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Mexicali, Baja California

WESTERN WATER BULLETIN 1967

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

COLORADO RIVER

TIJUANA RIVER

SANTA CRUZ RIVER

WHITEWATER DRAW

1967

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FOREWORD

This bulletin is the eighth annual compilation of stream discharges and other hydrographic data relating to the international aspects of the Colorado River below Imperial Dam, the Tijuana River and other streams crossing the western land boundary. 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 volume contains the information for the year 1967.

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

Colorado River below Imperial Dam

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

The ordinary flows of Colorado River below Imperial Dam are largely controlled by releases at Hoover Dam, completed in 1935. The releases are further regulated at Davis Dam, completed in 1950, and by Parker and Imperial Dams, completed in 1938. Small amounts of runoff may occasionally be contributed to the flow in the lower river from the usually dry arroyos draining the 10,900 square miles along the river from Hoover Dam to the mouth of the Gila River, not including 5,500 square miles in the Bill Williams River watershed. In addition, flows ranging from usually minor amounts to infrequent torrential floods may enter the lower Colorado River from the Bill Williams River and from the Gila River, draining about 7,300 square miles below Painted Rock Dam and Reservoir, completed in January 1960.

At Imperial Dam, diversions are made to Gila Gravity Main Canal and All-American Canal for irrigation projects in Arizona, including the Yuma Valley, Gila and Wellton-Mohawk projects, and in California, including the Imperial Valley, Coachella Valley and Reservation Division of Yuma Project. Also, under the provisions ot 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 guaranteed annual allotment of waters of the Colorado River. No such diversions were made in 1967.

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

In the limitrophe section of the river, 1.1 miles downstream from the northerly boundary, Morelos Dam, the principal diversion structure for Mexico, was completed and placed in operation on November 8, 1950. Since that date all of Mexico's guaranteed treaty allotment of Colorado River water has been delivered in the limitrophe section of the river. The greater portion of such deliveries has been diverted to the Alamo Canal at Morelos Dam.

Tijuana River Basin

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

Whitewater Draw near Douglas, Arizona

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

San Pedro River at Palominas, Arizona

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

FOREWORD

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 returns to the United States near Nogales, Arizona, eventually discharging into the Gila River southwest of Phoenix, Arizona. The drainage area of the Santa Cruz River above Nogales station is 533 square miles. Of this amount, 349 square miles lie in Mexico. There are a few ground water irrigation diversions above the Lochiel station in Arizona and an unknown amount of water diverted for irrigation in Mexico.

Acknowledgments

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

Units of Measure

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

METRIC UNITS		ENGLISH UNITS
	LENGTHS	
1 Centimeter		0.393701 Inch
1 Meter		3.28084 Feet
1 Kilometer		0.621371 Mile
	AREAS	
1 Square Meter		10.76391 Square Feet
1 Hectare		2.471054 Acres
1 Square Kilometer		0.386102 Square Mile
	VOLUME	
1 Cubic Meter		61023.74 Cubic Inches
1 Cubic Meter		35.31467 Cubic Feet
1 Cubic Meter		1.30795 Cubic Yards
1000 Cubic Meters		0.81071 Acre-Foot
1 Liter		0.264172 U. S. Gallon
	WEIGHTS	
1 Kilogram		2.204623 Pounds
1 Metric Ton		2204.623 Pounds
1 Metric Ton		1.102311 Short Tons (2000 lbs.)

GENERAL HYDROLOGIC CONDITIONS FOR 1967

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 1967. The average seasonal (October 1966-September 1967) rainfall over the upper basin, as gaged at 13 index stations, was about 15.10 inches compared to a seasonal average of about 13.80 inches for the 45 seasons (1923-1967). In the lower basin of the Colorado River in Mexico, from Morelos Diversion Dam to the Gulf of California, the average precipitation (1967) measured at 6 index stations was 3.98 inches compared to an average of 1.97 inches during the last 9 years (1959 to 1967).

The flow of the Colorado River reaching Imperial Dam was 5,615,600 acre-feet, about 65% of the 33-year average (1935-1967) of 8,659,403 acre-feet. At the northerly international boundary, the total flow of the river during 1967 was 1,322,572 acre-feet, about 32% of the 1935-1967 average of 4,166,709 acre-feet. At the southerly international boundary, the flow during 1967 was only 93,418 acre-feet, or about 3% of the 1935-1967 average of 3,407,316 acre-feet. The total flow of the Colorado River reaching the El Marítimo gaging station, 47.9 miles downstream from the southerly international boundary, and 18.6 miles downstream from the Sonora-Baja California railroad bridge, was 91,184 acre-feet in 1967, about 46% of the 1960-1967 average of 199,428 acre-feet.

The total of all flows of the Colorado River entering Mexico in 1967 amounted to 1,558,977 acre-feet, 32% of the 1935-1967 average of 4,847,962 acre-feet, as measured 1) in the Colorado River at the northerly international boundary, 2) in the Wellton-Mohawk Main Outlet Drain Extension near Morelos Dam, 3) in the wasteways that discharge into the limitrophe section of the river from the United States bank, and 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, less diversions in the United States by pumps in the limitrophe section.

No flood peaks of importance occurred in streams of the lower Colorado River basin during 1967. A maximum instantaneous flow of 7,020 second-feet occurred in the Colorado River at the northerly boundary station September 4.

Stored waters at the end of the year in the three major reservoirs on the Colorado River below Lee's Ferry amounted to 16,616,000 acre-feet, 58% of the usable capacity of 28,588,400 acre-feet. The greater part (14,338,000 acre-feet) of the storage was contained in Lake Mead (Hoover Dam). There were no reported shortages of Colorado River water for irrigation during 1967 due to drought or accident to the irrigation system.

The total reported acreage irrigated from waters of the Colorado River below Imperial Dam in 1967 was 1,098,372 acres; 658,087 acres in the United States and 440,285 acres in Mexico. An estimated one-third of acreage in Mexico is served by pumping from ground water.

The suspended sediment load passing the northerly boundary station in 1967 was 71.8 acre-feet, about 20% of the 1956-1967 average of 360 acre-feet.

Tijuana River Basin

During 1967 the temperatures at Barrett Dam, California (elevation 1,750 feet) in the upper portion of the basin in the United States averaged 0.8 degree below the 37-year mean. In the extreme upper portion of the basin in Mexico at San Juan de Dios, Baja California (elevation 3,280 feet), the recorded temperatures during the year averaged 54 degrees, 2 degrees below the long-term average, and at Rodríguez Dam, Baja California (elevation 459 feet), the recorded temperatures averaged 63 degrees, equal to the 22-year normal.

At Barrett Dam in the upper portion of the basin in the United States, the recorded precipitation was 17.57 inches, 100% of normal, and at Chula Vista near the lower end of the basin, 11.34 inches, or 115% of normal. The recorded precipitation at San Juan de Dios in the upper portion of the basin in Mexico, was 16.26 inches, approximately 98% of the normal during the 12-year period, and at Rodríguez Dam in the lower portion of the basin in Mexico, 12.28 inches, 150% of the 30-year average.

Runoff in the basin during 1967 averaged less than 8% of normal. Above Morena Reservoir the runoff was 501 acre-feet, or about 8% of the 31-year 1937-1967 mean of 6,415 acre-feet. At Rodríguez Reservoir, the runoff was 1,143 acre-feet, or about 7% of the 30-year mean of 15,359 acre-feet.

The flow of the Tijuana River at the international boundary was 753 acre-feet during 1967, and the flow in the Tijuana River near Nestor was 213 acre-feet.

Whitewater Draw

During 1967, the average annual temperature over the watershed was slightly below normal, while the annual precipitation was above normal. Runoff for the year at the gaging station near Douglas, Arizona, of 10,397 acre-feet was about 140% of average.

GENERAL HYDROLOGIC CONDITIONS FOR 1967

San Pedro River

During 1967, the average annual temperature was below normal. The annual precipitation, as measured at Coronado National Monument Headquarters, was 120% of the 1961 - 1967 mean of 20.70 inches. The stream flow at the international boundary was 27,123 acre-feet, 116% of the 1951 - 1967 normal.

Santa Cruz River

During 1967, the average annual temperature over the watershed was somewhat below normal and the annual precipitation was about 126% of the 29-year 1939 - 1967 mean. Runoff measured at the Nogales gaging station where the stream re-enters the United States was 35,720 acre-feet. The total runoff for the year measured at the gaging station near Lochiel, Arizona, where the stream enters Mexico from the United States was 2,530 acre-feet. Therefore, neglecting stream flow depletions in Mexico, the records indicate a contribution of about 33,190 acre-feet from the loop of the river lying in Mexico, or approximately 93% of the flows reaching the Nogales station.

Alamo and New Rivers

During 1967, the average annual temperature over the drainage areas of the Alamo and New Rivers, as recorded at El Centro, California, and at Mexicali, Baja California, was 71.3 and 72.0 degrees, respectively, 1.0 and 0 degrees below the respective normals.

At El Centro, the precipitation was 4.39 inches, about 170% of the 37-year average, and in Mexicali the annual precipitation was 4.17 inches, 138% of the 42-year average. The total flow of the New River at the international boundary in 1967 was 96,899 acre-feet which was about 139% of the 1953 - 1967 normal.

Salton Sea

During 1967, the average annual temperature around the Salton Sea was about 98% of the long-term average while the annual precipitation recorded at Brawley, California, was approximately 233% of the long-term mean of 2.36 inches. The water surface of the Salton Sea rose approximately 0.2 foot during the year. The maximum stage, 232.0 feet below mean sea level, was recorded on April 10 and 11, 1967. The minimum stage, 232.8 feet below mean sea level, was recorded on January 1 and 2, 1967.

COLORADO RIVER AT YUMA, ARIZONA - STAGES

DESCRIPTION: Water-stage recorder 200 feet upstream from lower highway bridge, 6.9 miles upstream from the northerly international land boundary, 2,100 feet downstream from the upper highway and railroad bridges at Yuma, Arizona, 4.7 miles downstream from the mouth of the Gila River, 19.1 miles downstream from Imperial Dam, and 0.3 mile upstream from the mouth of the Yuma Main Canal Wasteway. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Mean daily gage heights are based on continuous water-stage records. Records available: Gage heights, January 1878 through August 10, 1965, furnished by the U. S. Geological Survey. From August 11, 1965 through December 1967, records obtained by the United States Section of this Commission.

EXTREMES: Prior to 1935: Maximum gage height 136.79 feet on January 22, 1916; minimum gage height 115.49 feet on September 17, 1917. Since 1935: Maximum gage height 127.36 feet on September 7, 1939; minimum gage height 111.22 feet on July 16, 1947.

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	¤113.45	113.22	112.80	113.93	113.28	113.68	113.05	113.96	113.11	112.87	113.07	112.83
2	¤113.02	113.20	113.21	113.67	113.36	113.65	113.07	113.54	113.97	112.89	113.03	112.93
3	¤112.97	113.06	113.40	113.61	113.36	113.67	113.07	113.23	115.35	112.92	113.03	112.89
4	¤113.02	112.99	113.00	113.25	113.56	113.65	113.66	113.28	114.98	112.94	113.08	112.89
5	¤112.97	113.08	112.94	113.08	113.45	113.65	113.62	113.27	113.77	112.97	113.07	112.90
6	¤112.98	113.08	112.99	113.10	113.23	113.62	113.18	113.39	113.53	112.98	113.04	112.92
7	¤112.97	112.96	113.08	113.14	113.29	113.61	113.07	113.29	113.99	112.93	113.01	112.89
8	¤112.91	113.01	112.93	113.48	113.24	113.62	113.08	113.20	113.83	113.20	113.01	112.91
9	¤112.90	113.08	112.91	113.99	113.28	113.61	113.10	113.20	113.24	113.13	113.03	112.93
10	¤112.88	113.08	112.91	113.59	113.30	113.58	113.15	113.17	113.01	113.17	113.06	112.94
11	*112.80	113.32	112.97	113.42	113.24	113.61	113.10	113.10	113.21	113.21	113.04	112.93
12	113.12	113.43	113.00	113.38	113.35	113.59	113.08	113.11	113.97	113.20	113.06	112.96
13	113.08	112.89	113.01	113.36	113.34	113.59	113.13	113.18	113.35	113.16	113.05	113.01
14	112.92	112.88	112.99	113.25	113.38	113.42	113.14	113.90	113.31	113.17	113.04	113.38
15	113.37	112.87	112.96	113.24	113.34	112.91	113.39	113.74	113.39	113.11	113.07	113.56
16	113.20	112.80	112.88	113.46	113.29	112.85	113.22	113.29	113.35	113.10	113.33	113.56
17	112.88	112.92	112.92	113.36	113.33	112.90	113.15	113.21	113.28	113.17	113.25	113.55
18	113.26	112.88	113.15	113.25	113.39	112.89	113.89	113.45	113.35	113.06	113.30	113.62
19	113.39	112.93	113.30	113.25	113.39	112.96	113.70	113.59	113.30	113.06	113.27	113.35
20	113.37	113.02	113.85	113.25	113.40	113.52	113.31	113.64	113.27	113.10	113.21	113.23
21	113.09	113.17	113.70	113.86	113.71	113.53	113.27	113.49	113.27	112.99	113.29	112.90
22	113.05	113.52	113.31	113.90	113.71	113.44	113.32	113.46	113.23	112.99	113.34	112.78
23	113.00	113.21	113.26	113.37	113.70	113.10	113.25	113.46	113.23	112.97	113.26	112.74
24	112.98	112.94	113.34	113.24	113.70	113.04	113.27	113.50	113.15	112.95	113.44	112.72
25	113.62	112.86	113.37	113.33	113.69	113.22	113.30	113.82	113.17	112.98	113.23	112.75
26	113.90	113.28	113.37	113.41	113.68	113.62	113.25	113.90	113.19	112.97	113.04	113.35
27	113.02	113.24	113.41	113.37	113.69	113.22	113.28	113.40	113.23	112.99	113.00	113.25
28	112.91	112.87	113.36	113.46	113.70	113.14	113.27	113.18	113.16	112.97	113.71	113.24
29	112.85		113.34	113.42	113.58	113.08	113.30	113.21	113.15	113.00	113.61	113.23
30	113.06		113.33	113.31	113.65	113.05	113.20	113.12	113.08	113.02	112.89	113.54
31	113.19		113.55		113.66		113.31	113.13		113.01		113.63
Avg.	113.10	113.06	113.18	113.42	113.46	113.37	113.26	113.40	113.48	113.04	113.16	113.11

¤ Estimated * Partly estimated

RESERVATION MAIN DRAIN NO. 4 (CALIFORNIA DRAIN)

DESCRIPTION: Water-stage recorder (digital) located 500 feet upstream from the U. S. Highway No. 80 crossing and one mile northwest of Yuma, Arizona. Discharge measurements are made from a footbridge immediately below the gage. The drainage canal discharges into the outfall channel of the Yuma Main Canal Wasteway 200 feet downstream from the spillway structure, and thence into the Colorado River on the right bank, 1,000 feet upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles upstream from the northerly international boundary. Prior to October 1955, published as "California Drainage Canal near Yuma, Arizona."

RECORDS: Based on 12 current meter measurements during the year 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 December 1967.

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

EXTREMES: Prior to 1937: Maximum annual flow 20,190 acre-feet, 1916; minimum annual flow 8,920 acre-feet, 1913.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	59	43	50	61	54	57	52	46	44	45	50	38
2	58	45	54	77	53	53	55	48	67	49	48	38
3	52	46	50	68	53	48	59	48	47	48	44	43
4	53	41	50	65	52	49	56	52	45	47	44	39
5	51	43	50	61	49	50	50	47	45	52	42	41
6	54	44	52	59	60	59	52	52	43	52	45	46
7	49	41	56	55	54	57	51	58	42	51	50	38
8	49	45	58	51	49	53	52	49	42	54	50	44
9	48	44	50	63	46	57	51	47	41	49	48	42
10	44	48	51	59	46	59	50	50	41	50	42	36
11	48	44	56	60	49	54	54	49	40	54	45	36
12	42	44	63	62	48	49	57	46	40	55	54	40
13	43	51	66	63	48	49	55	47	40	49	53	39
14	41	52	66	53	51	57	50	49	40	45	45	45
15	41	55	61	57	56	67	48	53	41	49	41	38
16	41	48	58	56	56	65	57	51	40	48	48	40
17	48	57	56	60	64	53	47	51	41	49	47	36
18	53	51	56	52	63	50	58	53	49	49	46	35
19	43	48	66	54	46	49	63	54	45	47	49	35
20	52	47	66	58	47	54	52	54	49	49	46	35
21	45	54	62	53	47	52	50	50	49	50	44	35
22	47	46	62	59	52	56	47	53	46	44	42	35
23	43	49	61	52	60	49	50	53	46	46	38	38
24	41	49	61	48	71	52	45	45	43	51	38	35
25	44	50	50	50	56	57	52	45	43	46	41	34
26	41	47	48	52	59	57	48	45	42	46	46	34
27	46	52	48	52	55	53	54	44	42	49	43	34
28	48	56	48	53	58	53	47	43	48	49	39	35
29	48		48	55	48	50	59	43	45	50	38	38
30	54		53	61	49	58	46	47	47	48	37	37
31	47		56		54		44	46		50		38
Sum	1,473	1,340	1,732	1,729	1,653	1,626	1,611	1,518	1,333	1,520	1,343	1,177

Month	Current Year 1967							Period 1937-1967		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			1	59	†14	41	47.5	2,922	3,314	4,780	877
Feb.			17	57	† 4	41	47.9	2,658	3,152	4,320	563
Mar.			†13	66	†26	48	55.9	3,435	3,844	5,240	1,240
Apr.			2	77	24	48	57.6	3,429	3,876	5,250	1,160
May			24	71	† 9	46	53.3	3,279	3,980	5,590	992
June			15	67	3	48	54.2	3,225	3,863	5,580	885
July			19	63	31	44	52.0	3,195	4,170	6,550	816
Aug			7	58	†28	43	49.0	3,011	4,113	6,810	861
Sept.			2	67	†11	40	44.4	2,644	3,900	6,220	889
Oct.			12	55	22	44	49.0	3,015	3,884	5,740	1,040
Nov.			12	54	30	37	44.8	2,664	3,623	5,490	994
Dec.			6	46	†25	34	38.0	2,335	3,522	4,960	966
Yearly				77		34	49.5	35,812	45,241	63,700	12,840

Ø Mean daily † And other days

YUMA MAIN CANAL WASTEWAY TO COLORADO RIVER AT YUMA, ARIZONA

DESCRIPTION: The wasteway receives water from the Yuma Main Canal at the check structure on the canal, 1,645 feet upstream from the intake of the Colorado River siphon, and 3.2 miles downstream from the Siphon Drop Power Plant. This wasteway discharges into the Colorado River on the California side, 1,000 feet upstream from Colorado River below Yuma Main Canal Wasteway, and 6.5 miles 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. 1967 records good, except those below 100 second-feet, which are poor. Records obtained and furnished by U. S. Geological Survey. Records available: April 1913 through December 1967.

REMARKS: The wasteway discharges to the river the flow in excess of irrigation water in the Yuma Main Canal. This excess flow, in addition to the irrigation water, was diverted from the All-American Canal into the Yuma Main Canal and utilized for power purposes at the Siphon Drop Power Plant.

EXTREMES: Prior to 1935, when storage began in Lake Mead: Average annual flow, 297,800 acre-feet; maximum annual flow, 913,700 acre-feet, 1932; minimum annual flow, 114,900 acre-feet, 1917. Since 1935: Maximum mean daily discharge, 2,020 second-feet, December 24-25, 1948; minimum mean daily discharge, no flow on numerous occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	731	70	40	27	714	881	30	23	41	231	164	56
2	31	167	26	67	759	863	39	23	56	191	170	311
3	23	291	23	49	811	939	23	29	42	203	197	301
4	32	265	23	31	917	979	29	27	56	203	194	305
5	41	199	23	27	817	908	24	23	41	194	155	305
6	26	256	23	29	691	909	27	24	32	188	170	287
7	23	322	23	39	715	893	23	23	31	198	186	268
8	31	441	26	27	674	916	23	23	29	96	218	288
9	30	237	26	33	695	897	26	23	33	82	170	308
10	26	261	30	31	670	890	33	32	31	69	190	341
11	23	648	36	37	659	928	29	31	34	67	208	305
12	25	719	49	29	706	924	23	23	435	38	203	356
13	24	32	41	23	658	881	29	29	713	40	180	363
14	176	23	35	23	651	711	23	29	743	41	182	145
15	892	23	38	27	587	35	23	23	648	90	183	406
16	720	33	27	29	524	39	25	33	510	125	31	902
17	412	32	27	26	588	50	23	31	617	41	58	876
18	284	45	37	31	634	61	24	23	596	177	23	712
19	63	44	32	39	688	29	29	25	573	140	60	676
20	184	37	34	39	663	25	32	35	598	148	30	310
21	323	30	31	39	850	28	28	45	658	223	18	36
22	358	30	46	41	818	23	28	29	679	264	19	28
23	315	32	33	33	833	23	34	24	736	225	21	26
24	363	30	23	24	890	23	39	23	694	199	7.0	30
25	398	38	27	413	885	31	35	23	703	169	35	35
26	365	32	38	679	908	33	26	25	706	176	257	766
27	167	26	32	700	927	25	24	37	768	177	231	681
28	332	29	23	834	909	25	32	35	646	199	144	686
29	367		23	805	818	29	28	23	699	197	31	655
30	234		23	711	913	25	23	32	604	197	28	320
31	84		26		931		26	43		194		355
Sum	7,103	4,392	944	4,942	23,503	13,023	860	871	12,752	4,782	3,763.0	11,439

Current Year 1967 — **Period 1935-1967**

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			15	892	† 3	23	229	14,089	68,015	110,700	3,230
Feb.			12	719	†14	23	157	8,711	59,173	89,140	2,856
Mar.			12	49	† 3	23	30.5	1,872	63,133	90,190	1,872
Apr.			28	834	†13	23	165	9,802	63,286	86,580	2,500
May			31	931	16	524	758	46,618	67,326	88,280	5,480
June			4	979	†22	23	434	25,831	61,733	86,960	3,330
July			† 2	39	† 3	23	27.7	1,706	62,493	91,220	1,706
Aug			21	45	† 1	23	28.1	1,728	62,837	89,890	1,728
Sept.			27	768	8	29	425	25,293	61,431	83,660	12,419
Oct.			22	264	12	38	154	9,485	59,338	90,050	2,176
Nov.			26	257	24	7.0	125	7,464	60,189	101,500	3,850
Dec.			16	902	23	26	369	22,689	68,075	108,800	2,440
Yearly				979		7.0	242	175,288	757,029	1,042,850	75,950

Ø Mean daily † And other days

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

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

RECORDS: Based on 25 current meter measurements during the year, 15 by the U. S. Geological Survey, 10 by the United States Section of the Commission, 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 December 1967. Records from January 1951 through September 1963, deduced from "Colorado River at Yuma" plus flows from "Reservation Canal Main Drain No. 4", and "Yuma Main Canal Wasteway".

REMARKS: Reservoirs on the Colorado River, including Lake Mead where storage began in 1935, transmountain diversions, reservoirs on the Gila River, irrigation diversions and return flows modify the river flow at this station.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,110	628	415	1,060	1,040	1,360	580	1,050	621	626	648	440
2	467	673	577	928	1,090	1,340	602	804	1,180	622	652	651
3	394	659	686	872	1,110	1,370	587	623	2,290	632	664	635
4	401	623	501	642	1,280	1,370	900	636	1,910	644	674	640
5	414	625	474	559	1,180	1,350	872	615	935	648	650	640
6	416	656	497	559	989	1,340	642	694	781	642	642	640
7	362	650	530	592	1,020	1,320	580	649	1,050	641	649	618
8	366	687	478	762	992	1,340	583	603	971	683	668	635
9	349	662	461	1,140	1,020	1,340	593	601	633	660	643	657
10	327	659	470	847	1,020	1,320	617	607	539	681	663	662
11	362	1,020	489	745	987	1,350	592	574	628	680	669	635
12	531	1,150	515	709	1,070	1,320	585	562	1,340	649	680	690
13	500	472	523	692	1,030	1,310	612	589	1,050	644	653	725
14	514	457	501	635	1,050	1,140	602	1,020	1,050	643	652	783
15	1,140	450	487	646	1,030	596	743	959	1,080	657	668	1,050
16	984	431	461	770	979	560	660	674	1,020	671	688	1,310
17	677	479	474	719	1,020	575	605	650	1,000	635	681	1,300
18	772	471	564	653	1,070	580	1,040	761	1,030	677	675	1,260
19	698	485	636	679	1,080	560	954	870	997	640	719	1,080
20	751	510	960	666	1,080	832	698	886	986	664	612	860
21	715	570	884	1,030	1,340	832	665	823	1,030	672	646	495
22	712	764	666	1,090	1,340	769	693	791	1,000	691	651	422
23	670	605	616	731	1,340	590	667	785	1,030	653	618	413
24	679	487	666	648	1,380	575	669	806	978	654	713	409
25	1,030	460	689	882	1,380	656	683	1,010	991	640	612	440
26	1,210	634	699	1,050	1,390	874	642	1,080	1,010	633	673	1,130
27	599	616	714	1,050	1,400	656	652	777	1,060	639	651	1,030
28	628	453	684	1,170	1,390	607	648	646	981	632	1,000	1,040
29	626		691	1,130	1,280	590	668	650	991	649	860	1,020
30	649		662	1,040	1,360	575	596	621	916	661	443	1,010
31	640		794		1,370		646	634		647		1,070
Sum	19,693	17,036	18,464	24,696	36,107	28,997	20,876	23,050	31,078	20,210	20,117	24,390

Current Year 1967									Period 1951-1967		
Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	11.33	9.59	26	1,390	10	312	635	39,060	292,484	979,890	39,060
Feb.	11.19	9.77	11	1,300	16	400	608	33,790	215,648	826,600	33,790
Mar.	10.80	9.74	20	1,020	1	387	596	36,623	237,342	1,073,270	36,623
Apr.	11.21	10.04	25	1,310	6	535	823	48,984	223,955	843,010	48,984
May	11.52	10.65	26	1,560	6	860	1,165	71,617	205,330	863,860	56,493
June	11.41	9.89	3	1,460	18	505	967	57,515	196,512	833,970	44,485
July	10.91	9.99	19	1,170	12	555	673	41,407	215,138	649,820	41,407
Aug	10.94	10.00	15	1,170	12	545	744	45,719	222,845	670,050	45,719
Sept.	12.37	10.03	3	2,450	11	515	1,036	61,642	182,935	775,930	49,523
Oct.	10.43	10.10	18	743	1	535	652	40,086	150,903	802,210	34,965
Nov.	11.11	9.75	29	1,210	30	375	671	39,901	180,543	911,370	36,924
Dec.	11.50	9.80	18	1,510	25	391	787	48,377	235,026	1,114,550	48,377
Yearly	12.37	9.59		2,450		312	780	564,721	2,558,661	10,220,870	564,721

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

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.97	10.28	9.80		10.89	11.29	10.04	10.72	10.11	10.27	10.26	9.90
2	9.96	10.35	10.13		10.96	11.27	10.08	10.41	10.95	10.26	10.27	10.32
3	9.83	10.32	10.33	10.60	10.99	11.31	10.02	10.13	12.22	10.27	10.29	10.28
4	9.81	10.25	9.98	10.24	11.20	11.31	10.55	10.16	11.85	10.29	10.31	10.30
5	9.84	10.25	9.92	10.09	11.07	11.28	10.52	10.13	10.69	10.30	10.27	10.31
6	9.84	10.30	9.97	10.09	10.83	11.27	10.15	10.27	10.46	10.27	10.25	10.31
7	9.72	10.29	10.03	10.15	10.87	11.25	10.04	10.19	10.84	10.27	10.27	10.27
8	9.73	10.34	9.92	10.42	10.83	11.27	10.05	10.11	10.74	10.34	10.30	10.30
9	9.69	10.30	9.89	10.96	10.86	11.27	10.06	10.11	10.24	10.30	10.26	10.34
10	9.63	10.29	9.91	10.57	10.86	11.25	10.11	10.12	10.07	10.32	10.29	10.35
11	9.71	10.83	9.95	10.42	10.82	11.29	10.06	10.06	10.23	10.32	10.30	10.31
12	10.09	10.97	10.00	10.36	10.93	11.25	10.05	10.03	11.25	10.27	10.32	10.41
13	10.03	9.93	10.02	10.33	10.88	11.23	10.10	10.09	10.89	10.26	10.27	10.47
14	10.02	9.90	9.97	10.23	10.91	11.00	10.08	10.75	10.91	10.26	10.27	10.56
15	11.03	9.88	9.94	10.25	10.87	10.07	10.31	10.66	10.95	10.28	10.30	10.91
16	10.82	9.84	9.89	10.46	10.81	10.01	10.18	10.24	10.86	10.31	10.35	11.26
17	10.36	9.95	9.91	10.38	10.86	10.03	10.09	10.20	10.84	10.24	10.33	11.25
18	10.52	9.93	10.10	10.26	10.93	10.04	10.74	10.37	10.88	10.32	10.32	11.21
19	10.40	9.96	10.22	10.31	10.95	10.00	10.62	10.55	10.84	10.25	10.30	10.98
20	10.49	10.01	10.73	10.29		10.46	10.25	10.57	10.82	10.29		10.61
21	10.43	10.13	10.62	10.81		10.47	10.20	10.48	10.88	10.31		10.03
22	10.43	10.46	10.29	10.89		10.36	10.25	10.43	10.84	10.34		9.88
23	10.35	10.19	10.19	10.40		10.06	10.20	10.42	10.88	10.27		9.85
24	10.37	9.96	10.29	10.26	11.33	10.03	10.20	10.45	10.81	10.28		9.84
25	10.88	9.90	10.33	10.60	11.32	10.17	10.23	10.74	10.83	10.25		9.90
26	11.11	10.25	10.34	10.91	11.33	10.52	10.15	10.83	10.85	10.24		11.00
27	10.19	10.21	10.37	10.90	11.34	10.18	10.17	10.41	10.92	10.25		10.88
28	10.28	9.89	10.32	11.06	11.33	10.09	10.16	10.19	10.81	10.24		10.89
29	10.27		10.33	11.01	11.20	10.06	10.21	10.20	10.83	10.27	10.31	10.87
30	10.32		10.28	10.90	11.29	10.03	10.08	10.15	10.72	10.29	9.90	10.85
31	10.30		10.48		11.31		10.16	10.17		10.26		10.94
Avg.	10.24	10.18	10.14			10.67	10.20	10.33	10.83	10.28		10.50

DRAIN NO. 8-B (ARAZ DRAIN)

DESCRIPTION: This drain discharges into the Colorado River 3.9 miles downstream from Colorado River below Yuma Main Canal Wasteway, and 2.5 miles upstream from the northerly international boundary. Prior to October 1955, published as "Araz Drain."

RECORDS: Records are furnished by U. S. Geological Survey from 12 current meter measurements during the year. Records available: May 1948 through December 1967.

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

EXTREMES: Mean daily discharge: Maximum, 24 second-feet on September 1, 1953; minimum, 0.1 second-foot several days in February 1966.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.0	1.2	1.3	1.3	0.9	1.3	1.2	1.3	1.5	1.1	1.1
2	1.2	1.0	1.2	1.3	1.3	1.0	1.3	1.2	1.4	1.5	1.1	1.1
3	1.2	1.0	1.2	1.3	1.3	1.0	1.3	1.2	1.4	1.5	1.1	1.1
4	1.2	1.1	1.2	1.3	1.3	1.0	1.3	1.2	1.4	1.5	1.1	1.1
5	1.2	1.1	1.2	1.3	1.2	1.0	1.3	1.2	1.5	1.5	1.1	1.1
6	1.2	1.1	1.2	1.3	1.2	1.0	1.3	1.2	1.5	1.5	1.1	1.1
7	1.2	1.1	1.2	1.3	1.2	1.0	1.2	1.2	1.5	1.5	1.1	1.1
8	1.2	1.2	1.2	1.3	1.2	1.0	1.2	1.2	1.5	1.5	1.1	1.1
9	1.2	1.2	1.2	1.3	1.2	1.0	1.2	1.2	1.5	1.5	1.1	1.1
10	1.2	1.2	1.2	1.3	1.2	1.1	1.2	1.2	1.5	1.5	1.1	1.1
11	1.2	1.2	1.2	1.3	1.2	1.1	1.2	1.2	1.5	1.4	1.1	1.1
12	1.2	1.2	1.2	1.3	1.2	1.1	1.2	1.2	1.5	1.3	1.1	1.1
13	1.2	1.2	1.2	1.3	1.1	1.1	1.2	1.2	1.5	1.3	1.1	1.1
14	1.2	1.2	1.2	1.3	1.1	1.1	1.2	1.2	1.5	1.2	1.1	1.1
15	1.2	1.2	1.2	1.3	1.1	1.1	1.2	1.2	1.5	1.1	1.1	1.1
16	1.2	1.2	1.2	1.3	1.1	1.1	1.2	1.2	1.5	1.1	1.1	1.1
17	1.2	1.2	1.2	1.3	1.1	1.2	1.2	1.2	1.5	1.0	1.1	1.1
18	1.2	1.2	1.2	1.3	1.1	1.2	1.2	1.2	1.5	1.0	1.1	1.1
19	1.2	1.2	1.2	1.3	1.1	1.2	1.2	1.2	1.5	1.0	1.1	1.1
20	1.2	1.2	1.2	1.3	1.0	1.2	1.2	1.2	1.5	1.0	1.1	1.1
21	1.2	1.2	1.2	1.3	1.0	1.2	1.1	1.2	1.5	1.0	1.1	1.1
22	1.2	1.2	1.2	1.3	1.0	1.2	1.1	1.2	1.5	1.0	1.1	1.0
23	1.1	1.2	1.2	1.3	1.0	1.2	1.1	1.2	1.5	1.0	1.1	1.0
24	1.1	1.2	1.2	1.3	1.0	1.2	1.1	1.2	1.5	1.0	1.1	.9
25	1.1	1.2	1.2	1.3	1.0	1.3	1.1	1.2	1.5	1.0	1.1	.8
26	1.1	1.2	1.2	1.3	1.0	1.3	1.1	1.2	1.5	1.0	1.1	.8
27	1.0	1.2	1.2	1.3	1.0	1.3	1.1	1.2	1.5	1.0	1.1	.7
28	1.0	1.2	1.2	1.3	.9	1.3	1.1	1.2	1.5	1.0	1.1	.7
29	1.0		1.2	1.3	.9	1.3	1.1	1.2	1.5	1.0	1.1	.7
30	1.0		1.2	1.3	.9	1.3	1.1	1.2	1.5	1.0	1.1	.7
31	1.0		1.2		.9		1.1	1.2		1.0		.7
Sum	35.8	32.6	37.2	39.0	34.1	34.0	36.7	37.2	44.5	37.4	33.0	31.1

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second Feet High Day	High	Low Day	Low	Average Second Feet	Total Acre Feet	Period May 1948-1967 Acre Feet Average	Maximum	Minimum
Jan.			† 1	1.2	†27	1.0	1.2	71.0	447	899	71.0
Feb.			† 8	1.2	† 1	1.0	1.2	64.7	387	746	40.5
Mar.			† 1	1.2	† 1	1.2	1.2	73.8	468	853	73.8
Apr.			† 1	1.3	† 1	1.3	1.3	77.4	492	1,000	77.4
May			† 1	1.3	†28	.9	1.1	67.6	489	966	61.5
June			†25	1.3	1	.9	1.1	67.4	513	1,030	67.4
July			† 1	1.3	†21	1.1	1.2	72.8	585	1,260	72.8
Aug			† 1	1.2	† 1	1.2	1.2	73.8	647	1,350	73.8
Sept.			† 5	1.5	1	1.3	1.5	88.3	616	1,370	88.3
Oct.			† 1	1.5	†17	1.0	1.2	74.2	623	1,220	74.2
Nov.			† 1	1.1	† 1	1.1	1.1	65.5	559	1,240	65.5
Dec.			† 1	1.1	†27	.7	1.0	61.7	511	1,050	61.7
Yearly				1.5		0.7	1.2	858	6,337	12,429	858

Ø Mean daily † And other days

PILOT KNOB POWER PLANT AND WASTEWAY NEAR PILOT KNOB, CALIFORNIA

DESCRIPTION: The Pilot Knob Power Plant and Wasteway is located on the All-American Canal, 20.8 miles downstream from the intake at Imperial Dam, 6 miles west of Yuma, about one mile north of the northerly international boundary and empties into the Alamo Canal in the United States and thence into the Colorado River through Rockwood gates, about one mile upstream from the northerly international boundary. Water-stage recorder is located in forebay on right bank of the All-American Canal, 550 feet upstream from wasteway gates and 1,800 feet from entrance to the power plant. Datum of gage is 150.00 feet above mean sea level. Tailrace gage is on left bank, 680 feet downstream from power plant with automatic recording equipment in control house. All bypass gates are equipped with calibrated openings which are read on all gate changes. Datum of tailrace gage is at mean sea level; elevation of sill of wasteway gates is 147.88 feet, U. S. C. & G. S. datum. Prior to October 1956, this station 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 December 1967. 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, 8,350 second-feet on January 26, 1958; minimum mean daily discharge, no flow during long periods.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40	0	1,450	2,410	0	0	1,620	2,210	1,560	0	0	913
2	1,010	0	1,220	2,500	0	0	1,580	2,300	3,790	0	0	0
3	1,210	0	1,060	2,420	0	0	1,570	2,600	4,900	0	0	0
4	1,340	0	1,330	2,670	0	0	1,320	2,640	4,400	0	0	0
5	1,180	0	1,360	2,830	0	0	1,260	2,630	2,170	0	0	0
6	1,040	0	1,300	2,740	0	0	1,480	2,490	1,330	0	0	0
7	1,080	0	1,340	2,700	0	0	1,590	2,610	1,050	0	0	0
8	1,050	0	1,400	2,610	0	0	1,620	2,690	1,020	0	0	0
9	1,090	0	1,390	2,280	0	0	1,570	2,690	1,060	0	0	0
10	1,130	0	1,430	2,180	0	0	1,600	2,610	1,080	0	0	0
11	1,100	0	1,680	2,360	0	0	1,610	2,650	1,060	0	0	0
12	917	47	1,660	2,280	0	0	1,650	2,540	0	0	0	0
13	938	1,060	1,600	2,360	0	0	1,940	2,500	0	0	0	0
14	933	1,020	1,630	2,400	0	45	1,960	2,090	0	0	0	0
15	0	1,020	1,660	2,510	0	1,150	1,880	2,080	0	0	0	0
16	0	1,070	1,700	2,310	0	1,250	1,900	2,370	0	0	0	0
17	0	1,050	1,950	2,040	0	1,390	1,920	2,330	0	0	0	0
18	0	1,020	2,160	2,130	0	1,400	1,640	2,470	0	0	0	0
19	0	1,100	2,130	2,090	0	1,420	1,640	2,490	0	0	0	0
20	0	1,210	1,820	1,930	0	1,200	1,860	2,130	0	0	0	827
21	0	1,180	2,020	1,450	0	1,140	2,100	1,910	0	0	0	1,140
22	0	1,220	2,570	1,080	0	1,310	2,110	1,810	0	0	0	1,000
23	0	1,160	2,870	1,180	0	1,500	2,120	1,660	0	0	0	1,010
24	0	1,030	2,840	1,070	0	1,550	2,120	1,670	0	0	0	1,000
25	0	1,230	2,740	635	0	1,600	2,070	1,310	0	0	0	998
26	0	1,150	2,750	0	0	1,240	2,050	1,150	0	0	0	0
27	0	1,070	2,680	0	0	1,410	2,090	1,450	0	0	0	0
28	0	1,260	2,710	0	0	1,440	2,090	1,440	0	0	773	0
29	0		2,760	0	0	1,490	2,080	1,500	0	0	1,660	0
30	0		2,710	0	0	1,620	2,350	1,590	0	0	1,040	0
31	0		2,720		0		2,250	1,570		0		44
Sum	14,058	17,897	60,640	53,165	0	22,155	56,640	66,180	23,420	0	3,473	6,932

Month	Extreme Gage Feet		Current Year 1967 — Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1944-1967 — Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			4	1,340	†15	0	453	27,884	41,338	400,200	0
Feb.			28	1,260	† 1	0	639	35,498	16,191	149,500	0
Mar.			23	2,870	3	1,060	1,956	120,278	57,510	279,300	0
Apr.			5	2,830	†26	0	1,772	105,451	88,622	260,900	0
May				0		0	0	0	23,093	165,400	0
June			30	1,620	† 1	0	738	43,944	66,407	204,300	0
July			30	2,350	5	1,260	1,827	112,344	115,401	260,000	0
Aug			† 8	2,690	26	1,150	2,135	131,266	120,213	270,100	0
Sept.			3	4,900	†12	0	781	46,453	63,820	173,300	0
Oct.				0		0	0	0	13,168	51,460	0
Nov.			29	1,660	† 1	0	116	6,889	18,505	182,600	0
Dec.			21	1,140	† 2	0	224	13,749	36,287	319,700	0
Yearly				4,900		0	889	643,756	660,555	1,944,700	0

Ø Mean daily † And other days

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

DESCRIPTION: Diversion structure (Main Outlet Drain Extension No. 1) in Wellton-Mohawk Drainage Extension Channel for diverting water to the Gila River, 0.5 mile upstream from the confluence of the Gila and Colorado Rivers. A continuous water-stage recorder immediately upstream from outlet structure (Main Outlet Drain Extension No. 2), 0.4 mile downstream from diversion structure which diverts water from the Extension Channel directly to the Colorado River at a point 0.8 mile upstream from the northerly international boundary, and 1.9 miles upstream from Morelos Dam. The Gila River enters the Colorado River 13 miles upstream from Morelos Dam.

RECORDS: Partial diversions of the Extension Channel flow at M.O.D.E. No. 1 were determined from the gate openings, rated by discharge measurements below the outlet. Diversions of the total Extension Channel flow were determined at an upstream measuring station at channel station 9+00. Flows diverted at M.O.D.E. No. 2 were based on 47 discharge measurements during the year and a continuous record of gage heights. Records furnished by Bureau of Reclamation. The record shown below is the combination of diversions at M.O.D.E. No. 1 and M.O.D.E. No. 2. Records available: February 10, 1961 through December 1967.

REMARKS: Pursuant to Minute No. 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles, and placed in operation on November 16, 1965. Drainage flows may be discharged to the Gila River and thence to the Colorado River at the diversion structure, M.O.D.E. No. 1, at the upstream end of the extension; and directly to the Colorado River at the structure above Morelos Dam, M.O.D.E. No. 2, and at the structure immediately below Morelos Dam, M.O.D.E. No. 3, the record of which is shown on page 22.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	74	0	143	281	142	233	249	295	244	0	0	0
2	100	0	143	282	152	231	249	298	142	0	0	0
3	68	0	140	281	153	237	247	293	0	0	0	0
4	38	0	139	266	40.8	236	245	295	0	0	0	0
5	106	0	142	241	72.2	237	245	298	0	0	0	0
6	107	0	147	252	162	239	245	300	219	0	0	0
7	92	0	147	260	186	237	253	293	237	0	0	0
8	89	0	143	255	188	237	245	298	236	0	0	0
9	89	0	142	255	179	244	245	300	202	0	0	0
10	56	22	143	234	185	249	265	301	190	0	0	0
11	0	53	162	241	188	250	269	303	176	0	0	0
12	0	86	159	212	189	249	271	303	166	0	0	0
13	0	116	161	226	189	241	292	303	136	0	0	0
14	0	117	158	236	190	237	300	301	113	0	0	33.1
15	0	123	157	241	186	233	297	289	113	0	0	48.7
16	0	136	159	244	183	213	293	269	108	0	0	65.2
17	0	137	180	219	176	220	297	298	107	0	0	67.5
18	0	138	204	208	182	218	295	330	107	0	0	67.5
19	0	110	207	207	186	230	292	300	121	0	0	55.0
20	0	60	230	194	218	249	293	298	142	0	0	55.0
21	0	32	276	172	247	250	295	295	152	0	0	55.0
22	0	19	263	164	244	284	300	289	178	0	0	56.4
23	0	44	260	158	245	274	300	285	180	0	0	53.6
24	0	111	261	134	237	266	301	275	182	0	0	55.7
25	0	133	265	113	244	275	297	245	182	0	0	55.0
26	0	148	263	101	239	260	295	253	179	0	0	69.8
27	0	150	273	145	239	244	295	261	176	0	0	84.1
28	0	144	274	164	237	245	293	236	178	0	0	75.3
29	0		276	165	236	242	292	242	176	0	0	74.5
30	0		276	144	237	244	287	247	178	0	0	71.4
31	0		271		239		289	249		0		71.4
Sum	819	1,879	6,164	6,295	5,991.0	7,304	8,631	8,842	4,520	0	0	1,114.2

Current Year 1967 | **Period 1961-1967**

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			6	107	†11	0	26.4	1,624	9,665	19,452	0
Feb.			27	150	† 1	0	67.1	3,727	9,265	16,784	0
Mar.			†21	276	4	139	199	12,226	15,110	18,742	8,434
Apr.			2	282	26	101	210	12,486	15,357	18,573	11,948
May			21	247	4	40.8	193	11,883	14,830	19,783	11,459
June			22	284	16	213	243	14,487	15,311	19,186	12,829
July			24	301	† 4	245	278	17,119	17,623	19,295	15,072
Aug			18	330	28	236	285	17,538	17,284	18,887	15,102
Sept.			1	244	† 3	0	151	8,965	14,323	18,313	8,965
Oct.				0		0	0	0	10,152	18,625	0
Nov.				0		0	0	0	9,706	17,627	0
Dec.			27	84.1	† 1	0	35.9	2,210	8,777	18,988	930
Yearly				330		0	141	102,265	157,403	215,087	102,265

Ø Mean daily † And other days

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

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

RECORDS: Based on 376 current meter measurements during the year, 206 by the United States Section, 159 by the Mexican Section of the Commission, 11 by the U.S. Geological Survey, and a continuous record of gage heights. Computations by shifting control methods. Discharges are computed on the basis of a water-stage recorder located 1,680 feet 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 December 1967; daily discharge records available January 1, 1950 through December 1967.

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 1967, the flow at this point represented the total amount of Colorado River water which crossed the northerly international boundary.

EXTREMES: Prior to January 1935: Maximum instantaneous discharge estimated about 250,000 second-feet, January 22, 1916; minimum discharge, no flow several days during August and September 1934; average annual flow 13,443,000 acre-feet; maximum annual flow 25,480,000 acre-feet, 1907; minimum annual flow 1,174,000 acre-feet, 1934. Since January 1935: Maximum mean daily discharge, about 33,000 second-feet, February 7, 1942; minimum discharge, no flow during April 1935.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	724	1,970	3,660	1,220	1,630	2,470	3,430	2,430	678	712	1,440
2	1,590	738	1,950	3,680	1,300	1,640	2,470	3,460	4,690	676	678	661
3	1,710	729	1,940	3,590	1,230	1,660	2,470	3,500	6,850	721	705	700
4	1,820	708	1,880	3,560	1,310	1,700	2,480	3,550	6,410	691	718	689
5	1,770	702	1,940	3,600	1,360	1,650	2,460	3,540	3,470	696	711	688
6	1,660	710	1,900	3,580	1,260	1,640	2,460	3,440	2,450	708	706	704
7	1,640	690	1,960	3,540	1,250	1,630	2,480	3,500	2,370	687	682	671
8	1,610	722	1,970	3,530	1,240	1,660	2,480	3,530	2,300	707	722	669
9	1,610	720	1,970	3,610	1,250	1,640	2,490	3,570	1,940	715	697	685
10	1,620	722	1,980	3,270	1,250	1,620	2,560	3,560	1,810	705	689	690
11	1,540	1,070	2,260	3,310	1,240	1,670	2,560	3,520	1,850	735	698	689
12	1,560	1,350	2,300	3,300	1,310	1,660	2,580	3,370	1,500	712	712	704
13	1,550	1,620	2,260	3,260	1,290	1,660	2,860	3,400	1,220	701	701	758
14	1,560	1,590	2,250	3,290	1,300	1,640	2,860	3,370	1,200	683	687	815
15	1,260	1,570	2,240	3,320	1,270	1,930	2,870	3,370	1,250	671	705	1,090
16	1,060	1,560	2,260	3,280	1,270	1,960	2,870	3,410	1,210	713	729	1,370
17	774	1,670	2,490	2,970	1,250	2,090	2,840	3,350	1,180	676	704	1,380
18	857	1,620	2,800	2,910	1,320	2,160	2,840	3,350	1,180	688	728	1,410
19	793	1,670	2,910	2,900	1,360	2,130	2,880	3,380	1,200	686	793	1,140
20	809	1,710	2,980	2,750	1,380	2,170	2,840	3,080	1,180	696	673	1,670
21	803	1,740	3,070	2,560	1,650	2,220	3,020	2,820	1,180	705	696	1,720
22	805	1,910	3,440	2,340	1,640	2,380	3,030	2,670	1,230	729	714	1,460
23	753	1,820	3,570	2,110	1,680	2,340	3,000	2,520	1,210	722	693	1,440
24	774	1,680	3,660	1,800	1,670	2,340	3,030	2,550	1,230	726	766	1,450
25	1,040	1,780	3,610	1,670	1,650	2,380	3,000	2,450	1,230	696	697	1,450
26	1,270	1,930	3,670	1,220	1,660	2,370	3,000	2,400	1,220	705	708	1,240
27	755	1,890	3,650	1,200	1,630	2,310	3,030	2,470	1,220	705	722	1,160
28	724	1,870	3,660	1,280	1,670	2,300	3,010	2,390	1,240	705	1,510	1,160
29	715		3,670	1,300	1,600	2,380	3,020	2,410	1,220	688	2,670	1,130
30	753		3,630	1,230	1,610	2,430	3,210	2,530	1,210	691	1,570	1,140
31	731		3,720		1,660		3,140	2,500		670		1,230
Sum	37,266	37,215	83,560	83,620	43,780	58,990	86,310	96,390	59,880	21,687	24,896	33,203

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1935-1967 Acre Feet Average	Maximum	Minimum
Jan.	103.41	101.90	5	1,920	27	555	1,200	73,916	485,519	1,644,000	31,900
Feb.	103.71	102.09	22	2,030	3	620	1,330	73,815	405,336	1,378,000	60,400
Mar.	105.07	103.53	31	3,850	4	1,780	2,700	165,739	390,442	1,120,000	19,400
Apr.	105.07	102.85	1	3,770	27	1,140	2,790	165,858	297,454	823,850	0
May	103.36	102.78	23	1,760	3	1,140	1,410	86,836	321,088	1,151,000	77,400
June	104.03	102.97	25	2,520	14	1,320	1,970	117,005	296,810	1,175,000	8,500
July	104.65	103.88	30	3,270	9	2,380	2,780	171,193	279,063	763,800	24,400
Aug	105.04	103.74	11	3,650	28	2,160	3,110	191,187	298,712	791,600	43,800
Sept.	109.60	102.50	4	7,020	30	861	2,000	118,770	280,420	1,029,000	60,000
Oct.	102.47	102.10	1	837	1	596	700	43,016	286,731	1,186,000	43,016
Nov.	104.31	102.08	29	3,000	26	570	830	49,380	362,485	1,422,000	42,363
Dec.	103.74	102.14	20	2,130	2	576	1,070	65,857	462,649	1,832,000	42,000
Yearly	109.60	101.90		7,020		555	1,827	1,322,572	4,166,709	10,596,900	722,100

= Estimated

COLORADO RIVER AT NORTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.89	102.21	103.66	104.93	102.88	103.27	103.96	104.79	104.00	*102.25	102.26	103.12
2	103.17	102.20	103.64	104.91	102.94	103.29	103.94	104.76	105.75	*102.22	102.22	102.25
3	103.26	102.21	103.64	104.86	102.92	103.31	103.94	104.81	108.90	*102.28	102.27	102.31
4	103.37	102.17	103.63	104.86	102.99	103.32	103.95	104.89	108.69	102.26	102.29	102.25
5	103.33	102.20	103.67	104.89	103.03	103.30	103.93	104.89	105.14	102.29	102.28	102.30
6	103.24	102.18	103.64	104.85	102.89	103.27	103.97	104.83	103.90	102.26	102.25	102.30
7	103.18	102.16	103.69	104.84	102.91	103.25	103.99	104.89	103.81	102.25	102.24	102.26
8	103.16	102.20	103.69	104.86	102.88	103.29	104.00	104.94	103.80	102.31	102.27	102.25
9	103.16	102.22	103.67	104.91	102.88	103.26	103.97	104.94	103.52	*102.30	102.24	102.28
10	103.18	102.22	103.70	104.67	102.91	103.26	104.02	104.89	103.42	*102.30	102.26	102.29
11	103.12	102.60	103.93	104.72	102.90	103.29	104.02	104.92	103.43	102.32	102.27	102.25
12	103.12	102.91	103.96	104.71	102.93	103.29	104.05	104.80	103.14	102.26	102.29	102.29
13	103.13	103.15	103.92	104.70	102.92	103.28	104.28	104.78	102.88	102.26	102.26	102.35
14	103.11	103.13	103.89	104.71	102.95	103.23	104.28	104.74	102.87	102.25	102.24	102.42
15	102.82	103.20	103.91	104.78	102.94	103.50	104.29	104.73	102.91	102.24	102.26	102.74
16	102.60	103.35	103.91	104.78	102.92	103.55	104.31	104.74	102.85	102.29	102.29	103.06
17	102.24	103.44	104.10	104.49	102.90	103.66	104.26	104.68	102.81	102.25	102.27	103.09
18	102.34	103.44	104.33	104.40	102.98	103.73	104.30	104.72	102.83	102.26	102.31	103.09
19	102.26	103.47	104.38	104.35	103.00	103.70	104.32	104.76	102.85	102.25	102.38	102.85
20	102.28	103.50	104.42	104.19	102.99	103.76	104.28	104.49	102.84	102.27	102.22	103.33
21	102.26	103.50	104.51	104.08	103.26	103.74	104.45	104.24	102.88	102.28	102.25	103.42
22	102.25	103.60	104.75	103.89	103.26	103.86	104.46	104.13	102.90	102.32	102.23	103.21
23	102.22	103.56	104.90	103.72	103.28	103.87	104.46	104.01	102.89	102.29	102.26	103.20
24	102.22	103.38	104.95	103.50	103.27	103.90	104.45	104.02	102.88	*102.28	102.34	103.19
25	102.57	103.47	104.92	103.34	103.28	*103.95	104.43	103.95	102.87	*102.26	102.29	103.20
26	102.82	103.62	104.95	102.89	103.28	*103.88	104.40	103.92	102.87	102.26	102.26	102.94
27	102.22	103.56	104.91	102.90	103.28	103.83	104.43	104.01	102.90	102.27	102.33	102.87
28	102.18	103.55	104.91	103.01	103.30	103.81	104.42	103.93	102.88	102.26	103.00	102.86
29	102.17		104.94	103.03	103.22	103.86	104.44	103.94	102.87	*102.24	104.08	102.83
30	102.23		104.91	102.93	103.28	103.94	104.60	104.02	102.84	*102.23	103.25	102.84
31	102.20		104.97		103.29		104.53	104.01		102.21		102.93
Avg.	102.72	102.94	104.23	104.26	103.05	103.55	104.23	104.52	103.64	102.27	102.39	102.73

* Partly estimated

COLORADO RIVER IMMEDIATELY ABOVE MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico attached to the upstream abutment of the gates of the Intake Canal at Morelos Dam, 1.1 miles downstream from the northerly international boundary, and about 8 miles downstream from the Yuma Gaging Station. Zero of the gage is 0.16 foot below mean sea level, U.S.C. & G.S. datum.

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 December 1967.

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 gage height, 112.70 feet on January 2, 1958; minimum mean daily gage height, 101.51 feet on February 17, 1957.

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102.26	101.80	103.02	104.07	102.30	102.62	103.15	103.84	103.18	101.77	101.80	102.40
2	102.49	101.80	102.99	104.07	102.33	102.62	103.15	103.81	104.40	101.77	101.77	101.84
3	102.59	101.80	102.99	104.04	102.30	102.66	103.12	103.87	108.37	101.77	101.80	101.84
4	102.66	101.80	102.99	104.04	102.33	102.66	103.15	103.97	108.33	101.77	101.80	101.80
5	102.62	101.77	103.02	104.07	102.40	102.66	103.12	104.04	104.40	101.80	101.80	101.80
6	102.56	101.80	102.99	104.04	102.30	102.62	103.15	104.00	102.99	101.80	101.77	101.80
7	102.53	101.77	103.02	104.04	102.30	102.62	103.15	104.00	102.95	101.77	101.77	101.80
8	102.49	101.80	103.02	104.04	102.30	102.66	103.18	104.04	102.92	101.80	101.80	101.80
9	102.49	101.80	103.02	104.07	102.30	102.62	103.15	104.04	102.72	101.80	101.80	101.80
10	102.46	101.80	103.05	103.87	102.33	102.62	103.22	104.00	102.62	101.80	101.80	101.80
11	102.43	102.07	103.22	103.94	102.33	102.66	103.22	104.00	102.66	101.80	101.80	101.77
12	102.43	102.30	103.25	103.90	102.33	102.59	103.22	103.90	102.43	101.77	101.80	101.84
13	102.43	102.49	103.25	103.90	102.33	102.59	103.41	103.84	102.23	101.77	101.77	101.87
14	102.43	102.49	103.22	103.94	102.36	102.56	103.41	103.77	102.20	101.77	101.80	101.90
15	102.20	102.62	103.25	103.97	102.30	102.76	103.41	103.77	102.26	101.77	101.80	102.13
16	102.07	102.85	103.25	103.97	102.26	102.82	103.44	103.77	102.20	101.80	101.84	102.33
17	101.87	102.92	103.38	103.71	102.26	102.89	103.41	103.71	102.17	101.77	101.80	102.36
18	101.90	102.89	103.61	103.61	102.33	102.95	103.44	103.71	102.20	101.77	101.84	102.36
19	101.84	102.92	103.64	103.54	102.36	102.95	103.44	103.74	102.20	101.77	101.87	102.20
20	101.87	102.99	103.71	103.38	102.36	102.99	103.41	103.54	102.20	101.77	101.77	102.53
21	101.87	102.95	103.77	103.28	102.59	102.99	103.54	103.38	102.23	101.77	101.80	102.59
22	101.87	102.99	103.97	103.12	102.59	103.08	103.54	103.28	102.23	101.80	101.84	102.43
23	101.84	102.92	104.10	102.95	102.62	103.08	103.54	103.18	102.23	101.77	101.80	102.43
24	101.84	102.79	104.13	102.79	102.62	103.12	103.54	103.18	102.20	101.77	101.84	102.40
25	102.07	102.89	104.10	102.66	102.62	103.15	103.54	103.15	102.20	101.77	101.80	102.40
26	102.26	102.99	104.10	102.30	102.62	103.08	103.51	103.12	102.20	101.77	101.84	102.26
27	101.84	102.95	104.07	102.30	102.62	103.08	103.54	103.15	102.23	101.77	101.84	102.20
28	101.80	102.92	104.10	102.40	102.62	103.05	103.51	103.12	102.20	101.77	102.40	102.20
29	101.80		104.10	102.40	102.59	103.08	103.54	103.15	102.20	101.77	103.22	102.17
30	101.80		104.07	102.33	102.62	103.15	103.67	103.22	102.17	101.77	102.49	102.17
31	101.80		104.10		102.66		103.64	103.18		101.77		102.23
Avg.	102.17	102.42	103.50	103.49	102.43	102.83	103.37	103.63	102.92	101.78	101.90	102.11

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - DISCHARGES

DESCRIPTION: Water-stage recorder and staff gage on left bank of Intake Canal, 200 feet downstream from the intake at Morelos Dam, 1,350 feet upstream from the point where it joins the old Alamo Canal, 2.2 miles upstream from Matamoros Check, and about one mile south of the northerly international boundary. Zero of gage is 0.16 foot 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 1967. 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. Water for use in Mexico may also 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 under conditions set forth in the 1944 Water Treaty. No diversions of the above nature have been made during the years 1951 through 1967 and consequently the records reported below show the total water diverted from the Colorado River to the Alamo Canal during those years. Other diversions from the Colorado River are made by Mexico downstream from Morelos Dam by means of pumps.

EXTREMES: Maximum mean daily discharge, 6,540 second-feet, August 3, 1958; maximum mean daily gage height, 107.22 feet on November 8, 1950. Minimum daily discharge, no flow on various occasions.

Mean Daily Discharge in Second-Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,350	720	1,970	3,640	1,210	1,620	2,460	3,430	2,430	675	710	1,430
2	1,590	735	1,950	3,670	1,300	1,640	2,460	3,460	4,310	671	671	657
3	1,710	724	1,940	3,570	1,230	1,660	2,460	3,500	3,960	717	696	696
4	1,820	703	1,880	3,530	1,310	1,700	2,480	3,530	3,710	689	710	682
5	1,770	699	1,940	3,570	1,360	1,650	2,460	3,530	3,230	692	699	682
6	1,660	706	1,900	3,570	1,260	1,640	2,460	3,440	2,420	703	699	699
7	1,640	685	1,960	3,530	1,250	1,620	2,480	3,500	2,350	682	678	667
8	1,610	717	1,970	3,530	1,240	1,660	2,480	3,530	2,280	703	717	664
9	1,610	717	1,970	3,600	1,250	1,640	2,490	3,570	1,940	710	692	682
10	1,620	717	1,980	3,270	1,250	1,620	2,560	3,530	1,800	699	682	685
11	1,540	1,070	2,260	3,310	1,240	1,670	2,560	3,520	1,850	731	696	685
12	1,560	1,350	2,300	3,290	1,310	1,660	2,580	3,370	1,500	706	703	699
13	1,550	1,620	2,260	3,260	1,290	1,660	2,860	3,400	1,210	696	696	756
14	1,560	1,590	2,250	3,290	1,300	1,640	2,860	3,370	1,200	675	682	805
15	1,260	1,560	2,240	3,320	1,270	1,920	2,870	3,370	1,240	664	699	1,080
16	1,060	1,560	2,260	3,280	1,270	1,960	2,870	3,410	1,210	706	720	1,360
17	770	1,670	2,490	2,970	1,250	2,090	2,840	3,350	1,180	671	699	1,370
18	855	1,620	2,800	2,910	1,320	2,160	2,840	3,350	1,180	682	724	1,410
19	788	1,670	2,910	2,900	1,360	2,130	2,870	3,380	1,190	678	788	1,140
20	805	1,710	2,980	2,750	1,380	2,160	2,840	3,080	1,170	692	667	1,660
21	798	1,740	3,070	2,560	1,650	2,220	3,020	2,810	1,170	703	689	1,720
22	802	1,910	3,440	2,340	1,640	2,380	3,030	2,670	1,230	724	710	1,450
23	749	1,820	3,570	2,100	1,680	2,340	2,990	2,520	1,210	717	689	1,430
24	770	1,680	3,640	1,800	1,670	2,340	3,030	2,550	1,230	720	763	1,440
25	1,030	1,780	3,600	1,670	1,650	2,380	2,990	2,450	1,230	692	692	1,440
26	1,270	1,920	3,640	1,210	1,660	2,370	2,990	2,400	1,210	699	703	1,230
27	752	1,890	3,640	1,200	1,620	2,310	3,030	2,460	1,210	699	713	1,150
28	720	1,860	3,640	1,270	1,670	2,300	3,010	2,390	1,230	699	1,490	1,150
29	710		3,640	1,300	1,600	2,380	3,020	2,400	1,210	678	2,650	1,120
30	749		3,600	1,230	1,610	2,430	3,210	2,520	1,200	685	1,560	1,130
31	727		3,710		1,660		3,140	2,500		664		1,230
Sum	37,205	37,143	83,400	83,440	43,760	58,950	86,240	96,290	53,490	21,522	24,687	32,999

Current Year 1967 — **Period** 1950-1967

Month	Extreme Gage Feet		Ø Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	101.94	99.15	4	1,820	29	710	1,200	73,681	51,757	114,523	965
Feb.	102.30	99.02	26	1,920	7	685	1,320	73,596	50,901	101,685	9,232
Mar.	103.18	101.03	31	3,710	4	1,880	2,690	165,230	164,013	216,994	97,902
Apr.	103.12	99.97	2	3,670	27	1,200	2,780	165,412	196,952	264,127	158,162
May	100.82	99.87	23	1,680	1	1,210	1,410	86,611	100,646	159,010	65,207
June	101.64	100.30	30	2,430	10	1,620	1,960	116,772	178,339	269,632	116,772
July	102.46	101.38	30	3,210	† 5	2,460	2,780	170,953	250,839	304,263	170,953
Aug.	102.85	101.31	9	3,570	28	2,390	3,100	190,881	251,241	341,044	185,235
Sept.	104.72	99.93	2	4,310	† 20	1,170	1,780	106,000	148,289	198,095	93,489
Oct.	99.93	99.28	11	731	† 15	664	696	42,686	49,832	90,639	10,453
Nov.	102.99	98.95	29	2,650	20	667	823	48,955	35,044	103,954	7,516
Dec.	102.13	99.08	21	1,720	2	657	1,070	65,503	54,568	131,440	8,825
Yearly	104.72	98.95		4,310		657	1,800	1,306,276	1,535,293	1,961,556	1,306,276

Ø Mean daily † And other days

INTAKE CANAL AT MORELOS DIVERSION STRUCTURE - STAGES

(See Preceding Page for Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.33	99.11	102.03	102.89	99.84	100.56	101.31	102.46	101.38	99.41	99.28	100.52
2	100.52	98.98	102.00	102.89	99.93	100.59	101.28	102.49	103.48	99.25	99.25	99.11
3	100.59	99.02	102.03	102.82	99.87	100.59	101.28	102.56	103.87	99.28	99.31	99.15
4	100.66	98.95	102.03	102.85	99.93	100.43	101.31	102.59	103.71	99.28	99.31	99.11
5	100.62	98.95	102.03	102.85	100.00	100.43	101.28	102.56	103.15	99.25	99.28	99.11
6	100.49	98.98	102.03	102.85	99.84	100.46	101.31	102.53	102.30	99.28	99.28	99.11
7	100.49	99.02	102.03	102.85	99.87	100.66	101.35	102.56	102.00	99.28	99.28	99.05
8	100.46	99.08	102.03	102.82	99.84	100.39	101.35	102.59	101.44	99.28	99.31	99.05
9	100.49	99.11	101.97	102.82	99.87	100.36	101.31	102.59	101.18	99.28	99.25	99.15
10	100.52	99.08	101.38	102.46	99.87	100.36	101.35	102.56	101.12	99.28	99.28	99.15
11	100.69	99.51	101.41	102.49	99.87	100.39	101.35	102.59	101.15	99.31	99.31	99.11
12	101.57	99.93	101.48	102.43	99.90	100.39	101.38	102.53	100.82	99.28	99.31	99.18
13	101.57	100.33	101.48	102.46	99.87	100.39	101.67	102.56	100.56	99.28	99.28	99.28
14	101.57	100.39	101.44	102.46	99.90	100.36	101.71	102.53	100.00	99.28	99.28	99.38
15	101.48	100.46	101.48	102.49	99.87	100.62	101.71	102.53	100.03	99.25	99.28	99.80
16	101.35	100.49	101.48	102.49	99.87	100.69	101.74	102.53	99.97	99.28	99.31	100.20
17	100.62	100.66	101.64	102.33	99.87	100.95	101.67	102.49	99.90	99.25	99.28	100.33
18	100.33	100.72	102.07	102.36	99.93	101.05	101.74	102.49	99.90	99.28	99.34	100.30
19	99.34	100.85	102.13	102.33	99.93	101.02	101.74	102.43	99.90	99.25	99.34	100.10
20	99.34	100.98	102.17	102.30	99.93	101.05	101.71	102.23	99.87	99.28	99.02	100.95
21	99.34	100.95	102.23	102.07	100.36	101.05	101.94	101.94	99.90	99.28	99.05	101.67
22	99.34	101.44	102.53	101.71	100.39	101.25	101.97	101.74	99.90	99.31	99.11	101.54
23	99.31	102.00	102.82	101.67	100.43	101.25	101.97	101.54	99.90	99.28	99.05	101.15
24	99.25	101.84	102.89	101.48	100.39	101.28	101.97	101.48	99.90	99.28	99.15	100.52
25	99.80	101.74	102.82	101.15	100.46	101.35	101.97	101.38	99.87	99.28	99.11	100.52
26	100.79	101.90	102.85	100.30	100.43	101.25	101.94	101.35	99.90	99.28	99.05	100.30
27	100.56	102.00	102.79	99.90	100.43	101.18	101.94	101.44	99.90	99.28	99.15	100.23
28	99.15	102.00	102.79	100.00	100.49	101.12	101.94	101.35	99.93	99.28	100.20	100.26
29	99.05		102.82	100.00	100.36	101.18	101.97	101.38	99.87	99.21	102.49	100.23
30	99.15		102.79	99.87	100.49	101.28	102.17	101.44	99.90	99.25	100.82	100.26
31	99.11		102.85		100.59		102.13	101.41		99.21		100.33
Avg.	100.25	100.30	102.15	102.01	100.08	100.80	101.66	102.16	100.82	99.28	99.43	99.94

COLORADO RIVER IMMEDIATELY BELOW MORELOS DAM - STAGES

DESCRIPTION: Water-stage recorder located on the right bank of the Colorado River in Mexico immediately downstream from Morelos Dam, 1.1 miles downstream from the northerly international boundary, and about 7.5 miles downstream from the Colorado River below Yuma Main Canal Wasteway. Zero of the gage is 0.16 foot below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records obtained and furnished by the Mexican Section of the Commission. Records available: Staff gage heights, February 20, 1951 to June 6, 1966; a continuous record of gage heights, June 7, 1966 through 1967.

REMARKS: Prior to June 7, 1966, when a continuous water-stage recorder was installed, mean daily gage height records were determined from hourly readings of a staff gage painted on sloping concrete apron of Morelos Dam.

EXTREMES: Maximum mean daily gage height, 112.63 feet on January 2, 1958; minimum mean daily gage height, 98.13 feet several days during March and April 1967.

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100.26	100.46	99.64	98.13	98.92	98.75	99.11	98.62	99.67	101.57	101.84	101.87
2	100.10	100.46	99.64	98.13	98.26	98.72	99.11	98.62	101.61	101.74	101.87	101.80
3	99.74	100.43	99.64	98.13	98.06	98.72	99.15	98.65	108.37	101.77	101.87	101.80
4	99.21	100.43	99.64	98.39	98.06	98.72	99.15	98.65	107.91	101.67	101.87	101.80
5	99.90	100.43	99.67	98.82	98.52	98.72	99.15	98.69	102.13	101.31	101.84	101.80
6	100.03	100.43	99.64	98.72	99.28	98.75	99.08	98.72	99.90	101.48	101.87	101.80
7	100.13	100.43	99.64	98.72	99.11	98.75	99.02	98.72	99.70	101.80	101.87	101.74
8	100.10	100.39	99.64	98.72	99.11	98.75	99.11	98.72	99.77	101.84	101.90	101.74
9	100.07	100.43	99.64	98.69	99.18	98.75	99.18	98.72	100.07	101.80	101.94	101.74
10	100.20	100.36	99.64	98.88	99.15	98.79	98.88	98.72	100.20	101.80	101.94	101.74
11	100.49	100.23	99.57	98.92	99.11	98.88	98.85	98.75	100.26	101.80	101.94	101.74
12	100.52	100.03	99.54	98.98	99.08	98.82	98.88	98.75	100.33	101.80	101.94	101.74
13	100.52	99.90	99.54	98.92	99.08	98.82	98.62	98.75	100.56	101.84	101.90	101.77
14	100.52	99.90	99.54	98.92	99.08	98.92	98.49	98.75	100.75	101.80	101.90	101.64
15	100.49	99.87	99.51	98.92	99.08	98.95	98.46	98.79	100.79	101.80	101.90	101.57
16	100.49	99.80	99.51	98.92	99.11	99.21	98.49	98.79	100.85	101.80	101.90	101.44
17	100.49	99.80	99.34	99.15	98.75	99.21	98.49	98.82	100.85	101.84	101.90	101.38
18	100.49	99.74	99.15	99.18	98.20	99.25	98.49	98.79	100.89	101.84	101.90	101.38
19	100.46	98.75	99.08	99.21	98.00	99.15	98.49	98.79	100.85	101.84	101.90	101.44
20	100.46	98.23	99.82	99.31	98.16	98.98	98.49	98.79	100.15	101.84	101.84	101.44
21	100.46	98.16	98.29	99.34	98.46	98.92	98.49	98.79	100.72	101.84	101.84	101.41
22	100.49	98.13	98.16	99.31	98.65	98.39	98.49	98.79	100.56	101.84	101.84	101.41
23	100.46	98.79	98.16	99.38	98.69	98.49	98.52	98.75	100.52	101.80	101.80	101.41
24	100.49	99.80	98.16	99.61	98.79	98.72	98.56	98.79	100.56	101.80	101.84	101.48
25	100.46	99.70	98.13	99.74	98.79	98.72	98.52	99.70	100.52	101.80	101.87	101.48
26	100.46	99.64	98.13	99.80	98.79	98.88	98.56	99.70	100.56	101.84	101.87	101.38
27	100.46	99.61	98.13	98.92	98.79	99.08	98.62	99.67	100.52	101.84	101.84	101.25
28	100.46	99.67	98.13	98.20	98.79	99.08	98.62	99.80	100.52	101.87	101.87	101.31
29	100.46		98.13	98.49	98.79	99.08	98.65	99.77	100.56	101.84	101.94	101.31
30	100.49		98.13	99.51	98.75	99.08	98.62	99.70	100.56	101.84	101.87	101.31
31	100.49		98.13		98.79		98.65	99.67		101.84		101.28
Avg.	100.32	99.79	99.02	98.94	98.75	98.87	98.74	98.96	101.06	101.78	101.88	101.56

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

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

RECORDS: Based on 26 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 1967.

REMARKS: Pursuant to Minute No. 218 of the Commission, an extension to the Wellton-Mohawk Drainage Conveyance Channel was constructed along the left bank of the Colorado River to a point immediately below Morelos Dam, a distance of about 12 miles, and placed in operation on November 16, 1965. Drainage flows may be discharged to the Gila River and thence to the Colorado River at the diversion structure, Main Outlet Drain Extension No. 1, at the upstream end of the extension; directly to the Colorado River at Main Outlet Drain Extension No. 2, 1.9 miles upstream from Morelos Dam; and immediately below Morelos Dam at this station, Main Outlet Drain Extension No. 3. The combined 1967 record of discharges to the river above Morelos Dam through M.O.D.E. No. 1 and No. 2 is shown on page 15.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	210	294	138	0	60.4	42.1	35.4	0	42.8	266	294	303
2	179	294	140	0	10.6	37.8	35.8	0	77.3	290	290	296
3	114	290	139	0	0	33.8	37.8	0	228	292	294	301
4	65.3	290	138	19.7	0	34.4	36.5	0	278	269	294	301
5	156	290	144	46.2	36.6	33.8	36.5	0	275	209	290	300
6	176	290	140	33.4	104	33.8	26.8	0	60.2	245	294	298
7	196	283	141	34.4	87.5	33.8	20.3	0	50.2	295	295	295
8	193	289	143	36.5	88.5	34.4	33.1	0	57.1	298	296	290
9	193	283	143	32.4	96.2	31.1	33.8	0	84.5	295	300	295
10	221	255	143	* 55.7	89.4	37.1	13.7	0	94.9	292	301	296
11	284	231	130	* 56.5	81.9	39.2	11.4	0	102	292	301	294
12	292	197	129	62.3	80.9	34.8	11.9	0	106	290	300	300
13	295	169	125	54.7	80.9	35.0	* 2.3	0	139	290	300	303
14	294	167	122	54.4	81.9	37.5	0	0	164	289	298	275
15	290	160	121	56.0	85.6	45.6	0	0	164	289	296	259
16	289	150	124	56.0	83.7	65.8	0	0	170	289	300	237
17	286	151	103	80.9	47.2	66.6	0	0	170	292	300	231
18	286	144	78.6	87.5	6.4	65.8	0	0	170	294	300	228
19	288	34.9	71.6	88.5	0	52.1	0	0	158	292	301	244
20	289	0	43.9	104	9.6	34.7	0	0	144	294	298	245
21	289	0	2.7	108	25.4	28.7	0	0	135	294	296	241
22	288	0	0	104	37.0	2.6	0	0	109	290	298	240
23	286	55.8	0	112	39.2	8.0	0	0	103	290	295	245
24	284	165	0	139	48.1	13.2	0	3.0	103	289	296	252
25	288	151	0	167	45.5	12.3	0	48.9	104	290	303	255
26	292	139	0	176	44.3	25.2	0	48.9	103	294	304	237
27	294	133	0	* 64.3	44.3	35.1	0	45.0	98.2	294	301	219
28	295	138	0	* 4.2	45.0	35.1	0	59.7	97.2	294	292	231
29	295		0	* 34.6	44.3	35.1	0	53.6	97.2	292	295	234
30	295		0	137	44.3	33.0	0	47.3	97.2	292	300	235
31	294		0		44.3		0	43.6		292		233
Sum	7,796.3	5,043.7	2,459.8	2,005.2	1,593.0	1,057.5	335.3	350.0	3,781.8	8,873	8,922	8,213

Current Year 1967									Period 1966-1967		
Month	Ø Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
				High		Low			Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.	3.12	1.18	†13	295	4	65.3	251	15,464	16,602	17,740	15,464
Feb.	3.09	0	† 1	294	†20	0	180	10,004	12,579	15,154	10,004
Mar.	1.97	0	5	144	†22	0	79.3	4,879	4,114	4,879	3,350
Apr.	2.24	0	26	176	† 1	0	66.8	3,977	2,627	3,977	1,277
May	1.60	0	6	104	† 3	0	51.4	3,160	4,473	5,786	3,160
June	1.25	.10	17	66.6	22	2.6	35.2	2,098	2,822	3,546	2,098
July	.90	0	3	37.8	†14	0	10.8	665	332	665	0
Aug	1.15	0	28	59.7	† 1	0	11.3	694	364	694	34.9
Sept.	3.02	.94	4	278	1	42.8	126	7,501	5,538	7,501	3,575
Oct.	3.10	2.48	8	298	5	209	286	17,599	17,708	17,816	17,599
Nov.	3.16	3.06	26	304	† 2	290	297	17,697	17,466	17,697	17,234
Dec.	3.13	2.55	† 1	303	27	219	265	16,290	15,950	16,290	15,610
Yearly	3.16	0		304		0	138	100,028	100,575	101,123	100,028

Ø Mean daily † And other days * Partly estimated

COOPER WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging regulatory waste water from the Cooper Canal to the Colorado River. This wasteway is located 1.5 miles downstream from the northerly international boundary and 0.4 mile downstream from Morelos Diversion Dam. This is one 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.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by monthly meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, March 1950 through December 1967, obtained by the United States Section; monthly discharge, January 1934 through March 1950, by the Bureau of Reclamation.

EXTREMES: Prior to March 1950, maximum monthly discharge, 914 acre-feet, January 1940; minimum monthly discharge, zero for various months. Since March 1950, maximum instantaneous discharge, 79.3 second-feet, June 19, 1965, at maximum gage height of 114.13 feet; minimum instantaneous discharge, zero during parts of each month.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.5	1.1	0.9	5.0	7.8	1.7	4.0	0.1	0.4	0.7	2.1	0.3
2	.5	1.0	.8	1.3	5.5	2.7	4.0	0	4.6	.6	7.2	.3
3	.4	3.0	1.4	.4	3.7	6.7	1.2	0	.5	.6	3.1	.1
4	.4	1.3	1.2	.2	2.0	.4	1.0	.4	.1	.6	4.6	.1
5	1.4	1.5	2.7	0	.7	.7	1.0	1.5	.3	.6	.8	.1
6	2.6	1.3	1.4	.3	.7	.4	1.4	7.0	.1	.4	2.6	1.7
7	1.3	.1	.2	.4	.8	.6	4.1	.7	.2	1.5	2.7	1.0
8	.8	0	0	.3	1.1	.9	4.6	.4	.4	.7	.8	2.8
9	.8	.7	1.2	.7	1.6	1.1	1.9	0	1.7	.2	1.3	2.8
10	.8	.5	1.2	3.5	1.9	3.3	.6	.4	1.2	.1	2.0	.4
11	2.6	.4	.6	.6	2.3	4.9	2.0	.8	1.7	.6	7.6	.4
12	.4	1.3	.1	1.1	3.3	.9	2.0	.9	1.7	.6	1.5	.8
13	.6	2.6	2.6	4.1	.4	.4	.5	1.5	1.6	.7	.4	.5
14	.4	3.1	.5	1.6	1.8	1.4	1.5	.9	1.9	.4	.4	.4
15	.2	1.5	1.8	4.3	.3	2.1	1.4	2.7	.5	.6	1.0	.3
16	.3	.9	1.3	1.2	.5	2.8	¤ 2.9	2.7	.4	.8	1.4	.3
17	.8	1.0	.6	1.4	.9	.6	* .8	9.6	.4	1.1	.7	.3
18	.2	2.0	.4	1.3	.8	.2	.6	.7	.4	.4	1.5	.3
19	1.0	1.3	3.5	.9	.6	.1	.4	1.3	.4	.3	3.4	.4
20	1.2	.7	2.4	.8	.5	.1	.6	3.0	.5	.7	.8	.3
21	.9	.9	3.8	.7	.5	2.4	3.8	4.2	1.0	.4	.3	.3
22	.7	.7	1.6	.6	1.3	.4	1.9	5.0	.9	.5	0	.3
23	.3	.5	1.4	4.3	2.1	.5	.6	4.2	.9	.7	0	.1
24	.1	3.0	.6	1.8	2.5	.8	1.3	5.0	.9	1.4	0	8.4
25	0	1.1	1.2	.7	4.6	2.8	1.1	3.7	.9	1.0	0	3.4
26	0	1.4	2.9	.3	1.8	.3	1.4	2.2	1.0	1.5	.1	.4
27	0	.8	.3	.5	1.6	3.9	4.2	8.1	.9	1.5	.8	.4
28	0	1.3	1.7	.7	1.2	.2	4.1	1.0	.7	5.2	.4	3.9
29	0		1.4	.7	.9	1.1	5.4	.5	.7	1.1	.4	1.0
30	0		.4	5.5	.7	7.2	1.9	.1	.7	.2	.3	.5
31	.6		2.3		.7		2.2	0		0		.4
Sum	19.8	35.0	42.4	45.2	55.1	51.6	64.4	68.6	27.6	25.7	48.2	32.7

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1935-1967 Acre Feet Average	Maximum	Minimum
Jan.	112.40	111.00	11	23.1	† 15	0	0.6	39.3	199	914	0
Feb.	112.10	111.00	24	16.1	† 7	0	1.2	69.4	174	400	6
Mar.	112.29	111.00	26	20.4	† 7	0	1.4	84.1	186	517	0
Apr.	112.50	111.00	30	25.6	† 5	0	1.5	89.7	202	425	40
May	112.39	111.00	8	22.8	† 16	0	1.8	109	190	440	76
June	112.48	111.00	10	25.1	† 19	0	1.7	102	180	595	47
July	112.02	111.02	7	24.6	23	.1	2.1	128	165	516	0
Aug	112.36	111.00	27	22.1	† 1	0	2.2	136	128	617	0
Sept.	112.00	111.00	2	14.1	† 1	0	.9	54.7	128	462	0
Oct.	112.30	111.00	28	20.6	† 10	0	.8	51.0	154	490	0
Nov.	112.41	111.00	11	23.4	† 1	0	1.6	95.6	180	462	9
Dec.	112.34	111.00	24	21.6	† 3	0	1.1	64.9	215	592	64.9
Yearly	112.50	111.00		25.6		0	1.4	1,023.7	2,101	4,500	1,023.7

¤ Estimated * Partly estimated † And other days

COLORADO RIVER AT MORELOS GAGING STATION - DISCHARGES

DESCRIPTION: Water-stage recorder on the left (Arizona) bank of the river, and cableway 1.8 miles downstream from the northerly international boundary, 0.7 mile downstream from Morelos Diversion Dam, and about 9 miles downstream from Yuma, Arizona, along the river levee. The cableway and recorder are 1,260 feet and 1,300 feet, respectively, below the mouth of Cooper Wasteway. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 161 current meter measurements during the year, 100 by the United States Section, 61 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: Daily discharges, January 1, 1954 through December 1967; continuous record of gage heights, July 20, 1952 through December 1967.

REMARKS: Reservoirs, diversions in United States and Mexico, drainage returns, and waste flows modify the river flow at this station. The record at this station, less that of Cooper Wasteway and Main Outlet Drain Extension No. 3, represents the river flow passing Morelos Diversion Dam.

EXTREMES: Maximum instantaneous discharge, 22,240 second-feet on January 4, 1955; maximum gage height, 112.18 feet on January 28, 1958. Minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	224	298	141	9.6	78.6	49.0	47.0	5.0	50.0	248	300	312
2	194	298	145	7.3	23.6	46.0	48.0	5.9	473	288	305	301
3	147	300	143	7.0	10.7	46.0	47.0	5.9	3,110	291	305	307
4	63.6	296	141	21.6	7.4	40.0	47.0	5.9	2,980	273	307	307
5	157	298	150	52.4	33.2	38.0	46.0	6.8	515	192	301	305
6	179	296	145	39.5	98.2	39.0	39.0	10.6	94.8	224	303	305
7	202	289	145	40.4	85.9	39.0	34.0	6.4	68.6	300	303	301
8	197	292	145	41.2	86.2	41.0	47.0	5.9	71.9	303	303	298
9	199	291	147	36.4	92.8	39.0	46.0	5.0	84.6	301	307	303
10	217	264	147	57.7	88.4	46.0	26.5	5.4	93.4	298	309	303
11	289	242	132	65.3	81.8	51.0	22.0	5.4	102	296	312	300
12	298	202	132	69.7	82.9	42.0	22.0	5.4	108	296	310	303
13	298	174	131	67.2	79.6	41.8	11.4	6.8	135	298	307	305
14	300	170	124	63.2	84.0	48.0	7.2	6.8	164	296	305	286
15	296	163	126	64.3	87.3	53.6	6.4	7.7	170	296	303	270
16	300	152	127	64.3	84.0	76.3	8.2	9.0	174	296	309	244
17	298	152	111	87.1	52.3	77.4	5.9	15.9	176	298	307	237
18	305	147	81.5	92.5	12.3	77.4	5.9	8.2	176	300	307	232
19	301	40.5	74.6	92.5	5.8	62.4	5.9	7.7	170	300	311	248
20	305	7.9	50.4	107	12.5	41.0	5.0	8.6	158	300	305	251
21	303	7.9	13.8	114	25.2	39.0	6.4	8.6	152	298	303	246
22	305	8.2	8.2	108	37.5	12.9	5.9	9.0	115	296	303	246
23	303	42.3	7.0	122	43.7	11.7	4.6	9.5	107	294	300	252
24	300	169	6.7	141	51.3	20.6	5.4	10.6	107	296	300	265
25	298	156	6.7	162	51.0	22.0	5.4	50.8	108	296	307	264
26	300	142	8.1	174	49.0	29.2	5.4	52.1	111	300	309	248
27	300	136	6.1	80.7	49.0	44.0	8.2	54.3	109	301	309	228
28	301	139	7.0	11.0	48.0	42.0	9.0	62.0	111	305	310	240
29	303		7.2	33.1	48.0	44.0	10.0	59.8	111	303	321	242
30	303		7.0	132	48.0	48.0	6.8	51.0	112	298	314	243
31	300		7.6		48.0		5.9	48.0		298		238
Sum	8,085.6	5,172.8	2,623.9	2,164.0	1,686.2	1,307.3	600.4	560.0	10,217.3	8,979	9,195	8,430

Current Year 1967 — **Period** 1954-1967

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	100.03	98.37	18	307	4	39.6	261	16,038	218,050	969,540	949
Feb.	99.96	97.74	5	303	20	7.6	185	10,260	109,771	414,310	977
Mar.	99.00	97.41	5	157	24	5.8	84.6	5,204	70,185	630,230	780
Apr.	99.09	97.36	26	197	2	6.7	72.1	4,292	55,006	532,320	899
May	98.77	97.28	1	149	20	5.0	54.4	3,345	64,442	375,970	460
June	98.06	97.32	16	81.8	23	6.8	43.6	2,593	14,791	119,980	834
July	97.95	97.47	8	53.2	21	4.0	19.4	1,191	14,068	89,430	654
Aug	98.68	97.70	27	62.0	15	4.0	18.1	1,111	24,442	125,590	702
Sept.	108.40	98.56	4	* 4,000	1	49.0	341	20,266	19,692	87,830	113
Oct.	101.18	99.70	28	316	1	117	290	17,810	56,581	172,940	9,750
Nov.	101.24	100.98	29	325	24	293	306	18,238	106,890	356,390	4,869
Dec.	101.09	100.19	1	314	27	224	272	16,721	148,717	643,850	1,111
Yearly	108.40	97.28		* 4,000		4.0	162	117,069	902,635	3,957,730	101,758

* Partly estimated

COLORADO RIVER AT MORELOS GAGING STATION - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	99.68	99.93	98.91	97.50	98.16	97.81	97.84	97.71	98.63	100.69	101.09	101.08
2	99.48	99.93	98.93	97.42	97.59	97.80	97.86	97.73	100.42	100.92	101.12	101.01
3	99.17	99.94	98.92	97.41	97.41	97.80	97.86	97.74	107.60	100.94	101.12	101.01
4	98.60	99.92	98.91	97.59	97.35	97.74	97.87	97.75	107.22	100.88	101.13	101.00
5	99.23	99.93	98.96	97.99	97.64	97.73	97.87	97.78	101.40	100.52	101.10	100.99
6	99.35	99.92	98.93	97.88	98.32	97.74	97.80	97.88	98.95	100.65	101.12	100.98
7	99.48	99.88	98.92	97.88	98.22	97.73	97.76	97.81	98.63	101.00	101.13	100.93
8	99.45	99.90	98.92	97.89	98.22	97.74	97.89	97.82	98.66	101.04	[1] 101.14	100.88
9	99.46	99.89	98.92	97.85	98.28	97.72	97.88	97.82	98.90	101.03	* 101.17	100.91
10	99.56	99.73	98.92	98.03	98.24	97.79	97.69	97.84	99.01	101.01	101.18	100.90
11	99.96	99.61	98.83	98.07	98.18	97.84	97.65	97.85	99.12	101.00	101.20	100.87
12	100.01	99.39	98.83	98.10	98.19	97.75	97.66	97.86	99.18	101.00	101.19	100.88
13	100.01	99.23	98.82	98.07	98.15	97.74	97.53	97.90	99.40	101.01	101.16	100.89
14	100.02	99.20	98.78	98.04	98.19	97.78	97.49	97.91	99.62	101.00	101.14	100.78
15	100.00	99.15	98.77	98.05	98.21	97.82	97.50	97.94	99.67	101.00	101.12	100.69
16	100.00	99.07	98.77	98.05	98.19	98.01	97.54	97.97	99.73	101.01	101.14	100.52
17	99.97	99.06	98.60	98.25	97.89	98.02	97.49	98.07	99.77	101.04	101.13	100.45
18	99.99	99.03	98.40	98.30	97.43	98.02	97.49	97.95	99.80	101.05	101.13	100.41
19	99.97	98.18	98.35	98.31	97.30	97.91	97.50	97.95	99.78	101.05	101.17	100.49
20	99.99	97.75	98.12	98.42	97.40	97.95	97.50	97.98	99.70	101.05	101.09	100.51
21	99.98	97.75	97.64	98.47	97.58	97.73	97.57	97.99	99.68	101.05	101.04	100.47
22	99.99	97.76	97.52	98.44	97.71	97.42	97.57	98.01	99.50	101.04	101.04	100.42
23	99.97	98.13	97.48	98.53	97.78	97.42	97.55	98.00	99.48	101.04	101.02	100.45
24	99.94	99.08	97.47	98.70	97.85	97.56	97.59	97.99	99.49	101.05	101.02	100.51
25	99.93	99.01	97.46	98.87	97.86	97.58	97.60	98.55	99.52	101.05	101.05	100.49
26	99.94	98.92	97.50	98.95	97.82	97.67	97.62	98.58	99.55	101.08	101.05	100.39
27	99.94	98.89	97.44	98.14	97.82	97.82	97.69	98.61	99.54	101.09	101.06	100.22
28	99.95	98.91	97.46	97.44	97.82	97.79	97.71	98.69	99.55	101.12	101.07	100.27
29	99.96		97.45	97.67	97.83	97.79	97.75	98.68	99.57	101.11	101.13	100.28
30	99.96		97.42	98.64	97.83	97.84	97.72	98.62	99.59	101.08	101.09	100.29
31	99.94		97.44		97.83		97.72	98.61		101.08		100.25
Avg.	99.77	99.18	98.32	98.10	97.88	97.77	97.67	98.05	100.02	100.99	101.11	100.65

[1] Estimated * Partly estimated

ELEVEN MILE WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir on wasteway for discharging water from the West Main Canal to the Colorado River. This wasteway is located in Arizona 4.3 miles downstream from the northerly international boundary and 3.2 miles 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.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by monthly current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through December 1967, obtained by the United States Section; monthly discharge, January 1924 through December 1950, by Bureau of Reclamation.

EXTREMES: Prior to January 1951, maximum monthly discharge, 9,740 acre-feet in August 1940; minimum monthly discharge, zero in April 1941. Since January 1, 1951, maximum instantaneous discharge, 800 second-feet on December 3, 1961, at a maximum gage height of 117.60 feet; minimum instantaneous discharge, zero during parts of most years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	1.0	0.9	2.2	2.8	1.3	1.9	1.4	0.9	2.7	5.6	1.2
2	2.0	.8	.7	82.7	3.7	.6	1.0	1.1	46.4	11.6	9.2	.8
3	2.8	11.8	2.9	35.7	1.5	.7	5.2	1.0	9.0	4.9	18.5	.9
4	1.0	1.5	12.4	2.1	1.4	4.2	.8	1.0	1.1	1.9	6.2	.9
5	2.2	44.7	77.2	2.0	1.0	6.7	3.8	1.0	.5	.9	5.0	3.4
6	3.4	17.6	27.8	9.0	8.9	3.8	1.2	81.1	3.5	.8	.9	4.0
7	.8	6.6	2.7	.8	6.8	10.7	1.3	12.0	3.4	.8	.8	.9
8	.9	3.9	1.9	.5	5.8	3.7	10.8	1.4	3.1	4.4	.8	1.8
9	3.1	5.6	.7	2.5	1.6	1.2	3.9	1.4	2.2	7.6	1.7	13.8
10	8.3	10.2	1.4	4.1	5.9	.6	8.3	.7	1.0	4.6	12.1	9.4
11	.9	.6	1.8	2.8	1.1	1.3	1.0	.5	.8	1.1	2.9	1.0
12	.9	6.2	3.9	4.7	.9	10.2	1.3	.5	.8	7.3	37.9	9.0
13	7.6	.6	2.7	.9	8.0	.8	3.0	.5	.7	2.9	10.5	4.0
14	.9	.7	4.5	.8	4.7	1.3	2.1	.7	.7	¤ 1.3	2.7	2.6
15	.8	.6	1.2	.8	11.5	1.2	1.2	.6	.7	¤ 1.1	2.4	13.3
16	2.9	.7	.7	.9	6.0	1.1	3.3	.6	.7	3.7	1.5	1.5
17	13.4	.6	.7	3.6	1.2	.9	4.4	.7	.5	5.5	1.0	.9
18	.8	.5	5.4	1.0	3.7	2.7	1.7	.7	4.6	2.3	7.0	2.5
19	.8	10.0	11.1	.8	2.1	3.1	2.0	.8	.7	¤ 1.2	99.7	1.5
20	2.8	1.9	1.0	2.0	1.8	.9	2.9	.7	.7	* 2.2	15.9	1.3
21	.7	.7	4.1	12.7	1.6	3.1	3.3	.9	.7	4.8	1.2	.9
22	.6	2.6	2.2	1.0	2.3	4.7	1.7	1.5	7.5	1.1	.6	.7
23	16.9	19.5	1.2	25.5	4.6	.8	1.9	.8	4.1	4.1	.3	.8
24	9.1	1.4	4.7	10.6	2.3	.7	10.3	.8	.7	8.6	0	.8
25	3.0	.7	6.3	2.6	1.6	.6	3.5	.8	2.6	6.1	0	.8
26	2.4	.6	4.0	1.1	2.7	2.2	6.0	.8	1.5	12.1	4.0	.7
27	1.9	8.2	1.3	1.5	9.6	2.9	7.7	1.8	1.0	16.4	5.4	.7
28	.6	14.1	1.9	2.0	11.1	.7	1.9	49.4	1.2	64.0	1.0	.9
29	13.8		1.3	1.0	1.4	.7	1.0	36.1	.7	62.0	1.5	.7
30	.8		2.8	5.1	1.3	1.0	1.2	9.5	1.8	9.0	2.4	.6
31	4.3		1.2		1.0		1.7	6.5		12.4		.6
Sum	111.4	173.9	192.6	223.0	119.9	74.4	101.3	217.3	103.8	269.4	258.7	82.9

Current Year 1967 | Period 1935-1967

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	112.83	111.79	23	60.1	29	0.5	3.6	221	4,016	9,570	215
Feb.	115.73	111.79	5	270	8	.5	6.2	345	3,223	8,430	345
Mar.	114.99	111.78	5	192	8	.4	6.2	382	3,021	6,230	171
Apr.	115.75	111.80	2	272	8	.5	7.4	442	2,797	6,300	0
May	112.74	111.83	13	** 47.4	12	.8	3.9	238	3,383	9,320	101
June	112.59	111.80	12	37.5	2	.5	2.5	148	3,200	7,440	148
July	112.65	111.81	17	41.5	7	.6	3.3	201	3,242	8,320	201
Aug	116.33	111.78	6	366	12	.4	7.0	431	2,740	9,740	378
Sept.	115.53	111.79	2	244	5	.5	3.5	206	2,016	6,140	133
Oct.	115.74	111.80	28	271	31	.5	8.7	534	2,728	5,680	372
Nov.	116.24	111.72	19	348	†24	0	8.6	513	3,238	8,220	418
Dec.	113.46	111.81	15	96.3	†29	.6	2.7	164	4,319	9,430	164
Yearly	116.33	111.72		366		0	5.3	3,825	37,923	82,900	3,825

¤ Estimated * Partly estimated ** Based on gate openings and overflow ratings
† And other days

COLORADO RIVER AT ELEVEN MILE GAGE - STAGES

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

RECORDS: Mean daily gage heights based on continuous water-stage records. Records available: Continuous record of gage heights, November 1947 through December 1967; once weekly readings obtained by the U. S. Bureau of Reclamation, January 1940 through October 1947.

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

EXTREMES: Since November 1947, maximum mean daily gage height, 108.20 feet on January 2, 1958; minimum mean daily gage height, 95.00 feet on August 3, 1967.

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	96.97	97.10	96.20	95.04	95.90	95.46	95.38	95.02	95.64	97.06	97.86	97.78
2	96.58	97.09	96.20	95.69	95.34	95.42	95.40	95.01	97.16	97.54	97.91	97.70
3	96.31	97.15	96.22	95.41	95.12	95.44	95.42	95.00	103.93	97.52	97.95	97.70
4	95.83	97.10	96.26	95.16	95.07	95.44	95.41	95.02	104.34	97.47	97.90	97.70
5	96.31	97.27	96.60	95.58	95.23	95.45	95.46	95.03	99.92	97.04	97.85	97.69
6	96.47	97.19	96.40	95.49	95.93	95.42	95.40	95.71	96.40	97.12	97.86	97.69
7	96.59	97.08	96.23	95.42	95.87	95.46	95.33	95.26	95.96	97.52	97.87	97.63
8	96.59	97.08	96.23	95.43	95.86	95.39	95.50	95.09	95.91	97.60	97.87	97.59
9	96.60	97.09	96.23	95.44	95.89	95.37	95.44	95.07	96.02	97.64	97.89	97.66
10	96.70	96.96	96.22	95.61	95.89	95.40	95.34	95.06	96.08	97.62	97.94	97.63
11	97.05	96.79	96.15	95.66	95.82	95.44	95.22	95.05	96.11	97.60	97.92	97.56
12	97.10	96.63	96.15	95.68	95.78	95.45	95.22	95.05	96.12	97.63	98.10	97.61
13	97.17	96.44	96.13	95.66	95.82	95.34	95.16	95.06	96.28	97.64	97.92	97.61
14	97.14	96.40	96.11	95.61	95.81	95.36	95.08	95.06	96.45	97.62	97.86	97.51
15	97.13	96.38	96.09	95.64	95.87	95.37	95.05	95.06	96.51	97.66	97.85	97.46
16	97.11	96.29	96.09	95.63	95.81	95.55	95.13	95.07	96.53	97.67	97.86	97.25
17	97.16	96.29	95.99	95.79	95.64	95.56	95.10	95.18	96.54	97.68	97.85	97.16
18	97.09	96.26	95.86	95.84	95.22	95.58	95.06	95.08	96.57	97.69	97.88	97.14
19	97.09	95.90	95.84	95.85	95.08	95.53	95.06	95.07	96.51	97.69	98.33	97.19
20	97.11	ᵁ95.24	95.63	95.94	95.14	95.34	95.09	95.08	96.40	97.71	97.91	97.21
21	97.10	*95.16	95.28	96.04	95.25	95.30	95.12	95.12	96.36	97.75	97.75	97.18
22	97.11	95.16	95.13	95.96	95.39	95.13	95.08	95.15	96.22	97.72	97.74	97.13
23	97.19	95.53	95.07	96.14	95.49	95.05	95.08	95.12	96.18	97.74	97.72	97.15
24	97.13	96.32	95.10	96.24	95.51	95.15	95.19	95.12	96.13	97.79	97.71	97.22
25	97.09	96.28	95.11	96.31	95.53	95.17	95.10	95.52	96.15	97.78	97.75	97.22
26	97.10	96.23	95.15	96.40	95.50	95.25	95.11	95.61	96.14	97.87	97.77	97.13
27	97.12	96.21	95.07	95.86	95.54	95.39	95.16	95.65	96.12	97.89	97.80	96.94
28	97.11	96.26	95.05	95.19	95.57	95.34	95.09	96.00	96.10	98.14	97.75	97.01
29	97.16		95.03	95.27	95.48	95.35	95.09	95.97	96.10	98.14	97.84	97.02
30	97.10		95.03	96.14	95.47	95.39	95.06	95.72	96.14	97.86	97.80	97.03
31	97.11		95.02		95.47		95.06	95.70		97.88		96.98
Avg.	96.92	96.46	95.77	95.70	95.56	95.38	95.21	95.25	96.90	97.65	97.87	97.37

ᵁ Estimated * Partly estimated

TWENTY-ONE 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 18.5 miles downstream from the northerly international boundary, 17.4 miles downstream from Morelos Diversion Dam, and 2.2 miles upstream from the southerly international boundary. It is the farthest downstream of the 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.

RECORDS: Flow is computed from head on the weir measured by the water-stage recorder and weir rating determined by monthly current meter measurements. Station operated by the United States Section of the Commission. Records available: Daily discharge, January 1951 through December 1967, obtained by the United States Section; monthly discharge, March 1939 through December 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.

EXTREMES: Prior to January 1951, maximum monthly discharge, 2,860 acre-feet in January 1946; minimum monthly discharge, 122 acre-feet in September 1950. Since January 1, 1951, maximum instantaneous discharge, 102 second-feet on January 24, 1954, at a maximum gage height of 95.46 feet (present datum); minimum instantaneous discharge, zero during a part of most months.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.2	0.8	3.7	6.3	3.2	1.8	0.2	0.8	4.3	2.9	0.3	1.9
2	5.9	.2	.8	39.7	.6	0	.7	1.3	29.1	4.3	.8	1.2
3	* 1.9	.2	1.1	28.2	.3	.1	1.0	.3	10.0	.6	0	3.2
4	.3	11.5	3.8	1.9	3.5	.2	.4	.3	1.9	5.6	.4	1.6
5	.8	6.3	16.5	1.2	1.1	.5	.3	1.2	.1	4.5	4.1	6.2
6	15.2	*10.6	16.1	1.2	.1	1.9	.3	5.0	.1	.5	3.1	.6
7	3.6	* 3.4	2.0	.1	.1	1.9	.2	8.2	.2	2.0	1.3	.6
8	3.1	1.1	.5	3.2	1.1	3.5	1.1	1.1	.2	3.3	.4	1.3
9	6.6	4.6	5.5	.3	.2	3.0	.2	.6	4.4	5.6	1.3	6.8
10	3.7	2.3	.8	.1	.1	1.1	.3	.9	9.0	2.3	6.5	1.9
11	4.9	1.1	10.2	6.3	.3	1.1	.3	2.5	5.0	.3	5.1	1.7
12	3.0	3.7	12.6	13.5	.1	.5	.2	.2	1.0	7.8	9.6	2.1
13	1.3	6.2	.3	4.3	10.9	4.2	2.4	.2	.2	2.1	4.7	1.7
14	.2	.2	4.6	5.1	.1	.7	.3	.3	.2	.6	1.4	3.6
15	3.9	.9	7.5	2.0	0	0	.1	1.5	1.2	* .5	.4	11.9
16	7.5	4.2	.6	4.7	.9	.2	4.3	1.0	.4	* 1.4	.1	7.0
17	2.9	3.8	5.4	2.4	6.0	.5	2.8	1.0	1.0	1.9	.1	3.9
18	2.9	3.2	5.4	.1	.2	2.4	1.5	2.1	2.9	3.5	3.4	2.6
19	.3	2.3	2.8	4.0	.2	1.3	2.5	.6	.1	5.9	15.5	4.3
20	1.1	2.4	1.3	7.2	3.2	.6	1.0	1.1	2.1	7.9	18.5	1.8
21	2.4	0	.5	2.8	.2	3.0	1.0	1.9	.2	3.6	.9	.8
22	1.2	0	.5	.7	2.7	3.4	1.8	2.4	.2	.1	.4	* 1.2
23	.6	5.1	.6	4.2	3.2	2.9	1.7	1.0	4.6	2.0	.1	u 1.5
24	3.0	1.7	2.1	3.4	.2	2.7	2.8	.3	.3	1.9	0	u 1.2
25	1.0	3.8	2.0	2.9	.2	.3	.8	.2	.2	1.1	0	u 2.1
26	.8	3.0	.3	4.1	.2	* 10.0	2.0	1.4	2.2	4.1	7.0	* 1.2
27	2.1	3.5	.7	.2	7.0	* 3.7	2.2	.4	.3	2.8	24.0	.5
28	1.1	1.0	5.2	1.7	1.5	.7	5.6	5.8	.2	21.4	4.6	.4
29	14.9		4.0	3.1	10.1	.3	.2	16.7	.2	20.0	4.0	7.6
30	4.3		.5	3.3	2.0	.3	2.4	.7	1.1	1.0	2.4	5.1
31	1.1		5.1		.5		1.1	0		.3		4.7
Sum	101.8	87.1	123.0	158.2	60.0	52.8	41.7	61.0	82.9	121.8	120.4	92.2

Current Year 1967 — **Period 1939-1967**

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	94.16	92.93	29	26.1	†28	0	3.3	202	1,016	2,860	157
Feb.	94.79	92.92	9	50.1	†21	0	3.1	173	869	2,510	173
Mar.	94.81	92.92	5	50.9	† 8	0	4.0	244	800	1,660	216
Apr.	94.90	92.92	2	54.5	†20	0	5.3	314	863	1,940	237
May	94.40	92.92	13	34.5	†10	0	1.9	119	1,060	2,470	59.3
June	93.96	92.92	26	19.8	†11	0	1.8	105	926	2,350	105
July	94.10	92.92	21	24.0	† 8	0	1.3	82.7	800	1,950	82.7
Aug	94.44	92.92	29	36.1	†27	0	2.0	121	837	2,530	121
Sept.	94.84	92.92	2	52.1	† 1	0	2.8	164	749	2,180	122
Oct.	94.71	92.92	28	46.9	† 2	0	3.9	242	902	2,100	217
Nov.	94.46	92.92	26	36.9	†24	0	4.0	239	1,042	2,380	194
Dec.	94.20	92.94	17	27.5	10	.1	3.0	183	1,176	2,680	125
Yearly	94.90	92.92		54.5		0	3.0	2,188.7	11,040	24,370	2,188.7

† And other days u Estimated * Partly estimated

DIVERSIONS BY PUMPS IN THE UNITED STATES - LIMITROPHE SECTION

DESCRIPTION: One privately operated pump located on the left bank of the Colorado River in the limitrophe section pumps water for irrigating land in the river floodway in the United States.

RECORDS: Quantities of water pumped are estimated by the United States Section of the Commission from weekly readings of a running time meter attached to the pump, and pump capacity. Records available: January 1956 through December 1967.

REMARKS: These records are used in the computations of water delivered to Mexico.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	4.8	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	3.0	0
5	0	0	0	0	5.4	0	0	0	0	0	7.2	0
6	0	0	0	0	0	0	0	4.5	0	0	7.2	0
7	0	0	0	0	0	0	0	4.2	0	0	3.0	0
8	0	0	0	0	0	0	2.4	0	0	0	0	0
9	5.7	0	0	0	0	0	0	0	0	0	0	0
10	3.6	0	0	0	0	0	0	0	0	0	0	0
11	0	0	5.4	0	0	0	0	0	0	0	0	0
12	5.1	0	6.0	5.7	0	0	0	0	0	0	0	0
13	1.5	0	0	6.0	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	4.4	0	0	2.4	.6	0	4.2	0	0	0	3.0	0
19	0	0	0	0	0	0	3.3	0	0	0	3.9	0
20	0	13.1	0	0	3.3	0	2.4	0	0	0	5.4	0
21	0	11.6	0	0	0	7.2	0	0	0	0	0	0
22	0	12.0	0	0	2.7	7.2	0	0	0	0	0	0
23	12.4	14.6	0	0	2.4	4.7	5.7	0	0	0	0	0
24	12.4	10.0	0	0	0	0	4.2	0	0	0	0	0
25	12.4	8.8	0	0	0	0	0	0	0	0	0	0
26	2.2	0	0	0	0	0	1.5	0	0	0	0	0
27	2.9	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	5.4	0	3.6	0	0	3.0	0	0
29	0		0	0	1.5	0	0	0	0	7.2	0	0
30	0		0	4.2	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	62.6	70.1	11.4	18.3	26.1	19.1	27.3	8.7	0	10.2	32.7	0

Month	Current Year 1967								Period 1956-1967		
	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			†23	12.4	† 1	0	2.0	124	157	280	0
Feb.			23	14.6	† 1	0	2.5	139	269	500	26.2
Mar.			12	6.0	† 1	0	.4	22.6	340	600	11.3
Apr.			13	6.0	† 1	0	.6	36.3	433	670	36.3
May			† 5	5.4	† 2	0	.8	51.8	481	770	51.8
June			†21	7.2	† 1	0	.6	37.9	511	800	37.9
July			23	5.7	† 1	0	.9	54.1	521	820	54.1
Aug			6	4.5	† 1	0	.3	17.3	349	800	17.3
Sept.				0		0	0	0	327	940	0
Oct.			29	7.2	† 1	0	.3	20.2	230	390	0
Nov.			† 5	7.2	† 1	0	1.1	64.9	180	330	29.8
Dec.				0		0	0	0	130	230	0
Yearly				14.6		0	0.8	568	3,928	6,480	568

ø Mean daily † And other days

EAST MAIN CANAL WASTEWAY (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorder and control weir located about 300 feet north of the southerly international land boundary and 1.5 miles east of the Colorado River.

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 December 1967. Records of monthly discharges also are available for the periods January 1924 through June 1928; January 1932 through December 1933, and April 1935 through September 1946.

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	22.8	6.2	4.7	8.6	6.6	0	7.2	4.2	5.6	9.8	4.2	4.1
2	8.8	12.3	8.2	12.1	1.2	0	3.0	4.9	* 31.5	12.9	2.7	0
3	1.0	3.4	2.8	16.6	4.8	6.1	5.7	3.9	16.3	10.6	7.9	0
4	14.1	10.5	4.5	4.0	.3	11.5	3.4	.1	8.3	11.7	15.7	0
5	3.0	7.3	10.9	0	3.6	13.1	0	0	* 24.0	12.5	9.6	5.7
6	1.3	4.6	3.4	7.2	.3	1.9	12.2	.6	21.2	14.9	8.0	1.9
7	2.2	2.7	2.8	1.3	2.0	6.8	2.0	.7	17.6	4.5	8.7	1.6
8	9.7	5.7	11.3	12.7	12.5	20.3	10.1	20.8	16.4	3.2	13.6	.2
9	6.5	4.2	5.1	3.6	6.7	11.8	6.0	9.4	13.7	3.1	9.6	12.4
10	11.4	11.6	2.1	.9	2.6	.3	4.8	1.0	3.3	1.2	2.3	11.9
11	9.2	5.7	1.9	9.0	12.9	5.7	2.0	5.4	.8	3.6	1.2	11.3
12	1.9	2.0	16.2	12.2	16.1	8.1	5.6	3.3	11.4	5.5	1.3	2.6
13	8.6	11.5	7.6	3.8	.7	22.4	4.3	0	1.9	2.7	.7	3.6
14	6.6	11.9	7.0	8.9	3.6	4.7	1.2	0	.2	17.0	.2	4.6
15	.7	4.7	10.7	5.3	5.0	10.2	25.0	0	0	11.0	1.8	27.2
16	1.1	13.8	7.2	7.4	3.9	7.0	6.2	2.2	4.4	14.7	0	28.6
17	14.3	14.0	3.4	24.3	0	8.3	4.7	1.0	9.9	4.6	16.7	9.7
18	3.3	14.0	7.5	3.6	.3	1.5	3.9	1.5	9.7	.6	9.7	12.4
19	11.1	6.3	8.3	1.2	14.4	.2	0	3.0	7.3	0	6.0	2.9
20	12.2	22.9	29.9	.6	5.0	.9	.1	1.3	1.4	.6	22.2	.5
21	7.3	6.1	6.1	4.6	1.9	2.8	0	0	11.0	13.2	6.4	0
22	.7	3.1	1.6	5.0	8.6	2.4	2.2	0	12.8	3.7	1.9	0
23	6.9	2.4	0	.3	1.1	2.9	.7	.9	9.6	4.0	.4	0
24	11.3	4.1	.3	8.0	7.5	0	6.3	1.3	6.4	.6	0	2.4
25	5.4	12.8	6.2	9.1	8.2	0	7.3	5.8	2.9	0	0	8.4
26	1.4	16.2	5.1	8.7	1.9	0	1.4	4.2	13.3	.9	1.8	4.0
27	6.0	15.3	8.2	8.1	3.7	4.1	.8	13.5	11.1	17.4	18.6	10.2
28	.6	4.6	1.6	7.0	.1	.5	3.9	12.0	0	10.0	9.6	3.5
29	0		9.0	6.9	1.2	0	9.4	15.6	3.3	13.8	9.9	6.8
30	16.1		8.0	9.9	12.6	1.0	11.8	7.9	3.4	6.8	16.5	7.3
31	11.5		1.4		3.0		12.9	3.8		11.4		9.8
Sum	217.0	239.9	203.0	210.9	152.3	154.5	164.1	128.3	278.7	226.5	207.2	193.6

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1935-1967 Acre Feet Average	Maximum	Minimum
Jan.	90.92	90.15	30	36.5	† 3	0	7.0	430	1,359	3,360	ᵘ 383
Feb.	91.03	90.15	8	46.2	† 4	0	8.6	476	1,129	3,170	328
Mar.	90.98	90.15	20	41.6	† 1	0	6.5	403	1,306	2,920	190
Apr.	91.18	90.15	6	60.5	† 1	0	7.0	418	1,279	3,170	197
May	91.00	90.15	11	43.4	† 4	0	4.9	302	1,405	3,040	302
June	91.20	90.15	3	62.5	† 1	0	5.2	306	1,196	3,660	175
July	91.11	90.15	28	53.7	† 1	0	5.3	325	1,294	3,590	182
Aug	91.20 †	90.15	25	62.5	† 3	0	4.1	254	1,311	3,960	169
Sept.	90.98	90.15	2	41.6	† 1	0	9.3	553	1,191	3,170	159
Oct.	91.20	90.15	21	62.5	† 1	0	7.3	449	1,245	3,290	432
Nov.	91.19	90.15	20	61.5	†11	0	6.9	411	1,380	3,570	411
Dec.	91.12	90.15	27	54.6	† 2	0	6.2	384	1,358	3,080	384
Yearly	91.20	90.15		62.5		0	6.5	4,711	15,453	38,310	4,448

* Partly estimated ᵘ Estimated † And other days

YUMA MAIN DRAIN (VALLEY DIVISION, YUMA PROJECT)

DESCRIPTION: Water-stage recorders located in the forebay and afterbay of the Boundary Pumping Plant on the Main Drain about 200 feet north of the international boundary near San Luis, Arizona, 1.3 miles east of the Colorado River.

RECORDS: Main Drain discharges are lifted 10 to 12 feet at the pumping plant and are computed from pump ratings and the differential head measured by the two gages. Pump ratings are checked by monthly current meter measurements. During the year, 39 measurements were made by the United States Section of the Commission. Records obtained and computed by the United States Section of the Commission. Records available: Monthly discharges June 1919 through December 1951; daily discharges January 1952 through December 1967.

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	186	176	190	175	163	167	167	163	152	173	178	164
2	170	179	185	172	168	175	166	166	199	172	191	162
3	166	185	187	172	161	179	165	167	176	187	181	162
4	163	176	181	166	167	179	161	165	156	179	174	174
5	174	176	172	169	163	169	163	163	150	184	186	169
6	177	188	182	167	170	168	169	169	152	190	187	169
7	178	194	191	173	165	175	163	178	151	196	193	163
8	174	182	171	188	167	178	162	160	145	199	180	159
9	170	178	174	176	165	162	160	167	162	202	189	171
10	166	168	175	181	179	187	165	164	164	198	195	171
11	165	179	194	155	175	178	165	164	160	194	199	157
12	175	179	195	183	172	180	165	165	160	190	189	151
13	172	182	198	183	184	171	161	167	155	197	190	122
14	145	183	189	183	179	165	172	166	159	203	191	130
15	151	186	189	182	173	169	160	152	157	201	190	158
16	150	187	189	186	181	171	167	161	162	206	191	159
17	152	181	183	187	170	184	160	160	182	195	189	152
18	160	192	180	184	169	182	152	163	173	189	189	165
19	160	188	187	174	171	171	163	168	173	190	212	160
20	168	194	183	172	168	161	152	165	184	195	207	152
21	158	176	166	178	172	165	155	170	180	200	189	161
22	167	183	172	185	173	171	161	167	178	204	185	158
23	144	163	174	174	167	165	161	152	164	200	176	158
24	149	186	171	180	179	172	173	154	175	197	176	173
25	151	181	169	173	170	168	156	154	172	191	167	162
26	156	191	183	177	173	164	174	156	174	188	165	165
27	146	180	179	178	181	170	167	158	150	195	146	163
28	149	187	173	170	180	173	170	159	184	190	160	167
29	156		178	172	182	161	171	166	178	198	171	176
30	168		168	170	182	168	169	163	186	186	163	165
31	171		179		181		163	152		190		161
Sum	5,037	5,100	5,607	5,285	5,350	5,148	5,078	5,044	5,013	5,979	5,499	4,979

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1935-1967 Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
			Current Year 1967								
Jan.			1	186	23	144	162	9,991	7,598	11,203	1,740
Feb.			† 7	194	23	163	182	10,116	7,529	11,988	1,640
Mar.			13	198	21	166	181	11,121	8,641	12,430	1,940
Apr.			8	188	11	155	176	10,483	8,338	11,890	1,920
May			13	184	3	161	173	10,612	8,446	13,140	1,950
June			10	187	†20	161	172	10,211	7,763	12,040	2,290
July			26	174	†18	152	164	10,072	7,537	11,830	2,530
Aug			7	178	†15	152	163	10,005	7,466	11,960	2,560
Sept.			2	199	8	145	167	9,943	7,533	11,560	2,280
Oct.			16	206	2	172	193	11,859	8,607	12,385	2,940
Nov.			19	212	27	146	183	10,907	8,420	12,010	2,800
Dec.			29	176	13	122	161	9,876	8,129	11,480	2,450
Yearly				212		122	173	125,196	96,007	139,380	27,040

Ø Mean daily † And other days

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

DESCRIPTION: The tabulated data below is the combined flows of the East Main Canal Wasteway and the Yuma Main Drain and represents the total water crossing the international land boundary into the Sánchez Mejorada Canal near San Luis, Arizona. The Mexican Section maintains a water-stage recorder in Mexico on right bank of Sánchez Mejorada Canal and obtains check measurements on a bridge located 0.2 mile downstream from the international boundary, 1.2 miles east of the Colorado River and 0.6 mile west of San Luis, Sonora.

RECORDS: Records obtained and computed by the United States Section of the Commission. Records available: January 1935 through 1967.

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	209	182	195	184	170	167	174	167	158	183	182	168
2	179	191	193	184	169	175	169	171	* 230	185	194	162
3	167	188	190	189	166	185	171	171	192	198	189	162
4	177	186	186	170	167	190	164	165	164	191	190	174
5	177	183	183	169	167	182	163	163	* 174	196	196	175
6	178	193	185	174	170	170	181	170	173	205	195	171
7	180	197	194	174	167	182	165	179	169	200	202	165
8	184	188	182	201	180	198	172	181	161	202	194	159
9	176	182	179	180	172	174	166	176	176	205	199	183
10	177	180	177	182	182	187	170	165	167	199	197	183
11	174	185	196	164	188	184	167	169	161	198	200	168
12	177	181	211	195	188	188	171	168	171	196	190	154
13	181	194	206	187	185	193	165	167	157	200	191	126
14	152	195	196	192	183	170	173	166	159	220	191	135
15	152	191	200	187	178	179	185	152	157	212	192	185
16	151	201	196	193	185	178	173	163	166	221	191	188
17	166	195	186	211	170	192	165	161	192	200	206	162
18	163	206	188	188	169	184	156	164	183	190	199	177
19	171	194	195	175	185	171	163	171	180	190	218	163
20	180	217	213	173	173	162	152	166	185	196	229	152
21	165	182	172	183	174	168	155	170	191	213	195	161
22	168	186	174	190	182	173	163	167	191	208	187	158
23	151	165	174	174	168	168	162	153	174	204	176	158
24	160	190	171	188	186	172	179	155	181	198	176	175
25	156	194	175	182	178	168	163	160	175	191	167	170
26	157	207	188	186	175	164	175	160	187	189	167	169
27	152	195	187	186	185	174	168	172	161	212	165	173
28	150	192	175	177	180	174	174	171	184	200	170	170
29	156		187	179	183	161	180	182	181	212	181	183
30	184		176	180	195	169	181	171	189	193	180	172
31	182		180		184		176	156		201		171
Sum	5,252	5,340	5,810	5,497	5,504	5,302	5,241	5,172	5,289	6,208	5,709	5,172

Month	Current Year 1967								Period 1935-1967		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			1	209	28	150	169	10,421	8,957	12,131	* 2,123
Feb.			20	217	23	165	191	10,592	8,658	12,970	* 2,023
Mar.			20	213	24	171	187	11,524	9,947	13,704	* 2,322
Apr.			17	211	11	164	183	10,901	9,617	12,982	2,117
May			30	195	3	166	178	10,914	9,851	13,900	2,473
June			8	198	29	161	177	10,517	8,959	12,570	2,525
July			15	185	20	152	169	10,397	8,831	12,420	2,927
Aug			29	182	15	152	167	10,259	8,777	12,657	2,989
Sept.			2	* 230	†15	157	176	10,496	8,724	12,450	2,602
Oct.			16	221	1	183	200	12,308	9,852	13,898	3,444
Nov.			20	229	27	165	190	11,318	9,800	12,712	3,407
Dec.			16	188	13	126	167	10,260	9,487	12,050	2,888
Yearly				* 230		126	179	129,907	111,460	149,010	31,840

* Partly estimated Ø Mean daily † And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - DISCHARGES

DESCRIPTION: Water-stage recorder located in Mexico on the right bank of the river about 1,000 feet upstream from the southerly international boundary, 2 miles west of San Luis, Arizona, and 19.4 miles downstream from Morelos Dam. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

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 December 1967; continuous record of gage heights, January 1947 through December 1967. Monthly flows for this station have been derived for the period January 1935 through December 1949 based on the computed records of monthly flows of the Colorado River at the northerly international boundary combined with the measured monthly flows from the wasteways discharging into the boundary section of the river from the Yuma Project in Arizona.

REMARKS: Reservoirs, diversions in the United States and Mexico, drainage returns, and waste flows modify the river flow at this station. The river flow past this station is depleted by pumps and gravity diversions before it reaches the Gulf of California.

EXTREMES: Since January 1950: Maximum instantaneous discharge, 28,610 second-feet on December 18, 1952; maximum gage height, 84.84 feet on November 29, 1957. Minimum discharge, no flow on several occasions since September 1, 1956.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	216	255	135	23.2	96.4	34.4	14.0	0	0	79.6	230	268
2	195	252	131	40.3	64.1	34.4	14.0	0	11.3	171	230	266
3	165	252	131	102	33.2	32.0	14.0	0	260	195	233	259
4	123	264	135	43.4	22.0	31.3	15.0	0	1,840	207	242	259
5	97.2	261	143	28.6	16.0	30.6	14.5	0	1,620	198	235	262
6	149	294	218	46.3	29.6	31.3	15.0	0	500	158	231	262
7	162	258	137	38.1	76.3	31.3	12.4	0	176	178	230	259
8	165	249	127	33.6	71.2	32.8	9.6	0	120	210	230	255
9	172	252	127	35.2	70.0	28.5	14.5	0	102	216	233	256
10	172	252	127	35.2	68.4	27.1	12.8	0	113	219	247	261
11	195	234	127	43.6	70.0	25.0	7.5	0	108	213	256	261
12	231	216	121	59.0	68.9	28.5	.2	0	98.8	222	260	255
13	240	198	111	55.0	71.2	29.2	0	0	94.0	219	276	261
14	246	160	113	58.0	68.9	26.4	0	0	111	213	251	264
15	246	153	117	58.0	70.0	26.4	0	0	125	210	243	262
16	255	149	111	58.0	72.4	29.2	0	0	127	210	242	259
17	249	139	110	61.2	68.2	37.6	0	0	127	213	245	233
18	246	139	95.5	77.6	45.8	39.2	0	0	127	222	248	214
19	243	129	83.5	71.2	23.8	40.0	0	0	123	225	264	208
20	246	75.8	76.0	80.8	18.5	35.2	0	0	117	234	322	212
21	252	45.4	56.9	88.0	19.0	23.8	0	0	104	228	268	214
22	255	40.9	37.9	92.5	22.8	18.5	0	0	92.5	222	245	214
23	258	40.9	29.9	88.0	32.0	12.8	0	0	85.0	219	242	212
24	258	68.9	26.4	115	34.4	7.9	0	0	76.0	216	235	219
25	255	127	25.7	119	36.8	8.2	0	0	72.4	216	228	235
26	249	133	25.0	140	35.9	8.6	0	0	72.4	219	239	233
27	258	131	23.8	129	38.4	17.5	0	0	73.6	222	282	215
28	261	133	23.8	68.6	44.5	18.5	0	0	70.0	235	261	199
29	277		23.8	39.8	46.3	14.0	0	.5	67.8	285	255	217
30	274		21.4	49.5	37.6	13.6	0	2.1	67.8	250	267	217
31	258		20.8		35.2		0	0		228		215
Sum	6,868.2	4,901.9	2,791.4	1,977.7	1,507.8	773.8	143.5	2.6	6,681.6	6,552.6	7,470	7,426

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	High	Extreme Second Feet Low Day	Low	Average Second Feet	Total Acre Feet	Period 1935-1967 Acre Feet Average	Maximum	Minimum
Jan.	75.90	74.96	29	291	5	83.5	222	13,623	462,582	1,672,000	1,821
Feb.	76.02	74.49	6	316	23	35.2	175	9,723	384,924	1,385,000	2,040
Mar.	75.70	74.29	6	246	31	20.8	90.0	5,537	309,565	1,127,000	1,493
Apr.	75.70	74.29	26	147	1	20.8	65.9	3,923	197,654	700,900	977
May	75.28	74.45	1	101	6	12.8	48.6	2,991	271,137	1,160,000	1,045
June	74.74	74.25	18	40.0	24	6.8	25.8	1,535	208,691	1,180,000	143
July	74.44	74.03	6	16.0	† 12	0	4.6	285	152,504	772,800	0
Aug	74.29	74.03	30	4.8	† 1	0	.1	5.2	169,934	796,000	0
Sept.	80.54	74.03	5	2,270	1	0	223	13,253	205,788	1,033,000	0
Oct.	76.88	75.08	29	302	1	67.8	211	12,997	262,456	1,192,000	9,120
Nov.	77.26	76.37	20	339	25	223	249	14,817	345,682	1,428,000	7,180
Dec.	76.66	76.19	1	270	28	195	240	14,729	436,399	1,839,000	2,320
Yearly	80.54	74.03		2,270		0	129	93,418	3,407,316	10,688,800	93,418

† And other days

COLORADO RIVER AT SOUTHERLY INTERNATIONAL BOUNDARY - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	75.64	75.81	75.25	74.33	75.25	74.68	74.40		74.03	75.18	76.41	76.65
2	75.57	75.80	75.23	74.54	75.01	74.68	74.40		74.44	75.83	76.41	76.63
3	75.46	75.80	75.23	75.08	74.78	74.65	74.40		75.82	76.00	76.43	76.59
4	75.22	75.85	75.25	74.59	74.63	74.64	74.42		79.30	76.09	76.48	76.59
5	75.05	75.85	75.29	74.41	74.56	74.63	74.41		78.82	76.02	76.44	76.60
6	75.38	75.96	75.60	74.62	74.70	74.64	74.42		76.74	75.75	76.42	76.60
7	75.45	75.86	75.31	74.56	75.10	74.64	74.36		75.74	75.89	76.41	76.58
8	75.46	75.83	75.26	74.51	75.06	74.66	74.29		75.52	76.14	76.41	76.55
9	75.49	75.84	75.26	74.53	75.05	74.60	74.41		75.45	76.21	76.43	76.56
10	75.49	75.83	75.26	74.53	75.06	74.58	74.37		75.49	76.22	76.51	76.59
11	75.59	75.75	75.26	74.64	75.04	74.54	74.25		75.42	76.20	76.57	76.59
12	75.74	75.67	75.23	74.80	75.03	74.59	74.04		75.36	76.23	76.60	76.55
13	75.77	75.58	75.19	* 74.76	75.05	74.59	74.03		75.33	76.22	76.70	76.59
14	75.80	75.45	75.21	* 74.79	75.02	74.56			75.42	76.20	76.54	76.61
15	75.80	75.42	75.23	74.79	75.03	74.57			75.51	76.19	76.49	76.60
16	75.83	75.40	75.18	74.79	75.05	74.61			75.53	76.19	76.48	76.58
17	75.81	75.35	75.14	74.82	75.05	74.72			75.54	76.20	76.50	76.42
18	75.80	75.34	75.06	75.19	74.84	74.73			75.55	76.23	76.52	76.31
19	75.78	75.28	74.98	75.54	74.60	74.74			75.54	76.24	76.62	76.28
20	75.79	74.89	74.92	75.53	74.49	74.67			75.48	76.28	77.10	76.30
21	75.80	74.61	74.75	75.48	74.48	74.54			75.39	76.26	76.65	76.31
22	75.81	74.56	74.54	75.48	74.52	74.49			75.32	76.25	76.50	76.30
23	75.81	74.56	74.44	75.43	74.65	74.39			75.26	76.24	76.48	76.29
24	75.81	74.84	74.38	75.57	74.69	74.28			75.18	76.25	76.44	76.33
25	75.79	75.21	74.37	75.57	74.72	74.29			75.14	76.26	76.40	76.42
26	75.77	75.24	74.36	75.65	74.69	74.30			75.14	76.29	76.47	76.40
27	75.80	75.23	74.33	75.50	74.69	74.46			75.14	76.35	76.75	76.30
28	75.81	75.24	74.32	75.08	74.76	74.46		74.03	75.10	76.44	76.60	76.21
29	75.86		74.33	74.78	74.78	74.40		74.07	75.08	76.79	76.56	76.30
30	75.85		74.30	74.86	74.70	74.39		74.15	75.08	76.55	76.64	76.30
31	75.81		74.29		74.69			74.03		76.40		76.29
Avg.	75.67	75.43	74.93	74.96	74.83	74.56			75.60	76.18	76.53	76.46

* Partly estimated

WASTEWAY TO COLORADO RIVER AT KILOMETER 27 IN MEXICO

DESCRIPTION: Water-stage recorder and cableway located on the left bank of the Canal de Conexión wasteway, immediately upstream from where it discharges into the Colorado River, 0.6 mile downstream from the wasteway gates on Canal de Conexión, 16.8 miles downstream from Morelos Dam, and 0.2 mile south of the junction of the Mexicali-San Luis and Algodones-Pescaderos highways.

RECORDS: Data obtained and computed by the Colorado River Irrigation District of the Ministry of Hydraulic Resources and furnished by the Mexican Section of the Commission. Records shown in table below are waste returns to the Colorado River. 1967 records good. Records available: April 1956 through December 1967.

REMARKS: The Colorado River Irrigation District transports water for irrigation of land on the left bank of the Colorado River by the Canal de Conexión 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 Sánchez Mejorada Siphon, which was placed in operation on June 28, 1963.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	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	157	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
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	0	0	0	0	0	0	0	0	157	0	0	0

Month	Current Year 1967 — Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1956-1967 — Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.				0		0	0	0	8,526	69,527	0
Feb.				0		0	0	0	1,715	8,679	0
Mar.				0		0	0	0	9,924	35,492	0
Apr.				0		0	0	0	22,055	68,714	0
May				0		0	0	0	9,516	22,072	0
June				0		0	0	0	15,195	28,915	0
July				0		0	0	0	23,840	46,139	0
Aug				0		0	0	0	25,758	55,497	0
Sept.			5	157	† 1	0	5.3	311	15,540	37,194	0
Oct.				0		0	0	0	5,626	20,512	0
Nov.				0		0	0	0	13,206	69,415	0
Dec.				0		0	0	0	8,379	70,213	0
Yearly				157		0	0.4	311	152,897	346,339	311

Ø Mean daily † And other days

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO – DISCHARGES

DESCRIPTION: Water-stage recorder and cableway located in Mexico on the left bank of the Colorado River about 24.5 miles downstream from the southerly international boundary, 44.5 miles downstream from Morelos Dam, and 4.5 miles upstream from the Sonora-Baja California railroad bridge. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 55 current meter measurements made during the year and a continuous record of gage heights. Data obtained and furnished by the Mexican Section of the Commission. From June 1951 to July 1954, discharges were computed from gage height records based on daily gage readings at 8:00 a.m., Pacific Standard Time. A continuous record of gage heights obtained since July 21, 1954. Records available: June 1951 through 1967.

REMARKS: Diversions and return flows modify the flow of the river at this station. On many occasions the flow at this station consists solely of seepage from canals which run parallel and adjacent to the river at a higher elevation.

EXTREMES: Since January 1, 1952: Maximum mean daily gage height, 53.28 feet on January 4, 1958 with a discharge of 18,500 second-feet; minimum mean daily gage height, 37.86 feet on June 11, 1965 with a discharge of 1.4 second-feet; maximum mean daily discharge, 20,200 second-feet on December 19, 1952 with a gage height of 52.30 feet; minimum mean daily discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	112	122	83.0	18.7	13.1	13.1	13.1	10.9	15.2	15.5	99.9	191
2	113	122	86.2	18.7	14.5	13.1	12.0	9.5	19.8	15.5	96.8	175
3	113	122	86.2	17.0	14.5	14.5	10.6	4.9	16.6	15.5	99.9	170
4	112	122	83.0	17.0	14.5	14.5	12.0	6.0	15.2	15.5	103	160
5	113	125	80.2	17.0	14.5	14.5	14.5	12.0	15.2	15.5	106	154
6	105	125	83.0	15.2	13.1	14.5	13.1	12.0	154	15.5	109	149
7	105	132	105	15.2	13.1	14.5	13.1	12.0	204	15.5	109	149
8	107	174	98.5	15.2	14.5	14.5	12.0	13.4	61.4	15.5	109	144
9	108	171	77.0	15.2	14.5	14.5	14.5	10.9	25.4	14.1	109	134
10	109	171	74.2	17.0	14.5	14.5	14.5	10.9	21.5	25.4	109	134
11	110	168	77.0	17.0	14.5	14.5	14.5	10.9	19.8	42.0	113	139
12	111	158	74.2	15.2	16.2	13.1	13.1	12.0	19.8	48.0	121	144
13	114	152	71.0	17.0	16.2	12.0	13.1	13.4	18.4	52.3	125	144
14	117	142	68.2	18.7	14.5	9.2	13.1	13.4	18.4	58.6	139	139
15	121	124	62.2	20.8	14.5	9.2	13.1	13.4	18.4	65.3	139	144
16	120	118	62.2	23.0	14.5	12.0	13.1	13.4	18.4	67.8	129	149
17	119	115	59.3	23.0	14.5	13.1	13.1	13.4	16.6	72.4	129	149
18	119	113	53.7	17.0	14.5	12.0	14.5	15.2	15.2	77.3	129	129
19	119	110	48.0	17.0	14.5	12.0	14.5	15.2	13.4	82.6	129	117
20	118	104	43.1	15.2	16.2	13.1	14.5	15.2	15.2	87.9	134	106
21	119	87.6	38.1	15.2	16.2	13.1	12.0	15.2	16.6	90.8	149	106
22	118	68.9	31.4	13.1	18.0	13.1	13.1	15.2	16.6	96.4	154	125
23	120	61.4	23.0	13.1	18.0	12.0	12.0	13.4	16.6	99.6	144	137
24	120	56.5	18.7	15.2	18.0	13.1	12.0	13.4	16.6	102	134	137
25	120	54.4	17.0	15.2	18.0	14.5	13.1	13.4	16.6	105	129	137
26	119	76.6	18.7	15.2	18.0	13.1	12.0	15.2	15.5	111	134	141
27	118	90.1	17.0	15.2	18.0	13.1	14.5	15.2	15.5	114	144	144
28	120	92.9	14.8	23.0	16.2	13.1	16.2	15.2	15.5	112	154	141
29	120		14.8	23.0	16.2	14.5	14.5	13.4	15.5	109	160	130
30	121		17.0	15.2	14.5	14.5	14.5	13.4	15.5	106	175	130
31	122		17.0		14.5		13.1	15.2		103		130
Sum	3,582	3,278.4	1,702.7	513.5	476.5	396.5	413.0	396.2	882.4	1,966.5	3,814.6	4,378

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1951-1967 Acre Feet Average	Maximum	Minimum
Jan.	39.86	38.85	15	124	† 6	103	115	7,101	299,876	1,047,732	426
Feb.	39.93	38.35	7	175	25	51.9	117	6,504	188,271	696,461	317
Mar.	39.17	37.99	7	112	† 28	14.8	54.7	3,376	132,352	807,342	0
Apr.	38.19	37.96	† 28	27.2	† 20	13.1	17.0	1,017	87,472	588,983	0
May	38.12	37.99	† 22	18.0	1	12.0	15.5	945	121,824	732,815	0
June	38.09	37.93	4	16.2	† 14	8.8	13.1	786	52,252	555,460	0
July	38.09	37.96	28	16.2	† 2	10.6	13.4	818	28,057	264,561	0
Aug	38.12	37.76	† 18	15.2	† 3	2.5	12.7	786	41,634	309,320	0
Sept.	41.11	38.09	† 6	338	† 1	13.4	30.0	1,751	65,136	572,551	0
Oct.	39.99	38.16	27	117	† 9	14.1	63.6	3,903	106,783	769,939	2,459
Nov.	40.62	39.90	30	196	† 1	96.8	127	7,581	177,420	909,399	6,227
Dec.	40.62	39.90	1	196	† 20	103	141	8,696	240,431	1,060,767	687
Yearly	41.11	37.76		338		2.5	60.0	43,264	1,504,923	7,923,600	43,264

† And other days

COLORADO RIVER AT MIGUEL C. RODRIGUEZ IN MEXICO – STAGES

(See Preceding Page for Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39.37	39.73	38.88	38.06	38.02	38.02	38.02	38.02	38.12	38.19	39.93	40.58
2	39.40	39.73	38.91	38.06	38.06	38.02	37.99	37.99	38.22	38.19	39.90	40.49
3	39.40	39.73	38.91	38.02	38.06	38.06	37.96	37.86	38.16	38.19	39.93	40.45
4	39.34	39.73	38.88	38.02	38.06	38.06	37.99	37.89	38.12	38.19	39.96	40.39
5	39.40	39.76	38.85	38.02	38.06	38.06	38.06	38.06	38.12	38.19	39.99	40.35
6	38.94	39.76	38.88	37.99	38.02	38.06	38.02	38.06	40.03	38.19	40.03	40.32
7	38.94	39.86	39.11	37.99	38.02	38.06	38.02	38.06	40.45	38.19	40.03	40.32
8	39.11	39.80	39.04	37.99	38.06	38.06	37.99	38.09	38.91	38.19	40.03	40.29
9	39.14	39.73	38.81	37.99	38.06	38.06	38.06	38.02	38.32	38.16	40.03	40.22
10	39.21	39.73	38.78	38.02	38.06	38.06	38.06	38.02	38.25	38.39	40.03	40.22
11	39.24	39.70	38.81	38.02	38.06	38.06	38.06	38.02	38.22	38.68	40.06	40.26
12	39.27	39.60	38.78	37.99	38.09	38.02	38.02	38.06	38.22	38.78	40.12	40.29
13	39.47	39.53	38.75	38.02	38.09	37.99	38.02	38.09	38.19	38.85	40.16	40.29
14	39.57	39.44	38.71	38.06	38.06	37.93	38.02	38.09	38.19	38.94	40.26	40.26
15	39.76	39.24	38.65	38.09	38.06	37.93	38.02	38.09	38.19	39.04	40.26	40.29
16	39.70	39.17	38.65	38.12	38.06	37.99	38.02	38.09	38.19	39.07	40.19	40.32
17	39.67	39.14	38.62	38.12	38.06	38.02	38.02	38.09	38.16	39.14	40.19	40.32
18	39.67	39.11	38.55	38.02	38.06	37.99	38.06	38.12	38.12	39.21	40.19	40.19
19	39.67	39.07	38.48	38.02	38.06	37.99	38.06	38.12	38.09	39.27	40.19	40.09
20	39.63	39.01	38.42	37.99	38.09	38.02	38.06	38.12	38.12	39.34	40.22	39.99
21	39.67	38.81	38.35	37.99	38.09	38.02	37.99	38.12	38.16	39.37	40.32	39.99
22	39.63	38.58	38.25	37.96	38.12	38.02	38.02	38.12	38.16	39.44	40.35	40.16
23	39.70	38.48	38.12	37.96	38.12	37.99	37.99	38.09	38.16	39.47	40.29	39.96
24	39.70	38.42	38.06	37.99	38.12	38.02	37.99	38.09	38.16	39.50	40.22	39.96
25	39.70	38.39	38.02	37.99	38.12	38.06	38.02	38.09	38.16	39.53	40.19	39.96
26	39.67	38.68	38.06	37.99	38.12	38.02	37.99	38.12	38.19	39.60	40.22	39.99
27	39.63	38.85	38.02	37.99	38.12	38.02	38.06	38.12	38.19	39.63	40.29	40.03
28	39.70	38.88	37.99	38.12	38.09	38.02	38.09	38.12	38.19	39.73	40.35	39.99
29	39.73		37.99	38.12	38.09	38.06	38.06	38.09	38.19	39.80	40.39	39.90
30	39.76		38.02	37.99	38.06	38.06	38.06	38.09	38.19	39.90	40.49	39.90
31	39.80		38.02		38.06		38.02	38.12		39.96		39.90
Avg.	39.50	39.27	38.53	38.02	38.07	38.02	38.03	38.07	38.34	38.98	40.16	40.18

COLORADO RIVER AT EL MARITIMO IN MEXICO - DISCHARGES

DESCRIPTION: Water-stage recorder and cableway in Mexico, 47.6 miles downstream from the southerly international boundary, 18.6 miles downstream from the Sonora-Baja California railroad bridge, and 3.7 miles east of Kilometer 70 of the Mexicali-San Felipe highway. The recorder is located on the right bank of the Colorado River. Zero of gage is 9.84 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 42 current meter measurements made during the year and a continuous record of gage heights. During 1967, the mean daily discharges were deduced from stage-discharge curves based on measurements at low tide and on the flows of the river measured at the Carranza dam site, located about 14 miles upstream from El Marítimo, in addition to the discharges of the drains and wasteways which flow from the Hardy River into the Colorado River immediately upstream from this station. Data obtained and furnished by the Mexican Section of this Commission. Records available: Mean daily stages and discharges from January 1, 1960 through December 1967. Incomplete record of gage heights, March 1, 1946 through November 1947; twice daily readings of gage heights, January 1, 1948 through 1949; continuous record of gage heights since installation of water-stage recorder February 8, 1956.

REMARKS: The flow past this station is affected by the tides in the Gulf of California. Measurements for basic computations are taken near the date of the first or third quarter moon (neap tide).

EXTREMES: Maximum discharge, 4,410 second-feet, January 21, 1960; minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	288	180	138	138	73.1	51.2	36.7	33.9	33.5	116	149	173
2	288	180	143	134	73.1	51.2	36.7	33.9	45.9	99.6	149	173
3	268	180	143	134	73.1	51.2	36.7	33.9	81.2	99.6	149	173
4	268	180	138	101	73.1	51.2	36.7	33.5	90.4	133	149	173
5	288	187	138	101	73.1	47.7	36.4	33.5	133	133	115	173
6	295	187	138	101	68.9	47.7	36.4	124	149	133	115	173
7	295	187	138	101	68.9	51.2	36.4	124	165	133	115	173
8	295	187	143	92.5	68.9	47.7	36.4	124	208	116	115	179
9	295	187	147	92.5	65.3	47.7	36.4	124	208	116	124	164
10	215	194	147	101	65.3	47.7	36.4	124	208	99.6	124	173
11	226	201	147	97.1	61.8	47.7	36.0	124	208	99.6	124	173
12	226	194	147	92.5	61.8	47.7	36.4	124	208	99.6	124	173
13	226	201	147	92.5	58.3	44.8	36.0	70.6	208	99.6	124	164
14	226	208	147	97.1	54.7	44.8	35.7	70.6	182	99.6	132	173
15	240	208	147	92.5	54.7	44.8	35.7	70.6	182	81.2	132	179
16	268	208	143	89.0	58.3	44.8	35.7	70.6	182	81.2	140	187
17	268	201	143	89.0	58.3	41.3	35.3	70.6	182	81.2	140	196
18	268	208	143	84.8	58.3	38.8	35.3	124	182	81.2	140	203
19	252	208	143	84.8	58.3	38.8	35.3	124	165	99.6	140	203
20	268	198	143	84.8	58.3	41.3	35.0	124	165	99.6	140	203
21	251	194	143	89.0	54.7	41.3	35.0	124	165	99.6	140	203
22	247	198	143	84.8	54.7	38.8	35.3	124	165	116	140	196
23	247	198	143	84.8	58.3	38.8	35.0	124	149	116	140	203
24	251	200	143	80.2	58.3	38.8	35.0	124	149	116	140	209
25	251	200	138	80.2	58.3	38.8	35.0	124	133	133	148	209
26	251	198	143	80.2	54.7	38.8	34.6	70.6	133	133	148	215
27	252	194	138	80.2	54.7	36.0	34.6	70.6	133	133	156	221
28	252	194	138	84.8	51.2	36.0	34.3	70.6	133	149	164	226
29	253		138	73.1	51.2	36.0	34.3	70.6	133	133	164	221
30	253		138	73.1	51.2	36.0	34.3	70.6	133	116	164	221
31	253		138		51.2		34.3	70.6		133		221
Sum	8,024	5,460	4,406	2,810.5	1,884.1	1,308.6	1,103.3	2,805.3	4,612.0	3,478.8	4,144	5,926

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Extreme Second Feet High Day	Extreme Second Feet High	Extreme Second Feet Low Day	Extreme Second Feet Low	Average Second Feet	Total Acre Feet	Period 1960-1967 Acre Feet Average	Maximum	Minimum
Jan.	15.32	14.96	† 6	295	10	215	259	15,922	50,012	225,224	1,111
Feb.	15.49	15.29	14	220	† 1	180	195	10,844	24,596	55,735	3,351
Mar.	15.49	15.35	9	152	4	134	142	8,753	7,913	16,226	98.9
Apr.	15.39	15.06	† 1	138	29	68.9	93.6	5,572	5,150	9,978	269
May	15.16	14.86	2	80.2	29	47.7	60.7	3,737	11,999	31,886	128
June	14.93	14.73	7	54.7	† 24	36.0	43.8	2,597	2,649	6,600	0
July	14.76	14.37	† 2	37.1	† 28	34.3	35.7	2,187	1,567	4,096	0
Aug	14.37	14.17	10	177	† 4	33.2	90.4	5,553	2,305	5,553	0
Sept.	14.99	14.21	† 8	230	1	33.2	154	9,150	6,521	23,532	0
Oct.	14.90	14.67	† 28	165	† 15	71.7	112	6,899	15,605	57,672	1,549
Nov.	15.09	14.83	† 28	164	1	97.1	138	8,212	39,763	94,442	7,173
Dec.	15.42	15.06	28	232	9	156	191	11,757	31,349	97,155	2,174
Yearly	15.49	14.17		295		33.2	126	91,184	199,428	503,260	76,623

† And other days

COLORADO RIVER AT EL MARITIMO IN MEXICO - STAGES

(See Preceding Page For Description)

Mean Daily Gage Height in Feet 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.99	15.29	15.39	15.39	15.09	14.90	14.73	14.34	14.24	14.80	14.86	15.12
2	14.99	15.29	15.42	15.35	15.09	14.90	14.73	14.30	14.53	14.76	14.86	15.12
3	14.66	15.29	15.42	15.35	15.09	14.90	14.73	14.30	14.70	14.76	14.86	15.12
4	14.66	15.29	15.39	15.32	15.09	14.90	14.73	14.27	14.73	14.83	14.86	15.12
5	14.99	15.32	15.39	15.32	15.09	14.86	14.70	14.27	14.83	14.83	14.90	15.12
6	15.03	15.32	15.39	15.32	15.06	14.86	14.70	14.24	14.86	14.83	14.90	15.12
7	15.03	15.32	15.39	15.32	15.06	14.90	14.70	14.24	14.90	14.83	14.90	15.12
8	15.03	15.32	15.42	15.26	15.06	14.86	14.70	14.24	14.96	14.80	14.90	15.16
9	15.03	15.32	15.45	15.26	15.03	14.86	14.67	14.24	14.96	14.80	14.93	15.09
10	15.06	15.35	15.45	15.32	15.03	14.86	14.67	14.24	14.96	14.76	14.93	15.12
11	15.09	15.39	15.45	15.29	14.99	14.86	14.63	14.24	14.96	14.76	14.93	15.12
12	15.09	15.35	15.45	15.26	14.99	14.86	14.67	14.24	14.96	14.76	14.93	15.12
13	15.09	15.39	15.45	15.26	14.96	14.83	14.63	14.21	14.96	14.76	14.93	15.09
14	15.09	15.42	15.45	15.29	14.93	14.83	14.60	14.21	14.93	14.76	14.96	15.12
15	15.12	15.42	15.45	15.26	14.93	14.83	14.60	14.21	14.93	14.70	14.96	15.16
16	15.19	15.42	15.42	15.22	14.96	14.83	14.60	14.21	14.93	14.70	14.99	15.19
17	15.19	15.39	15.42	15.22	14.96	14.80	14.57	14.21	14.93	14.70	14.99	15.22
18	15.19	15.42	15.42	15.19	14.96	14.76	14.57	14.24	14.93	14.70	14.99	15.26
19	15.16	15.42	15.42	15.19	14.96	14.76	14.53	14.24	14.90	14.76	14.99	15.26
20	15.19	15.39	15.42	15.19	14.96	14.80	14.50	14.24	14.90	14.76	14.99	15.26
21	15.19	15.35	15.42	15.22	14.93	14.80	14.50	14.24	14.90	14.76	14.99	15.26
22	15.16	15.39	15.42	15.19	14.93	14.76	14.53	14.24	14.90	14.80	14.99	15.22
23	15.16	15.39	15.42	15.19	14.96	14.76	14.50	14.24	14.86	14.80	14.99	15.26
24	15.19	15.42	15.42	15.16	14.96	14.76	14.47	14.24	14.86	14.80	14.99	15.29
25	15.22	15.42	15.39	15.16	14.96	14.76	14.47	14.24	14.83	14.83	15.03	15.29
26	15.22	15.39	15.42	15.16	14.93	14.76	14.44	14.21	14.83	14.83	15.03	15.32
27	15.26	15.35	15.39	15.16	14.93	14.73	14.44	14.21	14.93	14.83	15.06	15.35
28	15.26	15.35	15.39	15.19	14.90	14.73	14.40	14.21	14.83	14.86	15.09	15.39
29	15.29		15.39	15.09	14.90	14.73	14.40	14.21	14.83	14.83	15.09	15.35
30	15.29		15.39	15.09	14.90	14.73	14.37	14.21	14.83	14.80	15.09	15.35
31	15.29		15.39		14.90		14.37	14.21		14.83		15.35
Avg.	15.12	15.35	15.42	15.22	14.99	14.83	14.57	14.24	14.86	14.80	14.96	15.22

SANTA CLARA ESTUARY AT RAILROAD CROSSING IN MEXICO

DESCRIPTION: A measuring section located in a drain constructed by the Ministry of Hydraulic Resources that crosses the railroad at Kilometer 66, 400 feet west of Monument C.I.L.A. FC-49, and 1.2 miles to the southwest from the village of Riito, Sonora. The measuring section is located on this drain, 4.8 miles to the south of the railroad.

RECORDS: Based on 33 double current meter measurements made during the year. Data obtained and furnished by the Mexican Section of the Commission. Records available: January 1958 through December 1967.

REMARKS: The flow at this station consists of return flows from the wasteways on the left bank of the Colorado River and from the Bolsa Drain through an old channel of the Colorado River into the Gulf of California.

EXTREMES: Maximum discharge, 91.8 second-feet on November 10, 1958; minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.8	16.2	18.0	17.7	18.0	19.8	18.4	18.4	13.4	12.4	11.3	13.1
2	20.5	17.0	17.7	18.0	18.0	19.8	18.7	16.6	13.4	11.7	11.3	13.4
3	21.2	17.3	17.7	18.0	18.0	19.4	18.7	14.8	13.8	10.9	11.3	13.4
4	20.5	18.0	17.3	18.4	17.7	19.4	18.7	13.4	14.1	10.9	11.3	13.4
5	19.8	18.4	17.3	18.4	17.7	19.4	18.7	11.7	14.5	10.9	11.3	13.4
6	19.4	19.1	17.0	18.4	17.3	19.4	19.1	9.9	14.8	10.9	10.9	13.4
7	18.7	19.8	17.0	18.4	17.3	19.4	19.1	8.1	15.2	10.9	10.9	13.1
8	18.0	20.1	16.6	18.4	17.3	19.4	18.7	6.4	15.5	10.9	10.6	13.1
9	17.7	20.8	16.6	18.0	17.0	19.4	18.4	4.6	15.5	10.9	10.6	12.7
10	17.0	21.2	16.6	18.0	17.0	19.1	18.0	4.9	15.9	10.9	10.9	12.7
11	17.0	21.2	16.6	18.0	17.0	19.1	18.0	5.3	16.2	10.9	10.9	12.7
12	17.0	20.8	16.6	18.0	17.3	19.1	18.0	6.4	16.6	10.9	10.9	12.7
13	17.0	20.8	16.6	18.0	17.7	19.1	18.0	6.4	17.0	10.9	11.3	12.4
14	17.0	20.5	16.6	18.4	17.7	19.1	18.0	6.4	16.2	10.9	11.3	12.4
15	17.0	20.5	16.6	18.4	18.0	18.7	18.0	7.1	15.9	10.9	11.3	12.4
16	17.0	20.1	16.6	18.4	18.4	18.4	18.0	7.4	15.5	10.9	11.7	12.4
17	17.0	20.1	17.3	18.7	18.4	18.4	18.0	7.1	15.2	11.3	11.7	12.4
18	17.0	19.8	17.7	18.7	18.7	18.0	18.0	6.7	14.8	11.3	11.7	12.4
19	17.0	19.8	18.4	19.1	18.7	17.7	18.0	6.4	14.5	11.3	12.0	12.4
20	16.6	19.4	19.1	19.1	18.7	17.3	18.0	6.0	14.1	11.3	12.0	12.4
21	16.6	19.4	19.4	18.7	18.7	17.7	18.0	5.7	13.4	11.3	12.0	12.4
22	16.6	19.1	20.1	18.7	19.1	17.7	18.0	5.3	13.8	11.3	12.0	12.4
23	16.6	19.1	19.4	18.7	19.1	17.7	18.0	6.4	13.8	11.3	12.4	12.4
24	16.6	18.7	19.1	18.7	19.1	17.7	18.0	7.4	13.8	11.3	12.4	12.4
25	16.6	18.7	18.4	18.4	19.1	18.0	18.4	8.5	13.8	11.3	12.4	12.4
26	16.6	18.4	18.0	18.4	19.1	18.0	18.4	9.5	13.8	11.3	12.7	12.4
27	16.6	18.4	17.7	18.4	19.4	18.0	18.4	10.6	13.8	11.3	12.7	12.4
28	16.6	18.0	17.0	18.4	19.4	18.4	18.4	11.3	14.1	11.3	12.7	12.4
29	16.6		17.3	18.4	19.4	18.4	18.4	12.4	14.1	11.3	13.1	12.4
30	16.2		17.3	18.4	19.4	18.4	18.4	12.7	13.1	11.3	13.1	12.4
31	16.2		17.7		19.4		18.4	13.1		11.3		12.4
Sum	544.0	540.7	545.3	551.7	567.1	559.4	567.3	276.9	439.6	346.2	350.7	392.7

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1958-1967 Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			3	21.2	†30	16.2	17.7	1,078	683	1,981	0
Feb.			†10	21.2	1	16.2	19.4	1,073	563	1,892	0
Mar.			22	20.1	† 8	16.6	17.7	1,081	618	2,031	0
Apr.			†19	19.1	1	17.7	18.4	1,094	981	2,706	0
May			†27	19.4	† 9	17.0	18.4	1,124	1,130	2,615	0
June			† 1	19.8	20	17.3	18.7	1,109	750	1,677	0
July			† 6	19.1	† 9	18.0	18.4	1,125	316	1,125	0
Aug			1	18.4	9	4.6	8.8	547	415	1,386	0
Sept.			13	17.0	30	13.1	14.8	872	803	2,058	0
Oct.			1	12.4	† 3	10.9	11.3	687	1,269	4,610	0
Nov.			†29	13.1	† 8	10.6	11.7	696	951	4,088	122
Dec.			† 2	13.4	†14	12.4	12.7	777	512	1,139	73.5
Yearly				21.2		4.6	15.5	11,264	8,990	24,595	1,107

Current Year 1967

Ø Mean daily † And other days

STORED WATER IN LARGE RESERVOIRS OF THE COLORADO RIVER

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

In Thousands of Acre-Feet

Month	LAKE MEAD (Capacity 26,159.0)		LAKE MOHAVE (Capacity 1,810.0)		HAVASU LAKE (Capacity 619.4)		TOTAL IN UNITED STATES RESERVOIRS (Capacity 28,588.4)	
	1967	Average 1935-1967	1967	Average 1951-1967	1967	Average 1939-1967	1967	Estimated Average
Jan.	15,629.0	16,530.2	1,639.0	1,650.0	547.6	557.6	17,815.6	18,737.8
Feb.	15,617.0	16,190.5	1,662.0	1,679.8	533.7	561.8	17,812.7	18,432.1
Mar.	15,438.0	15,877.0	1,677.0	1,680.8	553.1	576.9	17,668.1	18,134.7
Apr.	14,530.0	16,058.5	1,673.0	1,697.0	598.6	604.7	16,801.6	18,360.2
May	14,506.0	17,288.8	1,753.0	1,739.8	605.2	600.9	16,864.2	19,629.5
June	14,395.0	18,986.4	1,670.0	1,612.0	612.0	604.8	16,677.0	21,203.2
July	14,233.0	19,214.4	1,590.0	1,474.8	571.3	593.6	16,394.3	21,282.8
Aug.	14,196.0	18,899.7	1,498.0	1,400.4	561.6	576.4	16,255.6	20,876.5
Sept.	14,375.0	18,496.6	1,399.0	1,397.5	559.8	572.2	16,333.8	20,466.3
Oct.	14,219.0	18,140.4	1,435.0	1,420.9	547.0	577.4	16,201.0	20,138.7
Nov.	14,122.0	17,804.0	1,628.0	1,511.7	547.4	565.0	16,297.4	19,880.7
Dec.	14,338.0	17,410.7	1,734.0	1,623.8	544.0	560.5	16,616.0	19,595.0
Avg.	14,633.2	17,574.8	1,613.2	1,574.0	565.1	579.3	16,811.5	19,728.1
Max.	15,629.0	27,780.0	1,753.0	1,808.0	612.0	688.7	17,815.6	28,235.0
Min.	14,122.0	* 10,727.0	1,399.0	1,186.0	533.7	76.9	16,201.0	13,062.6

* Minimum since 1940

SUSPENDED SILT

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

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

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

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

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

Month	1967							Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot			
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum

Colorado River at Northerly International Boundary

Period 1956-1967

Jan.	100,452,000	4,000	5	0.0040	0.0055	0.0026	2.2	46.6	336	1.6
Feb.	100,315,000	6,100	5	.0061	.0080	.0020	3.3	20.5	116	1.6
Mar.	225,239,000	28,400	4	.0126	.0177	.0046	15.4	64.9	499	8.8
Apr.	225,401,000	17,600	4	.0078	.0120	.0044	9.5	59.8	434	9.4
May	118,010,000	7,100	5	.0060	.0094	.0031	3.8	22.5	201	2.7
June	159,010,000	12,800	4	.0080	.0302	.0053	6.9	21.3	92.6	5.1
July	232,651,000	19,200	4	.0082	.0092	.0064	10.4	29.4	89.3	7.4
Aug.	259,823,000	20,300	5	.0078	.0212	.0033	11.0	27.5	103	7.9
Sept.	161,408,000	10,700	6	.0066	.0096	.0041	5.8	12.5	43.6	2.9
Oct.	58,459,000	1,900	4	.0032	.0038	.0028	1.0	5.8	20.0	.8
Nov.	67,107,000	2,100	5	.0031	.0091	.0010	1.1	16.8	89.9	1.0
Dec.	89,500,000	2,500	4	.0028	.0068	.0010	1.4	32.5	174	.6
Yearly	1,797,375,000	132,700	55	0.0074	0.0302	0.0010	71.8	360	2,198	71.8

Samples by U. S. Section, and Analyses by Mexican Section, Method A

Intake Canal at Morelos Diversion Structure

Period 1952-1967

Jan.	100,181,000	2,860	4	0.0029	0.0041	0.0019	1.5	6.1	22.3	0.2
Feb.	100,067,000	4,730	4	.0047	.0068	.0014	2.6	6.5	19.4	.9
Mar.	224,659,000	22,104	5	.0098	.0162	.0027	11.9	54.6	154	11.1
Apr.	224,907,000	29,751	4	.0132	.0245	.0062	16.1	49.9	121	15.8
May	117,763,000	7,496	1	.0064	.0072	.0062	4.1	14.0	51.2	2.6
June	158,772,000	12,982	5	.0082	.0102	.0055	7.0	40.9	109	6.7
July	232,440,000	27,420	3	.0118	.0137	.0080	14.8	58.4	156	11.9
Aug.	259,535,000	38,064	6	.0147	.0268	.0104	20.6	54.3	135	14.2
Sept.	144,125,000	13,663	5	.0095	.0149	.0034	7.4	22.5	64.7	2.8
Oct.	58,038,000	1,372	4	.0024	.0044	.0011	0.7	5.0	12.0	.3
Nov.	66,562,000	1,738	5	.0026	.0040	.0014	1.0	2.4	9.3	.2
Dec.	89,058,000	2,366	4	.0027	.0042	.0014	1.3	5.2	14.8	1.1
Yearly	1,776,107,000	164,546	50	0.0093	0.0268	0.0011	88.9	320	696	88.9

Samples and Analyses by Mexican Section, Method B

SUSPENDED SILT

Month	1967						Period of Record		
	Tons		No. of Samples	Gravimetric Percentages			Acre-Feet at 1,847 Tons Per Acre Foot		
	Water	Silt		Average	Maximum Sample	Minimum Sample	Average	Maximum	Minimum

Colorado River at Southerly International Boundary

Period 1946-1967

Jan.	18,514,000		0							
Feb.	13,214,000		0							
Mar.	7,525,000		0							
Apr.	5,331,000		0							
May	4,065,000		0							
June	2,086,000	300	4	0.0121	0.0232	0.0050	0.2			
July	387,000	20	1	.0070	.0010	.0044	0			
Aug.	7,000		0							
Sept.	18,010,000	2,100	1	.0116	.0121	.0010	1.1			
Oct.	17,663,000	2,000	3	.0113	.0135	.0081	1.1			
Nov.	20,136,000	1,300	4	.0064	.0130	.0051	.7			
Dec.	20,017,000	1,400	3	.0070	.0120	.0044	.8			
Yearly	108,955,000		16							

Samples and Analyses by U. S. Section, Method A

Colorado River at Miguel C. Rodríguez Gaging Station

Period 1960-1967

Jan.	9,655,000	2,189	3	0.0227	0.0333	0.0148	1.2	35.1	251	0
Feb.	8,843,000	1,576	4	.0178	.0265	.0100	.8	5.0	13.9	0
Mar.	4,590,000	885	5	.0193	.0438	.0058	.5	.8	4.1	0
Apr.	1,383,000	118	4	.0085	.0146	.0042	.1	.2	1.1	0
May	1,285,000	151	3	.0118	.0122	.0098	.1	.6	1.5	0
June	1,068,000	158	6	.0148	.0235	.0081	.1	.1	.1	0
July	1,112,000	241	5	.0217	.0414	.0058	.2	.1	.2	0
Aug.	1,069,000	56	5	.0052	.0150	.0020		.1	.2	0
Sept.	2,381,000	85	5	.0036	.0074	.0020	.1	.6	4.5	0
Oct.	5,306,000	617	3	.0116	.0145	.0071	.3	3.6	20.8	0.1
Nov.	10,308,000	739	5	.0072	.0150	.0050	.4	5.8	36.0	0.3
Dec.	11,823,000	988	5	.0084	.0128	.0053	.6	5.6	13.0	.1
Yearly	58,823,000	7,803	53	0.0133	0.0438	0.0020	4.3	57.4	289	4.3

Samples and Analyses by Mexican Section, Method C

CHEMICAL ANALYSES OF WATER SAMPLES
1967

The tables below are based on chemical analyses of weekly samples from the Colorado River at the Northerly International Boundary taken by the United States Section of this Commission and analyzed by the United States Geological Survey. Samples from the Intake Canal at Morelos Diversion Structure were taken by the Mexican Section of this Commission and analyzed by the Ministry of Hydraulic Resources.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20; Mg, 12.16; Na, 23; (CO_3 plus HCO_3) expressed as CO_3, 30; SO_4, 48; Cl, 35.5; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as $EC \times 10^6$ at 25°C, is a relative measure of the total salt concentration.

Colorado River at Northerly International Boundary

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	$EC \times 10^6$ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	5	1,50	111,000	1,900		7.7	51	41	5.69	3.57	9.58	3.36	7.82	7.66	
Feb.	4	1.59	117,000	1,900		7.9	51	40	5.61	3.61	9.61	3.31	8.06	7.45	
Mar.	4	1.60	265,000	1,980		7.9	51	42	5.84	3.66	9.73	3.14	8.11	7.99	
Apr.	4	1.65	273,000	2,120		7.9	52	44	6.03	3.83	10.66	3.22	8.18	9.12	
May	5	1.74	151,000	2,210		7.8	53	43	6.24	3.96	11.70	3.51	8.96	9.42	
June	4	1.79	210,000	2,200		7.8	53	44	6.23	3.87	11.45	3.40	8.57	9.58	
July	5	1.76	301,000	2,140		7.7	54	45	5.92	3.86	11.33	3.28	8.34	9.48	
Aug.	4	1.68	321,000	2,040		7.6	53	44	5.78	3.66	10.74	3.20	8.14	8.82	
Sept.	4	1.52	181,000	1,710		7.6	51	37	5.15	3.29	8.82	3.19	7.70	6.38	
Oct.	5	1.62	69,600	1,950		7.6	52	42	5.74	3.66	10.03	3.41	7.88	8.16	
Nov.	4	1.61	79,300	1,980		7.8	52	42	5.91	3.55	10.27	3.57	7.77	8.38	
Dec.	4	1.70	112,000	2,040		7.9	54	42	5.90	3.57	10.92	3.55	8.35	8.49	
Mean ⊕	Ø52	1.66	Ø2,190,900	2,030		7.8	52	43	5.84	3.70	10.47	3.30	8.19	8.53	
Period Avg.		1.83	2,895,000	2,230		7.8	53	46	6.52	4.06	11.76	3.28	8.67	10.40	
Tons of Constituents 1967									210,000	80,900	433,000	178,000	707,000	545,000	
Avg. Tons Period 1962-1967									280,000	106,000	582,000	210,000	892,000	798,000	

Intake Canal at Morelos Diversion Structure

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	$EC \times 10^6$ @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	31	1.55	114,000	1.767	1,141	8.3	47		5.11	3.91	8.07	3.37	7.26	6.60	
Feb.	28	1.59	117.000	1.833	1,174	8.5	48		5.31	4.04	8.65	3.37	7.36	7.26	
Mar.	30	1.70	280,000	1,953	1,247	8.4	50		5.43	4.14	9.63	3.19	7.57	8.43	
Apr.	30	1.76	293,000	2,038	1,303	8.3	51		5.51	4.24	10.24	3.23	7.87	8.90	
May	31	1.78	154,000	2,062	1,306	8.5	51		5.69	4.21	10.31	3.38	8.31	8.52	
June	30	1.79	209,000	2,072	1,320	8.4	52		5.75	4.19	10.75	3.32	8.07	9.30	
July	31	1.82	311,000	2,115	1,336	8.5	52		5.59	4.30	10.95	3.24	7.90	9.71	
Aug.	31	1.78	340,000	2,070	1,308	8.4	53		5.43	4.23	10.70	3.21	7.91	9.24	
Sept.	30	1.63	172,000	1,953	1,197	8.3	51		5.25	4.05	9.81	3.33	7.94	7.84	
Oct.	31	1.65	701,000	1,924	1,207	8.5	49		5.51	4.08	9.16	2.88	7.78	8.10	
Nov.	30	1.63	80,000	1,955	1,202	7.9	49		5.65	4.05	9.28	2.83	7.71	8.46	
Dec.	30	1.70	112,000	2,007	1,254	8.0	50		5.79	4.06	9.78	2.89	8.09	8.65	
Mean ⊕	Ø363	1.70	Ø2,883,000	1,979	1,250	8.3	50		5.50	4.12	9.78	3.19	7.81	8.42	
Period Avg.		1.85	2,716,800	2,188	1,363	8.1	50		5.99	4.71	11.03	3.34	8.16	10.24	
Tons of Constituents 1967									195,000	88,200	79,400	345,000	668,000	545,000	
Avg. Tons Period 1962-1967									229,000	109,000	429,000	377,000	755,000	689,000	

** Percent of total cations *** Percent of total anions ⊕ Weighted mean Ø Total

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES
1967

The following tables show electrical conductivity, expressed in mhos per centimeter cube x 10^6 at 25°C, of individual water samples taken at one Colorado River station and in Mexican canals. Samples were taken at the Northerly International Boundary station by the United States Section of this Commission and conductivity determinations were made by the United States Geological Survey. Samples for the Intake Canal at Morelos Dam, Sánchez Mejorada Canal, Miguel C. Rodríguez Gaging Station, and El Marítimo Gaging Station were taken by the Mexican Section of the Commission and determinations were made by the Ministry of Hydraulic Resources.

Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C	Date	ECx10^6 @25°C

Colorado River at Northerly International Boundary

January		February		April		May		July		August		October		November	
1	2,070	14	1,910	1	2,050	17	2,160	1	2,040	16	1,900	1	1,540	16	2,000
2	2,150	15	1,920	2	2,020	18	2,020	2	2,210	17	2,010	2	1,920	17	2,000
3	2,110	16	2,000	3	2,080	19	2,040	3	2,140	18	2,000	3	1,930	18	2,000
4	1,690	17	2,010	4	2,050	20	2,100	4	2,160	19	2,120	4	2,050	19	2,040
5	2,040	18	1,950	5	1,980	21	2,120	5	2,150	20	2,130	5	2,060	20	1,880
6	2,300	19	2,060	6	2,070	22	2,350	6	2,140	21	1,980	6	2,060	21	1,960
6	2,200	20	1,660	7	2,180	23	2,330	7	2,120	22	2,080	7	1,990	22	2,060
7	2,190	21	1,860	8	2,120	24	2,210	8	2,310	23	2,120	8	1,970	23	1,980
8	2,260	22	1,950	9	2,050	25	2,190	9	2,220	24	2,120	9	1,960	24	1,920
9	1,980	23	1,470	10	2,160	26	2,230	10	2,090	25	2,040	10	1,960	25	1,960
10	1,970	24	1,900	11	2,090	27	2,150	11	2,140	26	2,220	11	1,970	26	2,080
11	1,560	25	2,030	12	2,100	28	2,240	12	2,150	27	2,440	12	2,020	27	1,980
12	1,590	26	2,230	13	2,120	29	2,200	13	2,060	28	2,100	13	2,010	28	2,070
13	1,590	27	2,160	14	2,110	30	2,200	14	2,130	29	2,110	14	2,000	29	1,720
14	1,520	28	2,180	15	2,070	31	2,200	15	2,230	30	2,130	15	1,980	30	1,760
15	1,600	March		16	2,110	June		16	2,220	31	2,170	16	1,900	December	
16	1,650	1	2,040	17	2,130	1	2,200	17	2,170	September		17	2,090	1	1,760
17	1,780	2	2,020	18	2,080	2	2,210	18	2,200	1	2,160	18	2,060	2	2,030
18	1,770	3	2,030	19	2,140	3	2,170	19	2,140	3	1,320	19	1,890	3	2,050
19	1,710	4	2,160	20	2,010	4	2,210	20	2,230	4	1,330	20	1,920	4	2,060
20	1,750	5	2,100	21	2,130	5	2,210	21	2,180	5	1,440	21	1,930	5	2,090
21	1,760	6	1,930	22	2,030	6	2,290	22	2,270	6	2,030	22	1,930	6	2,100
22	1,720	7	1,870	23	2,070	7	2,270	23	2,180	7	2,260	23	1,950	7	2,130
23	1,750	8	1,830	24	2,110	8	2,230	24	2,170	8	2,060	24	1,970	8	2,060
24	1,800	9	1,840	24	2,150	9	2,260	25	2,100	9	2,150	25	2,010	9	2,060
25	1,770	10	1,850	25	1,850	10	2,350	26	2,090	10	2,240	26	1,970	10	2,020
26	1,660	11	1,960	26	1,810	11	2,300	27	2,130	11	2,110	27	2,030	11	2,040
27	1,660	12	2,250	27	1,920	12	2,310	28	2,140	12	2,150	28	2,000	12	2,080
28	1,740	13	1,920	28	1,880	13	2,290	29	2,170	13	2,230	30	2,060	13	2,010
29	1,790	14	1,910	30	2,040	14	2,270	30	2,120	13	2,010	31	2,050	14	2,260
30	1,810	15	1,900	May		15	2,370	31	2,100	14	2,020	November		15	2,210
31	1,800	16	1,890	1	2,140	15	2,360	August		15	1,930	1	1,990	16	2,150
February		17	1,980	2	1,920	16	2,220	1	2,020	16	1,880	2	2,100	17	2,150
1	1,850	18	2,160	3	1,940	17	2,140	2	2,010	17	1,980	3	2,030	18	2,010
2	1,880	19	1,830	4	1,610	18	2,080	3	1,960	18	1,900	4	2,000	19	2,050
3	1,800	20	2,060	5	1,680	19	2,040	4	1,970	19	1,930	5	1,980	20	1,980
4	1,840	21	2,230	6	2,060	20	2,130	5	2,110	20	2,070	6	2,020	21	1,800
5	1,840	22	2,060	8	2,150	21	2,090	6	2,220	21	1,930	7	2,090	22	1,960
6	1,890	23	1,980	9	2,140	22	2,260	7	2,000	22	2,000	8	2,040	24	1,940
7	1,860	24	1,930	10	2,170	23	2,360	8	1,980	23	2,140	9	2,040	25	2,000
8	1,850	25	2,000	11	2,180	24	2,280	9	1,970	24	2,190	10	1,980	26	2,080
9	1,870	26	1,950	12	2,140	25	2,350	10	2,000	25	2,150	11	1,990	27	2,390
10	1,900	27	1,990	13	2,210	26	2,280	11	2,020	26	2,060	12	1,990	28	2,260
10	1,910	28	1,970	14	2,270	27	2,210	12	2,170	27	2,010	13	2,010	29	2,280
11	1,800	29	1,970	15	2,160	28	2,310	13	2,190	28	1,950	14	2,040	30	2,370
12	1,860	30	1,950	16	2,130	29	2,130	14	2,060	29	2,070	15	2,070	31	2,340
13	1,900	31	1,930			30	2,090	15	2,000	30	2,080				

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1967

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Intake Canal at Morelos Diversion Structure

January		February		April		May		July		August		October		November	
1	2,050	15	1,850	1	2,150	17	2,100	1	2,000	16	2,000	1	1,550	16	1,900
2	2,000	16	1,950	2	2,200	18	2,000	2	2,100	17	2,100	2	1,950	17	1,900
3	1,950	17	1,925	3	2,250	19	2,000	3	2,150	18	2,100	3	1,950	18	1,950
4	1,650	18	1,850	4	2,150	20	2,000	4	2,150	19	2,000	4	2,000	19	2,000
5	1,975	19	1,700	5	2,000	21	2,150	5	2,100	20	2,100	5	2,000	20	2,000
6	2,150	20	1,600	6	2,050	22	2,250	6	2,100	21	1,950	6	2,000	21	2,050
7	1,900	21	1,750	7	2,050	23	2,250	7	2,100	22	2,100	7	1,900	22	2,050
8	1,950	22	1,750	8	2,075	24	2,150	8	2,075	23	2,100	8	1,950	23	2,150
9	1,950	23	1,850	9	2,125	25	2,150	9	2,075	24	2,100	9	1,900	24	2,000
10	1,925	24	1,750	10	2,075	26	2,150	10	2,100	25	1,975	10	1,950	25	2,000
11	1,600	25	1,850	11	2,050	27	2,150	11	2,150	26	2,150	11	1,900	26	2,200
12	1,575	26	2,100	12	2,050	28	2,150	12	2,050	27	2,200	12	1,950	27	2,000
13	1,550	27	1,925	13	2,050	29	2,200	13	2,050	28	2,050	13	1,950	28	1,900
14	1,500	28	2,050	14	2,100	30	2,150	14	2,150	29	2,100	14	1,950	29	1,700
15	1,550	March		15	2,050	31	2,175	15	2,100	30	2,050	15	1,900	30	1,700
16	1,650	1	1,950	16	2,100	June		16	2,125	31	2,100	16	1,850	December	
17	1,750	2	1,950	17	2,150	1	2,100	17	2,125	September		17	2,000	1	1,700
18	1,700	3	1,925	18	2,100	2	2,100	18	2,200	1	2,100	18	2,050	2	2,000
19	1,700	4	1,900	19	2,050	3	2,050	19	2,100	2	1,800	19	1,850	3	2,000
20	1,725	5	1,850	20	2,000	4	2,050	20	2,175	3	1,400	20	1,850	4	2,050
21	1,750	6	1,800	21	2,025	5	2,150	21	2,125	4	1,300	21	1,900	5	2,000
22	1,700	7	1,700	22	1,975	6	2,050	22	2,100	5	1,475	22	1,900	6	2,050
23	1,725	8	1,850	23	2,050	7	2,150	23	2,150	6	2,000	23	1,900	7	2,000
24	1,800	9	1,800	24	2,100	8	2,100	24	2,150	7	2,100	24	1,950	8	2,000
25	1,725	10	1,750	25	1,825	9	2,050	25	2,150	8	2,000	25	1,950	9	2,000
26	1,550	11	1,950	26	1,775	10	2,150	26	2,100	9	2,050	26	1,950	10	2,000
27	1,625	12	1,925	27	1,850	11	2,150	27	2,150	10	2,150	27	1,950	11	2,000
28	1,750	13	1,950	28	1,900	12	2,200	28	2,100	11	2,025	28	1,900	12	2,000
29	1,800	14	1,900	29	1,850	13	2,200	29	2,150	12	2,150	29	1,950	13	1,950
30	1,800	15	1,900	30	1,975	14	2,100	30	2,100	13	2,200	30	2,000	14	2,100
31	1,750	16	1,950	May		15	2,200	31	2,125	14	1,950	31	1,900	15	2,100
February		17	1,800	1	2,050	16	1,950	August		15	1,925	November		16	2,000
1	1,800	18	2,050	2	1,900	17	1,900	1	2,050	16	1,925	1	1,950	17	2,050
2	1,800	19	2,100	3	1,850	18	1,900	2	2,000	17	1,925	2	2,050	18	1,950
3	1,800	20	1,900	4	1,650	19	1,900	3	2,000	18	1,825	3	1,900	19	2,000
4	1,800	21	2,250	5	1,700	20	2,000	4	2,000	19	1,850	4	1,950	20	1,900
5	1,850	22	2,000	6	1,975	21	1,900	5	2,100	20	2,000	5	1,900	21	1,800
6	1,800	23	2,050	7	2,050	22	2,100	6	2,150	21	1,950	6	1,950	22	1,900
7	1,825	24	2,100	8	2,100	23	2,200	7	2,025	22	2,025	7	1,900	24	1,950
8	1,825	25	2,100	9	2,100	24	2,100	8	2,075	23	2,000	8	1,950	25	2,000
9	1,800	26	2,100	10	2,075	25	2,100	9	2,050	24	2,075	9	1,950	26	2,050
10	1,825	27	2,150	11	2,100	26	2,100	10	2,050	25	2,150	10	1,900	27	2,250
11	1,800	28	2,100	12	2,050	27	2,000	11	2,050	26	2,150	11	1,950	28	2,200
12	1,800	29	2,050	13	2,100	28	2,100	12	2,150	27	2,000	12	1,950	29	2,150
13	1,850	30	1,800	14	2,100	29	2,100	13	2,150	28	2,000	13	1,950	30	1,950
14	1,850	31	1,950	15	2,000	30	2,000	14	2,100	29	2,050	14	1,950	31	2,100
				16	2,100			15	2,050	30	2,050	15	1,950		

ELECTRICAL CONDUCTIVITY OF WATER SAMPLES

1967

Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C	Date	ECx10⁶ @25°C

Sánchez Mejorada Canal

January		March		April		May		June		August		September		November	
3	2,600	1	2,500	7	2,400	12	2,400	15	2,400	12	2,400	12	2,600	3	2,300
11	2,500	9	2,500	12	2,600	17	2,400	20	2,450	14	2,400	19	2,400	9	2,400
25	2,500	15	2,500	19	2,500	25	2,400	July		23	2,500	29	2,400	15	2,500
February		22	2,600	26	2,500	30	2,400	7	2,400	30	2,400	October		25	2,700
2	2,400	28	2,400	May		June		15	2,200	September		13	2,500	30	2,500
10	2,550			3	2,600	7	2,425	20	2,500	5	2,400	17	2,500		
13	2,500			10	2,400			31	2,400						

Colorado River at Miguel C. Rodríguez Gaging Station

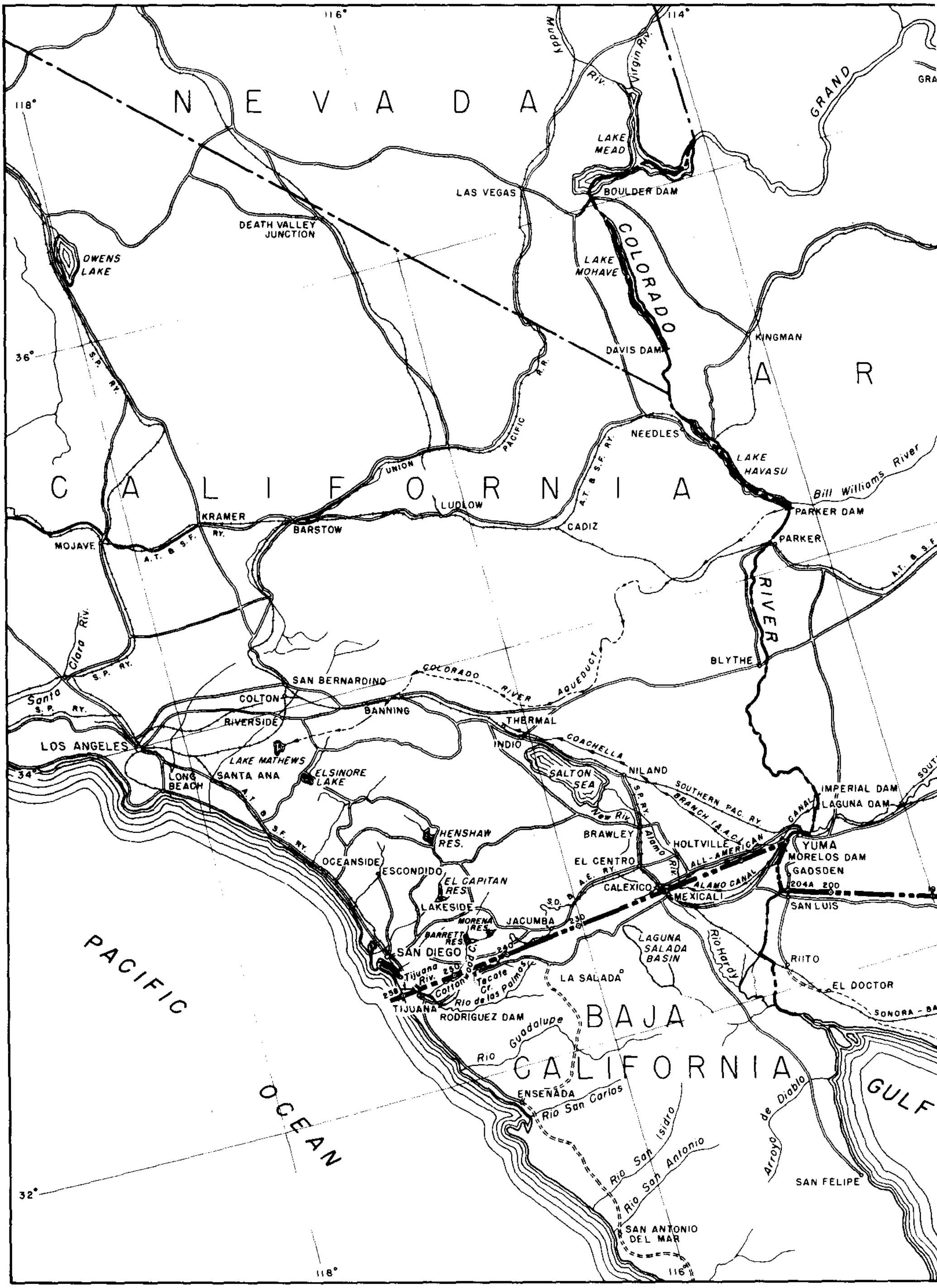
January		February		April		May		July		August		October		November	
2	7,000	23	4,250	7	3,100	24	3,000	3	3,000	16	2,900	3	3,150	29	6,500
10	6,500	March		12	3,000	25	3,000	5	3,000	22	3,000	17	7,000	December	
20	6,750	1	6,000	19	3,200	June		10	3,100	29	2,800	24	7,000	4	7,250
25	6,500	9	5,000	26	3,100	1	3,000	19	2,900	September		November		13	7,000
February		16	6,000	May		9	3,200	28	3,100	4	2,900	3	7,000	29	7,000
1	6,750	22	5,600	2	3,200	14	3,000	August		7	2,800	8	7,300		
10	7,000	28	3,200	10	3,000	20	3,100	1	3,000	13	3,000	14	7,000		
18	5,300	April		18	3,000	22	3,100	9	2,600	21	3,000	24	7,400		
		5	3,300			28	2,900			29	2,900				

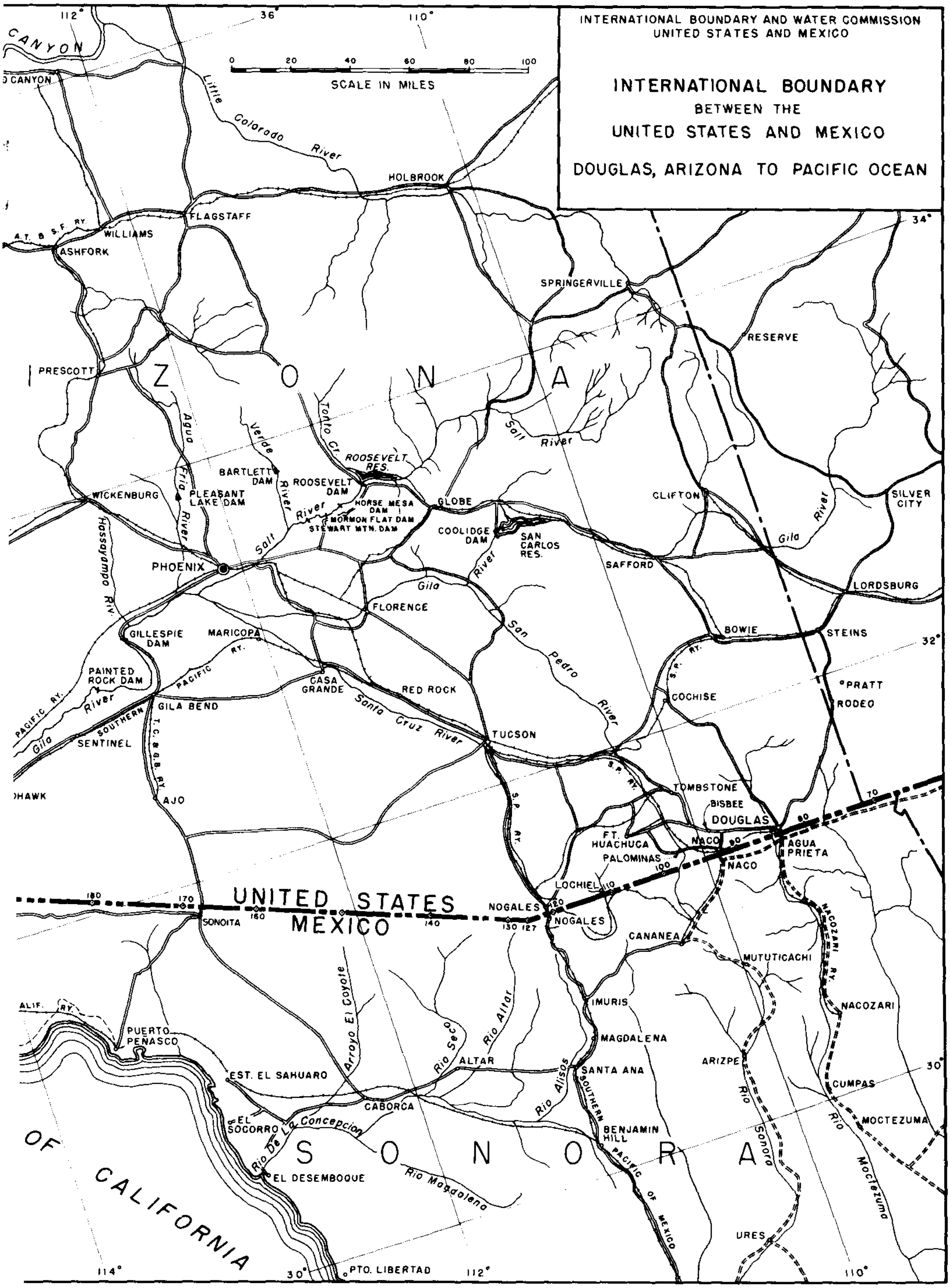
Colorado River at El Marítimo Gaging Station

January		March		May		July		August		September		October		November	
3	9,000	1	7,000	18	10,000	3	12,000	1	14,000	8	8,300	20	11,500	28	8,500
10	7,750	16	8,000	June		5	11,000	10	13,500	14	11,000	25	10,000	December	
20	7,500	April		1	12,500	10	10,000	17	15,000	26	12,000	31	9,500	9	9,000
February		5	11,000	9	13,000	19	14,000	21	19,000	28	14,000	November		12	9,000
1	7,000	19	12,000	14	11,000	28	15,000	28	20,000	October		7	9,000	22	8,500
18	6,250	May		22	13,000					4	13,000	11	9,500		
		2	13,000	28	13,000					10	13,300	21	9,500		

New River at International Boundary

January		February		March		May		June		July		August		November	
12	5,750	13	5,800	31	6,250	6	6,500	13	6,500	20	7,000	31	8,250	10	6,250
19	5,100	22	6,000	April		13	6,500	23	6,000	26	8,000	September		16	7,000
February		March		13	5,900	19	6,500	July		August		6	10,500	December	
2	5,750	11	5,250	22	6,500	27	6,400	1	6,000	3	6,000	October		1	13,000
11	6,000	16	5,500	28	6,250	June		4	6,000	19	9,250	7	8,750	6	8,500
		20	5,500			2	6,500	15	5,700	24	8,500	27	6,500		


NEVADA
CALIFORNIA
AR
BAJA CALIFORNIA
PACIFIC OCEAN
GULF
GRAND
COLORADO RIVER
LAS VEGAS
DEATH VALLEY JUNCTION
OWENS LAKE
LAKE MEAD
BOULDER DAM
LAKE MOHAVE
DAVIS DAM
KINGMAN
NEEDLES
LAKE HAVASU
Bill Williams River
PARKER DAM
PARKER
KRAMER
BARSTOW
LUDLOW
CADIZ
MOJAVE
BLYTHE
SAN BERNARDINO
COLTON
RIVERSIDE
BANNING
LOS ANGELES
LONG BEACH
SANTA ANA
LAKE MATHEWS
ELSINORE LAKE
COLORADO RIVER AQUEDUCT
THERMAL
INDIO
COACHELLA
SALTON SEA
NILAND
SOUTHERN PAC. RY.
BRANCH (A.A.C.)
IMPERIAL DAM
LAGUNA DAM
YUMA
MORELOS DAM
GADSDEN
SAN LUIS
HENSHAW RES.
BRAWLEY
HOLTVILLE
ALL-AMERICAN CANAL
EL CENTRO
CALEXICO
MEXICALI
ALAMO CANAL
OCEANSIDE
ESCONDIDO
EL CAPITAN RES.
LAKESIDE
MORENA RES.
BARRETT RES.
JACUMBA
SAN DIEGO
TIJUANA
RODRIGUEZ DAM
LAGUNA SALADA BASIN
LA SALADA
Rio Hardy
RIITO
EL DOCTOR
SONORA - BAJ
Rio Guadalupe
ENSENADA
Rio San Carlos
Rio San Isidro
Rio San Antonio
Arroyo de Diablo
SAN FELIPE
SAN ANTONIO DEL MAR
Tijuana Riv.
Cottonwood Cr.
Tecate Cr.
Rio de las Palmas
New Riv.
Alamo Riv.
Santa Clara Riv.
Muddy Riv.
Virgin Riv.
UNION PACIFIC R.R.
A.T. & S.F. RY.
S.P. RY.
S.D. & A.E. RY.
118°
116°
114°
36°
34°
32°


INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
INTERNATIONAL BOUNDARY
BETWEEN THE
UNITED STATES AND MEXICO
DOUGLAS, ARIZONA TO PACIFIC OCEAN
SCALE IN MILES
0 20 40 60 80 100
ARIZONA
SONORA
UNITED STATES
MEXICO
GULF OF CALIFORNIA
PHOENIX
TUCSON
DOUGLAS
AGUA PRIETA
NOGALES
NACO
SONOITA
FLAGSTAFF
HOLBROOK
WILLIAMS
ASHFORK
PRESCOTT
WICKENBURG
SPRINGERVILLE
RESERVE
CLIFTON
SILVER CITY
GLOBE
SAFFORD
LORDSBURG
FLORENCE
BOWIE
STEINS
CASA GRANDE
RED ROCK
GILA BEND
SENTINEL
AJO
COCHISE
TOMBSTONE
BISBEE
FT. HUACHUCA
PALOMINAS
LOCHIEL
CANANEA
MUTUTICACHI
NACOZARI
IMURIS
MAGDALENA
SANTA ANA
ARIZPE
CUMPAS
MOCTEZUMA
BENJAMIN HILL
URES
ALTAR
CABORCA
EST. EL SAHUARO
PUERTO PEÑASCO
EL SOCORRO
EL DESEMBOQUE
PTO. LIBERTAD
ROOSEVELT RES.
ROOSEVELT DAM
BARTLETT DAM
PLEASANT LAKE DAM
HORSE MESA DAM
MORMON FLAT DAM
STEWART MTN. DAM
COOLIDGE DAM
SAN CARLOS RES.
GILLESPIE DAM
PAINTED ROCK DAM
MARICOPA
PRATT
RODEO
Little Colorado River
Salt River
Gila River
San Pedro River
Santa Cruz River
Verde River
Agua Fria River
Hassayampa Riv.
Tonto Cr.
Rio Sonora
Rio Moctezuma
Rio Magdalena
Rio Altar
Rio Seco
Rio Alisos
Rio De La Concepcion
Arroyo El Coyote
SOUTHERN PACIFIC RY.
S.P. RY.
A.T. & S.F. RY.
T.C. & G.B. RY.
NACOZARI RY.
PACIFIC OF MEXICO
GRAND CANYON
36° 110° 112° 34° 32° 30° 114°
180 170 160 140 130 127 120 110 100 90 80 70

RAINFALL ON THE COLORADO RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall at stations located in California and Arizona in the United States and in Baja California and Sonora in Mexico, with averages for their periods of record. Records of daily rainfall amounts, where available, are on file in the offices of the United States or Mexican Sections of this Commission. For location, elevation, period of record, and the observer, see alphabetical listings of these stations on page 51 in this bulletin.

In United States

Month	Brawley, California		El Centro, California		Blythe, California		Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1967	Average 1931-1967	1967	Average 1931-1967	1967	Average 1931-1967	1967	Average 1955-1967	1967	Average 1931-1967
Jan.	0.38	0.32	0.26	0.36	0.25	0.47	0.49	0.40	0.31	0.39
Feb.	0	.31	0	.36	0	.41	0	.42	0	.34
Mar.	.15	.13	.20	.18	.30	.38	.09	.30	.06	.20
Apr.	0	.09	0	.11	.07	.16	.35	.41	0	.12
May	0	.01	0	0	0	.02	.02	.09	0	.01
June	0	.01	0	.01	0	.03	0	0	0	.02
July	T	.02	0	.08	.02	.17	.32	.20	.03	.16
Aug.	1.65	.32	0	.33	1.25	.78	.69	.55	.29	.43
Sept.	1.15	.32	1.47	.28	.78	.34	.20	.31	2.40	.40
Oct.	0	.22	0	.24	0	.29	0	.35	0	.40
Nov.	1.36	.15	1.69	.15	.72	.27	.44	.50	.92	.17
Dec.	.80	.46	.77	.48	1.03	.58	1.02	.60	.70	.42
Yearly	5.49	2.36	4.39	2.58	4.42	3.90	3.62	4.13	4.71	3.06

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California		San Luis, R. C., Sonora		Delta, Baja California	
	1967	Average 1948-1967	1967	Average 1926-1967	1967	Average 1948-1967	1967	Average 1949-1967	1967	Average 1948-1967
Jan.	0.24	0.43	0.08	0.35	0	0.35	0	0.31	0.20	0.39
Feb.	0	.16	T	.31	0	.08	0	.12	0	.08
Mar.	T	.08	.12	.20	0	.04	0	.08	0	.08
Apr.	T	.08	T	.08	0	.08	0	0	0	.04
May	0	0	0	0	0	0		0	0	0
June	0	0	0	0	0	0		0	0	0
July	0	.08	.04	.08	0	0	0	.12	0	.04
Aug.	.24	.20	.08	.31	1.30	.12		.35	.94	.16
Sept.	1.34	.24	1.73	.35	0	.04	0	.16	1.10	.16
Oct.	0	.31	0	.28	0	.20		.16	0	.16
Nov.	.16	.12	1.46	.16	.98	.08	11.30	.63	.91	.08
Dec.	.63	.31	.67	.87	T	.20	5.83	.63	.55	.31
Yearly	2.60	2.01	4.17	3.03	2.28	1.22		1.50	3.70	1.46

Month	Kilometer 50, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California			
	1967	Average 1952-1967	1967	Average 1959-1967	1967	Average 1949-1967	1967	Average 1948-1967		
Jan.	0.16	0.67	0.04	0.28	0.12	0.20	0	0.28		
Feb.	0	.24	0	.04	0	.12	0	.08		
Mar.	.16	.24	.08	0	.04	.12	0	.16		
Apr.	0	.16	0	0	0	.04	0	.08		
May	0	.04	0	0	0	0	0	0		
June	0	0	0	0	0	0	0	.08		
July	0	.16	0	0	0	.08	0	.12		
Aug.	.08	.35	0	.08	0	.35	.55	.31		
Sept.	1.26	.28	3.82	.63	4.49	.63	.75	.43		
Oct.	0	.39	0	.08	0	.24	0	.31		
Nov.	0	.24	1.02	.24	.47	.08	.63	.08		
Dec.	.75	.39	.47	.51	.63	.35	.47	.39		
Yearly	2.40	1.85	5.43	1.89	5.75	2.20	2.40	2.44		

T Trace

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 1967.

In United States

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
* Blythe, California	33° 37'	114° 36'	268	1909	State Division of Forestry
Brawley, California	32° 57'	115° 33'	100	1908	Agricultural Research Service
* Davis Dam No. 2, Arizona	35° 12'	114° 34'	657	1954	U. S. Bureau of Reclamation
El Centro, California	32° 46'	115° 34'	30	1930	El Centro Water Department
Yuma Citrus Station, Arizona	32° 37'	114° 39'	191	1923	University of Arizona Experimental Farm

In Mexico

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Bataques, Baja California	32° 33'	115° 04'	** 66	1948	Hydraulic Resources
Delta, Baja California	32° 21'	115° 11'	** 39	1948	Hydraulic Resources
El Mayor, Baja California	32° 08'	115° 15'	** 33	1949	Hydraulic Resources
Kilometer 50, Baja California	32° 15'	115° 03'	49	1952	Hydraulic Resources
Los Algodones, Baja California	32° 42'	114° 44'	115	1948	Hydraulic Resources
Mexicali, Baja California	32° 40'	115° 28'	13	1926	Hydraulic Resources
Riito, Sonora	32° 10'	114° 57'	** 39	1959	Hydraulic Resources
* San Felipe, Baja California	31° 02'	114° 53'	33	1948	Hydraulic Resources
San Luis, R. C., Sonora	32° 28'	114° 47'	131	1949	Hydraulic Resources

* Not shown on map

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

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

EVAPORATION IN THE COLORADO RIVER BASIN
IN INCHES

Tabulated below are records of evaporation observed at two stations in Arizona and at seven stations in Baja California and Sonora, Mexico. The stations in the United States are operated by the U. S. Bureau of Reclamation and by the University of Arizona Experimental Farm. The stations in Mexico are operated by the Ministry of Hydraulic Resources. The type of pan used at all these stations was the U. S. Weather Bureau standard pan, four feet in diameter. For specific location of these stations, refer to data opposite the same station name shown in "Location of Rainfall Stations," page 51 in this bulletin.

In United States

Month	Davis Dam No. 2, Arizona		Yuma Citrus Station, Arizona	
	1967	Average 1955-1967	1967	Average 1931-1967
Jan.	8.09	7.48	4.02	3.90
Feb.	10.22	7.74	5.70	4.94
Mar.	10.02	10.28	7.89	θ 7.88
Apr.	11.49	13.48	8.67	10.29
May	17.28	17.16	# 12.62	13.42
June	19.40	19.95	# 13.21	14.62
July	19.61	20.63	15.00	15.87
Aug.	18.19	18.49	13.66	13.98
Sept.	14.30	14.89	8.48	11.09
Oct.	14.10	12.35	7.93	8.03
Nov.	7.36	8.72	4.34	5.09
Dec.	6.54	8.22	3.20	3.70
Total	156.60	159.39	104.72	θ 112.81

In Mexico

Month	Los Algodones, Baja California		Mexicali, Baja California		Bataques, Baja California	
	1967	Av. 1949-55 1961-1967	1967	Average 1926-1967	1967	Average 1963-1967
Jan.	4.61	4.17	3.11	2.64	3.50	4.06
Feb.	6.54	5.31	4.49	3.50	6.18	5.28
Mar.	7.72	7.09	6.26	5.83	8.43	7.56
Apr.	9.13	9.57	7.28	7.91	8.03	9.06
May	13.07	12.24	10.98	10.51	11.54	11.85
June	12.87	12.68	11.42	11.50	12.20	11.93
July	12.52	12.80	12.05	11.73	12.64	12.40
Aug.	11.73	11.61	10.83	10.04	11.26	9.61
Sept.	8.11	9.49	6.93	8.11	8.19	8.70
Oct.	8.39	7.76	5.91	5.63	6.10	5.67
Nov.	4.13	4.69	2.87	3.35	3.86	5.04
Dec.	3.78	3.98	1.81	2.44	2.05	3.66
Total	102.60	102.99	83.94	83.11	93.98	94.65

Month	Delta, Baja California		Riito, Sonora		El Mayor, Baja California		San Felipe, Baja California	
	1967	Average 1959-1967	1967	Average 1963-1967	1967	Average 1953-1967	1967	Average 1952-1967
Jan.	3.46	3.27	4.21	3.35	3.98	3.66	3.78	5.04
Feb.	3.94	4.25	4.61	4.57	5.31	4.41	7.52	6.02
Mar.	6.34	6.30	7.09	6.22	5.91	6.22	7.40	6.89
Apr.	6.81	8.03	7.80	6.93	7.20	8.19	8.35	8.54
May	9.76	10.16	11.26	9.06	10.08	10.04	10.51	10.67
June	11.06	10.94	11.85	10.12	8.31	11.30	10.47	11.02
July	9.76	11.02	14.72	11.38	13.43	12.87	11.46	11.65
Aug.	8.74	9.45	12.80	8.50	12.52	12.01	13.15	10.91
Sept.	8.23	7.64	7.36	6.93	7.36	10.47	8.39	10.00
Oct.	5.28	5.79	6.42	5.00	8.23	8.15	8.50	8.58
Nov.	2.99	3.54	3.19	3.23	2.87	4.72	6.22	6.22
Dec.	2.40	2.99	2.44	2.95	3.23	3.94	4.69	5.20
Total	78.78	83.35	93.74	83.54	88.46	95.47	100.43	100.98

Adjusted to a full month θ One year missing

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 51 in this bulletin.

In United States

Month	Blythe, California				Davis Dam No. 2, Arizona				Yuma Citrus Station, Arizona			
	1967			Average 1931-67	1967			Average 1955-67	1967			Average 1931-67
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	52.7	78	28	52.2	# 53.3	73	34	52.7	52.3	80	29	53.0
Feb.	58.8	83	30	57.1	# 57.8	76	36	56.3	57.8	84	31	56.9
Mar.	63.9	91	34	63.0	# 64.8	90	40	62.2	63.5	93	34	
Apr.	63.1	90	39	70.5	# 63.0	86	42	69.9	61.2	88	37	69.1
May	76.6	108	43	77.4	# 77.8	111	51	78.6	73.9	106	38	76.0
June	82.3	112	54	84.8	# 84.9	110	60	88.1	# 80.1	110	54	83.4
July	93.5	115	73	92.0	# 95.9	121	76	94.8	91.9	112	68	91.3
Aug.	93.1	113	70	91.0	# 95.6	114	76	93.5	91.8	113	70	90.7
Sept.	84.0	105	57	85.1	# 87.1	105	69	86.0	82.7	104	60	85.3
Oct.	74.7	98	47	73.4	# 76.9	98	56	75.3	74.3	99	43	74.1
Nov.	64.3	89	39	60.2	# 63.9	87	40	61.8	# 65.5	91	37	61.7
Dec.	50.6	74	29	53.6	# 49.3	68	27	54.8	49.9	75	30	54.9
Yearly	71.5	115	28	71.7	# 72.5	121	27	72.9	# 70.4	113	29	

Month	Brawley, California				El Centro, California			
	1967			Average 1931-67	1967			Average 1931-67
	Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	53.0	80	25	53.7	54.0	82	26	53.5
Feb.	58.5	82	32	58.0	58.9	85	34	57.7
Mar.	64.2	91	35	63.6	63.6	93	30	63.2
Apr.	61.9	88	40	70.8	61.6	89	37	70.2
May	75.5	108	46	78.0	74.5	107	39	77.4
June	80.3	112	52	85.3	80.9	112	50	84.8
July	91.3	113	71	92.4	92.9	115	72	91.9
Aug.	91.7	114	70	92.0	93.1	117	64	91.2
Sept.	83.8	105	62	86.8	83.9	107	60	85.8
Oct.	75.6	98	48	75.6	75.6	103	41	75.0
Nov.	66.3	98	42	62.6	65.5	91	41	62.2
Dec.	51.2	77	30	55.4	51.1	78	29	55.0
Yearly	71.1	114	25	72.8	71.3	117	26	72.3

In Mexico

Month	Los Algodones, Baja California				Mexicali, Baja California				Bataques, Baja California			
	1967		1949-1967		1967		1926-1967		1967		1948-1967	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	82	34	86	23	81	27	93	19	83	19	113	19
Feb.	86	37	95	28	84	36	93	23	99	50	99	21
Mar.	95	41	100	32	90	39	100	32	108	50	113	25
Apr.	90	41	109	37	90	41	106	34	106	50	118	16
May	109	46	117	43	108	43	117	43	118	55	124	34
June	109	59	126	52	111	50	120	50	113	57	135	43
July	115	64	118	61	113	75	118	55	118	59	133	45
Aug.	111	70	120	61	113	72	118	54	115	70	129	40
Sept.	104	64	122	54	106	63	122	48	113	63	135	39
Oct.	99	50	111	32	100	48	109	39	100	46	118	41
Nov.	93	43	100	27	95	41	99	28	95	41	115	32
Dec.	79	36	88	28	79	30	90	25	75	32	97	25
Yearly	115	34	126	23	113	27	122	19	118	19	135	16

One or more days missing

TEMPERATURE IN THE COLORADO RIVER BASIN IN DEGREES FAHRENHEIT

In Mexico

Month	San Luis, R. C., Sonora				Delta, Baja California				Kilometer 50, Baja California			
	1967		1949-1967		1967		1948-1967		1967		1950-59 & 1961-67	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	93	41	100	19	104	36	104	30	64	19	91	19
Feb.	99	46	109	27	108	32	108	28	68	32	97	21
Mar.	99	48	108	32	113	32	113	28	79	37	99	28
Apr.	109	50	115	37	118	32	118	32	79	32	106	30
May	θ	θ	115	41	129	32	129	32	99	43	117	36
June	θ	θ	126	45	117	46	133	36	102	48	117	39
July	126	68	126	59	117	72	135	45	115	61	120	45
Aug.	θ	θ	122	59	136	68	140	52	109	61	118	50
Sept.	115	61	118	52	117	52	135	39	104	54	115	39
Oct.	θ	θ	118	43	100	48	117	36	97	46	108	36
Nov.	97	41	113	30	95	43	120	32	79	34	104	25
Dec.	75	25	102	23	75	36	104	27	66	19	95	19
Yearly			126	19	129	32	140	27	115	19	120	19

Month	Riito, Sonora				El Mayor, Baja California				San Felipe, Baja California			
	1967		1949-1967		1967		1949-1967		1967		1948-1967	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	84	27	91	19	93	23	108	23	73	39	99	32
Feb.	90	28	95	21	86	36	93	27	77	39	102	32
Mar.	95	32	100	25	95	37	100	34	104	39	104	32
Apr.	91	37	109	37	93	41	108	36	75	36	113	37
May	108	43	115	43	102	41	113	37	97	46	120	41
June	113	52	124	45	108	46	122	37	99	54	124	50
July	113	68	140	52	120	59	122	39	100	72	124	50
Aug.	111	68	122	46	120	61	122	41	108	70	135	41
Sept.	100	61	118	39	109	61	120	34	95	59	126	37
Oct.	95	43	115	34	99	50	120	37	90	52	117	41
Nov.	90	39	118	27	95	41	120	34	84	43	118	21
Dec.	77	32	86	21	79	34	106	19	72	32	97	28
Yearly	113	27	140	19	120	23	122	19	108	32	135	21

θ Records incomplete

IRRIGATED AREAS ALONG COLORADO RIVER BELOW IMPERIAL DAM

1967

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

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

Point of Diversion from Colorado River and Designation of Areas	Total Irrigated Areas Acres
IN UNITED STATES:	
Imperial Dam	
Yuma Valley Division	44,875
Reservation Division	11,082
Yuma Mesa	17,168
Yuma Aux. Project Unit "B" (Yuma Mesa)	3,221
South Gila Valley	10,053
North Gila Valley	5,882
Wellton-Mohawk	61,190
Coachella Valley	52,008
Imperial Valley	445,428
Warren Act	80
Non-Project lands adjacent to Colorado River	7,100
Total in United States	658,087
IN MEXICO:	
Morelos Dam	
Mexicali Valley	* 440,285
Total in United States and Mexico	1,098,372

* An estimated one-third of total acreage is served by pumping from ground water in Mexicali Valley

MESA DRAIN NEAR CUDAHY IN MEXICO

DESCRIPTION: Staff gage, bridge, and measuring section located at Kilometer 1+500, about 0.9 mile upstream from the pumping plant to the Alamo Canal above Cudahy Check. From October 10, 1960 until August 1962, measurements were made at various locations on the drain.

RECORDS: Based on 43 current meter measurements, 40 double and 3 single, made during the year from the bridge or by wading. Data obtained and furnished by the Mexican Section of the Commission. Records available: July 25, 1956 through December 1967.

REMARKS: Mesa Drain is located immediately south of the sand hills. Flow in the drain, consisting of ground water and agricultural returns, is modified by pumping for agricultural and domestic use in Mexico above the station.

EXTREMES: Maximum measured discharge, 78.0 second-feet on February 22, 1960; minimum measured discharge, zero several days in August 1965, August and September 1967.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	50.5	43.8	47.7	32.5	27.5	32.8	26.8	24.0	4.2	2.1	31.8	22.6
2	50.1	43.4	47.7	32.1	26.8	33.9	27.2	23.7	6.7	3.2	31.8	25.1
3	49.4	43.8	47.7	31.8	26.5	35.0	27.2	23.0	8.8	4.2	32.1	27.2
4	48.4	44.1	47.3	31.4	26.5	36.4	27.5	22.6	10.9	5.7	29.7	29.7
5	47.3	44.5	47.3	31.1	26.8	37.4	27.5	21.9	13.4	6.7	27.2	31.8
6	46.3	44.8	47.3	30.4	26.8	38.5	27.9	21.5	15.5	7.8	24.7	31.8
7	45.2	45.2	47.0	30.4	27.2	39.6	27.9	20.8	15.9	8.8	22.6	31.8
8	44.1	45.9	47.0	30.4	27.2	37.8	29.0	20.5	16.2	9.9	20.1	32.1
9	43.1	46.3	47.0	30.7	27.5	36.0	30.0	19.8	16.6	10.9	17.7	32.1
10	44.5	44.8	47.0	30.7	27.5	34.3	31.1	19.4	17.0	12.0	15.2	32.1
11	45.9	43.8	47.0	31.1	28.6	32.5	32.5	18.7	17.3	13.4	17.7	32.1
12	47.3	42.4	46.6	31.1	29.7	30.7	33.5	18.4	17.7	14.5	20.5	32.5
13	48.7	41.3	46.6	30.7	30.7	28.6	34.6	15.2	18.4	15.5	23.0	32.5
14	50.1	42.0	46.6	30.4	31.8	26.8	35.7	12.0	18.7	16.6	25.4	32.5
15	51.6	42.7	46.6	30.0	33.2	25.1	35.0	10.9	19.1	17.7	28.3	32.5
16	53.0	43.4	45.9	29.7	34.3	25.8	33.9	10.2	20.1	18.7	30.7	32.5
17	52.3	44.1	44.8	29.3	35.3	26.5	33.2	9.2	20.8	19.8	30.4	32.8
18	51.6	44.8	44.1	29.0	35.0	27.2	32.5	8.5	21.9	20.8	30.0	32.8
19	50.9	45.6	43.1	29.0	34.6	28.3	31.8	7.4	23.0	22.2	29.3	32.8
20	50.1	46.3	42.4	29.0	34.3	29.0	30.7	6.7	20.8	23.3	28.6	32.8
21	49.4	47.0	41.3	29.0	33.9	28.3	30.4	5.7	18.4	24.4	28.3	33.2
22	48.7	47.7	40.6	29.3	33.9	27.9	29.7	4.9	16.2	25.4	27.5	33.2
23	48.0	48.4	39.6	29.3	33.5	27.5	29.0	3.9	13.8	26.5	27.2	33.2
24	47.3	48.4	38.5	29.3	33.2	26.8	28.6	3.5	11.7	27.5	26.5	33.2
25	46.6	48.4	37.1	29.7	32.8	26.5	27.9	2.8	9.2	28.6	26.1	33.2
26	45.9	48.0	36.0	29.7	32.5	26.1	27.5	2.1	7.1	29.7	25.4	33.5
27	45.6	48.0	35.0	29.3	31.8	26.1	26.8	1.8	4.6	31.1	24.7	33.5
28	45.2	48.0	33.9	28.6	31.4	26.5	26.5	1.1	2.1	31.1	24.4	33.5
29	44.8		33.5	28.3	31.1	26.5	25.8	.7	0	31.4	23.7	33.9
30	44.5		33.2	27.9	30.4	26.8	25.4	0	ᵛ 0	31.4	23.3	33.9
31	44.1		32.8		31.8		24.7	2.1		31.8		33.9
Sum	1,480.5	1,266.9	1,328.2	901.2	954.1	911.2	917.8	363.0	406.1	572.7	773.9	990.3

Current Year 1967 | **Period** 1956-1967

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			16	53.0	9	43.1	47.7	2,936	2,694	3,072	2,234
Feb.			† 23	48.4	13	41.3	45.2	2,512	2,547	3,439	1,725
Mar.			† 1	47.7	31	32.8	42.7	2,634	2,609	3,225	1,686
Apr.			1	32.5	30	27.9	30.0	1,785	2,404	3,381	1,291
May			17	35.3	† 3	26.5	30.7	1,892	2,444	3,365	1,566
June			7	39.6	15	25.1	30.4	1,808	1,842	3,324	726
July			14	35.7	31	24.7	29.7	1,819	1,775	2,688	803
Aug			1	24.0	30	0	11.7	718	1,728	3,468	434
Sept.			19	23.0	† 29	0	13.4	805	1,947	2,720	805
Oct.			31	31.8	1	2.1	18.4	1,136	2,297	3,414	1,136
Nov.			3	32.1	10	15.2	25.8	1,534	2,309	3,416	1,534
Dec.			† 29	33.9	1	22.6	31.8	1,964	2,672	3,244	1,964
Yearly				53.0		0	29.7	21,543	26,181	34,661	21,075

† And other days Ø Mean daily ᵛ Estimated

ALAMO RIVER AT INTERNATIONAL BOUNDARY

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

RECORDS: Computed on the basis of head on the Cipolletti weir from daily staff gage readings, and weir ratings as determined by monthly current meter measurements. Records obtained and furnished by Imperial Irrigation District. 1967 records excellent. Records available: June 1942 through December 1967.

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

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.10	2.91	3.03	1.89	2.21	2.21	2.00	1.68	1.49	2.67	2.79	2.79
2	2.00	2.55	2.91	2.21	2.21	2.21	1.68	2.10	1.58	2.55	2.79	2.67
3	2.00	2.55	2.79	2.21	1.79	2.21	1.68	2.10	1.58	2.55	2.79	2.91
4	2.00	2.44	2.91	2.21	1.79	2.00	1.58	1.89	1.58	2.21	2.79	2.79
5	2.00	2.44	2.67	2.21	2.21	2.00	1.58	1.89	1.58	2.21	2.67	2.79
6	1.79	2.44	2.67	2.00	2.21	2.00	1.58	1.79	2.00	2.21	2.67	2.44
7	1.89	2.32	2.67	2.00	2.32	1.79	1.58	1.79	2.00	2.21	2.67	2.44
8	1.89	2.21	2.79	2.00	2.32	1.79	1.39	1.79	1.89	2.79	2.21	2.44
9	1.89	2.21	2.67	2.00	2.21	1.89	1.49	1.79	2.00	2.79	2.21	2.44
10	1.89	2.21	2.79	2.10	2.00	1.79	1.58	1.79	2.00	2.67	2.21	2.10
11	1.89	2.32	2.79	2.00	2.00	2.10	2.00	1.79	2.00	2.44	2.21	2.10
12	1.89	2.55	2.55	2.00	2.00	2.00	1.89	1.89	2.00	2.44	1.89	2.10
13	1.89	1.89	2.67	2.00	2.10	2.10	2.00	1.89	1.79	2.32	2.00	2.00
14	2.00	2.10	2.67	2.00	2.10	1.89	2.00	1.89	1.79	2.44	1.89	2.00
15	2.00	1.79	2.44	2.00	1.89	1.89	2.00	1.89	1.89	2.32	2.44	2.00
16	1.89	1.89	2.44	2.21	1.89	1.79	1.79	1.79	2.00	2.32	2.44	2.00
17	2.00	2.00	2.67	2.21	1.89	1.79	1.79	1.89	1.79	2.21	2.32	2.00
18	2.00	2.00	2.67	2.21	1.89	1.79	1.79	1.79	1.89	3.54	2.21	2.00
19	2.00	2.44	2.67	2.55	2.00	1.79	1.89	1.79	1.79	3.41	2.21	2.79
20	1.89	2.32	2.21	2.55	2.00	1.79	1.89	1.79	1.79	3.80	2.21	2.79
21	1.89	2.21	2.10	2.21	1.79	1.89	2.10	2.00	1.79	3.67	2.21	2.00
22	1.79	2.67	2.32	2.21	1.89	1.89	2.10	2.00	2.00	2.44	2.21	2.21
23	1.79	2.55	2.21	2.10	2.00	1.89	2.10	1.20	2.00	2.32	2.21	2.21
24	1.89	3.15	2.21	2.21	2.00	1.89	2.10	1.20	2.67	2.32	2.00	2.21
25	2.10	3.03	2.10	2.10	2.00	2.21	2.10	1.58	2.67	2.67	2.00	2.10
26	2.10	2.67	2.21	2.00	2.00	2.21	2.10	1.58	2.67	2.67	2.21	2.00
27	2.00	2.55	2.21	2.00	1.89	2.21	2.10	1.58	2.55	2.79	2.21	2.21
28	2.10	2.44	2.21	2.21	1.68	1.68	1.79	1.58	2.55	2.67	2.21	2.44
29	2.00		2.21	2.21	1.68	1.68	1.79	1.58	2.67	2.79	2.21	2.44
30	2.00		2.21	2.21	1.68	1.89	1.58	1.39	2.67	2.79	2.21	3.28
31	2.00		1.89		2.21		1.58	1.39		2.67		2.32
Sum	60.56	66.85	77.56	64.02	61.85	58.26	56.62	54.09	60.67	81.90	69.30	73.01

Month	Current Year 1967							Period 1943-1967		
	Ø Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	0.29	0.26	† 1	2.10	† 6	1.79	1.95	120	427	2,790	99
Feb.	.38	.26	24	3.15	15	1.79	2.39	133	388	2,822	100
Mar.	.37	.27	1	3.03	31	1.89	2.50	154	435	3,154	111
Apr.	.33	.27	†19	2.55	1	1.89	2.13	127	471	2,222	97
May	.31	.25	† 7	2.32	†28	1.68	2.00	123	359	1,799	73
June	.30	.25	† 1	2.21	†28	1.68	1.94	116	357	1,686	61
July	.29	.22	†21	2.10	8	1.39	1.83	112	325	1,712	59
Aug	.29	.20	† 2	2.10	†23	1.20	1.74	107	394	1,672	83
Sept.	.34	.23	†24	2.67	1	1.49	2.02	120	369	1,406	91
Oct.	.43	.30	20	3.80	† 4	2.21	2.64	162	401	1,845	102
Nov.	.35	.27	† 1	2.79	†12	1.89	2.31	137	408	2,080	86
Dec.	.39	.28	30	3.28	†13	2.00	2.36	145	374	1,686	80
Yearly	0.43	0.20		3.80		1.20	2.15	1,556	4,708	22,146	1,251

Ø Mean daily † And other days

NEW RIVER AT INTERNATIONAL BOUNDARY

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

RECORDS: Based on a continuous record of gage heights and weekly current meter measurements, supplemented by additional measurements during periods of high flow by the Imperial Irrigation District. Measurements are also made generally once each month by the United States Section of the Commission. Records computed and furnished by the District. 1967 records good. Records available: June 1942 through December 1967.

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

EXTREMES: Maximum mean daily discharge, 691 second-feet on December 3, 1962; minimum mean daily discharge, 2 second-feet on May 14, 1945. Prior to the period of record, and since 1900, much higher flows occurred. During the years 1905 to 1907, when the Colorado River flowed into the Salton Sea, a considerable part of its flow passed through the New River channel.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	133	140	150	141	148	107	123	88	118	160	132	133
2	133	135	154	137	146	145	128	92	137	197	133	134
3	131	127	155	138	143	158	125	84	155	177	133	134
4	133	122	151	143	140	148	119	75	186	166	135	135
5	133	120	151	151	136	154	112	70	209	156	137	133
6	133	122	162	154	139	143	110	69	212	158	140	132
7	140	127	166	155	129	108	107	71	213	151	133	127
8	144	130	146	152	128	133	104	67	211	147	128	124
9	146	129	147	149	119	135	103	66	212	148	125	123
10	145	127	147	154	108	162	106	65	213	154	124	122
11	146	127	151	176	108	161	99	62	215	164	129	128
12	145	130	153	169	115	144	85	68	211	165	123	127
13	145	133	163	167	117	133	83	74	209	159	127	127
14	150	136	153	162	119	130	75	82	204	155	119	126
15	146	141	141	158	116	133	73	92	202	156	115	128
16	147	146	141	158	111	127	78	99	190	156	116	125
17	162	148	139	158	108	126	78	97	184	150	115	130
18	180	150	138	164	103	128	78	92	177	145	112	146
19	182	151	137	172	101	133	73	90	176	141	112	142
20	203	152	136	174	105	133	75	90	168	138	112	127
21	191	150	127	167	105	136	74	94	163	133	115	127
22	179	146	127	175	100	138	76	90	173	128	120	124
23	182	147	120	169	101	135	84	88	169	125	118	122
24	166	155	123	160	112	136	92	85	167	116	123	119
25	151	155	132	150	125	136	94	83	165	108	124	118
26	144	154	138	145	98	138	100	84	158	116	158	132
27	137	150	147	174	108	126	104	87	134	127	136	145
28	135	149	142	169	141	110	105	88	134	137	145	152
29	135		150	159	131	110	105	92	137	142	146	149
30	141		147	151	108	112	104	93	141	152	141	145
31	143		142		101		96	100		141		140
Sum	4,681	3,899	4,479	4,751	3,669	4,018	2,968	2,577	5,343	4,568	3,824	4,076

Month	Current Year 1967								Period 1943-1967		
	Ø Extreme Gage ** Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	40.89	41.40	20	203	3	131	151	9,285	6,762	20,160	1,751
Feb.	41.17	41.50	†24	155	5	120	139	7,734	5,530	17,845	1,258
Mar.	40.98	41.40	7	166	23	120	144	8,884	5,915	12,960	1,008
Apr.	40.85	41.34	11	176	2	137	158	9,423	6,070	14,489	1,390
May	41.17	41.82	1	148	26	98	118	7,277	5,276	10,618	629
June	41.03	41.68	10	162	1	107	134	7,970	4,740	9,689	1,087
July	41.67	42.25	2	128	†15	73	96	5,887	4,516	9,086	817
Aug	41.79	42.28	31	100	11	62	83	5,111	5,548	10,921	1,139
Sept.	40.74	41.67	11	215	1	118	178	10,598	6,023	12,688	1,795
Oct.	40.85	41.47	2	197	25	108	147	9,060	6,332	11,710	2,081
Nov.	41.11	41.63	26	158	†18	112	127	7,585	6,085	12,323	2,483
Dec.	41.16	41.70	28	152	25	118	131	8,085	6,828	21,205	1,763
Yearly	40.74	42.28		215		62	134	96,899	69,625	138,906	24,573

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

VOLCANO DRAIN TO NEW RIVER IN MEXICO

DESCRIPTION: *Volcano Drain is measured at a point about 1,000 feet downstream from the highway bridge at the junction* of the Tijuana-San Felipe highway, 5.8 miles upstream from the international boundary and 3.7 miles south of Mexicali, Baja California. Measurements obtained at a point near the crossing of the siphon of the West Main Canal and Volcano Drain.

RECORDS: Based on 39 double current meter measurements made by wading during the year. Data obtained and furnished by the Mexican Section of the Commission. Records available: January 1957 through December 1967.

REMARKS: Volcano Drain carries agricultural return flow from a large part of the Mexicali Valley. Cofferdams and other structures in the Laguna Mexico and other points upstream which are not subject to control affect the return flows, which results in an irregular discharge.

EXTREMES: Maximum measured discharge, 249 second-feet on July 22, 1964; minimum measured discharge, 8.1 second-feet on May 16, 1964.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	93.2	64.3	81.6	79.1	71.3	46.6	45.2	33.9	81.2	122	86.5	111
2	95.0	63.2	81.6	79.5	72.4	45.9	43.8	33.5	97.8	121	85.5	111
3	96.4	66.0	81.9	79.8	73.5	45.2	42.7	33.5	114	120	84.8	111
4	98.2	68.9	81.9	80.2	74.5	44.8	41.3	35.0	131	119	84.0	110
5	99.6	71.7	81.9	80.5	75.6	44.1	41.3	36.7	148	118	83.0	109
6	101	74.5	81.9	80.9	76.6	43.4	41.0	38.1	165	117	82.3	109
7	99.9	77.3	81.9	81.6	76.6	43.1	41.0	39.6	164	117	81.6	109
8	98.9	80.2	81.9	81.9	76.3	42.4	40.6	41.3	163	115	80.9	110
9	97.5	83.0	81.9	82.3	76.3	42.0	40.6	42.7	162	114	79.8	110
10	96.4	85.8	81.9	82.6	75.9	41.3	40.3	44.5	162	113	79.1	110
11	95.0	88.6	81.9	83.0	75.9	40.6	40.3	45.9	160	111	81.2	111
12	93.9	86.9	81.9	83.3	75.6	40.3	39.9	47.3	159	110	83.3	111
13	91.8	85.1	82.3	83.7	75.6	39.6	39.9	49.1	159	109	85.5	111
14	89.7	84.8	82.3	84.0	72.0	40.3	39.6	50.5	158	107	87.6	111
15	87.6	84.4	82.6	84.0	68.5	41.0	39.6	52.3	157	106	89.7	112
16	85.8	84.0	82.6	84.4	65.0	41.7	37.8	53.7	154	105	91.8	112
17	83.7	83.7	81.9	84.8	61.8	42.4	36.4	55.1	151	103	93.2	112
18	81.6	83.0	81.6	84.8	58.3	42.7	34.6	56.9	149	102	94.3	112
19	79.5	82.6	80.9	85.1	54.7	43.4	33.2	58.3	146	101	95.7	113
20	78.4	82.3	80.5	85.5	54.0	44.1	31.4	57.2	144	99.6	97.1	113
21	77.0	81.9	80.5	85.5	53.3	44.8	31.8	55.8	141	98.2	98.2	113
22	75.9	81.6	80.2	85.8	53.0	45.6	32.5	54.7	138	96.8	99.6	113
23	74.9	81.6	80.2	83.0	52.3	46.3	32.8	53.3	136	95.7	101	114
24	73.8	81.6	79.8	79.8	51.6	46.3	33.5	52.3	133	94.3	102	114
25	72.4	81.6	79.8	77.0	50.9	45.9	33.9	54.0	131	92.9	103	114
26	71.3	81.6	79.5	74.2	50.5	45.9	34.6	55.8	128	91.8	105	114
27	70.3	81.6	79.5	71.0	49.8	45.6	34.6	57.6	125	90.4	106	115
28	68.9	81.6	79.1	68.2	49.1	45.6	34.3	59.3	124	89.7	107	115
29	67.8		79.1	69.2	48.4	45.6	34.3	61.1	124	88.6	109	115
30	66.7		78.8	70.3	47.7	45.2	33.9	62.9	123	87.9	110	115
31	65.7		78.8		47.3		33.9	64.6		87.2		116
Sum	2,627.8	2,233.4	2,512.2	2,415.0	1,964.3	1,311.7	1,160.6	1,536.5	4,228.0	3,243.1	2,767.7	3,476.0

Month	Current Year 1967 Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1957-1967 Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			6	101	31	65.7	84.8	5,213	6,539	9,142	4,076
Feb.			11	88.6	2	63.2	79.8	4,430	5,976	8,165	3,536
Mar.			† 15	82.6	† 30	78.8	80.9	4,983	6,855	9,347	4,491
Apr.			22	85.8	28	68.2	80.5	4,790	7,484	11,914	4,373
May			† 6	76.6	31	47.3	63.2	3,896	6,645	8,971	3,896
June			1	46.6	13	39.6	43.8	2,602	5,624	7,676	2,602
July			1	45.2	20	31.4	37.4	2,302	5,536	7,996	2,302
Aug			31	64.6	† 2	33.5	49.4	3,048	6,176	8,367	3,048
Sept.			6	165	1	81.2	141	8,385	7,139	9,027	4,912
Oct.			1	122	31	87.2	105	6,435	6,391	8,118	4,570
Nov.			30	110	10	79.1	92.2	5,490	5,795	7,511	3,570
Dec.			31	116	5	109	112	6,897	6,368	7,528	4,511
Yearly				165		31.4	80.9	58,471	76,528	95,812	50,245

Ø Mean daily † And other days

WISTERIA WASTEWAY TO NEW RIVER IN MEXICO

DESCRIPTION: Staff gage located near operator's house upstream from wasteway gates, 1,000 feet downstream from the confluence of the Cerro Prieto and West Main Canals of the Colorado River Irrigation District in Colonia Wisteria, 4.3 miles upstream from the international boundary, 1.9 miles east of the highway to Tijuana at the Tijuana-San Felipe junction, 3.0 miles west of the highway to San Felipe, and 3.1 miles south of Mexicali. The wasteway structure is composed of three rectangular gates, two of which operate manually and one automatically.

RECORDS: Based on gate openings and water surface elevations upstream from the wasteway gates obtained by the Ministry of Hydraulic Resources and 31 check measurements during the year at various locations by the Mexican Section of the Commission. Records computed and furnished by the Mexican Section of the Commission. Records available: January 1951 through December 1967. Records reported below are part of the waste flows from the Mexican system of canals discharging into the territory of the United States, which wastes are not to exceed an average annual quantity of 35,000 acre-feet during any successive five-year period under the provisions of Minute No. 197 of the Commission.

EXTREMES: Maximum instantaneous discharge, 675 second-feet on January 24, 1962; minimum discharge, no flow on various occasions.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	0.7	1.1	0.7	0.7	0.4	0.4	0	0	0	0	0
2	1.1	.7	1.1	.7	.7	.4	.4	0	0	.4	0	0
3	1.4	.7	1.1	.7	1.1	.4	.4	0	35.7	.4	0	0
4	1.4	1.1	1.1	.7	1.1	.4	.4	0	0	.4	0	0
5	1.8	1.1	1.1	.7	1.1	.4	.4	0	0	.4	0	0
6	1.8	1.4	1.1	.7	1.1	.4	.4	0	0	.4	0	0
7	1.8	1.4	.7	.4	1.1	.4	.4	0	0	.4	0	0
8	1.8	1.8	.7	.4	1.1	.4	.4	0	0	.4	0	0
9	1.8	1.8	.7	.4	1.1	.4	.4	0	0	.4	0	0
10	2.1	2.1	.7	.4	.7	.4	.4	0	0	.4	0	0
11	2.1	2.1	.7	.4	.7	.4	.4	0	0	.4	0	0
12	2.1	1.8	.7	.4	.7	.4	.4	0	0	.4	0	0
13	2.1	1.4	.7	.4	.7	.4	.4	0	0	.4	0	0
14	1.8	1.4	.7	.4	.7	.4	.4	0	0	0	0	0
15	1.8	1.4	.7	.4	.4	.4	.4	0	0	0	0	0
16	1.4	1.4	.7	.7	.4	.4	.4	0	0	0	0	0
17	1.4	1.4	.7	.7	.4	.4	.4	0	0	0	0	0
18	1.1	1.4	.7	.7	0	.4	0	0	0	0	0	0
19	1.1	1.4	1.1	.7	0	.4	0	0	0	0	0	0
20	1.1	1.4	1.1	1.1	0	.4	0	0	0	0	0	0
21	1.1	1.4	1.1	1.1	0	.4	0	0	0	0	0	0
22	1.1	1.4	1.1	1.1	.4	.4	0	0	0	0	0	0
23	1.1	1.4	1.1	1.1	.4	.4	0	0	0	0	0	0
24	1.1	1.4	1.1	1.1	.4	.4	0	0	0	0	0	0
25	1.1	1.4	1.1	.7	.7	.4	0	0	0	0	0	0
26	.7	1.4	.7	.7	.7	.4	0	0	0	0	0	0
27	.7	1.1	.7	.7	.7	.4	0	0	0	0	0	0
28	.7	1.1	.7	.7	.7	.4	0	0	0	0	0	0
29	.7		.7	.7	.7	.4	0	0	0	0	0	0
30	.7		.7	.7	.4	.4	0	0	0	0	0	0
31	.7		.7		.4		0	0		0		0
Sum	41.8	38.5	26.9	20.3	19.3	12.0	6.8	0	35.7	4.8	0	0

Month	Current Year 1967 — Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1951-1967 — Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			† 10	2.1	† 26	0.7	1.4	81.9	2,031	8,735	0
Feb.			† 10	2.1	† 1	.7	1.4	76.4	1,261	7,218	0
Mar.			† 1	1.1	† 7	.7	.9	52.5	934	2,568	0
Apr.			† 20	1.1	† 7	.4	.7	39.2	906	4,433	0
May			† 3	1.1	† 18	0	.6	37.1	627	1,892	0
June			† 1	.4	† 1	.4	.4	21.0	373	1,450	0
July			† 1	.4	† 18	0	.4	11.9	291	2,040	0
Aug				0		0	0	0	572	1,926	0
Sept.			3	35.7	† 1	0	1.1	70.8	791	2,915	21.0
Oct.			† 2	.4	† 1	0	0	8.4	1,084	2,993	8.4
Nov.				0		0	0	0	1,209	3,768	0
Dec.				0		0	0	0	1,784	8,669	0
Yearly				35.7		0	0.7	399	11,862	27,083	399

† And other days Ø Mean daily

WISTERIA DRAIN TO NEW RIVER IN MEXICO

DESCRIPTION: Wisteria Drain discharges into the stilling basin above the weir of Wisteria Wasteway immediately downstream from the spillway structure of Cerro Prieto and West Main Canals through a 20-inch pipe and thence into New River. The pipe outlet is located in the right bank of the basin in Colonia Wisteria, 4.3 miles upstream from the international boundary, and about 1.9 miles east of the Tijuana highway from the Tijuana-San Felipe junction.

RECORDS: Based on weekly readings of water surface elevations, discharges are computed from horizontal pipe formula. Data furnished by the Mexican Section of the Commission. Records available: January 1957 through December 1967.

EXTREMES: Maximum mean daily discharge, 2.1 second-feet, January 23, 1964; minimum, no flow on various occasions. Maximum monthly volume, 58.1 acre-feet, January 1964; minimum monthly volume, zero on various occasions during 1966 and 1967.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	0.4	u 0.4	0.4	0.4	0.4	0	0	0	0	0	0
2	1.1	.4	u .4	.4	.4	.4	0	0	0	0	0	0
3	1.1	.4	u .4	.4	.4	.4	0	0	0	0	0	0
4	1.4	.4	u .4	.4	.4	.4	0	0	0	0	0	0
5	1.4	.4	u .4	.4	.4	0	0	0	0	0	0	0
6	1.1	.4	u .4	.4	.4	0	0	0	0	0	0	0
7	1.1	.4	u .4	.4	.4	0	0	0	0	0	0	0
8	1.1	.4	u .4	.4	.4	0	0	0	0	0	0	0
9	.7	.4	u .4	.4	.4	0	0	0	0	0	0	0
10	.7	.4	u .4	.4	.4	0	0	0	0	0	0	0
11	.7	.4	.4	.4	.4	0	0	0	0	0	0	0
12	.7	.4	.4	.4	.4	0	0	0	0	0	0	0
13	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
14	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
15	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
16	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
17	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
18	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
19	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
20	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
21	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
22	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
23	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
24	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
25	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
26	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
27	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
28	.4	u .4	.4	.4	.4	0	0	0	0	0	0	0
29	.4		.4	.4	.4	0	0	0	0	0	0	0
30	.4		.4	.4	.4	0	0	0	0	0	0	0
31	.4		.4		.4		0	0		0		0
Sum	19.8	11.2	12.4	12.0	12.4	1.6	0	0	0	0	0	0

Month	Current Year 1967								Period 1957-1967		
	Extreme Gage Feet		ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			† 4	1.4	† 13	0.4	0.7	37.1	27.3	58.1	7.0
Feb.			† 1	.4	1	.4	.4	19.6	21.4	32.2	12.2
Mar.			† 1	.4	1	.4	.4	21.7	25.2	52.5	8.4
Apr.			† 1	.4	1	.4	.4	21.0	29.3	47.7	8.4
May			† 1	.4	1	.4	.4	21.7	16.1	28.7	2.1
June				0		0	0	2.8	15.7	27.6	2.1
July				0		0	0	0	15.6	35.7	0
Aug				0		0	0	0	17.6	55.9	0
Sept.				0		0	0	0	13.2	31.5	0
Oct.				0		0	0	0	12.3	26.6	0
Nov.				0		0	0	0	16.6	46.2	0
Dec.				0		0	0	0	22.0	49.0	0
Yearly				1.4		0	0.4	124	233	357	124

u Estimated ø Mean daily † And other days

RIVERA DRAIN TO NEW RIVER IN MEXICO

DESCRIPTION: Parshall flume located 5.0 miles from the confluence of the drain with the New River and 328 feet south of the point where the Mexicali-Compuertas highway crosses the drain.

RECORDS: Based on 37 double measurements made during the year. Data obtained and furnished by the Mexican Section of the Commission. Records available: January 1957 through December 1967. Prior to January 1963, measurements were obtained at a rectangular control section in the channel of the drain between "K" and "L" streets in the city of Mexicali.

REMARKS: Rivera Drain begins near the right bank of the West Main Canal, 0.9 mile south of Sharpe Heading, and runs westward across Mexicali, Baja California, and discharges into New River 0.9 mile upstream from the international boundary. Flow at the station consists mainly of agricultural drainage with a small amount of sewage from Mexicali, Baja California.

EXTREMES: Since January 1963: Maximum measured discharge, 3.9 second-feet on March 6, 1963; minimum measured discharge, zero on several days during October 1965 and December 1966, and on May 19, 1967.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	1.8	2.5	2.8	2.1	1.8	1.8	1.8	0.7	0.7	0.7	1.4
2	.7	1.8	2.5	2.8	2.1	1.8	1.8	1.8	.7	.7	.7	1.4
3	.7	1.8	2.5	2.8	2.1	1.8	1.8	1.8	.7	.7	.7	1.4
4	.7	1.8	2.5	2.8	2.1	1.8	1.8	1.4	.7	.7	1.1	1.1
5	1.1	1.8	2.5	2.8	2.1	1.8	1.8	1.4	.7	.7	1.1	1.1
6	1.1	2.1	2.5	2.8	2.1	1.8	1.4	1.4	.7	1.1	1.1	1.1
7	1.1	2.1	2.5	2.8	2.1	1.8	1.4	1.4	.7	1.1	1.1	1.1
8	1.4	2.1	2.5	2.8	2.1	1.8	1.4	1.4	.7	1.1	1.1	1.1
9	1.4	2.1	2.8	2.8	2.1	1.8	1.4	1.4	.7	1.1	1.1	1.1
10	1.4	2.1	2.5	2.8	2.1	1.8	1.4	1.1	.7	1.1	1.1	1.1
11	1.8	2.1	2.5	2.8	2.1	1.8	1.4	1.1	.7	1.1	1.1	1.1
12	1.8	2.1	2.5	2.8	1.8	1.8	1.4	1.1	.7	1.1	1.1	1.1
13	1.8	1.8	2.1	2.5	1.8	1.8	1.4	1.1	.7	.7	1.1	1.1
14	1.8	2.1	2.1	2.5	1.4	1.8	1.1	1.1	.7	.7	1.1	1.1
15	1.8	2.1	2.1	2.5	1.4	1.8	1.1	1.1	.7	.7	1.1	1.4
16	1.8	2.1	2.1	2.5	1.1	1.8	1.1	.7	.7	.7	1.1	1.4
17	1.8	2.1	2.1	2.5	.7	1.8	1.4	.7	.7	.7	1.1	1.4
18	1.8	2.1	2.1	2.5	.4	1.8	1.4	.7	.7	.7	1.1	1.4
19	1.8	2.1	2.5	2.5	0	1.8	1.4	.7	.7	.7	1.1	1.4
20	1.8	2.1	2.5	2.5	.4	1.8	1.4	.7	.7	.7	1.1	1.4
21	1.8	2.1	2.5	2.5	.4	1.8	1.4	.7	.7	.7	1.4	1.4
22	1.8	2.1	2.5	2.5	.7	1.8	1.4	.7	.7	.7	1.4	1.4
23	1.8	2.1	2.5	2.5	1.1	1.8	1.8	.7	.7	.7	1.4	1.4
24	1.8	2.1	2.8	2.1	1.4	1.8	1.8	.7	.7	.	1.4	1.4
25	1.8	2.1	2.8	2.1	1.4	1.8	1.8	.7	.7	.7	1.4	1.4
26	1.8	2.5	2.8	2.1	1.8	1.8	1.8	.7	.7	.7	1.4	1.4
27	1.8	2.5	2.8	2.1	2.1	1.8	1.8	.7	.7	.7	1.4	1.8
28	1.8	2.5	2.8	2.1	2.1	1.8	1.8	.7	.7	.7	1.4	1.8
29	1.8		2.8	2.1	1.8	1.8	1.8	.7	.7	.7	1.4	1.8
30	1.8		2.8	2.1	1.8	1.8	1.8	.7	.7	.7	1.4	1.8
31	1.8		2.8		1.8		1.8	.7		.7		1.8
Sum	48.1	58.2	77.8	75.8	48.5	54.0	48.1	31.6	21.0	24.5	34.8	42.1

Current Year 1967 — Period 1963-1967

Month	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High		Low				Average	Maximum	Minimum
			Day		Day						
Jan.			†11	1.8	† 1	0.7	1.4	94.0	107	129	94.0
Feb.			†26	2.5	† 1	1.8	2.1	116	118	127	110
Mar.			† 9	2.8	†13	2.1	2.5	154	157	182	129
Apr.			† 1	2.8	†24	2.1	2.5	151	126	161	88.4
May			† 1	2.1	†19	0	1.4	95.7	105	126	90.0
June			† 1	1.8	† 1	1.8	1.8	105	86.7	108	67.9
July			† 1	1.8	†14	1.1	1.4	94.9	79.5	94.9	65.2
Aug			† 1	1.8	†16	.7	1.1	62.3	80.3	117	62.3
Sept.			† 1	.7	† 1	.7	.7	42.0	66.9	94.9	42.0
Oct.			† 6	1.1	† 1	.7	.7	48.3	59.3	83.5	41.3
Nov.			†21	1.4	† 1	.7	1.1	67.9	79.8	88.4	67.9
Dec.			†27	1.8	† 4	1.1	1.4	82.7	86.7	108	54.6
Yearly				2.8		0	1.4	1,114	1,152	1,325	1,098

Ø Mean daily † And other days

WASTE WATERS FROM MEXICAN SYSTEM OF CANALS ENTERING THE UNITED STATES

DESCRIPTION: During 1967, the discharge to the New River in Mexico was from Wisteria Wasteway only, located 2.9 miles upstream from the international boundary in Colonia Wisteria, at the wasteway gates of the Cerro Prieto and East Main Canals.

RECORDS: Computations of flows from Wisteria Wasteway are based on gate openings and water-stage elevations upstream from the wasteway made by the Ministry of Hydraulic Resources, and of weekly measurements taken downstream from the weir by the Mexican Section of the Commission. Data furnished by the Mexican Section of the Commission. Records available: Wisteria Wasteway, January 1951 through 1967; Sifón Wasteway, January 1952 through April 1964; Pueblo Nuevo Wasteway, January 1956 through 1965.

REMARKS: Records for Sifón and Pueblo Nuevo Wasteways are shown in previously published bulletins, 1960 through 1965. Flows from these two wasteways are used for irrigation and no longer reach New River.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1956-1967		
		Average	Maximum	Minimum
January	81.9	2,037	8,758	15.4
February	76.4	1,358	7,281	19.6
March	52.5	766	2,610	21.7
April	39.2	571	2,843	16.1
May	37.1	339	1,141	9.1
June	21.0	248	1,477	0
July	11.9	130	348	0
August	0	387	1,413	0
September	70.8	472	2,081	21.0
October	8.4	684	2,024	8.4
November	0	1,027	3,784	0
December	0	1,916	8,691	0
Yearly	399	9,934	27,430	399

SALTON SEA - ELEVATIONS OF WATER SURFACE

DESCRIPTION: Water-stage recorder and staff gage located on the western shore of the Salton Sea, 15.5 miles northwest of Westmoreland, California. The Salton Sea is situated in Imperial and Riverside counties of California in the United States, 125 miles northwest of the Gulf of California, 18 miles northwest of Brawley, California, and 42 miles north of the international boundary between the United States and Mexico. The sea lies in the bottom of a closed basin known as the Salton Sink, which has a drainage area of 8,360 square miles. Zero of gage is 250.00 feet below mean sea level, U. S. C. & G. S. datum.

RECORDS: Records of water surface elevations available from November 1904 through December 1967. From January 1925 to October 22, 1951, records were collected by Imperial Irrigation District and based generally upon one water surface reading each month, determined from a bench mark at Figtree John's Spring about 22 miles northwest along the western shore from the present gage. Since October 24, 1951, a continuous record of gage heights has been obtained by the U. S. Geological Survey at new gaging station published as "Salton Sea near Westmoreland, California." The elevation of the old station is at a datum of one foot higher than that of the present station, therefore to make the records comparable it is necessary to subtract one foot from the elevations of the records obtained at the old station. All records reported below and the area and capacity table are adjusted to the datum of the present station. The area and capacity table dated January 8, 1965, is based on resurveys made in 1957 above elevation -240 feet and in 1962 below elevation -236 feet.

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 River and New River channels. The bottom of the sea is 277.7 feet below mean sea level, U. S. C. & G. S. datum.

EXTREMES: Maximum elevation during year, 232.0 feet below mean sea level. Minimum elevation during year, 232.8 feet below mean sea level. Prior to 1935, and since the sea was filled by flood waters of the Colorado River 1905-1906, maximum elevation 195.9 feet below mean sea level (present datum), February 10 to March 29, 1907; minimum elevation 251.6 feet below mean sea level in November 1924.

Mean Daily Water Surface Elevation in Feet below Mean Sea Level - 1967

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	232.8	232.5	232.3	232.1	232.1	232.2	232.4	232.4	"232.6	232.7	232.7	232.6
2	232.8	232.5	232.3	232.1	232.1	232.2	232.4	232.4	232.5	232.7	232.7	232.6
3	232.7	232.4	232.3	232.1	232.1	232.2	232.4	232.5	232.5	232.7	232.7	232.6
4	232.7	232.4	232.3	232.1	232.1	232.2	232.4	232.5	232.5	232.7	232.7	232.6
5	232.7	232.5	232.3	232.1	232.1	232.3	232.4	232.5	232.5	232.7	232.7	232.6
6	232.7	232.5	232.3	232.1	232.1	232.3	232.4	232.5	232.5	232.7	232.7	232.6
7	232.7	232.5	232.3	232.1	232.1	232.3	232.4	232.5	232.5	232.7	232.7	232.6
8	232.7	232.5	232.3	232.1	232.1	232.3	232.4	232.5	232.5	232.7	232.7	232.6
9	232.7	232.4	232.3	232.1	232.1	232.3	232.4	232.5	232.6	232.7	232.7	232.6
10	232.7	232.4	232.3	232.0	232.1	232.3	232.4	232.5	232.6	232.7	232.7	232.6
11	232.7	232.4	232.3	232.0	232.1	232.3	232.3	232.5	232.6	232.7	232.7	232.6
12	232.7	232.4	232.3	232.1	232.1	232.3	232.3	232.5	232.6	232.7	232.7	232.6
13	232.7	232.4	232.2	232.1	232.1	232.4	232.3	232.5	232.6	232.7	232.7	232.6
14	232.7	232.4	232.2	232.1	232.1	232.4	232.3	232.5	232.6	232.7	232.7	232.7
15	232.7	232.4	232.2	232.1	232.1	232.3	232.3	232.5	232.6	232.7	232.7	232.7
16	232.7	232.4	232.2	232.1	232.1	232.3	232.4	232.5	232.6	232.7	232.7	232.7
17	232.7	232.4	232.2	232.1	232.1	232.4	232.4	232.5	232.6	232.7	232.7	232.7
18	232.6	232.4	232.2	232.1	232.1	232.4	232.4	232.5	232.6	232.7	232.7	232.7
19	232.6	232.4	232.2	232.1	232.1	232.4	232.4	232.5	232.6	232.7	232.6	232.7
20	232.6	232.3	232.1	232.1	232.1	232.3	232.4	232.5	232.6	232.7	232.6	232.7
21	232.6	232.3	232.1	232.1	232.1	232.3	232.4	232.5	232.7	232.7	232.6	232.6
22	232.6	232.3	232.1	232.1	232.1	232.4	232.4	232.6	232.7	232.7	232.6	232.6
23	232.6	232.3	232.1	232.1	232.1	232.4	232.4	232.6	232.7	232.7	232.6	232.6
24	232.6	232.3	232.1	232.1	232.1	232.4	232.4	232.6	232.7	232.7	232.6	232.6
25	232.6	232.4	232.1	232.1	232.1	232.4	232.4	232.6	232.7	232.7	232.6	232.6
26	232.5	232.3	232.1	232.1	232.2	232.4	232.4	232.6	232.7	232.7	232.6	232.6
27	232.5	232.3	232.1	232.1	232.2	232.4	232.4	232.6	232.7	232.7	232.6	232.6
28	232.5	232.3	232.1	232.1	232.2	232.4	232.4	232.7	232.7	232.7	232.6	232.6
29	232.5		232.1	232.1	232.2	232.4	232.4	232.7	232.7	232.7	232.6	232.6
30	232.5		232.1	232.1	232.2	232.4	232.4	232.7	232.7	232.7	232.6	232.6
31	232.5		232.1		232.2		232.4	"232.7		232.7		232.6
Avg.	232.6	232.4	232.2	232.1	232.1	232.3	232.4	232.5	232.6	232.7	232.7	232.6

Current Year 1967			Period 1935-1967		
Month	Ø Extreme Elev. Feet		Elevation Feet		
	High	Low	# Average	# Maximum	‡ Minimum
Jan.	232.5	232.8	239.38	232.05	249.3
Feb.	232.3	232.5	239.07	231.79	248.8
Mar.	232.1	232.3	238.80	231.57	248.6
Apr.	232.0	232.1	238.61	231.39	248.7
May	232.1	232.2	238.60	231.54	248.5
June	232.2	232.4	238.77	231.71	248.8
July	232.3	232.4	238.93	231.92	249.1
Aug.	232.4	232.7	239.13	232.17	249.4
Sept.	232.5	232.7	239.31	232.49	249.4
Oct.	232.7	232.7	239.38	232.49	249.8
Nov.	232.6	232.7	239.37	232.30	250.0
Dec.	232.6	232.7	239.20	232.23	249.6
Yearly	232.0	232.8	239.05	232.06	250.0

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

" Estimated Ø Mean daily # Mean monthly ‡ Reading near first day of month

CHEMICAL ANALYSES OF WATER SAMPLES
1967

The tables below are based on bi-monthly samples from the Alamo and New Rivers taken and analyzed by the State of California Department of Water Resources.

Samples from the Alamo River are taken near the international boundary upstream from seepage pipes from the All-American Canal. Samples from New River are taken from the right bank at road bridge 450 feet north of international boundary. Records of sampling extend from April 1951 through December 1967.

To convert milligram equivalents to parts per million by weight, multiply each ion by its appropriate conversion factor. These factors are: Ca, 20; Mg, 12.16; Na, 23; (CO_3 plus HCO_3) expressed as CO_3, 30; SO_4, 48; Cl, 35.5; NO_3, 62. To convert tons per acre-foot to parts per million, multiply tons per acre-foot by 735.5. Electrical conductivity, reported in the tables as ECx10^6 at 25° C, is a relative measure of the total salt concentration.

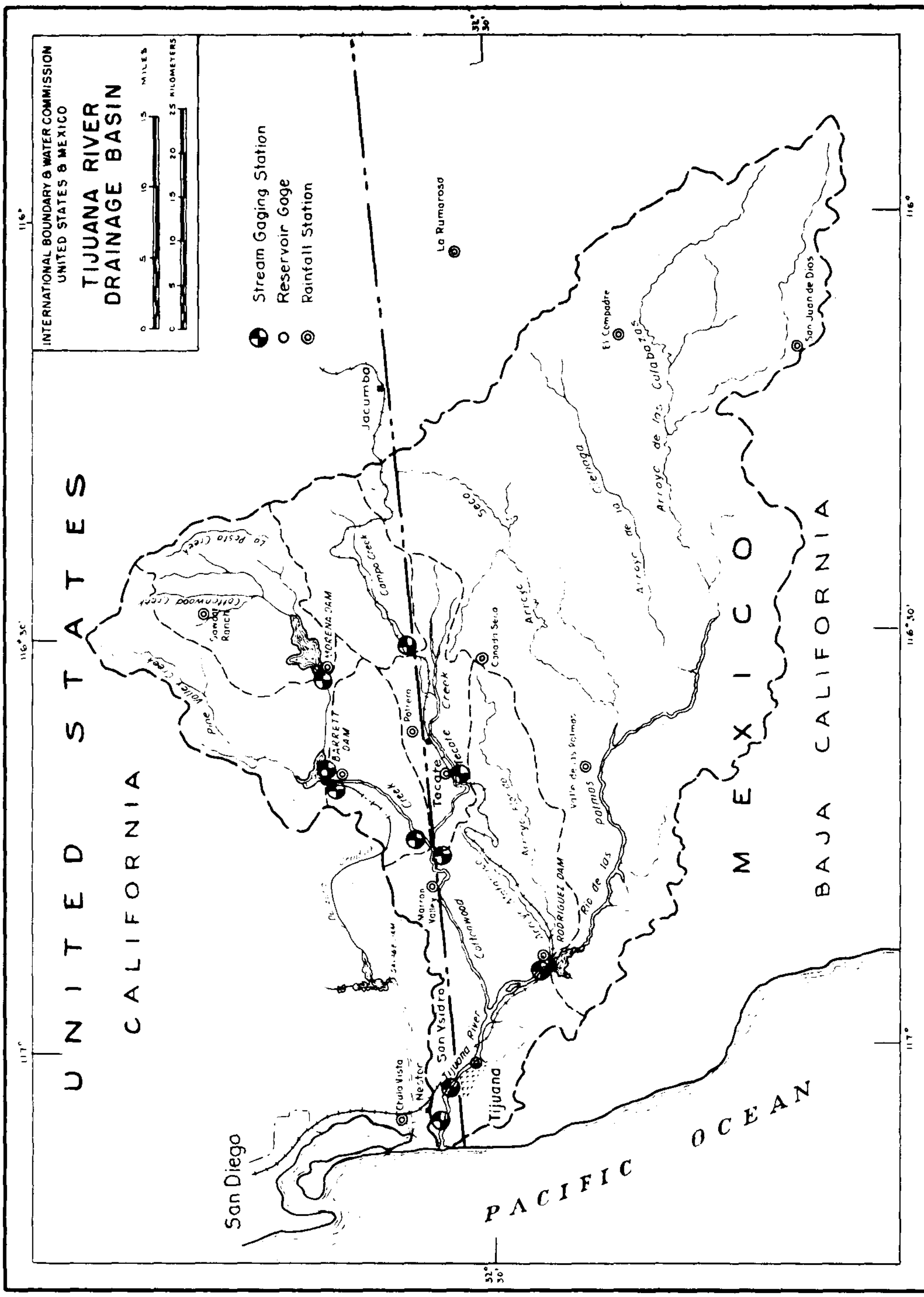
Alamo River

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	1	3.81		4,141	1.2	7.8	60	49	9.68	8.14	26.62	5.15	17.16	21.85	0.05
Feb.															
Mar.	1	4.49		4,822	1.6	7.9	62	50	10.53	9.45	32.54	5.48	20.38	25.91	.06
Apr.															
May	1	5.02		5,092	.50	7.7	63	52	10.73	10.19	35.10	5.07	21.98	29.58	.03
June															
July	1	5.29		5,464	.84	8.0	61	53	11.03	12.08	36.54	5.03	23.09	31.58	.08
Aug.															
Sept.	1	4.38		4,613	1.2	7.9	61	50	9.83	9.04	29.93	5.25	19.01	24.25	.06
Oct.															
Nov.	1	2.96		3,290	1.2	7.8	58	48	8.53	6.00	20.66	4.72	13.82	16.78	.12
Dec.															
Total	6														

New River

Month	No. of Samples	Dissolved Solids: Tons Per Acre-Foot	Dissolved Solids: Total Tons	ECx10^6 @25°C	Boron p.p.m.	pH	% Na **	% Cl ***	Mean Milligram Equivalents per Liter: Ca	Mg	Na	CO_3 + HCO_3	SO_4	Cl	NO_3
Jan.	1	5.23		6,143	1.4	7.4	67	70	11.18	8.47	42.63	5.12	13.46	43.99	0.02
Feb.															
Mar.	1	4.72		5,470	1.4	7.3	64	67	10.53	8.30	36.19	4.87	13.48	37.59	.14
Apr.															
May	1	6.11		6,531	.48	7.2	65	69	13.17	11.42	46.50	4.48	17.55	49.04	.14
June															
July	1	6.37		6,897	1.6	7.1	66	70	11.63	11.92	47.85	4.08	17.72	49.91	.16
Aug.															
Sept.	1	7.31		8,026	1.6	7.5	69	73	12.97	12.16	56.03	3.64	18.22	59.92	.03
Oct.															
Nov.	1	5.66		6,536	1.5	7.3	68	73	10.88	8.96	45.02	4.52	13.62	48.22	.08
Dec.															
Total	6														

** Percent of total cations *** Percent of total anions


INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
TIJUANA RIVER
DRAINAGE BASIN
MILES
KILOMETERS
Stream Gaging Station
Reservoir Gage
Raintall Station
UNITED STATES
CALIFORNIA
MEXICO
BAJA CALIFORNIA
PACIFIC OCEAN
San Diego
Chula Vista
Nestor
San Ysidro
Tijuana
Tijuana River
Cottonwood
Marron Valley
RODRIGUEZ DAM
Rio de las palmas
Valle de las Palmas
Tecate
Tecate Creek
Potrero
Campo Creek
Jacumba
La Rumarosa
El Compadre
San Juan de Dios
Arroyo de los Culabazas
Arroyo de la Cienaga
BARRETT DAM
MORENA DAM
Sandia Ranch
Cottonwood Creek
La Posta Creek
Pine Valley Creek
Canada Seca
116°
116° 30'
117°
32° 30'

COTTONWOOD CREEK ABOVE MORENA DAM, CALIFORNIA

DESCRIPTION: Staff gage located on east side of outlet tower immediately upstream from face of Morena Dam. The dam is located on Cottonwood Creek 1.8 miles upstream from the mouth of Hauser Creek, 8.5 miles upstream from Barrett Dam, and about 20 miles upstream from the international boundary. Zero of gage is 2,882.4 feet 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 available: April 1911 through December 1967.

REMARKS: Storage began in Morena Reservoir March 1910. Reservoir capacity and area ratings date from 1910 when Morena Dam was completed. Records for 1967 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 present crest of ungated spillway is 157.00 feet, gage datum. Reservoir capacity at spillway crest, 1948 survey, is 50,210 acre-feet. 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: Prior to 1937, maximum monthly inflow, 37,200 acre-feet, January 1916; minimum, no flow during parts of many years.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1937-1967		
		Average	Maximum	Minimum
January	79.0	493	3,520	4.8
February	37.9	1,181	16,700	8
March	49.7	1,822	13,220	19.3
April	113	1,174	11,490	3.3
May	41.5	413	3,550	0
June	3.1	214	1,660	0
July	3.5	152	1,010	0
August	19.8	108	1,260	0
September	17.4	75.2	1,070	0
October	2.7	87.8	1,270	0
November	40.6	161	1,380	0
December	92.5	534	3,590	4.4
Yearly	501	6,415	39,439	121

Note: For months when inflow to the reservoir was small and other quantities were large, discordant figures of inflow may appear. This arises primarily from the difficulty of computing inflow as the residual of several larger quantities, which are not susceptible to measurement with a precision necessary to produce a final answer within desirable limits of accuracy.

COTTONWOOD CREEK BELOW MORENA DAM, CALIFORNIA

DESCRIPTION: Two water-stage recorders, one on the upstream side of the southeast abutment of Morena Dam for measuring head on the spillway crest and one immediately below the dam with a rectangular control weir for measuring ordinary reservoir releases, and cableway located about 0.8 mile 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 December 1967.

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: Prior to 1937, maximum monthly discharge, 21,400 acre-feet, February 1916; minimum, zero during December 1936.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1937-1967		
		Average	Maximum	Minimum
January	2.0	140	1,700	1
February	1.8	381	4,260	1.5
March	2.0	263	1,490	1.7
April	2.0	974	12,950	1
May	2.0	266	3,040	1
June	1.7	365	7,360	0
July	1.7	207	2,340	.6
August	1.7	172	1,550	.6
September	1.7	338	5,880	0
October	1.4	101	529	0
November	1.1	136	1,260	0
December	3.2	377	5,350	1
Yearly	22.3	3,720	24,825	15.6

COTTONWOOD CREEK ABOVE BARRETT DAM, CALIFORNIA

DESCRIPTION: Staff gage located immediately upstream from face of dam on west side of outlet tower. Barrett Dam is located on Cottonwood Creek 8.5 miles downstream from Morena Dam, one mile downstream from the mouth of Pine Valley Creek and about 12 miles upstream from the international boundary. Zero of gage is 1,446.12 feet 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 December 1967. 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. Capacity of reservoir at top of flash gates on spillway (gage height 168.88 feet) is 44,755 acre-feet. Capacity at spillway crest (gage height 160.88 feet) is 37,950 acre-feet. Dead storage, 719 acre-feet below lowest outlet (gage height 58.88 feet) 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: Prior to 1937, maximum monthly discharge, 54,800 acre-feet, February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1937-1967		
		Average	Maximum	Minimum
January	245	607	3,430	5.2
February	228	1,658	26,790	7.6
March	337	2,856	18,860	14.1
April	689	1,970	21,630	10.2
May	248	597	5,130	0
June	53.8	248	1,730	0
July	2.9	162	1,010	0
August	.6	96.3	579	0
September	1.6	110	759	0
October	.2	68.7	645	.1
November	32.4	143	1,200	0
December	226	540	3,380	5.5
Yearly	2,064	9,056	59,387	129

Note: For months when inflow to the reservoir was small and other quantities were large, discordant figures of inflow may appear. This arises primarily from the difficulty of computing inflow as the residual of several larger quantities, which are not susceptible to measurement with a precision necessary to produce a final answer within desirable limits of accuracy.

DULZURA CONDUIT BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder 0.5 mile downstream from Barrett Dam on right bank of Dulzura Conduit 50 feet 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 at present location are good. Records available: January 1909 through December 1967.

REMARKS: Barrett Dam was completed in 1921. Prior to this date the intake of Dulzura Conduit was located 1.5 miles upstream. The conduit carries diversions from Barrett Reservoir on Cottonwood Creek westerly across the divide into Otay Reservoir for municipal use by the city of San Diego. Prior to September 30, 1958, station was located 8 miles 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 losses in the reach from the reservoir to the gaging station.

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16.2	18.4	32.9	0	0	0	0	0	0	0	0	0
2	16.2	18.2	33.4	0	0	0	0	0	0	0	0	0
3	16.0	18.0	32.8	0	0	0	0	0	0	0	0	0
4	16.0	18.0	32.9	0	0	0	0	0	0	0	0	0
5	16.0	18.0	32.6	0	0	0	0	0	0	0	0	3.2
6	15.8	18.0	33.5	0	0	0	0	0	0	0	0	5.1
7	15.8	18.4	35.2	0	0	0	0	0	0	0	0	5.1
8	15.7	18.7	33.4	0	0	0	0	0	0	0	0	5.2
9	15.7	18.7	33.1	0	0	0	0	0	0	0	0	5.2
10	15.7	18.7	33.0	0	0	0	0	0	0	0	0	5.0
11	15.5	18.5	32.0	0	0	0	0	0	0	0	0	8.4
12	15.5	18.5	31.5	0	0	0	0	0	0	0	0	11.4
13	15.3	18.4	28.5	0	0	0	0	0	0	0	0	15.7
14	15.3	18.2	7.2	0	0	0	0	0	0	0	0	19.5
15	15.3	20.8	37.6	0	0	0	0	0	0	0	0	18.9
16	15.3	22.9	32.3	0	0	0	0	0	0	0	0	18.2
17	15.1	22.7	27.8	0	0	0	0	0	0	0	0	17.8
18	15.1	22.5	20.4	0	0	0	0	0	0	0	0	17.6
19	15.1	22.3	14.8	0	0	0	0	0	0	0	0	10.2
20	15.1	22.1	11.1	0	0	0	0	0	0	0	0	6.6
21	15.0	24.4	8.5	0	0	0	0	0	0	0	0	18.5
22	13.8	27.1	6.9	0	0	0	0	0	0	0	0	18.2
23	.2	29.9	3.8	0	0	0	0	0	0	0	0	17.8
24	7.0	32.0	0	0	0	0	0	0	0	0	0	17.5
25	16.7	31.3	0	0	0	0	0	0	0	0	0	16.7
26	16.7	30.5	0	0	0	0	0	0	0	0	0	16.2
27	16.7	31.4	0	0	0	0	0	0	0	0	0	15.8
28	16.7	33.0	0	0	0	0	0	0	0	0	0	15.3
29	16.6		0	0	0	0	0	0	0	0	0	14.8
30	17.6		0	0	0	0	0	0	0	0	0	14.4
31	18.4		0		0		0	0		0		14.1
Sum	467.1	629.6	595.2	0	0	0	0	0	0	0	0	352.4

Month	Current Year 1967								Period 1937-1967		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			31	18.4	23	0.2	15.1	926	447	2,350	0
Feb.			28	33.0	† 3	18.0	22.5	1,249	461	2,130	0
Mar.			15	37.6	†24	0	19.2	1,181	599	2,330	0
Apr.				0		0	0	0	884	2,860	0
May				0		0	0	0	1,001	3,040	0
June				0		0	0	0	1,026	2,920	0
July				0		0	0	0	855	2,920	0
Aug				0		0	0	0	770	2,820	0
Sept.				0		0	0	0	534	2,320	0
Oct.				0		0	0	0	408	2,450	0
Nov.				0		0	0	0	563	2,760	0
Dec.			14	19.5	† 1	0	11.4	699	520	2,305	0
Yearly				37.6		0	5.6	4,055	8,068	27,170	0

Ø Mean daily † And other days

COTTONWOOD CREEK BELOW BARRETT DAM, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located about 2.5 miles downstream from Barrett Dam and 0.5 mile upstream from Rattlesnake Canyon for measuring Barrett Dam spills, and staff gage and control weir located immediately below the dam for measuring leakage. The elevation of the gage is about 1,000 feet (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 this Commission. The recorder is to be operated only when Barrett Reservoir is near or above spillway level. There have been no spillway discharges since May 1943. 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 December 1967. 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: Prior to 1937, maximum monthly discharge 38,400 acre-feet, February 1927; minimum, no flow during several months of various years.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1937-1967		
		Average	Maximum	Minimum
January	0.3	19.4	590	0
February	.4	33.2	990	0
March	.3	893	13,390	0
April	.2	1,311	33,400	0
May	.1	297	7,520	0
June	.1	41.8	890	0
July	0	2.3	21	0
August	0	2.0	21	0
September	0	1.6	21	0
October	0	1.5	21	0
November	0	1.1	15	0
December	0	1.7	21	0
Yearly	1.4	2,606	50,364	0

COTTONWOOD CREEK ABOVE TECATE CREEK NEAR DULZURA, CALIFORNIA

DESCRIPTION: Water-stage recorder and cableway located 1.6 miles upstream from the international land boundary between the United States and Mexico, 0.8 mile upstream from the confluence with Tecate Creek, and 5.1 miles south of Dulzura, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the cableway which is located 700 feet downstream from the gage. Zero of gage is 569.40 feet 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 generally made twice each month. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through December 1967.

REMARKS: Flow is largely controlled by Barrett and Morena Reservoirs, 10 and 18 miles, respectively, upstream from this station. During 1967, there were no releases or spills to the natural channel of Cottonwood Creek at Barrett Dam, the lowermost dam in Cottonwood Creek Basin.

EXTREMES: Maximum discharge 4,340 second-feet February 7, 1937 (gage height 9.65 feet), from rating curve extended above 1,500 second-feet by logarithmic plotting. Minimum discharge, no flow during part of each year.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.50	2.0	0.10	0.60	0.30	0	0	0	0	0	0	0
2	.50	1.7	.10	.50	.20	0	0	0	0	0	0	0
3	.40	1.5	.10	.30	.20	0	0	0	0	0	0	0
4	.40	1.3	.40	.30	.20	0	0	0	0	0	0	0
5	.40	1.2	.40	.30	.20	0	0	0	0	0	0	0
6	.40	.90	.30	.20	.20	0	0	0	0	0	0	0
7	.30	.80	.20	.20	.10	0	0	0	0	0	0	0
8	.30	.60	.20	.20	.10	0	0	0	0	0	0	0
9	.30	.60	.20	.20	.10	0	0	0	0	0	0	0
10	.30	.60	.20	.20	.10	0	0	0	0	0	0	0
11	.30	.50	.30	3.0	.10	0	0	0	0	0	0	0
12	.30	.40	.30	3.5	.10	0	0	0	0	0	0	0
13	.30	.40	.40	1.0	0	0	0	0	0	0	0	0
14	.30	.40	2.0	.50	0	0	0	0	0	0	0	0
15	.30	.40	.80	.30	0	0	0	0	0	0	0	0
16	.30	.30	.40	.20	0	0	0	0	0	0	0	.10
17	.30	.30	.30	.20	0	0	0	0	0	0	0	.60
18	.20	.20	.30	.20	0	0	0	0	0	0	0	8.6
19	.20	.20	.30	.80	0	0	0	0	0	0	0	44
20	.30	.20	.20	.80	0	0	0	0	0	0	0	18
21	.30	.20	.20	.60	0	0	0	0	0	0	0	10
22	1.2	.20	.20	1.7	0	0	0	0	0	0	0	6.4
23	11	.20	.20	1.1	0	0	0	0	0	0	0	4.7
24	3.4	.20	.20	1.0	0	0	0	0	0	0	0	3.9
25	7.1	.20	.20	.90	0	0	0	0	0	0	0	3.2
26	4.9	.20	.20	.60	0	0	0	0	0	0	1.6	2.7
27	3.7	.20	.20	.50	0	0	0	0	0	0	.30	2.3
28	3.2	.20	.20	.50	0	0	0	0	0	0	0	2.2
29	2.5		.40	.50	0	0	0	0	0	0	0	2.0
30	2.3		.30	.50	0	0	0	0	0	0	0	1.7
31	2.2		.30		0		0	0		0		1.6
Sum	48.40	16.10	10.10	21.40	1.90	0	0	0	0	0	1.90	112.00

Month	Current Year 1967 Extreme Gage Feet High	Extreme Gage Feet Low	Ø Extreme Second Feet High Day	High	Low Day	Low	Average Second Feet	Total Acre Feet	Period 1937-1967 Acre Feet Average	Maximum	Minimum
Jan.			23	11	†18	0.20	1.56	96.0	212	1,190	0
Feb.			1	2.0	†18	.20	.58	31.9	645	9,940	0
Mar.			14	2.0	† 1	.10	.33	20.0	1,864	20,880	0
Apr.			12	3.5	† 6	.20	.71	42.4	1,813	40,240	0
May			1	.30	†13	0	.06	3.8	421	10,040	0
June				0		0	0	0	80.9	1,590	0
July				0		0	0	0	9.0	206	0
Aug				0		0	0	0	.4	7.7	0
Sept.				0		0	0	0	2.3	72	0
Oct.				0		0	0	0	4.6	101	0
Nov.			26	1.6	† 1	0	.06	3.8	25.6	440	0
Dec.			19	44	† 1	0	3.61	222	163	1,316	0
Yearly				44		0	0.58	420	5,241	66,700	0

Ø Mean daily † And other days

CAMPO CREEK NEAR CAMPO, CALIFORNIA

DESCRIPTION: Water-stage recorder and broad-crested weir on left bank, 0.5 mile upstream from the international land boundary between the United States and Mexico, just upstream from bridge on California State Highway 94, 3.5 miles southwest of Campo, California. Low water discharge measurements are made by wading at the gage; high water measurements are made from the bridge. Zero of gage is 2,178.92 feet above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on current meter measurements and observation of no flow. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1936 through December 1967.

REMARKS: Campo Creek originates in the United States and flows southwestward into Mexico where it joins Tecate Creek. The flow at this station is partially regulated by a small conservation reservoir a quarter of a mile upstream, completed in August 1956.

EXTREMES: Maximum instantaneous discharge during 1967, 0.60 second-foot on November 19 (gage height 1.21 feet); no flow most of the year including maximum day, which was less than 0.05 second-foot. Maximum discharge 880 second-feet, February 6, 1937 (gage height 4.80 feet, present datum), from rating curve extended above 110 second-feet on basis of velocity-depth relation and cross-section area at the control. Minimum discharge, no flow during part of most years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0.10	0.10	0	0	0	0	0	0	0
2	0	0	0	.10	.10	0	0	0	0	0	0	0
3	0	0	0	.10	.20	0	0	0	0	0	0	0
4	0	0	0	.10	.20	0	0	0	0	0	0	0
5	0	0	0	.10	.20	0	0	0	0	0	0	0
6	0	0	0	.10	.20	0	0	0	0	0	0	0
7	0	0	0	.10	.20	0	0	0	0	0	0	0
8	0	0	0	.10	.20	0	0	0	0	0	0	0
9	0	0	0	.10	.20	0	0	0	0	0	0	0
10	0	0	0	.10	.20	0	0	0	0	0	0	0
11	0	0	.10	.10	.20	0	0	0	0	0	0	0
12	0	0	.10	.10	.20	0	0	0	0	0	0	0
13	0	0	.10	.10	.10	0	0	0	0	0	0	0
14	0	0	.10	0	.10	0	0	0	0	0	0	0
15	0	0	.10	0	0	0	0	0	0	0	0	0
16	0	0	.10	0	0	0	0	0	0	0	0	0
17	0	0	.10	0	0	0	0	0	0	0	0	0
18	0	0	.10	0	0	0	0	0	0	0	0	0
19	0	0	.10	.10	0	0	0	0	0	0	0	0
20	0	0	.10	.10	0	0	0	0	0	0	0	0
21	0	0	.10	.10	0	0	0	0	0	0	0	0
22	0	0	.10	.10	0	0	0	0	0	0	0	0
23	0	0	.10	.10	0	0	0	0	0	0	0	0
24	0	0	.10	.10	0	0	0	0	0	0	0	0
25	0	0	.10	.10	0	0	0	0	0	0	0	0
26	0	0	.10	.10	0	0	0	0	0	0	0	0
27	0	0	.10	.10	0	0	0	0	0	0	0	0
28	0	0	.10	.10	0	0	0	0	0	0	0	0
29	0		.10	.20	0	0	0	0	0	0	0	0
30	0		.10	.10	0	0	0	0	0	0	0	0
31	0		.10		0		0	0		0		0
Sum	0	0	2.10	2.60	2.40	0	0	0	0	0	0	0

Month	Current Year 1967								Period 1937-1967		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.				0		0	0	0	151	906	0
Feb.				0		0	0	0	266	1,730	0
Mar.			†11	.10	† 1	0	.07	4.2	380	2,360	0
Apr.			29	.20	†14	0	.09	5.2	267	3,250	0
May			† 3	.20	†15	0	.08	4.8	122	1,540	0
June				0		0	0	0	47.4	719	0
July				0		0	0	0	19.1	361	0
Aug				0		0	0	0	13.8	321	0
Sept.				0		0	0	0	13.1	264	0
Oct.				0		0	0	0	23.4	543	0
Nov.				0		0	0	0	43.4	542	0
Dec.				0		0	0	0	120	808	0
Yearly				0.20		0	0.02	14.2	1,466	11,141	0

Ø Mean daily † And other days

COTTONWOOD CREEK NEAR INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder and cableway, 0.6 mile upstream from the international land boundary between the United States and Mexico, 0.5 mile downstream from the confluence of Cottonwood Creek and Tecate Creek, and 5.5 miles south of Dulzura, California. Low water discharge measurements are made by wading at the gage. Zero of gage is 542.42 feet 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 generally made twice each month. Records obtained and furnished by the U. S. Geological Survey. 1967 records good. Records available: October 1936 through December 1967.

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

EXTREMES: Maximum discharge, 4,700 second-feet, February 7, 1937 (gage height 8.50 feet) from rating curve extended above 300 second-feet on basis of velocity, mean-depth and area computations. Minimum discharge, no flow for part of most years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	3.8	0.70	0.40	0.90	0.20	0.10	0.10	0	0	0	0.10
2	1.5	3.6	.60	.40	.90	.20	.10	.10	0	0	0	.10
3	1.4	3.4	.60	.30	.90	.20	.10	.10	0	0	0	.10
4	1.4	3.2	.70	.30	.90	.20	.10	.10	0	0	0	.20
5	1.5	3.2	.60	.20	.90	.20	.10	.10	0	0	0	.20
6	1.4	2.7	.60	.20	.80	.20	.10	.10	0	0	0	.20
7	1.1	2.5	.60	.20	.70	.20	.10	.10	0	0	0	.20
8	.90	2.2	.60	.10	.70	.20	.10	.10	0	0	0	.20
9	1.0	2.1	.60	.10	.60	.20	.10	.10	0	0	0	.20
10	1.0	1.9	.60	.10	.60	.20	.10	.10	0	0	0	.20
11	1.1	1.7	.70	1.7	.60	.20	.10	.10	0	0	0	.20
12	1.3	1.7	.60	6.8	.50	.20	.10	.10	0	0	0	.20
13	1.3	1.5	.60	3.4	.50	.30	.10	.10	0	0	0	.20
14	1.2	1.4	1.8	1.5	.40	.30	.10	0	0	0	0	.20
15	1.2	1.3	.90	1.0	.30	.30	.10	0	0	0	0	.20
16	1.3	1.2	.60	.70	.20	.20	.10	0	0	0	0	.20
17	1.2	1.1	.40	.50	.20	.20	.10	0	0	0	0	.20
18	1.0	1.0	.40	.50	.20	.20	.10	0	0	0	0	4.4
19	1.0	1.0	.40	1.7	.20	.20	.10	0	0	0	.10	86
20	1.2	1.0	.40	2.1	.20	.20	.10	0	0	0	.10	32
21	1.4	.80	.40	1.4	.20	.20	.10	0	0	0	.10	15
22	3.4	.80	.40	2.2	.20	.20	.10	0	0	0	.20	8.2
23	31	.80	.30	2.1	.20	.10	.10	0	0	0	.20	5.3
24	7.4	.80	.30	1.5	.20	.10	.10	0	0	0	.10	4.5
25	12	.70	.30	1.4	.20	.10	.10	0	0	0	.10	3.8
26	7.8	.70	.30	1.1	.20	.10	.10	0	0	0	.20	3.0
27	6.2	.70	.30	.90	.20	.10	.10	0	0	0	.10	2.7
28	5.1	.70	.30	.90	.20	.10	.10	0	0	0	.10	2.4
29	4.5		.40	.90	.20	.10	.10	0	0	0	.10	2.1
30	4.1		.40	.90	.20	.10	.10	0	0	0	.10	1.8
31	4.1		.30		.20		.10	0		0		1.5
Sum	111.50	47.50	16.70	35.50	13.40	5.50	3.10	1.30	0	0	1.50	175.80

Month	Current Year 1967								Period 1937-1967		
	Extreme Gage Feet		Ø Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
	High	Low	High Day	High	Low Day	Low			Average	Maximum	Minimum
Jan.			23	31	8	0.90	3.60	221	456	2,750	0
Feb.			1	3.8	†25	.70	1.70	94.2	1,168	13,680	0
Mar.			14	1.8	†23	.30	.54	33.1	2,955	27,140	0
Apr.			12	6.8	† 8	.10	1.18	70.4	2,473	51,060	0
May			† 1	.90	†16	.20	.43	26.6	625	14,110	0
June			†13	.30	†23	.10	.18	10.9	127	2,630	0
July			† 1	.10	† 1	.10	.10	6.1	20.0	312	0
Aug			† 1	.10	†14	0	.04	2.6	6.9	171	0
Sept.				0		0	0	0	9.8	152	0
Oct.				0		0	0	0	25.6	705	0
Nov.			†22	.20	† 1	0	.05	3.0	65.3	839	0
Dec.			19	86	† 1	.10	5.67	349	400	3,330	0
Yearly				86		0	1.13	817	8,332	97,900	0

Ø Mean daily † And other days

INFLOWS TO RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Rodríguez Dam is located in Mexico on Río de las Palmas, the principal tributary to the Tijuana River, about 5.5 miles upstream from its confluence with Cottonwood Creek, 11 miles upstream from the point where the Tijuana River crosses the international boundary between the United States and Mexico, and 10 miles 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 Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano of Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Service for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through December 1967. Storage began in Rodríguez Reservoir on September 22, 1936.

REMARKS: Records of runoff represent all water reaching Rodríguez Reservoir including rainfall on the reservoir water surface. Area-capacity-elevation rating for reservoir used in the computations is dated 1927 when the reservoir area was initially surveyed. Elevation of crest of spillway 380.08 feet above mean sea level; at top of spillway gates 410.10 feet above mean sea level. Reservoir capacity at spillway crest 76,210 acre-feet; at top of spillway gates 111,070 acre-feet.

EXTREMES: Maximum monthly inflow, 77,320 acre-feet, April 1941; minimum, no flow during part of most years.

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1938-1967		
		Average	Maximum	Minimum
January	346	940	6,569	0
February	170	2,502	41,295	5.8
March	30.0	6,675	68,321	4.2
April	52.0	3,498	77,790	0
May	.2	435	9,962	0
June	.2	80.8	891	0
July	31.9	83.5	326	0
August	109	55.6	770	0
September	31.9	52.6	466	0
October	88.4	66.6	344	0
November	146	173	1,940	0
December	300	1,044	15,686	12.8
Yearly	1,305	15,607	177,668	254

DIVERSIONS FROM RODRIGUEZ RESERVOIR, BAJA CALIFORNIA

DESCRIPTION: Sparling flow meter located immediately below the dam in the pipe line which carries water released from Rodríguez Reservoir to the North and South Canals.

RECORDS: Direct recording by Sparling flow meter. Records obtained by the Ministry of Hydraulic Resources through May 1961; from June 1961 through March 1966 by the Junta de Agua Potable y Alcantarillado del Distrito Urbano of Tijuana, Baja California, and from April 1966 by the State of Baja California Commission of Public Service for Tijuana. Records furnished by the Mexican Section of the Commission. Records available: May 1937 through December 1967.

REMARKS: Since the dam was completed in 1937, water has been diverted directly into the aqueduct for domestic use for Tijuana, Baja California and into the North and South Canals for irrigation in Mexico. The North Canal delivers water to lands in the Tijuana Valley north of the Río de las Palmas and the South Canal delivers water to lands in the valley south of the Río de las Palmas and the Tijuana River. During 1967, no water was released for irrigation of farm lands.

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

Monthly Discharge in Acre-Feet

Month	Current Year 1967	Period 1938-1967		
		Average	Maximum	Minimum
January	148	261	782	2.3
February	156	290	1,132	1.9
March	249	353	1,223	0
April	269	508	1,602	0
May	344	700	1,676	1.8
June	297	813	1,857	1.9
July	390	861	1,963	1.9
August	252	736	1,859	0
September	132	592	1,420	1.9
October	150	509	1,187	1.9
November	142	391	1,037	2.3
December	149	345	981	0
Yearly	2,677	6,358	15,317	59.6

TIJUANA RIVER AT INTERNATIONAL BOUNDARY

DESCRIPTION: Water-stage recorder on right bank about 550 feet downstream from the international boundary and about 0.8 mile west of the international gate at San Ysidro, California. Zero of gage is at mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 12 current meter measurements and observations of no flow and a continuous record of gage heights. Records obtained and furnished by the United States Section of the Commission. Records available: May 1947 through December 1967.

EXTREMES: Since May 1947: Maximum instantaneous discharge, 2,570 second-feet, March 15, 1952; minimum discharge, no flow during part or all of each year since 1951.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	1.1
2	0	0	0	0	0	0	0	0	0	0	0	.2
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	23.5	0	0	0	0	0	0	0	0
12	0	0	0	4.3	0	0	0	0	0	0	0	0
13	0	0	0	.2	0	0	0	0	0	0	0	0
14	0	0	.1	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	43.0
19	0	0	0	.1	0	0	0	0	0	0	0	133
20	0	0	0	.1	0	0	0	0	0	0	2.9	27.9
21	0	0	0	0	0	0	0	0	0	0	7.9	3.1
22	13.1	0	0	.3	0	0	0	0	0	0	13.2	.4
23	61.3	0	0	0	0	0	0	0	0	0	.9	0
24	.9	0	0	0	0	0	0	0	0	0	0	0
25	6.3	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	20.9	0
27	0	0	0	0	0	0	0	0	0	0	10.5	0
28	0	0	0	0	0	0	0	0	0	0	2.8	0
29	0		0	0	0	0	0	0	0	0	.5	0
30	0		0	0	0	0	0	0	0	0	.7	0
31	0		0		0		0	0		0		0
Sum	81.6	0	0.1	28.5	0	0	0	0	0	0	60.3	208.7

Month	Current Year 1967 Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1947-1967 Acre Feet		
			High		Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.	48.47	46.26	23	270	† 1	0	2.6	162	467	4,603	0
Feb.				0		0	0	0	170	1,496	0
Mar.	46.57	46.26	14	2.2	† 1	0	0	.2	911	13,309	0
Apr.	47.73	46.40	11	91.8	† 1	0	1.0	56.5	296	2,926	0
May				0		0	0	0	48.6	312	0
June				0		0	0	0	31.9	309	0
July				0		0	0	0	25.1	239	0
Aug				0		0	0	0	21.8	193	0
Sept.				0		0	0	0	28.3	216	0
Oct.				0		0	0	0	41.9	305	0
Nov.	47.84	46.35	21	107	† 1	0	2.0	120	123	1,084	0
Dec.	48.47	46.35	† 18	232	† 2	0	6.7	414	330	2,725	0
Yearly	48.47	46.26		270		0	1.0	752.7	2,494.6	19,882	0

† And other days

TIJUANA RIVER NEAR NESTOR, CALIFORNIA

DESCRIPTION: Water-stage recorder on county road bridge 4.1 miles downstream from the international land boundary between the United States and Mexico, 2.9 miles upstream from mouth of the river, and 1.7 miles south of Nestor, California. Zero of gage is 15.14 feet above mean sea level, U. S. C. & G. S. datum. From April 10, 1953 to August 5, 1958, station was located 2 miles upstream at different datum.

RECORDS: Based on current meter measurements or observation of no flow generally made twice a month. Records obtained and furnished by the U. S. Geological Survey. Records available: October 1914 through September 1915, and October 1922 through December 1967. (October 1922 through May 1936 are from city of San Diego, California).

REMARKS: The flow at this station is partially controlled by Morena and Barrett Reservoirs on Cottonwood Creek in the United States and by Rodríguez Reservoir on Río de las Palmas in Mexico. Some diversions for irrigation are normally made in Mexico whenever surface runoff occurs in the river or in its two principal tributaries.

EXTREMES: Since October 1, 1936: Maximum discharge, 17,700 second-feet, February 7, 1937 (gage height 8.20 feet), obtained from rating curve extended above 2,000 second-feet on basis of velocity-depth relationship, and cross section after peak of the flood. Minimum discharge, no flow during parts of most years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	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	1.6	0	0	0	0	0	0	0	0
12	0	0	0	1.6	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	15
19	0	0	0	0	0	0	0	0	0	0	0	39
20	0	0	0	0	0	0	0	0	0	0	0	1.5
21	0	0	0	0	0	0	0	0	0	0	.40	.10
22	0	0	0	0	0	0	0	0	0	0	22	0
23	4.1	0	0	0	0	0	0	0	0	0	3.1	0
24	0	0	0	0	0	0	0	0	0	[illegible]	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	12	0
27	0	0	0	0	0	0	0	0	0	0	7.3	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
30	0		0	0	0	0	0	0	0	0	0	0
31	0		0		0		0	0		0		0
Sum	4.1	0	0	3.2	0	0	0	0	0	0	44.80	55.60

Month	Current Year 1967								Period 1937-1967		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			23	Ø 4.1	† 1	0	0.13	8.1	829	4,070	0
Feb.				0		0	0	0	4,495	66,920	0
Mar.				0		0	0	0	7,960	107,000	0
Apr.			†11	Ø 1.6	† 1	0	.11	6.3	6,840	181,900	0
May				0		0	0	0	764	18,340	0
June				0		0	0	0	129	3,060	0
July				0		0	0	0	25.6	523	0
Aug				0		0	0	0	18.1	242	0
Sept.				0		0	0	0	26.7	234	0
Oct.				0		0	0	0	91.3	1,340	0
Nov.			22	Ø 22	† 1	0	1.49	88.9	155	1,490	0
Dec.	3.61		18	150	† 1	0	1.79	110	838	7,930	0
Yearly				150		0	0.30	213	22,172	332,749	0

Ø Mean daily † And other days

STORED WATER IN RESERVOIRS, TIJUANA RIVER BASIN

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

Records for Morena and Barrett Reservoirs are obtained and furnished by the city of San Diego, the U. S. Geological Survey, and the U. S. Weather Bureau. Records for Rodríguez Reservoir obtained and furnished by the State Department of Public Works and Services for Tijuana, Baja California.

In Acre-Feet

Month	Morena Reservoir, California (Capacity 50,210)		Barrett Reservoir, California (Capacity 44,760)		Rodríguez Reservoir, Baja California (Capacity 111,880)		Total in Tijuana River Basin Reservoirs (Capacity 206,850)	
	1967	Average 1937-1967	1967	Average 1937-1967	1967	Average 1937-1967	1967	Average 1937-1967
Jan.	1,415	17,893	2,758	12,552	4,126	36,210	8,299	66,655
Feb.	1,426	18,589	1,717	13,996	4,041	36,888	7,184	69,473
Mar.	1,447	19,990	858	15,525	3,675	40,308	5,980	75,823
Apr.	1,534	19,968	1,532	16,171	3,330	40,301	6,396	76,440
May	1,512	19,793	1,745	15,472	2,794	40,246	6,051	75,511
June	1,447	19,250	1,759	14,707	2,356	39,041	5,562	72,998
July	1,394	18,743	1,705	13,887	1,873	37,764	4,972	70,394
Aug.	1,341	18,274	1,649	13,085	1,619	36,614	4,609	67,973
Sept.	1,300	17,688	1,612	12,766	1,440	35,636	4,352	66,090
Oct.	1,249	17,434	1,573	12,368	1,274	34,811	4,096	64,613
Nov.	1,269	17,312	1,591	11,958	1,218	34,250	4,078	63,520
Dec.	1,341	17,368	1,105	12,280	1,307	34,634	3,753	64,282
Avg.	1,390	18,525	1,634	13,731	2,421	37,225	5,445	69,481
Max.	1,534	# 61,670	2,758	θ 45,920	4,126	109,608	8,299	213,600
Min.	1,249	10	858	106	1,218	0	3,753	1,264

March 31, 1941 - Prior to removal of spillway gates
θ April 30, 1937 - Sandbags were placed on crest of spillway

RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

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

In United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Potrero, California	
	1967	Average 1906-1967	1967	Average 1907-1967	1967	Average 1951-1967	1967	Average 1914-1967
Jan.	1.91	3.82	2.39	3.35	2.45	2.61	2.36	3.41
Feb.	0	3.90	0	3.44	0	1.89	T	3.78
Mar.	1.43	3.43	1.21	2.91	1.43	2.18	1.34	2.95
Apr.	3.74	1.85	4.19	1.65	3.56	1.58	4.39	1.91
May	.20	.65	.38	.58	.14	.45	.23	.67
June	.15	.13	.11	.06	.13	.05	.18	.09
July	.21	.38	.36	.09	.14	.02	.51	.20
Aug.	1.21	.53	.07	.20	0	.14	.58	.19
Sept.	.52	.35	.20	.26	0	.23	.25	.26
Oct.	0	.90	0	.71	0	.32	0	.73
Nov.	3.53	1.56	3.73	1.33	4.11	1.67	3.73	1.47
Dec.	4.72	3.37	4.93	2.98	3.75	2.40	5.07	3.28
Yearly	17.62	20.87	17.57	17.56	15.71	13.54	18.64	18.94

Month	Sawday Ranch, California		Campo, California		Chula Vista, California			
	1967	Average 1950-1967	1967	Average 1900-1967	1967	Average 1930-1967		
Jan.	1.91	2.98	1.42	3.02	1.67	1.84		
Feb.	0	2.22	T	3.39	T	1.77		
Mar.	1.26	2.74	1.03	2.77	.46	1.44		
Apr.	4.32	1.98	3.54	1.54	3.22	.92		
May	0	.47	.48	.55	.04	.25		
June	.17	.05	.06	.07	.09	.05		
July	.29	.50	.34	.53	.06	.01		
Aug.	1.23	.82	.49	.50	T	.08		
Sept.	.59	.42	.82	.34	.05	.18		
Oct.	0	.40	0	.64	0	.42		
Nov.	3.65	1.88	3.65	1.37	3.66	1.07		
Dec.	5.16	2.45	4.23	2.64	2.09	1.80		
Yearly	18.58	16.91	16.06	17.36	11.34	9.83		

In Mexico

Month	La Rumorosa, Baja California		Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California	
	1967	Average 1946-1967	1967	Av. 1946-59 & 1961-1967	1967	Av. 1948-59 & 1961-1967	1967	Average 1938-1967
Jan.	.87	.75	.63	2.24	1.77	1.81	3.15	1.50
Feb.	0	.35	0	1.14	0	1.14	T	1.22
Mar.	.04	.51	1.34	1.77	1.18	1.10	.79	1.34
Apr.	T	.39	4.65	1.26	2.09	.75	1.81	.83
May	.39	.08	.08	.31	.04	.24	T	.12
June	0	.04	.04	.08	.04	.04	T	0
July	0	.20	.31	.08	.08	0	.08	0
Aug.	.39	.71	0	.16	0	.04	T	.08
Sept.	1.97	.28	.28	.12	0	.16	T	.24
Oct.	0	.35	0	.31	0	.28	T	.31
Nov.	1.61	.31	4.72	1.26	3.70	1.14	3.66	.91
Dec.	1.97	.75	4.21	2.17	2.09	1.38	2.80	1.73
Yearly	7.24	4.72	16.26	11.54	10.98	8.78	12.28	8.19

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RAINFALL ON THE TIJUANA RIVER WATERSHED IN INCHES

In Mexico

Month	Valle de las Palmas, Baja California		El Pinal, Baja California		San Juan de Dios, Baja California			
	1967	Average 1948-1967	1967	Average 1964-1967	1967	Average 1956-1967		
Jan.	1.34	1.61	1.73	1.26	1.10	1.97		
Feb.	0	.94	0	1.57	0	1.85		
Mar.	.35	1.10	1.46	1.61	.71	1.65		
Apr.	1.57	.67	3.11	3.27	2.28	1.61		
May	0	.24	.20	.08	.12	.31		
June	0	0	0	0	0	.24		
July	0	.04	1.73	.83	1.50	.83		
Aug.	0	.04	1.14	1.14	1.18	.75		
Sept.	0	.16	2.80	.83	1.38	.51		
Oct.	0	.20	0	.16	0	.59		
Nov.	.83	.79	2.52	2.52	2.44	1.42		
Dec.	1.89	1.06	5.20	5.31	5.43	2.05		
Yearly	5.98	6.93	19.88	19.88	16.26	16.61		

LOCATION OF RAINFALL STATIONS

In United States

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
Barrett Dam, California	32° 41'	116° 40'	1,750	1907	City of San Diego
Campo, California	32° 37'	116° 28'	2,630	1877	Archie C. Leach
Chula Vista, California	32° 36'	117° 06'	9	1930	Western Salt Company
Marron Valley, California	32° 34'	116° 46'	550	1951	Fred Mellor
Morena Dam, California	32° 41'	116° 32'	3,010	1906	City of San Diego
Potrero, California	32° 37'	116° 37'	2,390	1914	L. W. Whitehouse
Sawday Ranch, California	32° 45'	116° 29'	3,200	1950	William Tulloch

In Mexico

NAME OF STATION	LATITUDE	LONGITUDE	δ ELEV. (FT.)	RECORD BEGAN	OBSERVER
El Pinal, Baja California	ᵘ 32° 12'	ᵘ116° 17'	ᵘ 4,429	1964	Hydraulic Resources
La Rumorosa, Baja California	32° 33'	116° 03'	3,937	1946	Hydraulic Resources
Rodríguez Dam, Baja California	32° 26'	116° 55'	459	1938	Hydraulic Resources
San Juan de Dios, Baja California	32° 08'	116° 10'	ᵘ 3,280	1956	Hydraulic Resources
Tecate, Baja California	32° 32'	116° 39'	ᵘ 1,690	1946	Hydraulic Resources
Tijuana, Baja California	32° 31'	117° 02'	180	1948	Hydraulic Resources
Valle de las Palmas, Baja California	32° 23'	116° 40'	148	1948	Hydraulic Resources

δ Elevation above mean sea level ᵘ Estimated from topographic maps

EVAPORATION IN THE TIJUANA RIVER BASIN
IN INCHES

Tabulated below are records of evaporation observed at four stations in California and at four 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 Hydraulic Resources. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 81 in this bulletin.

Types of pans used:

1. Barrett Reservoir: January 1921 through September 1926, square 3-foot by 3-foot by 18-inch deep floating pan. October 1926 through 1967, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

2. Chula Vista: September 1918 through 1967, U. S. Weather Bureau 4-foot diameter pan, 10 inches deep, set on 2-inch by 4-inch timber grill.

3. Marron Valley: February 1951 to April 30, 1956, 2-foot diameter screened pan, 36 inches deep with automatic level attachment. From April 30, 1956 through April 29, 1963, same type of pan 22.5 inches in diameter. From April 30, 1963 to date, 2-foot diameter screened pan, same type.

4. Morena Reservoir: October 1915 through December 1921, square 3-foot by 3-foot by 18-inch deep floating pan. January 1922 through August 1926 records are the average of evaporation in a square 3-foot by 3-foot by 18-inch deep floating pan and a land pan of the same dimensions. September 1926 through 1967, square 3-foot by 3-foot by 18-inch deep land pan set 15 inches in ground.

5. All stations in Mexico: U. S. Weather Bureau 4-foot diameter pan.

In United States

Month	Morena Dam, California		Barrett Dam, California		Marron Valley, California		Chula Vista, California	
	1967	Average 1916-67	1967	Average 1921-67	1967	Average 1951-67	1967	Average 1919-67
Jan.	2.44	2.29	1.92	1.88	2.45	2.71	2.80	2.81
Feb.	2.53	2.35	2.60	2.24	3.26	3.28	3.50	3.33
Mar.	2.67	3.64	2.92	3.61	3.41	4.02	5.10	4.99
Apr.	2.33	4.90	2.89	4.89	4.16	5.43	5.71	5.86
May	5.97	6.92	5.84	7.04	5.90	6.79	7.23	6.88
June	6.54	8.88	6.15	8.61	6.77	8.14	6.29	6.99
July	6.62	10.37	8.75	10.31	8.77	9.80	7.44	7.63
Aug.	7.20	9.65	8.82	9.67	8.91	9.34	7.30	7.30
Sept.	5.08	7.82	5.52	7.89	7.04	8.10	6.28	6.07
Oct.	5.33	5.53	6.45	5.60	7.35	6.66	5.62	4.88
Nov.	2.08	3.64	2.56	3.51	3.46	4.47	3.63	3.62
Dec.	2.03	2.61	1.40	2.17	2.68	3.14	2.98	2.75
Yearly	50.82	68.60	55.82	67.42	64.16	71.93	63.88	63.11

In Mexico

Month	Tecate, Baja California		Tijuana, Baja California		Rodríguez Dam, Baja California		Valle de las Palmas, Baja California	
	1967	Average 1961-67	1967	Av. 1952-59 1961-67	1967	Av. 1939-42 1946-67	1967	Average 1952-67
Jan.	3.54	3.27	2.72	2.83	3.90	3.82	4.84	3.70
Feb.	4.53	3.43	3.54	3.35	4.13	3.94	6.10	3.74
Mar.	θ	4.02	3.78	4.02	3.94	5.04	5.24	5.20
Apr.	3.43	5.31	3.03	4.69	3.86	5.79	3.98	6.73
May	6.81	6.46	6.14	5.87	6.93	7.36	θ	7.56
June	5.83	6.06	5.79	5.71	6.65	8.07	6.85	9.49
July	8.11	9.21	7.40	6.69	8.54	9.09	11.18	11.30
Aug.	7.99	8.86	7.64	6.97	8.07	8.35	11.46	10.63
Sept.	6.69	6.89	6.30	5.98	6.06	7.09	7.24	8.78
Oct.	7.83	6.65	6.02	4.69	7.56	6.06	7.76	6.57
Nov.	3.62	3.58	2.17	3.27	2.91	5.12	5.67	4.61
Dec.	4.69	3.62	θ	2.95	2.83	4.29	5.28	4.21
Yearly		69.57		55.51	65.39	74.49		81.10

θ Record incomplete

TEMPERATURE IN THE TIJUANA RIVER BASIN IN DEGREES FAHRENHEIT

The maximum, minimum, and monthly mean temperature observations for United States stations are from daily readings of thermometers generally exposed in a shelter located a few feet above sod-covered ground. The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations, with maximum and minimum for their periods of record. For specific location, elevation, period of record, and the observer, refer to data opposite same station name as shown in "Location of Rainfall Stations," page 81 in this bulletin.

In United States

Month	Barrett Dam, California				Chula Vista, California				Campo, California			
	1967			Average 1931-67	1967			Average 1931-67	1967			Average 1951-67
	Mean	Max.	Min.		Mean	Max.	Min.		Mean	Max.	Min.	
Jan.	49.2	80	25	48.5	52.8	72	36	52.3	47.7	75	22	46.6
Feb.	50.8	81	25	50.2	54.8	74	39	53.6	48.6	81	19	47.6
Mar.	52.5	# 85	# 28	53.3	57.3	82	41	55.2	51.2	84	21	49.2
Apr.	49.7	73	31	58.0	53.9	69	43	57.9	47.0	72	24	8 53.5
May	61.3	96	33	62.8	60.3	# 85	# 43	60.6	58.4	97	27	58.0
June	63.7	94	37	68.0	60.9	70	47	62.9	61.7	96	30	64.4
July	76.7	100	51	76.1	67.2	# 79	# 60		76.0	103	48	73.2
Aug.	80.0	106	57	76.2	70.4	80	64		78.5	103	52	73.5
Sept.	71.8	95	50	72.4	71.0	96	61		68.8	93	44	69.1
Oct.	65.7	94	39	64.4	65.2	92	50	62.9	63.4	91	32	61.5
Nov.	59.0	89	# 35	56.0	62.2	78	47		56.8	88	30	52.7
Dec.	46.2	75	29	50.8	52.9	75	36	54.4	45.4	75	22	
Yearly	60.6	106	25	61.4	60.7	96	36		58.6	103	19	

In Mexico

Month	La Rumorosa, Baja California				Tecate, Baja California				Tijuana, Baja California			
	1967		1946-1967		1967		1946-59 & 1961-67		1967		1948-59 & 1961-67	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	72	30	81	5	100	21	100	21	82	37	91	27
Feb.	75	32	82	10	100	21	100	21	81	39	102	32
Mar.	75	30	88	16	93	27	93	27	86	41	90	34
Apr.	70	28	91	23	70	32	99	32	70	45	97	34
May	90	36	97	28	82	34	100	34	93	45	97	43
June	90	39	113	34	91	37	104	37	81	46	99	41
July	100	50	104	50	93	36	115	36	91	61	120	46
Aug.	97	57	102	46	104	34	113	34	91	64	106	52
Sept.	86	50	104	34	93	37	115	37	97	61	120	46
Oct.	84	46	93	25	93	34	106	34	100	50	117	43
Nov.	82	36	88	14	90	27	97	27	93	46	108	32
Dec.	72	19	81	10	77	23	90	23	79	36	81	25
Yearly	100	19	113	5	104	21	115	21	100	36	120	25

Month	Rodríguez Dam, Baja California				Valle de las Palmas, Baja California				El Pinal, Baja California			
	1967		1938-1967		1967		1948-1967		1967		1964-1967	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Jan.	81	36	88	27	86	23	88	12	66	12	72	12
Feb.	82	36	91	32	84	30	99	23	75	32	75	21
Mar.	88	37	88	32	90	32	100	28	75	30	75	23
Apr.	72	39	93	36	90	37	104	32	70	18	82	18
May	99	43	99	37	95	39	100	39	79	36	81	27
June	84	43	108	46	99	41	108	41	88	39	91	30
July	91	55	104	50	99	50	120	48	95	50	95	39
Aug.	99	61	104	52	109	48	109	48	93	50	102	39
Sept.	95	59	108	48	100	43	117	43	86	41	102	39
Oct.	99	48	108	43	99	34	108	34	84	36	95	34
Nov.	91	43	99	30	86	34	97	19	84	32	84	28
Dec.	77	36	93	27	84	30	91	21	61	25	79	25
Yearly	99	36	108	27	109	23	120	12	95	12	102	12

One or more days missing 8 1956 records missing

TEMPERATURE IN THE TIJUANA RIVER BASIN
IN DEGREES FAHRENHEIT

In Mexico

Month	San Juan de Dios, Baja California											
	1967		1956-1967									
	Max.	Min.	Max.	Min.								
Jan.	73	21	88	7								
Feb.	77	21	84	16								
Mar.	77	21	84	18								
Apr.	66	21	102	19								
May	90	28	91	21								
June	95	28	106	28								
July	97	50	120	36								
Aug.	95	54	106	32								
Sept.	93	41	100	25								
Oct.	84	36	99	19								
Nov.	81	28	99	12								
Dec.	72	14	88	14								
Yearly	97	14	120	7								

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

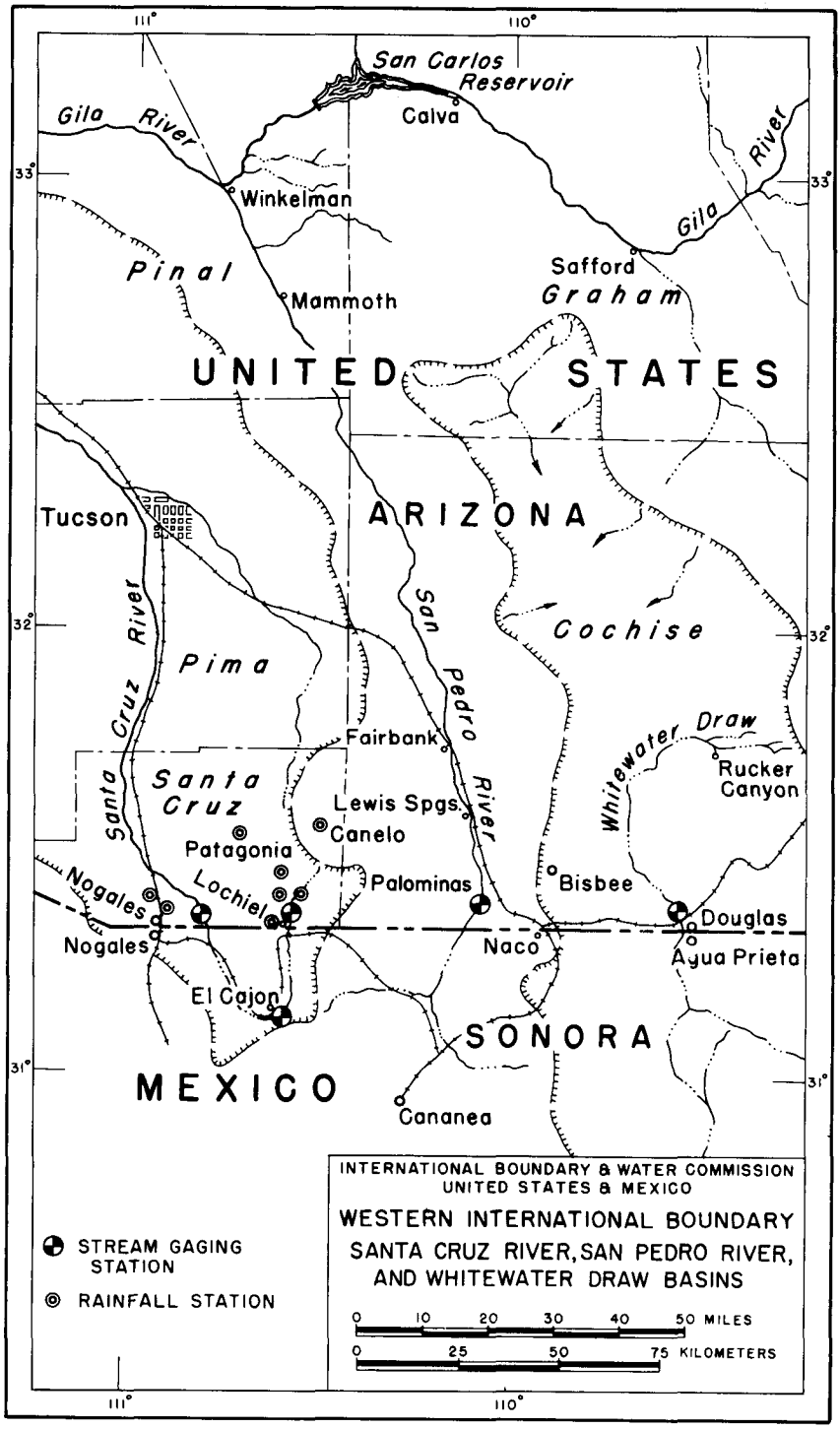
1967

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

The irrigated areas, tabulated in downstream sequence, are from the most reliable sources available. Those in the United States were furnished by the United States Department of Agriculture and the State Engineer, State of California, or estimated from aerial photographs. Those in Mexico were furnished by the Ministry of Hydraulic Resources of Mexico through the Mexican Section of the Commission. All irrigation in the Tijuana Basin in 1967 was by pumping from ground water.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Cottonwood Creek						
above Morena Dam	114	0	114	a) 75	0	a) 75
Morena Dam to Barrett Dam	133	0	133	0	0	0
above Barrett Dam	247	0	247	a) 75	0	a) 75
below Barrett Dam and above Tecate Creek	65	0	65	a) 145	0	a) 145
above Tecate Creek	312	0	312	a) 220	0	a) 220
Campo Creek						
above International Boundary	82	4	86	a) 320	0	a) 320
Tecate Creek						
above International Boundary (does not include Campo Creek)	19	64	83	0	0	0
Cottonwood Creek						
above International Boundary Station	413	68	481	a) 540	0	a) 540
Río de las Palmas						
above Rodríguez Dam	7	981	988	0	b) 0	0
Tijuana River						
above Nestor Gaging Station	458	1,266	1,724			
above the Mouth	462	1,269	1,731	3,000	c) 350	3,350

a) Estimated as of 1948. During extremely dry years these areas may be materially reduced.
b) Areas in upper valleys may be irrigated by pumping from ground water.
c) There was no irrigation in 1967 in the Tijuana Irrigation District, Tijuana Valley, Baja California, Mexico, from the Rodríguez Reservoir, but an estimated area of about 350 acres was irrigated by pumping from ground water. Depending upon the availability of water this acreage varies considerably from year to year.


111°
110°
San Carlos Reservoir
Calva
Gila River
Winkelman
Gila River
33°
Pinal
Mammoth
Safford
Graham
UNITED STATES
Tucson
ARIZONA
Santa Cruz River
San Pedro River
32°
Pima
Cochise
Fairbank
Whitewater Draw
Rucker Canyon
Santa Cruz
Lewis Spgs
Canelo
Patagonia
Nogales
Lochiel
Palominas
Bisbee
Douglas
Nogales
Naco
Agua Prieta
El Cajon
SONORA
31°
MEXICO
Cananea
INTERNATIONAL BOUNDARY & WATER COMMISSION
UNITED STATES & MEXICO
WESTERN INTERNATIONAL BOUNDARY
SANTA CRUZ RIVER, SAN PEDRO RIVER,
AND WHITEWATER DRAW BASINS
STREAM GAGING STATION
RAINFALL STATION
0 10 20 30 40 50 MILES
0 25 50 75 KILOMETERS

WHITEWATER DRAW NEAR DOUGLAS, ARIZONA

DESCRIPTION: Water-stage recorder located on U. S. Highway 80 bridge between Douglas and Bisbee, Arizona, about 450 feet upstream from the Southern Pacific Railroad bridge, 1.5 miles upstream from the international boundary, and 2 miles west of Douglas, Arizona. Zero of gage is 3,906.94 feet above mean sea level, U. S. C. & G. S. datum of 1929.

RECORDS: Based on 10 current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records fair except for periods of fragmentary or no gage height record, which are poor. Records available: August to October 1911 (gage heights and discharge measurements only), July to October 1912, January to June 1913, October 1913, December 1913 to June 1914, February to June 1915, October 1915 to September 1919, October 1919 to April 1922 (gage heights and discharge measurements only), June 1930 to December 1933, May 1935 to July 1947, October 1947 through December 1967 (July 1954 to March 1955 monthly discharge only).

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

EXTREMES: Prior to 1936: Maximum recorded discharge, 3,450 second-feet August 10, 1931 (gage height 12.15 feet); maximum estimated discharge, 4,050 second-feet July 27, 1919; minimum discharge, no flow for several days of many years. Since 1936: Maximum discharge, 5,060 second-feet August 7, 1955; maximum gage height 14.93 feet July 27, 1959; minimum daily discharge, no flow at times during most years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.13	0.13	0.09	0.01	0	0	0	39	0.57	0.41	0.29	0.05
2	.13	.13	.08	.01	0	0	0	24	14	.41	.23	.04
3	.13	.12	.08	.01	0	0	0	26	11	50	.20	.05
4	.12	.12	.08	.01	0	0	0	110	4.7	85	.20	.07
5	.13	.12	.08	.01	0	0	9.4	1,260	3.3	2.1	.20	.06
6	.13	.11	.07	.01	0	0	31	450	1.4	.70	.17	.05
7	.12	.11	.07	.01	0	0	25	54	.77	.51	.14	.05
8	.12	.11	.07	.01	0	0	23	33	3.8	.44	.13	.05
9	.11	.11	.08	.01	0	0	59	72	1.8	.38	.14	.05
10	.12	.11	.07	.01	0	0	3.6	209	.57	.38	.13	.03
11	.12	.11	.07	.01	0	0	.64	12	22	.35	.13	.04
12	.12	.11	.08	.11	0	0	18	44	1.2	.35	.12	.03
13	.14	.10	.07	.44	0	0	9.4	118	.57	.35	.11	.04
14	.13	.10	.06	.13	0	0	30	49	.57	.32	.11	.11
15	.14	.09	.05	.08	0	0	5.8	32	.44	.32	.11	185
16	.14	.09	.05	.03	0	0	6.4	23	.44	.32	.10	42
17	.14	.09	.06	.01	0	0	59	12	.44	.29	.10	6.4
18	.14	.09	.06	.01	0	0	20	9.0	.44	.29	.09	19
19	.13	.10	.05	.01	0	0	147	6.4	.41	.29	.09	16
20	.13	.11	.04	0	0	0	4.9	3.9	.41	.29	.07	546
21	.13	.10	.04	0	0	0	8.6	2.3	.38	.29	.07	218
22	.12	.10	.05	0	0	0	71	2.3	.35	.32	.09	100
23	.12	.10	.05	0	0	0	7.5	2.0	.35	.32	.09	32
24	.13	.09	.04	0	0	0	5.7	12	8.6	.32	.07	13
25	.13	.10	.03	0	0	0	53	1.9	16	.29	.07	6.0
26	.13	.12	.02	0	0	0	16	1.6	7.5	.29	.07	2.8
27	.12	.11	.02	0	0	0	279	1.0	1.1	.29	.14	1.8
28	.13	.10	.02	0	0	0	70	.50	.51	.29	.07	.97
29	.13		.01	0	0	0	134	.30	.44	.23	.07	.77
30	.14		.01	0	0	0	51	.44	.44	.20	.05	.64
31	.14		.01		0		27	.41		.18		.44
Sum	3.99	2.98	1.66	0.93	0	0	1,174.94	2,611.05	104.50	146.52	3.65	1,191.54

Month	Current Year 1967								Period 1936-1967		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Ø Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 13	Ø 0.14	9	0.11	0.13	7.9	49.6	451	1.0
Feb.			† 1	Ø .13	† 15	.09	.11	5.9	26.4	132	0
Mar.			1	Ø .09	† 29	.01	.05	3.3	28.4	130	0
Apr.			13	Ø .44	† 20	0	.03	1.8	26.3	173	0
May				0		0	0	0	19.3	138	0
June				0		0	0	0	169	1,590	0
July	14.08		19	1,220	† 1	0	37.9	2,330	# 2,286	8,110	39
Aug	15.83		5	2,930	29	.30	84.2	5,179	# 3,542	14,480	.3
Sept.			11	Ø 22	† 22	.35	3.48	207	# 799	3,170	.8
Oct.			4	Ø 85	31	.18	4.73	291	170	2,210	.4
Nov.			1	Ø .29	30	.05	.12	7.2	48.4	352	.2
Dec.			20	Ø 546	† 10	.03	38.4	2,363	161	2,363	.4
Yearly				2,930		0	14.4	10,396		22,321	900

Ø Mean daily † And other days # 1947 Records not available

SEWAGE EFFLUENT, DOUGLAS, ARIZONA AND AGUA PRIETA, SONORA INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Flume in influent line at treatment plant, equipped with stilling well and staff gage, for measuring combined flows of Douglas, Arizona and Agua Prieta, Sonora, and Parshall flume with recording flow meter for measuring flows from the city of Douglas. Flows from Mexico are deduced from total flows and city of Douglas flows.

RECORDS: Combined discharges are computed from daily 11:00 a.m. readings of the staff gages by applying an 11:00 a.m. index determined from 7 days of hourly measurements during which the relationship between mean daily readings and 11:00 a.m. readings was developed. Records available: Continuous monthly records since March 1948; daily records March 18, 1948 through December 1950 and January 1952 through December 1967.

REMARKS: Douglas-Agua Prieta International Treatment Plant was constructed by the Governments of the United States and Mexico in 1947 to correct a serious international sanitation problem and is located in the United States adjacent to the international boundary about one mile west of the Douglas-Agua Prieta Port of Entry. The effluent from the plant is treated in oxidation ponds in Mexico.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1967			Period 1952-1967		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	28.965	14.812	43.777	1.507	1.271	1.412	1.507	0.619	1.043
Feb.	25.864	13.640	39.504	1.491	1.253	1.411	1.784	.584	1.047
* Mar.	27.968	15.553	43.521	1.598	1.279	1.404	1.598	.590	1.047
Apr.	28.134	15.840	43.974	1.536	1.388	1.466	1.536	.619	1.068
May	30.038	16.657	46.695	1.591	1.411	1.507	1.595	.619	1.081
June	30.510	17.599	48.109	1.784	1.493	1.604	1.784	.626	1.144
July	32.993	19.384	52.377	1.807	1.542	1.690	3.209	.619	1.206
Aug.	32.781	20.048	52.829	1.967	1.562	1.704	1.985	.619	1.223
Sept.	30.298	18.485	48.783	1.789	1.520	1.626	1.884	.626	1.206
Oct.	28.811	18.600	47.411	1.604	1.466	1.529	1.667	.626	1.141
Nov.	26.991	17.415	44.406	1.586	1.426	1.480	1.586	.619	1.100
Dec.	29.097	17.540	46.637	1.736	1.319	1.504	1.736	.619	1.103
Yearly	352.450	205.573	558.023	1.967	1.253	1.529	3.209	0.584	1.118

* Combined capacity of mechanical plant and lagoons in Mexico is 1,724,000 gallons per day

SAN PEDRO RIVER AT PALOMINAS, ARIZONA

DESCRIPTION: Water-stage recorder located near left bank on the downstream side of pier on bridge on State Highway No. 92, 0.7 mile east of Palominas, 2.5 miles upstream from Green Brush Draw, 4.5 miles downstream from international boundary, and 12 miles southwest of Bisbee, Arizona. Zero of gage is 4,187.62 feet above mean sea level (State Highway bench mark).

RECORDS: Based on current meter measurements or observations of no flow during the year. Records available: May 1930 to October 1933, May 1935 to July 1941, and July 1950 through December 1967. Records obtained and furnished by U. S. Geological Survey.

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

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

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.1	3.8	1.7	0.08	0.08	0.11	0	100	0.2	0.2	0	1.9
2	5.8	3.8	1.6	.08	.06	.11	0	130	.5	.1	0	1.9
3	5.4	3.5	1.6	.08	.08	.05	0	127	6.2	.1	.1	3.3
4	5.4	3.5	.97	.08	.05	.08	0	437	.5	1.4	.5	3.8
5	5.8	3.3	.85	.08	0	.04	393	233	14	1.4	.6	3.5
6	5.4	3.5	.64	.11	0	.03	184	213	3.8	.5	1.0	3.0
7	5.4	3.5	1.1	.08	0	.03	50	100	.6	.2	1.6	3.0
8	5.1	3.5	1.4	.08	0	.02	81	111	.2	.1	1.9	2.8
9	5.1	3.5	1.4	.08	0	0	71	156	.6	.1	1.9	2.8
10	6.1	3.5	1.7	.08	0	.02	102	143	.2	.1	1.4	2.1
11	6.1	3.5	1.7	.08	0	.11	7.0	100	28	.1	1.1	2.0
12	6.1	3.3	1.2	.08	.10	.11	590	80	5.0	.1	1.0	3.0
13	5.8	3.0	.74	.08	.07	.16	63	50	.9	0	1.0	5.0
14	5.4	3.0	.54	.08	.16	0	29	40	2.8	0	1.1	7.0
15	3.8	3.0	.20	.08	.10	0	79	30	2.0	0	1.1	40
16	3.0	3.3	.08	.08	.16	0	93	20	2.0	0	1.0	40
17	2.5	3.5	.04	.08	.20	.05	82	97	1.0	0	.8	20
18	2.1	3.8	.02	.08	.16	0	107	70	1.0	0	1.0	20
19	2.1	4.1	.04	.08	.16	0	54	50	.5	0	.7	70
20	2.8	4.4	.04	.08	.16	0	17	30	.4	0	.9	2,700
21	3.3	3.5	.01	.08	.06	0	222	20	.3	0	1.6	1,800
22	3.8	3.0	.01	.16	.01	0	339	10	.3	0	1.7	310
23	3.8	2.8	.01	.11	.05	0	141	10	.3	0	1.9	150
24	4.1	2.3	.06	.08	.08	0	172	5.0	.3	0	1.7	80
25	4.1	2.3	.08	.08	.08	0	154	4.0	29	0	2.1	60
26	4.4	2.1	.08	.11	.04	0	1,050	3.0	3.8	0	3.0	50
27	4.4	2.1	.08	.11	.04	0	192	1.0	3.0	0	3.3	40
28	4.4	1.9	.06	.08	.05	0	327	.5	.7	.1	2.3	30
29	4.4		.06	.08	.12	0	376	.5	.5	0	2.3	30
30	4.4		.06	.08	.11	0	225	.1	.2	0	1.9	20
31	3.8		.08		.11		170	.1		0		20
Sum	140.2	90.3	18.15	2.60	2.29	0.92	5,370.0	2,371.2	108.8	4.5	40.5	5,525.1

Current Year 1967 — **Period 1951-1967**

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Ø Low						
	High	Low	Day		Day				Average	Maximum	Minimum
Jan.			† 1	Ø 6.1	† 18	2.1	4.5	278	756	7,813	2.6
Feb.			20	Ø 4.4	28	1.9	3.2	179	340	1,390	3.0
Mar.			† 1	Ø 1.7	† 21	.01	.6	36.0	230	580	36.0
Apr.			22	Ø .16	† 1	.08	.09	5.2	86.9	330	5.2
May			17	Ø .20	† 5	0	.07	4.5	19.4	68.8	0
June			13	Ø .16	† 9	0	.03	1.8	214	1,391	0
July	10.50		26	5,560	† 1	0	173	10,651	7,100	17,238	523
Aug			4	Ø 437	† 30	.1	76.5	4,703	11,375	36,369	165
Sept.			25	Ø 29	† 8	.2	3.6	216	1,896	16,344	28.4
Oct.			† 4	Ø 1.4	† 13	0	.2	8.9	171	1,201	0
Nov.			27	Ø 3.3	† 1	0	1.4	80.3	147	609	0
Dec.			20	6,500	† 1	1.9	178	10,959	1,065	10,959	6.2
Yearly				6,500		0	37.5	27,123	23,400	55,364	4,400

Ø Mean daily † And other days

SANTA CRUZ RIVER NEAR LOCHIEL, ARIZONA

DESCRIPTION: Water-stage recorder located in the United States near left bank on the downstream side of concrete bridge pier of county highway bridge, 2.5 miles northeast of Lochiel, Arizona, and 1.5 miles upstream from the international land boundary. The elevation of the zero of the gage has not been determined but topographic maps indicate the elevation of the stream bed at the gage is about 4,620 feet.

RECORDS: Based on 12 current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. Records available: January 1949 through December 1967.

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

EXTREMES: Maximum discharge, 4,810 second-feet on September 12, 1965 (gage height 8.90 feet); minimum discharge, no flow for several days of each year.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.6	1.0	0.68	0.26	0.47	0	0.40	6.4	3.7	1.7	0.70	1.1
2	1.6	1.0	.74	.26	.47	0	1.0	6.4	3.5	1.9	.74	1.2
3	1.6	1.0	.74	.32	.46	0	17	180	3.3	2.1	.74	1.3
4	1.6	1.0	.74	.26	.48	.02	8.0	110	2.9	1.8	.66	1.3
5	1.6	1.0	.74	.32	.43	.02	1.1	12	2.7	1.6	.58	1.3
6	1.5	1.0	.74	.32	.44	.04	11	6.0	2.5	1.6	.61	1.4
7	1.4	.96	.74	.32	.45	.05	1.5	10	4.9	1.6	.68	1.4
8	1.4	.88	.68	.38	.44	.09	.50	7.6	2.9	1.5	.66	1.4
9	1.4	.88	.62	.38	.44	.13	.50	7.6	2.3	1.5	.64	1.4
10	1.4	.80	.62	.38	.43	.17	1.1	5.0	5.9	1.4	.62	1.4
11	1.5	.74	.62	.38	.43	.20	.50	4.5	3.0	1.5	.62	1.5
12	1.5	.74	.62	.44	.39	.25	53	4.0	2.4	1.4	.59	1.5
13	1.5	.74	.62	.44	.35	.27	.40	5.5	2.2	1.3	.73	1.7
14	1.4	.80	.56	.44	.34	.26	.40	5.5	2.2	1.3	.79	1.8
15	1.4	.74	.56	.44	.31	.33	1.5	4.5	2.2	1.1	.80	2.6
16	1.4	.88	.50	.50	.32	.36	.40	4.5	2.1	.98	.77	2.0
17	1.4	.88	.44	.50	.31	.34	.40	4.5	2.0	.82	.74	3.1
18	1.3	.88	.38	.50	.36	.72	.50	4.5	2.0	.76	.79	3.0
19	1.3	.96	.38	.44	.35	.59	.50	4.0	1.9	.75	.88	4.4
20	1.3	.88	.44	.45	.22	.40	.60	4.0	1.9	.66	.88	299
21	1.2	.88	.38	.48	.10	.30	8.5	4.0	1.9	.67	.83	3.7
22	1.2	.80	.38	.44	.14	.30	1.1	4.0	1.9	.65	.88	1.4
23	1.3	.88	.38	.49	.07	.30	.80	4.1	1.9	.68	.87	1.3
24	1.3	.74	.38	.49	.07	.30	.90	3.8	1.9	.68	.79	1.3
25	1.2	.68	.38	.49	.04	.30	.90	3.6	2.6	.69	.72	1.3
26	1.1	.74	.38	.48	.02	.30	1.3	3.3	1.9	.77	.93	1.2
27	1.1	.74	.38	.46	.02	.40	1.1	2.9	2.5	.72	.99	1.1
28	1.1	.68	.32	.45	0	.40	1.1	2.9	1.9	.69	1.0	1.1
29	1.2		.38	.43	0	.40	63	2.9	1.7	.70	1.1	1.1
30	1.2		.38	.43	0	.50	53	2.6	1.6	.67	1.1	1.1
31	1.1		.32		0		16	2.6		.62		1.2
Sum	42.1	23.90	16.22	12.37	8.35	7.74	248.00	433.2	76.3	34.81	23.43	349.6

Month	Current Year 1967								Period 1949-1967		
	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Acre Feet		
			High		Ø Low				Average	Maximum	Minimum
	High	Low	Day		Day						
Jan.			† 1	Ø 1.6	†26	1.1	1.36	83.5	41.7	226	1.3
Feb.			† 1	Ø 1.0	†25	.68	.85	47.4	35.5	261	1.8
Mar.			† 2	Ø .74	†28	.32	.52	32.2	31.0	250	.7
Apr.			†16	Ø .50	† 1	.26	.41	24.5	18.2	148	0
May			4	Ø .48	†28	0	.27	16.6	6.0	44.2	0
June			18	Ø .72	† 1	0	.26	15.4	1.7	12.1	0
July			29	Ø 63	† 1	.40	8.00	492	584	4,270	1.6
Aug	5.84		3	1,870	†30	2.6	14.0	859	1,263	10,120	.08
Sept.			10	Ø 5.9	30	1.6	2.54	151	387	2,634	0
Oct.			3	Ø 2.1	31	.62	1.12	69.0	94.3	448	0
Nov.			†29	Ø 1.1	5	.58	.78	46.5	41.7	182	0
Dec.			20	Ø 299	† 1	1.1	11.3	693	77.9	693	0
Yearly				1,870		0	3.50	2,530	2,582	12,633	126

Ø Mean daily † And other days

SANTA CRUZ RIVER AT EL CAJON, SONORA

DESCRIPTION: Water-stage recorder, cableway, and Cipolletti weir with crest length of 26.25 feet and depth of 0.82 foot, 4.3 miles southwest of Santa Cruz, Sonora and approximately 30 miles southeast of Nogales, Sonora. Zero of gage is 4,270.24 feet above mean sea level, U. S. C. & G. S. datum, which is the same elevation as the crest of the weir.

RECORDS: Data is based on river stages and on current meter measurements made during the year. Data obtained and furnished by the Mexican Section of the Commission. Records available: January 14, 1954 through August 1959; October 1, 1959 to June 14, 1960; July 1960; January 6, 1961 to September 5, 1963; October 15, 1963 to August 3, 1964; January 9 to February 11 and April 1 through December 1965; January 1, 1966 through November 1967.

REMARKS: Irrigation diversions above the station affect the regimen of the river. A flood in August 1955 destroyed the weir which was repaired in February 1957.

EXTREMES: Maximum instantaneous discharge, 4,590 second-feet on August 6, 1955 with stage of 6.00 feet. Minimum discharge, 0.2 second-foot several days during April 1961 with stage of 0.03 foot.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11.7	5.7	9.9	8.5	3.5	1.1	2.8	7.4	3.9	7.1	6.7	
2	11.7	6.7	8.8	9.2	4.2	1.1	4.2	4.9	3.5	6.4	6.0	
3	11.7	8.8	9.2	7.8	3.2	1.1	4.9	4.2	2.8	5.3	5.3	
4	11.7	6.7	12.4	7.8	3.5	1.1	2.1	12.0	3.9	5.7	4.9	
5	11.7	7.1	10.2	8.5	3.5	1.8	1.8	22.2	4.2	6.0	4.9	
6	11.7	7.1	9.9	8.5	3.9	2.5	2.1	17.3	3.9	6.0	5.3	
7	10.6	7.1	9.5	6.7	4.2	2.8	1.8	13.1	7.4	6.4	4.9	
8	9.9	6.7	10.6	6.7	3.9	3.2	1.4	10.2	3.5	6.4	4.9	
9	9.5	7.4	8.5	7.1	2.5	3.5	2.1	9.9	3.5	6.4	4.9	
10	10.6	8.5	8.5	7.8	1.8	3.5	2.1	7.4	3.2	6.4	4.2	
11	10.9	8.5	6.7	6.7	2.5	3.2	2.8	4.9	3.5	6.4	3.9	
12	10.2	8.5	7.1	5.3	2.1	3.5	3.5	4.2	3.5	2.5	5.3	
13	9.9	8.1	7.8	4.9	2.1	3.2	4.9	4.2	3.5	3.2	4.9	
14	9.5	7.8	8.1	4.6	2.5	3.2	4.6	4.9	3.5	4.2	4.6	
15	9.5	7.8	8.1	4.6	3.2	3.2	3.5	3.5	3.9	4.9	3.9	
16	9.9	7.8	7.1	3.2	2.5	3.5	2.5	4.2	4.2	5.3	4.2	
17	10.6	6.4	6.4	2.8	2.8	3.5	1.8	3.9	4.6	6.0	4.2	
18	10.2	5.7	6.7	4.6	3.5	3.5	1.8	3.2	4.9	7.4	4.2	
19	9.9	6.4	7.8	4.6	2.8	3.9	1.8	2.1	5.3	6.4	4.2	
20	9.5	6.7	8.8	3.2	1.8	3.9	2.1	1.8	5.3	5.7	3.9	
21	9.2	7.8	7.1	3.2	1.4	3.5	2.8	1.8	6.0	6.0	3.9	
22	9.2	7.4	8.5	2.5	1.8	1.8	3.2	2.5	6.4	5.7	4.2	
23	8.8	7.4	8.8	2.5	2.1	2.1	3.5	4.2	7.1	4.9	4.2	
24	7.8	10.2	8.5	3.5	2.8	1.8	4.2	8.1	7.1	4.9	3.9	
25	5.3	10.6	8.1	4.2	2.1	2.8	4.9	4.6	7.4	4.9	3.9	
26	5.7	9.9	8.5	3.9	1.8	15.2	4.9	2.1	6.0	4.9	4.6	
27	6.7	10.2	8.5	3.2	1.8	38.8	3.2	3.2	5.3	5.7	4.9	
28	6.4	10.6	7.8	3.2	1.8	14.8	2.8	3.5	6.0	6.4	5.3	
29	6.4		7.4	2.1	1.4	4.9	5.3	3.5	6.4	6.4	4.9	
30	5.7		7.8	2.5	1.1	1.8	24.7	3.9	7.1	6.4	4.9	
31	5.3		8.5		1.1		9.5	4.6		6.4		
Sum	287.4	219.6	261.6	153.9	79.2	143.8	123.6	187.5	146.8	176.7	140.0	

Current Year 1967

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet
			High		Low			
	High	Low	Day		Day			
Jan.	0.23	0.10	1	11.7	† 24	5.3	9.2	569
Feb.	.23	.10	25	10.9	† 17	5.3	7.8	435
Mar.	.30	.10	4	13.4	† 11	5.3	8.5	518
Apr.	.20	.03	1	10.6	† 27	1.8	4.9	305
May	.10	0	7	4.9	† 29	.7	2.5	157
June	.98	0	26	91.8	3	.7	4.9	285
July	.69	.03	30	59.7	† 8	1.4	3.9	246
Aug	.43	.03	9	23.7	20	1.4	6.0	373
Sept.	.59	.03	7	39.2	† 2	2.1	4.9	291
Oct.	.16	.07	18	7.8	12	2.1	5.7	349
Nov.	.13	.07	1	7.1	11	2.8	4.6	279
Dec.								
Yearly								

Period #1954-1967

Acre Feet		
Average	Maximum	Minimum
550	1,486	208
451	1,598	98.1
366	868	176
227	528	74.9
195	512	101
156	486	63.1
710	1,227	83.5
4,509	32,608	229
1,002	3,000	106
404	1,165	78.5
392	838	134
448	831	186
11,565	38,895	2,317

Some months and years incomplete † And other days

SANTA CRUZ RIVER NEAR NOGALES, ARIZONA

DESCRIPTION: Water-stage recorder, cable with sit-down cable car located 5.5 miles east of Nogales, Arizona, 0.75 mile downstream from the international land boundary and 6 miles upstream from the Santa Cruz River bridge on State Highway No. 82. Zero of gage is 3,702.54 feet above mean sea level, U. S. C. & G. S. datum (levels by International Boundary and Water Commission).

RECORDS: Based on 13 current meter measurements or observations of no flow during the year. Computations by shifting control methods. Records obtained and furnished by the U. S. Geological Survey. 1967 records good. 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, July 1935 through December 1967.

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 1967.

EXTREMES: Prior to 1936: Maximum discharge, 12,000 second-feet on August 31, 1935 (gage height 12.3 feet); minimum discharge, no flow for several days each year. Since 1936: Maximum discharge, 10,600 second-feet on July 10, 1954 (gage height 13.27 feet); minimum discharge, no flow for several days of many years.

Mean Daily Discharge in Second Feet 1967 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19	8.9	9.4	5.3	3.0	0.30	0.30	15	3.0	3.0	2.2	3.4
2	19	11	10	4.9	2.6	.30	.10	9.4	3.8	3.0	1.8	3.0
3	18	11	10	5.3	1.8	.30	.10	9.0	3.8	3.8	1.6	3.8
4	18	11	11	5.3	1.3	.30	2.0	31	3.5	3.0	1.6	4.2
5	19	11	11	5.7	1.1	.20	.80	65	8.4	3.0	1.6	3.8
6	18	9.4	9.4	5.7	1.1	.20	48	32	7.7	2.6	1.6	3.8
7	16	8.9	7.7	5.7	.90	.20	7.0	19	2.4	3.0	1.8	3.8
8	14	8.3	7.1	4.5	1.1	.20	2.0	15	2.0	2.6	1.8	3.8
9	12	8.9	7.1	4.2	1.1	.20	1.0	63	2.0	2.6	1.8	3.8
10	11	8.9	8.3	3.4	1.1	.10	60	48	2.2	2.6	1.8	3.4
11	11	8.3	9.4	2.2	1.1	.10	57	22	3.0	2.6	1.8	3.0
12	12	8.3	7.7	3.4	.90	.10	36	17	2.6	2.6	1.8	2.6
13	12	8.9	6.6	5.7	.72	.10	44	16	2.6	2.6	1.8	3.8
14	11	8.9	5.7	5.3	.72	.10	22	15	2.2	2.2	3.4	6.1
15	11	8.3	5.7	4.9	.72	.10	14	15	2.2	2.2	3.4	1,110
16	10	8.3	7.7	4.9	.47	.10	17	27	2.2	2.2	3.4	167
17	10	7.7	8.9	4.9	.47	.10	150	30	2.0	2.6	3.4	441
18	11	7.1	9.4	4.2	.47	.10	11	12	2.0	2.2	3.4	1,170
19	9.4	8.3	8.9	2.6	.59	.10	5.7	8.3	2.0	2.2	3.4	2,580
20	10	8.3	8.9	2.2	.59	0	6.4	7.7	2.0	2.6	3.4	6,160
21	11	9.4	7.7	3.4	.47	0	4.2	7.1	2.0	2.6	3.8	979
22	9.4	8.9	7.7	2.6	.47	0	2.2	8.3	2.2	3.0	4.2	535
23	8.9	9.4	6.6	2.2	.59	0	1.3	10	1.8	3.4	4.2	288
24	11	8.9	4.9	2.2	.72	0	.60	6.6	1.8	3.4	4.2	190
25	10	9.4	4.5	1.8	.72	20	126	4.9	2.2	3.4	4.2	164
26	8.3	11	4.5	1.8	.59	51	98	4.5	2.2	3.4	4.5	140
27	8.3	9.4	4.5	1.6	.47	2.0	891	3.0	1.8	3.0	4.2	110
28	7.7	9.4	4.9	1.3	.37	1.0	15	1.8	1.8	2.6	3.8	92
29	7.1		4.9	.90	.37	.60	14	1.6	1.8	2.6	4.2	81
30	7.1		5.3	1.1	.37	.50	102	1.6	2.2	2.2	3.8	74
31	7.7		4.9		.37		22	1.3		2.2		65
Sum	367.9	255.5	230.3	109.20	27.36	78.30	1,760.70	527.1	81.4	85.0	87.9	14,398.3

Month	Extreme Gage Feet		Extreme Second Feet				Average Second Feet	Total Acre Feet	Period 1936-1967 Acre Feet		
			High		Ø Low						
	High	Low	Day		Day				Average	Maximum	Minimum
			Current Year 1967								
Jan.			† 1	Ø 19	†29	7.1	11.9	730	1,238	16,710	62
Feb.			† 2	Ø 11	18	7.1	9.12	507	888	11,129	59
Mar.			† 4	Ø 11	†25	4.5	7.43	457	499	2,692	95
Apr.			† 5	Ø 5.7	29	.90	3.64	217	194	795	19
May			1	Ø 3.0	†28	.37	.883	54.3	63.4	180	2
June			26	Ø 51	†20	0	2.61	155	75.7	1,020	0
July	11.40		27	6,310	† 2	.10	56.8	3,492	2,613	15,610	45
Aug			5	Ø 65	31	1.3	17.0	1,045	6,476	45,790	91
Sept.			5	Ø 8.4	†23	1.8	2.71	161	1,346	7,507	17
Oct.			3	Ø 3.8	†14	2.2	2.74	169	345	1,550	1.2
Nov.			26	Ø 4.5	† 3	1.6	2.93	174	270	1,140	1.2
Dec.			20	6,160	12	2.6	464	28,559	2,058	28,559	27
Yearly				6,310		0	49.3	35,720	16,066	57,671	3,499

† And other days Ø Mean daily

SEWAGE EFFLUENT, NOGALES INTERNATIONAL TREATMENT PLANT

DESCRIPTION: Two 12-inch Parshall flumes, each with a recording flow meter and continuous totalizer, one located at the international boundary for measuring effluent coming from Nogales, Sonora and the second located at the treatment plant in the influent line of secondary settling tank; and two calibrated sludge pumps of which pumping times are recorded. One pumps from primary settling tank into digester and the other recirculates sludge from secondary tank to primary tank. Bypass of raw sewage may be made to Nogales Wash, the quantity being estimated on basis of head in a control box in influent line ahead of primary tank. Nogales international sewage treatment plant is located near the north edge of Nogales, Arizona on right bank of Nogales Wash, approximately 2 miles downstream from the international boundary.

RECORDS: Total effluent is computed by adding to the flow measured in the flume from primary to secondary tank, the sludge pumped from primary tank into digester, which does not pass through this flume; subtracting the sludge recirculated from secondary to primary tank, which passes through this flume twice; and adding those flows of bypassed raw sewage into Nogales Wash. Flows from the United States are deduced from total measured flows less measured flows from Mexico. Records available: Continuous monthly record since the plant was placed in operation in August 1951, daily record January 1952 through December 1967.

REMARKS: Nogales International Treatment Plant treats combined sewage from Nogales, Arizona and Nogales, Sonora by means of primary and secondary sedimentation, sludge digestion, and trickling filters. Chlorination of plant effluent, which may be used for irrigation of lands lying north of the plant, is carried out by the United States at its expense.

Month	Total Monthly Flows Millions of Gallons			Mean Daily Flows-Millions of Gallons Per Day					
				Current Year 1967			Period 1952-1967		
	U.S.	Mexico	Total	Maximum	Minimum	Mean	Maximum	Minimum	Mean
Jan.	43.000	39.400	82.400	3.000	2.500	2.658	* 4.800	0.650	1.963
Feb.	34.400	36.400	70.800	2.700	2.300	2.529	* 6.130	.650	2.042
Mar.	35.900	39.500	75.400	2.600	2.200	2.432	3.662	.750	1.945
Apr.	38.268	39.400	77.668	3.138	2.300	2.589	3.962	.700	1.908
May	35.600	40.500	76.100	2.700	2.300	2.455	3.634	.550	1.817
June	32.466	38.200	70.666	3.026	2.100	2.356	3.317	.700	1.723
July	31.485	40.700	72.185	2.707	1.530	2.329	3.502	.700	1.757
Aug.	38.140	40.800	78.940	2.900	2.200	2.546	3.587	.750	2.077
Sept.	41.440	43.900	85.340	3.350	2.580	2.845	4.112	.800	2.334
Oct.	47.100	44.900	92.000	3.100	2.700	2.968	3.761	.700	2.239
Nov.	40.600	44.100	84.700	3.100	2.500	2.823	3.510	.800	2.021
Dec.	45.580	61.800	107.380	5.030	1.780	3.464	* 5.200	.350	2.073
Yearly	463.979	509.600	973.579	5.030	1.530	2.667	* 6.130	0.350	1.991

* Partly estimated

RAINFALL ON THE SANTA CRUZ RIVER WATERSHED IN INCHES

Tabulated below are monthly records of rainfall with averages for their periods of record at stations located in Arizona. Five stations are operated and maintained by the United States Section of this Commission and three by the U.S. Weather Bureau. For location, elevation, period of record, type of gage in use, and the observer, see alphabetical listing of stations at bottom of page following the monthly record.

Month	Meigs Ranch, Arizona		Jones Ranch, Arizona		Greene Cattle Company, Arizona		Nogales Sanitation Plant 2N, Arizona	
	1967	Average 1952-1967	1967	Average 1952-1967	1967	Average 1953-1967	1967	Average 1953-1967
Jan.	0.14	# 0.90	0		0.19	0.89	0.06	1.06
Feb.	.39	# .38	0		.30	.50	.17	.54
Mar.	.33	# .83	0		.10	.68	.13	.73
Apr.	.20	# .24	0	0.23	.10	.11	.24	.15
May	.35	.08	0	.03	.25	.10	.19	.06
June	1.11	.53	.50		1.20	.52	2.24	.50
July	7.99	4.94	6.75	5.99		# 4.44	9.03	4.66
Aug.	3.30	4.79	2.30			# 3.44	2.48	4.37
Sept.	3.79	1.59	1.35			# 1.29	1.45	1.37
Oct.	.60	.77	0			# .95	.12	.93
Nov.	.60	.52	.50		.90	.46	.71	.58
Dec.	5.54	1.30	5.40	1.40	2.30	1.06	6.47	1.58
Yearly	24.34	#16.87	16.80			# 14.44	23.29	16.53

Month	Nogales, Arizona		San Rafael Ranch, Arizona		Canelo, Arizona		Patagonia, Arizona	
	1967	Average 1914-1967	1967	Average 1924-1967	1967	Average 1930-1967	1967	Average 1930-1967
Jan.	0.03	1.08	0.08	0.98	0.04	1.18	0.02	1.26
Feb.	.16	.83	.28	.94	.52	1.08	.35	1.01
Mar.	.11	.74	.30	.86	.19	.74	.23	.79
Apr.	.25	.30	.30	.39	.32	.37	.35	.34
May	.25	.14	.30	.11	.31	.13	.65	.17
June	2.22	.48	1.30	.76	1.46	.92	.87	.48
July	9.22	4.14	6.40	4.59	4.97	4.29	4.33	4.52
Aug.	2.26	3.98	2.10	4.11	3.22	4.54	3.93	4.27
Sept.	1.54	1.61	2.13	1.79	3.03	1.73	1.80	1.85
Oct.	.15	.73	.28	.83	2.03	.89	.55	.81
Nov.	.69	.71	.75	.65	.53	.76	.67	.79
Dec.	6.53	1.35	4.95	1.26	5.19	1.47	6.80	1.48
Yearly	23.41	16.09	19.17	17.27	21.81	18.10	20.55	17.77

Some months missing

LOCATION OF RAINFALL STATIONS

NAME OF STATION	TYPE GAGE	LATITUDE	LONGITUDE	ELEV. (FT.)	RECORD BEGAN	OBSERVER
Canelo	S	31° 33'	110° 32'	4,985	1930	R. E. Ewing
Greene Cattle Company (San Rafael)	R	31° 22'	110° 35'	4,644	June 1952	I. B. & W. C.
Jones Ranch	S	31° 22'	110° 36'	4,960	Mar. 1952	I. B. & W. C.
Meigs Ranch	S	31° 26'	110° 36'	4,836	Mar. 1952	I. B. & W. C.
Nogales	R	31° 21'	110° 55'	3,808	1914	I. B. & W. C.
Nogales Sanitation Plant 2N	S	31° 21'	110° 56'	3,757	June 1952	I. B. & W. C.
Patagonia	S	31° 33'	110° 45'	4,044	1930	O. J. Rothrock
San Rafael Ranch	S	31° 21'	110° 37'	4,741	1924	San Rafael Ranch

S Standard 8" rain gage R Recording rain gage

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

Tabulated below are monthly records of temperature, humidity, evaporation, and wind at the station two miles north of the Nogales Sanitation Plant in Arizona. This station is operated and maintained by the United States Section of this Commission. Also tabulated below are the monthly records of temperature and evaporation for a station at San Lázaro, Sonora, located approximately 6.5 miles southwest of Santa Cruz, Sonora, and approximately 22 miles southeast of Nogales, Sonora. This station is operated and maintained by the Mexican Section of the Commission. The equipment at the Nogales Sanitation Plant - 2N consists of: Standard 8-inch rain gage, 48-inch diameter evaporation pan with stillwell and hook gage, maximum and minimum thermometer, anemometer (registers miles), hygrothermograph, and psychrometer, hand turbine type. The equipment at the station at San Lázaro, Sonora, consists of: Maximum and minimum thermometer, standard 8-inch rain gage and a 48-inch diameter evaporation pan.

For specific location of these two stations, refer to data opposite same station name shown in "Location of Rainfall Stations," page 94 of this bulletin.

In United States

Temperature - Degrees Fahrenheit

Month	Nogales Sanitation Plant - 2N 1967		
	Mean	Max.	Min.
Jan.	44.6	83	10
Feb.	48.2	82	19
Mar.	55.2	87	18
Apr.	56.0	84	25
May	63.7	98	27
June	72.0	100	34
July	77.3	101	61
Aug.	76.1	99	53
Sept.	71.8	95	46
Oct.	63.9	100	28
Nov.	55.5	87	24
Dec.	43.5	71	15
Yearly	60.7	101	10

Mean Relative Humidity - Percent

Month	Nogales Sanitation Plant - 2N 1967	
	Max.	Min.
Jan.	100	61
Feb.	100	53
Mar.	96	67
Apr.	96	50
May	96	63
June	97	65
July	97	79
Aug.	100	76
Sept.	100	83
Oct.	100	75
Nov.	100	76
Dec.	100	71
Yearly	100	50

Evaporation - Inches

Month	Nogales Sanitation Plant - 2N	
	1967	Average #1953-1967
Jan.	4.44	3.56
Feb.	6.95	4.73
Mar.	‡ 10.66	7.45
Apr.	12.62	10.00
May	‡ 11.87	12.62
June	‡ 13.96	13.79
July	‡ 9.11	9.81
Aug.	‡ 7.99	7.37
Sept.	‡ 6.66	7.44
Oct.	‡ 6.25	6.83
Nov.	‡ 4.59	4.34
Dec.	‡ 3.02	3.18
Total	‡ 98.12	91.12

Mean Wind Speed - Miles Per Hour

Month	Nogales Sanitation Plant - 2N	
	1967	Average 1953-1967
Jan.	1.9	2.0
Feb.	2.3	2.4
Mar.	2.9	2.7
Apr.	3.0	2.5
May	2.3	2.4
June	2.5	2.2
July	1.2	1.5
Aug.	0.8	.8
Sept.	0.9	1.0
Oct.	1.0	1.5
Nov.	1.2	1.4
Dec.	2.0	1.7
Yearly	1.8	1.8

In Mexico

Temperature - Degrees Fahrenheit

Month	San Lázaro, Sonora 1967		1961-1967	
	Max.	Min.	Max.	Min.
Jan.	77	21	93	14
Feb.	75	25	88	16
Mar.	86	32	99	23
Apr.	81	30	106	30
May	97	32	117	32
June	*	*	124	43
July	102	61	126	52
Aug.	95	59	117	52
Sept.	91	50	115	39
Oct.	91	37	111	34
Nov.	82	28	102	21
Dec.	70	23	95	18
Yearly	102	21	126	14

‡ Adjusted to full month
\# Some months missing
* Record Incomplete

Evaporation - Inches

Month	San Lázaro, Sonora	
	1967	Average 1961-1967
Jan.	4.33	3.66
Feb.	5.04	4.25
Mar.	8.31	7.17
Apr.	9.8	9.57
May	11.93	12.13
June	*	12.32
July	7.48	8.03
Aug.	6.26	7.13
Sept.	6.65	6.97
Oct.	6.77	6.89
Nov.	5.2	4.49
Dec.	3.43	3.43
Total		

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

1967

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 Smoke Control Section, Phelps-Dodge Smelter at Douglas, Arizona.

Designation of Areas	Drainage Basin-Square Miles			Irrigated Areas-Acres		
	United States	Mexico	Total	United States	Mexico	Total
Santa Cruz River:						
Above Lochiel, Arizona Gaging Station	82	0	82	200	0	200
Lochiel Station to Nogales Station	103	348	451	0	2,300	2,300
Above Nogales, Arizona Gaging Station	185	348	533	200	2,300	2,500
Whitewater Draw:						
Above Douglas, Arizona Gaging Station	1,023	0	1,023	31,700	0	31,700