01 | .02 | 0 | .01 | .02 | .01 | .01 | .03 | .02 |
| 22 | .02 | .01 | .01 | .01 | .02 | 0 | .01 | .02 | .02 | .01 | .03 | .05 |
| 23 | .02 | .01 | .02 | .01 | .01 | 0 | .01 | .01 | .03 | .01 | .03 | .02 |
| 24 | .02 | .01 | .03 | .01 | .01 | 0 | 0 | 3.48 | .03 | .01 | .03 | .03 |
| 25 | .02 | .01 | .01 | .01 | .01 | 0 | .01 | .10 | .04 | .01 | .03 | .03 |
| 26 | .02 | .01 | .01 | .01 | .01 | 0 | 0 | .04 | .05 | .01 | .03 | .02 |
| 27 | .02 | .01 | .02 | .01 | .01 | 0 | 0 | .04 | .03 | .01 | .04 | .02 |
| 28 | .02 | .02 | .01 | .01 | .01 | 0 | 0 | 5.07 | .02 | .01 | .04 | .02 |
| 29 | .02 | .01 | .01 | .01 | .02 | 0 | .01 | .40 | .01 | .01 | .04 | .02 |
| 30 | .02 | .01 | .01 | .01 | .01 | 0 | 0 | .08 | .02 | .01 | .04 | .02 |
| 31 | .02 | .01 | .02 | .01 | .01 | 0 | 0 | .07 | .01 | .01 | .04 | .02 |
| Sum | 0.60 | 0.41 | 0.41 | 0.49 | 0.28 | 0.17 | 0.66 | 11.02 | 8.05 | 0.34 | 0.65 | 1.24 |

Current Year 1997

Period 1949-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|-----|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | 1 | 0.02 | 1 | 0.01 | 0.02 | 51.8 | 367 | 8,822 | 1.6 |
| Feb. | | | 1 | .02 | 113 | .01 | .01 | 35.4 | 128 | 1,233 | 2.2 |
| Mar. | | | 117 | .03 | 1 | .01 | .01 | 35.4 | 144 | 2,594 | .9 |
| April | | | 1 | .03 | 1 | .01 | .02 | 42.3 | 66.5 | 638 | 0 |
| May | | | 121 | .02 | 1 | 0 | .01 | 24.2 | 33.8 | 210 | 0 |
| June | | | 1 | .01 | 118 | 0 | .01 | 14.7 | 23.2 | 208 | 0 |
| July | | | 19 | .51 | 1 | 0 | .02 | 57.0 | 566 | 5,267 | 2.0 |
| Aug. | | | 28 | 5.07 | 1 | 0 | .36 | 952 | 1,156 | 14,207 | .1 |
| Sept. | | | 11 | 4.96 | 119 | .01 | .27 | 696 | 363 | 3,249 | 0 |
| Oct. | | | 1 | .05 | 117 | 0 | .01 | 29.4 | 332 | 5,837 | 0 |
| Nov. | | | 127 | .04 | 1 | .01 | .02 | 56.2 | 75.5 | 497 | 0 |
| Dec. | | | 7 | .07 | 121 | .02 | .04 | 107 | 135 | 1,348 | 0 |
| Yearly | | | | 5.07 | | 0 | 0.07 | 2,101 | 3,390 | 21,433 | 155 |

φ Mean daily

! And other days

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 8.9 kilometers east of Nogales, Arizona, 1.3 kilometer downstream from the international boundary and 9.7 kilometers upstream from the Santa Cruz bridge on State Highway No. 82. Zero of gage is 1,128.54 meters above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on current meter measurements, observations of no flow, and a continuous record of gage heights. Records obtained and furnished by the U. S. Geological Survey. Records available: March to November 1907 and April 1909 to December 1912 (discharge measurements and fragmentary gage height record); January 1913 to June 1922 (October 1915 to September 1916, monthly discharges only); May 1930 to December 1933; and July 1935 through 1997.

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 1994.

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

MEAN DAILY DISCHARGE IN CUBIC METERS PER SECOND 1997 --- ANNUAL AND PERIOD SUMMARY

| Day | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-----|------|------|------|-------|-----|------|------|------|-------|------|------|------|
| 1 | 0.02 | 0 | 1.90 | 0 | 0 | 0 | 0 | 0 | 4.47 | 0.08 | 0 | 0 |
| 2 | .01 | 0 | 1.56 | 0 | 0 | 0 | 0 | 0 | .09 | 0 | 0 | 0 |
| 3 | .01 | 0 | .18 | 0 | 0 | 0 | 0 | 0 | .03 | 0 | 0 | 0 |
| 4 | .01 | 0 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | .02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.56 | 0 | 0 | 0 |
| 8 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .22 | 0 | 0 | 0 |
| 9 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .07 | 0 | 0 | 0 |
| 10 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .02 | 0 | 0 | 0 | 0 |
| 13 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .48 | .10 | 0 | 0 | 0 |
| 14 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .71 | 0 | 0 | 0 | 0 |
| 16 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .08 | 0 | 0 | 0 | 0 |
| 17 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .07 | 0 | 0 | 0 | .01 |
| 23 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03 | 0 | 0 | 0 |
| 24 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | .18 | 0 | 0 | 0 | .10 |
| 26 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .48 |
| 27 | .01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .17 |
| 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03 | 0 | 0 | 0 | .04 |
| 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.10 | 0 | 0 | 0 | .01 |
| 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.18 | 0 | 0 | 0 | 0 |
| Sum | 0.28 | 0 | 3.65 | 0 | 0 | 0 | 0 | 7.85 | 6.57 | 0.08 | 0 | 0.81 |

Current Year 1997

Period 1936-1997

| Month | Extreme Gage Meters | | Extreme-Cubic Meters per Second | | | | Average | Volume-Thousand Cubic Meters | | | |
|--------|---------------------|-----|---------------------------------|--------|------|-------|---------|------------------------------|---------|---------|---------|
| | High | Low | Day | φ High | Day | φ Low | | Total | Average | Maximum | Minimum |
| | | | | | | | | | | | |
| Jan. | | | ! 1 | 0.02 | ! 12 | 0 | 0.01 | 24.2 | 3,048 | 37,352 | 0 |
| Feb. | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 2,190 | 25,344 | 0 |
| Mar. | | | ! 1 | 1.90 | ! 5 | 0 | .12 | 315 | 1,952 | 24,145 | 0 |
| April | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 558 | 4,263 | 0 |
| May | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 142 | 1,272 | 0 |
| June | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 96.7 | 1,787 | 0 |
| July | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 3,042 | 19,255 | 0 |
| Aug. | | | 31 | 5.18 | ! 1 | 0 | .25 | 678 | 6,395 | 56,481 | 12.1 |
| Sept. | | | ! 1 | 4.47 | ! 4 | 0 | .22 | 568 | 1,799 | 111,633 | 0 |
| Oct. | | | ! 1 | .08 | ! 2 | 0 | 0 | 6.9 | 2,128 | 72,806 | 0 |
| Nov. | | | ! 1 | 0 | ! 1 | 0 | 0 | 0 | 624 | 9,108 | 0 |
| Dec. | | | 26 | .48 | ! 1 | 0 | .03 | 70.0 | 2,923 | 41,405 | 0 |
| Yearly | | | | 5.18 | | 0 | 0.05 | 1,662 | 24,898 | 108,071 | 1,662 |

φ Mean daily

! And other days

SEWAGE INFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

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

RECORDS: Flows from the United States are deduced from total plant influent less the flows measured crossing the international boundary from Mexico. Records available: Continuous monthly record for plant influent since August 1951; daily records for plant influent, January 1952 through 1997.

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

| Month | Total Monthly Flows Thousand Cubic Meters | | | | Daily Flows—Thousand Cubic Meters Per Day | | | | | |
|--------|--|--------|--------|--------|---|---------|------|------------------|---------|------|
| | U.S. | Mexico | Plant* | Total | Current Year 1997 | | | Period 1952-1997 | | |
| | | | | | Maximum | Minimum | Mean | Maximum | Minimum | Mean |
| Jan. | 1,114 | 495 | 0 | 1,609 | 37.5 | 45.1 | 51.9 | 93.0 | 2.5 | 22.3 |
| Feb. | 976 | 411 | 0 | 1,387 | 69.2 | 43.2 | 47.8 | 80.4 | 2.5 | 22.8 |
| Mar. | 1,083 | 413 | 0 | 1,496 | 64.3 | 40.6 | 48.3 | 85.7 | 2.8 | 22.6 |
| April | 968 | 416 | 0 | 1,384 | 57.6 | 42.4 | 46.1 | 69.2 | 2.6 | 21.4 |
| May | 1,018 | 407 | 0 | 1,425 | 49.0 | 42.1 | 46.0 | 59.4 | 2.1 | 20.1 |
| June | 892 | 367 | 0 | 1,259 | 45.5 | 37.9 | 42.0 | 62.5 | 2.6 | 18.7 |
| July | 846 | 377 | 0 | 1,223 | 45.3 | 34.0 | 39.5 | 58.2 | 2.6 | 19.5 |
| Aug. | 887 | 514 | 0 | 1,401 | 57.5 | 34.4 | 45.2 | 64.6 | 2.8 | 21.0 |
| Sept. | 1,028 | 520 | 0 | 1,548 | 58.3 | 43.9 | 51.6 | 61.1 | 3.0 | 22.3 |
| Oct. | 1,034 | 640 | 0 | 1,674 | 66.0 | 49.3 | 54.0 | 76.3 | 2.6 | 22.3 |
| Nov. | 901 | 580 | 0 | 1,481 | 57.4 | 44.2 | 49.4 | 81.8 | 3.0 | 22.0 |
| Dec. | 1,005 | 628 | 0 | 1,633 | 71.7 | 45.8 | 52.7 | 75.9 | 1.3 | 22.3 |
| Yearly | 11,752 | 5,768 | 0 | 17,520 | 71.7 | 34.0 | 48.0 | 93.0 | 1.3 | 21.4 |

* Nogales Wash Pumping Plant

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED
IN MILLIMETERS

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

IN THE UNITED STATES

| Month | San Rafael #2, Arizona | | Canelo, Arizona | | Patagonia, Arizona | | Nogales Sanitation Plant 6N, Arizona | | | |
|--------|---------------------------|----------------------|--------------------|----------------------|-----------------------|----------------------|---|----------------------|--|--|
| | 1997 | Average 1973-1997 | 1997 | Average 1930-1997 | 1997 | Average 1930-1997 | 1997 | Average 1953-1997 | | |
| Jan. | 51 | 47 | 51 | 33 | 32 | 34 | 11 | 32 | | |
| Feb. | 74 | 36 | 37 | 28 | 35 | 28 | 17 | 23 | | |
| Mar. | 0 | 33 | 5 | 23 | 0 | 25 | 10 | 24 | | |
| April | 13 | 13 | 17 | 10 | 12 | 10 | 13 | 9 | | |
| May | 29 | 9 | 14 | 5 | 12 | 5 | 8 | 6 | | |
| June | 0 | 14 | 0 | 18 | 2 | 11 | 0 | 10 | | |
| July | 56 | 117 | 37 | 103 | 24 | 108 | 29 | 113 | | |
| Aug. | 126 | 102 | 143 | 107 | 156 | 106 | 140 | 105 | | |
| Sept. | 49 | 58 | 37 | 44 | 78 | 45 | 29 | 41 | | |
| Oct. | 22 | 33 | 21 | 26 | 11 | 28 | 4 | 32 | | |
| Nov. | 24 | 25 | 23 | 21 | 20 | 21 | 23 | 18 | | |
| Dec. | 55 | 44 | 83 | 37 | 102 | 39 | 92 | 39 | | |
| Yearly | 499 | 531 | 468 | 455 | 484 | 460 | 376 | 452 | | |

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 1997.

IN THE UNITED STATES

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

S Standard 203 millimeter rain gage

TEMPERATURE IN THE SANTA CRUZ RIVER BASIN
IN DEGREES CELSIUS

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

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

| Nogales Sanitation Plant - 9N | | | |
|-------------------------------|------|------|------|
| 1997 | | | |
| Month | Mean | Max. | Min. |
| Jan. | 7.7 | 23.9 | -7.2 |
| Feb. | 8.2 | 25.6 | -9.4 |
| Mar. | 13.7 | 30.6 | -4.4 |
| April | 14.2 | 31.1 | -0.6 |
| May | 21.6 | 37.8 | 5.6 |
| June | 22.9 | 38.3 | 8.3 |
| July | 26.7 | 41.1 | 12.2 |
| Aug. | 26.3 | 37.2 | 16.7 |
| Sept. | 24.8 | 36.7 | 11.7 |
| Oct. | 17.0 | 36.1 | -1.1 |
| Nov. | 12.3 | 30.6 | -3.3 |
| Dec. | 5.9 | 22.8 | -6.1 |
| Yearly | 16.8 | 41.1 | -9.4 |

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

1997

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

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

