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WATER BULLETIN NUMBER 50

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# Flow of the Rio Grande and Related Data

*From Elephant Butte Dam, New Mexico  
to the Gulf of Mexico*

1980

STORAGE IN MAJOR RESERVOIRS  
SOURCES OF RIVER FLOW  
DIVERSIONS  
SUSPENDED SILT  
CHEMICAL ANALYSES  
SANITARY ASPECTS OF WATER QUALITY  
CLIMATOLOGICAL DATA  
DRAINAGE BASIN AND IRRIGATED AREAS

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## FOREWORD

This bulletin presents the fiftieth compilation of the stream discharges and related data concerning the international portion of the Rio Grande, prepared jointly by the United States and Mexican Sections of the International Boundary and Water Commission. The streamflow data and kindred subjects pertain to the Rio Grande and its important tributaries near their confluence with the main stream from Elephant Butte, New Mexico to the Gulf of Mexico. The first publication in the series was Water Bulletin No. 1 for the year 1931. The present volume contains information for the year 1980.

International stream gaging on the Rio Grande was initiated in 1889, when the station at El Paso, Texas was established. Several stations on the Rio Grande and its tributaries downstream from El Paso were established in 1900 and operated until 1914. Between 1914 and 1923, except for a few months in 1919 and 1920, all stream-gaging work on the international reach of the river was suspended. In 1923 the work was resumed and carried on independently by the two countries until 1931, when the present joint program of stream measurements was adopted.

During 1980 the United States Section of the Commission operated the stream-gaging stations on the Rio Grande at El Paso, American Dam, Clint, Acala, Fort Quitman, Candelaria, Above Rio Conchos, Below Rio Conchos, Johnson Ranch, Foster Ranch, Del Rio, El Indio, Rio Grande City, San Benito, and Brownsville. The Mexican Section operated the stream-gaging stations on the Rio Grande at Below Amistad Dam, Jimenez, Piedras Negras, Villa Hidalgo, Laredo, and Below Anzalduas Dam. The station at Falcon Dam was operated jointly by the two Sections. Each Section operated the gaging stations on tributary streams, floodways, and diversions within its own country.

Beginning in 1976, the names of several gaging stations have been changed, pursuant to agreement between the two Sections of the Commission. Where it has been decided that some confusion may result from this change, a note giving the former name has been added to the descriptive heading of the gaging station.

The total drainage area within the outer rim of the Rio Grande Basin is 335,500 square miles. However, about half of this area yields no runoff to the river, the estimated productive area of the watershed being 176,333 square miles. Reservoirs in the basin have a total storage capacity of approximately 11,906,100 acre-feet, in addition to the International Amistad and Falcon Reservoirs, which have a combined conservation capacity of 6,165,000 acre-feet. In the Rio Grande Basin, a rounded total of 2,277,000 acres is irrigated below Elephant Butte Dam on the Rio Grande and below Girvin on the Pecos River. The flow of the Rio Grande to the Gulf of Mexico below Brownsville prior to construction of Falcon Dam averaged 2,600,000 acre-feet per year for the period 1934-1952. For the period 1954-1980, this flow has averaged 897,800 acre-feet per year.

The mean sea level datum, referred to as the U. S. C. & G. S. in the description of the stream-gaging stations, is the North American Vertical Datum of 1927.

## Acknowledgments

Other agencies which have contributed to some part of the data published herein include: The Agricultural Research Service and the Soil Conservation Service of the U. S. Department of Agriculture; the Bureau of Reclamation and the Geological Survey of the U. S. Department of the Interior; the National Weather Service of the U. S. Department of Commerce; the Texas Board of Health; the Texas Department of Water Resources; the Sanchez Ditch and Reservoir Company; the Middle Rio Grande Conservancy District; the Red Bluff Water Power Control District; State of Colorado, Division of Water Resources; the New Mexico State Engineer Office; the Rio Grande Compact Commission; the Willacy County Water Control and Improvement District No. 1; the Del Rio City Water Department; the Eagle Pass City Water Department; the Laredo City Water Department; the Del Mar Conservation District; Central Power and Light Company; the El Paso Department of Water and Sewerage; the Maverick County Water Control and Improvement District No. 1; the Ministry of Agriculture and Hydraulic Resources of Mexico; the Meteorological Service of Mexico; Meteorological Service of the State of Chihuahua, Mexico; Federal Power Commission of Mexico; Potable Water Board of Piedras Negras, Coahuila; the Federal Board of Public Improvement Works of Nuevo Laredo, Tamaulipas; and the Water and Drainage Board of Cd. Acuna, Coahuila.

Additional contributions have been made by individuals and corporations; and specific notation is made for such, as well as for those of the above-named agencies, where the data appear. The courtesy and cooperation of those who made these contributions are acknowledged with appreciation.

## Period Averages

In Water Bulletins Nos. 1 through 29, normal or average discharge volumes shown for the various gaging stations were based on a period beginning in 1924, or thereafter when records became available.

Beginning with Water Bulletin No. 30, the periods have been revised to include only the years following completion of major projects below which the flow of the Rio Grande or a major tributary was modified, or later when records became available. The revised periods are based on the completion of Caballo Dam in 1938, irrigation projects on the Rio Conchos and its tributaries in 1947, International Falcon Dam in 1953, and Amistad Dam and Luis L. Leon Dam in 1968.

For purposes of comparison with the average flows in the Rio Grande below Caballo Dam, records of average discharge in the Rio Grande below Elephant Butte Dam have also been revised to include the same period.

The period of record used to determine the average diversions from the Rio Grande to the United States below Falcon Dam published herein was restricted to begin in 1957, the first complete year of record after United States' waters in Falcon Reservoir were placed under the jurisdiction of the 93rd District Court of Texas.

## FOREWORD

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 volumes from metric to English units is direct. For this reason the monthly average discharge in cubic feet per second and monthly volumes in acre-feet shown for gaging stations operated by the Mexican Section cannot necessarily be obtained in the usual manner from the total monthly flow in second-foot days. For the same reason, evaporation and rainfall data, when totaled, may not be equivalent to the direct conversion from metric to English units. The following factors have been used for data in this bulletin.

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

Both English and metric units are used to report the figures in the descriptive headings and for the yearly figures of the annual and period summaries of all gaging station pages. Most of the stations have been converted to the metric system, and the yearly figures for the summaries cannot be obtained by direct conversion. The stations published in this bulletin that have not been converted to the metric system are those at Elephant Butte Dam, Caballo Dam, El Paso, American Canal, below American Dam, McKee Spring, Cantu Spring, return flow from the Maverick Power Plant and the District, and the diversions from the Rio Grande, U. S. side, below Falcon Dam.

## GENERAL HYDROLOGIC CONDITIONS FOR 1980

### Along and Adjacent to the International Portion of the Rio Grande

During the year 1980, temperatures were about average on the watershed of the Rio Grande below El Paso, Texas. Evaporation was 104% of average. Precipitation was 91% of average from El Paso to Amistad Dam, 75% of average from Amistad Dam to Falcon Dam, 52% of average from Falcon Dam to Rio Grande City, and 95% of average in the Lower Rio Grande Valley on the United States side.

The yearly volume of flow of the Rio Grande was below average from El Paso to Amistad Reservoir and above average from Amistad Dam to Falcon Reservoir, and below average from Falcon Dam to the Gulf of Mexico. In the reach between El Paso and the confluence of the Rio Conchos, the flow was 67% of average, ranging from 97% of average at El Paso to 2% at Clint; in the reach between the confluence of the Rio Conchos and Amistad Reservoir, where flows were partly regulated by releases from Luis L. Leon Reservoir (El Granero) on the Rio Conchos, the flow was 81% of average; and in the reach between Amistad Dam and Falcon Reservoir, where flows were partly regulated by releases from Amistad Reservoir, the flow was 113% of average. Flows passing Rio Grande stations below Falcon Dam were partly regulated by releases from Falcon Reservoir. Such releases in 1980 amounted to 2,635,716 acre-feet, or 111% of the average for the twenty-seven years of operation, 1954 to 1980. The volume of flow wasted to the Gulf of Mexico was 274,609 acre-feet, which is 31% of the average for this twenty-seven year period.

The total annual flow of all measured tributaries below Fort Quitman was 68% of average. The total flow of these tributaries in the United States was 529,096 acre-feet, or 76% of average. For Mexico the measured tributary flow, excluding Rio Alamo and Rio San Juan, was 1,121,873 acre-feet, or 87% of average. The flows of the Rio Alamo and Rio San Juan were 31% and 11% of their respective averages.

Return flow to the Rio Grande at Maverick Power Plant near Eagle Pass was 825,970 acre-feet, or 145% of the thirteen-year average. Return flow to the Rio Grande through various drains in the Maverick County irrigation district, excluding storm inflow, amounted to 94,776 acre-feet, or 63% of the thirteen-year average.

There were no floods of consequence on the Rio Grande in 1980. The highest peak flows recorded on the Rio Grande were, above Falcon Dam, 59,000 second-feet at Foster Ranch; and, below Falcon Dam, 12,400 second-foot release from Falcon Reservoir.

For all reservoirs in the Rio Grande basin having a capacity greater than 15,000 acre-feet, excepting Amistad and Falcon International Reservoirs, the average amount of water in storage in 1980 was 5,827,800 acre-feet, or 131% of the average 4,456,500 acre-feet. In the United States, stored water in these reservoirs was 150% of average, while in Mexico it was 122% of average.

In International Amistad Reservoir there was a net decrease in storage during the year of 319,000 acre-feet. Storage ranged from a high of 3,427,000 acre-feet on January 1 to a low of 2,524,900 acre-feet on August 9 and averaged 3,085,600 acre-feet during the year, or 103% of the average for the period of operation June 1968 through 1980. In International Falcon Reservoir there was a net decrease in storage during the year of 349,500 acre-feet. The storage varied from a high of 2,535,500 acre-feet on January 7 to a low of 1,575,300 acre-feet on August 8 and averaged 2,042,400 acre-feet during the year, or 101% of the average for the twenty-seven years of operation, 1954 through 1980.

Diversions from the Rio Grande in the United States were 128% of average. Diversions into the American Canal were 107% of average; into the Maverick Canal, 128% of average; and in the United States below Falcon Dam, 135% of the average for the twenty-four years, 1957-1980. In Mexico diversions were 146% of average. Diversions into the Acequia Madre were 127% of average, while diversions through the Anzalduas Canal for irrigation in Mexico were 148% of the twenty-seven year average.

In 1980, the total reported irrigated acreage from the Rio Grande and its tributaries below El Paso, Texas showed an increase of 11% from the previous year. On the United States side, there was an increase of about 3% above, and no change below, Falcon Dam, for an overall average increase of 0.5%. On the Mexican side, there was an increase of 2% above Falcon Dam and an increase of 36% below, for an overall average increase of 20%.

The 1980 investigation of the quality of Rio Grande water extended from El Paso to Brownsville. The annual tonnage of salts carried by the river at Fort Quitman was 97% of the 1938-1980 average; above Amistad Reservoir at Foster Ranch, 88% of the 1968-1980 average; above Falcon Reservoir at Laredo, 108% of the 1968-1980 average; and at the station below Anzalduas Dam, 77% of the 1959-1980 average. The volume of suspended silt transported by the Rio Grande in 1980 was 110% of the 1969-1980 average at Foster Ranch above Amistad Reservoir, 51% of the 1968-1980 average at Laredo above Falcon Reservoir, and 35% of the 1955-1980 average at Brownsville.

**RIO GRANDE BELOW ELEPHANT BUTTE DAM, NEW MEXICO**

**DESCRIPTION:** Concrete wall control, bubbler gage, and water-stage recorder located on the left bank 100 feet (30.5 m) upstream from the cableway at latitude 33°08'45", longitude 107°12'20", and river mile 1,389.1 (2,235.5 km); 0.7 river mile (1.1 km) downstream from Elephant Butte Dam, 1.5 river miles (2.4 km) upstream from Cuchillo Negro River, and 135.1 river miles (217.4 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,242.09 feet (1,292.99 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 28 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the United States Geological Survey. Records available: 1915 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Beginning December 1940, hydroelectric power generation facilities for 27,000 kva were placed in operation at Elephant Butte Dam.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Foot (Cubic Meters per Second)			
Daily:	Max. 8,220 (233)	May 22, 1942	Min. 0	Occasionally	
Monthly:	Max. 7,600 (215)	May 1942	Min. 1.2 (0.03)	Nov. 1971	
Yearly:	Max. 2,510 (71.1)	1942	Min. 253 (7.16)	1964	

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,230	1,100 *	23.0	1,760	1,890	1,880	1,430 *	1,410	713	* 10.0	18.0	1,080 *
2	1,220 *	31.0	20.0	1,800	1,900	1,850 *	1,420	1,840	992 *	9.8	18.0	1,370
3	1,220	27.0	21.0	1,790	1,910	1,820	1,430	1,830	980	* 10.0	17.0	1,320
4	1,120	1,040	20.0	1,790	1,920	1,810	1,430	1,830	692	10.0	17.0	1,360
5	31.0	1,280	20.0	1,780	1,930	1,800	1,440	1,840	701	10.0	17.0	1,240
6	26.0	1,290	20.0	1,780	1,940	1,800	1,450	1,830	702	11.0	17.0	29.0
7	1,030	1,290	20.0	1,770	1,940	1,800	1,460	1,820 *	701	* 10.0	17.0	24.0
8	1,260	1,180	20.0	1,770	1,940	1,800	1,260	1,820	702	9.8	17.0	1,090
9	1,260	30.0	20.0	1,780	1,940	1,800	1,380	1,820	704	10.0	16.0	1,330
10	1,280	25.0	19.0	1,790	1,940	1,800	1,380	1,790	33.0	9.1	16.0	1,360
11	1,190	1,050	21.0	1,790	1,940	1,790	1,390	1,760	* 8.1	6.6	16.0	1,370
12	32.0	1,290	* 20.0	1,780	1,940	1,790	1,390	1,820	* 8.1	6.3	16.0	1,320 *
13	27.0	1,290	21.0	1,790	1,940	1,790	1,370	1,830	7.2	6.2	16.0	32.0
14	1,020 *	1,280	22.0	1,790 *	1,940	1,800 *	1,370 *	1,830 *	* 8.3	* 6.1	745 *	24.0
15	1,250	1,190 *	23.0	1,770	1,940	1,810	1,320	1,410 *	8.0	7.5	26.0	1,140
16	1,260	32.0	23.0	1,760	1,930	1,810	1,390	1,340	8.0	7.8	26.0	1,360
17	1,260	28.0	23.0	1,770	1,930	1,800	1,400	1,350	8.0	8.8	21.0	1,410
18	1,210	1,060	24.0	1,770	1,920	1,800	1,400	1,350	8.0	9.8	15.0	1,340
19	32.0	1,280	25.0	1,780	1,920	1,790	1,390	1,360	8.0	10.0	15.0	1,220
20	26.0	1,290	25.0	1,790	1,910 *	1,780	1,400	1,350	7.5	11.0	15.0	33.0
21	1,080	1,300	28.0	1,800	1,900	1,770	1,390	695	7.0	12.0	16.0	25.0
22	1,210	1,230	30.0	1,810	1,890	1,760	1,390	685	7.0	13.0	16.0	1,130
23	1,210	33.0	29.0	1,810	1,890	1,760	1,400	697	7.5	14.0	17.0	1,370
24	1,200	28.0	283	1,830	1,890	1,750	1,390	709	85.0	16.0	17.0	1,370
25	30.0	1,250	14.0	1,840	1,890	1,740	1,390	718	10.0	18.0	18.0	1,380
26	25.0	1,980	14.0	1,850	1,890	1,740	1,380	704	9.0	21.0	17.0	1,250
27	20.0	1,990	14.0	1,860	1,890	1,730	1,390	703	9.5	21.0	17.0	31.0
28	940	1,980	13.0	1,880	1,900	1,740	1,390	703	9.5	27.0	19.0	25.0
29	30.0	1,720 *	14.0	1,890	1,890	1,720	1,390	702	10.0	36.0	19.0	1,130
30	1,200	18.0	18.0	1,880 *	1,890	1,720	1,390	705 *	10.0	34.0	18.0	1,370
31	1,210	* 18.0	* 18.0	1,890	1,890	1,720	1,390 *	712		* 18.0		1,430
Sum	25,139.0	28,594.0	905.0	54,050	59,370	53,550	43,190	40,963	7,163.7	409.8	1,255.0	29,963.0

Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Period 1938-1980 Acre-Feet			
	High	Low	High		Low	Average			Maximum	Minimum		
	Day	Day	Day	Day	Day	Day	Day	Day	Day			
Jan.			10	1,280	27	20.0	811	49,862	24,155	86,500	200	
Feb.			27	1,990	10	25.0	986	56,715	36,606	88,861	188	
Mar.			29	283	28	13.0	29.2	1,795	68,808	128,925	1,520	
Apr.			24	1,890	!	1,760	1,800	107,207	78,006	162,000	11,207	
May			1	1,940	!	1,890	1,920	117,759	80,094	467,000	512	
June			1	1,880	!	1,720	1,780	106,215	91,445	363,000	16,913	
July			7	1,460	8	1,260	1,390	85,666	92,798	211,000	41,352	
Aug.			2	1,840	22	685	1,320	81,249	74,753	134,000	9,530	
Sept.			2	992	121	7.0	239	14,209	31,507	129,000	163	
Oct.			29	36.0	14	6.1	13.2	813	15,912	72,100	166	
Nov.			14	745	!	15.0	41.8	2,489	16,004	158,000	74.2	
Dec.			31	1,430	!	24.0	967	59,431	20,068	87,300	179	
Yearly				1,990		6.1	941	683,410	630,156	1,818,800	183,415	
				Cubic Meters per Second			Thousands of Cubic Meters					
				56.4	0.17	26.6	842,986	777,297	2,243,490	226,242		

\* Discharge measurement made on this day      ! Mean daily      ! And other days

**RIO GRANDE BELOW CABALLO DAM, NEW MEXICO**

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank at latitude 32°53'05", longitude 107°17'30", and river mile 1,360.8 (2,190.0); 0.8 river mile (1.3 km) downstream from Caballo Dam, about 3 miles (5 km) northeast of Arrey, New Mexico, 5 miles (8.0 km) south of Caballo, New Mexico, and 106.8 river miles (171.9 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 4,140.90 feet (1,262.15 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 85 discharge measurements during the year and a continuous record of gage heights. Records were furnished by the El Paso office of the United States Bureau of Reclamation. Records available: 1938 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. In addition to the outflow from Caballo Dam listed below, 599 acre-feet (739,000 m<sup>3</sup>) of water were diverted in 1980 into Bonita Lateral, a small irrigation canal just below Caballo Dam. Prior to 1938, discharge records were kept at Percha Dam, a low diversion dam about 1.5 miles (2.4 km) downstream from this station. Small accretions to the river take place between the station and Percha Dam.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Foot (Cubic Meters per Second)				
Daily:	Max. 7,650 (217)	May 20, 1942	Min. 0.1 (0.003)	Several days 1954,		
Monthly:	Max. 6,710 (190)	May 1942	Min. 0.1 (0.003)	1955 and 1972		
Yearly:	Max. 2,480 (70.2)	1942	Min. 284 (8.04)	Nov. & Dec. 1955		1964

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	156	1,250	1,520	1,090	1,790	2,210	2,190 *	1,200	* 1.2	0.9	1.2
2	1.4	156	1,210 *	1,510	1,280 *	1,780	2,400 *	2,370	1,500 *	1.2	.9	1.0
3	1.4	156	1,190	1,450 *	1,150	1,730 *	2,400 *	2,400 *	1,750	1.3	.9	.8
4	* 1.4	155	1,090	1,220	924	1,670	2,170	2,290	1,910	1.3	.9	.7
5	1.4	87.0	1,010 *	1,070 *	924	1,660	2,140	2,110 *	1,570	1.3	1.0	* .7
6	1.4	12.0	1,010	1,040	1,010 *	1,760	2,140 *	2,100	1,420	1.4	* 1.0	.8
7	1.4	3.0	1,130 *	899	1,100 *	1,850 *	2,010	2,180	1,160	1.4	* 1.0	.9
8	1.4	47.0	1,230	1,290	1,100	1,870	1,720 *	2,170 *	973	1.4	1.0	1.0
9	1.4	3.0	1,200 *	1,650 *	1,160	1,880	1,960	2,130	828	1.4	.9	1.1
10	1.4	3.0	1,220	1,650	1,220	1,990 *	2,000	1,820	727 *	* 1.5	.8	* 1.2
11	1.4	3.0	1,360 *	1,660	1,220 *	2,080	2,000 *	1,940	668	1.5	.8	1.2
12	1.4	* 91.0	1,520	1,500	1,200	2,080	1,960	1,570	657	1.5	.8	1.2
13	1.4	152 *	1,520	1,370	1,320 *	1,840 *	1,960 *	1,190	629	1.5	.7	1.2
14	1.4	180 *	1,460	1,310	1,360 *	1,650	1,770	1,020	544	1.5	* .7	1.2
15	1.4	193	1,420 *	1,160	1,350	1,650	1,800 *	911 *	535	1.5	.7	1.2
16	1.4	191	1,410	1,000	1,410	1,650	1,910	924	522 *	1.5	.8	1.2
17	169	192	1,390	968 *	1,420	1,930 *	1,910	871	645	1.4	.8	* 1.2
18	393 *	191	1,530	1,120	1,400	2,210	2,070 *	808	718	1.4	.9	1.2
19	397	289 *	1,670 *	1,200	1,420	2,220	2,190	804 *	793 *	1.3	1.0	1.3
20	382	374	1,680	1,120	1,520 *	2,210	2,080	1,070	837 *	1.3	1.0	1.3
21	382 *	370	1,650	1,080	1,600	2,210	1,920	1,320	769 *	1.2	* 1.1	1.3
22	296	463	1,650	1,220	1,600	2,140	1,970 *	1,470 *	364	1.1	1.2	1.4
23	206 *	553	1,630	1,410	1,470 *	2,090	2,140	1,520	5.0	1.1	1.3	1.4
24	219	553	1,630	1,380	1,390	2,130 *	2,080	1,510	1.2	* 1.1	1.4	1.4
25	212 *	621 *	1,740	1,310	1,380	2,190	2,040 *	1,340	1.2	1.1	1.5	1.4
26	209 *	938 *	1,820 *	1,280	1,380	2,210	2,210 *	1,300 *	1.2	1.1	1.6	1.5
27	191	1,150	1,800	1,280 *	1,660 *	2,360 *	2,210	1,320	1.2	1.0	1.7	1.5
28	162 *	1,160	1,780	1,280	1,950 *	2,480	2,150	1,320	1.2	1.0	* 1.7	1.5
29	156 *	1,210	1,770	1,240	1,940	2,460	2,100 *	1,260 *	1.2	1.0	1.5	1.5
30	156		1,740	1,090 *	1,930	2,250	2,090	1,200	1.2	1.0	1.3	1.6
31	156		1,560	2,040	2,040	2,090	2,090	1,200		* .9		1.6
Sum		9,652.0		38,277		60,020		47,628		20,732.4	39.4	37.7
	3,708.4	45,270		42,888		63,800		47,628		20,732.4	31.8	

Month	Extreme Gage Feet		Current Year 1980				Average Second-Foot	Total Acre-Feet	Period 1938-1980		
	High	Low	Extreme Second-Foot		Total	Acre-Feet					
			Day	Day		Average			Maximum	Minimum	
Jan.	19	397	1	1.4	120	7,356	1,215	21,032	19.2		
Feb.	29	1,210	1	7	333	19,144	7,438	64,300	11.7		
Mar.	26	1,820	5	1,010	1,460	89,792	83,153	135,000	24,900		
Apr.	11	1,660	7	899	1,280	75,921	78,637	212,000	25,470		
May	31	2,040	1	924	1,380	85,067	73,454	412,000	75.2		
June	28	2,480	114	1,650	2,000	119,048	103,073	354,000	25,289		
July	124	2,400	8	1,720	2,060	126,545	108,985	234,000	28,200		
Aug.	3	2,400	19	804	1,540	94,469	104,948	179,000	20,500		
Sept.	4	1,910	124	1.2	691	41,122	47,763	181,000	6,757		
Oct.	10	1.5	31	.9	1.3	78.1	3,921	35,400	15.5		
Nov.	27	1.7	113	.7	1.1	63.1	2,105	14,400	7.0		
Dec.	130	1.6	1	.7	1.2	74.8	2,182	19,100	6.0		
Yearly			2,480		0.7	907	658,680	616,874	1,795,670	206,084.6	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
			70.2		0.02	25.7	812,482	760,914	2,214,959	254,205	

\* Discharge measurement made on this day      Ø Mean daily      ! And other days

### RIO GRANDE AT EL PASO, TEXAS

**DESCRIPTION:** Gravity well and water-stage recorder located on the downstream side of the first pier from the left abutment of the Courchesne Bridge at latitude 31°48'10", longitude 106°32'25", and river mile 1,255.7 (2,020.8 km); 5.5 river miles (8.9 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua and 1.7 miles (2.7 km) upstream from the American Dam at El Paso, Texas. The zero of the gage is 3,722.30 feet (1,134.56 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Mean daily discharges in 1980 were computed by adding the flows in the American Canal and the flows at the river station below the American Dam. Because the mean daily discharges are rounded, the monthly sum for this station may not equal the sum of the monthly sums of the other two stations. Extreme discharges are those passing the El Paso station, where measurements are made only during high flows. Records available: 1889 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 24,000 second-feet (680 m<sup>3</sup>/sec) on June 12, 1905. Min. occasionally no flow. Since Elephant Butte Dam was closed in 1915, the largest peak flow to pass this station was 13,500 second-feet (382 m<sup>3</sup>/sec) on September 3, 1925.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 23,680 (671)	June 12, 1905	Min. 0	Occasionally
Monthly:	Max. 14,300 (405)	June 1905	Min. 0	Occasionally
Yearly:	Max. 2,780 (78.7)	1905	Min. 70.1 (1.99)	1902

#### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	60.1	194	381	853	706	971	1,180	903	588	283	133	123
2	60.2	196	414	675	533	1,120	962	992	560	267	132	122
3	60.3	187	450	608	530	1,020	914	1,080	564	263	132	122
4	60.3	183	486	560	750	997	1,030	1,180	583	258	128	122
5	60.3	179	527	524	887	878	1,120	1,210	582	253	127	122
6	60.3	162	566	620	645	740	1,120	1,160	774	249	130	125
7	60.3	150	504	588	588	738	1,120	1,010	1,010	239	133	126
8	58.5	139	490	546	586	835	1,200	909	945	223	132	125
9	58.5	170	518	402	563	904	1,210	1,050	811	203	131	120
10	58.5	137	570	435	584	949	816	1,010	782	182	130	119
11	58.5	87.4	604	740	628	941	951	1,210	849	177	132	117
12	58.5	86.6	616	828	710	994	936	840	582	173	129	118
13	58.5	82.1	582	944	695	987	928	1,250	504	169	129	125
14	58.5	77.1	509	950	652	1,010	906	1,410	573	164	127	124
15	58.5	70.4	521	863	591	942	910	1,130	535	159	126	124
16	58.5	71.8	518	793	606	882	854	995	529	155	146	125
17	61.5	79.4	496	714	663	895	689	778	432	150	126	125
18	62.3	68.5	493	609	755	834	741	759	378	150	130	124
19	64.3	80.1	541	576	783	878	755	712	326	153	132	120
20	73.0	70.4	525	607	734	884	864	685	326	153	131	118
21	269	67.2	503	604	672	929	978	539	277	154	128	113
22	364	77.2	502	602	654	942	985	440	257	150	130	111
23	390	80.8	519	543	656	1,010	896	570	276	150	130	111
24	385	140	530	529	640	938	738	718	286	136	129	111
25	318	97.0	524	531	595	904	955	753	299	139	125	111
26	286	96.2	522	554	583	857	1,000	787	325	134	124	111
27	272	176	543	547	554	806	1,060	818	297	135	123	111
28	257	168	610	588	642	850	1,120	675	297	155	123	111
29	244	388	606	653	801	1,060	1,110	628	355	135	121	111
30	230	681	681	713	798	1,170	1,070	602	300	136	120	111
31	215	851	851	713	809	809	1,020	543	300	136	120	111
Sum	4,439.4	3,761.2	16,702	19,299	20,593	27,865	30,138	27,346	15,202	5,583	3,869	3,669

Month	Current Year 1980						Period 1938-1980				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	2.79		24	410	1 8	58.5	143	8,805	6,258	15,594	220
Feb.	2.82	1.68	29	388	21	58.7	130	7,460	7,039	52,200	136
Mar.	4.22	2.82	31	981	1	381	539	33,128	33,834	62,500	1,790
Apr.	4.34	2.86	14	1,010	10	331	643	38,279	40,615	139,000	6,820
May	4.52	3.25	5	887	2	482	664	40,846	45,219	357,000	5,222
June	4.80	3.80	30	1,170	7	738	929	55,269	51,840	304,000	6,020
July	3.86	3.65	9	1,210	17	689	972	59,778	57,612	198,000	9,652
Aug.	5.14	3.12	14	1,410	22	440	882	54,240	56,238	158,000	4,870
Sept.	4.52	2.75	7	1,010	22	257	507	30,153	37,949	171,000	2,430
Oct.	2.73	2.18	1	283	26	134	180	11,074	13,476	57,900	151
Nov.	2.37	2.13	16	202	27	119	129	7,674	8,108	21,300	229
Dec.	2.15	1.99	6	127	121	111	118	7,277	7,667	25,600	206
Yearly	5.14			1,410		58.5	488	353,983	363,855	1,559,200	57,481
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	1.57			39.9		1.66	13.8	436,638	448,816	1,923,273	70,903

☐ Mean daily      ! And other days

## DIVERSIONS FROM THE RIO GRANDE AMERICAN CANAL AT EL PASO, TEXAS

**DESCRIPTION:** Concrete control consisting of two triangular-shaped wingwalls extending toward the center of the canal about one-fourth of the canal width and downstream at a 30° angle with the canal side walls, bubbler gage, water-stage recorders (graphic and digital), and binary decimal transmitter located on the right bank of the concrete-lined canal at El Paso, Texas, latitude 31°46'40", longitude 106°31'35", and about 2,400 feet (700 m) downstream from the headgates of the American Dam, which are located at river mile 1,254.0 (2,018.0 km). The zero of the gage is 3,712.09 feet (1,131.45 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on a stable rating curve at medium and high flows, and a continuous record of gage heights. Records available: June 2, 1938 through 1980.

**REMARKS:** This canal diverts water from the Rio Grande at the American Dam at El Paso, Texas, 2.1 river miles (3.4 km) upstream from the International Dam at Juarez, Chihuahua. Water from this canal discharges into the Franklin Canal from which water is frequently returned to the Rio Grande at spillways 2.2 (3.5), 2.7 (4.3), and 3.6 (5.8) river miles (km) downstream from the American Dam. The transmitter relays gage height data upon interrogation by telephone via commercial circuits.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,840 second-feet (52.1 m<sup>3</sup>/sec) on March 27, 1944. Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 1,510 (42.8)	Aug. 13, 1945	Min. 0	Frequently
Monthly:	Max. 1,210 (34.3)	Aug. 1943	Min. 0	Frequently since 1952
Yearly:	Max. 748 (21.2)	1943	Min. 65.6 (1.86)	1956

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1	1.0	191	379	665	520	812	971	706	488	282	132	122		
2	1.0	193	412	475	370	895	765	792	456	266	131	121		
3	1.0	184	448	404	362	777	706	887	461	262	131	121		
4	1.0	180	484	352	569	777	807	985	479	257	127	121		
5	1.0	177	524	316	711	660	895	1,010	477	252	126	121		
6	1.0	160	563	412	479	520	900	949	669	248	129	124		
7	1.0	148	501	390	423	520	905	797	905	238	132	125		
8	1.0	137	488	352	416	623	989	705	843	222	131	124		
9	1.0	168	516	204	395	694	1,000	845	706	202	130	119		
10	1.0	135	567	224	414	748	604	814	672	181	129	118		
11	1.0	85.1	602	520	456	731	739	1,020	729	176	131	116		
12	1.0	84.3	613	613	543	787	727	617	470	172	128	117		
13	1.0	79.8	579	734	535	782	715	1,000	392	168	128	124		
14	1.0	74.8	505	748	495	810	704	1,100	461	163	126	123		
15	1.0	68.0	516	658	436	734	704	910	452	158	125	123		
16	1.0	69.4	512	588	454	681	651	814	526	154	145	124		
17	22.6	77.0	490	508	510	685	486	594	429	149	125	124		
18	54.6	66.1	486	402	598	638	533	567	376	149	129	123		
19	56.9	77.7	533	368	625	662	551	520	324	152	131	119		
20	65.9	68.0	516	395	579	674	660	493	324	152	130	117		
21	262	64.8	493	395	516	722	780	346	275	153	127	112		
22	358	74.8	492	392	497	734	787	244	256	149	129	86.0		
23	384	78.4	508	332	501	802	697	364	275	149	129	61.0		
24	379	138	505	319	481	731	535	512	285	135	128	61.0		
25	312	94.6	512	322	434	704	736	553	298	138	124	61.0		
26	281	93.8	510	346	424	649	792	583	324	133	123	61.0		
27	267	174	531	343	394	598	850	621	296	134	122	61.0		
28	252	166	492	381	484	638	910	488	296	154	122	61.0		
29	240	386	419	447	642	832	910	452	354	134	120	61.0		
30	226		490	508	638	954	874	423	299	135	119	61.0		
31	211		660		651		822	426		135		61.0		
<b>Sum</b>		3,693.6		13,113		21,574		21,138		5,552		3,173.0		
	3,388.0	15,846			15,552		23,705		13,597		3,839			
<b>Current Year 1980</b>												<b>Period 1939-1980</b>		
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet						
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum			
Jan.	6.17		24	404	1	0	109	6,720	2,341	15,594	0			
Feb.		3.23	29	386	21	56.3	127	7,326	4,703	19,500	0			
Mar.	8.05		31	790	1	0	379	511	31,430	30,447	1,700			
Apr.	8.11	4.19	14	804	10	133	437	26,009	29,826	70,900	4,560			
May		5.62	5	711	2	319	502	30,847	26,836	69,000	392			
June			9	954	1	6	520	42,791	36,109	65,700	5,990			
July			30	1,000	17	486	765	47,018	42,700	70,700	8,673			
Aug.			14	1,100	22	244	682	41,927	42,254	74,600	4,840			
Sept.			7	905	22	256	453	26,969	27,666	63,100	2,230			
Oct.			1	282	26	133	179	11,012	11,257	39,000	0			
Nov.	4.75	4.04	16	201	27	118	128	7,615	6,643	21,000	0			
Dec.	4.12	3.96	1	126	123	61.0	102	6,294	6,547	25,500	0			
<b>Yearly</b>				1,100		1.0	394	285,958	267,349	541,610	47,397.4			
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>								
				31.2		0.03	11.2	352,729	329,775	668,076	58,465			

0 Mean daily

! And other days

## RIO GRANDE BELOW AMERICAN DAM AT EL PASO, TEXAS AND CD. JUAREZ, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the retaining wall of the Smelter Pump on the left bank of the river at latitude 31°46'35", longitude 106°31'20", and river mile 1,253.4 (2,017.1 km); 1.5 river miles (2.4 km) upstream from the International Dam, 3.1 river miles (5.0 km) upstream from the Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua, and 0.6 river mile (1.0 km) downstream from the American Dam. The zero of the gage is 3,712.30 feet (1,131.51 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: June 1938 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The operation of the American Dam began June 2, 1938. At this dam, part of the flow passing the El Paso Gaging Station is diverted into the American Canal; and the remainder, including excess flood flows, passes this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 11,300 second-feet (320 m<sup>3</sup>/sec) on September 14, 1958 with a gage height of 14.50 feet (4.42 m). Min. occasionally no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,040 (171)	May 20, 1942	Min. 0	
Monthly:	Max. 4,880 (138)	May 1942	Min. 0	Occasionally
Yearly:	Max. 1,510 (42.8)	1942	Min. 13.8 (0.39)	Occasionally 1956

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	59.1	3.5	2.4	188 *	186 *	159	208	197	100	1.2	1.2	1.1
2	59.2	3.2	2.4	200	163 *	221	197	200	104	1.2	1.2	1.1
3	* 59.3	2.9	2.4	204	168	238	208	198	103	1.2	1.2	1.1
4	59.3	2.6	2.4	208	181	220	220	198	104	1.2	1.2	1.1
5	59.3	* 2.3	2.5	208	176	218	227	202	105	1.2	1.2	1.1
6	59.3	2.3	2.5	208	166	220	220	212	105	1.2	1.2	1.1
7	59.3	2.3	2.5	198 *	165 *	218	220	210	104	1.2	1.2	1.1
8	57.5	2.3	2.5	194	170	212	208	203	102	1.2	1.2	1.1
9	57.5	2.3	2.5	198	168 *	210	212	201	105	1.2	1.2	1.1
10	57.5	2.3	2.5	211	170	201	212 *	194	110	1.2	1.2	1.1
11	57.5	2.3	2.5	220 *	172	210 *	212	194	120 *	1.2	1.2	1.1
12	57.5	2.3	* 2.5	215	167	207	209	223	112 *	1.2	1.2	1.1
13	57.5	2.3	3.3	210	160	205	213	250	112	1.2	1.2	1.1
14	57.5	2.3	4.1	202	157 *	203	202	310	112	1.2	1.2	1.1
15	57.5	2.4	4.9	205	155	208	206	216	82.8	1.2	1.2	1.1
16	57.5	2.4	5.7	205 *	152	201	203	181	3.0	1.2	1.1	1.1
17	38.9	2.4	6.4	206	153	210	203	184	2.5	1.2	1.1	1.0
18	7.7	2.4	7.2	207	157	196	208	192	2.3	1.2	1.1	1.0
19	7.4	2.4	8.0	208	158	216	204	192	2.3	1.2	1.1	1.0
20	7.1	2.4	8.8	212	155	210	204	192	2.1	1.2	1.1	1.0
21	6.8	2.4	* 9.6	209	156 *	207	198	193 *	1.8	1.2	1.1	1.0
22	6.5	2.4	10.2	210	157	208	198	196	1.4	1.2	1.1	1.0
23	6.2	2.4	10.7	211 *	155	209	199	206	1.4	1.2	1.1	1.0
24	5.9	2.4	25.5	210	159	207	203	206	1.2 *	1.2	1.1	1.0
25	5.6	2.4	11.8	209	161	200 *	219	200	1.2	1.2	1.1	1.0
26	5.3	2.4	* 12.4	208	159	208	211	204	1.2	1.2	1.1	1.0
27	5.0	2.4	12.4	204	160	208	212	197	1.2	1.2	1.1	1.0
28	4.7	2.4	118 *	207	158 *	212	212	187	1.2	1.2	1.1	1.0
29	4.4	2.4	187	206 *	159	223	196	176	1.2	1.2	1.1	1.0
30	4.1		191	205	160	216	193	179	1.2	1.2	1.1	1.0
31	3.8		191 *		158		193	117		1.2	1.2	1.0
<b>Sum</b>	1,051.7	71.2	857.6	6,186	5,041	6,281	6,430	6,210	1,606.0	37.2	34.5	32.6
<b>Current Year 1980</b>										<b>Period 1939-1980</b>		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	5.08		1 4	59.3	31 0	3.8	33.9	2,086	3,811	12,000	0	
Feb.			1 0	3.5	1 5	0 2.3	2.5	141	2,079	32,800	0	
Mar.	6.71		24	791	1 1	0 2.4	27.7	1,701	3,149	22,800	81.9	
Apr.	6.18	5.86	12	342	8	182	206	12,270	10,183	74,500	2,230	
May	5.93	5.59	1	238	23	142	163	9,999	15,717	300,000	25.2	
June	6.11	5.62	29	342	1	148	209	12,458	15,090	250,000	0	
July	6.21	5.72	5	403	28	182	207	12,754	14,413	155,000	967	
Aug.	6.11	5.14	14	358	31	93.7	200	12,317	13,675	114,000	37.5	
Sept.	5.83	4.10	7	199	124	0 1.2	53.5	3,185	9,732	124,000	53.8	
Oct.	4.18	4.08	1 1	0 1.2	1 1	0 1.2	1.2	73.8	1,889	19,000	18.0	
Nov.	4.14	4.10	1 1	0 1.2	1 1	0 1.1	1.2	68.4	1,259	8,700	0	
Dec.	4.14	4.09	1 1	0 1.1	1 1	0 1.0	1.1	64.7	911	7,760	0	
<b>Yearly</b>	6.71	4.08		791		0 1.0	92.5	67,117.9	91,908	1,093,553	10,001.1	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	2.05	1.24		22.4		0 0.03	2.62	82,790	113,369	1,348,898	12,336	

\* Discharge measurement made on this day    0 Mean daily    ! And other days

### DIVERSIONS FROM THE RIO GRANDE ACEQUIA MADRE AT CD. JUAREZ, CHIHUAHUA

**DESCRIPTION:** Bridge for making discharge measurements, gravity well, and water-stage recorder located on the right bank of the canal at Juarez, Chihuahua, latitude 31°45'40", longitude 106°30'30", about 260 feet (80 m) downstream from the canal intake at the International Dam at Juarez, Chihuahua, which is located at river mile 1,251.8 (2,014.7 km) and 2.1 river miles (3.4 km) downstream from the American Dam at El Paso, Texas.

**RECORDS:** Based on 77 discharge measurements during the year, 47 by the Mexican Section and 30 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1980. These records, showing the water actually diverted by Mexico, do not necessarily reflect the quantities of water made available to Mexico in the bed of the river by the United States under terms of the Convention of 1906. Such quantities of water are included in the record of "Rio Grande below American Dam at El Paso, Texas." See page 11 in this Water Bulletin.

**REMARKS:** In 1980 all of the 60,033 acre-feet (74,049,000 m<sup>3</sup>) tabulated below were distributed to land irrigated in the first unit under the canal.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 480 second-feet (13.6 m<sup>3</sup>/sec) on July 21, 1944 with a gage height of 6.00 feet (1.83 m). Min. no flow during several months throughout the year.

Average Flow in Second-Foot (Cubic Meters per Second)						
Daily:	Max.	339 (9.61)	May 10, 1942	Min.	0	Several months each year
Monthly:	Max.	283 (8.00)	May 1938	Min.	0	Several months each year
Yearly:	Max.	116 (3.28)	1942	Min.	9.2 (0.26)	1964

#### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	184 *	172	154	200	196 *	91.4	0	0	0
2	0	0	0	204 *	147 *	184	190	193	93.6	0	0	0
3	0	0	0	204	149	201	194	192	78.0	0	0	0
4	0	0	0	208	154	194	200 *	194	70.6	0	0	0
5	0	0	0	210	154	194 *	169	189	85.8	0	0	0
6	0	0	0	214	147 *	196 *	193	189 *	89.0	0	0	0
7	0	0	0	206 *	146 *	195	190 *	190	90.4	0	0	0
8	0	0	0	208	148 *	195	192	191 *	86.2	0	0	0
9	0	0	0	200 *	144	197 *	198	193	91.1	0	0	0
10	0	0	0	200	144	196	193	195	98.9	0	0	0
11	0	0	0	203 *	147	200	194 *	194	112 *	0	0	0
12	0	0	0	200	145	198 *	195	195	111 *	0	0	0
13	0	0	0	202	143	195 *	195	191 *	112	0	0	0
14	0	0	0	198 *	143 *	195	194	188	109	0	0	0
15	0	0	0	196	142	196	193	191	87.2	0	0	0
16	0	0	0	198 *	143 *	196 *	193 *	185	6.0	0	0	0
17	0	0	0	201	142	194	195	186	0	0	0	0
18	0	0	0	200	142	194 *	197 *	187 *	0	0	0	0
19	0	0	0	199	148	197	196	189	0	0	0	0
20	0	0	0	203	149	194	197	188 *	0	0	0	0
21	0	0	0	204 *	143 *	194	197 *	184 *	0	0	0	0
22	0	0	0	204	144 *	192	195	183 *	0	0	0	0
23	0	0	0	203 *	145 *	195 *	195 *	188	0	0	0	0
24	0	0	0	203 *	145	195	197	193	0	0	0	0
25	0	0	0	207 *	144 *	196 *	202	189 *	0	0	0	0
26	0	0	0	208	145	196	199	193	0	0	0	0
27	0	0	0	205	145	197	197	193	0	0	0	0
28	0	0	* 79.1	206 *	144 *	197	194	181	0	0	0	0
29	0	0	155	207	145	201	191	178 *	0	0	0	0
30	0	0	156	207	145 *	203	193 *	178	0	0	0	0
31	0	0	159 *	207	145	203	193	147	0	0	0	0
<b>Sum</b>	0	0	549.1	6,092	4,539	5,831	6,021	5,823	1,412.2	0	0	0

Current Year 1980								Period 1938-1980			
Month	Average Rainfall Inches**		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Acre-Feet			
	1938-1980	1980	Day	High	Low			Average	Maximum	Minimum	
Jan.	0.40	0.37		0	0	0	0	0	0	0	
Feb.	.35	.50		0	0	0	0	0	0	0	
Mar.	.24	.16	31	164	! 1	0	17.7	1,088	1,178	6,482	
Apr.	.17	.22	6	221	1	163	203	12,088	7,909	12,383	
May	.33	.08	1	205	7	138	146	9,001	8,774	17,380	
June	.66	0	30	208	1	152	194	11,564	8,264	15,700	
July	1.55	.22	1	205	5	127	194	11,941	8,470	15,170	
Aug.	1.33	1.46	13	201	31	147	188	11,549	8,262	12,620	
Sept.	1.26	3.01	13	125	116	0	47.0	2,802	4,423	12,380	
Oct.	.77	.82		0	0	0	0	0	35.7	328	
Nov.	.31	.40		0	0	0	0	0	0	0	
Dec.	.43	.04		0	0	0	0	0	0	0	
<b>Yearly</b>	7.80	7.28		221		0	82.6	60,033	47,315.7	83,930	6,653
	Millimeters		Cubic Meters per Second			Thousands of Cubic Meters					
	198	185		6.27		0	2.34	74,049	58,365	103,511	8,207

\* Discharge measurement made on this day ! And other days  
 \*\* Average for valley floor in United States and Mexico from El Paso to Clint Station

**RIO GRANDE NEAR CLINT, TEXAS  
AND SAN AGUSTIN, CHIHUAHUA**

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31° 32' 00", longitude 106° 14' 35", and river mile 1,226.9 (1,974.5 km); 0.7 river mile (1.1 km) downstream from the Riverside Canal Wasteway No. 2, about 4 miles (6.4 km) south southwest of Clint, Texas, and 27.1 river miles (43.5 km) downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,608.99 feet (1,100.02 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 12 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: August 17, 1938 through 1980. Records prior to 1976 were published under the title "Rio Grande - Island Station near Clint, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 7,050 second-feet (200 m<sup>3</sup>/sec) on September 14, 1958 with a gage height of 15.80 feet (4.82 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 6,140 (174)	May 19, 1942	Min. 0	Frequently
Monthly:	Max. 4,880 (138)	May 1942	Min. 0	Frequently
Yearly:	Max. 1,490 (42.2)	1942	Min. 0.3 (0.01)	1956

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	9.9	0	0	0	0	10.6	5.8	4.2
2	0	0	0	0	9.5	0	0	0	0	10.6	4.8	1.4
3	0	0	0	* 4.9	8.8	0	0	0	0	10.6	3.9	1.4
4	* 0	0	0	3.9	8.5	0	0	0	0	10.6	* 3.0	1.4
5	0	0	0	2.8	7.8	0	0	0	0	8.8	2.8	1.4
6	0	0	* 0	2.1	7.4	0	0	0	0	7.1	2.7	1.4
7	0	* 0	0	1.1	6.7	0	0	0	.4	5.3	2.5	1.4
8	0	0	0	0	6.4	0	0	0	3.5	3.5	2.3	1.4
9	0	0	0	0	6.0	0	0	0	10.6	1.8	2.2	1.4
10	0	0	0	0	5.3	0	0	0	8.8	.4	2.0	1.4
11	0	0	0	0	4.9	0	0	0	7.1	0	1.8	1.4
12	0	0	0	0	4.2	0	0	0	5.3	0	1.7	1.4
13	0	0	0	0	3.9	0	0	40.6	4.2	0	* 1.5	1.4
14	0	0	0	0	3.2	0	0	83.3	3.5	0	1.5	1.4
15	0	0	0	0	* 2.8	0	0	24.4	2.8	0	1.5	1.4
16	0	0	0	0	2.5	0	0	3.5	1.8	0	1.5	1.4
17	0	0	0	0	2.5	0	0	2.1	1.1	0	1.5	2.5
18	0	0	0	* 0	2.1	0	0	1.8	.4	0	1.5	1.4
19	0	0	0	0	2.1	0	0	* 1.4	0	0	2.1	6.0
20	0	0	* 0	0	1.8	0	0	1.1	0	0	2.8	6.4
21	0	0	0	0	1.4	0	0	.4	0	0	1.4	9.5
22	0	0	0	0	1.4	0	0	0	0	0	1.4	4.6
23	0	0	0	0	1.1	0	0	0	0	0	1.4	2.8
24	* 0	0	0	0	1.1	0	0	0	0	0	1.4	5.3
25	0	0	0	0	.7	0	0	0	.7	0	1.4	6.7
26	0	0	0	0	.4	0	0	0	3.5	0	4.6	7.8
27	0	0	0	0	.4	0	0	0	5.3	10.6	9.5	7.8
28	0	0	0	0	0	0	0	0	7.1	9.5	6.4	6.4
29	0	0	0	0	* 0	0	0	0	8.8	8.5	8.5	6.4
30	0	0	0	0	0	0	0	0	10.6	7.8	9.5	9.5
31	0	0	0	0	0	0	0	0	0	6.7	6.7	10.6
Sum	0	0	0	14.8	112.8	0	0	158.6	85.5	112.4	94.9	118.9

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1939-1980		
	High	Low	Day	High		Low			Average	Maximum	Minimum
				Day	Day						
Jan.				0		0	0	3,754	11,900	0	
Feb.				0		0	0	2,435	37,000	0	
Mar.				0		0	0	1,955	21,000	0	
Apr.			3	0 4.9	1 1	0	.4	29.4	2,905	70,500	0
May			1	0 9.9	128	0	3.5	224	8,350	299,800	0
June				0		0	0	0	7,175	241,000	0
July				0		0	0	0	7,373	118,500	0
Aug.	11.68		14	215	1 1	0	4.9	315	6,847	99,400	0
Sept.	9.28		1 9	0 10.6	4 1	0	2.8	169	7,446	119,200	0
Oct.			1 1	0 10.6	111	0	3.5	223	3,539	42,800	0
Nov.	9.42		30	9.5	113	0 1.4	3.2	188	1,026	7,270	0
Dec.	9.48		130	11.7	1 2	0 1.4	3.9	236	1,743	12,900	0
Yearly	11.68			215		0	1.91	1,384.4	54,548	1,079,340	238.1
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	3.56			6.09		0	0.05	1,708	67,285	1,331,366	294

\* Discharge measurement made on this day      0 Mean daily      ! And other days

## RIO GRANDE NEAR ACALA, TEXAS AND PRADEXES GUERRERO, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31°22'50", longitude 105°59'10", and river mile 1,206.7 (1,942.0 km); 0.8 river mile (1.3 km) downstream from the El Paso-Hudspeth County Line, 5.5 miles (8.9 km) northwest of Acala, Texas, about 8 miles (12.9 km) southeast of Tornillo, Texas, and 47.2 river miles (76.0 km) downstream from the American Dam at El Paso, Texas. The zero of the gage is 3,547.59 feet (1,081.31 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 11 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1938 through 1980. Records prior to 1976 were published under the title "Rio Grande - County Line Station near Acala, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 6,340 second-feet (180 m<sup>3</sup>/sec) on May 19, 1942 with a gage height of 8.66 feet (2.64 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 6,180 (175)	May 18, 1942	Min. 0	Frequently
Monthly:	Max. 4,920 (139)	May 1942	Min. 0	Frequently
Yearly:	Max. 1,720 (48.7)	1942	Min. 0	1956 & 1964

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	0	6.4	0	0	209	75.6	45.6
2	0	0	0	45.2	0	0	49.8	0	0	160	75.9	45.6
3	0	0	0	19.1	0	29.3	23.7	0	0	145	75.9	* 45.6
4	* 0	0	0	.4	0	3.2	1.4	0	0	139	76.3	45.6
5	0	0	0	0	.4	1.1	0	0	0	135	76.3	45.2
6	0	0	* 0	0	44.1	.7	0	0	0	104	* 76.6	45.2
7	0	* 0	0	10.2	9.9	0	0	0	0	105	76.6	45.2
8	0	0	0	8.5	1.4	0	0	0	215	97.1	74.2	44.8
9	0	0	0	.4	0	0	0	0	282	132	73.1	44.8
10	0	0	0	0	0	0	7.8	0	255	92.5	72.0	44.8
11	0	8.1	0	0	0	0	1.8	0	251	74.9	71.0	44.5
12	0	0	0	0	0	0	0	0	196	75.2	69.6	44.5
13	0	0	0	11.7	0	0	0	0	72.7	59.7	68.5	44.5
14	0	0	0	29.7	0	0	0	165	86.2	44.1	67.5	44.1
15	0	0	0	14.5	* 0	0	5.3	260	170	42.7	66.4	44.1
16	0	0	0	.7	0	0	8.8	225	162	32.8	65.0	44.1
17	0	0	0	13.1	0	0	.4	205	157	20.5	63.9	43.8
18	0	0	0	20.5	0	0	0	122	53.0	16.2	62.9	* 43.8
19	0	0	0	3.5	0	0	0	* 35.3	.4	15.9	61.8	40.3
20	0	0	0	0	0	0	0	16.2	0	68.2	60.4	36.4
21	0	0	0	0	0	0	0	8.8	0	79.5	59.3	32.8
22	0	0	0	0	0	0	0	.7	0	73.1	58.3	29.3
23	0	0	0	0	0	7.4	0	0	0	* 51.9	57.2	25.4
24	0	0	0	0	0	21.9	0	0	0	41.7	55.8	21.9
25	0	0	0	0	2.1	5.6	0	0	0	56.2	54.7	18.4
26	0	0	* 0	0	37.1	0	0	0	17.3	38.1	53.7	14.5
27	0	0	0	0	1.8	0	0	0	240	41.3	52.6	10.9
28	0	0	0	0	0	0	0	24.4	213	49.8	51.2	7.4
29	0	0	0	0	* 0	0	0	22.5	224	49.8	50.1	3.5
30	0	0	0	0	0	0	0	0	238	49.8	49.1	0
31	0	0	0	0	0	0	0	0	0	49.8	49.8	0
Sum	0	8.1	0	177.5	96.8	69.2	105.4	1,064.9	2,832.6	2,349.8	1,951.5	1,046.6

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1938-1980		
	High	Low	Day	High	Low	Day			Acre-Feet	Average	Maximum
							Day	Day		Day	
Jan.			11	0	0	0	0	4,895	20,000	0	
Feb.	1.08			17.3	! 1	0	.4	16.1	4,054	47,900	0
Mar.				0	0	0	0	0	3,604	38,900	0
Apr.			2	Ø 45.2	! 1	0	6.0	352	5,376	84,200	0
May	1.94		6	89.3	! 1	0	3.2	192	10,359	303,000	0
June	1.74		3	66.0	! 1	0	2.1	136	9,163	239,000	0
July	1.67		2	59.0	! 5	0	3.5	208	9,779	140,000	0
Aug.	4.27		15	353	! 1	0	34.3	2,114	9,209	123,000	0
Sept.	4.23		! 8	347	! 1	0	94.3	5,617	11,822	140,000	0
Oct.	3.38		1	239	19	8.8	75.9	4,658	7,220	61,400	0
Nov.			! 6	Ø 76.6	30	Ø 49.1	65.0	3,869	4,604	20,400	0
Dec.			! 1	Ø 45.6	! 30	0	33.9	2,076	5,079	29,700	0
Yearly	4.27			353		0	26.4	19,238.1	85,164	1,247,500	0
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	1.30			10.0		0	0.75	23,730	105,050	1,538,791	0

\* Discharge measurement made on this day      Ø Mean daily      ! And other days

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank of the rectified channel of the Rio Grande at latitude 31°05'10", longitude 105°36'30", and river mile 1,173.2 (1,888.1 km); 1.5 river miles (2.4 km) downstream from Old Fort Quitman, 9 miles (14.5 km) southeast of Esperanza, Texas, and 17.5 miles (28.2 km) southeast of McNary, Texas. The zero of the gage is 3,450.57 feet (1,051.73 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 18 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 10,600 second-feet (300 m<sup>3</sup>/sec) October 5, 1946 with a gage height of 10.00 feet (3.05 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)**			
Daily:	Max. 5,890 (167)	May 19, 1942	Min. 0
Monthly:	Max. 5,030 (142)	May 1942	Min. 0
Yearly:	Max. 1,750 (49.6)	1942	Min. 2.3 (0.07)
			Frequently 1965
			Several months since 1951

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23.7	20.8	17.3	2.8	12.0	20.1	17.3	17.7	170	302	156	99.9
2	22.2	21.9	18.0	2.8	13.8	18.7	* 13.1	15.2	171	298	159	* 99.2
3	20.5	23.3	18.7	* 7.1	15.5	18.7	14.1	12.4	171	295	155	98.9
4	* 19.1	24.7	19.4	7.4	17.0	19.1	15.2	9.9	171	292	152	98.9
5	18.7	25.8	20.1	7.8	18.7	19.1	16.6	7.4	410	289	155	98.5
6	18.0	26.8	* 20.8	7.8	16.2	16.6	17.7	7.4	431	285	152 *	98.5
7	17.7	* 28.3	27.9	8.1	13.4	14.1	18.7	7.8	396	282	151	98.2
8	17.3	26.8	35.0	6.4	10.9	12.0	18.7	7.8	396	279	151	98.2
9	17.0	25.8	42.0	4.6	15.5	9.5	18.7	8.1	396	218 *	150	97.8
10	16.2	24.7	49.1	2.8	20.1	9.5	18.7	8.1	396 *	218	143	97.8
11	15.9	23.3	56.2	4.9	24.7	9.5	18.7	8.1	381	207	142	97.5
12	15.5	22.2	35.7	7.4	29.3	9.5	18.7	8.1	364	206	142	103
13	14.8	20.8	20.5	9.5	25.1	9.5	18.7	12.9	360	196	134	103
14	14.5	19.8	19.4	11.7	20.8	9.5	18.7	367	360	195	133	108
15	14.1	18.7	18.4	8.8	* 16.6	9.9	18.7	305	351	195	133	108
16	13.8	17.3	17.3	5.6	19.8	9.9	18.7	286	335	194	126	114
17	13.4	16.2	16.2	2.8	23.3	13.1	18.7	274	320	184	126	114
18	13.0	14.8	15.9	* 8.8	26.5	15.9	18.7	269	315	193	125	114 *
19	12.7	13.8	15.2	16.2	29.7	19.1	18.7	263 *	300	183	124	108
20	12.4	12.4	* 14.8	23.7	26.1	19.1	18.7	259	285	183	118	108
21	12.0	* 11.3	11.7	31.1	22.2	19.1	18.7	238	271	182	117	102
22	11.7	12.0	8.8	24.7	18.7	19.1	18.7	218	260	182	117	102
23	11.3	12.7	6.0	18.0	20.8	19.1	18.7	203	250	181 *	116	103
24	* 10.9	13.4	2.8	11.7	22.6	15.9	18.7	194	239	187	109	103
25	12.0	14.1	4.2	11.7	24.7	13.1	19.1	175	265	173	109	97.5
26	13.4	14.8	5.7	11.7	26.5	9.9	19.8	347	590	178	108	91.8
27	14.8	15.5	7.1	11.7	28.6	11.7	20.5	253	660	165	108	92.2
28	15.9	15.9	6.0	11.7	26.5	13.1	20.8	196	344	160	107	87.2
29	17.3	16.6	4.9	11.7	* 24.4	14.1	20.5	183	322	165	107	87.2
30	18.4		3.9	11.7	23.0	15.5	20.5	178	317	161	100	87.6
31	19.8		2.8		21.5		20.1	174		157		82.6
Sum	488.0	554.5	561.8	312.7	654.5	433.0	571.9	4,629.0	9,997	6,585	3,925	3,099.5

Current Year 1980										Period 1938-1980				
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet					
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum			
Jan.			1	0	23.7	24	0	10.9	15.9	968	5,709	20,900	0	
Feb.			7	0	28.3	21	0	11.3	19.1	1,100	4,816	50,100	0	
Mar.			11	0	56.2	124	0	2.8	18.0	1,115	3,764	38,900	0	
Apr.			21	0	31.1	1	1	0	2.8	10.6	620	4,684	77,000	0
May			19	0	29.7	8	0	10.9	21.2	1,299	11,029	309,000	0	
June			1	0	20.1	1	9	9.5	14.5	859	9,832	240,000	0	
July			28	0	20.8	2	0	13.1	18.4	1,135	11,357	140,000	3.8	
Aug.			13	0	1,390	1	5	0	7.4	149	9,185	11,489	127,000	16.7
Sept.	6.89	4.33	26	0	971	1	170	333	333	19,823	15,658	147,000	0	
Oct.	5.51	5.25	1	302	31	157	212	212	13,058	11,327	66,500	0		
Nov.	5.35	5.15	2	159	30	100	131	7,784	7,307	24,500	0	0		
Dec.	5.25	5.05	116	118	31	82.6	99.9	6,152	7,346	31,000	0	0		
Yearly				0	1,390		0	2.8	86.9	63,098	104,318	1,270,400	1,662.3	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters							
					39.4			0.08	2.46	77,831	128,676	1,567,038	2,050	

\*\* Period 1924-1980

\* Discharge measurement made on this day

0 Mean daily

! And other days

**RIO GRANDE NEAR CANDELARIA, TEXAS  
AND SAN ANTONIO DEL BRAVO, CHIHUAHUA**

**DESCRIPTION:** Cableway, gravity well, and digital recorder located on the left bank of the Rio Grande at San Antonio Diversion Dam, latitude 30°10'30", longitude 104°41'10" and river mile 1,038.8 (1,671.8 km), 0.5 river mile (0.8 km) upstream from Capote Creek and about 2.5 miles (4.0 km) north of Candelaria, Texas and San Antonio, Chihuahua. The zero of the gage is 2,857.96 feet (871.11 m) above mean sea level, U.S.C. & G.S. datum.

**RECORDS:** Based on 26 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: November 19, 1975 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the flow at this station. An auxiliary well, located 300 feet (91 m) upstream, is used to record extreme low flows. Prior to June 1979 the zero of the gage was 2,857.84 feet (871.07 m) above mean sea level, U.S.C. & G.S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 19,800 second-feet (561 m<sup>3</sup>/sec) on September 30, 1978 with a gage height of 10.86 feet (3.31 m). Min. frequently no flow.

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	* 37.9	22.8	17.0	1.4	0	0	* 0	0	20.1	183	93.9	83.7
2	36.2	22.9	15.5	* 1.4	* 0	0	0	0	14.5	208 *	94.3	* 97.5
3	35.6	22.9	15.9	0	0	0	0	0	17.7	271	94.6	92.5
4	36.3	23.0	16.2	.4	0	* 0	0	0	* 14.1	271	99.6	103
5	36.9	23.1	* 15.9	.4	0	0	0	* 0	64.3	271	105	108
6	37.0	* 23.1	15.9	0	0	0	0	0	14.8	283	105	108
7	37.0	23.2	15.9	0	0	0	0	0	67.5	252	100	103
8	34.8	24.7	15.5	0	0	0	0	1.4	24.0	254	95.3	98.2
9	31.4	25.3	15.2	0	* 0	52.3	34.6	0	19.4	192	100	98.2
10	29.4	24.4	14.8	0	0	10.9	4.9	0	74.5	202	101	93.2
11	26.9	24.1	14.8	0	0	7.4	.4	9.2	81.2	270	101	93.6
12	26.4	24.2	14.5	0	0	1.8	0	63.9	50.1	207	96.1	* 93.6
13	26.5	24.7	14.5	0	0	0	0	1.8	38.5	170	91.1	98.5
14	26.5	22.2	* 14.1	0	0	0	0	* 0	37.1	149	* 91.5	103
15	26.6	21.4	12.7	0	0	0	0	0	123 *	133 *	91.5	98.5
16	26.1	21.5	13.1	* 0	0	0	* 0	0	69.2	124	106	98.5
17	26.2	21.6	15.9	0	0	0	0	0	78.8	108	96.4	98.5
18	26.2	20.9	14.8	0	0	0	0	0	78.4	108	96.4	98.5
19	25.8	20.1	9.9	0	0	0	0	2.8	88.3	97.5	91.5	98.5
20	25.9	20.2	8.8	0	0	* 0	0	44.5	105	141	86.9	93.6
21	25.9	20.3	8.8	0	0	0	0	27.9	105	92.9	86.9	93.6
22	26.0	19.5	7.4	0	69.6	0	0	11.3	104	87.9	91.1	88.6
23	25.5	18.7	5.7	0	.4	0	0	6.4	104	83.7	91.1	88.6
24	25.6	18.8	6.0	0	0	0	0	.7	190	79.5	96.1	84.4
25	25.2	18.9	4.6	0	0	0	0	33.5	* 61.4	79.5	* 96.1	80.2
26	25.3	18.1	6.0	0	0	0	0	23.3	53.7	88.3	90.8	84.8
27	25.3	17.4	* 6.0	0	0	0	0	41.7	152	88.3	90.1	89.0
28	24.9	17.6	4.9	0	0	0	0	* 25.4	410	98.5	89.7	93.9
29	24.1	17.7	2.1	0	0	0	0	16.6	249	* 98.5	89.0	89.0
30	23.2	2.1	0	0	0	0	0	16.6	154	88.6	98.5	84.8
31	22.8	1.8	0	0	0	0	0	18.4	88.6	88.6	98.5	84.8
Sum	889.4	623.3	346.3	4.3	70.0	72.4	39.9	412.9	2,672.7	4,828.8	2,856.5	2,921.8
Current Year 1980										Period Dec. 1975-1980		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	3.06		1	39.1	31	0 22.8	28.7	1,764	3,238	7,415	0	
Feb.			9	0 25.3	27	0 17.4	21.5	1,236	1,791	3,396	0	
Mar.	2.66	2.23	16	18.4	31	1.4	11.3	687	945	1,518	0	
Apr.	2.26		1	2.1	6	0	.1		686	2,505	8.4	
May	4.36		22	313	1	1	0	139	1,745	5,031	0	
June	4.17		9	254	1	1	0	2.5	143	2,966	143	
July	5.58		9	1,510	1	1	0	1.4	79.1	2,670	79.1	
Aug.	4.04		7	218	1	1	0	13.4	819	3,852	6,699	
Sept.	5.15	2.36	10	989	5	.4	89.0	5,299	30,815	135,232	362	
Oct.	4.66	3.48	11	360	124	79.5	156	9,577	15,495	57,823	435	
Nov.	3.74	3.31	16	123	29	60.7	95.3	5,665	5,130	10,241	0	
Dec.	3.67	3.48	7	108	25	80.2	94.3	5,797	4,743	11,506	0	
Yearly	5.58			1,510		0	43.0	31,213.5	74,076	214,936	15,148	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	1.70			42.8		0	1.22	38,502	91,373	265,124	18,685	

\* Discharge measurement made on this day    Ø Mean daily    ! And other days    # Estimated

**RIO GRANDE ABOVE RIO CONCHOS NEAR PRESIDIO, TEXAS  
AND OJINAGA, CHIHUAHUA**

**DESCRIPTION:** Cableway, bubbler gage, and digital water-stage recorder located on the left bank at latitude 29°36'15", longitude 104°27'05", and river mile 963.7 (1,551.0 km); 5.0 river miles (8.0 km) upstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua and 2.4 river miles (3.8 km) upstream from the Rio Conchos. The zero of the gage is 2,573.14 feet (784.29 m) above mean sea level, U.S.C. & G.S. datum.

**RECORDS:** Based on 58 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1889 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Prior to 1978 the zero of the gage was 2,576.66 feet (785.37 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 14,000 second-feet (396 m<sup>3</sup>/sec) on June 14, 1905. Highest flow recorded since 1924 was 5,160 second-feet (146 m<sup>3</sup>/sec), with a gage height of 10.57 feet (3.22 m), on May 26, 1942. Min. frequently no flow.

		Average Flow in Second-Foot (Cubic Meters per Second)**				
Daily:	Max. 13,700 (388)	June 13 & 14, 1905	Min. 0			
Monthly:	Max. 10,150 (287)	June 1905	Min. 0	Frequently		
Yearly:	Max. 1,970 (55.8)	1907	Min. 1.3 (0.04)	Frequently 1964		

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.1	16.1	6.0	11.3	15.5	1.8	2.5	7.4	4.9	61.1	44.5	53.4
2	20.4	18.0	5.3	* 5.3	* 10.6	1.1	6.0	5.3	5.3	* 63.2	43.8	* 56.5
3	* 20.9	15.5	7.4	3.5	14.1	1.4	4.2	3.9	* 6.4	73.5	47.0	57.2
4	24.8	* 16.7	* 7.4	2.8	13.1	.7	5.7	* 4.2	9.9	86.5	* 46.6	56.2
5	30.2	15.1	4.6	8.5	* 12.0	1.1	7.4	6.0	10.2	70.6	46.3	55.4
6	27.3	17.0	3.9	9.9	14.8	10.2	* 7.8	6.4	8.5	* 71.7	42.4	57.9
7	* 28.0	17.8	4.2	13.1	14.8	7.8	* 12.0	6.0	10.6	73.5	46.3	60.4
8	21.5	13.6	3.5	* 11.3	14.8	30.4	10.6	6.0	* 10.6	79.1	45.9	* 59.3
9	19.9	11.9	4.2	10.2	11.3	* 12.7	12.0	9.2	9.2	94.3	45.6	67.8
10	23.0	13.0	* 10.2	9.2	6.4	3.9	7.8	14.8	11.7	121	* 45.6	72.4
11	30.0	* 13.6	7.8	10.9	8.1	3.5	8.8	* 93.9	12.7	133	41.7	76.6
12	29.0	15.3	12.0	8.8	10.9	5.3	10.2	325 *	9.5	135	45.6	78.4
13	32.8	15.9	7.4	13.4	* 12.0	4.6	10.2	501	9.5	143	48.7	79.1
14	30.9	17.0	6.4	31.8	12.4	3.9	19.4	692 *	8.1	138	51.9	79.8
15	* 21.6	17.6	11.7	* 21.9	9.9	3.9	* 17.0	713 *	7.4	152 *	55.4	76.3
16	27.2	16.4	14.1	17.3	11.7	* 4.9	15.2	569	* 7.1	164	55.4	* 68.5
17	28.3	15.8	18.4	15.2	12.0	4.2	13.8	367	8.1	151	66.7	60.0
18	28.4	16.9	* 13.8	11.7	8.5	4.2	10.9	137 *	9.2	122	* 62.9	58.6
19	25.0	* 17.5	9.5	9.9	12.7	3.5	9.5	57.2	8.5	102	55.4	* 66.0
20	20.4	14.1	5.3	14.1	* 13.1	3.5	8.1	154	8.1	106	55.1	75.6
21	* 19.8	16.3	3.9	13.8	6.7	5.3	* 8.5	118	* 6.4	106	51.6	71.3
22	* 16.6	14.9	0	* 10.2	4.6	6.4	7.8	32.5	* 8.5	91.1	48.4	* 68.2
23	16.6	10.8	0	10.2	6.0	* 6.4	7.8	14.5	7.8	90.8	51.2	67.1
24	19.9	10.5	0	5.7	6.4	3.2	8.1	8.8	40.6	86.2	* 51.2	70.6
25	16.6	* 12.1	3.2	6.4	6.4	1.8	6.7	* 7.4	35.3	81.2	48.7	69.9
26	15.4	12.7	* 4.9	10.2	6.0	1.4	9.5	5.6	54.0	* 76.3	46.6	65.3
27	12.9	9.2	7.1	10.2	4.9	2.1	11.3	5.6	37.8	* 68.2	50.9	64.6
28	18.5	6.2	4.2	* 10.2	* 1.4	1.8	* 16.2	5.3	149	60.4	48.4	60.7
29	18.0	7.7	2.8	11.7	3.8	.7	14.0	5.3	121 *	53.0	49.1	* 60.0
30	14.9		7.4	13.4	2.1	* 1.4	13.4	4.9	83.7	45.2	53.3	53.7
31	14.2		* 10.2		1.6		13.1	4.9		44.8		57.2
Sum	692.1	415.2	206.8	342.1	288.6	143.1	315.5	3,891.1	719.6	2,943.7	1,492.2	2,024.0

Month	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Period 1938-1980			
	High	Low	High	Day	Low			Average	Maximum	Minimum	
	High	Low	Day	Day	Day	Acre-Feet	Average	Maximum	Minimum		
Jan.	1.98	1.65	13	33.7	27	10.6	22.3	1,373	5,228	24,400	0
Feb.	1.81	1.57	2	20.0	28	6.2	14.3	824	4,241	40,800	0
Mar.	1.84	1.21	17	20.8	122	0	6.7	410	3,022	39,100	0
Apr.	2.00	1.44	14	38.5	4	2.8	11.3	679	2,225	41,600	0
May	1.80	1.31	3	20.1	31	.7	9.2	570	7,702	240,000	0
June	4.07	1.18	8	338	1	.7	4.6	284	8,277	216,000	0
July	1.94	1.38	14	29.7	1	2.1	10.2	626	10,938	156,000	0
Aug.	5.51	1.38	14	862	3	3.9	126	7,720	11,160	133,000	0
Sept.	4.23	1.35	28	360	2	4.6	24.0	1,428	15,262	151,000	0
Oct.	2.89	2.03	16	170	31	41.0	95.0	5,839	14,174	105,000	0
Nov.	2.30	2.00	17	66.7	11	34.3	49.8	2,959	5,588	34,500	0
Dec.	2.53	2.13	21	102	8	49.1	65.3	4,017	5,536	30,900	0
Yearly	5.51	1.18		862		0	36.8	26,729	93,353	1,176,700	951.8
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	1.68	0.36		24.4		0	1.04	32,970	115,151	1,451,459	1,174

\*\* Period June 1900-March 1914; September 1919-March 1920; and 1924-1980  
 \* Discharge measurement made on this day

**RIO CONCHOS NEAR OJINAGA, CHIHUAHUA**

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the right bank at latitude 29° 34' 55", longitude 104° 25' 50", 0.6 river miles (1.0 km) from the confluence with the Rio Grande, 2.5 miles (4 km) northwest of Ojinaga, Chihuahua, and 3.7 miles (6 km) northwest of Presidio, Texas. This stream enters the Rio Grande at river mile 961.4 (1,547.2 km), 11.6 river miles (18.7 km) upstream from the "Rio Grande below Rio Conchos" Gaging Station. The zero of the gage is 2,560.37 feet (780.40 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 108 discharge measurements during the year, 106 by the Mexican Section and 2 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1896 through 1980. Prior to April 4, 1954, flow records were determined from records of the Rio Grande at stations located upstream and downstream from the Rio Conchos confluence.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. La Boquilla Reservoir, La Colina Reservoir, La Rosetilla Reservoir, and Luis L. Leon Reservoir are located 252 (405), 244 (393), 188 (302), and 114 (183) river miles (km), respectively, upstream from this station. Francisco I. Madero Reservoir is located on the Rio San Pedro, a tributary which enters the Rio Conchos 176 river miles (283 km) upstream from this station. Power generation facilities: La Boquilla 14,647 kw., La Colina 3,620 kw., La Rosetilla 5,150 kw., Francisco I. Madero and Luis L. Leon, none. The station was relocated on January 20, 1978 incident to the Rio Grande channel rectification in the Presidio-Ojinaga area.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 162,000 second-feet (4,590 m<sup>3</sup>/sec) on September 11, 1904.  
Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 52,600 (#1,490)	Oct. 1, 1978	Min. 23.0 (0.65)	Dec. 19, 1973
Monthly:	Max. 10,700 (302)	Oct. 1978	Min. 57.9 (1.64)	Feb. 1968
Yearly:	Max. 2,340 (66.4)	1978	Min. 639 (18.1)	1971

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	308	271	337	650	632 *	445	151	238	459	2,730	487	406 *
2	309	266	314	639	685	396	121	228	470 *	2,740	480	406 *
3	304 *	247	262 *	632 *	1,450	374 *	259 *	235	636	3,080 *	473 *	406 *
4	298	247	227	636	1,500	345	274	204 *	2,040 *	2,840	459	406 *
5	300	261	303	650	1,530 *	219 *	299	83.3	2,320 *	2,140	456	406 *
6	300	277	364 *	660	1,510	145	339	145	2,370	1,940 *	569 *	406 *
7	309 *	278 *	618	675 *	1,450	112	371 *	132 *	2,170	1,890	530	403
8	302	284	657	667	1,380 *	331	360	151	2,380 *	1,880	516	314 *
9	298	285	678	653	1,350	181 *	339	132	2,560	1,880 *	498	247
10	295 *	287	717 *	586	1,320	203	343 *	132	2,170	1,250	487 *	216
11	295	286 *	713	604 *	1,300	177	340	1,250	3,070 *	752	477	199 *
12	293	277	731	614	1,280 *	177 *	344	8,440 *	4,310 *	682	463	194
13	297	285	706 *	653	1,230	184	381	8,260 *	3,420	600 *	459 *	181
14	298 *	289 *	699	660 *	1,180	159	417	7,130	3,020	544	586	274
15	283	287	703	675	1,470 *	141	403	3,880 *	2,210 *	505	579	305 *
16	277	290	735	667	1,450	131 *	410	1,250 *	1,880	501 *	547	322
17	279 *	284	727 *	646 *	1,410	124	371 *	982	876	501	565	353
18	284	284 *	710	643	1,370	107	279 *	1,720 *	600 *	501	547	406 *
19	284	287	692	646	1,330 *	88.3	268	1,660	487	501	526	448
20	291	284	685 *	664	1,280	70.6	249	2,190 *	445	742	494 *	530
21	298 *	277 *	682	706 *	1,340	66.7	250 *	2,560	410	579 *	424	445
22	284	275	724	710	1,350 *	78.4	238	1,120 *	388 *	530	410	441 *
23	283	277	717	685	1,290 *	42.7	238	593	388	519	403	427 *
24	281 *	287	692 *	650 *	1,240	46.3	269 *	664	999	516	406 *	441
25	275	291 *	689	636	1,150	43.8	308	540 *	2,750	516 *	417	434 *
26	272	286	682	646	978 *	46.3	304	399	2,800	516	388	431
27	272	289	657 *	653	784	38.5	263	353 *	4,270	516	388 *	431
28	272 *	289 *	625	671 *	667	30.0	277 *	300	6,750	501	388	431
29	272	298	604	625	533 *	24.0	286	291 *	5,900	494 *	388	438 *
30	272	282	622	639	491	44.1	258	344	4,270	484	388	441
31	272 *	287	639 *	636	487		240 *	424		463 *		441
Sum	8,957	8,125	18,911	19,541	36,417	4,570.7	9,249	46,030.3	66,818	33,833	14,198	11,629

Month	Current Year 1980						Period 1968-1980					
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	2.92	2.76	7	335	126	261	289	17,762	38,167	131,293	14,390	
Feb.	2.89	2.69	29	318	12	247	280	16,115	32,856	124,386	3,336	
Mar.	3.54	2.62	22	802	3	201	611	37,507	52,396	201,219	4,171	
Apr.	3.77	3.02	121	717	10	459	650	38,763	44,627	89,875	5,565	
May	4.30	3.05	3	1,590	29	459	1,180	72,280	49,328	123,749	10,932	
June	3.48	2.03	8	830	30	21.2	152	9,061	47,702	139,972	6,000	
July	3.15	2.46	13	466	2	113	298	18,346	64,872	154,562	18,346	
Aug.	12.89	2.26	12	14,100	5	63.6	1,490	91,360	101,413	243,660	31,728	
Sept.	11.15	2.85	28	11,200	122	388	2,230	132,526	168,002	468,680	17,892	
Oct.	5.74	2.95	3	3,250	31	459	1,090	67,097	121,745	655,967	16,883	
Nov.	3.44	2.62	14	865	126	388	473	28,165	45,985	137,415	7,484	
Dec.	3.38	2.43	118	812	110	106	374	23,073	28,944	51,114	13,724	
Yearly	12.89	2.03		14,100		21.2	759	552,055	796,037	1,698,395	463,767	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	3.93	0.62		400		0.60	21.5	680,953	981,901	2,094,945	572,051	

\*\* Period 1968-1980

\* Discharge measurement made on this day

! And other days

**ALAMITO CREEK NEAR PRESIDIO, TEXAS**

**DESCRIPTION:** Gravity well and water-stage recorder located on the left bank 300 feet (91.4 m) upstream from the highway bridge on Farm-to-Market Road 170 at latitude 29°31'25", longitude 104°17'15", about 2,000 feet (610 m) from the confluence with the Rio Grande, and about 6 miles (9.7 km) southeast of Presidio, Texas. This stream enters the Rio Grande near the lower end of the Presidio Valley at river mile 950.1 (1,529.1 km), 8.6 river miles (13.8 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. Measurements of high flows are made from the highway bridge. The zero of the gage is 2,541.61 feet (774.68 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 62 discharge measurements during the year at low and medium flows, a high flow rating curve determined by slope-area calculations, and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1980.

**REMARKS:** A small irrigation reservoir (San Esteban) 10.5 miles (16.9 km) south of Marfa, Texas and irrigation diversions below the reservoir modify the flow of this spring-fed creek. Backwater from the Rio Grande begins to affect the station record when the flow at the station on the Rio Grande below Rio Conchos reaches about 35,000 second-feet (991 m<sup>3</sup>/sec).

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 56,400 second-feet (1,600 m<sup>3</sup>/sec), determined by slope-area calculations, on September 2, 1962, with a gage height of 13.54 feet (4.13 m). Min. 00.1 second-foot (0.003 m<sup>3</sup>/sec) occasionally.

	Average Flow in Second-Foot (Cubic Meters per Second)				
Daily	Max. 12,400 (351)	Sept. 21, 1974	Min. 0.1 (0.003)	Occasionally	
Monthly:	Max. 998 (28.3)	Sept. 1974	Min. 0.2 (0.005)	July 1980	
Yearly:	Max. 97.1 (2.75)	1974	Min. 4.3 (0.12)	1951	

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	1.2	1.1	1.1	1.1	0.4	0.2	0.1	0.4	16.2	1.8	1.8
2	1.2	1.3	1.1	1.1	1.1	.4	.2	.1	.4	13.1	1.8	1.8
3	* 1.2	1.3	1.1	1.1	1.1	.4	.2	.1	* .4	7.1	1.8	1.8
4	1.2	* 1.3	* 1.1	1.1	1.1	.4	.2	* .1	1.4	4.2	* 1.8	1.8
5	1.2	1.3	1.1	1.1	.7	.4	.1	.1	.4	3.5	1.8	1.8
6	1.2	1.3	1.1	1.1	.7	.4	.1	.1	.4	* 2.8	1.8	1.8
7	* 1.2	1.3	1.1	1.1	.7	.4	* .1	.1	.4	2.8	1.8	1.8
8	1.2	1.2	1.1	* 1.1	.7	.4	.1	* .1	* .4	2.8	1.8	* 1.8
9	1.2	1.2	1.1	1.1	.7	* .4	.1	.1	77.3	2.5	1.8	1.8
10	1.2	1.2	* 1.1	1.1	.7	8.8	.1	.1	579	2.5	* 1.8	1.8
11	1.3	* 1.2	1.1	1.1	.7	* 9.9	.1	* 1.8	360	2.5	1.8	1.8
12	1.3	1.2	1.1	1.1	.7	1.4	.2	* 79.1	* 1.4	2.5	2.1	1.4
13	1.3	1.2	1.1	1.1	* .7	1.1	.2	68.2	1.1	2.1	2.1	1.4
14	1.3	1.2	1.1	1.1	.7	1.1	.2	314 *	1.1	2.1	2.1	1.4
15	* 1.3	1.2	1.1	* 1.1	.7	.1	* .2	* 5.6	.4	* 2.1	2.1	1.4
16	1.3	1.2	1.1	1.1	.7	.7	.2	.7	* .7	2.1	2.5	* 1.4
17	1.2	1.2	1.1	1.1	.7	* .4	.2	.7	.7	2.1	2.1	1.4
18	1.2	* 1.2	* 1.1	1.1	.7	.4	.2	* .7	.7	1.8	* 2.1	1.4
19	1.2	1.2	1.1	1.1	.7	.4	.2	.7	.7	1.8	1.8	1.4
20	1.2	1.2	1.1	1.1	* .7	.4	.2	1.4	1.1	* 1.8	1.8	1.4
21	1.1	1.2	1.1	1.1	.7	.4	* .2	.7	1.1	1.8	1.8	1.4
22	* 1.1	1.2	1.1	* 1.1	.7	.1	.2	* .7	* 1.1	1.8	1.8	* 1.4
23	1.1	1.1	1.1	1.1	.7	* .1	.2	.7	2.1	1.8	1.4	1.4
24	1.1	1.1	1.1	1.1	.7	.1	.2	.7	228	1.8	* 1.4	1.4
25	1.1	* 1.1	1.1	1.1	.7	.1	.1	* .7	269 *	1.4	1.4	1.4
26	1.2	1.1	* 1.1	1.1	.7	.1	.1	.7	33.9	1.4	1.4	1.4
27	1.2	1.1	1.1	1.1	.7	.2	.1	.7	81.2	* 1.4	1.4	1.4
28	1.2	1.1	1.1	* 1.1	* .7	.2	* .1	.7	2,850 *	1.4	1.4	1.4
29	1.2	1.2	1.1	1.1	.7	.2	.1	.4	509 *	1.4	1.4	* 1.4
30	1.2	1.1	1.1	1.1	.7	* .4	.1	.4	133	1.4	1.4	1.4
31	1.2		* 1.1	1.1	.4	.1	.1	.4		1.4	1.4	1.4
Sum	37.3	34.8	34.1	33.0	23.0	31.0	4.8	480.7	5,136.8	95.4	53.3	47.8

Month	Current Year 1980						Period 1932-1980						
	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Foot	Acre-Foot					
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum		
Jan.	5.71	5.68	111	0	1.3	121	0	1.1	1.2	74.0	137	273	46.4
Feb.	5.68	5.66	12	0	1.3	123	0	1.1	1.2	69.0	188	3,120	41.5
Mar.	5.68	5.64	11	0	1.1	11	0	1.1	1.1	65.2	157	1,018	46.4
Apr.	5.68	5.64	11	0	1.1	11	0	1.1	1.1	63.1	206	1,140	40.3
May	5.68	5.61	11	0	1.1	31	0	.4	.7	45.6	944	8,520	34.7
June	6.92		10	0	166	124	0	.1	1.0	60.2	1,812	12,653	24.2
July			11	0	.2	15	0	.1	.2	9.5	3,160	18,500	9.5
Aug.	7.19		14	0	1,410	11	0	.1	15.5	953	3,192	16,330	56.9
Sept.	10.01	5.54	28	14	2,000	11	0	.4	171	10,195	4,803	59,380	128
Oct.	5.87	5.71	1	0	19.1	125	0	1.4	3.2	189	1,776	19,200	36.9
Nov.			16	0	2.5	123	0	1.4	1.8	105	202	2,554	35.7
Dec.			11	0	1.8	112	0	1.4	1.4	94.0	145	408	39.3
Yearly	10.01				14,200			0.1	16.4	11,922.6	16,722	70,273.8	3,109.2
	Meters		Cubic Meters per Second			Thousands of Cubic Meters							
	3.05				402			0.003	0.46	14,707	20,627	86,683	3,835

\* Discharge measurement made on this day      0 Mean daily      ! And other days

## RIO GRANDE BELOW RIO CONCHOS NEAR PRESIDIO, TEXAS AND OJINAGA, CHIHUAHUA

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, water-stage recorders (graphic and digital), and binary decimal transmitter located on the left bank at latitude 29°31'10", longitude 104°17'10", and river mile 949.8 (1,528.5 km); 0.4 river mile (0.6 km) downstream from Alamito Creek and 9.0 river miles (14.4 km) downstream from the international highway bridge between Presidio, Texas and Ojinaga, Chihuahua. The zero of the gage is 2,532.00 feet (771.75 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 67 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: 1955 through 1980. Records are also available from 1896 through June 13, 1932 for a station located about 12.1 river miles (19.5 km) downstream from the Rio Conchos and 1.3 miles (2.1 km) upstream from Alamito Creek; and from June 14, 1932 through 1954 for a station about 2.0 river miles (3.2 km) downstream from the Rio Conchos and 11.4 river miles (18.3 km) upstream from Alamito Creek.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits. Prior to December 1, 1979 the zero of the gage was 2,536.00 feet (772.97 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 61,200 second-feet (1,730 m<sup>3</sup>/sec) on September 30, 1978 with a gage height of 15.41 feet (4.70 m). The greatest recorded flow occurred September 11, 1904, with a peak flow estimated at 162,000 second-feet (4,590 m<sup>3</sup>/sec) at a station 11.8 miles (19.0 km) upstream. Min. 0.2 second-foot (0.01 m<sup>3</sup>/sec) several days in July 1955, and on June 30, 1958.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 53,300 (1,510)	Oct. 1, 1978	Min. 12.9 (0.37)	March 27, 1968
Monthly:	Max. 11,500 (326)	Oct. 1978	Min. 74.5 (2.11)	March 1968
Yearly:	Max. 2,390 (67.7)	1978	Min. 667 (18.9)	1977

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	341	297	317	636	622	501	105	268	484	4,730	480	487
2	341	294	326	622 *	625 *	484	108 *	262	516	4,100 *	491	484 *
3	345 *	259	304	636	1,060	452 *	171	278	463 *	3,640	505	473
4	335	256 *	221 *	636	1,250	417	238	286 *	3,010	3,010	512 *	463
5	330	278	266	671	1,350 *	313	283	215	2,190	2,270	501	473
6	325	294	311	675	1,320	248	330	275	2,220	2,080 *	547	477
7	324 *	286	533	692	1,320	197	367 *	206	2,120	2,040	484	477
8	322	283	643	678 *	1,310	413	371	194	2,120 *	2,010	494	431
9	325	290	678	643	1,290	357 *	349	191	2,540	2,010	491	367 *
10	320	291	727 *	576	1,280	240	350	188	2,390	1,650	487	345
11	323	289 *	727 *	572	1,270	222	351	487 *	3,850	1,050	473	334
12	327	291	727 *	572	1,260	232	341	8,510 *	4,800 *	961	470	321
13	331	293	692	660	1,260 *	251	364	11,000	3,920	840	477	321
14	338	307	689	675	1,220	188	424	8,760 *	3,520	798	516	338
15	323 *	306	685	685 *	1,310	163	413 *	4,450 *	2,670	735 *	509	431
16	308	300	710	689	1,330	155	417 *	1,620	2,270 *	717	593	406 *
17	314	302	706	653	1,320	156 *	420	1,120	1,550	660	569	487
18	311	301	685 *	653	1,310	137	340	2,010 *	1,180	604	604 *	501 *
19	311	303 *	671	643	1,310	104 *	309	1,830	1,000	547	537	491
20	308	299	657	696	1,280	89.7	291	2,480	692	766 *	544	593
21	317	282	639	731	1,300	88.6	293 *	1,360	501	724	533	501
22	305 *	284	671	745 *	1,320	94.3	281	3,090	487 *	572	519	491 *
23	298	283	685	706	1,300	* 80.2	259	673	437	547	526	459
24	313	287	685	643	1,280	62.5	266	671	1,130	519	519 *	487
25	303	298 *	657	607	1,260	41.7	309	501 *	2,190	516	516	505
26	293	287	671	604	1,130	48.4	281	406	3,420	526	498	509
27	290	286	671	636	971	50.1	279	431	2,990	523	494	498
28	292 *	284	639	664 *	795 *	41.0	277 *	357	8,970 *	516 *	491	452
29	295	282	607	618	685	32.8	290	371	5,330	491	491	509 *
30	287	607	636	562	* 30.0	294	346	4,700 *	491	487	509	509
31	287	639 *		547		278	463		494			
Sum	9,782	8,392	18,446	19,553	35,447	5,889.3	9,449	53,289	72,540	41,137	15,358	14,129

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
			Day								
Jan.	2.65	2.46	8	345	127	281	316	19,402	37,931	116,947	16,068
Feb.	2.55	2.36	14	313	4	253	289	16,645	31,881	110,937	4,745
Mar.	3.58	2.23	110	727	4	212	597	36,595	51,875	223,755	4,583
Apr.	3.64	3.02	22	756	10	463	650	38,777	43,849	89,704	6,497
May	4.59	3.15	5	1,350	31	533	1,140	70,305	49,177	124,046	12,147
June	3.61	1.25	8	777	30	25.8	198	11,682	47,334	146,055	5,927
July	2.82	1.28	17	445	1	24.4	305	18,744	69,302	172,324	18,744
Aug.	9.55	1.77	13	15,800	5	146	1,720	105,670	108,499	270,367	30,365
Sept.	11.19	2.79	28	22,400	3	420	2,420	143,859	181,252	469,832	22,489
Oct.	6.17	2.95	1	4,730	29	466	1,330	81,596	139,539	706,691	16,772
Nov.	3.48	2.76	14	731	7	406	512	30,462	48,370	128,549	8,741
Dec.	3.58	2.49	20	801	13	311	456	28,023	31,110	52,176	15,554
Yearly	11.19	1.25		22,400		24.4	829	601,760	840,119	1,732,514	483,092
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	3.41	0.38		634		0.69	23.5	742,271	1,036,287	2,137,056	595,894

\*\* Period 1968-1980

\* Discharge measurement made on this day

! And other days

**TERLINGUA CREEK NEAR TERLINGUA, TEXAS**

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank at latitude 29°11'50", longitude 103°36'20", 2.6 creek miles (4.2 km) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) south of Terlingua, Brewster County, Texas. This creek enters the Rio Grande at river mile 885.2 (1,424.6 km), the lower end of Santa Helena Canyon. The zero of the gage is 2,200.64 feet (670.76 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1932 through 1980.

**REMARKS:** Irrigation diversions modify the flow of this spring-fed creek at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 34,900 second-feet (988 m<sup>3</sup>/sec) on May 24, 1935 with a gage height of 17.59 feet (5.36 m) on a gage 0.3 mile (0.5 km) downstream. Min. 0.1 second-foot (0.003 m<sup>3</sup>/sec) several days in June and July 1950.

		Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max. 17,200 (487)	June 1, 1937		Min. 0.1 (0.003)	Several days in June & July 1950
Monthly:	Max. 1,150 (32.6)	Sept. 1974		Min. 0.8 (0.02)	October 1934
Yearly:	Max. 146 (4.13)	1937		Min. 5.5 (0.16)	1943

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.8	2.5	2.1	2.1	1.8	1.8	2.1	1.8	798	94.6	2.8	2.1
2	2.8	2.5	2.1	2.1	1.8	1.8	2.1	1.8	1,340	38.5	2.8	2.1
3	2.7	2.4	2.1	2.1	1.8	1.8	2.1	1.8	15.5	14.8	2.8	2.1
4	2.7	2.4	2.1	2.1	1.8	1.8	2.1	1.8	7.1	6.5	2.8	2.1
5	2.6	2.4	2.1	2.1	1.8	1.8	2.1	3.9	5.6	4.2	2.8	2.1
6	2.6	2.4	2.1	2.1	1.8	1.8	2.1	18.0	4.6	4.2	2.8	2.1
7	2.5	2.3	2.1	2.1	1.8	1.8	1.8	10.2	3.5	2.5	2.8	2.1
8	2.5	2.3	2.1	2.1	1.8	32.8	1.8	6.7	71.3	34.6	2.8	2.1
9	2.5	2.3	2.1	2.1	1.8	2.8	1.8	3.9	205	30.7	2.8	2.1
10	2.5	2.3	2.1	2.1	1.8	2.5	1.8	2.8	5,160	37.4	2.8	2.1
11	2.4	2.2	2.1	2.1	1.8	2.5	1.8	36.0	260	39.2	2.8	2.1
12	2.4	2.2	2.1	2.1	1.8	2.5	1.8	194	40.6	45.6	2.8	2.1
13	2.4	2.2	2.1	2.1	1.8	2.5	1.8	17.0	16.6	11.3	2.8	2.1
14	2.4	2.2	2.1	2.1	1.8	2.5	1.8	16.6	7.8	6.4	2.8	2.1
15	2.4	2.2	2.1	2.1	1.8	2.5	1.8	1,880	3.9	4.2	2.8	2.1
16	2.4	2.2	2.1	2.1	1.8	2.5	1.8	142	4.2	4.2	4.9	2.1
17	2.4	2.2	2.1	2.1	1.8	2.5	1.8	179	3.2	4.2	2.8	2.1
18	2.3	2.2	2.1	2.1	1.8	2.5	1.8	285	3.2	4.2	2.5	1.8
19	2.3	2.2	2.1	2.1	1.8	2.5	1.8	66.4	3.2	4.2	2.5	1.8
20	2.3	2.2	2.1	2.1	1.8	2.5	1.8	287	3.2	2.5	2.5	1.8
21	2.3	2.2	2.1	2.1	1.8	2.5	1.8	24.4	3.2	2.5	2.5	1.8
22	2.3	2.2	2.1	2.1	1.8	13.8	1.8	10.2	4.2	2.5	2.5	1.8
23	2.3	2.2	2.1	2.1	1.8	16.6	1.8	6.0	4.2	2.5	2.5	1.8
24	2.4	2.2	2.1	1.8	1.8	1.8	1.8	4.6	4.2	2.5	2.5	1.8
25	2.4	2.2	2.1	1.8	1.8	1.8	1.8	4.6	114	2.5	2.1	1.8
26	2.4	2.2	2.1	1.8	1.8	1.8	1.8	3.5	185	4.2	2.1	1.8
27	2.4	2.2	2.1	1.8	1.8	1.8	1.8	3.5	809	2.5	2.1	1.8
28	2.4	2.2	2.1	1.8	1.8	1.8	1.8	3.2	5,230	2.8	2.1	1.4
29	2.4	2.2	2.1	1.8	1.8	1.8	1.8	3.2	5,370	2.8	2.1	1.4
30	2.5	2.1	1.8	1.8	1.8	1.8	1.8	3.2	325	2.8	2.1	1.4
31	2.5	2.1	1.8	1.8	1.8	1.8	1.8	3.2		2.8	2.1	1.4
Sum	76.2	65.6	65.1	60.9	55.8	121.2	57.6	3,225.3	20,005.3	426.4	79.8	59.3

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1932-1980				
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum		
				Day	Day								
Jan.			11	0	2.8	118	0	2.3	2.5	151	190	875	82.7
Feb.			11	0	2.5	111	0	2.2	2.3	130	234	4,400	73.4
Mar.			11	0	2.1	11	0	2.1	2.1	130	261	2,410	72.4
Apr.	1.90	1.90	11	0	2.1	124	0	1.8	2.1	121	905	15,500	55.1
May	1.90	1.84	11	0	1.8	11	0	1.8	1.8	109	3,530	26,000	81.3
June	3.02		8	225	1	1	0	1.8	3.9	239	6,442	54,800	59.5
July			11	1	2.1	17	1	1.8	1.8	113	8,378	28,700	113
Aug.	6.40	1.67	15	9,080	11	1	1.8	104	6,403	6,370	33,617	123	
Sept.	9.28	1.57	29	19,300	8	2.8	667	39,662	9,136	68,375	123	123	
Oct.	2.17	1.54	1	137	17	2.5	13.8	846	3,064	27,900	50.8	50.8	
Nov.	1.67		16	11.3	125	2.1	2.8	159	403	3,058	64.9	64.9	
Dec.			11	2.1	128	1.4	1.8	118	314	3,080	90.0	90.0	
Yearly	9.28			19,300		1.4	66.4	48,181	39,227	105,807	3,958	3,958	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters						
	2.83			547		0.04	1.88	59,431	48,387	130,513	4,882	4,882	

\* Discharge measurement made on this day    Ø Mean daily    † And other days

## RIO GRANDE AT JOHNSON RANCH NEAR CASTOLON, TEXAS AND SANTA ELENA, CHIHUAHUA

**DESCRIPTION:** Cableway, gravity well, and digital water-stage recorder located on the left bank at latitude 29°02'05", longitude 103°23'25", and river mile 862.4 (1,388.0 km); 1.3 river miles (2.2 km) upstream from the old Johnson Ranch headquarters, 6.0 river miles (9.7 km) downstream from Smoky Creek, and 9.2 river miles (14.8 km) upstream from Chizos Crossing and the Chihuahua-Coahuila state line. The zero of the gage is 2,045.30 feet (623.41 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 27 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: April 1936 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 71,900 second-feet (2,040 m<sup>3</sup>/sec), on September 30, 1978 with a gage height of 28.40 feet (8.66 m). A flow estimated at 97,000 second-feet (2,750 m<sup>3</sup>/sec) with a stage of 24.6 feet (7.50 m) occurred at this station site on October 3, 1932. Min. no flow several days in 1953, 1955, 1957, and 1958.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 65,300 (1,850)	Oct. 1, 1978	Min. 27.5 (0.78)	Sept. 9, 1968
Monthly:	Max. 12,200 (345)	Oct. 1978	Min. 96.9 (2.74)	April 1976
Yearly:	Max. 2,490 (70.5)	1978	Min. 692 (19.6)	1977

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	327	270 *	262	593 *	589 *	551	* 38.5	203 *	1,030	4,800 *	569	551 *
2	325	276	254	593	613	523 *	39.2	179	1,970 *	4,200	551	551
3	342	281	270 *	579	601	505	33.5	168	583	3,810	547 *	547
4	345	281	300	576	717	466	31.4	150	509	3,400	547	533
5	342	254	283	576	1,220	452	32.5	163	1,650	2,900	544	530
6	328	250	218	593	1,270	381	74.2	579	2,760	2,500	558	530
7	331 *	258	217	611	1,270	324	145	166	2,450	2,150	526	526
8	334	267	256	643	1,250	915	201	124	2,340	2,150	540	554
9	336	254	462	625	1,240	1,620	238	107	5,790	2,120	523	526
10	332	257	548	611	1,250	579	248	72.7	10,000	2,170	523	456
11	327	266	594	593	1,230	410	230	102	4,910	2,180	523	420
12	326	275 *	622	533	1,260 *	288	240	1,670	3,990	1,500	519	381
13	329	275	626	533	1,240	236	251	10,100	4,030	1,150	505	371
14	332	269	625	562 *	1,210	217	251 *	7,840	3,170	1,080 *	501	357
15	342	266	605	643	1,170	226	291	9,710	2,800 *	943	516	357 *
16	341	278	618	660	1,270	189 *	335	4,940	2,200	886	554	396
17	319	272	638 *	629	1,350	156	322	2,630	1,970	869	618 *	452
18	304	266	657	629	1,330	135	345	2,660	1,330	851	622	470
19	300	291	643	614	1,350	136	321	2,330 *	957	869	625	509
20	299	275	624	614	1,310	123	256	3,190	819	833	597	523
21	295 *	270	610	618	1,300	97.1	236	3,430	671	784	569	565
22	293	273	586	650	1,250	86.2	254	2,710	593	961	572	583
23	297	264	596	678	1,340	87.2	234	1,450	547	798	562	569
24	282	257	626	664	1,300	94.3	206	798	922	731	565	558
25	280	249	646	632	1,280	89.3	188	636	3,410	713	558	544
26	291	252	630	586	1,250	63.6	179	593	4,590	696	562	562
27	292	264	613	586	1,150 *	46.6	212	470	12,300	682 *	551	576
28	274	261	617	622	1,000	47.7	212	413	16,400	660	540	579
29	272	261 *	593	636	854	50.9	220	424	16,000	625	544	519
30	275	255	558	636	760	45.6	210	385	8,230	607	561	537
31	274	255	559	611	611	611	209	381	586	586	554	554
<b>Sum</b>		7,732		18,318		9,140.5		58,773.7		49,204		15,686
	9,686		15,956		34,845		6,283.3		118,921		16,592	

Month	Current Year 1980							Period 1968-1980			
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.29	2.04	4	345	29	266	312	19,212	38,990	118,276	15,957
Feb.	2.14	1.95	19	297	6	241	267	15,336	32,202	111,869	7,743
Mar.	3.05	1.77	25	671	6	191	516	31,647	49,724	211,676	6,067
Apr.	3.05	2.62	23	678	11	473	611	36,333	42,233	98,106	5,765
May	4.20	2.82	19	1,390	3	586	1,120	69,072	51,137	116,801	14,544
June	8.07		9	5,970	30	45.6	305	18,128	55,296	192,801	5,839
July	2.72	.69	22	533	5	22.6	202	12,460	78,820	194,499	12,460
Aug.	13.98	1.38	15	15,100	10	72.7	1,900	116,607	121,895	242,539	30,689
Sept.	19.55	2.13	28	30,700	1	37.1	3,960	235,710	192,497	472,093	27,759
Oct.	7.68	2.66	1	5,400	31	572	1,590	97,601	155,628	751,755	17,776
Nov.	2.92	2.53	17	667	8	498	554	32,908	52,453	147,392	13,267
Dec.	2.79	2.00	21	643	15	325	505	31,107	33,544	54,064	15,334
<b>Yearly</b>	19.55	0.69		30,700		22.6	986	716,121	904,419	1,801,958	501,243
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
	5.96	0.21		869		0.64	27.9	883,335	1,115,601	2,222,715	618,283

\*\* Period 1968-1980

\* Discharge measurement made on this day

Ø Mean daily

**RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TEXAS  
AND RANCHO SANTA ROSA, COAHUILA**

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 29°46'50", longitude 101°45'30", and river mile 657.5 (1,058.2 km); 500 feet (152 m) downstream from the Terrell-Val Verde County Line, 5.4 river miles (8.8 km) downstream from Lozier Canyon, and about 12.3 miles (19.8 km) west of Langtry, Texas. The zero of the gage is 1,157.17 feet (352.71 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year, 20 by the United States Section and 4 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1961 through 1980.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The concrete control weir was placed in operation on February 21, 1967.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 148,000 second-feet (4,190 m<sup>3</sup>/sec) on November 5, 1978 with a gage height of 38.14 feet (11.63 m). Min. 188 second-feet (5.32 m<sup>3</sup>/sec) on August 19, 1965.

		Average Flow in Second-Foot (Cubic Meters per Second)**			
Daily:	Max. 81,600 (2,310)	Sept. 20, 1974	Min. 217 (6.15)	July 1, 1968	
Monthly:	Max. 14,700 (416)	Oct. 1978	Min. 322 (9.12)	March 1968	
Yearly:	Max. 3,030 (85.8)	1978	Min. 907 (25.7)	1977	

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	617	583	533	883	840	1,070	318	466	883	12,300 *	1,070	883 *
2	617	572	533	883	840	1,020	318	498	798	6,670	1,020	883
3	562	583	533	840	1,500	883	318	434	798	5,120	1,020 *	883
4	583	583	533	840	1,890	840	290	434 *	2,010	4,660	971	883
5	617	583	533	840	883 *	798	290	434	1,370	4,410	971	883
6	640	572	533	840	925	798	290	403	1,070	3,780 *	971	883
7	652 *	572	533	840 *	1,280	759	265 *	434	1,030	3,370	971	929
8	652	562	569	840	1,370	717	290	604	2,390	2,810	971	929
9	652	551	569	840	1,420	717	290	498	2,340	2,630	929	883
10	640	551	533	840	1,370	756	265	604	4,240	2,720	929	883
11	640	551	498	840	1,370	2,000	265	13,300	9,680	2,630	929	883
12	640	551	569	883	1,370	1,080	318	30,500	8,300	2,720	883	883
13	640	562	759	840	1,370	798	403	2,410	5,260	2,410	883 *	840
14	640	572	798	840	1,370	678	434	2,950	6,110	1,890	883	798
15	640	572 *	840	840	1,370	569	434	9,430	4,310 *	1,710	883	759 *
16	640	583	883	798	1,370	533 *	434	8,510	3,670	1,530	883	759
17	629	593	883 *	798	1,310	533	434	8,970	3,180	1,420	883	759
18	629	594	883	883	1,310	498	434	6,250	2,550	1,370	929	759
19	629	572	883	883	1,370 *	498	434	4,030	2,340	1,310	929	717
20	629	583	883	883	1,420	466	498	3,450	1,950	1,260 *	971	798
21	617 *	572	929	883 *	1,480 *	434	498 *	3,280	1,530	1,260	971	798
22	617	562	929	883	1,530	646	533	3,880	1,310	1,260	971	840
23	617	562	929	840	1,530	374	533	3,740	1,160	1,210	971	840
24	617	562	883	840	1,530	420	498	2,910	1,070	1,260	971	883
25	606	569 *	840	840	1,420	498	466	2,140	1,020	1,260	929	929
26	594	569	840	840	1,480	374	466	1,650	2,780	1,160	929	929
27	594	569	929	840	1,420	374	466	1,310	6,110	1,160	929	929
28	594	569	929	883	1,420	374	403	1,160 *	7,840	1,110	883	883
29	583	569	883	840	1,370	346	403	1,110	11,900	1,070	883	883
30	594		883	840	1,260	318	374	1,020	11,800	1,070	883	883
31	594		883		1,160		374	929		1,070		883

<b>Sum</b>	19,215	16,538	23,138	25,503	41,548	20,169	12,036	117,738	110,799	79,610	28,199	26,557
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Month	Current Year 1980						Period 1968-1980				
	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	2.06	1.96	17	652	3	541	620	38,112	54,393	122,084	31,343
Feb.	2.01	1.94	118	594	29	533	570	32,803	46,133	115,301	22,435
Mar.	2.26	1.90	121	929	110	498	745	45,893	65,000	224,767	19,789
Apr.	2.23	2.17	11	883	13	798	851	50,600	60,710	129,796	20,200
May	4.46	2.20	4	6,850	11	840	1,340	82,359	71,174	129,421	28,616
June	3.15	1.71	11	2,480	129	318	671	40,003	79,551	251,940	22,463
July	1.97	1.64	122	569	17	265	388	23,871	98,749	218,916	23,871
Aug.	22.97	1.80	11	59,000	6	403	3,810	233,664	148,285	233,664	45,474
Sept.	8.53	2.16	30	14,900	12	798	3,710	219,683	208,066	590,037	48,928
Oct.	9.19	2.33	1	16,200	31	1,020	2,570	157,931	193,023	901,825	32,134
Nov.	2.36	2.23	1	1,070	112	883	939	55,910	84,391	357,878	30,399
Dec.	2.26	2.10	17	929	19	717	858	52,674	50,883	74,035	32,025
<b>Yearly</b>	22.97	1.64		59,000		265	1,420	1,033,503	1,160,358	2,196,111	656,287
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>					
	7.00	0.50		1,670		7.50	40.2	1,274,826	1,431,302	2,738,903	809,530

\*\* Period 1968-1980      \* Discharge measurement made on this day      † And other days

## PECOS RIVER NEAR LANGTRY, TEXAS

**DESCRIPTION:** Cableway, concrete control weir, bubbler gage, and water-stage recorders (graphic and digital), located on the right bank at latitude 29°48'10", longitude 101°26'45", about 7.5 miles (12.1 km) east of Langtry, Texas, 9.5 river miles (15.3 km) upstream from the Pecos High Railroad Bridge, and 15.0 river miles (24.1 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 616.0 (991.4 km); 23.6 river miles (38.0 km) downstream from Langtry, Texas. The zero of the gage is 1,133.08 feet (345.36 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year, 20 by the United States Section and 4 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on stable control weir rating curves defined by meter measurements. Records available: July 1967 through 1980. Records are also available for Pecos River near Comstock, 9.5 river miles (15.3 km) downstream, from March 17 through December 3, 1898 and May 1900 through October 7, 1954; for Pecos River near Shumla, 3.5 river miles (5.6 km) upstream, from October 8, 1954 through June 1967; and for Pecos River at Mouth near Comstock, from March 1961 through July 2, 1968.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 577,000 second-feet (16,300 m<sup>3</sup>/sec) on September 20, 1974 with a gage height of 75.30 feet (22.95 m). The greatest flood of record, which exceeded a gage height of 100 feet (30.5 m) at this station, occurred on June 28, 1954. The peak discharge was 348,000 second-feet (26,800 m<sup>3</sup>/sec) at the gaging station located near the railroad bridge 9.5 river miles (15.3 km) downstream. Min. 58.3 second-feet (1.65 m<sup>3</sup>/sec) on July 27, 1974 with a gage height of 1.47 feet (0.45 m).

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 153,000 (4,330)	Sept. 20, 1974	Min. 59.5 (1.69)	Aug. 20, 21, & 22, 1970
Monthly:	Max. 13,500 (382)	Sept. 1974	Min. 68.0 (1.93)	August 1970
Yearly:	Max. 1,500 (42.5)	1974	Min. 131 (3.71)	1970

## Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	185	179	173	153	135	135	91.8	84.0	173	378	237	237 *
2	188	179	163	163	135	135	91.8	84.0	173 *	353	237	237
3	185	182	163	153	135	125	91.8	84.0	163	331	237 *	237
4	182	179	173	153	163	125	84.0	* 76.6	163	331	237	237
5	182	179	173	144	163 *	117	84.0	76.6	163	353	237	226
6	182	179	173	144	153	117	84.0	76.6	153	378 *	237	226
7	182 *	175	173	153	153	117	* 84.0	76.6	153	403	237	226
8	182	175	173	144	153	117	84.0	84.0	153	403	237	226
9	182	179	173	144	153	117	76.6	84.0	144	403	226	226
10	182	179	173	135	153	125	76.6	84.0	144	378	226	237
11	182	179	173	135	144	117	76.6	6,500	144	353	226	226
12	185	179	173	135	144	108	76.6	3,960	144	353	226	237 *
13	188	182	163	135	135	108	76.6	562	215	353	226	237
14	188	182	163	144	144	108	76.6	260	193	331	226	237
15	188	185	163	144	153	99.9	76.6	215	173 *	331	226	249 *
16	188	188	163 *	144	144	* 99.9	76.6	193	173	309	249	249
17	188	182	163 *	135	144	99.9	76.6	183	163	297	249	249
18	185	175	163	135	144	99.9	76.6	183 *	173	284	237	249
19	185	179 *	163	135	144 *	* 99.9	76.6	314	193 *	284	237	249
20	204	179	163 *	135	144	99.9	76.6	579	183	272 *	237	237
21	191 *	172	163	135 *	135	99.9	* 76.6	378	173	284	237	237
22	188	169	153	135	135	91.8	84.0	284	163	284	237	237
23	188	172	153	135	135	91.8	99.9	249	163	272	237	249
24	191	172	153	144	135	99.9	91.8	226	153	260	237	249
25	188	166	153	135	125	99.9	91.8	215	4,450	249	237	249
26	185	160	153	135	135	99.9	91.8	193	4,770 *	249	237	249
27	179	163	183	135	125	99.9	84.0	193	706	249	237	249
28	179	166	173	135	117	99.9	84.0	183	547	237	237	249
29	182	163	163	135	125	91.8	84.0	173	456	237	237	249
30	182	153	135	399	91.8	91.8	84.0	173	353	237	237	249
31	182	153	135	163	135	91.8	84.0	163	237	237	237	249
Sum	5,748	5,098	5,113	4,222	4,665	3,237.0	2,570.5	16,189.4	15,270	9,673	7,057	7,449

Month	Current Year 1980						Period July 1967-1980				
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	2.05	1.93	20	218	1 9	179	185	11,401	13,075	29,240	7,559
Feb.	1.98	1.87	16	195	26	160	176	10,112	11,563	25,414	7,012
Mar.	1.97	1.84	27	197	22	153	165	10,133	11,663	22,124	6,929
Apr.	1.90	1.74	2	173	28	125	141	8,357	14,021	28,705	8,156
May	3.08	1.71	30	1,150	128	117	150	9,244	13,264	28,767	7,207
June	1.80	1.61	1	144	29	91.8	108	6,417	13,173	37,856	5,458
July	1.64	1.51	23	99.9	117	69.6	83.0	5,101	18,371	76,891	4,289
Aug.	12.96	1.54	11	17,600	1 3	76.6	523	32,094	24,502	162,055	4,178
Sept.	16.93	1.80	25	31,600	1 9	144	509	30,277	73,605	804,466	7,674
Oct.	2.43	2.10	1 7	403	128	237	312	19,184	21,108	113,911	7,123
Nov.	2.17	2.03	17	260	15	215	235	13,990	17,028	59,734	6,589
Dec.	2.13	2.07	115	249	1 5	226	240	14,759	14,162	37,859	7,662
Yearly	16.93	1.51		31,600		69.6	236	171,069	245,535	1,087,822	94,683
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	5.16	0.46		895		1.97	6.68	211,014	302,867	1,341,828	116,791

\* Discharge measurement made on this day

! And other days

**DEAD MANS CANYON NEAR COMSTOCK, TEXAS**

In order to determine storm runoff formerly included with measured flows at a gaging station on the Pecos River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Dead Mans Canyon.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the canyon at latitude 29°47'05", longitude 101°19'25", 2.3 miles (3.7 km) upstream from its confluence with the Pecos River, which is 9.5 miles (15.3 km) upstream from the Pecos River confluence with the Rio Grande. The zero of the gage is 1,178.00 feet (359.05 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: March 1968 through 1980.

**REMARKS:** This stream is normally dry, its flow being confined to periods of storm runoff from its 88 square miles (228 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 37,800 second-feet (1,070 m<sup>3</sup>/sec) on September 17, 1974 with a gage height of 12.78 feet (3.90 m). Maximum volumes: Monthly, 29,164 acre-feet (35,974,000 m<sup>3</sup>) in September 1974; yearly 30,527 acre-feet (37,655,000 m<sup>3</sup>) in 1974.

Average Flow in Second-Foot (Cubic Meters per Second)

Daily:	Max.	5,850 (166)	Sept. 18, 1974	Min.	} see REMARKS
Monthly:	Max.	490 (13.9)	Sept. 1974	Min.	
Yearly:	Max.	42.2 (1.20)	1974	Min.	

**Mean Daily Discharge in Second-Foot 1980**

**Annual Summary**

Month and Day				Maximum Gage and Discharge			Total
Month	Day	Feet	Second-Foot	Day	Feet	Second-Foot	Acre-Feet
Aug.	11	396					
	12	2.5					
Sept.	26	24.7					
Aug.	11	4.10	3,740				790
Sept.	26	2.23	756				49.0
			4.10			3,740	839
Yearly		Meters	Cubic Meters per Second				Thous. of Cub. Meters
		1.25	106				1,035

## DOLAN SPRINGS NEAR LOMA ALTA, TEXAS

DESCRIPTION: Concrete wall control, bubbler gage, and water-stage recorder located on the left bank of Snake Creek near its mouth, latitude 29°53'40", longitude 100°59'00", and about 12 miles (19.3 km) west of Loma Alta, Val Verde County, Texas. Snake Creek enters Dolan Creek from the left side, 0.9 creek mile (1.4 km) from the confluence with Devils River. Dolan Creek enters Devils River from the left side, 16.8 river miles (27.0 km) upstream from Pafford Crossing, and 42.3 river miles (68.1 km) from the confluence with the Rio Grande. The zero of the gage is 1,338.5 feet (407.97 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 12 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1966 through 1980.

REMARKS: The flow of these springs is very uniform during periods of dry weather and is not modified by diversions or storage. All storm flow passing this station is deducted and is not included in the tabulation below. This station was established for purposes of correlating the flow of these springs with precipitation data and the flow of other springs in the area.

## EXTREME FLOWS FROM RECORDS:

		Average Flow in Second-Foot (Cubic Meters per Second)		
Daily:	Max. 25.0 (0.71)	July 18, 1976	Min. 1.0 (0.03)	Several days in May 1971
Monthly:	Max. 20.4 (0.58)	March 1977	Min. 1.1 (0.03)	March, April & May 1971
Yearly:	Max. 17.2 (0.49)	1977	Min. 1.7 (0.05)	1968

## Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.3	6.4	4.5	6.7	6.4	4.2	4.6	4.6	5.3	8.1	7.4	6.4
2	7.3	6.4	4.4	7.1	6.4	4.2	4.6	4.6	5.3	8.1	7.4	6.4
3	7.3	6.3	4.4	7.1	6.0	3.9	4.6	4.6	5.3	8.1	7.4	6.4
4	7.3	6.3	4.5	7.1	6.0	3.9	4.6	4.6	5.3	8.1	7.4	6.4
5	7.5	6.3	4.6	7.1	6.0	3.9	4.6	4.6	5.3	8.1	7.4	6.4
6	7.5	6.2	4.7	7.4	6.0	3.9	4.6	4.6	5.3	8.1	7.4	6.0
7	7.5	6.1	4.8	7.4	6.0	3.9	4.6	4.6	5.3	8.1	7.4	6.0
8	7.5	6.0	5.0	7.1	6.0	4.2	4.2	4.6	5.3	8.1	7.1	6.0
9	7.4	5.8	5.0	7.1	6.0	4.2	4.2	4.6	5.3	8.1	7.1	6.0
10	7.4	5.5	5.1	7.1	6.0	4.2	4.2	4.6	5.3	8.1	7.1	6.0
11	7.4	5.7	5.4	7.1	6.0	4.2	4.2	4.6	5.3	8.1	7.1	6.0
12	7.4	5.6	5.3	7.1	5.7	4.2	4.2	4.6	5.3	8.1	7.1	6.0
13	7.3	5.6	4.9	7.1	5.7	4.2	4.2	4.9	5.3	8.1	7.1	6.0
14	7.3	5.5	4.9	6.7	5.7	4.2	4.2	4.9	5.3	7.8	7.1	6.0
15	7.3	5.5	4.9	6.7	5.7	4.2	4.2	4.9	5.3	7.8	7.1	5.7
16	7.3	5.4	5.3	6.7	5.7	4.2	4.2	4.9	5.3	7.8	7.1	5.7
17	7.2	5.4	5.3	6.7	5.7	4.2	4.2	4.9	5.3	7.8	7.1	5.7
18	7.2	5.4	5.3	6.7	5.3	4.2	4.2	4.9	5.3	7.8	6.7	5.7
19	7.2	5.3	5.7	6.7	5.3	4.2	4.2	4.9	5.3	7.8	6.7	5.7
20	7.1	5.1	5.7	6.7	5.3	4.6	4.2	4.9	5.3	7.8	6.7	5.7
21	7.1	4.9	5.7	6.7	5.3	4.6	4.6	4.9	5.3	7.8	6.7	5.7
22	6.9	4.9	5.7	6.7	5.3	4.6	4.6	4.9	5.3	7.8	6.7	5.7
23	6.7	4.8	6.0	6.4	5.3	4.6	4.6	4.9	5.3	7.8	6.7	5.3
24	6.7	4.8	6.0	6.4	4.9	4.6	4.6	4.9	5.3	7.8	6.7	5.3
25	6.7	4.8	6.0	6.4	4.9	4.6	4.6	4.9	6.7	7.8	6.7	5.3
26	6.6	4.8	6.4	6.4	4.6	4.6	4.6	5.3	8.1	7.8	6.7	5.3
27	6.4	4.7	6.4	6.4	4.6	4.6	4.6	5.3	8.1	7.8	6.4	5.3
28	6.4	4.7	6.4	6.4	4.6	4.6	4.6	5.3	8.1	7.4	6.4	5.3
29	6.5	4.6	6.4	6.4	4.6	4.6	4.6	5.3	8.1	7.4	6.4	5.3
30	6.4		6.7	6.4	4.2	4.6	4.6	5.3	8.1	7.4	6.4	5.3
31	6.4		6.7		4.2		4.6	5.3		7.4		5.3
Sum	219.5	158.8	168.1	204.0	169.4	128.9	137.4	151.0	174.4	244.1	208.7	179.3
Current Year 1980									Period 1966-1980			
Month	Extreme Gage ** Feet		Extreme Second-Foot				Average Second- Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.	1.57	1.53	1 4	7.5	127	6.4	7.1	435	508	1,093	77.2	
Feb.	1.54	1.49	1 1	6.4	29	4.5	5.5	315	411	1,068	66.8	
Mar.	1.51	1.44	130	6.7	1 2	4.2	5.3	332	426	1,295	70.4	
Apr.	1.48	1.41	1 6	7.4	123	6.4	6.7	404	377	1,061	65.5	
May	1.44	1.38	1 1	6.4	130	4.2	5.3	336	411	1,096	66.2	
June	1.41	1.38	120	4.6	1 4	3.9	4.2	256	408	1,129	87.9	
July	1.38	1.35	1 1	4.6	1 8	4.2	4.6	273	439	1,117	80.9	
Aug.	1.35	1.35	126	5.3	1 1	4.6	4.9	301	525	1,105	93.8	
Sept.			126	0 8.1	1 1	0 5.3	5.7	346	540	1,167	85.5	
Oct.			1 1	0 8.1	128	0 7.4	7.8	484	617	1,188	87.9	
Nov.			1 1	0 7.4	127	0 6.4	7.1	413	607	1,203	84.5	
Dec.			1 1	0 6.4	123	0 5.3	5.7	354	589	1,177	83.9	
				0 8.1		3.9	5.9	4,249	5,858	12,443	1,257.2	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0 0.23	0.11	0.17	5,241	7,226	15,348	1,551		

\* Discharge measurement made on this day \*\* Includes storm flow 0 Mean daily  
! And other days

**DEVILS RIVER AT PAFFORD CROSSING NEAR COMSTOCK, TEXAS**

**DESCRIPTION:** Concrete control wall with rectangular notch opening of 900 second-foot (25.5 m<sup>3</sup>/sec) capacity, cableway, bubbler gage, water-stage recorders (graphic & digital), and binary decimal transmitter located on the left bank at latitude 29°40'35", longitude 101°00'00", about 11.5 miles (18.5 km) east of Comstock, Val Verde County, Texas, and 25.5 river miles (41.0 km) from the confluence with the Rio Grande. The confluence is located at river mile 574.6 (924.7 km), 0.7 river mile (1.1 km) upstream from Amistad Dam. The zero of the gage is 1,131.88 feet (345.00 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 16 discharge measurements during the year, 12 by the United States Section and 4 by the Mexican Section of the Commission, a stable rating curve based on meter measurements, and a continuous record of gage heights. Records available: 1960 through 1980. Records are also available from May 1900 through March 1914 for a station 23.8 river miles (38.3 km) downstream; from December 1923 through September 1932 for a station 22.8 river miles (36.7 km) downstream; from September 2, 1932 through August 1957 for a station 21.0 river miles (33.8 km) downstream; from August 7, 1954 through January 1958 for a station 5.4 river miles (8.7 km) upstream; and from August 1954 through May 31, 1968 for a station at the mouth 24.7 river miles (39.8 km) downstream.

**REMARKS:** At this station the flow of this spring-fed stream is very uniform during periods of dry weather and is not modified by diversions or storage. The transmitter relays gage height data upon interrogation from the Amistad Dam hydrographic office of the United States Section of the Commission and is also programmed to relay similar data to this office at predetermined time intervals. Transmission is via radio.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 250,000 second-feet (7,080 m<sup>3</sup>/sec) on September 18, 1974 with a gage height of 19.82 feet (6.04 m). Min. 48.6 second-feet (1.38 m<sup>3</sup>/sec) on August 20, 1969.

Average Flow in Second-Foot (Cubic Meters per Second)			
Daily:	Max. 123,000 (3,480)	Sept. 18, 1974	Min. 53.7 (1.52) August 20, 1969
Monthly:	Max. 8,460 (240)	Sept. 1974	Min. 64.3 (1.82) August 1964
Yearly:	Max. 977 (27.7)	1974	Min. 99.9 (2.83) 1968

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	270	256	237	252	223	223	209	223	209	420	283	283
2	270	256	252	252	223	223	209	223	209	403	283	267
3	265	260	252	237	237	223	209	209	209	385	283	267
4	265	260	252	237	267	223	209	209	209	385	298	267
5	265	256	252	237	267	223	209	209	209	385	298	267
6	265	260	252	237	252	223 *	209	209	209	367	298	267
7	270	260	252	252	252	223	209	209	209	367	298	267
8	270	260	267	237	252	223	209	209	209	367	298	267
9	270	260	267	237	252	223	209	209	209	367	283	267
10	270	260	267	237	252	252	209 *	209	209	348	283	267
11	270	265	267	237	237	331	209	330	209	348	283	267
12	265	260	252	237	252	267	209	537	209	331	283	267
13	265	267	252	237	237	237	209	331	209	331	283	267
14	265	267	252	237	252	237	209	283	209	331	283	267
15	270	267	252	237	256	237	209	267	209 *	331	283	267 *
16	270 *	267	267	237	252	237	196	267	209	331 *	283	267
17	270	267	252 *	237	252	237	196	252	209	315	283 *	267
18	270	267	237	237	237	237	196	252 *	209	315	283	252
19	270	267	252	237	237 *	237	196	252	209	315	283	252
20	280	267	252	237	237	223	209	237	209	315 *	283	252
21	285	252	252	237 *	237	223	209 *	237	209	315	283	252
22	270	252	252	237	237	223	209	237	209	298	283	252
23	256	252	252	237	237	223	237	237	209	298	283	252
24	256 *	252	252	237 *	237	223	237	237	209	298	283	252
25	260	252 *	252	223	237	209	223	237	24,500	283	283	252
26	260	252	252	223	223	209	223	223	3,180	283	283	252
27	256	252	252	223	223	209	223	223	1,050	283	283	252
28	260	252	267	237	237	209	223	223	685	283	283	252
29	260	252	237	237	223	209	252	223	494	267	283	252
30	260	237	223	223	223	209	237	223	434	267	283	252
31	256	237	223	223	223	209	223	223	283	283	283	252
Sum	8,254	7,517	7,827	7,099	7,463	6,885	6,624	7,649	35,359	10,215	8,565	8,083

Month	Current Year 1980						Period 1960-1980				
	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.75	1.69	120	285	122	256	266	16,372	14,414	28,842	4,647
Feb.	1.71	1.64	11	267	29	237	259	14,911	12,371	25,287	3,999
Mar.	1.71	1.64	18	267	11	237	252	15,533	12,379	26,404	4,186
Apr.	1.67	1.61	11	252	125	223	237	14,097	13,576	38,777	4,520
May	1.84	1.61	15	331	11	223	241	14,815	13,968	32,716	4,517
June	1.84	1.57	11	331	125	209	230	13,667	17,617	54,328	4,259
July	1.71	1.54	128	267	116	196	214	13,142	21,655	186,522	4,034
Aug.	2.72	1.57	12	964	13	209	247	15,179	46,983	408,908	3,955
Sept.	11.55	1.57	25	94,100	11	209	1,180	70,149	54,180	503,506	5,000
Oct.	2.03	1.71	1	434	128	267	329	20,260	20,459	50,845	5,004
Nov.	1.77	1.71	13	298	12	267	285	16,968	16,098	33,013	4,532
Dec.	1.74	1.67	1	283	118	252	261	16,035	15,216	31,063	4,697
Yearly	11.55	1.54		94,100		196	332	241,128	258,916	707,092	72,494
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	3.52	0.47		2,660		5.55	9.40	297,431	319,373	872,198	89,421

\* Discharge measurement made on this day ! And other days

## BIG SATAN CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Big Satan Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°39'50", longitude 100°57'50", 1.1 miles (1.8 km) upstream from its confluence with the Devils River, which is 21.2 miles (34.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,134.00 feet (345.64 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: May 1968 through 1980.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 42 square miles (109 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 56,100 second-feet (1,590 m<sup>3</sup>/sec) on August 15, 1971 with a gage height of 12.31 feet (3.75 m). Maximum volumes: Monthly, 12,204 acre-feet (15,054,000 m<sup>3</sup>) in August 1971; yearly 12,525 acre-feet (15,450,000 m<sup>3</sup>) in 1971.

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max.	4,480 (127)	Aug. 15, 1971	Min.
Monthly:	Max.	198 (5.61)	Aug. 1971	Min.
Yearly:	Max.	17.3 (0.49)	1971	Min.

} see REMARKS

### Mean Daily Discharge in Second Feet 1980

Month and Day			
No flow during 1980			

### Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters

## ROUGH CANYON NEAR DEL RIO, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Rough Canyon.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank at latitude 29°34'40", longitude 100°56'00", 3.9 miles (6.3 km) upstream from its confluence with the Devils River, which is 11.1 miles (17.9 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,129.00 feet (344.12 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1980.

**REMARKS:** This stream is normally dry, its flow being confined to periods of storm runoff from its 24 square miles (62.2 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 7,040 second-feet (199 m<sup>3</sup>/sec) on August 12, 1972 with a gage height of 6.80 feet (2.07 m). Maximum volumes: Monthly, 8,230 acre-feet (10,152,000 m<sup>3</sup>) in August 1971; yearly 8,232.2 acre-feet (10,154,000 m<sup>3</sup>) in 1971.

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max.	2,140 (60.6)	Aug. 16, 1971	Min.
Monthly:	Max.	134 (3.79)	Aug. 1971	Min.
Yearly:	Max.	11.4 (0.32)	1971	Min.

} see REMARKS

### Mean Daily Discharge in Second-Feet 1980

Month and Day			
No flow during 1980			

### Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters

**NORTH FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS**

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the north fork of San Pedro Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°31'20", longitude 100°53'00", 3 miles (4.8 km) upstream from its confluence with the Middle Fork Branch, which is 6.3 miles (10.1 km) upstream from its confluence with Devils River, which itself is 4.5 river miles (7.2 km) above the Devils River confluence with the Rio Grande. The zero of the gage is 1,126.92 feet (343.49 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: January 1968 through 1980.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 17 square miles (44 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 5,070 second-feet (144 m<sup>3</sup>/sec) on August 12, 1972 with a gage height of 8.44 feet (2.57 m). Maximum volumes: Monthly, 3,403 acre-feet (4,198,000 m<sup>3</sup>) in October 1969; yearly 4,061.7 acre-feet (5,010,000 m<sup>3</sup>) in 1969.

Average Flow in Second-Foot (Cubic Meters per Second)							
Daily:	Max.	1,240	(35.1)	Oct. 4, 1969	Min.	}	see REMARKS
Monthly:	Max.	55.3	(1.57)	Oct. 1969	Min.		
Yearly:	Max.	5.6	(0.16)	1969	Min.		

**Mean Daily Discharge in Second Feet 1980**

Month and Day			
No flow during 1980			

**Annual Summary**

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Foot	
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters

**MIDDLE FORK SAN PEDRO CREEK NEAR DEL RIO, TEXAS**

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on the middle fork of San Pedro Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the right bank of the creek at latitude 29°29'30", longitude 100°52'50", 3.2 miles (5.1 km) upstream from its confluence with the North Fork Branch, which is 6.3 miles (10.1 km) above the confluence with Devils River, which itself is 4.5 river miles (7.2 km) above the Devils River confluence with the Rio Grande. The zero of the gage is 1,132.02 feet (345.04 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1980.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 12 square miles (31 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 10,200 second-feet (289 m<sup>3</sup>/sec) on July 17, 1975 with a gage height of 5.84 feet (1.78 m). Maximum volumes: Monthly, 3,726 acre-feet (4,596,000 m<sup>3</sup>) in July 1975; yearly 3,726 acre-feet (4,596,000 m<sup>3</sup>) in 1975.

Average Flow in Second-Foot (Cubic Meters per Second)							
Daily:	Max.	1,390	(39.4)	July 17, 1975	Min.	}	see REMARKS
Monthly:	Max.	60.6	(1.72)	July 1975	Min.		
Yearly:	Max.	5.1	(0.14)	1975	Min.		

**Mean Daily Discharge in Second-Foot 1980**

Month and Day			
No flow during 1980			

**Annual Summary**

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Foot	
Yearly		Meters	Cubic Meters per Second	Thous. of Cub. Meters

### EVANS CREEK NEAR COMSTOCK, TEXAS

In order to determine storm runoff formerly included with measured flows at a gaging station on the Devils River before its relocation upstream incident to the completion of Amistad Dam, a gaging station was established during 1968 on Evans Creek.

**DESCRIPTION:** Cableway, control weir, bubbler gage, and digital recorder located on the left bank of the creek at latitude 29°32'15", longitude 101°06'10", 11.0 miles (17.7 km) upstream from its confluence with Devils River, which is 3.2 miles (5.1 km) upstream from the Devils River confluence with the Rio Grande. The zero of the gage is 1,162.54 feet (354.34 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on current meter measurements, a continuous record of gage heights, and the weir discharge rating. Records available: December 1967 through 1980.

**REMARKS:** This creek is normally dry, its flow being confined to periods of storm runoff from its 74 square miles (192 km<sup>2</sup>) of watershed area. Only the days of flow are shown below.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 17,400 second-feet (493 m<sup>3</sup>/sec) on June 12, 1971 with a gage height of 5.99 feet (1.83 m). Maximum volumes: Monthly, 9,281 acre-feet (11,448,000 m<sup>3</sup>) in August 1971; yearly 14,404 acre-feet (17,767,000 m<sup>3</sup>) in 1971.

Average Flow in Second-Foot (Cubic Meters per Second)

Daily:	Max.	3,940	(112)	Aug. 15, 1971	Min.	} see REMARKS
Monthly:	Max.	151	(4.28)	Aug. 1971	Min.	
Yearly:	Max.	19.9	(0.56)	1971	Min.	

#### Mean Daily Discharge in Second Feet 1980

Month and Day			
Aug. 11	484		
12	31.4		

#### Annual Summary

Month	Maximum Gage and Discharge			Total Acre-Feet
	Day	Feet	Second-Feet	
Aug.	11	2.72	2,610	1,022
		2.72	2,610	1,022
Yearly	Meters		Cubic Meters per Second	Thous. of Cub. Meters
		0.83	74.0	1,261

**CARMINA SPRINGS NEAR CD. ACUNA, COAHUILA**

**DESCRIPTION:** Cipolletti weir of 70.6 second-foot (2.0 m<sup>3</sup>/sec) capacity and staff gage located on a creek that runs almost parallel to Amistad Dam, about 130 feet (40 m) from the confluence with the Rio Grande, at latitude 29°26'50", longitude 101°03'35", and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.7 (923.2 km), 0.2 river mile (400 m) downstream from Amistad Dam and 12.6 river miles (20.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

**REMARKS:** At least six separate springs have emerged on the watershed of this small creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. On September 24, 1971, a flood destroyed part of the weir.

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
2	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
3	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
4	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
5	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
6	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
7	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	48.4
8	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	49.4
9	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.0	47.3	47.7	48.0	49.4
10	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.0	49.4
11	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.7	47.3	47.7	47.7	49.4
12	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.7	47.3	47.7	47.7	49.4
13	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
14	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
15	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
16	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
17	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
18	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
19	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
20	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
21	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	47.7	49.4
22	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.0	48.0
23	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.0	48.0
24	51.2	51.2	51.2	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.0	48.0
25	51.2	51.2	50.9	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.0	48.0
26	51.2	51.2	50.5	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.4	48.0
27	51.2	51.2	50.1	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.4	48.0
28	51.2	51.2	49.4	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.4	48.0
29	51.2	51.2	49.1	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.4	48.4
30	51.2		48.4	47.7	47.7	47.7	47.0	47.3	47.3	47.7	48.4	48.4
31	51.2		48.4		47.7		47.0	47.3		47.7		48.4

<b>Sum</b>		1,484.8		1,431.0		1,478.7		1,431.0		1,457.0		1,464.4		1,419.0		1,478.7		1,438.7		1,511.6
	1,587.2		1,575.6																	

Month	Current Year 1980							Period 1969-1980					
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum		
							Day	Day					
Jan.			1	1	51.2	1	1	51.2	51.2	3,149	2,602	3,707	364
Feb.			1	1	51.2	1	1	51.2	51.2	2,945	2,401	3,405	373
Mar.			1	1	51.2	130	1	48.4	50.9	3,125	2,572	3,621	525
Apr.			1	1	47.7	1	1	47.7	47.7	2,837	2,464	3,497	629
May			1	1	47.7	1	1	47.7	47.7	2,932	2,495	3,492	709
June			1	1	47.7	1	1	47.7	47.7	2,837	2,399	3,383	598
July			1	1	47.0	1	1	47.0	47.0	2,888	2,452	3,412	533
Aug.			111	1	47.7	1	1	47.0	47.3	2,905	2,549	3,361	540
Sept.			1	1	47.3	1	1	47.3	47.3	2,816	2,548	3,377	593
Oct.			1	1	47.7	1	1	47.7	47.7	2,932	2,753	3,816	830
Nov.			126	1	48.4	111	1	47.7	48.0	2,854	2,695	3,685	964
Dec.			1	8	49.4	122	1	48.0	48.7	3,000	2,816	3,786	1,077
<b>Yearly</b>					51.2			47.0	48.7	35,220	30,746	41,290	9,080
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>						
					1.45			1.33	1.38	43,440	37,924	50,932	11,201

0 Mean daily

1 And other days

## LOURDES, HILDA, AND ERNESTINA SPRINGS NEAR CD. ACUNA, COAHUILA

### LOURDES SPRING

**DESCRIPTION:** Rectangular sharp-crested weir of 28.8 second-foot (815 l/sec) capacity and staff gage located at latitude 29°26'35", longitude 101°03'30", at the base of the high bank of the Rio Grande, and about 11.1 miles (17.9 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 573.2 (922.5 km), 12.2 river miles (19.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 926.28 feet (282.33 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

**REMARKS:** This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 1.4 (0.04) to 1.8 second-foot (0.05 m<sup>3</sup>/sec) and averaged 1.8 second-foot (0.05 m<sup>3</sup>/sec). The volume for the year amounted to 1,261.7 acre-feet (1,556,000 m<sup>3</sup>).

### HILDA SPRING

**DESCRIPTION:** Rectangular sharp-crested weir of 53.0 second-foot (1.50 m<sup>3</sup>/sec) capacity and staff gage located at latitude 29°26'20", longitude 101°03'35", about 328 feet (100 m) from the confluence with the Rio Grande and about 11.0 miles (17.7 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 572.8 (921.8 km), 11.8 river miles (19.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 908.14 feet (276.80 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

**REMARKS:** This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted. The daily flow throughout the year ranged from 2.5 (0.07) to 2.8 second-foot (0.08 m<sup>3</sup>/sec) and averaged 2.7 second-foot (0.07 m<sup>3</sup>/sec). The volume for the year amounted to 1,917 acre-feet (2,365,000 m<sup>3</sup>).

In order to determine what effect storage in Amistad Reservoir has on the flow of various Mexican springs in the vicinity of Amistad Dam, gaging stations were established in November 1961 at Ernestina and Rosita Springs. The station at Rosita Spring was discontinued in June 1976. The station and spring at Ernestina are described as follows:

### ERNESTINA SPRING

**DESCRIPTION:** A 90° V-notch weir of 1.4 second-foot (39 l/sec) capacity and staff gage located at the spring on the right bank of Arroyo del Buey about 100 feet (30 m) from the right bank of the Rio Grande at latitude 29°24'20", longitude 101°02'10", and about 8.5 miles (13.7 km) northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 570.4 (918.0 km), 9.4 river miles (15.1 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 3.5 river miles (5.6 km) downstream from Amistad Dam. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 7, 1961 through 1980.

**REMARKS:** The flow of this spring is small and very uniform except during periods of very heavy rainfall, at which time the capacity of the weir may be exceeded. The daily flow throughout the year was 0.106 second-foot (0.003 m<sup>3</sup>/sec), or 48 gallons per minute. The volume for the year amounted to 78.0 acre-feet (96,000 m<sup>3</sup>). Waters from this spring have a high sulfur content.

## RIO GRANDE BELOW AMISTAD DAM NEAR CD. ACUNA, COAHUILA AND DEL RIO, TEXAS

**DESCRIPTION:** Cableway, gravity well, concrete control weir, and water-stage recorders (graphic and digital), and binary decimal transmitter located on the left bank at latitude 29°25'30", longitude 101°02'25", and river mile 571.8 (920.3 km), 2.2 river miles (3.4 km) downstream from Amistad Dam and 10.8 river miles (17.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 898.94 feet (274.00 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 25 discharge measurements during the year, 13 by the Mexican Section and 12 by the United States Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: September 1954 through 1980. Records are also available from May 1900 through April 1915 for a station 1.9 miles (3 km) upstream; from December 1919 through March 1920 for a station 1.7 miles (3 km) downstream near McKee's Switch; from July 2, 1941 through August 1954 and October 1960 through 1967 for a station at the international highway bridge; and from December 1923 through July 2, 1941, and 1968 through 1980 for a station approximately 10.6 miles (17.0 km) downstream.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. On May 31, 1968 Amistad Dam started impounding water. After this day, flow at this station is controlled largely by releases from Amistad Reservoir, 2.1 river miles (3.3 km) upstream. The transmitter relays gage height data upon interrogation by telephone via private line to the Amistad office.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,158,000 second-feet (32,800 m<sup>3</sup>/sec) on June 28, 1954, determined by slope-area computation, with a gage height of 55.72 feet (16.98 m) at the old station site 500 feet (152 m) downstream. This is the greatest rate of discharge recorded at any point on the Rio Grande. Max. since Amistad Dam, 62,200 second-feet (1,760 m<sup>3</sup>/sec) on Sept. 21, 1974. Min. 22.2 second-feet (0.63 m<sup>3</sup>/sec) on February 14, 1969 with a gage height of 1.08 feet (0.33 m).

		Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max. 61,100 (1,730)	Sept. 22, 1974	Min. 46.6 (1.32)	April 13, 1971	
Monthly:	Max. 21,500 (609)	Sept. 1974	Min. 60.7 (1.72)	Oct. 1971	
Yearly:	Max. 4,910 (139)	1974	Min. 576 (16.3)	1972	

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,350	2,440	1,260	4,170	1,030	3,960	7,700	2,030	2,000	2,020	1,990	1,990
2	2,350	2,440	1,260	1,240	1,030	3,920	7,700	2,030	2,000	1,970	1,990	1,990
3	2,350	2,430	1,260	1,240	1,100	3,960	7,700	2,030	1,990	2,010	1,990	1,990
4	2,370	2,410	1,590	1,240	1,030	3,960	7,840	2,010	1,990	2,020	1,990	1,990
5	2,370	2,410	1,950	1,240	1,030	3,960	7,840	1,990	1,990	2,020	1,990	1,990
6	2,360	2,410	1,950	1,240	1,000	3,960	7,770	1,980	1,990	2,020	1,980	1,990
7	2,340	2,410	1,950	1,240	1,000	3,960	7,700	1,980	1,990	2,020	1,950	1,990
8	2,340	2,410	1,950	1,240	1,000	3,920	7,700	1,990	1,990	2,020	1,950	1,990
9	2,340	2,410	1,950	1,240	1,500	3,920	7,700	1,960	2,030	2,020	1,950	1,990
10	2,340	2,410	2,170	1,240	2,320	3,920	7,840	1,990	2,030	2,020	1,950	1,990
11	2,340	2,400	2,550	1,240	2,320	3,920	7,840	2,260	2,030	2,020	1,950	1,990
12	2,340	2,390	2,560	1,240	4,450	4,030	7,840	2,230	2,030	2,020	1,950	1,990
13	2,340	2,390	2,560	1,240	5,830	3,010	7,840	2,300	2,030	2,020	1,950	1,990
14	2,340	2,390	2,820	1,250	5,900	4,130	7,840	2,310	2,030	2,040	1,950	1,990
15	2,330	2,390	3,210	1,250	5,190	4,130	7,840	2,370	2,070	2,070	1,970	1,980
16	2,330	2,390	3,210	1,240	3,990	4,060	7,840	2,370	2,070	2,060	1,990	1,980
17	2,330	2,400	3,210	1,240	3,990	4,060	7,840	2,390	2,070	2,030	1,990	1,980
18	2,330	2,400	3,210	1,240	3,990	4,030	6,570	2,280	2,070	2,030	1,990	1,990
19	2,330	2,380	3,210	1,240	3,990	4,030	4,130	2,080	2,070	2,030	1,990	1,990
20	2,330	2,380	3,490	1,240	3,990	4,030	4,130	2,050	2,070	2,030	1,990	1,990
21	2,340	2,380	3,960	1,150	3,990	3,990	4,060	2,050	2,070	2,030	1,990	1,990
22	2,340	2,380	3,920	1,010	3,990	3,960	4,060	2,050	2,070	2,010	1,990	1,990
23	2,340	2,390	3,920	1,010	3,990	3,960	3,990	2,060	2,070	1,990	1,990	1,990
24	2,330	2,390	4,560	1,040	3,990	3,920	3,990	2,060	2,070	1,990	1,990	1,990
25	2,330	2,390	5,580	1,070	3,990	3,920	3,990	2,060	2,110	2,000	1,990	1,970
26	2,440	2,390	5,580	1,070	3,990	3,960	3,960	2,060	2,130	1,990	1,990	1,950
27	2,440	2,390	3,880	1,070	3,990	3,920	3,960	2,030	2,130	1,980	1,990	1,950
28	2,440	1,970	6,000	1,070	3,990	3,920	3,490	1,980	2,150	1,980	1,990	1,950
29	2,430	1,260	6,000	1,060	3,990	3,920	2,030	2,000	2,170	1,980	1,990	1,950
30	2,430		6,000	1,060	3,990	2,030	2,030	1,980	2,180	1,990	1,990	1,980
31	2,440		5,930		3,990	5,050	2,030	1,980	1,980	1,980	1,990	1,980
Sum	73,150	68,030	102,650	38,360	99,570	119,390	184,790	64,940	61,690	62,410	59,350	61,460

Month	Current Year 1980						Period 1968-1980				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
						Day	Day				
Jan.	1.74	1.71	126	2,440	115	2,330	2,360	145,106	73,792	145,106	5,318
Feb.	1.74	1.28	1	2,440	29	1,260	2,350	135,082	116,695	467,202	12,467
Mar.	2.85	1.25	128	6,000	3	1,240	3,310	203,608	128,776	396,457	7,271
Apr.	2.82	1.12	1	5,930	122	1,010	1,280	76,062	98,994	342,129	27,570
May	2.82	1.12	113	5,900	1	1,000	3,210	197,542	198,066	506,848	24,137
June	3.25	.36	30	7,700	13	143	3,990	236,705	149,133	327,602	16,418
July	3.28	1.61	110	7,840	129	2,030	5,970	366,470	132,418	366,470	23,182
Aug.	2.17	1.57	11	3,600	1	1,950	2,090	128,835	151,660	662,215	15,589
Sept.	1.67	1.57	128	2,190	1	1,950	2,060	122,187	218,040	1,280,079	17,606
Oct.	1.64	1.57	1	2,110	2	1,950	2,010	123,784	161,925	812,596	3,734
Nov.	1.61	1.57	15	2,020	1	1,950	1,980	117,634	98,881	502,295	4,539
Dec.	1.57	1.57	1	1,990	126	1,950	1,980	121,844	71,100	216,286	4,859
Yearly	3.28	0.36		7,840		143	2,720	1,974,859	1,599,480	3,566,066	416,788
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	1.00	0.11		222		4.05	77.0	2,435,962	1,972,939	4,398,694	514,104

\* Discharge measurement made on this day      † And other days

## SPRING M-15 AND SPRING M-5 NEAR CD. ACUNA, COAHUILA

## SPRING M-15

DESCRIPTION: Rectangular sharp-crested weir of 8.1 second-foot (230 l/sec) capacity and staff gage located at latitude 29°25'20", longitude 101°02'40", about 1,300 feet (400 m) from the confluence with the Rio Grande and about 9.4 miles (15.1 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.3 (919.4 km), 10.3 river miles (16.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 925.13 feet (281.98 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Month	Extreme Gage Feet		Current Year 1980				Average Second-Foot	Total Acre-Feet	Period 1969-1980		
	High	Low	Extreme Second-Foot		Day	Low			Acre-Feet		
			Day	High					Average	Maximum	Minimum
Jan.	1	1	1	1.1	1	1.1	1.1	64.9	78.6	131	21.1
Feb.	1	1	1	1.1	1	1.1	1.1	60.8	70.5	123	19.5
Mar.	1	1	1	1.1	1	1.1	1.1	64.9	73.0	122	21.9
Apr.	1	1	1	1.4	1	1.1	1.4	73.8	71.3	105	21.1
May	1	1	1	1.1	1	1.1	1.1	64.9	75.4	109	21.9
June	1	1	1	1.1	1	1.1	1.1	63.2	65.7	121	21.1
July	1	1	1	1.1	1	1.1	1.1	54.3	68.1	106	21.1
Aug.	1	1	1	.7	1	.7	.7	43.8	65.7	122	0
Sept.	1	1	1	.7	1	.7	.7	42.2	67.3	105	0
Oct.	1	1	1	.7	1	.7	.7	43.8	70.5	117	0
Nov.	1	1	1	.7	1	.7	.7	42.2	72.2	124	21.1
Dec.	1	1	1	1.4	1	1.4	1.4	86.7	79.4	131	21.9
Yearly				1.4		0.7	1.1	705.5	857.7	1,362.2	257.2
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.04		0.02	0.03	870	1,058	1,679	317

## SPRING M-5

DESCRIPTION: Rectangular sharp-crested weir of 17.7 second-foot (500 l/sec) capacity and staff gage located at latitude 29°25'20", longitude 101°02'35", at the base of the high bank of the Rio Grande, and about 9.2 miles (14.8 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 571.1 (919.1 km), 10.1 river miles (16.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 932.38 feet (284.19 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

REMARKS: This spring emerged since operation of Amistad Dam began in May 1968. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Month	Extreme Gage Feet		Current Year 1980				Average Second-Foot	Total Acre-Feet	Period 1969-1980		
	High	Low	Extreme Second-Foot		Day	Low			Acre-Feet		
			Day	High					Average	Maximum	Minimum
Jan.	1	1	1	2.8	1	2.8	2.8	173	156	195	86.7
Feb.	1	1	1	2.8	1	2.8	2.8	162	139	162	78.6
Mar.	1	1	1	2.8	1	2.8	2.8	173	149	173	64.9
Apr.	1	1	1	2.8	1	2.8	2.8	168	144	168	63.2
May	1	1	1	2.8	1	2.8	2.8	173	150	173	64.9
June	1	1	1	2.8	1	2.8	2.8	168	141	168	63.2
July	1	1	1	2.8	1	2.8	2.8	173	143	173	43.8
Aug.	1	1	1	2.8	1	2.8	2.8	173	149	195	43.8
Sept.	1	1	1	2.8	1	2.8	2.8	168	147	189	42.2
Oct.	1	1	1	2.8	1	2.8	2.8	173	152	195	43.8
Nov.	1	1	1	2.8	1	2.8	2.8	168	149	189	63.2
Dec.	1	1	1	2.8	1	2.8	2.8	173	153	195	64.9
Yearly				2.8		2.8	2.8	2,045	1,772	2,148	723.2
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.08		0.08	0.08	2,526	2,186	2,653	892

⊘ Mean daily

1 And other days

ARROYO DE LOS JABONCILLOS NEAR CD. ACUNA, COAHUILA

DESCRIPTION: Cipolletti weir of 70.6 second-foot (2 m<sup>3</sup>/sec) capacity and staff gage located at latitude 29°24'25"N, longitude 101°02'20"W, about 660 feet (200 m) from the confluence with the Rio Grande, and about 8.6 miles (13.8 km) northwest of Cd. Acuna, Coahuila. This creek enters the Rio Grande from the Mexican side at river mile 570.5 (918.2 km), 9.5 river miles (15.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

RECORDS: Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: 1969 through 1980.

REMARKS: At least 9 separate springs have emerged along this creek since operation of Amistad Dam began in May 1968. Prior to this time, flow in this creek was exclusively from storm runoff. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below.

Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	65.7	65.7	65.7	61.1	61.1	59.3	56.5	50.5	57.2	57.9	58.6	60.4
2	65.7	65.7	65.7	61.1	61.1	59.3	56.2	50.5	57.2	57.9	58.6	60.4
3	65.7	65.7	65.7	61.1	61.1	59.3	55.8	50.5	55.1	57.9	58.6	60.4
4	65.7	65.7	65.0	61.1	61.1	59.3	55.4	50.5	55.8	57.9	57.9	60.4
5	65.7	65.7	65.0	61.1	61.1	59.3	55.1	50.5	55.8	57.9	57.9	60.4
6	65.7	65.7	65.0	61.1	61.1	59.3	55.1	50.5	55.8	57.9	57.9	60.4
7	65.7	65.7	65.0	61.1	61.1	59.3	53.7	50.5	56.5	57.9	57.9	60.4
8	65.7	65.7	65.0	61.1	61.1	59.3	53.7	50.5	56.5	57.9	57.9	60.4
9	65.7	65.7	65.0	61.1	61.1	59.3	53.7	50.5	57.2	57.9	57.9	59.3
10	65.7	65.7	65.0	61.1	61.1	59.3	53.7	54.7	57.2	57.9	57.9	59.3
11	65.7	65.7	65.0	61.1	61.1	59.3	53.7	58.6	57.2	57.9	59.3	59.3
12	65.7	65.7	63.6	61.1	61.1	59.3	53.7	58.6	56.5	57.9	59.3	59.3
13	65.7	65.7	62.5	61.1	61.1	59.3	53.7	58.6	56.5	57.9	59.3	59.3
14	65.7	65.7	62.5	61.1	61.1	59.3	53.7	58.6	56.5	57.9	59.3	59.3
15	65.7	65.7	62.5	61.1	61.1	59.3	53.7	58.6	56.5	57.9	59.3	61.1
16	65.7	65.7	62.5	61.1	61.1	59.3	53.7	58.6	55.8	57.9	59.3	61.1
17	65.7	65.7	62.5	61.1	61.1	59.3	53.7	58.6	55.8	57.9	59.3	61.1
18	65.7	65.7	62.5	61.1	61.1	59.3	52.3	58.6	55.8	58.6	59.3	61.1
19	65.7	65.7	62.5	61.1	61.1	59.3	50.5	58.6	55.8	58.6	60.4	60.4
20	65.7	65.7	62.5	61.1	61.1	59.3	50.5	58.6	55.8	59.3	60.4	60.4
21	65.7	65.7	62.5	61.1	61.1	59.3	50.5	57.9	55.8	59.3	60.4	60.4
22	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	55.8	60.0	61.1	60.4
23	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	55.8	60.0	61.1	60.4
24	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	56.5	59.7	60.4	60.4
25	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	56.5	59.7	60.4	60.4
26	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	56.9	59.3	61.1	60.4
27	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.9	57.9	59.3	61.1	60.4
28	65.7	65.7	62.5	60.7	61.1	59.3	50.5	57.2	57.9	58.6	60.4	60.4
29	65.7	65.7	62.2	60.7	61.1	59.3	50.5	57.2	57.9	58.6	60.4	60.4
30	65.7	65.7	62.2	60.7	61.1	59.3	50.5	57.2	57.9	58.6	60.4	60.4
31	65.7	65.7	61.8	60.7	61.1	59.3	50.5	57.2	57.2	58.6	60.4	60.4
Sum	2,036.7	1,905.3	1,966.9	1,829.4	1,894.1	1,779.0	1,633.6	1,728.6	1,695.4	1,812.5	1,783.1	1,868.6
Current Year 1980									Period 1969-1980			
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Foot			
	High	Low	Day	High	Low	Average			Maximum	Minimum		
Jan.			1 1	65.7	1 1	65.7	65.7	4,039	3,364	4,720	349	
Feb.			1 1	65.7	1 1	65.7	65.7	3,778	3,082	4,207	381	
Mar.			1 1	65.7	3 1	61.8	63.6	3,901	3,323	4,574	526	
Apr.			1 1	61.1	1 22	60.7	61.1	3,629	3,187	4,345	636	
May			1 1	61.1	1 1	61.1	61.1	3,757	3,234	4,540	721	
June			1 1	59.3	1 1	59.3	59.3	3,531	3,004	4,071	678	
July			1 1	56.5	1 19	50.5	52.6	3,240	3,074	4,367	769	
Aug.			1 11	58.6	1 1	50.5	55.8	3,429	3,176	4,321	782	
Sept.			1 27	57.9	3	55.1	56.5	3,363	3,232	* 4,417	782	
Oct.			1 22	60.0	1 1	57.9	58.6	3,596	3,554	† 5,211	1,097	
Nov.			1 22	61.1	1 4	57.9	59.3	3,537	3,517	† 4,847	1,282	
Dec.			1 15	61.1	1 9	59.3	60.4	3,706	3,617	† 4,709	1,398	
Yearly				65.7		50.5	60.0	43,506	39,364	51,839	9,850	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1.86		1.43	1.70	53,663	48,553	63,943	12,152	

Ø Mean daily    † And other days    \* Partly estimated    † Estimated

## ARROYO DEL BUEY AND ARROYO DE LA TREINTA Y UNA NEAR CD. ACUNA, COAHUILA

### ARROYO DEL BUEY

**DESCRIPTION:** Cipolletti weir of 35.3 second-foot (1 m<sup>3</sup>/sec) capacity, located at latitude 29°24'20", longitude 101°02'25", 0.2 creek mile (300 m) from the confluence with the Rio Grande, and about 8.5 miles (13.7 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 570.4 (918.0 km), 3.5 river miles (5.6 km) downstream from Amistad Dam and 9.4 river miles (15.2 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 1961 through 1980.

**REMARKS:** The flow of this stream is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. At approximately 0.3 creek mile (0.5 km) upstream from the weir four springs have emerged since Amistad Reservoir storage began. Backwater from the Rio Grande will affect the flow of this stream when the flow in the river is approximately 20,000 second-foot (566 m<sup>3</sup>/sec).

Current Year 1980								Period # Nov. 1961-1980			
Month	Extreme Gage Feet		Ø Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet		
	High	Low	High		Low				Average	Maximum	Minimum
			Day		Day						
Jan.	! 1		! 1	6.7	! 1	6.7	6.7	413	282	528	6.8
Feb.	! 1		! 1	6.4	! 1	6.4	6.4	366	255	477	5.4
Mar.	! 1		! 1	6.4	! 1	6.4	6.4	391	276	520	9.3
Apr.	! 16		! 1	6.7	! 1	6.4	6.7	389	304	540	6.3
May	! 1		! 1	6.4	! 1	6.4	6.4	391	285	544	10.9
June	! 1		! 1	6.4	! 21	5.7	6.0	358	285	492	6.3
July	! 1		! 1	5.7	! 1	5.7	5.7	348	273	503	6.5
Aug.	! 11		! 1	6.7	! 1	5.7	6.4	392	299	517	6.7
Sept.	! 1		! 1	6.7	! 6	6.4	6.4	382	307	493	6.6
Oct.	! 8		! 1	6.7	! 1	6.4	6.7	408	330	544	6.5
Nov.	! 1		! 1	7.1	! 1	7.1	7.1	420	291	515	6.3
Dec.	! 1		! 1	7.1	! 1	7.1	7.1	435	293	538	6.5
				7.1		5.7	6.4	4,693	3,480	6,031	216.8
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.20		0.16	0.18	5,785	4,293	7,438	267

### ARROYO DE LA TREINTA Y UNA

**DESCRIPTION:** Cipolletti weir of 35.3 second-foot (1 m<sup>3</sup>/sec) capacity, located at latitude 29°22'35", longitude 101°01'15", 0.6 creek mile (900 m) from the confluence with the Rio Grande, and about 6.5 miles (10.5 km) northwest of Cd. Acuna, Coahuila. This stream enters the Rio Grande from the Mexican side at river mile 567.6 (913.5 km), 6.3 river miles (10 km) downstream from Amistad Dam and 6.6 river miles (10.6 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: May 1961 through 1980.

**REMARKS:** The flow of this stream is very uniform during periods of dry weather and is not modified by diversions or storage. Prior to 1969 discharges were based on a continuous record of gage heights and the weir discharge table. Storm flow is deducted and not included in tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this stream. It is estimated that backwater from the Rio Grande will affect the flow at this station only during times of extremely high releases.

Current Year 1980								Period # May 1961-1980			
Month	Extreme Gage Feet		Ø Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet		
	High	Low	High		Low				Average	Maximum	Minimum
			Day		Day						
Jan.	! 1		! 1	3.2	! 1	3.2	3.2	195	159	282	15.2
Feb.	! 1		! 1	3.2	! 1	3.2	3.2	183	144	257	13.9
Mar.	! 1		! 1	3.2	! 1	3.2	3.2	195	159	327	14.2
Apr.	! 1		! 1	3.2	! 1	3.2	3.2	189	169	302	10.5
May	! 1		! 1	3.5	! 1	3.5	3.5	217	159	261	5.9
June	! 1		! 1	3.5	! 21	2.8	3.2	189	146	254	4.2
July	! 1		! 1	2.8	! 1	2.8	2.8	173	148	253	0
Aug.	! 1		! 1	3.2	! 1	2.8	3.2	191	158	323	0
Sept.	! 1		! 1	3.2	! 1	3.2	3.2	189	173	273	13.1
Oct.	! 1		! 1	3.2	! 1	3.2	3.2	195	181	282	12.1
Nov.	! 1		! 1	3.2	! 1	3.2	3.2	189	164	273	14.2
Dec.	! 1		! 1	3.2	! 1	3.2	3.2	195	166	282	15.2
				3.5		2.8	3.2	2,300	1,926	3,264	250.4
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.10		0.08	0.09	2,840	2,375	4,025	308.6

Ø Mean daily

! And other days

# Some months missing

**MARIS SPRING NEAR CD. ACUNA, COAHUILA**

**DESCRIPTION:** Cipolletti weir of 106 second-foot (3 m<sup>3</sup>/sec) capacity and staff gage located at the spring about 100 feet (30 m) from the right bank of the Rio Grande at latitude 29°24'00", longitude 101°01'40", and about 8 miles (12.9 km) northwest of Cd. Acuna, Coahuila. This spring enters the Rio Grande at river mile 569.9 (917.2 km), 8.9 river miles (14.3 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 4.0 river miles (6 km) downstream from Amistad Dam. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on periodic staff gage readings and the weir discharge table. Mean daily discharges determined by prorating between readings. Records available: November 14, 1961 through 1980.

**REMARKS:** The flow of this spring is very uniform during periods of dry weather and is not modified by diversions or storage. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir will have on the flow of this spring. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. Prior to May 1969 the weir had an 11.1 second-foot (315 l/sec) capacity.

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.2	9.2	8.5	8.1	8.1	8.5	8.1	7.1	17.3	11.3	9.5	8.8
2	9.2	9.2	8.5	8.1	8.1	8.5	8.1	7.1	17.0	11.3	9.5	8.8
3	9.2	9.2	8.5	8.1	8.5	8.5	8.1	7.1	16.6	11.3	9.5	8.8
4	9.2	9.2	8.5	8.1	9.2	8.5	8.1	7.1	16.2	11.3	9.5	8.8
5	9.2	9.2	8.5	8.1	8.8	8.5	8.1	7.1	16.2	11.3	9.5	8.8
6	9.2	9.2	8.5	8.1	8.8	8.5	8.1	7.1	16.2	11.3	9.5	8.8
7	9.2	9.2	8.5	8.1	8.8	8.5	8.1	7.1	15.9	11.3	9.5	8.8
8	9.2	9.2	8.5	8.1	9.9	8.5	8.1	7.1	15.2	10.9	9.5	8.8
9	9.2	9.2	8.5	8.1	10.6	8.5	8.1	7.1	14.8	10.9	9.5	8.8
10	9.2	9.2	8.5	8.1	9.9	8.5	8.1	7.1	14.8	10.9	9.5	8.8
11	9.2	9.2	8.5	8.1	9.5	8.5	8.1	7.1	14.8	10.9	9.5	8.8
12	9.2	9.2	8.5	8.1	9.5	8.5	8.1	18.0	14.5	10.9	9.5	8.8
13	9.2	9.2	8.5	8.1	9.5	8.5	8.1	26.1	13.8	10.9	9.5	8.8
14	9.2	9.2	8.5	8.1	9.5	8.1	8.1	26.1	13.4	10.6	9.5	8.8
15	9.2	9.2	8.5	8.1	9.5	8.1	8.1	23.7	13.1	10.6	9.5	8.8
16	9.2	9.2	8.5	8.1	9.2	8.1	8.1	23.0	13.1	10.2	9.5	8.8
17	9.2	9.2	8.5	8.1	9.2	8.1	8.1	22.2	12.7	10.2	9.5	8.8
18	9.2	9.2	8.5	8.1	9.2	8.1	7.8	21.5	12.7	10.2	9.5	8.8
19	9.2	9.2	8.5	8.1	8.5	8.1	7.4	20.8	12.7	10.2	9.5	8.8
20	9.2	9.2	8.5	8.1	8.5	8.1	7.4	20.5	12.7	10.2	9.2	8.8
21	9.2	9.2	8.5	8.1	8.5	8.1	7.4	20.5	12.0	10.2	9.2	8.8
22	9.2	9.2	8.5	8.1	8.5	8.1	7.4	20.1	12.0	10.2	9.2	8.8
23	9.2	9.2	8.5	8.1	8.5	8.1	7.4	19.4	11.7	10.2	9.2	8.8
24	9.2	9.2	8.5	8.1	8.5	8.1	7.4	19.1	11.7	10.2	9.2	8.8
25	9.2	9.2	8.5	8.1	8.5	8.1	7.4	18.7	11.7	10.2	9.2	8.8
26	9.2	9.2	8.5	8.1	8.5	8.1	7.1	18.7	11.7	9.9	9.2	8.8
27	9.2	9.2	8.5	8.1	8.5	8.1	7.1	18.4	11.7	9.9	9.2	8.8
28	9.2	9.2	8.5	8.1	8.5	8.1	7.1	18.0	11.7	9.5	9.2	8.8
29	9.2	9.2	8.5	8.1	8.5	8.1	7.1	18.0	11.3	9.5	8.8	8.8
30	9.2	9.2	8.5	8.1	8.5	8.1	7.1	17.7	11.3	9.5	8.8	8.5
31	9.2	9.2	8.5	8.1	8.5	8.1	7.1	17.7	11.3	9.5	8.8	8.5
<b>Sum</b>	285.2	266.8	263.5	243.0	276.3	248.2	239.9	486.3	410.5	325.5	280.9	272.2
<b>Current Year 1980</b>									<b>Period #Dec. 1961-1980</b>			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			1	9.2	1	9.2	9.2	564	481	934	4.4	
Feb.			1	9.2	1	9.2	9.2	528	428	843	4.1	
Mar.			1	8.5	1	8.5	8.5	521	455	923	4.9	
Apr.			1	8.1	1	8.1	8.1	483	461	878	4.2	
May			9	10.6	1	8.1	8.8	548	509	976	8.7	
June			1	8.5	114	8.1	8.1	492	460	917	6.0	
July			1	8.1	126	7.1	7.8	477	512	977	7.9	
Aug.			113	26.1	1	7.1	15.5	964	560	1,216	6.2	
Sept.			1	17.3	129	11.3	13.8	814	623	1,111	5.4	
Oct.			1	11.3	128	9.5	10.6	647	679	1,420	4.6	
Nov.			1	9.5	129	8.8	9.5	559	606	1,338	4.2	
Dec.			1	8.8	130	8.5	8.8	542	525	1,187	4.4	
<b>Yearly</b>				26.1		7.1	9.9	7,139	6,299	11,421	146.2	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				0.74		0.20	0.28	8,805	7,769	14,089	180.1	

∅ Mean daily

# Some months missing

! And other days

## EIGHT MILE CREEK NEAR DEL RIO, TEXAS

**DESCRIPTION:** Concrete wall with 90° V-notch weir of 6.9 second-foot (0.2 m<sup>3</sup>/sec) capacity, bubbler gage, and water-stage recorder located on the left bank at latitude 29°24'00", longitude 101°00'55", 0.8 creek mile (1.3 km) from the confluence with the Rio Grande, and about 8 miles (12.9 km) northwest of Del Rio, Texas. This stream enters the Rio Grande from the United States side at river mile 569.3 (916.2 km), 4.6 river miles (7.4 km) downstream from Amistad Dam, and 8.3 river miles (13.4 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuña, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on a continuous record of gage heights and the weir discharge table. Records available: March 1961 through 1980.

**REMARKS:** The source of flow of this stream is from surface runoff during rainy periods and the subsequent flow from underground seepage as a result of such rains. All storm water from surface runoff passing this station is deducted and is not included in the tabulation below. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this stream.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Feet (Cubic Meters per Second)		
Daily:	Max. 15.9 (0.45)	July 23 & 24, 1976	Min. 0	Occasionally
Monthly:	Max. 6.3 (0.18)	July 1976	Min. 0	Occasionally
Yearly:	Max. 4.0 (0.11)	1974 & 1975	Min. 0	Several years

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.1	3.0	2.8	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.5	2.5
2	3.1	3.0	2.8	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.5	2.5
3	3.1	3.0	2.8	2.8	3.2	2.5	2.1	1.8	2.1	2.1	2.5	2.5
4	3.2	3.1	2.8	2.8	2.8	2.5	1.8	1.4	1.8	2.1	2.5	2.5
5	3.2	3.0	2.8	2.5	2.8	2.1	1.8	1.4	2.1	2.1	2.5	2.5
6	3.3	2.9	2.8	2.5	2.8	2.1	1.8	1.4	2.1	2.1	2.5	2.8
7	3.2	3.0	2.8	2.5	2.8	2.1	1.8	1.4	1.8	2.1	2.5	2.5
8	3.2	3.0	2.8	2.5	2.8	2.1	1.8	1.4	2.1	2.1	2.5	2.5
9	3.1	2.9	2.8	2.5	2.8	2.1	1.8	1.4	1.8	2.1	2.5	2.5
10	3.2	2.9	2.8	2.5	2.8	2.1	1.8	1.8	1.8	2.1	2.5	2.5
11	3.1	3.0	2.8	2.5	2.8	2.1	1.8	2.8	1.8	2.1	2.5	2.5
12	3.0	2.9	2.8	2.5	2.5	2.1	1.8	3.2	1.8	2.1	2.5	2.5
13	3.0	2.9	2.8	2.5	2.5	2.1	1.8	2.5	1.8	2.1	2.5	2.5
14	3.0	2.9	2.8	2.5	2.8	2.1	1.8	2.1	2.1	2.1	2.5	2.8
15	3.1	2.9	2.8	2.5	2.8	2.1	1.8	2.1	2.1	2.1	2.5	2.8
16	3.1	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.8	2.5
17	3.0	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.5
18	3.1	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.5
19	3.2	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.5
20	3.1	3.0	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.5
21	3.2	3.0	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.5
22	3.2	3.0	2.8	2.8	2.5	2.1	1.8	2.1	2.1	2.1	2.8	2.8
23	3.2	3.0	2.8	2.8	2.5	2.1	2.5	2.1	1.8	2.1	2.5	2.8
24	3.2	3.0	2.8	2.8	2.5	2.1	2.1	2.1	1.8	2.1	2.5	2.8
25	3.1	2.9	2.8	2.5	2.5	2.1	2.1	2.1	2.1	2.1	2.8	2.8
26	3.1	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.5	2.1	2.5	2.8
27	3.0	2.9	3.2	2.5	2.8	2.1	1.8	2.1	2.1	2.1	2.5	2.8
28	3.1	2.9	2.8	2.5	2.8	2.1	1.8	2.1	2.1	2.1	2.5	2.8
29	3.1	2.9	2.8	2.5	2.8	2.1	1.8	2.1	2.1	2.1	2.5	2.8
30	3.1	2.9	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.1	2.5	2.8
31	3.0	2.8	2.8	2.5	2.5	2.1	1.8	2.1	2.1	2.5	2.5	2.8
Sum	96.7	85.5	87.2	77.1	82.1	64.6	58.0	61.9	60.7	65.9	75.9	81.4

Current Year 1980							Period #March 1961-1980				
Month	Extreme Gage ** Feet		Extreme Second-Feet				Average Second- Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	1.52	1.07	22	7.1	111	3.0	3.1	192	101	294	0
Feb.	1.10	1.04	16	3.2	29	2.8	2.9	170	91.9	273	0
Mar.	1.12	.98	27	3.2	112	2.5	2.8	174	94.0	271	0
Apr.	1.05	.95	11	2.8	17	2.1	2.5	152	95.9	244	0
May	2.17	.95	3	3.2	11	2.5	2.5	162	94.3	224	0
June	1.18	.85	11	2.5	113	1.8	2.1	129	85.2	214	0
July	2.92	.79	23	2.5	14	1.8	1.8	113	94.3	390	0
Aug.	4.04	.75	111	3.2	16	1.4	2.1	123	98.4	299	0
Sept.	1.04	.83	26	2.8	16	1.8	2.1	120	88.7	240	0
Oct.	.98	.89	120	2.5	13	1.8	2.1	132	106	334	0
Nov.	1.64	.95	15	2.8	15	2.5	2.5	149	97.8	321	0
Dec.	1.05	.98	16	2.8	11	2.5	2.5	161	102	283	0
Yearly	4.04	0.75		7.1		1.4	2.4	1,777	1,149.5	2,892	3.4
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	1.23	0.23		0.20		0.04	0.07	2,192	1,418	3,567	4.2

# Some months missing

\*\* Includes storm runoff

0 Mean daily

1 And other days

**MCKEE SPRING NEAR DEL RIO, TEXAS**

**DESCRIPTION:** Cipolletti weir of 21.5 second-foot (0.6 m<sup>3</sup>/sec) capacity located on the source pool of this spring, which is located on the left flood plain of the Rio Grande at latitude 29°23'35", longitude 101°01'15", about 150 feet (45.7 m) from the edge of the low-flow channel and about 8 miles (12.9 km) northwest of Del Rio, Texas. Water from this spring enters the Rio Grande at river mile 569.1 (915.9 km), 4.8 river miles (7.7 km) downstream from Amistad Dam. The zero of the gage is 894.59 feet above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 27 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: November 1961 through 1980.

**REMARKS:** The flow of this spring is uniform during periods of dry weather and is not modified by diversions or storage. It is estimated that backwater from the Rio Grande will reach the emergence of this spring when the river flow is approximately 14,000 second-feet (396 m<sup>3</sup>/sec). This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring. In April 1977 the water began to leak under the weir, causing the gage height-discharge relationship to become ineffective.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 9.6 (0.27)	Nov. 21, 1979	Min. 0	Occasionally
Monthly:	Max. 8.7 (0.25)	Nov. 1979	Min. 0	Occasionally
Yearly:	Max. 7.8 (0.22)	1979	Min. 0	1963

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.9	7.9	7.3	* 7.8	6.9	7.9	* 7.3	7.3	7.9	6.7	5.6	6.3
2	8.0	7.6	7.3	* 7.8	6.9	7.8	* 7.4	7.4	* 7.8	* 6.6	5.8	6.2
3	* 8.1	7.4	7.2	7.7	6.9	7.7	7.4	* 7.8	6.6	5.9	* 6.2	
4	8.2	7.1	7.2	7.7	6.9	7.7	7.3	7.4	7.8	6.7	6.1	6.2
5	8.2	6.9	* 7.1	7.6	* 6.9	* 7.6	7.3	7.5	7.8	6.7	* 6.2	6.1
6	8.3	* 6.6	7.2	7.5	6.9	7.5	7.2	* 7.5	7.9	6.7	6.2	6.1
7	8.4	6.7	7.3	7.4	6.9	7.5	7.2	7.6	7.9	6.8	6.3	6.1
8	8.4	6.8	7.4	7.4	7.0	7.4	7.1	7.6	7.9	6.8	6.3	6.0
9	8.5	6.9	7.5	7.3	7.2	7.3	7.1	7.7	7.9	6.8	6.3	6.0
10	8.6	7.0	7.6	7.2	7.3	7.3	7.1	7.8	7.9	6.8	6.3	5.9
11	8.7	7.1	7.7	7.2	7.4	7.2	7.0	7.8	8.0	6.9	6.4	5.9
12	8.7	7.2	7.8	7.1	7.5	7.1	7.0	7.9	8.0	6.9	6.4	5.9
13	8.8	7.2	7.9	7.0	7.7	7.1	6.9	7.9	8.0	6.9	6.4	5.8
14	8.9	7.3	8.0	6.9	7.8	7.0	6.9	8.0	8.0	7.0	6.5	5.8
15	8.9	7.4	8.1	6.9	7.9	7.0	6.8	8.1	8.1	* 7.0	6.5	5.8
16	* 9.0	7.5	8.2	* 6.8	8.1	6.9	* 6.8	8.1	* 8.1	6.9	6.5	5.7
17	9.0	7.6	8.3	6.8	8.2	6.8	6.8	8.2	* 8.1	6.7	6.5	* 5.7
18	8.9	7.7	8.4	6.8	8.3	6.8	6.9	8.3	8.0	6.6	6.6	5.7
19	8.9	7.8	* 8.5	6.8	8.4	* 6.7	6.9	8.3	7.9	6.5	* 6.6	5.7
20	8.8	* 7.9	8.4	6.8	8.6	6.8	6.9	* 8.4	7.8	6.4	6.6	5.7
21	8.8	7.8	8.4	6.8	* 8.7	6.8	7.0	8.4	7.7	6.2	6.5	5.8
22	8.7	7.8	8.4	6.8	8.6	6.9	7.0	8.3	7.6	6.1	6.5	5.8
23	8.7	7.7	8.3	6.8	8.6	6.9	7.0	8.3	7.5	6.0	6.5	5.8
24	8.7	7.7	8.2	6.8	8.5	7.0	7.1	8.2	7.4	5.8	6.5	5.8
25	8.6	7.6	8.2	6.8	8.4	7.0	7.1	8.2	7.3	5.7	6.4	5.8
26	8.6	7.6	8.2	6.8	8.3	7.1	7.1	8.1	7.2	5.6	6.4	5.8
27	8.5	7.5	8.1	6.9	8.3	7.1	7.2	8.1	7.1	5.5	6.4	5.8
28	8.5	7.4	8.0	6.9	8.2	7.2	7.2	8.1	7.0	5.3	6.3	5.9
29	8.4	7.4	8.0	6.9	8.1	7.2	7.2	8.0	6.9	* 5.2	6.3	5.9
30	* 8.4		8.0	6.9	8.0	7.3	7.3	8.0	6.8	5.3	6.3	5.9
31	8.1		7.9		8.0		7.3	7.9		5.5		* 5.9
Sum	265.2	214.1	244.1	212.9	241.4	215.6	219.8	245.8	231.1	197.2	190.1	183.0

Month	Current Year 1980						Period Nov. 1961-1980				
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			116	9.0	1	7.9	8.6	526	276	526	0
Feb.			1	7.9	6	6.6	7.4	425	251	461	0
Mar.			19	8.5	5	7.1	7.9	484	276	527	0
Apr.			1	7.8	116	6.8	7.1	422	274	490	0
May			21	8.7	1	6.9	7.8	479	301	480	.7
June			1	7.9	19	6.7	7.2	428	268	441	0
July			1	7.4	115	6.8	7.1	436	275	474	0
Aug.			120	8.4	1	7.3	7.9	488	282	488	0
Sept.			115	8.1	30	6.8	7.7	458	281	479	0
Oct.			114	7.0	29	5.2	6.4	391	293	519	0
Nov.			118	6.6	1	5.6	6.3	377	280	516	0
Dec.			1	6.3	116	5.7	5.9	363	281	483	0
Yearly				9.0		5.2	7.3	5,277	3,338	5,657	0.7
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.25		0.15	0.21	6,509	4,117	6,978	0.9

\* Discharge measurement made on this day      Ø Mean daily      ! And other days

## CANTU SPRING NEAR DEL RIO, TEXAS

**DESCRIPTION:** Concrete enclosure located at the spring source in the channel of a small tributary to Cienegas Creek at latitude 29°23'15", longitude 100°56'00", about 2.5 miles (4.0 km) northwest of Del Rio, Texas and 3.5 creek miles (5.6 km) from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km), 1.8 river miles (3.0 km) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 53 discharge measurements during the year. Mean daily discharges determined by prorating between measurements. Records available: March 1961 through 1980.

**REMARKS:** The flow of this spring is very uniform and is not modified by diversions or storage. A weir was installed on May 24, 1961 and removed November 21, 1962. This station was established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of this spring.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max. 10.0 (0.28)	July 27 & 28, 1976		Min. 0	Occasionally
Monthly:	Max. 8.9 (0.25)	December 1976		Min. 0	Occasionally
Yearly:	Max. 8.2 (0.23)	1977		Min. 0	1963

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.6	7.2	6.9	6.5	5.7	6.2	5.1	4.6	4.5	5.2	4.7	5.0
2	6.6	7.1	6.9	6.5	6.0	6.3	5.1	4.6	4.4	5.3	4.6	5.0
3	6.6	7.0	6.9	6.4	6.2	6.4	5.1	4.6	4.2	5.2	4.5	5.0
4	6.6	6.9	7.0	6.3	6.4	6.4	5.1	4.6	4.3	5.1	4.3	5.0
5	6.5	6.9	7.0	6.2	6.6	6.5	5.1	4.5	4.3	4.9	4.2	5.0
6	6.5	6.8	7.0	6.2	6.9	6.3	5.2	4.5	4.4	4.8	4.2	5.0
7	6.5	6.8	6.9	6.1	7.1	6.1	5.2	4.5	4.4	4.7	4.3	5.0
8	6.4	6.8	6.9	6.0	6.9	5.9	5.2	4.5	4.5	4.6	4.3	5.0
9	6.4	6.8	6.9	5.9	6.8	5.8	5.2	4.5	4.5	4.6	4.4	5.0
10	6.5	6.8	6.9	5.9	6.6	5.6	5.2	4.5	4.6	4.7	4.4	5.0
11	6.6	6.8	6.8	5.9	6.4	5.4	5.1	4.5	4.5	4.7	4.5	5.0
12	6.7	6.8	6.8	5.9	6.2	5.3	5.1	4.5	4.5	4.8	4.5	5.0
13	6.9	6.8	6.8	5.8	6.1	5.3	5.0	4.4	4.4	4.8	4.6	5.0
14	7.0	6.8	6.8	5.8	5.9	5.2	5.0	4.5	4.4	4.9	4.6	5.1
15	7.1	6.8	6.8	5.8	5.7	5.1	4.9	4.5	4.3	4.9	4.7	5.1
16	7.2	6.8	6.7	5.8	5.5	5.0	4.9	4.5	4.3	4.9	4.7	5.1
17	7.2	6.8	6.7	5.8	5.3	5.0	4.8	4.6	4.2	5.0	4.8	5.1
18	7.2	6.8	6.7	5.8	5.2	4.9	4.7	4.6	4.3	5.0	4.8	5.1
19	7.2	6.8	6.7	5.8	5.0	4.9	4.6	4.6	4.3	5.1	4.9	5.1
20	7.2	6.8	6.6	5.9	4.8	5.0	4.5	4.6	4.4	5.1	4.9	5.1
21	7.2	6.8	6.6	5.9	4.6	5.0	4.4	4.7	4.5	5.2	4.9	5.1
22	7.2	6.8	6.5	5.9	4.8	5.0	4.3	4.8	4.6	5.2	4.9	5.1
23	7.2	6.8	6.4	5.9	5.0	5.0	4.2	4.8	4.6	5.2	5.0	5.1
24	7.2	6.8	6.3	5.8	5.2	5.1	4.3	4.9	4.7	5.2	5.0	5.1
25	7.2	6.8	6.3	5.8	5.4	5.1	4.3	4.9	4.8	5.2	5.0	5.1
26	7.2	6.8	6.2	5.7	5.6	5.1	4.4	5.0	4.8	5.1	5.0	5.0
27	7.3	6.8	6.2	5.7	5.8	5.1	4.5	5.1	4.9	5.1	5.0	5.0
28	7.3	6.8	6.3	5.6	6.0	5.1	4.6	5.2	5.0	5.1	5.0	4.9
29	7.3	6.9	6.3	5.6	6.1	5.1	4.6	5.0	5.1	5.1	5.0	4.9
30	7.3	6.4	5.5	5.5	6.1	5.1	4.7	4.9	5.2	5.0	5.0	4.8
31	7.2	6.4	6.4	6.2	6.2	5.1	4.7	4.7	4.7	4.8	5.0	4.8
Sum	215.1	198.4	206.6	177.7	182.1	163.3	149.1	144.9	135.9	154.5	140.7	155.6
Current Year 1980									Period March 1961-1980			
Month	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Low			Average	Maximum	Minimum		
Jan.			127	7.3	1.8	6.4	6.9	427	286	525	0	
Feb.			1	7.2	1.6	6.8	6.8	394	259	474	0	
Mar.			14	7.0	1.26	6.2	6.7	410	272	518	0	
Apr.			1	6.5	30	5.5	5.9	352	257	480	0	
May			7	7.1	21	4.6	5.9	361	255	508	0	
June			5	6.5	118	4.9	5.4	324	237	531	0	
July			16	5.2	23	4.2	4.8	296	244	505	0	
Aug.			28	5.2	15	4.5	4.7	287	252	526	0	
Sept.			30	5.2	13	4.2	4.5	270	259	520	0	
Oct.			2	5.3	1.8	4.6	5.0	306	283	538	0	
Nov.			123	5.0	1.5	4.2	4.7	279	276	521	0	
Dec.			114	5.1	1.30	4.8	5.0	309	287	544	0	
Yearly				7.3		4.2	5.5	4,015	3,167	5,918	0	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
				0.21		0.12	0.16	4,953	3,906	7,300	0	

\* Discharge measurement made on this day

Ø Mean daily

! And other days

**CIENEGAS CREEK NEAR DEL RIO, TEXAS**

**DESCRIPTION:** Gravity wells and water-stage recorders located, one each, on the left bank of the Cienegas Creek at latitude 29°21'00", longitude 100°56'40", 0.3 creek mile (0.5 km) from the confluence with the Rio Grande; and for the Briggs Farm ditch, on the right bank of a concrete flume at latitude 29°21'40", longitude 100°56'30", 2,900 feet (884 m) from the ditch intake which branches off the right bank of Cienegas Creek immediately upstream from a small diversion dam across the creek, and about 2.5 miles (4.0 km) west of Del Rio, Texas. The point of diversion is 1.8 creek miles (2.9 km) from the confluence with the Rio Grande. Cienegas Creek enters the Rio Grande at river mile 562.9 (905.8 km), 1.8 river miles (3.0 km) upstream from the International highway bridge between Del Rio, Texas and Cd. Aouma, Coahuila. The elevation of the zero of the gages has not been determined.

**RECORDS:** Based on 53 and 47 discharge measurements at Cienegas Creek and Briggs Farm Ditch, respectively, during the year and a continuous record of gage heights. Mean daily discharge computations determined by combining the two records for the total yield of the springs. Records available: March 1965 through 1980. Discharge measurement data available since November 1962. Records are also available from September 1931 through June 1935 for a station 0.1 creek mile (0.2 km) downstream.

**REMARKS:** Low flow of this stream is from springs, one of which is Cantu Spring whose discharge is shown on page 40. The flow of this stream is modified by irrigation diversions through the Briggs Farm ditch. During 1980 there were no appreciable diversions from the creek, other than through the Briggs Farm ditch, whose net amount of diversion is included in the tabulation below. All storm flow passing this station is deducted and is not included in the tabulation. These stations were established for investigational purposes in connection with Amistad Dam to determine what effect storage in Amistad Reservoir may have on the flow of these springs.

**EXTREME FLOWS FROM RECORDS:**

Daily:	Max. 42.7 (1.21)	August 12, 1972	Min. 0.5 (0.01)	April 21, 1966
Monthly:	Max. 24.8 (0.70)	July 1976	Min. 0.8 (0.02)	August 1967
Yearly:	Max. 17.9 (0.51)	1977	Min. 2.2 (0.06)	1968

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.7	14.8	13.4	13.8	11.7	12.7	7.4	7.8	8.5	10.9	12.7	11.3
2	15.0	14.8	15.2	13.8	12.0	13.1	8.5	7.4	8.8	11.3	12.7	10.6
3	15.2	14.1	15.2	14.5	11.3	13.4	7.8	7.1	8.5	10.6	12.7	10.9
4	15.2	14.8	14.5	14.1	18.7	13.4	8.1	6.7	9.9	10.2	12.7	11.3
5	14.6	14.1	15.9	14.5	15.5	12.0	7.8	6.4	9.2	10.2	12.4	11.7
6	14.6	14.1	15.2	13.4	13.4	11.7	7.8	6.0	9.5	9.9	12.4	12.0
7	14.6	14.1	15.5	14.1	12.0	11.7	8.1	6.0	12.0	9.2	11.7	12.0
8	14.5	13.8	14.8	13.1	17.7	11.7	8.8	7.4	12.0	9.5	11.3	14.1
9	14.3	13.8	14.8	13.1	19.8	11.3	7.8	6.4	10.9	9.9	10.9	13.4
10	14.3	13.8	14.1	14.1	16.6	11.3	7.8	7.8	10.2	9.5	10.9	13.1
11	14.6	13.4	13.4	14.1	14.1	10.9	7.8	10.6	9.5	10.9	10.2	10.9
12	14.3	13.8	13.1	14.5	12.0	10.9	7.8	10.9	9.5	10.2	10.2	9.9
13	14.6	13.8	13.1	15.2	10.9	9.9	7.4	8.8	9.2	10.9	9.5	8.8
14	15.1	13.8	14.8	15.2	10.9	9.9	7.4	9.5	9.2	11.3	9.2	10.6
15	15.7	13.4	14.8	13.8	12.0	9.9	7.8	8.8	9.2	11.7	10.6	11.3
16	15.7	13.4	14.8	14.1	11.7	9.9	7.4	9.5	8.8	10.6	12.4	11.3
17	15.4	13.8	14.8	14.5	12.4	9.5	7.1	9.5	8.5	10.6	12.4	10.6
18	15.5	14.1	14.8	14.1	11.3	10.6	7.8	10.6	8.5	10.2	11.3	10.9
19	15.4	14.1	14.8	13.8	11.3	10.2	6.7	10.6	8.8	9.9	10.6	10.9
20	15.5	13.8	14.1	12.0	10.9	9.9	7.4	10.9	8.8	10.6	10.6	11.3
21	16.1	14.8	14.8	12.0	9.5	9.9	7.8	10.2	9.2	10.2	10.9	11.3
22	16.7	14.8	14.8	11.7	9.9	9.9	7.4	9.9	9.2	11.3	10.6	11.7
23	16.5	14.8	15.2	12.7	9.2	9.5	7.4	8.8	9.2	11.3	11.3	13.1
24	16.9	15.2	14.8	12.4	9.9	9.5	7.8	8.1	9.2	10.9	10.6	13.4
25	16.2	14.5	14.5	11.3	10.6	9.5	8.1	7.8	9.9	10.9	11.3	13.4
26	15.7	14.1	14.8	11.3	11.6	9.5	8.1	8.5	12.7	11.3	10.6	13.4
27	15.5	14.1	15.5	12.4	17.3	8.5	8.1	7.8	11.3	11.7	10.9	13.4
28	15.4	13.4	15.5	12.0	14.8	8.1	8.1	7.8	10.9	12.0	11.3	12.7
29	15.1	13.8	15.2	12.4	13.4	7.8	8.5	7.8	10.9	12.0	11.3	12.7
30	14.8	15.2	12.4	12.4	12.4	8.8	8.5	8.1	11.3	12.0	10.9	11.7
31	14.6	14.5	14.5	10.9	10.9	10.9	8.1	7.4	12.7	12.7	12.4	12.4
Sum	473.3	409.1	455.9	400.4	395.7	314.9	242.4	260.9	293.3	334.4	337.1	366.1

Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot		
	High	Low	Day	High	Day				Average	Maximum	Minimum
					Low	High	Low				
Jan.			24	16.9	1 9	14.3	15.3	939	771	1,242	134
Feb.			24	15.2	111	13.4	14.1	811	728	1,157	98.0
Mar.			5	15.9	112	13.1	14.8	905	745	1,185	102
Apr.			113	15.2	125	11.3	13.4	794	689	1,125	100
May			9	19.8	23	9.2	12.7	786	681	1,159	109
June			1 3	13.4	29	7.8	10.5	625	600	1,070	86.3
July			8	8.8	19	6.7	7.8	481	630	1,527	85.5
Aug.			112	10.9	1 6	6.0	8.5	517	649	1,241	48.4
Sept.			26	12.7	1 1	8.5	9.9	579	640	1,043	84.1
Oct.			31	12.7	7	9.2	10.9	664	739	1,135	150
Nov.			1 1	12.7	14	9.2	11.3	669	738	1,117	152
Dec.			8	14.1	13	8.8	11.7	726	768	1,168	133
Yearly				19.8		6.0	11.7	8,496	8,378	12,965	1,530.9
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				0.56		0.17	0.33	10,480	10,334	15,992	1,888

Ø Mean daily

1 And other days

## RIO GRANDE AT DEL RIO, TEXAS AND CD. ACUNA, COAHUILA

**DESCRIPTION:** Cableway, gravity well, concrete control weir, water-stage recorders (graphic and digital) and binary decimal transmitter located on the right bank at latitude 29°19'40", longitude 100°55'50", and river mile 561.2 (903.2 km), 1,200 feet (366 m) upstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.7 river miles (20.4 km) downstream from Amistad Dam. The zero of the gage is 869.20 feet (264.93 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 23 discharge measurements during the year, 11 by the United States Section and 12 by the Mexican Section of the Commission, and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: December 1923 through July 2, 1941 and January 1968 through 1980. Records are available from May 1900 through April 1915 for a station 12.2 miles (19.6 km) upstream; for December 1919 through March 1920 for a station 8.7 miles (14.0 km) upstream near McKee's Switch; from July 2, 1941 through 1954 and October 1960 through 1967 for a station 1,200 feet (366 m) downstream at the international highway bridge; and from September 1954 through 1980 for a station, Rio Grande below Amistad Dam, 10.6 miles (17.0 km) upstream.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and small intervening diversions below Amistad Dam, flow at this station, after May 31, 1968 is controlled largely by releases from Amistad Reservoir. The transmitter, operated in cooperation with the National Weather Service, relays gage height data upon interrogation by telephone via commercial circuits.

**EXTREME FLOWS FROM RECORDS:** The greatest recorded flow of 1,140,000 second-feet (32,300 m<sup>3</sup>/sec) occurred on June 28, 1954, with a gage height of 38.25 feet (11.66 m) at a station 1,200 feet (366 m) downstream. The lowest recorded flow was 124 second-feet (3.51 m<sup>3</sup>/sec) which occurred March 5 and 6, 1969, with a gage height of 1.24 feet (0.38 m).

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 63,800 (1,810)	Sept. 22, 1974	Min. 164 (4.64)	Aug. 13, 1971
Monthly:	Max. 22,300 (632)	Sept. 1974	Min. 188 (5.32)	October 1971
Yearly:	Max. 5,170 (146)	1974	Min. 701 (19.9)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,540	2,670	1,480	4,590	1,240 *	4,100	7,660	2,110	2,210	2,210	2,110	2,110
2	2,570	2,670	1,480	1,480	1,240	4,100	7,660	2,110	2,210	2,110	2,110	2,110
3	2,570 *	2,640	1,480	1,480 *	1,400	4,100	7,660	2,110	2,210	2,110 *	2,110	2,110
4	2,570	2,640	1,700	1,390	1,410	4,100	7,660	2,110	2,110 *	2,210	2,110	2,210 *
5	2,570	2,610	2,110	1,390	1,240	4,100 *	7,660	2,110	2,110	2,110	2,110	2,210 *
6	2,570	2,610	2,210 *	1,390	1,240	4,100	7,660	2,110	2,110	2,210	2,110 *	2,210
7	2,570	2,610 *	2,210 *	1,390	1,160	4,100	7,490	2,110 *	2,110	2,210	2,110	2,210
8	2,570	2,640	2,110	1,390	1,360	4,100	7,490	2,110	2,110	2,210	2,110	2,210
9	2,570	2,640	2,210	1,390	1,600	4,100	7,490	2,110	2,110	2,210	2,110	2,210
10	2,570	2,640	2,360	1,480	2,520	4,100	7,660	2,210	2,210	2,210	2,110	2,210
11	2,570	2,640	2,740	1,480	2,520	3,960	7,660	2,620	2,210	2,210	2,110	2,210
12	2,570	2,640	2,740	1,480	4,060	4,100 *	7,660	2,740	2,210	2,210	2,110	2,210
13	2,570	2,640	2,850	1,480	5,970	3,060	7,660	2,630	2,210	2,210	2,110	2,210
14	2,570	2,670	3,010	1,480	5,970	4,200	7,660	2,520	2,210	2,210	2,110	2,210
15	2,570	2,670	3,440	1,480	5,330 *	4,200	7,840	2,520	2,210	2,210	2,210	2,200
16	2,570	2,670	3,440	1,480	4,100	4,200	7,660	2,520	2,210	2,110	2,210	2,110
17	2,570	2,670	3,440	1,480 *	4,100	4,200	7,660	2,520	2,210	2,110	2,110	2,110
18	2,570	2,670	3,440	1,480	4,100	4,200	6,530	2,520	2,210	2,110	2,210	2,110
19	2,570	2,640	3,440	1,480	4,100	4,200	4,340	2,210	2,210	2,110	2,210 *	2,210
20	2,570	2,640	3,600	1,480	4,100	4,200	4,340	2,210	2,210	2,110	2,210	2,210
21	2,570	2,640 *	4,200	1,390	4,100	4,200	4,200	2,210	2,210	2,110	2,210	2,210
22	2,610	2,640	4,200	1,240	4,100	4,200	4,340	2,210	2,210	2,110	2,210	2,210
23	2,570	2,640	4,200	1,240	4,100	4,100	4,200	2,210	2,210	2,110 *	2,210	2,210
24	2,570	2,640	4,630	1,240	4,100	4,100	4,200	2,210	2,210	2,110	2,210	2,110
25	2,610 *	2,610	5,830	1,240	4,200	4,100	4,200 *	2,210	2,210 *	2,110	2,210	2,110
26	2,640	2,610	5,830	1,240	4,410	4,100	4,200	2,210	2,310	2,110	2,110	2,110
27	2,640	2,610	4,310	1,240	4,200	4,100	4,100	2,210	2,310	2,110	2,110	2,110
28	2,670	2,300	6,290	1,240	4,200	4,100	3,810	2,210	2,310	2,110	2,110	2,110
29	2,670	1,480	6,290	1,240	4,200	4,100	2,210	2,210 *	2,310	2,110	2,110	2,110
30	2,670		6,140	1,240	4,200	4,700	2,210	2,210	2,310	2,110	2,110	2,110
31	2,670		6,140		4,200		2,210	2,210		2,110		2,110
<b>Sum</b>	80,260	75,090	109,550	44,720	104,770	123,320	184,980	70,520	66,300	66,610	64,300	67,100
Current Year 1980									Period #1968-1980			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	2.48	2.44	128	2,670	1	2,540	2,590	159,193	81,144	159,193	14,497	
Feb.	2.48	2.07	1	2,670	29	1,480	2,590	148,958	121,182	448,205	18,633	
Mar.	3.35	1.64	128	6,290	27	582	3,530	217,260	135,209	382,036	17,298	
Apr.	3.31	1.94	1	6,140	122	1,160	1,490	88,600	106,587	354,407	33,846	
May	3.28	1.94	113	5,970	7	1,160	3,380	207,733	203,588	516,357	30,928	
June	3.61	1.57	30	7,660	13	478	4,100	284,507	154,886	332,331	23,143	
July	3.67	2.33	117	8,020	129	2,210	5,970	367,024	140,988	367,024	31,474	
Aug.	2.85	2.30	11	4,100	1	2,110	2,280	139,950	161,275	670,572	28,826	
Sept.	2.36	2.30	125	2,310	1	2,110	2,210	131,587	232,207	1,327,497	38,850	
Oct.	2.33	2.30	1	2,210	1	2,110	2,150	132,203	171,051	815,207	11,578	
Nov.	2.33	2.30	115	2,210	1	2,110	2,140	127,623	108,362	527,524	13,644	
Dec.	2.33	2.30	1	2,210	1	2,110	2,160	133,184	78,842	228,774	13,918	
<b>Yearly</b>	3.67	1.57		8,020		478	2,890	2,097,822	1,695,281	3,743,795	508,583	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	1.12	0.48		227		13.5	81.8	2,587,663	2,091,129	4,617,971	627,337	

\*\* Period 1968-1980      \* Discharge measurement made on this day      † And other days

# Values for January 1968 are Rio Grande near Del Rio less Arroyo Las Vacas Flow

**ARROYO DE LAS VACAS AT CD. ACUNA, COAHUILA**

DESCRIPTION: Cableway with sit-down cable car, concrete wall with a V-shape concrete control weir of 353 second-foot (10 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the left bank at Cd. Acuna, Coahuila, latitude 29°19'45", longitude 100°57'20" and 1.8 creek miles (3 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 561.0 (902.9 km) on the upstream side of the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila and 12.9 river miles (20.7 km) downstream from Amistad Dam. The zero of the gage is 885.82 feet (270 m) above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 11 discharge measurements during the year, a stable rating curve up to 353 second-foot (10 m<sup>3</sup>/sec), which is the capacity of the weir, and a continuous record of gage heights. Computations by shifting control methods for flows exceeding the capacity of the weir. During 1980, the flow was within the capacity of the weir practically all year. Records available: Occasional estimates from June 1935 to March 19, 1938 and a continuous record from March 20, 1938 through 1980.

REMARKS: Low flow of this stream is from springs and is modified by irrigation diversions upstream. On June 17, 1961, a flood destroyed the station, leaving the control wall under several feet of silt. The station was reconstructed in September and a V-shape concrete control weir with a capacity of 353 second-foot (10 m<sup>3</sup>/sec), constructed at this station, started operating December 14, 1961. On June 28, 1954, backwater from the Rio Grande reached an elevation of 902.49 feet (275.08 m) at this station. Records prior to 1965 were published under the title "Arroyo Las Vacas near Cd. Acuna, Coahuila."

EXTREME FLOWS FROM RECORDS: Momentary: Max. 63,570 second-foot (1,800 m<sup>3</sup>/sec) with a gage height of 25.26 feet (7.70 m) on June 17, 1961. Min. no flow several occasions in 1956, 1957, 1960, 1961, and September 1, 1967.

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily: Max. 23,940 (678) June 17, 1961 Min. 0 Several days Dec. 1956, Jan. 1957, & Sept. 1, 1967

Monthly: Max. 1,050 (29.8) June 1961 Min. 0.4 (0.01) Several months 1952, 1953, & 1954

Yearly: Max. 96.7 (2.74) 1961 Min. 2.8 (0.08) 1952

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.8	2.8	2.8	2.8	1.8	2.8	1.8	1.8	4.2	2.1	1.8	7.1
2	2.8	2.8	2.8	2.1	1.8	2.8	1.8	1.8	4.9	2.1	1.8	7.1
3	2.8	2.8	2.8	1.8	22.2	2.8	1.8	1.8	3.5	2.1	2.1	7.1
4	2.8	2.8	2.8	1.8	2.8	2.8	1.8	.7	3.5	2.1	2.1	6.0
5	2.8	2.8	2.8	1.8	2.8	2.8	1.1	.7	3.5	2.1	2.1	8.5
6	2.8	2.8	2.8	2.1	2.5	2.8	1.8	.7	2.8	2.1	2.1	7.8
7	2.8	2.8	2.8	2.1	2.1	2.8	1.1	.7	2.8	2.1	2.8	6.7
8	2.8	2.8	2.8	2.1	43.8	2.8	1.1	.7	2.8	2.1	2.5	8.1
9	2.8	2.8	2.8	1.8	* 4.2	2.5	1.1	.7	2.8	2.1	2.1	7.8
10	2.8	* 2.8	* 2.8	1.8	3.5	2.1	1.1	1.8	2.8	2.1	2.5	8.5
11	2.8	2.8	2.8	1.8	2.8	2.1	1.1	8,900 *	2.1	2.1	2.5	8.5
12	2.8	2.8	2.8	1.8	2.8	2.5	1.1	724	2.1	2.1	2.1	8.5
13	2.8	2.8	2.8	1.8	2.8	2.1	1.1	130	2.1	1.8	2.5	8.5
14	2.8	2.8	2.8	1.8	2.8	2.1	1.1	54.7	2.1	1.8	2.5	9.2
15	2.8	2.8	2.8	2.1	20.8	2.1	1.1	39.2	2.5	1.8	3.5	9.5
16	2.8	2.8	2.8	2.1	6.4	2.1	1.1	28.6	2.5	1.8	4.6	8.5
17	2.8	2.8	2.8	2.1	4.2	1.8	*	1.1	20.1	1.8	3.2	* 9.2
18	2.8	2.8	2.8	2.1	4.2	1.4	1.1	15.9	1.8	2.1	2.8	9.5
19	2.8	2.5	2.8	2.1	3.5	1.1	1.1	13.1	1.8	2.1	2.8	9.5
20	2.8	2.1	2.8	2.1	2.8	1.1	1.1	11.3	1.8	2.1	4.9	9.5
21	2.8	2.1	2.8	2.1	2.8	1.1	1.1	9.5	2.1	2.1	7.4	9.5
22	2.8	2.1	2.8	2.1	2.8	1.1	1.1	12.7	8.8	2.1	9.9	9.5
23	2.8	2.1	2.8	2.1	2.1	*	1.1	6.4	8.5	2.1	10.2	10.6
24	2.8	2.5	2.8	2.1	2.1	1.1	1.1	2.8	8.5	*	2.1	8.5
25	* 2.8	2.8	2.8	2.1	2.1	.7	2.1	7.8	5.7	2.1	6.7	7.1
26	2.8	2.8	2.8	2.1	237	.7	1.8	7.1	2.5	2.1	8.5	9.5
27	2.8	2.8	2.8	2.1	99.6	.7	1.8	6.4	2.5	2.1	* 7.1	6.4
28	2.8	2.8	2.8	2.1	5.3	.7	1.8	6.0	2.1	1.8	7.1	4.9
29	2.8	2.8	2.8	1.8	3.9	.7	1.8	6.0	2.1	1.8	7.1	4.6
30	2.8	2.8	2.8	1.8	3.9	.7	1.8	6.0	2.1	1.8	7.1	3.9
31	2.8	2.8	2.8	2.1	3.2	.7	1.8	5.3	2.1	1.8	7.1	3.5
Sum	86.8	77.8	86.8	60.4	505.4	54.0	61.4	10,028.2	79.6	62.7	132.9	243.8

Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	High	Low	High	Low			Average	Maximum	Minimum	
	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day		
Jan.	0.33	0.33	1	1	2.8	1	2.8	173	374	910	31.5	
Feb.	.33	.30	1	1	2.8	120	2.1	2.8	156	496	5,950	33.3
Mar.	.33	.33	1	1	2.8	1	2.8	2.8	173	546	2,600	59.2
Apr.	.33	.26	1	1	2.8	1	1.8	2.1	120	1,342	16,610	75.4
May	4.27	.26	26	1	2,050	1	1.8	16.2	1,002	1,302	9,080	90.0
June	1.41	.20	1	1	2.8	125	.7	1.8	107	2,465	62,520	43.8
July	17.88	.23	22	11	111	1	1.1	2.1	120	1,482	16,409	26.8
Aug.	.82	.20	11	31,700	1	1	.7	323	19,888	1,504	19,888	42.2
Sept.	.33	.26	25	26.8	117	1.8	2.8	2.8	158	2,730	49,566	37.3
Oct.	.59	.23	1	3.5	113	1.1	1.1	2.1	125	1,557	20,444	22.6
Nov.	.69	.23	23	10.6	12	1.1	4.6	4.6	263	431	2,855	21.0
Dec.	.69	.36	8	16.6	31	3.5	7.8	7.8	483	352	1,066	22.0
Yearly	17.88	0.20		31,700		0.7	31.4	22,768	14,581	70,026.3	2,066.7	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	5.45	0.06		899		0.02	0.89	28,086	17,984	86,384	2,555	

\*\* Period 1938-1980

\* Discharge measurement made on this day

! And other days

**SAN FELIPE SPRINGS AT DEL RIO, TEXAS**

**DESCRIPTION:** Two large and at least two smaller springs rise near the northeast city limits of Del Rio, Texas in or near the channel of San Felipe Creek at latitude 29°22'20" and longitude 100°53'00". The total yield of these springs consists of waters measured in the Val Verde Canal at Del Rio, Texas and in San Felipe Creek at Moore Park, Del Rio, Texas and diversions by the city of Del Rio. Diversions by the San Felipe Irrigation Company through the Val Verde Canal are measured at a gaging station consisting of a paved measuring section and gravity well and water-stage recorder located on the left side of the canal under the U. S. Highway 277 Bridge across San Felipe Creek at latitude 29°21'55" and longitude 100°53'10". The bridge is located about 0.6 creek mile (1.0 km) downstream from the source of the springs and 2.9 creek miles (4.7 km) from the confluence of the creek with the Rio Grande. The gaging station on San Felipe Creek at Moore Park consists of gravity well and water-stage recorder located on the left bank about 300 feet (91 m) downstream from the U. S. Highway 277 Bridge at latitude 29°21'50" and longitude 100°53'10". This stream enters the Rio Grande at river mile 560.5 (902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zeros of the gages for the two stations are, respectively, 942.58 feet (287.30 m) and 930.77 feet (283.70 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Records for the Val Verde Canal and San Felipe Creek at Moore Park are based on 53 and 53 discharge measurements, respectively, by wading during the year, and continuous records of gage heights. Computations by shifting control methods. Records for the Del Rio Pumping Plant are furnished by the City of Del Rio Water Department. Records available: Total yield of the springs, February 1961 through 1980.

**REMARKS:** The flows tabulated below represent only the total yield of the springs. All storm runoff has been eliminated from the tabulations.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 171 (4.84)	July 23, 1976	Min. 29.2 (0.83)	July 29, 1964
Monthly:	Max. 153 (4.33)	December 1976	Min. 34.4 (0.97)	August 1964
Yearly:	Max. 149 (4.22)	1977	Min. 50.5 (1.43)	1963

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	130	125	125	120	127	107	104	90.1	89.3	93.9	84.4	88.3
2	132	122	127	123	127	105	105	93.9	86.9	92.9	86.2	89.3
3	132	123	126	121	129	104	104	96.8	87.6	93.6	87.9	89.7
4	131	123	130	120	125	104	101	96.4	89.3	94.6	90.4	87.6
5	130	121	125	119	117	109	105	97.8	87.9	95.7	90.4	88.3
6	129	121	124	121	116	107	107	99.6	86.9	95.7	89.3	89.0
7	130	123	124	120	115	108	105	99.9	91.5	96.1	91.8	90.8
8	129	120	123	115	110	104	98.9	98.5	91.8	95.3	90.8	91.8
9	131	120	123	117	108	103	96.1	97.8	90.1	95.0	90.1	91.1
10	132	118	123	121	110	102	99.9	101	91.1	91.8	88.6	88.6
11	130	118	124	121	110	102	101	97.1	90.1	91.5	90.8	91.1
12	128	113	125	114	109	110	101	92.9	88.6	89.3	86.9	91.1
13	128	114	122	117	109	104	102	94.6	89.3	87.6	91.5	91.5
14	129	118	121	117	107	106	101	93.9	89.0	88.3	92.9	91.5
15	130	121	120	118	109	107	106	93.6	91.0	89.0	94.6	91.1
16	129	123	123	117	107	106	101	91.8	91.1	91.1	99.2	90.8
17	130	122	120	116	108	110	99.6	91.8	92.2	90.8	91.8	90.4
18	132	123	119	112	106	109	98.5	91.1	92.9	92.2	88.6	90.4
19	130	126	120	118	108	107	96.1	90.8	90.8	90.1	90.1	92.2
20	130	127	125	115	108	105	96.8	92.5	91.1	89.3	88.3	92.5
21	132	126	120	113	112	98.9	96.4	93.6	89.7	88.6	90.1	91.8
22	131	124	118	112	114	97.8	92.2	93.9	89.3	90.4	89.3	93.6
23	129	124	120	116	111	96.8	96.8	92.2	90.4	89.3	89.0	92.5
24	129	125	123	112	113	97.8	97.1	92.5	91.5	88.3	89.3	90.4
25	129	126	123	110	118	107	96.4	93.9	90.8	88.3	90.4	91.8
26	129	124	123	112	107	102	96.4	94.6	89.3	87.2	90.0	92.9
27	130	127	123	109	109	102	93.6	93.2	88.3	88.3	87.2	90.4
28	131	125	123	111	109	101	95.7	91.5	89.7	85.5	86.5	92.2
29	130	127	119	114	105	103	95.3	92.2	91.5	86.5	86.9	92.5
30	129	123	118	104	104	104	96.4	91.5	90.1	86.9	84.8	92.9
31	125	120	120	107	107	107	95.3	89.0	87.2	87.2	84.8	92.5
Sum	4,026	3,549	3,804	3,489	3,474	3,129.3	3,080.5	2,920.0	2,699.1	2,810.3	2,688.1	2,820.6

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day	Feet	Acre-Feet	Average	Maximum	Minimum
									Day	Day	Day
Jan.			1 2	132	31	125	130	7,985	6,688	9,370	2,274
Feb.			120	127	12	113	123	5,898	5,898	8,212	2,119
Mar.			4	130	22	118	123	7,543	6,388	9,029	2,365
Apr.			2	123	27	109	117	6,924	6,114	8,602	2,291
May			3	129	30	104	112	6,893	6,416	9,300	2,842
June			112	110	23	96.8	104	6,207	6,198	9,049	2,481
July			6	107	22	92.2	99.2	6,108	6,389	9,342	2,214
Aug.			10	101	31	89.0	94.3	5,791	6,357	9,039	2,114
Sept.			18	92.9	1 2	86.9	90.1	5,354	6,225	8,884	2,555
Oct.			7	96.1	28	85.5	90.8	5,574	6,628	9,249	2,508
Nov.			16	99.2	1	84.4	89.7	5,332	6,439	8,965	2,384
Dec.			22	93.6	4	87.6	91.1	5,595	6,719	9,431	2,390
Yearly				132		84.4	105	76,349	76,459	107,892	36,580
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
				3.74		2.39	2.97	94,176	94,312	133,085	45,121

Ø Mean daily

! And other days

**SAN FELIPE CREEK NEAR DEL RIO, TEXAS**

**DESCRIPTION:** Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the right bank at latitude 29° 19'50", longitude 100° 53'20", immediately upstream from the Silos Farm road bridge, 1.1 creek miles (1.8 km) from the confluence with the Rio Grande, and about 2 miles (3.2 km) south-southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 560.5 (902.1 km), 0.5 river mile (0.8 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 877.43 feet (267.44 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 53 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: September 1931 through 1980.

**REMARKS:** Municipal diversions at Del Rio and irrigation diversions greatly modify the flow of this spring-fed creek at this station. Backwater from the Rio Grande reaches this station when the Rio Grande near Del Rio reaches a stage of 15 feet (4.6 m), or a flow of about 60,000 second-foot (1,700 m<sup>3</sup>/sec). On June 28, 1954 combined creek flow and backwater from the Rio Grande reached a stage of 24.51 feet (7.47 m), the highest of record, at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 45,000 second-foot (1,270 m<sup>3</sup>/sec) on June 14, 1935 with a gage height of 23.20 feet (7.07 m). Min. 0.4 second-foot (0.01 m<sup>3</sup>/sec) on July 20, 1953.

		Average Flow in Second-Foot (Cubic Meters per Second)		
Daily:	Max. 16,200 (459)	June 14, 1935	Min. 1.5 (0.04)	July 21, 1953
Monthly:	Max. 805 (22.8)	June 1935	Min. 4.6 (0.13)	July 1953
Yearly:	Max. 136 (3.85)	1935	Min. 25.1 (0.71)	1953

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	127	117	95.7	81.9	61.8	92.5	53.7	41.3	55.4	73.1	65.7	65.7
2	129 *	117	95.7	80.9	60.7	82.3	53.3	41.0	58.6	69.9	60.0	66.0
3	126	117	95.7	76.6	135	75.2	52.6	41.0	59.0	70.6	60.4	65.3
4	125	117	95.7	78.8	99.6	72.4	55.1	43.8	59.0	67.8	57.6	65.0
5	125	115 *	92.5	77.7	91.8	68.9	54.7	41.0	56.2	68.5	57.6	64.3
6	125	114	96.4	76.6	90.8	66.0	54.4	40.3	59.7	68.9	57.6	63.6
7	122	117	93.2	75.6	91.8	69.2	60.0	39.2	60.0	69.6	57.6	66.0
8	120 *	118	89.7	81.6	113	69.6	59.7	43.8	60.0	66.4	57.6	78.4
9	120	120	90.1	81.9	95.3	73.1	59.3	58.3	57.2	66.7	57.6	71.7
10	120	120	86.9	82.6	90.8	73.5	53.0	73.1	60.7	67.1	57.6	68.9
11	116	120	87.2	83.0	89.7	70.3	46.6	112	54.4	67.5	57.6	68.9
12	115	120 *	90.8	94.3	85.5	67.5	46.6	82.6	54.7	68.2	57.6	69.2
13	115	120	90.8	95.0	87.9	67.8	46.3	78.4	54.7	68.5	56.5	69.2
14	114	113	94.6	88.3	81.6	64.6	46.3	78.8	55.1	72.4	59.0	76.3
15	114 *	114	91.1	81.2	89.7	65.0	49.1	75.6	55.1	72.7	69.2	76.3
16	114	116	87.6	77.3	86.9	62.2	52.6	75.9	49.4	68.9	86.2	76.6
17	115	116	91.1	77.0	87.9	62.5	50.5	76.3	53.0	65.7	72.0	76.6
18	115	111	91.1	73.5	88.6	62.9	51.2	76.6	49.8	68.5	74.2	76.6
19	116	107	95.0	72.7	86.2	59.7	48.4	70.3	53.3	71.7	71.0	76.6
20	117	99.5	95.0	68.9	76.6	60.0	52.3	63.6	56.5	74.9	67.5	76.3
21	117	96.9	95.0	72.0	73.1	60.4	53.0	63.2	56.9	71.3	64.3	76.3
22	119 *	89.4	98.5	74.9	73.1	60.7	53.7	63.2	47.7	71.3	63.9	76.3
23	118	93.3	98.5	74.2	69.2	54.7	54.0	63.2	42.4	67.5	60.7	76.3
24	116	93.0	98.5	70.3	72.4	55.1	57.2	63.2	44.5	68.2	63.9	75.9
25	116	88.7	102 *	72.7	71.7	51.6	42.7	59.7	60.0	68.9	67.1	75.2
26	115	92.3	98.2	75.9	132	45.6	40.3	59.7	58.3	69.6	64.3	74.9
27	117	92.3	102	78.8	98.5	48.0	46.3	56.5	67.8	70.3	64.6	74.2
28	116	92.3	97.5	74.5	88.6	48.0	52.6	53.0	70.3	58.6	65.0	73.8
29	117 *	92.3	90.1	70.3	88.6	47.7	49.8	53.0	76.3	52.6	65.0	78.0
30	118		89.7	66.0	88.6	54.0	44.1	52.6	72.4	56.2	65.3	72.0
31	117		89.3		92.5		41.3	52.6		65.7		77.7
Sum		3,139.0		2,335.0		1,911.0		1,892.8		2,107.8		2,248.1
	3,676		2,905.2		2,739.5		1,580.7		1,718.4		1,904.2	

Month	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	High	Day	Low			Average	Maximum	Minimum	
	Day										
Jan.	1.65	1.25	2	157	14	108	119	7,291	4,925	8,906	934
Feb.	1.35	.77	11	128	14	64.6	108	6,226	4,023	8,630	487
Mar.	1.27	1.02	119	109	10	80.2	93.6	5,763	3,821	8,354	689
Apr.	1.51	.82	12	129	30	49.1	77.7	4,632	4,234	10,407	566
May	4.92	.79	26	763	2	57.6	88.3	5,434	4,977	17,600	739
June	1.15	.52	1	96.4	29	39.2	63.6	3,790	5,215	47,900	301
July	.95	.43	22	79.5	25	31.4	50.9	3,135	4,277	22,077	285
Aug.	1.71	.46	11	162	7	33.5	61.1	3,753	3,833	7,584	350
Sept.	1.94	.49	25	191	123	36.4	57.2	3,408	5,206	28,678	872
Oct.	.95	.56	15	82.6	28	46.6	68.2	4,180	5,060	14,229	1,000
Nov.	1.51	.56	16	145	1	48.7	63.6	3,776	4,340	8,567	526
Dec.	1.61	.75	8	154	5	61.1	72.4	4,459	4,455	8,642	496
Yearly	4.92	0.43		763		31.4	76.9	55,847	54,366	98,137	18,201
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	1.50	0.13		21.6		0.89	2.18	68,887	67,060	121,052	22,451

\* Discharge measurement made on this day ! And other days

## DIVERSIONS FROM THE RIO GRANDE

### MAVERICK CANAL AT MILE 13 NEAR QUEMADO, TEXAS

**DESCRIPTION:** Light-weight cableway for making current meter measurements from the bank, bubbler gage, and water-stage recorders (graphic and digital), located on the left bank of a gunnite-lined section of the canal at latitude 29°03'00", longitude 100°39'40", 0.5 canal mile (0.8 km) downstream from the Tequesquite Creek Siphon, 3.5 canal miles (5.6 km) upstream from the Las Moras Creek Siphon, about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas, and 12.8 canal miles (20.6 km) from the canal intake. The canal intake is at river mile 543.6 (874.9 km), 17.4 river miles (28.0 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Aouana, Coahuila. The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 28 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Gage heights at this station are affected by gate operation at Las Moras Siphon. Records available: June 21, 1949 through 1980.

**REMARKS:** At canal mile 31.8 (51.2 km) a portion of the diverted water returns to the river through the Maverick Power Plant, and the remainder enters the Maverick Canal Extension. In 1980, 11,148 acres (4,511 ha) of land were irrigated between canal mile 31.8 (51.2 km) and the power plant, and 26,800 acres (10,846 ha) were irrigated from the extension, making a total of 37,948 acres (15,357 ha). A total of 920,746 acre-feet (1,135,740,000 m<sup>3</sup>) returned to the Rio Grande at the power plant and through the irrigation system (see pages 51, 53, and 56).

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 1,750 second-feet (49.6 m<sup>3</sup>/sec) on August 30, 1973. Min. No flow several days in June, July, and November 1954; and October 1978.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 1,730 (49.0)	August 29, 1973	Min. 0	Oct. 2 & 3, 1978
Monthly:	Max. 1,590 (45.0)	July & Dec. 1980	Min. 295 (8.35)	February 1977
Yearly:	Max. 1,490 (42.2)	1980	Min. 632 (17.9)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,500	1,510	1,410	1,480	1,190	1,490	1,480	1,500	1,390	1,580	1,530	1,540
2	1,480	1,530	1,420	1,450	1,140	1,490	1,570	1,490	618	1,560	1,540	1,570
3	1,430	1,510	1,420	1,450	1,130	1,450	1,580	1,510	1,440	1,570	1,520	1,590
4	1,500	1,510	1,390	1,440	1,190	1,530	1,610	1,490	1,500	1,570	1,530	1,610
5	1,500	1,500	1,380	1,440	1,160	1,520	1,590	1,500	1,510	1,600	1,510	1,590
6	1,480	1,500	1,350	1,440	1,180	1,510	1,610	1,490	1,500	1,550	1,510	1,600
7	1,470	1,490	1,360	1,430	1,170	1,570	1,600	1,540	1,550	1,580	1,530	1,610
8	1,460	1,460	1,330	1,420	1,200	1,570	1,620	1,530	1,530	1,580	1,500	1,600
9	1,430	1,470	1,410	1,410	1,230	1,550	1,590	1,510	1,570	1,580	1,520	1,600
10	1,450	1,500	1,380	1,410	1,280	1,580	1,610	1,540	1,580	1,580	1,520	1,620
11	1,450	1,530	1,360	1,410	1,360	1,560	1,640	1,430	1,590	1,570	1,540	1,620
12	1,430	1,510	1,370	1,420	1,450	1,560	1,530	1,450	1,600	1,600	1,540	1,640
13	1,430	1,510	1,320	1,420	1,450	1,550	1,590	1,510	1,570	1,560	1,490	1,640
14	1,430	1,510	1,350	1,400	1,470	1,400	1,650	1,490	1,550	1,590	1,490	1,620
15	1,440	1,510	1,350	1,410	1,460	1,540	1,630	1,550	1,500	1,580	1,480	1,620
16	1,450	1,490	1,330	1,390	1,440	1,550	1,630	1,550	1,550	1,570	1,530	1,620
17	1,450	1,480	1,340	1,380	1,510	1,510	1,630	1,510	1,560	1,580	1,530	1,620
18	1,450	1,520	1,350	1,360	1,570	1,510	1,640	1,540	1,580	1,550	1,550	1,590
19	1,470	1,500	1,320	1,360	1,480	1,550	1,590	1,590	1,580	1,550	1,560	1,580
20	1,460	1,480	1,330	1,350	1,470	1,560	1,600	1,580	1,530	1,580	1,550	1,560
21	1,450	1,490	1,340	1,360	1,590	1,570	1,540	1,580	1,580	1,560	1,530	1,590
22	1,450	1,480	1,360	1,290	1,550	1,630	1,600	1,560	1,590	1,560	1,530	1,560
23	1,480	1,470	1,370	1,170	1,530	1,590	1,550	1,560	1,580	1,510	1,530	1,570
24	1,470	1,480	1,350	1,120	1,540	1,560	1,590	1,580	1,580	1,500	1,530	1,570
25	1,470	1,480	1,330	1,110	1,520	1,580	1,610	1,590	1,590	1,500	1,570	1,540
26	1,480	1,460	1,370	1,150	1,460	1,590	1,560	1,560	1,630	1,490	1,530	1,560
27	1,510	1,470	1,380	1,160	1,280	1,590	1,610	1,580	1,630	1,500	1,540	1,580
28	1,510	1,480	1,330	1,190	1,480	1,590	1,590	1,580	1,590	1,480	1,570	1,570
29	1,540	1,430	1,390	1,200	1,520	1,580	1,560	1,550	1,610	1,540	1,550	1,560
30	1,520		1,410	1,210	1,450	1,580	1,530	1,550	1,600	1,550	1,530	1,560
31	1,530		1,250		1,480		1,530	1,580		1,540		1,550
Sum	45,570	43,260	42,150	40,230	42,930	46,410	49,260	47,570	45,778	48,210	45,880	49,250
Current Year 1980										Period 1968-1980		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	9.84	9.28	31	1,550	3	1,380	1,470	90,387	63,544	93,759	20,860	
Feb.	9.79	9.36	1	1,540	29	1,410	1,490	85,805	59,007	86,817	16,403	
Mar.	9.94	7.94	10	1,450	31	982	1,360	83,676	66,165	95,048	27,679	
Apr.	10.01	8.23	1	1,500	24	1,100	1,340	79,767	71,050	89,843	40,721	
May	9.74	7.84	21	1,620	3	1,090	1,380	85,217	80,101	95,286	40,463	
June	9.88	8.53	22	1,660	14	1,310	1,550	92,081	77,780	93,302	31,210	
July	10.07	8.92	11	1,700	1	1,400	1,590	97,657	79,062	97,657	35,776	
Aug.	9.71	8.79	20	1,600	111	1,340	1,530	94,343	78,262	97,111	36,708	
Sept.	9.74	1.71	26	1,640	2	24.7	1,530	90,821	75,004	90,821	32,963	
Oct.	9.74	9.15	12	1,610	28	1,440	1,550	95,633	73,192	95,633	22,235	
Nov.	9.81	9.25	25	1,600	13	1,430	1,530	90,996	63,375	92,509	22,487	
Dec.	9.88	9.38	12	1,650	1	1,520	1,590	97,665	60,872	97,665	23,516	
Yearly	10.07	1.71		1,700		24.7	1,490	1,084,048	847,414	1,084,048	458,631	
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	3.07	0.52		48.1		0.70	42.2	1,337,173	1,045,285	1,337,173	565,721	

\*\* Period 1968-1980

\* Discharge measurement made on this day

! And other days

**PINTO CREEK NEAR DEL RIO, TEXAS**

**DESCRIPTION:** Cableway, solid ledge rock and concrete control, bubbler gage, and digital water-stage recorder located on the right bank at latitude 29°08'45", longitude 100°43'05", 1.6 creek miles (2.6 km) from the confluence with the Rio Grande, and about 19 miles (30.6 km) southeast of Del Rio, Texas. This stream enters the Rio Grande at river mile 536.9 (864.1 km), 5.6 river miles (9.1 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam. The zero of the gage is 813.68 feet (248.01 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 12 discharge measurements during the year and a continuous record of gage heights. Records available: September 1955 through 1980 at this station, and November 22, 1928 through August 1955 at a site 3.9 miles (6.3 km) upstream.

**REMARKS:** Small irrigation diversions modify the flow of this spring-fed creek at this station. When the flow in the Rio Grande at the confluence of this creek exceeds about 80,000 second-feet (2,270 m<sup>3</sup>/sec), backwater may reach this station. Backwater from the Rio Grande flood of June 1954 reached a gage height of 28.8 feet (8.78 m), or an elevation of 842.50 feet (256.79 m) above mean sea level, at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 186,000 second-feet (5,270 m<sup>3</sup>/sec) on June 24, 1948 with a gage height of 32.0 feet (9.75 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 28,200 (799)	June 24, 1948	Min. 0	Frequently
Monthly:	Max. 953 (27.0)	June 1948	Min. 0	Frequently
Yearly:	Max. 105 (2.97)	1932	Min. 1.3 (0.04)	1980

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	* 2.1	1.4	1.8	* 0.7	1.1	* 0	* 0	0	* 0	0	1.4
2	2.6	2.0	2.1	1.8	.7	.7	0	0	0	.4	0	.7
3	2.6	2.0	2.1	* 1.8	20.8	.7	0	0	0	.4	0	.7
4	* 2.7	2.0	2.1	1.8	62.5	.7	0	0	0	.4	0	* 0
5	2.7	2.0	2.1	1.8	17.0	* .7	0	0	* 0	.4	0	0
6	2.7	2.0	* 2.1	1.1	9.2	1.1	0	0	0	.4	* 0	0
7	2.7	2.0	2.1	1.1	6.4	1.1	0	0	0	0	0	0
8	2.7	1.8	2.1	1.1	9.5	.7	0	0	0	0	0	0
9	2.6	1.8	2.1	1.1	11.7	.7	0	0	0	0	0	0
10	2.6	2.0	2.1	1.1	3.2	.7	0	0	0	0	0	0
11	2.6	2.0	2.1	1.1	3.2	.7	0	0	0	0	0	0
12	2.8	2.0	2.1	1.1	3.2	.4	0	0	0	0	0	0
13	2.6	2.0	2.1	1.1	3.2	.4	0	0	0	0	0	1.1
14	2.6	2.1	2.1	1.8	2.5	.4	0	0	0	0	0	0
15	2.6	2.3	2.1	1.8	6.4	.4	0	0	0	0	0	1.1
16	2.6	2.1	2.1	1.8	5.3	.4	0	0	0	0	0	1.4
17	2.6	2.1	2.5	1.8	1.8	.4	0	0	0	0	0	1.4
18	2.5	2.1	2.5	1.8	1.8	.4	0	.4	0	0	0	1.8
19	2.5	2.1	2.1	1.8	2.1	.4	0	.7	0	0	0	0
20	2.5	2.2	2.1	1.8	1.8	.4	0	.7	0	0	1.1	0
21	2.2	2.1	1.8	1.8	1.8	.4	0	.4	0	0	.4	0
22	2.1	2.1	1.8	1.1	1.8	.4	0	0	0	0	.7	0
23	2.1	2.1	1.8	1.1	1.8	.4	0	0	0	0	1.4	0
24	2.1	1.9	1.8	1.1	1.8	.4	0	0	0	0	1.1	.4
25	2.1	1.9	1.8	1.8	1.4	0	0	0	0	0	.4	0
26	2.1	1.9	1.8	2.1	3.2	0	0	0	0	0	.4	.7
27	2.1	1.9	1.8	2.1	3.5	0	0	0	0	0	.4	1.4
28	2.0	2.1	1.8	2.1	2.1	0	0	0	0	0	1.1	.7
29	2.0	2.1	1.8	1.8	1.1	0	0	0	0	0	1.4	.4
30	2.0	2.0	1.8	1.8	1.1	0	0	0	0	0	1.1	1.8
31	2.0		1.8	1.1	1.1	0	0	0	0	0	1.1	1.8
<b>Sum</b>	75.2	58.8	61.9	47.2	193.7	14.1	0	2.2	0	2.0	9.5	16.8

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
	Jan.	0.82	0.75	11	3.2	31	1.8	2.4	149	551	2,270
Feb.	.79	.74	15	2.4	18	1.6	2.0	117	595	5,760	0
Mar.	.89	.72	17	4.2	123	1.1	2.1	122	528	2,500	0
Apr.	.82	.69	26	2.5	112	.7	1.4	91.6	1,303	27,100	0
May	3.84	.66	3	720	3	.4	6.4	383	2,039	29,400	0
June	.79		7	2.8	125	0	.4	26.8	3,575	56,700	0
July				0	0	0	0	0	1,539	30,000	0
Aug.	.69		118	.7	11	0	0	4.2	1,689	48,700	0
Sept.				0	0	0	0	0	2,272	48,965	0
Oct.	.56		12	.4	17	0	0	3.5	1,012	8,940	0
Nov.	1.02		123	10.2	11	0	.4	18.2	496	2,590	0
Dec.			118	1.8	14	0	.7	32.9	562	2,470	0
<b>Yearly</b>	3.84			720		0	1.3	948.2	16,161	76,259.3	948.2
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
	1.17			20.4		0	0.04	1,170	19,935	94,066	1,170

\* Discharge measurement made on this day      Ø Mean daily      ! And other days

## RIO SAN DIEGO NEAR JIMENEZ, COAHUILA

**DESCRIPTION:** Cableway, masonry and concrete Cipolletti weir of 777 second-foot (22 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the left bank of Rio San Diego, and gravity well and water-stage recorder on Acedia de Dolores, an irrigation canal that runs along the left bank of the river under the cable, located at latitude 29° 04' 20", longitude 100° 47' 35", about 3.5 miles (6 km) west of Jimenez, Coahuila, and 4.1 river miles (7 km) from the confluence with the Rio Grande. Part of the canal flow measured here returns to the river downstream. This stream enters the Rio Grande at river mile 532.2 (856.4 km), 10.4 river miles (16.8 km) downstream from Maverick County Water Control and Improvement District No. 1 diversion dam and 28.9 river miles (46.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Acuna, Coahuila. The zero of the gage is 831.73 feet (253.51 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** For the river, based on the weir discharge table and a continuous record of gage heights; and for the canal, on 11 discharge measurements during the year and a continuous record of gage heights. The flow tabulated below includes the flow of the canal, and prior to 1964, records do not include this flow. In 1980 the capacity of the weir was exceeded on May 27, August 11 through 14, and September 27 through October 3. Records available: 1922 through 1980. The records from 1922 through September 1932 are considered doubtful.

**REMARKS:** Reservoirs and irrigation diversions upstream from these stations modify the flow of this spring-fed stream. On December 24, 1955, the zero of the gage was raised 2.62 feet (0.80 m); in November 1961 an additional 0.20 foot (0.06 m), and the capacity of the weir was increased from 706 (20 m<sup>3</sup>/sec) to 777 second-foot (22 m<sup>3</sup>/sec).

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 81,930 second-feet (2,320 m<sup>3</sup>/sec) on June 17, 1961 with a gage height of 20.70 feet (6.31 m). Min. no flow occurred on several occasions during April, May, and June 1939, May and August 1952, and July and August 1953.

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily:	Max. 36,700 (1,040)	July 18, 1975	Min. 0	Occasionally
Monthly:	Max. 2,380 (67.5)	Oct. 1932	Min. 8.0 (0.23)	July 1956
Yearly:	Max. 622 (17.6)	1976	Min. 24.0 (0.68)	1956

## Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	65.3	89.7	38.5	45.6	32.1	63.6	19.8	18.7	329	862	593	537
2	65.3	89.7	38.8	43.4	32.5	56.2	19.4	20.5	318	833	593	537
3	65.3	66.4	38.5	41.3	36.4	47.7	19.4	21.5	306	816	579	523
4	65.3	53.3	38.8	41.3	36.7	47.3	19.1	20.5	306	766	593	523
5	65.3	44.5	34.3	41.3	37.1	46.6	19.1	20.5	306	735	593	523
6	65.3	49.8	34.3	41.3	40.3	46.6	19.1	20.5	306	682	565	512
7	65.3	47.7	34.3	41.3	40.3	43.4	19.1	20.8	294	675	537	512
8	65.3	47.7	34.3	41.3	39.9	39.6	19.1	21.2	282	671	537	523
9	65.3	47.7	34.3	41.3	39.6	39.9	19.1	20.8	282	703	537	512
10	65.3	56.6	34.3	41.3	39.6	39.9	18.7	30.0	282	706	512	512
11	65.3	56.6	34.3	41.7	39.6	39.6	18.7	8,370	281	713	512	512
12	65.3	56.6	38.8	42.4	39.6	39.6	18.4	1,720	281	713	484	484
13	65.3	47.7	38.8	42.7	85.1	39.2	18.4	968	271	731	484	484
14	65.3	48.0	38.8	42.0	163	34.6	18.4	848	271	745	484	484
15	77.7	48.0	39.2	42.0	332	35.0	18.4	735	271	745	484	484
16	96.4	48.0	38.8	41.7	115	35.0	18.4	657	266	731	512	459
17	117	48.0	38.8	41.3	79.5	34.6	18.4	597	266	699	484	441
18	117	48.0	38.1	41.3	67.8	30.4	19.1	554	260	682	484	431
19	117	39.6	37.8	41.3	67.8	30.0	18.4	530	261	682	512	406
20	117	39.6	38.1	41.0	62.9	29.7	18.0	487	250	667	512	431
21	117	39.6	38.8	41.7	48.7	29.0	18.7	463	251	667	537	406
22	117	39.6	38.5	42.4	44.8	25.1	19.4	420	240	653	565	406
23	117	39.2	38.5	40.0	40.6	23.3	18.7	410	240	653	551	388
24	117	39.2	38.8	36.4	40.6	23.3	18.7	410	241	639	551	388
25	117	39.2	39.6	32.5	40.3	23.0	18.7	396	242	622	551	388
26	117	39.2	40.3	31.8	272	22.6	19.1	371	263	622	551	388
27	117	39.2	41.3	31.4	491	22.6	19.1	357	1,100	607	551	374
28	117	38.8	42.7	30.0	117	21.5	19.8	357	1,470	593	551	374
29	117	38.8	44.1	30.7	83.3	21.5	19.4	357	992	593	551	364
30	103		45.6	31.4	83.7	21.2	18.7	345	911	593	551	350
31	89.7		45.6		65.7		18.7	329		593		343
Sum		1,426.0		1,186.1		1,051.6		585.5	19,896.0	21,392	16,115	13,999
	2,802.0		1,195.7		2,754.5					11,639		

Month	Current Year 1980						Period 1933-1980				
	Extreme Gage Feet		Extreme Second-Foot			Average Second-Foot	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	0.30	0.26	117	117	1	65.3	90.4	5,556	8,058	36,430	1,860
Feb.	.33	.16	1	89.7	128	38.8	49.1	2,828	6,284	25,760	1,060
Mar.	.20	.13	130	45.6	1	34.3	38.5	2,372	5,484	27,040	1,340
Apr.	.20	.13	1	45.6	28	30.0	39.6	2,353	6,454	40,270	1,110
May	2.36	.10	27	2,130	1	19.1	89.0	5,462	11,240	120,200	861
June	.23	.07	1	63.6	30	14.8	35.0	2,085	10,956	108,300	543
July	1.57	1.44	1	19.8	20	18.0	18.7	1,161	13,578	136,149	490
Aug.	9.78	.07	11	22,600	1	18.7	643	39,448	11,697	91,248	738
Sept.	2.23	.62	27	1,960	122	240	388	23,096	17,150	94,667	1,183
Oct.	1.38	1.08	1	879	31	579	689	42,433	18,670	71,830	1,698
Nov.	1.08	.95	1	593	112	484	537	31,961	13,180	64,060	803
Dec.	1.02	.79	1	537	31	341	452	27,767	9,336	45,320	1,130
Yearly	9.78	0.07		22,600		14.8	257	186,522	132,087	451,952	17,430
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	2.98	0.02		639		0.42	7.28	230,072	162,926	557,477	21,508

\*\* Period October 1932-1980

\* Discharge measurement made on this day

! And other days

**RIO GRANDE NEAR JIMENEZ, COAHUILA AND QUEMADO, TEXAS**

DESCRIPTION: Cableway, bubbler gage, control weir of 1,270 second-foot (36 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at latitude 29° 03' 00", longitude 100° 39' 50", and river mile 530.3 (853.5 km); 1.5 miles (2.4 km) south-southeast of Jimenez, Coahuila, 1.8 river miles (3.0 km) downstream from Rio San Diego, about 7.5 miles (12.1 km) north-northwest of Quemado, Maverick County, Texas, 12.3 river miles (19.8 km) downstream from the Maverick County Water Control and Improvement District No.1 diversion dam, and 30.7 river miles (49.4 km) downstream from the international highway bridge between Del Rio, Texas and Cd. Aouma, Coahuila. The zero of the gage is 769.00 feet (234.39 m) above mean sea level, U.S.C. & G.S. datum.

RECORDS: Based on 12 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods prior to completion of the weir and for flows exceeding the capacity of the weir thereafter. Computations for flows within the capacity of the weir were based on a stable control weir rating curve defined by meter measurements. Records available: 1965 through 1980. Records, excluding some high flow periods, are also available from 1956 through May 1965 for a station 8.1 river miles (14 km) upstream. Records prior to 1976 were published under the title "Rio Grande below Maverick Dam near Quemado, Texas."

REMARKS: This station was placed in operation January 1, 1965 and replaces the station "Rio Grande below Maverick Dam near Del Rio, Texas," which stopped operating June 1, 1965. Irrigation diversions 13.3 river miles (21.5 km) upstream largely control the flow at this station. The weir was placed in operation June 1, 1967, and the zero of the gage was set 3.28 feet (1 m) higher.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 79,800 second-feet (2,260 m<sup>3</sup>/sec) on July 18, 1975 with a gage height of 25.20 feet (7.68 m). Min. 3.5 second-feet (0.10 m<sup>3</sup>/sec) on March 9, 1969 with a gage height of 0.16 foot (0.05 m).

Average Flow in Second-Foot (Cubic Meters per Second)

Daily: Max. 67,100 (1,900) July 18, 1975 Min. 7.1 (0.20) July 16, 17, and 18, 1969  
 Monthly: Max. 21,300 (602) Sept. 1974 Min. 28.3 (0.80) June 1969  
 Yearly: Max. 4,380 (124) 1974 Min. 286 (8.11) 1968

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,100	1,300	159	4,240	124	2,810	5,160	569	886	1,470	1,050	1,140
2	1,160	1,240	120	802	98.9	2,810	5,620	611	2,010	1,390	1,060	1,110
3	1,270	1,270	106	141	124	2,750	5,510	590	929	1,290	1,080	1,100
4	1,170	1,240	115	80.9	893	2,650	5,720	579	925	1,270	1,040	1,050
5	1,170	1,240	431	53.0	297	2,640	5,650	558	925	1,200	1,050	1,050
6	1,170	1,240	710	40.3	190	2,630	5,620	576	939	1,230	978	1,060
7	1,200	1,240	720	53.0	139	2,600	5,540	540	908	1,150	953	1,070
8	1,190	1,320	752	53.0	210	2,650	5,540	547	890	1,170	989	1,130
9	1,220	1,270	710	31.1	254	2,650	5,470	583	823	1,200	978	1,080
10	1,200	1,260	717	31.1	780	2,570	5,650	653	865	1,300	975	1,060
11	1,200	1,220	1,230	21.5	1,170	2,570	5,620	14,400 #	833	1,240	957	1,040
12	1,230	1,230	1,350	31.1	1,420	2,560	5,760	13,900 #	830	1,200	975	1,020
13	1,250	1,200	1,380	53.0	4,380	2,520	5,690	2,560 #	869	1,240	1,010	1,020
14	1,200	1,170	1,380	65.7	4,590	1,810	5,580	2,120	886	1,200	985	1,060
15	1,230	1,180	2,010	40.3	5,010	2,730	5,760	1,770	890	1,210	1,060	1,030
16	1,260	1,190	2,130	53.0	2,950	2,700	5,690	1,710	886	1,220	1,270	1,020 *
17	1,280	1,190	2,090	31.1	2,730	2,690	5,580	1,540	879	1,140	1,100	999
18	1,280	1,170	2,010	31.1	2,670	2,630	5,650	1,630	848	1,120	1,050	1,010
19	1,300	1,180	2,120	65.7	2,120	2,570	2,830	1,270	862	1,120	1,060	999
20	1,320	1,210	2,120	65.7	2,760 *	2,570	2,600	1,130	883	1,120	1,090	1,040
21	1,320	1,190	2,480	65.7	2,680	2,540	2,660	1,100	802	1,140	1,120	978
22	1,350	1,210	2,870	65.7	2,700	2,500	2,580	1,070	773	1,110	1,120	971
23	1,240	1,190	2,880	65.7	2,730	2,540	2,760	1,040	766	1,160	1,160	982
24	1,270	1,200	2,880	116	2,730	2,500	2,540	1,020	756	1,120	1,140	978
25	1,240	1,170	4,380	156	2,730	2,500	2,510	1,020	759	1,130	1,130	989
26	1,340	1,200	4,130	153	3,270	2,500	2,540	982	869	1,150	1,200	975
27	1,350	1,200	3,740	158	4,480	2,500	2,530	1,050	982	1,150	1,140	964
28	1,400	1,140	3,340	192	2,950	2,500	2,500	929	2,270	1,100	1,100	957
29	1,350	487	4,480	146	2,830	2,500	1,140	908	1,720	1,030	1,140	925
30	1,370	4,480	4,480	135	2,870	2,500	632	897	1,600	1,030	1,150	904
31	1,300	4,700	4,700	2,810	2,810	2,500	579	872	1,070	1,070	978	922
Sum	38,930	34,547	62,720	7,236.7	66,319.9	77,190	129,211	58,724 #	30,121	36,670	32,200	31,593

Month	Extreme Gage Feet		Current Year 1980				Average Second-Foot	Total Acre-Foot	Period 1968-1980			
	High	Low	Extreme Second-Foot		Day	Acre-Foot			Average	Maximum	Minimum	
			High	Low								
Jan.	1.77	1.54	28	1,460	1	1,100	1,260	77,225	38,006	144,286	5,236	
Feb.	1.77	.43	8	1,460	29	149	1,190	68,483	81,456	401,339	5,788	
Mar.	3.28	.33	31	4,940	4	89.0	2,020	124,426	81,581	288,077	5,874	
Apr.	3.05	.26	1	4,240	11	21.5	2,41	14,349	51,856	293,637	5,030	
May	5.35	.36	15	10,600	2	98.9	2,140	131,542	137,656	422,934	6,574	
June	2.43	.69	1	2,880	14	330	2,570	153,035	91,840	291,767	1,671	
July	3.64	.98	12	5,860	31	544	4,170	256,219	107,444	311,781	2,322	
Aug.	14.34	.95	11	38,500	7	516	1,890	# 116,464	132,010	710,869	11,855	
Sept.	2.33	1.21	28	2,650	24	727	1,000	59,756	189,392	1,264,108	13,678	
Oct.	1.84	1.44	1	1,580	129	1,010	1,180	72,735	148,683	831,298	11,210	
Nov.	1.74	1.38	16	1,420	10	904	1,070	63,903	79,971	499,143	8,863	
Dec.	1.64	1.31	1	1,240	30	848	1,020	62,677	43,508	181,109	7,486	
Yearly	14.34	0.26		38,500		21.5	1,650	1,200,814	1,183,403	3,169,805	207,998	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	4.37	0.08		1,090		0.61	46.8	1,481,188	1,459,711	3,909,913	256,561	

\* Discharge measurement made on this day      # Estimated      # Partly estimated  
 † And other days

## RIO SAN RODRIGO AT EL MORAL, COAHUILA

DESCRIPTION: Gravity well and water-stage recorder located on the left bank of El Moral, Coahuila, latitude 28°53'20", longitude 100°37'55", 1.0 river mile (1.6 km) from the confluence with the Rio Grande, and about 15.5 miles (25 km) northwest of Piedras Negras, Coahuila. This stream enters the Rio Grande at river mile 518.2 (834.0 km), 24.4 river miles (39.3 km) downstream from the Maverick County Water Control and Improvement District No. 1 diversion dam and 21.9 river miles (35.2 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 750.95 feet (228.89 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 15 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1962 through 1980.

REMARKS: Prior to 1976 this station was published under the heading "Rio San Rodrigo near Mouth at El Moral, Coahuila." The flow of this spring-fed stream is modified by diversions above this station. The concrete control weir, placed in operation on November 25, 1969, was destroyed by the flood of July 12, 1976, and the station was relocated on October 15, 1976.

EXTREME FLOWS FROM RECORDS\*\*: Momentary: Max. 140,000 second-feet (3,970 m<sup>3</sup>/sec) on July 18, 1975 with a gage height of 18.44 feet (5.62 m). Min. frequently no flow.

Average Flow in Second-Foot (Cubic Meters per Second)

Daily:	Max. 44,500 (1,260)	July 18, 1975	Min. 0	Frequently
Monthly:	Max. 7,380 (209)	July 1976	Min. 0	Frequently
Yearly:	Max. 837 (23.7)	1976	Min. 5.3 (0.15)	1963

## Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.8	10.6	5.3	3.2	0	0.7	0.4	1.1	239	1,640	96.1	91.8
2	20.8	10.6	5.3	3.2	0	.7	.4	1.1	222	1,260	91.8	91.8
3	20.8	10.6	5.3	3.2	0	.7	.4	1.1	203	992	91.1	91.8
4	20.8	10.6	5.3	2.8	0	.7	.4	1.1	169	773	91.1	91.8
5	20.8	9.2	5.3	2.8	0	.7	.4	1.1	144	650	91.1	91.8
6	20.8	9.2	5.7	2.8	0	.7	.4	1.1	144	551	81.2	91.8
7	20.8	8.1	5.7	2.8	.4	.7	.4	1.1	152	487	81.2	91.8
8	20.8	8.1	5.3	2.8	.7	.7	.4	1.1	153	441	81.2	91.8
9	20.8	8.1	5.3	2.5	.4	.7	.4	1.1	149 *	396	81.2	* 86.5
10	20.8	7.4	4.9	2.5	.4	.7	.4	1.1	149	357	77.0	81.2
11	20.8	7.4	4.6	2.1	.4	.7	.4	7,100	139	331	74.2	81.2
12	20.8	7.4	4.6	1.8	.4	.7	.4	2,550	139	298	71.0	81.2
13	18.7	* 7.1	4.6	1.4	.4	.7	.4	2,740	139	272	69.6	81.2
14	15.9	7.1	4.2	1.1	.4	.7	.4	1,800	139	250	74.2	81.2
15	14.5	7.1	4.2	.7	.4	.7	.4	1,360	144	230	84.0	81.2
16	12.0	7.4	4.2	.4	1.1	.7	.4	1,030	149	266	141	81.2
17	12.0	7.4	4.2	.4	.7	.7	.4	872	133	285	139	81.2
18	12.0	7.4	4.2	.4	.4	.7	.4	685	96.1	262	123 *	81.2
19	10.6	6.7	* 4.2	.4	.4	.7	.4	657	89.0	237	108	77.7
20	10.6	5.7	3.9	.4	.4	.7	.4	791	86.5	231	101	74.2
21	10.6	5.7	3.9	.4	.4	.7	.4	717 *	86.5	205	101	74.2
22	10.6	5.7	3.5	.4	.4	.7	.4	593	84.0	179	118	69.9
23	10.2	5.7	3.9	.4	.4	.4	1.1	523	* 81.2	160	120	69.9
24	9.9	5.7	3.5	.4	.4	.4	.4	456	81.2	139	111	65.3
25	9.9	5.3	3.5	.4	.4	.4	.4	403	81.2	125	101	65.3
26	9.2	4.9	* 3.5	.4	86.5	.4	.4	367	83.7	120	110	65.3
27	9.2	4.9	* 3.9	.4	127	.4	.4	342	1,460	110 *	101	65.3
28	9.2	* 4.9	3.5	.4	1.4	.4	.4	319	6,820	106	101 *	65.3
29	9.2	4.9	3.5	.4	1.1	.4	.4	295	4,030	101	101	60.7
30	* 10.6		3.2	.4	1.1	.4	.4	278	2,390	96.4	101	* 60.7
31	10.6		3.2	.4	.7	.4	.4	255		96.4		57.9
Sum		210.9		41.7		18.6		24,144.0		11,646.8		2,423.4
	465.1		135.4		226.7		13.1		18,175.4		2,913.0	

Month	Current Year 1980								Period 1962-1980		
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum
Jan.	1.97	1.84	1 1	20.8	126	9.2	15.2	923	3,657	13,281	0
Feb.	1.87	1.74	1 1	10.6	126	4.9	7.4	418	2,534	9,932	0
Mar.	1.74	1.57	1 6	5.7	130	3.2	4.2	269	2,001	7,818	0
Apr.	1.57	1.41	1 1	3.2	116	.4	1.4	81.1	3,126	21,692	81.1
May	4.82	1.41	26	1,380	1 1	0	7.4	449	3,006	14,027	17.0
June	1.44	1.41	1 1	.7	123	.4	.7	36.5	2,120	12,764	0
July	1.71	1.41	23	1.1	1 1	.4	.4	23.5	38,402	454,643	0
Aug.	12.57	1.57	11	22,500	1 1	1.1	777	47,879	13,777	89,017	0
Sept.	8.53	2.36	28	8,090	123	81.2	607	36,047	16,521	48,065	0
Oct.	5.31	2.40	130	1,940	130	91.8	374	23,105	13,563	53,088	0
Nov.	2.59	2.26	16	149	12	61.1	97.1	5,772	9,914	84,015	0
Dec.	2.40	2.26	1 1	91.8	31	56.5	78.0	4,808	5,307	19,970	0
Yearly	12.57	1.41		22,500		0	165	119,811.1	113,928	606,526	3,850.7
	Meters		Cubic Meters per Second				Thousands of Cubic Meters				
	3.83	0.43		638		0	4.67	147,787	140,530	748,140	4,750

\*\* Period 1961-1980

\* Discharge measurement made on this day

! And other days

## RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK CANAL AT MAVERICK POWER PLANT NEAR EAGLE PASS, TEXAS

**DESCRIPTION:** A part of the water diverted from the river into the Maverick Canal is returned to the Rio Grande through the hydroelectric power plant located on the left bank of the Rio Grande at latitude 28°49'50", longitude 100°33'10", about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.2 canal miles (51.8 km) downstream from the point of diversion. The return enters the Rio Grande at river mile 506.8 (815.6 km).

**RECORDS:** Based on records furnished by the Maverick County Water Control and Improvement District No. 1, showing hourly discharge in cubic feet per second based on hourly manometer readings, through each turbine at the Central Power and Light Company hydroelectric power plant. The mean daily discharges computed from the manometer readings have been multiplied by a factor to make them agree with periodic current meter measurements of flows made under stable flow conditions by hydrographers of the Commission. There were 48 discharge measurements made during the year. Records available: 1949 through 1980.

**REMARKS:** This power plant began operating April 16, 1932 with hydroelectric power generating facilities for 12,000 kw. Because the September 1932 flood washed out the upper end of the Maverick Canal, this plant did not operate from September 2, 1932 until March 17, 1937. Since then it has operated continuously except for 44 days in 1953 when shortage of water prevented operation, and from June 30 through July 19 during flood of 1954, and while the canal was being repaired. The plant's operation is now governed by the amount of water released from Amistad Reservoir, which began operations on May 31, 1968.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 1,570 (44.5)	Dec. 16 & 17, 1980	Min. 0	Occasionally
Monthly:	Max. 1,480 (41.9)	Dec. 1980	Min. 42.4 (1.20)	December 1971
Yearly:	Max. 1,140 (32.3)	1980	Min. 232 (6.57)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,300	1,250	966	904	696	1,370	807	969	1,080	1,210	1,210	1,470
2	1,270	1,290	1,020	985	629	1,380	873	960	533	1,200	1,250	1,500 *
3	1,210 *	1,280	987	957	607	1,240 *	923	997	1,040	1,220	1,210	1,500
4	1,240	1,220	972 *	939	759	1,210	985	947	798	1,240	1,180	1,520
5	1,260	1,210 *	947	946	678	1,200	981	922	1,050	1,280	1,160	1,500
6	1,250	1,170	921	978	699 *	1,100	1,020	918	1,010	1,240	1,170 *	1,490
7	1,240	1,160	917	946	720	1,060	969	938	1,090	1,160	1,170	1,520
8	1,240 *	1,160	892	901 *	770	1,140	935 *	943	1,060	1,190	1,150	1,520
9	1,180	1,170	964	859	858	1,110	937	980	1,050 *	1,230 *	1,190	1,520
10	1,180	1,200	945 *	823	922	1,170 *	949	1,120	1,070	1,240	1,160 *	1,500
11	1,210	1,220	953	862	1,030	1,130	965	1,270	1,080	1,220	1,190	1,490
12	1,200	1,200 *	961	925	1,090	1,100	852	1,340	1,120	1,270	1,220	1,480
13	1,210	1,200	932	1,010	1,110 *	1,090	941	1,390	1,130	1,200	1,180	1,480
14	1,210	1,200	946	953	1,220	936	998	1,390 *	1,170	1,200	1,210	1,480
15	1,220 *	1,220	939	932 *	1,420	1,050	1,000 *	1,430	1,130 *	1,200	1,280	1,510
16	1,210	1,230	897	901	1,390	1,060	1,030	1,440	1,090	1,210 *	1,480	1,570 *
17	1,210	1,220	877	893	1,380	991 *	1,070	1,400	1,130	1,200	1,490	1,570
18	1,190	1,220	867 *	906	1,400	951	1,050	1,390	1,100	1,190	1,500	1,550
19	1,210	1,220	854	904	1,350	985	1,000	1,350 *	1,100	1,230	1,510	1,530
20	1,220	1,200	875	922	1,300 *	988	1,060	1,320	1,080	1,210	1,510 *	1,510
21	1,200	1,190 *	851	922	1,370	972	1,050	1,290	1,140	1,180	1,510	1,540
22	1,190	1,130	869	886 *	1,350	1,020	1,070	1,280	1,140	1,170	1,490	1,500 *
23	1,250 *	1,120	882	766	1,270	1,020	997	1,270	1,080 *	1,170 *	1,500	1,480
24	1,260	1,120	825	685	1,330	974 *	1,000 *	1,280	1,080	1,170	1,480	1,450
25	1,260	1,060	810 *	696	1,350	952	1,020	1,280	1,090	1,210	1,510	1,450
26	1,250	1,030 *	801	717	1,330	922	1,000	1,170 *	1,150	1,170	1,490	1,420
27	1,290	1,040	861	755	1,260	911	1,070	1,170	1,210	1,160	1,480	1,440
28	1,270	1,040	830	752	1,350	874	1,050	1,160	1,240	1,120	1,520	1,410
29	1,290 *	994	874	833 *	1,440	933	1,060 *	1,110	1,240 *	1,170	1,490	1,380
30	1,280	910	720	1,390	919 *	989	1,070	1,250	1,210	1,480	1,360 *	1,370
31	1,270		801 *	1,400		983	1,120			1,210		
<b>Sum</b>	<b>38,270</b>	<b>33,964</b>	<b>27,946</b>	<b>26,179</b>	<b>34,868</b>	<b>31,758</b>	<b>30,634</b>	<b>36,614</b>	<b>32,531</b>	<b>37,280</b>	<b>40,370</b>	<b>46,010</b>
<b>Current Year 1980</b>												
<b>Month</b>	<b>Extreme Gage Feet</b>		<b>Extreme Second-Feet</b>				<b>Average Second-Feet</b>	<b>Total</b>	<b>Period 1968-1980</b>			
	<b>High</b>	<b>Low</b>	<b>Day</b>	<b>High</b>	<b>Day</b>	<b>Low</b>			<b>Acree-Feet</b>	<b>Average</b>	<b>Maximum</b>	<b>Minimum</b>
Jan.			2	1,300	1	1,180	1,230	75,907	45,277	83,365	4,952	
Feb.			1	1,290	29	994	1,170	67,367	41,387	70,530	4,871	
Mar.			2	1,020	126	801	901	55,424	39,644	74,817	5,713	
Apr.			13	1,010	24	685	872	51,939	42,573	72,087	4,301	
May			29	1,440	3	607	1,120	69,156	55,696	76,998	13,888	
June			2	1,380	28	874	1,060	62,991	47,123	78,545	6,618	
July			17	1,070	1	807	988	60,762	46,996	76,637	5,537	
Aug.			16	1,440	6	918	1,180	72,623	49,837	72,623	18,457	
Sept.			30	1,250	2	533	1,080	64,524	55,268	78,962	13,741	
Oct.			5	1,280	28	1,120	1,200	73,944	55,446	79,674	11,147	
Nov.			28	1,520	8	1,150	1,350	80,073	46,215	80,073	3,203	
Dec.			116	1,570	30	1,360	1,480	91,260	43,986	91,260	2,608	
<b>Yearly</b>				1,570		533	1,140	825,970	569,448	825,970	168,354	
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>					
				44.5		15.1	32.3	1,018,834	702,414	1,018,834	207,665	

\*\* Period 1968-1980      \* Discharge measurement made on this day      Ø Mean daily  
! And other days

## MAVERICK CANAL EXTENSION BELOW THE POWER PLANT NEAR EAGLE PASS, TEXAS

**DESCRIPTION:** Gage well and digital water-stage recorder located on the downstream side of a wooden pile bridge at latitude 28°49'50" N, longitude 100°32'40" W, about 1 mile (1.6 km) downstream from the heading of this canal extension, about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 32.8 canal miles (52.8 km) downstream from the point of diversion from the Rio Grande, which is located at river mile 543.6 (874.9 km). The elevation of the zero of the gage has not been determined.

**RECORDS:** Based on 41 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1939 through 1980.

**REMARKS:** The main Maverick Canal divides into two branches at a point about 9 miles (14.5 km) north-northwest of Eagle Pass, Texas, and about 31.8 canal miles (51.2 km) downstream from the point at which water from the Rio Grande is diverted. One branch leads to the Maverick Power Plant and back to the Rio Grande, while the other branch forms this Maverick Canal Extension, which is used to transmit irrigation water. Irrigation from this canal extension began in June 1938. In 1980, 26,800 acres (10,846 ha) of land north and south of Eagle Pass were irrigated. A total of 61,390 acre-feet (75,725,000 m<sup>3</sup>) of water from this canal extension returned to the river through the irrigation system which extends approximately 67 canal miles (108 km) downstream.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 580 second-feet (16.4 m<sup>3</sup>) on July 25, 1964. Min. occasionally no flow.

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily:	Max. 552 (15.6)	June 6 & 7, 1968	Min. 0	Feb. 23, 1975
Monthly:	Max. 507 (14.9)	June 1968	Min. 50.9 (1.44)	December 1980
Yearly:	Max. 294 (8.33)	1972	Min. 201 (5.69)	1979

### Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	114	143	255	328	303	47.3	413	341	251	204	203	16.6
2	121	145	258	324	277	48.7	378	346	231	203	202	16.6
3	144 *	161	259	320	243	114 *	367	346	256	201	201	17.7
4	144	175	260 *	316	251	145	371	357	262	199	200	17.7
5	142	184 *	254	319	261	176	371	374	261	197	202	17.7
6	141	191	251	321	266 *	240	367	374	271	195	217 *	17.7
7	139	192	251	315	265	268	371	374	285	196	217	17.7
8	139 *	189	253	314 *	272	267	385 *	374	284	195	217	17.7
9	158	194	255	325	271	220	388	378	270 *	193 *	217	16.6
10	157	200	252 *	332	273	202 *	381	324	265	192	220	35.3
11	158	200	257	334	280	231	392	87.6	252	191	220	48.0
12	157	199 *	260	331	263	247	403	30.0	225	206	220	107
13	158	198	260	330	281 *	256	406	30.4	205	216	220	107
14	148	197	267	330	174	273	403	30.7	204	216	197	104
15	139 *	193	255	330 *	26.5	286	403 *	29.3	203	218	117	90.1
16	138	176	258	322	26.5	287	367	29.7	202	217	18.0	24.4
17	138	177	298	315	83.3	308 *	320	28.3	204	216	19.4	24.4
18	138	176	348 *	307	120	311	364	69.9	203	215	19.4	24.0
19	142	175	337	302	106	317	364	144	202	215	18.4	23.0
20	156	175	325	297	118 *	340	367	187	219	223	18.4	23.0
21	155	178 *	325	291	151	347	313	206	241	236	18.4	20.1
22	154	200	323	279 *	162	381	293	204	248	238	18.0	19.1
23	142 *	204	328	269	198	337	325	203	262 *	227 *	17.0	38.1
24	135	218	332	262	162	323 *	330 *	205	265	195	16.6	88.3
25	136	229	331 *	260	164	334	333	204	264	196	17.7	88.3
26	136	233 *	330	255	153	341	331	238 *	247	220	17.3	87.9
27	137	242	332	250	69.2	370	334	251	226	236	17.3	87.9
28	137	247	334	246	42.7	417	313	250	210	231	17.3	106
29	139 *	257	333	242 *	44.5	413	300 *	256	208	213	17.0	123
30	140		335	273	45.9	413 *	300	254	206	206	17.0	81.6
31	141		333 *		45.6		313	253		204		74.2
<b>Sum</b>	4,423	5,648	9,049	9,039	5,398.2	8,260.0	11,066	6,778.9	7,132	6,510	3,337.2	1,580.7
<b>Current Year 1980</b>								<b>Period 1968-1980</b>				
Month	Average Rainfall Inches***		Extreme Second-Foot				Average Second-Foot	Total Acre-Foot	Acre-Foot			
	1939-1980	1980	High		Low				Average	Maximum	Minimum	
Jan.	0.73	0.21	11	159	1	114	143	8,773	12,134	18,236	6,395	
Feb.	.87	.13	29	258	1	143	195	11,203	10,963	18,006	5,951	
Mar.	.65	.28	18	348	1	251	292	17,949	17,436	23,397	11,493	
Apr.	1.72	.38	11	334	29	242	301	17,926	19,032	25,900	11,116	
May	3.09	6.26	1	305	14	9.9	174	10,706	16,240	28,191	9,027	
June	2.11	.01	28	445	1	47.3	275	16,385	19,846	30,173	8,283	
July	1.50	.14	1	420	21	274	357	21,948	20,624	28,854	8,826	
Aug.	2.16	4.28	10	381	15	24.7	219	13,446	17,964	24,335	10,986	
Sept.	2.96	1.05	7	293	2	169	238	14,147	11,967	17,691	4,196	
Oct.	2.15	.14	23	240	11	191	210	12,918	11,260	16,504	4,702	
Nov.	.76	3.58	9	220	24	16.6	111	6,615	11,127	18,794	6,239	
Dec.	.64	.40	28	128	3	13.8	50.9	3,134	10,812	16,824	3,134	
<b>Yearly</b>	19.34	16.86		445		9.9	214	155,150	179,405	213,138	155,360	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	491	428		12.6		0.28	6.06	191,378	221,296	262,906	191,637	

\*\* Period 1968-1980      \* Discharge measurement made on this day      ! And other days

\*\*\* On the United States side from Maverick Power Plant to Cuervo Creek

## RETURN FLOW TO THE RIO GRANDE FROM THE MAVERICK IRRIGATION DISTRICT ABOVE EAGLE PASS, TEXAS

**DESCRIPTION:** Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Maverick Diversion Dam and Eagle Pass, Texas. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Lateral 2 Spill, Canon Grande, Quemado Creek, Lateral 15 Spill, Hardt Spill, Houchin Spill, Lateral 12 Spill, Lateral 8-B Spill, Elm Creek, and Seco Creek; and a Parshall flume at the Lateral 2 Sand Trap Spill into Las Moras Creek immediately below the canal siphon.

**RECORDS:** Based on the weir discharge table and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1980. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal - Maverick Dam to Eagle Pass, Texas."

**REMARKS:** In addition to the flows listed below, water from the Maverick Canal is returned to the Rio Grande in this reach at the Maverick Power Plant (see page 51).

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Foot (Cubic Meters per Second)**			
Daily:	Max. 929 (26.3)	Sept. 29, 1975	Min. 18.3 (0.52)
Monthly:	Max. 154 (4.36)	June 1968	Min. 32.8 (0.93)
Yearly:	Max. 126 (3.57)	1968	Min. 51.4 (1.46)
			March 9, 1969
			January 1973
			1973

### Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	53.2	48.1	64.1	57.2	52.6	56.0	68.1	51.5	56.2	56.0	70.3	52.4
2	61.3	52.6	56.5	87.1	58.7	57.6	78.5	53.1	124	73.5	67.5	47.9
3	63.4	54.6	65.4	68.2	71.2	59.5	71.9	70.4	49.0	63.7	82.6	46.3
4	65.1	66.5	72.1	64.2	57.1	60.1	68.5	72.5	48.2	50.3	67.9	48.3
5	58.6	73.7	68.7	71.1	52.1	56.1	71.3	69.3	45.6	47.5	70.3	53.3
6	62.1	62.6	69.5	71.8	44.5	62.4	74.1	64.9	48.4	51.2	59.0	50.2
7	56.8	60.5	78.6	53.2	48.3	67.4	75.7	61.7	52.4	60.9	62.8	41.5
8	57.7	62.5	81.4	54.3	54.5	72.4	75.7	66.6	60.7	48.0	69.7	41.4
9	62.4	58.9	72.4	68.9	44.9	64.8	72.8	63.6	45.6	53.4	73.2	33.7
10	63.2	45.9	79.3	80.7	49.1	57.7	77.5	64.8	47.7	47.2	72.9	34.4
11	58.9	45.5	87.5	83.4	51.8	61.4	81.5	66.8	49.7	54.1	68.1	27.7
12	58.5	53.2	79.6	78.2	49.3	61.5	82.3	58.3	46.0	60.7	59.2	26.8
13	58.1	55.0	69.1	57.8	44.1	52.9	69.5	49.4	52.3	59.0	61.4	26.1
14	56.7	49.3	64.8	50.4	50.3	55.7	62.1	40.1	48.5	68.7	54.0	29.1
15	59.7	46.9	75.0	51.1	72.9	65.0	66.7	39.2	47.4	62.1	59.1	28.1
16	66.2	54.1	57.7	47.2	97.5	54.0	49.3	51.1	46.6	56.9	60.5	25.5
17	68.5	46.1	63.9	46.0	59.1	48.0	48.1	50.3	52.6	62.2	55.2	25.2
18	69.3	49.5	49.7	43.2	55.8	49.4	45.5	42.3	58.8	54.4	51.1	28.1
19	65.6	59.4	53.3	45.9	48.3	50.9	52.6	40.6	51.1	51.3	51.9	36.9
20	56.8	60.0	58.1	51.8	46.0	59.5	62.0	41.0	49.4	56.1	50.5	28.3
21	57.9	54.2	61.4	43.1	51.8	56.5	58.4	56.5	50.0	44.9	54.4	31.6
22	56.1	45.8	69.2	36.9	57.3	53.4	54.9	51.0	59.4	53.3	56.5	40.4
23	52.5	57.5	69.9	34.9	57.4	55.7	58.1	46.8	52.5	46.5	54.3	30.1
24	43.3	60.5	67.1	44.2	69.9	67.9	58.9	47.9	62.1	46.1	52.3	30.0
25	43.6	64.4	61.4	54.9	53.9	73.9	59.3	42.6	55.5	56.1	58.6	23.9
26	41.7	62.3	64.9	47.6	63.3	76.9	57.7	48.5	53.2	61.0	52.3	35.4
27	37.5	63.0	62.9	45.5	254	74.4	66.2	50.3	54.2	57.3	52.6	38.7
28	35.4	60.5	57.2	48.7	74.4	73.9	54.9	56.1	49.1	76.3	58.2	39.8
29	39.0	69.5	50.0	54.7	56.4	84.3	47.4	57.1	50.5	71.5	62.4	33.5
30	43.4	60.3	51.8	56.9	70.6	44.9	44.9	55.4	50.0	57.3	60.1	37.9
31	43.4	166		57.2			44.8	47.9		60.0		49.3

<b>Sum</b>	1,715.9	1,642.6	2,157.0	1,694.0	1,960.6	1,859.8	1,959.2	1,677.6	1,616.7	1,767.5	1,828.9	1,125.8
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Month	Current Year 1980						Period 1968-1980			
	Extreme Gage Feet		Extreme Second-Foot		Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	High	Low			Average	Maximum	Minimum	
Jan.	18	69.3	28	35.4	55.4	3,403	3,892	7,640	2,014	
Feb.	5	73.7	11	45.5	56.6	3,258	3,597	6,126	2,206	
Mar.	31	166	18	49.7	69.6	4,278	4,654	6,437	3,061	
Apr.	2	87.1	23	34.9	56.5	3,360	4,689	7,795	3,360	
May	27	254	13	44.1	63.2	3,889	4,378	8,178	2,755	
June	29	84.3	17	48.0	62.0	3,689	4,844	9,190	2,912	
July	12	82.3	31	44.8	63.2	3,886	5,015	8,157	2,811	
Aug.	4	72.5	15	39.2	54.1	3,327	4,875	9,261	2,931	
Sept.	2	124	5	45.6	53.9	3,207	4,067	7,680	2,427	
Oct.	28	76.3	21	44.9	57.0	3,506	3,960	6,564	2,287	
Nov.	3	82.6	20	50.5	61.0	3,628	3,732	6,696	2,416	
Dec.	5	53.3	25	23.9	36.3	2,233	3,376	5,774	2,233	
<b>Yearly</b>			254	23.9	57.4	41,664	51,039	91,498	37,237	
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
			7.19	0.68	1.63	51,393	62,957	112,863	45,932	

\*\* Period 1968-1980

Ø Mean daily

## RIO GRANDE AT PIEDRAS NEGRAS, COAHUILA AND EAGLE PASS, TEXAS

**DESCRIPTION:** Cableway, gravity well, water-stage recorder, and resistance-type transmitter located on the left bank at latitude 28°42'50", longitude 100°30'25", and river mile 497.0 (799.8 km), 0.6 river mile (1.0 km) upstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila and 77.0 river miles (123.8 km) downstream from Amistad Dam. The zero of the gage is 682.91 feet (208.15 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 49 discharge measurements during the year, 37 by the Mexican Section and 12 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through March 1914; August 1914 through April 1916; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September, November, and December 1923; and 1924 through 1980. Records prior to 1976 were published under the title "Rio Grande at Eagle Pass, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The transmitter is coupled, via leased telephone circuits to a receiver located in the office of the Eagle Pass and Piedras Negras Bridge Company from where the Wheatstone bridge circuit can be balanced to indicate the existing gage height. This system is operated in cooperation with the National Weather Service.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 964,100 second-feet (27,300 m<sup>3</sup>/sec), determined by slope-area calculations, on June 29, 1954 with a gage height of 53.51 feet (16.31 m). Well-authenticated information indicates the occurrence of a flood in June 1865 with an estimated discharge of 1,236,000 second-feet (35,000 m<sup>3</sup>/sec) and a gage height of 56.00 feet (17.07 m) on the present gage, and also that these were the only floods since 1745 with flows greater than 825,000 second-feet (23,400 m<sup>3</sup>/sec). Min 24.4 second-foot (0.69 m<sup>3</sup>/sec) on June 22, 1953 with a gage height of 0.07 foot (0.02 m).

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max.	101,400 (2,870)	July 19, 1975	Min.	187 (5.30)	June 6, 7, & 8, 1972
Monthly:	Max.	22,000 (622)	Sept. 1974	Min.	323 (9.16)	June 1969
Yearly:	Max.	5,190 (147)	1974	Min.	971 (27.5)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,610	2,800	1,670	5,620	936	3,920	4,980	1,580	2,200	4,700	2,660	2,800
2	2,610 *	2,800	1,490	3,850	872	3,880	6,820	1,610	2,380	4,100	2,550	2,770 *
3	2,630	2,780	1,500	1,600	816	3,810 *	6,820	1,680	2,080	3,640	2,490	2,800
4	2,630	2,710	1,440 *	1,320	1,090	3,670	6,780	1,650	2,100 *	3,360	2,470 *	2,750
5	2,630	2,660	1,380	1,280	1,460	4,100	6,820	1,590 *	2,070	3,230	2,430	2,760
6	2,690	2,660 *	1,890	1,310	1,030	4,060	6,780	1,550	2,100	3,080	2,390	2,750
7	2,720	2,650 *	2,020	1,310	950	3,570	6,670	1,540	2,140	2,930 *	2,370	2,780
8	2,720 *	2,680	2,030	1,170 *	1,080	3,570	6,640	1,550	2,280	2,830	2,350	2,810 *
9	2,720	2,690	2,050	1,170	1,250 *	3,670	6,640	1,590	2,030 *	2,850	2,390	2,780
10	2,750	2,690	2,040	1,150 *	1,190	3,710	6,640 *	1,800	2,030	2,850	2,390	2,710
11	2,750	2,720	1,980 *	1,190	2,030	3,670	6,640	9,150	2,050	2,810	2,390 *	2,670
12	2,750	2,690 *	2,000	1,270	2,200	3,670	6,750	26,300 *	2,600	2,840	2,400	2,640
13	2,780	2,690	2,620	1,350	4,380 *	3,780	6,750	5,580	2,110	2,760	2,410	2,620
14	2,800	2,690	2,610	1,320	5,720	2,970	6,710	5,510	2,190	2,730	2,380	2,650
15	2,800	2,720	2,790	1,250 *	7,800 *	4,030	6,710 *	4,770	2,160	2,720	2,540	2,670
16	2,840	2,800	3,230	1,210	5,400	4,100	6,750	4,270	2,150	2,770	3,150	2,690
17	2,920	2,830	3,180	1,200	4,130	4,060 *	6,750	3,960	2,120	2,800	2,900	2,680
18	2,920	2,850	3,110	1,200	3,920	4,100	6,780 *	3,670	2,090	2,710	2,750	2,660
19	2,920	2,850	3,110	1,180	3,960	4,170 *	5,090	3,390 *	2,070 *	2,740	2,760	2,640
20	2,920	2,830	3,150	1,190	3,920	4,200	3,710	3,310	2,070	2,660	2,770	2,630
21	2,920	2,810	3,290	1,200	3,810	4,170	3,600	3,230	2,110	2,590 *	2,800	2,650
22	2,890 *	2,750	3,710	1,130 *	3,740	4,130	3,430 *	3,110	2,060	2,570	2,870	2,590
23	2,860	2,760	3,810	996	3,670	4,170 *	3,250	2,960	2,000 *	2,560	2,860	2,570 *
24	2,900	2,790	3,740	883	3,710	4,060	3,520	2,850	2,010	2,550	2,860	2,540
25	2,800	2,710 *	4,410 *	883 *	3,740	4,030	3,390	2,700	2,000	2,540	2,800	2,520
26	2,800	2,640	5,230	1,010	3,880	4,030	3,370	2,550 *	2,130	2,550	2,860	2,520
27	2,910	2,610	5,370	996	8,760 *	3,880	3,390	2,470	2,780	2,560 *	2,830	2,590
28	2,910	2,610	4,240	968	4,100	3,740	3,400	2,420	9,750	2,490 *	2,800	2,500
29	3,230	2,430	5,830	964	4,030	3,710	3,020 *	2,330	7,490	2,550	2,800	2,470
30	3,230		5,830	950	4,030	3,640	1,870	2,260	5,720 *	2,480	2,800	2,400
31	2,950		5,900	3,960			1,720	2,250		2,500		2,420
<b>Sum</b>		78,900		42,120		116,270		115,180		88,950		81,960
	87,510		97,250		101,564		162,190		80,500		79,220	

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Low	Day			Average	Maximum	Minimum
							High	Low			
Jan.	3.81	3.77	129	3,230	1	2,610	2,830	173,614	95,005	173,614	26,191
Feb.	3.77	3.22	20	2,860	29	1,970	2,720	156,509	128,806	448,150	35,604
Mar.	5.51	2.79	31	6,180	5	1,330	3,140	192,884	130,892	397,213	20,899
Apr.	5.28	2.46	1	5,650	124	883	1,410	83,522	105,097	351,859	24,030
May	8.46	2.36	27	13,300	3	766	3,280	201,465	208,209	588,871	36,193
June	4.53	3.15	20	4,200	14	1,870	3,880	230,603	157,526	415,943	19,254
July	5.91	3.02	3	6,890	31	1,640	5,230	321,592	215,653	779,878	26,100
Aug.	14.90	2.92	12	33,500	7	1,490	3,710	228,404	198,465	743,286	56,856
Sept.	7.58	3.18	28	10,900	2	1,900	2,680	159,634	263,459	1,306,836	80,699
Oct.	5.02	3.51	1	5,120	128	2,420	2,870	176,388	226,469	891,747	58,642
Nov.	3.97	3.44	16	3,220	14	2,310	2,640	157,223	144,203	570,870	46,790
Dec.	3.77	3.48	18	2,860	30	2,380	2,650	162,632	100,937	268,589	26,197
<b>Yearly</b>	14.90	2.36		33,500		766	3,090	2,244,470	1,974,721	3,753,089	705,670
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
	4.54	0.72		950		21.7	87.5	2,768,524	2,435,792	4,629,385	870,435

\*\* Period 1968-1980

\* Discharge measurement made on this day

! And other days

**RIO ESCONDIDO AT VILLA DE FUENTE, COAHUILA**

**DESCRIPTION:** Cableway, gravity well, concrete control weir of 1,750 second-foot (50 m<sup>3</sup>/sec) capacity, and water-stage recorder located on the downstream side of the left abutment of the highway bridge over Rio Escondido on the outskirts of Villa de Fuente, Coahuila, 1.2 river miles (1.9 km) downstream from the cableway at latitude 28°40'05", longitude 100°31'00", about 3 miles (5 km) southwest of Piedras Negras, Coahuila, 3.7 river miles (6.0 km) from the confluence with the Rio Grande, and 6.8 river miles (10.9 km) downstream from the confluence of Rio San Antonio with Rio Escondido. Rio Escondido enters the Rio Grande at river mile 493.2 (793.8 km), 3.1 river miles (5.0 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 718.37 feet (218.96 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 13 discharge measurements during the year and a continuous record of gage heights. Records available: 1922 through 1980. Records from 1922 through September 1932 are considered doubtful.

**REMARKS:** Diversions and drainage returns modify the flow of this spring-fed stream at this station. Backwater from the Rio Grande reached an elevation of 729.92 feet (222.48 m) during the flood of June 1954. Prior to November 1954, the gage well was located at the present cableway site. The weir was destroyed by a flood on September 24, 1964. On November 25, 1969, the concrete control weir was finished and placed in operation.

**EXTREME FLOWS FROM RECORDS\*\*:** Momentary: Max. 24,000 second-foot (680 m<sup>3</sup>/sec) on June 29, 1936 with a gage height of 19.13 feet (5.83 m). Min. frequently no flow.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 13,100 (371)	Sept. 24, 1964	Min. 0	Several days 1956-1958 & 1965
Monthly:	Max. 827 (23.4)	Sept. 1964	Min. 0.3 (0.01)	September 1965
Yearly:	Max. 219 (6.21)	1976	Min. 2.4 (0.07)	1956

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	50.1	46.3	31.8	30.4	12.7	39.6	3.5	2.8	23.0	67.5	109	133
2	52.3	50.1	33.5	30.4	12.7	39.6	3.5	2.8	23.0	71.3	109	129
3	54.0	54.0	33.5	30.4	12.7	39.6	3.5	3.2	23.0	71.3	116	129
4	54.0	54.0	33.5	27.9	13.4	39.6	3.5	2.8	23.0	71.3	116	129
5	54.0	54.0	33.5	27.9	13.4	39.6	3.5	* 2.8	20.5	71.3	116	129
6	54.0	56.2	33.5	27.9	14.5	31.1	3.5	2.8	20.5	81.2	116	129
7	54.0	56.2	33.5	27.9	14.5	21.9	3.5	2.8	41.0	88.6	116	144
8	* 54.0	56.2	33.5	* 25.4	18.4	18.4	2.8	2.8	29.3	86.2	116	144
9	54.0	56.2	33.5	36.4	15.9	12.7	2.8	4.2	41.3	86.2	116	144
10	54.0	56.2	33.5	39.6	12.7	12.7	2.8	63.6	27.9	86.2	116	147
11	54.0	56.2	33.5	38.1	11.3	* 11.3	2.8	3,810 *	24.0	86.2	116	147
12	54.0	* 56.2	33.5	36.4	11.3	11.3	3.9	445	23.0	89.0	109	147
13	46.6	56.2	33.5	36.4	11.3	11.3	3.2	108	23.0	91.8	103	147
14	42.7	56.2	33.5	36.4	35.0	9.9	3.2	67.8	23.0	* 91.8	103	151
15	42.7	56.2	33.5	36.4	33.9	11.3	3.2	57.9	23.0	91.8	114	159
16	42.7	55.1	33.5	26.8	84.0	9.9	3.2	54.0	24.4	91.8	172	155
17	44.5	55.1	31.8	15.5	25.4	9.9	2.8	48.0	26.8	94.6	136	151
18	44.5	55.1	* 30.4	14.5	23.0	9.9	2.8	46.3	27.9	97.5	126	151
19	42.7	55.1	30.4	14.5	30.0	8.5	2.8	46.3	30.4	97.5	123	151
20	42.7	55.8	30.4	14.5	* 39.6	6.0	2.8	44.5	32.8	103	116	151
21	42.7	55.8	30.4	14.5	35.0	6.0	2.8	41.0	35.3	103	123	151
22	42.7	51.2	30.4	14.5	27.9	7.4	* 2.8	41.0	36.4	103	129	151
23	42.7	46.3	26.1	14.5	27.9	6.0	2.8	36.4	35.0	107	129	151
24	42.7	44.5	23.0	14.5	32.5	5.3	2.8	36.4	39.6	103	129	151
25	42.7	37.1	24.0	14.5	84.8	4.2	2.8	36.4	40.6	103	129	151
26	42.7	31.8	27.9	13.8	123	7.8	3.2	36.4	93.6	103	129	151
27	42.7	30.4	30.4	13.8	675	13.4	4.2	33.5	66.4	103	129	151
28	42.7	31.8	30.4	13.4	66.0	4.6	3.2	28.3	62.5	103	129	151
29	44.5	31.8	30.4	12.7	81.9	4.2	3.2	23.0	59.7	103	129	155
30	46.3	30.4	30.4	12.7	54.4	4.2	3.2	23.0	61.4	107	129	159
31	46.3	30.4	30.4	42.7			3.2	23.0		107		159
Sum	1,470.2	1,457.3	971.1	712.6	1,696.8	457.2	97.8	5,176.8	1,061.3	2,861.1	3,648	4,548

Month	Current Year 1980						Period 1933-1980				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Low			Average	Maximum	Minimum	
Jan.	1.18	1.08	1 3	54.0	114	42.7	2,918	2,888	18,930	43.8	
Feb.	1.18	.95	1 6	56.2	27	30.4	2,889	2,145	14,433	38.9	
Mar.	.98	.85	1 2	33.5	24	23.0	1,927	1,771	11,407	92.4	
Apr.	1.05	.69	1 0	39.6	129	12.7	1,413	2,075	21,950	81.1	
May	4.76	.66	27	2,400	111	11.3	3,364	3,616	25,470	154	
June	1.05	.46	1 1	39.6	125	4.2	906	2,414	19,730	60.3	
July	.46	.39	27	4.2	1 8	2.8	3.2	195	1,912	15,568	57.6
Aug.	10.04	.39	11	17,200	1 1	2.8	167	10,276	3,528	30,106	34.9
Sept.	2.30	.82	26	313	1 5	20.5	35.3	2,104	4,698	49,182	17.8
Oct.	1.54	1.28	123	109	1 1	66.4	92.5	5,681	4,054	28,327	43.8
Nov.	2.03	1.48	16	227	14	97.5	121	7,239	3,303	25,730	43.8
Dec.	1.74	1.64	115	159	1 2	129	147	9,023	2,906	22,003	67.3
Yearly	10.04	0.39		17,200		2.8	66.0	47,935	35,310	159,211	1,755.3
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
	3.06	0.12		487		0.08	1.87	59,128	43,554	196,385	2,164

\*\* Period 1932-1980      \* Discharge measurement made on this day      ! And other days

**RETURN FLOW TO THE RIO GRANDE  
FROM THE MAVERICK IRRIGATION DISTRICT  
BELOW EAGLE PASS, TEXAS**

**DESCRIPTION:** Part of the water diverted from the Rio Grande into the Maverick Canal is returned to the river through various drains and spillways of the irrigation system located between Eagle Pass, Texas and the El Indio Gaging Station. These return flows are measured at gaging stations consisting of sharp-crested Cipolletti weirs or control structures equipped with continuous water-stage recorders located at Lateral 40 Spill, Lateral 40-D Spill, Canon Diablo, Lateral 50 Lowline No. 1, Lateral 50 Spill, Lateral 50 Lowline No. 2, Rosita Creek, Lateral 60-K Spill, Sauz Creek, Lateral 70 Spill No. 1, Lateral 70 Spill No. 2, Indio Creek, Gravel Spill, Lateral 71 Spill, and Cuervo Creek.

**RECORDS:** Based on the weir discharge table, stable station control rating tables, and a continuous record of gage heights. All storm flow occurring at these stations is deducted from the records and is not shown below. Records available: April 1959 through 1980. Records prior to 1976 were published under the title "Return Flow to the Rio Grande from Maverick Canal, Eagle Pass to San Antonio Crossing."

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily:	Max. 350 (9.91)	July 5, 1968	Min. 9.7 (0.27)	Dec. 10, 1980
Monthly:	Max. 247 (7.00)	July 1968	Min. 22.3 (0.63)	December 1980
Yearly:	Max. 180 (5.10)	1971	Min. 73.2 (2.07)	1980

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46.3	62.1	77.8	121	63.1	106	90.5	53.9	70.4	77.5	62.4	18.8
2	58.9	75.6	83.7	126	52.1	103	74.4	61.8	80.1	77.3	58.3	17.1
3	51.5	80.5	92.3	111	58.2	102	80.2	79.2	84.3	73.8	60.9	16.3
4	44.6	57.7	94.5	99.4	65.3	97.2	93.8	84.3	80.5	72.4	62.5	16.1
5	53.0	50.6	97.6	96.4	63.8	92.9	97.0	69.2	71.5	76.5	60.1	15.4
6	58.3	54.5	107	120	80.5	94.7	96.4	67.3	71.7	80.4	55.3	15.7
7	52.8	63.3	121	120	87.8	107	82.4	60.0	72.9	77.7	54.8	15.4
8	58.9	62.2	105	106	86.3	123	91.8	73.1	77.0	77.8	68.3	13.7
9	59.7	69.7	101	124	85.2	129	91.3	76.9	87.5	66.0	90.9	12.3
10	65.7	86.1	99.4	132	78.8	106	95.9	91.9	94.8	62.4	101	9.7
11	77.1	97.2	103	121	79.5	89.7	85.5	121	78.8	58.9	78.5	10.8
12	66.2	91.5	102	118	83.2	65.8	82.7	93.4	57.7	49.0	85.1	14.8
13	61.1	86.1	82.0	116	84.7	62.1	83.5	68.0	55.0	52.9	68.3	13.8
14	84.6	79.2	88.5	109	98.5	74.7	92.0	43.9	60.7	54.0	58.7	13.0
15	88.3	80.2	94.5	124	117	61.9	94.9	32.3	73.1	62.9	69.2	34.4
16	86.4	80.3	103	123	92.3	67.4	99.9	28.1	74.7	64.1	79.7	55.4
17	69.6	79.0	114	116	64.6	70.9	98.9	34.9	85.9	62.8	73.2	32.8
18	66.6	82.3	127	98.3	38.2	65.2	87.0	28.5	84.0	68.5	57.3	18.5
19	64.3	81.7	142	106	32.0	64.3	90.2	28.2	80.5	63.7	45.9	14.8
20	53.6	80.1	139	99.7	39.4	78.2	92.3	26.3	77.6	61.2	36.3	13.1
21	49.0	74.3	122	110	47.9	57.7	94.7	32.8	71.7	63.3	33.5	13.2
22	54.3	62.5	127	116	55.0	70.0	103	51.6	79.8	66.9	38.0	12.4
23	52.8	64.4	131	106	48.3	76.5	105	54.2	102	75.9	38.2	12.5
24	53.6	67.9	111	81.6	55.0	74.7	88.9	51.4	86.1	72.9	31.2	11.3
25	73.3	69.7	109	67.3	63.5	76.6	103	67.5	85.9	71.1	29.5	10.6
26	70.1	63.7	113	63.3	87.1	66.5	91.7	68.5	97.4	64.2	27.0	11.8
27	61.7	73.3	114	54.4	115	81.9	82.3	67.2	102	61.1	25.2	58.8
28	62.8	78.3	116	61.4	91.1	77.6	76.4	60.5	101	47.2	21.7	63.8
29	59.3	85.2	95.3	63.5	125	83.7	74.0	64.6	105	54.8	19.5	62.2
30	61.1	103	65.8	106	106	92.0	80.2	66.6	107	63.2	19.1	27.1
31	58.5	114	101	101	101	101	62.2	68.7	69.8	69.8	34.8	34.8

<b>Sum:</b>	2,139.2	3,076.1	2,345.4	2,518.2	2,762.0	1,875.8	2,050.2	1,609.6	690.4
	1,924.0	3,329.6							

Month	Current Year 1980						Period 1968-1980				
	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.			15	88.3	4	44.6	62.1	3,816	8,088	12,728	3,816
Feb.			11	97.2	5	50.6	73.8	4,243	6,820	10,704	3,250
Mar.			19	142	1	77.8	107	6,604	9,177	11,675	5,773
Apr.			10	132	27	54.4	103	6,101	10,106	14,646	6,101
May			29	125	19	32.0	75.7	4,652	9,117	14,327	4,652
June			9	129	21	57.7	83.9	4,995	9,784	14,384	4,731
July			23	105	31	62.2	89.1	5,478	9,390	15,180	5,223
Aug.			11	121	20	26.3	60.5	3,721	8,539	11,586	3,721
Sept.			30	107	13	55.0	81.9	4,873	6,980	9,162	4,358
Oct.			6	80.4	28	47.2	66.1	4,067	6,642	8,220	3,956
Nov.			10	101	30	19.1	53.7	3,193	6,758	10,790	3,193
Dec.			28	63.8	10	9.7	22.3	1,369	6,991	12,797	1,369
Yearly				142		9.7	73.2	53,112	98,392	130,563	53,112
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
				4.02		0.27	2.07	65,514	121,367	161,049	65,514

\*\* Period 1968-1980

Ø Mean daily

## RIO GRANDE NEAR EL INDIO, TEXAS AND VILLA GUERRERO, COAHUILA

**DESCRIPTION:** Cableway, bubbler gage, concrete control weir, and water-stage recorders (graphic and digital) located on the left bank at latitude 28°20'45", longitude 100°18'35", and river mile 460.4 (741.0 km), 0.6 river mile (0.9 km) downstream from Cuervo Creek, which marks the lower end of the Maverick County Water Control and Improvement District No. 1, 1.9 river miles (3.1 km) upstream from Tovar Creek, 5 miles (8.0 km) north-east of Villa Guerrero, Coahuila, about 11.5 miles (18.5 km) south of El Indio, Texas, and 35.9 river miles (57.8 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila. The zero of the gage is 580.00 feet (176.78 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 26 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: March, April, May, October, November, and December 1952 with some days missing; January through August 20, 1953; September 23, 1953 through June 14, 1954; and May 27, 1955 through 1980 with several days missing prior to September 1955. Records prior to 1976 were published under the title "Rio Grande at San Antonio Crossing near El Indio, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 912,000 second-feet (25,800 m<sup>3</sup>/sec) in June 1954, determined by slope-area computation, with an elevation of 624.31 feet (190.29 m). Min. 54.4 second-feet (1.54 m<sup>3</sup>/sec) on June 24, 1953 with an elevation of 581.96 feet (177.38 m) at a station 1,700 feet (518 m) upstream from the present site.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 96,400 (2,730)	July 19, 1975	Min. 327 (9.26)	June 29 & 30, 1972
Monthly:	Max. 21,800 (617)	Sept. 1974	Min. 501 (14.2)	June 1969
Yearly:	Max. 5,300 (150)	1974	Min. 1,230 (34.8)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,830	2,780	1,930	6,220	1,120	4,410	4,310	1,820	2,550	5,160	2,870	3,130
2	2,890*	2,800	1,490	5,470	1,120	4,410	7,060*	1,820	2,480	4,730	2,870	3,130
3	2,830	2,850	1,370	2,430	1,110	4,310	7,240	1,880	2,710	4,340	2,870	3,130*
4	2,800	2,830	1,320	1,540	1,050	4,130*	7,200	1,950	2,400	3,960	2,870	3,050
5	2,800	2,710	1,260	1,420	1,720	4,030	7,420	1,820	2,400	3,780	2,790*	3,130
6	2,820	2,680	1,430	1,420	1,480	4,030	7,380	1,750	2,330	3,600	2,720	3,130
7	2,810	2,660	1,870	1,420	1,190*	3,920	7,350	1,880	2,400	3,430	2,720	3,130
8	2,780	2,710	1,940	1,300	1,130	3,920	7,350	1,880	2,710	3,250*	2,720	3,210
9	2,780	2,730	2,000	1,250*	1,340	4,030	7,310	1,820	2,480	3,170	2,640	3,210
10	2,800	2,780	2,070	1,200	1,330	4,030	7,270	2,430	2,400*	3,170	2,640	3,130
11	2,790	2,900	2,000*	1,200	1,680	3,920	7,240	7,170	2,400	3,170	2,720	3,130
12	2,760	2,870	2,290	1,260	2,360	3,850	7,450	30,300	2,400	3,170	2,720	3,130
13	2,800	2,800*	2,590	1,270	3,110	3,920	7,420	11,700	2,400	3,170	2,790	3,130
14	2,800	2,780	2,500	1,330	6,000	3,400	7,380	6,670	2,480	3,090	2,790	3,130
15	2,820	2,750	2,610	1,330	7,660	3,440	7,170	5,510*	2,480	3,010	2,950	3,210
16	2,810*	2,750	3,100	1,290	6,570	4,030	7,350*	5,010	2,480	3,010	4,200	3,290
17	2,840	2,660	3,350	1,290	4,660	3,850	7,350	4,700	2,400	3,090	3,640	3,130*
18	2,890	2,660	3,360	1,240	4,340	3,850*	7,380	4,410	2,400	3,010	3,280	3,130
19	2,940	2,660	3,370	1,200	4,340	3,740	6,430	4,130	2,330	3,010	3,200*	3,050
20	2,910	2,660	3,380	1,200	4,340	3,740	4,100	3,850	2,330	3,010	3,200	3,050
21	2,840	2,590	3,390	1,260	4,240*	3,740	3,990	3,850	2,330	3,010	3,120	3,050
22	2,920	2,590	4,030	1,260	4,140	3,670	3,990	3,670	2,400	2,920*	3,200	3,050
23	2,920	2,950	4,310	1,220*	4,130	3,670	4,130	3,490	2,330	2,840	3,280	3,050
24	2,870	2,500	4,310	1,110	4,130	3,570	3,960	3,310	2,260	2,920	3,200	2,960
25	2,870	2,450	4,350	1,100	4,310	3,570	3,780	3,230	2,260*	2,840	3,200	2,960
26	2,850	2,470*	5,540*	996	5,790	3,570	3,780	3,070	2,330	2,840	3,200	2,960
27	2,950	2,470*	5,650	1,090	17,300	3,670	3,780	2,900	2,550	2,840	3,200	3,050
28	2,930	2,450	4,730	1,190	5,400	3,570	3,810	2,820	7,800	2,840	3,120	3,050
29	2,930	2,450	5,830	1,130	4,700	3,570	3,740	2,740	8,190	2,680	3,120	2,960
30	2,980*		6,220	1,130	4,520	3,670	2,520*	2,670	6,250	2,680	3,120	2,890
31	2,910		6,220	4,380		1,950	2,590		2,760		2,800*	
<b>Sum</b>	<b>88,470</b>	<b>77,350</b>	<b>100,010</b>	<b>47,666</b>	<b>120,680</b>	<b>115,230</b>	<b>178,590</b>	<b>136,840</b>	<b>87,660</b>	<b>100,500</b>	<b>90,960</b>	<b>95,540</b>

Month	Current Year 1980						Period 1968-1980				
	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet		
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum
Jan.	7.12	7.01	130	3,000	12	2,740	2,850	175,478	109,898	193,884	47,179
Feb.	7.10	6.84	11	2,950	23	2,340	2,670	153,421	139,854	444,879	51,336
Mar.	8.10	6.27	130	6,220	5	1,210	3,230	198,382	146,266	423,055	37,442
Apr.	8.17	6.07	1	6,640	26	950	1,590	94,533	119,468	361,567	37,386
May	10.89	6.07	27	29,600	4	908	3,880	239,414	224,284	600,198	50,723
June	7.71	6.76	11	4,410	14	1,970	3,850	228,530	178,262	473,653	29,808
July	8.37	6.63	12	7,700	31	1,890	5,760	354,191	227,310	788,688	37,228
Aug.	11.78	6.53	12	35,700	6	1,690	4,410	271,495	219,811	824,033	66,822
Sept.	8.76	6.79	28	10,800	125	2,190	2,920	173,993	275,345	1,296,059	83,327
Oct.	8.01	6.99	1	5,470	29	2,610	3,240	199,321	241,323	863,008	65,885
Nov.	7.71	6.99	16	4,590	6	2,640	3,030	180,472	161,560	552,893	58,569
Dec.	7.25	7.05	16	3,290	130	2,800	3,080	189,486	118,875	276,020	49,819
<b>Yearly</b>	<b>11.78</b>	<b>6.07</b>		<b>35,700</b>		<b>908</b>	<b>3,390</b>	<b>2,458,716</b>	<b>2,162,256</b>	<b>3,835,752</b>	<b>896,415</b>
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>				
	3.59	1.85		1,010		25.7	96.0	3,032,826	2,667,143	4,731,400	1,105,728

\*\* Period 1968-1980      \* Discharge measurement made on this day      † And other days

## RIO GRANDE AT VILLA HIDALGO, COAHUILA NEAR LAREDO, TEXAS

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the right bank on the outskirts of Palafox, Webb County, Texas and Villa Hidalgo, Coahuila at latitude 27° 47'55", longitude 99° 52'40", and river mile 406.0 (653.4 km) 1.9 river miles (3.1 km) downstream from Arroyo Agua Verde in Mexico, 13.1 river miles (21.1 km) upstream from Santo Tomas Creek in United States, and 45.1 river miles (72.6 km) upstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The zero of the gage is 436.02 feet (132.90 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 29 discharge measurements during the year, 17 by the Mexican Section and 12 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. High flows prior to early 1962 were computed from a rating curve developed after the cableway was installed. Records available: August 1959 through 1980. Records prior to 1976 were published under the title "Rio Grande at Palafox near Laredo, Texas."

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. The recorder was installed on August 5, 1959 and the cableway in early 1962.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 214,000 second-feet (6,060 m<sup>3</sup>/sec) on September 25, 1964 with a gage height of 42.06 feet (12.82 m). Min. 314 second-feet (8.90 m<sup>3</sup>/sec) on June 30 and July 1, 1972 with a gage height of -0.66 foot (-0.20 m).

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max.	134,000 (3,800)	June 29, 1971	Min.	314 (8.90)	July 1, 1972
Monthly:	Max.	21,000 (595)	Sept. 1974	Min.	434 (12.3)	June 1969
Yearly:	Max.	5,470 (155)	1974	Min.	1,270 (35.9)	1972

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,760	2,870	2,400	5,860	1,010	4,170	3,450	1,780	2,440	5,900	2,850	3,280
2	2,760	2,850	1,900	5,720 *	971	4,170	4,660	1,640	2,420	5,090	2,870	3,280
3	2,760	2,870	1,650	3,990	1,080	4,100 *	7,030 *	1,590	2,320	4,480 *	2,910	3,230 *
4	2,740	2,910	1,560	2,010	1,020	3,990	7,060	1,660	2,190 *	4,100	2,910	3,150
5	2,720	2,830	1,530 *	1,550	851	3,880	7,270	1,710 *	2,190	3,850	2,850	3,150
6	2,760	2,740	1,470	1,420	1,560 *	3,850	7,350	1,540	2,210	3,740	2,760	3,200
7	2,780 *	2,720 *	1,700	1,430	1,350	3,780	7,310	1,500	2,210	3,510	2,730 *	3,170
8	2,760	2,680	2,070	1,420	1,300	3,740	7,130	1,500	2,220	3,380	2,730	3,230
9	2,740	2,680	2,070	1,270 *	1,150	3,780	6,990	1,470	2,550	3,280	2,730	3,200
10	2,740	2,720	2,100	1,230	1,360	3,850	6,990	9,960	2,210	3,280	2,730	3,230
11	2,760	2,780 *	2,100	1,210	1,380	3,850	7,130	35,700	2,140	3,230	2,730	3,150
12	2,740	2,830	2,100	1,190	1,950	3,740	7,060	39,600	2,140	3,230	2,730	3,130
13	2,740	2,800	2,510	1,220	2,380 *	3,670	7,240	24,100	2,090	3,230	2,760	3,100
14	2,760	2,780	2,570	1,310	5,400	3,710	7,240	7,840	2,160	3,170	2,730	3,130
15	2,780	2,740	2,570	1,350	10,400	3,000 *	7,170	6,250	2,280	3,150	2,730	3,170
16	2,780	2,740	2,760	1,310	8,620	3,510	7,270	5,330	2,280	3,130	3,530	3,200
17	2,760	2,740	3,230	1,270	5,620	3,710	7,270	4,770	2,280	3,130	4,170	3,280
18	2,800	2,760	3,200	1,190	4,410	3,640	7,240	4,450	2,210	3,170	3,490	3,200
19	2,800	2,780	3,230	1,140	4,130	3,570	7,380	3,960	2,160 *	3,130	3,280	3,200
20	2,830	2,780	3,250	1,110	4,100	3,530	5,160	3,740	2,120	3,130	3,230	3,130
21	2,830	2,740	3,280	1,110	4,270	3,570	4,060	3,530	2,090	3,130	3,300	3,070
22	2,850	2,680	3,420	1,200	4,130	3,510	4,100	3,510	2,120	3,020	3,380	3,200
23	2,830	2,660	3,880	1,280	4,100	3,480	4,170	3,320	2,120	2,990	3,380	3,150
24	2,830 *	2,590	3,990	1,190	4,060	3,510	4,170	3,110	2,050	2,970	3,380	3,130
25	2,830	2,590	3,880	946	4,100	3,400	3,920	2,950	2,020	2,970	3,330	3,070
26	2,830	2,530	4,630	816	4,030	3,400	3,880	2,840	2,190	2,910	3,300	3,070
27	2,850	2,510	5,370	805	3,960	3,380	3,850	2,700	2,420	2,910	3,350	3,070
28	2,890	2,500	5,440	862	3,960	3,400	3,880	2,610	3,530	3,080	3,300	3,100
29	2,890	2,420	4,410	996	3,960	3,330	3,880	2,650	9,960	2,820	3,250	3,070
30	2,890		5,720	946	4,100	3,400	3,600	2,510	7,450	2,730	3,280	3,070
31	2,930		5,830		4,240		2,200	2,400		2,850		2,970
<b>Sum</b>	86,720	78,820	95,820	48,351	104,952	109,620	177,110	192,220	80,770	104,690	92,700	97,780
<b>Current Year 1980</b>										<b>Period 1968-1980</b>		
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	2.89	2.72	1 1	2,930	1 5	2,720	2,800	172,073	111,320	200,876	50,489	
Feb.	2.89	2.46	4	2,930	29	2,400	2,720	156,355	139,638	455,925	48,884	
Mar.	4.66	1.38	31	5,830	6	1,450	3,090	190,047	147,689	412,917	38,574	
Apr.	4.79	.46	1	6,040	26	770	1,610	95,878	121,527	356,909	36,522	
May	8.69	.52	15	15,900	5	805	3,380	208,104	229,154	611,076	60,344	
June	3.74	2.23	1	4,270	15	2,160	3,640	217,435	215,154	750,690	25,768	
July	5.41	2.13	1 6	7,420	31	1,810	5,720	351,347	241,071	921,377	30,729	
Aug.	20.51	1.71	12	45,200	9	1,410	6,180	381,068	230,924	730,503	70,515	
Sept.	6.89	2.30	29	10,800	24	1,980	2,690	160,173	280,417	1,250,870	93,812	
Oct.	5.02	2.79	1	6,500	1 7	2,730	3,380	207,573	266,756	922,217	70,340	
Nov.	3.94	2.76	17	4,590	7	2,670	3,090	183,918	168,423	601,059	56,954	
Dec.	3.12	2.89	1 1	3,280	31	2,910	3,150	193,956	125,014	317,123	51,077	
<b>Yearly</b>	20.51	0.46		45,200		770	3,470	2,517,927	2,277,087	3,963,062	920,935	
Meters		Cubic Meters per Second				Thousands of Cubic Meters						
	6.25	0.14		1,280		21.8	98.2	3,105,828	2,808,758	4,886,381	1,135,961	

\*\* Period 1968-1980

\* Discharge measurement made on this day

1 And other days

**RIO GRANDE AT NUEVO LAREDO, TAMAULIPAS AND LAREDO, TEXAS**

**DESCRIPTION:** Cableway, bubbler gage, and water-stage recorder located on the right bank at Laredo, Texas at latitude 27°29'45", longitude 99°29'25", and river mile 359.8 (579.0 km), immediately downstream from the Laredo, Texas sewage plant and 1.1 river mile (1.8 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The zero of the gage is 345.28 feet (105.24 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 62 discharge measurements during the year, 52 by the Mexican Section and 10 by the United States Section of the Commission, and a continuous record of gage heights. Computations by shifting control methods. Records available: May 1900 through 1913; May, June, and Oct. 1914; Sept. 1916; Sept. and Oct. 1917; Oct. 1918; Sept. and Oct. 1919; Aug. and Sept. 1920; June, Nov., and Dec. 1922; and 1923 through 1980. Gage height records are available for Jan., Feb., and Mar. 1914.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. This station was established in Jan. 1955 to replace the station 1.7 miles (2.7 km) upstream which was destroyed by the June-July 1954 flood. Prior to July 11, 1968 the recorder was located 0.2 river mile (0.3 km) upstream, where the cableway is still located, and the zero of the gage was 347.90 feet (106.04 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 716,900 second-feet (20,300 m<sup>3</sup>/sec) on June 30, 1954, determined by slope-area calculations, with a gage height of 61.35 feet (18.70 m). Much well-authenticated information established the occurrence of a greater flood in June 1865 with a gage height of 62.5 feet (19.05 m) on the same gage and discharge of approximately 950,000 second-feet (27,000 m<sup>3</sup>/sec), and also that these were the only floods since 1745 with flows greater than 600,000 second-feet (17,000 m<sup>3</sup>/sec). Min. no flow several days in June and July 1953 and on July 24, 1956.

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily:	Max. 115,000 (3,270)	June 30, 1971	Min. 247 (7.00)	July 2, 1972
Monthly:	Max. 20,400 (579)	Sept. 1974	Min. 498 (14.1)	June 1969
Yearly:	Max. 5,370 (152)	1974	Min. 1,350 (38.3)	1972

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,600	2,770	2,350	5,690	826	4,170	3,190	1,690	2,330	6,600	2,580	2,970
2	2,580	2,710	2,220	5,690	833	3,990	3,410	1,470	2,300	5,470	2,640	2,990
3	2,560	2,750	1,610	5,190	837	3,920	6,430	1,390	2,250	4,700	2,680	3,010
4	2,560	2,760	1,440	2,590	964	3,880	6,640	1,390	2,350	4,060	2,710	2,960
5	2,520	2,750	1,410	1,600	819	3,710	6,600	1,430	2,080	3,670	2,660	2,860
6	2,530	2,670	1,350	1,320	844	3,600	6,780	1,430	1,960	3,530	2,540	2,890
7	2,570	2,570	1,310	1,210	1,330	3,530	6,850	1,340	1,900	3,420	2,490	2,920
8	2,600	2,510	1,650	1,170	1,050	3,490	6,850	1,360	2,020	3,250	2,450	2,990
9	2,580	2,520	1,920	1,130	1,050	3,510	6,640	1,360	2,250	3,110	2,450	3,060
10	2,540	2,560	1,900	1,040	904	3,600	6,600	3,990	2,210	3,050	2,430	3,080
11	2,540	2,600	1,870	1,000	1,110	3,600	6,600	19,900	2,030	3,080	2,450	3,010
12	2,540	2,710	1,900	992	1,130	3,570	6,670	30,600	2,030	3,030	2,490	2,920
13	2,540	2,710	2,030	1,040	2,000	3,530	6,850	36,000	2,040	3,020	2,490	2,900
14	2,560	2,660	2,340	1,040	2,450	3,490	6,890	12,100	2,040	3,010	2,490	2,920
15	2,560	2,600	2,320	1,060	10,300	3,430	6,890	6,920	2,080	3,020	2,540	2,980
16	2,590	2,580	2,370	1,050	9,430	2,710	6,820	5,760	2,140	3,010	2,740	2,990
17	2,580	2,590	2,690	1,030	5,230	3,410	6,890	5,010	2,140	2,810	4,130	3,040
18	2,590	2,600	3,010	1,030	4,910	3,390	6,920	4,630	2,140	2,850	3,570	3,060
19	2,620	2,600	2,950	975	8,830	3,310	6,960	4,200	2,080	2,840	3,070	2,950
20	2,620	2,580	2,950	932	6,070	3,260	6,140	3,850	2,030	2,860	2,940	2,950
21	2,660	2,560	2,970	918	4,380	3,280	3,740	3,570	2,010	2,890	3,400	2,880
22	2,660	2,520	2,960	890	4,480	3,280	3,600	3,530	1,970	2,830	3,240	2,910
23	2,660	2,460	3,440	1,030	4,100	3,220	3,710	3,400	2,000	2,750	3,190	2,930
24	2,650	2,380	3,710	1,060	3,990	3,220	3,570	3,200	1,980	2,730	3,130	2,910
25	2,640	2,370	3,740	961	3,960	3,200	3,640	3,020	1,930	2,740	3,130	2,870
26	2,630	2,420	3,740	816	4,380	3,160	3,530	2,910	2,420	2,690	3,090	2,830
27	2,630	2,370	5,050	773	9,640	3,140	3,470	2,790	2,280	2,680	3,040	2,830
28	2,690	2,350	5,300	770	27,400	3,140	3,390	2,630	2,430	2,730	3,040	2,830
29	2,740	2,350	4,590	788	7,240	3,160	3,290	2,590	7,840	2,920	3,000	2,860
30	2,740	5,090	826	4,770	3,120	3,260	3,260	2,610	8,580	2,640	2,980	2,810
31	2,750	5,690	4,340	2,580	2,500	2,440	2,500	2,440	2,560	2,560	2,690	2,690
Sum	80,830	74,580	87,870	45,611	139,597	103,020	165,320	178,510	75,840	100,550	85,780	90,800

Month	Current Year 1980						Period 1968-1980					
	Extreme Gage Feet		Extreme Second-Foot		Average Second-Foot	Total Acre-Feet	Acre-Feet					
	High	Low	Day	High			Day	Average	Maximum	Minimum		
Jan.	3.81	3.58	31	2,780	5	2,500	2,610	160,348	111,916	211,754	49,774	
Feb.	3.81	3.41	1	2,780	128	2,300	2,570	147,936	140,548	450,602	39,225	
Mar.	5.97	2.43	31	5,760	8	1,270	2,830	174,259	146,513	395,686	37,096	
Apr.	6.07	1.71	2	5,900	28	759	1,520	90,449	120,938	360,566	35,107	
May	19.52	1.71	28	36,700	5	759	4,480	276,770	283,414	662,839	89,917	
June	5.38	3.31	1	4,630	16	2,140	3,430	204,309	217,430	695,494	29,685	
July	6.82	3.15	20	7,100	31	1,940	5,330	327,924	237,828	838,520	32,270	
Aug.	19.46	2.59	13	38,100	7	1,320	5,760	354,177	236,921	794,314	65,681	
Sept.	8.53	3.12	29	10,900	6	1,820	2,530	150,388	286,815	1,216,757	94,988	
Oct.	6.69	3.67	1	7,240	130	2,560	3,250	199,496	287,183	956,960	56,155	
Nov.	4.99	3.58	17	4,340	110	2,430	2,860	170,168	166,757	586,280	54,832	
Dec.	4.10	3.84	19	3,090	31	2,580	2,930	180,038	123,229	307,569	51,316	
Yearly	19.52	1.71		38,100		759	3,350	2,436,262	2,319,492	3,891,074	980,740	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	5.95	0.52		1,080		21.5	95.0	3,005,096	2,861,063	4,799,588	1,209,729	

\*\* Period 1968-1980      \* Discharge measurement made on this day      † And other days

## RIO SALADO NEAR LAS TORTILLAS, TAMAULIPAS

DESCRIPTION: Cableway, control weir with notch opening of 2,500 second-foot (72 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at latitude 26°50'10", longitude 99°33'50", 2.0 river miles (3 km) downstream from the confluence of Rio Sabinas with Rio Salado, 6 miles (10 km) southeast of the town of Las Tortillas, Tamaulipas, and 24.8 river miles (39.9 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 299.5 (482.0 km), 24.7 river miles (39.8 km) upstream from Falcon Dam. The zero of the gage is 325.72 feet (99.28 m) above mean sea level, U. S. C. & G. S. datum.

RECORDS: Based on 14 discharge measurements during the year, a stable rating curve up to 2,500 second-foot (72 m<sup>3</sup>/sec), and a continuous record of gage heights. Computations by shifting control methods for flows greater than 2,500 second-foot (72 m<sup>3</sup>/sec). Records available: September 9, 1953 through 1980. Records are also available for a station at old Cd. Guerrero, 21.7 miles (35 km) downstream, from 1900 through 1913 and 1923 through September 8, 1953.

REMARKS: Reservoirs and irrigation diversions modify the flow at this station.

EXTREME FLOWS FROM RECORDS: Momentary: Max. 65,000 second-foot (1,840 m<sup>3</sup>/sec) on September 16, 1971 with a gage height of 40.39 feet (12.31 m). Min. frequently no flow. The maximum discharge was measured at the highway bridge 13.0 river miles (20.9 km) downstream from the station. Extreme flow data for the Rio Salado at Cd. Guerrero prior to September 8, 1953 may be found in previous bulletins.

Average Flow in Second-Foot (Cubic Meters per Second)\*\*

Daily:	Max. 62,900 (1,780)	Sept. 16, 1971	Min. 0	Frequently
Monthly:	Max. 13,600 (384)	Sept. 1971	Min. 0	Frequently
Yearly:	Max. 3,310 (93.6)	1971	Min. 56.8 (1.61)	1956

## Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	84.8	56.5	18.4	* 56.5	45.9	160	39.6	3.5	97.1	279	97.1	101
2	80.9	60.7	43.8	56.5	* 48.0	121	* 41.7	20.8	89.0	149	93.2	101 *
3	72.7	68.5	52.3	43.8	52.3	121	39.6	32.5	* 97.1	117	89.0	101
4	* 64.6	64.6	* 52.3	56.5	43.8	113	22.6	29.0	89.0	109	89.0	93.2
5	64.6	64.6	43.8	64.6	56.5	97.1	22.6	12.0	102	109	89.0	97.1
6	56.5	* 64.6	31.1	80.9	60.7	89.0	18.4	* 11.3	149	109	* 97.1	97.1
7	60.7	56.5	14.1	89.0	64.6	80.9	35.3	8.5	89.0	105	89.0	89.0
8	52.3	52.3	35.3	84.8	60.7	80.9	35.3	4.2	80.9	101	89.0	101
9	56.5	60.7	80.9	89.0	56.5	72.7	43.8	7.8	72.7	93.2	80.9	101
10	54.4	72.7	97.1	72.7	52.3	72.7	29.0	20.8	72.7	93.2	89.0	97.1
11	50.1	64.6	64.6	50.1	50.1	72.7	41.7	3,270	64.6	93.2	89.0	93.2
12	45.9	80.9	43.8	37.4	64.6	56.5	33.2	15,200	64.6	93.2	89.0	89.0
13	52.3	97.1	43.8	50.1	52.3	52.3	35.3	18,700	60.7	93.2	93.2	89.0
14	56.5	101	39.6	64.6	52.3	52.3	48.0	15,600	56.5	93.2	89.0	97.1
15	50.1	80.9	39.6	64.6	52.3	43.8	37.4	3,810	72.7	* 97.1	89.0	105
16	48.0	72.7	43.8	56.5	105	48.0	12.7	1,630	64.6	84.8	89.0	105
17	48.0	64.6	52.3	56.5	54.4	52.3	8.5	939	64.6	97.1	89.0	101
18	45.9	54.4	56.5	43.8	41.7	56.5	4.2	622	68.5	101	80.9	97.1
19	48.0	52.3	48.0	45.9	50.1	52.3	3.5	452	72.7	89.0	77.0	89.0
20	64.6	48.0	39.6	35.3	96.1	39.6	9.5	410	64.6	89.0	77.0	97.1
21	64.6	31.1	35.3	39.6	341	39.6	14.1	364	72.7	97.1	132	89.0
22	77.0	39.6	26.8	31.1	2,360	56.5	11.3	310	64.6	97.1	544	85.1
23	64.6	39.6	35.3	31.1	646	80.9	7.1	283	72.7	97.1	314	77.0
24	56.5	35.3	52.3	31.1	484	50.1	8.5	242	* 61.4	89.0	242	56.5
25	52.3	31.1	43.8	31.1	192	35.3	14.1	214	57.6	89.0	182	77.0
26	52.3	26.8	22.6	31.1	130	35.3	35.3	198	252	89.0	149	77.0
27	52.3	13.4	35.3	52.3	167	26.8	31.1	160	245	93.2	121	77.0
28	52.3	11.3	52.3	60.7	1,300	18.4	26.8	138	347	101	105	77.0
29	50.1	14.1	52.3	45.9	3,710	26.8	12.7	130	456	105	101	80.9
30	64.6	64.6	52.3	41.7	618	37.4	4.2	113	381	101	101	80.9
31	56.5	56.5	56.5	56.5	357	357	2.8	101	101	97.1	101	80.9
Sum	1,800.5	1,580.5	1,405.5	1,594.8	11,465.2	1,941.7	729.9	63,223.6	3,602.6	3,250.8	3,747.3	2,799.3
Current Year 1980												
Month	Extreme Gage Feet		Extreme Second-Foot				Average Second-Foot	Total Acre-Feet	Period 1954-1980			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	0.82	0.52	2	97.1	19	39.6	57.9	3,572	11,525	59,812	0	
Feb.	.85	.26	14	105	28	11.3	54.4	3,135	8,741	66,880	0	
Mar.	.85	.30	9	105	7	12.7	45.2	2,787	5,210	29,690	0	
Apr.	.82	.39	7	97.1	23	22.6	53.3	3,163	6,563	21,994	0	
May	4.76	.49	22	5,230	18	35.3	371	22,740	17,951	100,919	0	
June	1.18	.33	1	203	28	14.1	64.6	3,853	25,485	172,970	0	
July	.62	.07	113	52.3	119	2.8	23.7	1,448	33,000	441,541	0	
Aug.	18.50	.07	13	21,100	1	2.8	2,040	125,496	26,727	210,031	0	
Sept.	2.10	.62	30	805	25	52.3	120	7,146	98,256	807,616	2,860	
Oct.	1.87	.75	1	597	115	80.9	105	6,452	64,495	550,739	110	
Nov.	2.20	.72	22	904	117	72.7	125	7,433	33,476	338,000	0	
Dec.	.85	.66	115	105	113	56.5	90.4	5,557	21,631	176,100	0	
Yearly	18.50	0.07		21,100		2.8	266	192,782	353,060	2,400,553.5	41,238.2	
Meters												
Cubic Meters per Second												
Thousands of Cubic Meters												
5.64	0.02		598		0.08	7.52	237,796	435,497	2,961,050	50,859		

\*\* Period September 1953-1980

\* Discharge measurement made on this day

! And other days

### RIO GRANDE BELOW FALCON DAM NEAR FALCON, TEXAS AND NUEVA CD. GUERRERO, TAMAULIPAS

**DESCRIPTION:** The discharges reported below represent water measured as it leaves Falcon Reservoir through turbine penstocks, bypass valves, spillway gates, and leakage. Falcon Dam, astride the Rio Grande, is located at latitude 26°33'35", longitude 99°10'00", and river mile 274.8 (442.3 km); about 7 miles (11.3 km) southwest of Falcon, Texas, and 86.1 river miles (138.6 km) downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. A gravity well and water-stage recorder located 2.5 river miles (4.1 km) downstream and a cableway located one mile (1.6 km) farther downstream are used to measure the flow of this station at times when spillway gates are in operation.

**RECORDS:** Based on daily Simplex meter records of releases through the six turbines, established rating curves for the four hollow-jet bypass valves, estimates of gate leakage, and measurements of flow at the cable during spillgate operations. During 1980 there were 11 discharge measurements made by the United States Section of the Commission. Records available: 1958 through 1980. Records are also available from December 17, 1952 through 1957 for a station at Chapeno, 2.6 miles (4.1 km) downstream, where discharges included arroyo inflow below Falcon Dam, which inflow is eliminated from the records reported below.

**REMARKS:** Computation of flow was made jointly by the United States and Mexican Sections of the Commission from a consolidation of the basic data gathered by each Section incident to the international operation of Falcon Reservoir.

**EXTREME FLOWS FROM RECORDS:\*\*** Momentary: Max. 82,600 second-feet (2,340 m<sup>3</sup>/sec) on September 18, 1971. Min. 1.5 second-feet (0.04 m<sup>3</sup>/sec) on March 24 and 25, 1957 (at Chapeno gaging station).

Average Flow in Second-Feet (Cubic Meters per Second)**			
Daily:	Max. 76,400 (2,160)	Sept. 18, 1971	Min. 1.5 (0.04) March 24 & 25, 1957
Monthly:	Max. 32,500 (920)	Oct. 1958	Min. 23.5 (0.67) November 1973
Yearly:	Max. 6,930 (196)	1958	Min. 1,580 (44.7) 1970

#### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	837	5,860	2,690	2,630	12,000	3,490	5,370	6,320	1,890	932	869	371
2	830	5,470	1,990	2,630	12,000	4,230	5,010	7,700	1,910	696	858	367
3	999	5,440	1,560	2,110	12,000	4,940	4,800	7,950	1,960	516	865	371
4	1,160	5,090	1,210	2,110	11,900	6,360	4,030	7,520	1,070	911	689	367
5	1,340	4,590	1,220	2,730	11,700	6,600	4,380	7,130	1,380	1,630	452	371
6	1,330	4,340	1,230	2,730	10,100	6,920	5,010	6,170	1,230	2,140	367	367
7	1,850	4,130	1,640	3,030	9,000	7,490	4,590	6,180	1,230	2,950	2,580	371
8	2,600	3,710	1,970	3,600	8,830	7,200	4,450	2,170	1,410	3,710	2,410	364
9	2,760	4,060	1,970	4,030	8,270	6,920	4,730	509	1,590	3,990	2,020	371
10	2,810	3,920	2,070	4,200	8,590	6,960	4,840	509	1,840	4,030	2,020	381
11	3,570	3,570	2,370	5,720	8,510	7,310	4,700	325	2,050	4,030	2,370	381
12	3,640	2,470	2,530	5,970	8,570	6,850	4,770	123	3,090	4,170	2,320	374
13	3,640	897	2,500	5,970	8,720	5,540	4,730	18.2	3,100	4,840	1,910	364
14	4,030	265	2,520	5,970	8,970	5,120	3,880	18.2	3,040	5,620	1,190	367
15	4,840	537	2,630	6,670	8,330	5,230	3,420	18.2	3,050	6,220	1,420	2,200
16	5,580	936	2,620	7,380	8,230	5,690	3,990	18.2	4,060	6,110	1,410	1,940
17	5,470	922	2,790	8,370	8,400	5,120	4,310	18.2	3,380	6,180	1,550	1,700
18	5,970	925	2,980	8,790	8,330	4,870	4,270	501	3,670	6,000	1,540	1,360
19	6,750	943	2,950	9,390	5,970	5,230	4,660	1,000	3,960	6,040	1,340	1,370
20	7,270	618	2,370	10,100	4,200	5,400	5,050	1,010	3,960	3,220	1,560	1,360
21	7,130	611	2,650	10,900 *	4,200	5,440	4,980	1,010	3,960	1,250	770	1,360
22	6,920	622	2,900	11,500 *	2,590	5,580	4,870	501	4,310	385	360	1,200
23	6,920	720	3,570	12,100	2,040	5,370	4,170	780	5,200	374	18.2	1,010
24	7,420	1,030	3,960	12,400	2,950	5,160	3,850	795	5,860	374	18.2	787
25	7,770	1,030	4,240	12,200 *	2,070	5,050	4,380	833	4,660	374	374	795
26	7,950	773	3,500	12,100	1,880	5,190	4,940	410	2,500	360	371	636
27	8,160	512	3,240	12,000	1,890	5,050	4,840	410	996	367	378	491
28	8,160	508	3,130	11,900	2,240	5,020	5,260	2,200	837	374	371	367
29	7,450	3,640	2,730	11,900	2,970	5,020	5,830	1,980	1,300	367	360	371
30	7,100		2,630	12,000	3,600	5,020	6,600	1,910	791	374	367	371
31	6,250		2,620		3,570		6,530	1,910		364		374
<b>Sum</b>	<b>148,506</b>	<b>68,139</b>	<b>78,980</b>	<b>223,130</b>	<b>211,520</b>	<b>169,370</b>	<b>147,240</b>	<b>67,947.0</b>	<b>79,104</b>	<b>78,898</b>	<b>33,127.4</b>	<b>22,879</b>

Month	Current Year 1980						Period #1954-1980					
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.			127	8,160	2	830	4,790	294,557	213,311	414,129	16,245	
Feb.			1	5,860	14	265	2,350	135,152	166,027	367,384	16,600	
Mar.			25	4,240	4	1,210	2,550	156,655	142,496	374,142	2,390	
Apr.			24	12,400	1	3	2,110	7,440	442,572	257,739	503,683	19,530
May			1	12,000	26	1,880	6,820	419,544	324,470	635,464	21,574	
June			7	7,490	1	3,490	5,650	335,940	260,563	672,976	22,887	
July			30	6,600	15	3,420	4,750	292,046	136,181	302,471	12,839	
Aug.			3	7,950	113	18.2	2,190	134,771	220,651	1,478,678	25,900	
Sept.			24	5,860	30	791	2,640	156,900	180,218	1,080,871	1,428	
Oct.			15	6,220	26	360	2,550	156,492	242,778	1,997,000	1,932	
Nov.			7	2,580	123	18.2	1,100	65,707	120,180	1,128,000	1,400	
Dec.			15	2,200	1	8	364	738	45,380	115,209	465,000	8,761
<b>Yearly</b>				<b>12,400</b>		<b>18.2</b>	<b>3,630</b>	<b>2,635,716</b>	<b>2,379,823</b>	<b>5,016,800</b>	<b>1,143,806</b>	
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>						
			351	0.52	103	3,251,156	2,935,512	6,188,223	1,410,885			

\*\* Period 1954-1980      \* Discharge measurement made on this day      # Values prior to 1958 are Chapeno discharge less arroyo inflow  
 @ Mean daily                      ! And other days

## RIO ALAMO AT CD. MIER, TAMAULIPAS

**DESCRIPTION:** Cableway, reinforced concrete weir of 177 second-foot (5 m<sup>3</sup>/sec) capacity, gravity well, and water-stage recorder located on the right bank at a point called "El Paso del Cantaro", latitude 26°27'00", longitude 99°09'05", about 0.5 mile (1 km) north of Cd. Mier, Tamaulipas, and 5.0 river miles (8 km) from the confluence with the Rio Grande. This stream enters the Rio Grande at river mile 262.4 (422.3 km), 12.4 river miles (20.0 km) downstream from Falcon Dam. The weir is located about 300 feet (91 m) downstream from the recorder. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 2 discharge measurements made at high flows during the year, the weir discharge table at low flows, and a continuous record of gage heights. High flow computations by shifting control methods. Records available: July 1923 through 1980.

**REMARKS:** Small reservoirs and irrigation diversions modify the flow of this spring-fed stream at this station. On June 11, 1952, the zero of the gage was raised 1.31 feet (0.40 m) to make it coincide with the weir crest elevation. Prior to January 1, 1969, the zero of the gage was 188.35 feet (57.41 m) above mean sea level, U. S. C. & G. S. datum.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 144,800 second-feet (4,100 m<sup>3</sup>/sec) on September 11, 1948 with a gage height of 33.56 feet (10.23 m). Min. periods of no flow have occurred at times during all years of record except 1934, 1935, 1968, 1972, 1974, 1976, 1977, and 1979.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max.	87,230 (2,470)	Sept. 11, 1948	Min.	0	Frequently
Monthly:	Max.	7,310 (207)	Sept. 1967	Min.	0	Frequently
Yearly:	Max.	837 (23.7)	1967	Min.	16.4 (0.47)	1929

## Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	27.9	18.7	4.2	0	0	5.7	0	0	10.6	13.8	1.8	4.2	
2	27.9	18.7	2.5	0	0	4.2	0	0	8.1	50.5	1.8	4.2	
3	26.1	18.7	2.5	0	0	2.5	0	0	8.1	20.5	1.8	4.2	
4	26.1	18.7	2.5	0	0	2.5	0	0	7.1	12.0	1.8	4.2	
5	26.1	17.3	4.2	0	0	1.1	0	0	4.2	7.1	1.8	4.2	
6	26.1	17.3	4.2	0	0	1.1	0	0	4.2	4.9	1.8	4.2	
7	26.1	18.7	4.2	0	0	1.1	0	0	43.1	4.2	1.8	4.2	
8	26.1	17.3	4.2	0	0	0	0	0	17.0	3.5	1.8	4.2	
9	27.9	13.1	4.2	0	0	0	0	0	8.1	2.5	1.8	4.2	
10	26.1	12.0	4.2	0	0	0	0	0	6.0	2.5	1.8	4.2	
11	21.5	12.0	4.2	0	0	0	0	221	4.2	2.5	1.8	4.2	
12	15.9	12.0	4.2	0	0	0	0	3,320 *	3.5	2.5	1.8	4.2	
13	15.9	13.1	4.2	0	0	0	0	9,080	2.5	2.5	1.8	4.2	
14	14.5	12.0	2.5	0	0	0	0	851	2.5	1.8	1.8	4.2	
15	14.5	8.1	2.5	0	0	0	0	164	2.5	1.8	2.8	4.2	
16	14.5	6.0	2.5	0	0	0	0	83.3	1.8	1.8	2.5	4.2	
17	18.7	10.6	2.5	0	0	0	0	58.3	1.1	1.8	1.8	4.2	
18	20.1	12.0	1.1	0	0	0	0	42.0	1.1	1.8	1.8	6.0	
19	21.5	12.0	1.1	0	122	0	0	38.5	1.1	1.1	1.8	6.0	
20	21.5	10.6	1.1	0	51.9	0	0	45.6	1.1	1.8	1.8	6.0	
21	473	10.6	1.1	0	13.1	0	0	42.4	.7	1.8	13.8	4.2	
22	125	10.6	1.1	0	269	0	0	37.1	0	1.8	65.3	4.2	
23	39.9	10.6	1.1	0	43.8	0	0	30.0	0	3.9	46.3	4.2	
24	24.7	10.6	0	0	12.7	0	0	18.7	0	509	23.3	4.2	
25	20.1	10.6	0	0	6.0	0	0	17.3	.7	35.0	13.1	6.0	
26	15.9	7.1	0	0	2.8	0	0	14.5	75.6	14.1	8.5	6.0	
27	15.9	6.0	0	0	943 *	0	0	13.1	805	5.7	6.0	6.0	
28	15.9	6.0	0	0	120	0	0	13.1	353	3.2	4.9	6.0	
29	18.7	6.0	0	0	44.1	0	0	13.1	60.0	2.5	4.2	6.0	
30	18.7	0	0	0	16.2	0	0	12.0	23.7	2.5	4.2	6.0	
31	18.7	0	0	0	8.1	0	0	10.6	0	2.5	0	6.0	
Sum	1,231.5	357.0	66.1	0	1,652.7	18.2	0	14,125.6	1,456.6	722.9	227.3	148.2	
Current Year 1980												Period 1924-1980	
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum		
Jan.	191.04	188.58	21	1,290	114	14.5	39.9	2,443	3,425	34,920	0		
Feb.	188.65	188.48	1	18.7	116	6.0	12.4	709	2,520	25,550	0		
Mar.	188.45	188.35	1	4.2	124	0	2.1	131	2,525	19,830	0		
Apr.	191.70	188.35	27	0	0	0	0	0	5,754	36,210	0		
May	191.70	188.35	27	2,100	1	1	0	3,278	11,884	137,000	0		
June	188.48	188.35	1	6.0	1	8	0	35.7	12,654	83,240	0		
July				0	0	0	0	.7	7,838	62,246	0		
Aug.	199.41	188.35	13	15,500	1	1	0	456	15,870	205,700	0		
Sept.	191.50	188.35	27	1,840	122	0	0	48.7	2,889	434,387	135		
Oct.	192.45	188.39	24	3,330	19	1.1	23.3	1,432	18,569	193,700	0		
Nov.	189.11	188.39	22	75.9	1	1	1.8	7.4	4,328	25,165	0		
Dec.	188.48	188.45	118	6.0	1	1	4.2	4.9	3,572	15,982	0		
Yearly	199.41	188.35		15,500		0	54.7	39,671.7	129,046	605,678.4	11,898.7		
Yearly	Meters		Cubic Meters per Second				Thousands of Cubic Meters						
	60.78	57.41		440		0	1.55	48,934	159,179	747,096	14,686		

\*\* Period 1924-1980

\* Discharge measurement made on this day

! And other days

**CONTRIBUTIONS TO THE RIO GRANDE FROM  
THE LOWER RIO SAN JUAN IRRIGATION DISTRICT  
FALCON DAM TO RIO GRANDE CITY**

**DESCRIPTION:** The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherias Drain, and Los Fresnos Drain; and between this station and Anzalduas Dam through Fuertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of water reaching the Rio Grande via drains located upstream from the Rio Grande City Gaging Station is shown below. Drain water reaching the Rio Grande through the Rio San Juan channel is included in the Rio San Juan tabulation. The portion of drain water from this irrigation district reaching the Rio Grande via channels located downstream from the Rio Grande City Gaging Station is shown on page 67 in this bulletin.

**RECORDS:** Water entering the Rio Grande through the Rio San Juan Channel, composed of spills and leakage from Marte R. Gomez Dam, storm inflow and drainage below the dam, is measured at the Rio San Juan Gaging Station at Camargo, Tamaulipas, 3.1 river miles (5 km) upstream from the confluence with the Rio Grande. The discharge through Rancherias Drain was determined by prorating between 49 current meter measurements made during the year. There were no drainage flows through Los Fresnos Drain in 1980. All storm water measured at these two drains was deducted and is not included in the tabulation below. Records available: 1953 through 1980. Records prior to 1975 include Rio San Juan Flow.

**REMARKS:** In 1980 there were 165,481 irrigable acres (66,968 ha) in the Lower Rio San Juan Irrigation District.

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.8	9.9	6.7	4.6	15.2	18.4	8.1	2.8	2.1	* 4.2	3.2	1.8
2	* 1.8	10.2	6.7	* 4.2	15.2	18.4	* 7.8	2.8	2.5	4.2	2.8	1.4
3	1.8	10.6	7.1	4.9	15.2	* 18.0	7.4	2.8	* 2.5	4.2	2.8	* 1.4
4	1.8	11.3	7.4	5.3	15.2	18.7	7.1	2.8	2.5	4.2	2.8	1.4
5	1.8	11.7	* 7.8	6.0	15.2	19.4	6.7	2.5	2.5	4.6	* 2.5	1.4
6	1.4	* 12.0	7.8	6.7	15.2	20.1	6.7	* 2.5	2.5	4.6	3.2	1.4
7	1.4	12.0	7.4	7.4	* 15.2	21.2	6.4	2.5	2.8	4.6	3.9	1.4
8	1.4	12.0	7.4	7.8	14.5	21.9	6.0	2.5	2.8	* 4.6	4.6	1.4
9	* 1.4	12.0	7.4	* 8.5	13.8	22.6	* 5.7	2.5	2.8	4.2	5.7	1.4
10	1.4	12.0	7.4	8.1	13.1	23.3	5.3	2.5	* 2.8	3.9	6.4	* 1.4
11	1.4	12.0	7.1	7.8	12.0	* 24.0	5.3	2.5	3.5	3.5	7.1	1.4
12	1.4	12.0	* 7.1	7.4	11.3	23.7	4.9	2.5	3.9	3.5	* 7.8	1.4
13	1.4	12.0	6.7	7.4	10.6	23.0	4.9	2.1	4.6	3.2	7.1	1.4
14	1.4	12.4	6.7	7.1	* 9.9	22.6	4.6	2.1	4.9	2.8	6.7	1.4
15	1.4	12.4	6.4	6.7	10.6	21.9	4.6	2.1	5.7	* 2.5	6.0	1.4
16	* 1.4	12.4	6.4	* 6.4	11.3	* 21.5	* 4.2	2.1	6.0	2.8	5.7	* 1.4
17	2.1	12.4	6.0	8.8	12.0	* 20.8	4.2	2.1	* 6.7	2.8	4.9	* 1.4
18	3.2	12.4	6.0	11.7	12.7	20.5	4.2	2.1	6.7	3.2	4.6	1.4
19	3.9	12.4	* 6.4	14.1	13.4	19.1	4.2	2.1	6.4	3.2	* 3.9	1.4
20	4.6	* 12.4	5.7	16.6	14.1	17.3	4.2	* 2.1	6.4	3.5	3.5	1.4
21	5.3	11.3	6.0	19.1	14.8	15.9	4.2	2.1	6.0	3.5	3.5	1.4
22	6.4	10.6	6.0	21.9	15.2	14.1	4.2	2.1	6.0	* 3.9	3.5	1.4
23	* 7.1	9.5	6.4	* 24.4	15.9	12.7	* 4.2	2.1	5.7	3.9	3.2	1.4
24	7.4	8.5	6.4	23.0	16.6	10.9	4.2	1.8	* 5.7	3.9	2.8	* 1.4
25	7.4	7.4	6.7	21.9	17.3	* 9.5	3.9	1.8	5.3	3.9	2.8	1.4
26	7.8	6.7	* 6.7	20.5	18.0	9.2	3.9	* 1.8	5.3	3.5	2.8	1.4
27	8.1	* 5.7	6.4	19.1	18.7	9.2	3.5	* 1.8	4.9	3.5	2.5	1.4
28	8.1	6.0	6.0	17.7	* 19.4	8.8	3.5	1.8	4.9	3.5	2.1	1.4
29	* 8.5	6.4	5.7	16.6	19.1	8.5	3.2	2.1	4.6	3.5	2.1	1.4
30	8.8		5.3	* 15.2	19.1	8.1	* 3.2	2.1	4.6	* 3.5	2.1	1.4
31	9.2		4.9		18.7		3.2	2.1		3.5		* 1.4
Sum	122.3	308.6	203.4	356.9	458.5	523.3	153.7	69.6	133.6	114.4	122.6	43.8

Month	Current Year 1980						Period 1954-1980				
	Extreme Gage Feet		Extreme Second-Feet		Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High			Low	Average	Maximum	Minimum	
Jan.			31	9.2	1.6	1.4	3.9	242	173	556	0
Feb.			114	12.4	27	5.7	10.6	611	298	938	0
Mar.			1	7.8	31	4.9	6.7	403	238	771	25.9
Apr.			23	24.4	2	4.2	12.0	708	292	708	19.5
May			28	19.4	14	9.9	14.8	909	590	1,454	61.6
June			11	24.0	30	8.1	17.3	1,038	522	1,257	55.9
July			1	8.1	129	3.2	4.9	306	255	525	32.4
Aug.			1	2.8	124	1.8	2.1	138	195	443	25.9
Sept.			117	6.7	1	2.1	4.6	265	211	697	15.4
Oct.			1	4.6	15	2.5	3.5	228	190	797	19.5
Nov.			12	7.8	128	2.1	4.2	243	184	641	6.5
Dec.			1	1.8	1	1.4	1.4	87.6	164	495	29.2
Yearly				24.4		1.4	7.1	5,178.6	3,312	6,786	490
	Meters		Cubic Meters per Second			Thousands of Cubic Meters					
				0.69		0.04	0.20	6,387	4,084	8,370	605

\* Discharge measurement made on this day      Ø Mean daily      † And other days



## DIVERSIONS FROM THE RIO GRANDE UNITED STATES SIDE, FALCON DAM TO RIO GRANDE CITY

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 4,993 irrigable acres (2,021 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Falcon Dam and the Rio Grande City gaging station. Such irrigable area was 0.7% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 11,209 acre-feet (13,826,000 m<sup>3</sup>), or 0.9% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

Records prior to 1976 were published under the title "Diversions from the Rio Grande, United States Side-Falcon Dam to Fort Ringgold."

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)

Daily:	Max. 77.0 (2.18)	May 1, 1962	Min. 0	Occasionally
Monthly:	Max. 43.8 (1.24)	June 1960	Min. 2.2 (0.06)	March 1957
Yearly:	Max. 20.3 (0.57)	1960	Min. 6.9 (0.20)	1968

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14.5	34.4	10.9	15.5	47.8	3.5	10.0	10.5	6.5	5.2	4.0	5.6
2	16.9	30.5	9.0	20.0	47.8	3.5	10.0	10.5	8.0	5.2	4.5	5.6
3	5.0	17.1	16.3	23.6	35.5	12.3	8.0	10.4	14.3	12.0	26.2	10.4
4	7.9	26.4	26.9	24.4	19.2	17.2	7.0	18.6	19.3	17.0	26.2	10.4
5	4.8	26.8	26.9	17.6	24.6	23.1	9.0	20.2	19.2	9.9	23.7	7.7
6	2.5	25.4	24.1	18.5	24.3	21.6	5.2	19.0	22.9	17.1	20.2	11.4
7	9.8	30.9	29.7	38.3	18.2	20.5	13.3	17.0	10.1	16.4	16.6	5.0
8	9.8	33.0	26.6	40.6	15.0	10.6	14.8	11.4	23.7	16.4	8.9	5.9
9	11.1	19.0	15.3	36.4	20.6	27.8	11.4	2.7	21.3	19.4	5.4	4.1
10	10.4	7.1	24.3	35.9	12.5	30.0	9.4	2.8	16.8	25.6	7.5	7.4
11	14.7	15.6	25.7	35.0	10.5	21.0	10.7	2.8	19.2	22.2	7.5	7.4
12	13.9	14.2	24.6	33.9	16.5	21.3	14.3	2.8	19.2	17.1	7.3	7.4
13	11.4	15.1	30.4	17.2	16.6	26.3	9.9	2.8	22.4	23.6	6.3	8.8
14	24.4	11.6	36.3	36.2	14.2	20.3	17.5	2.8	11.4	26.4	4.5	3.7
15	18.2	13.8	36.0	34.2	12.7	9.4	20.3	2.8	17.5	23.0	5.3	4.8
16	18.2	13.0	27.1	36.3	18.8	17.2	21.7	8.1	18.6	20.5	2.9	4.8
17	16.3	7.1	33.5	48.3	18.0	27.5	21.4	5.3	18.7	33.0	6.5	3.7
18	15.2	4.0	25.8	45.8	13.6	21.3	16.0	10.5	29.1	21.4	5.2	3.4
19	18.5	7.8	25.2	37.1	8.1	16.0	12.8	13.9	34.3	18.1	5.2	5.2
20	9.2	10.8	26.0	20.5	5.9	16.0	5.6	12.9	33.8	9.3	3.6	4.0
21	9.9	20.1	36.6	45.8	5.9	21.2	9.0	12.9	21.9	5.5	3.3	1.9
22	8.9	18.5	36.8	46.4	5.9	11.0	9.0	13.4	28.9	3.5	3.3	2.6
23	9.6	21.3	15.4	48.5	5.9	21.1	11.5	14.1	20.4	4.5	3.3	2.6
24	8.0	13.6	32.3	47.6	3.2	19.6	11.9	8.0	20.4	4.5	3.3	1.9
25	10.3	22.3	20.0	43.6	3.5	13.2	9.3	15.6	16.6	4.5	3.3	1.9
26	14.7	15.2	23.7	42.1	3.5	18.0	6.8	10.6	16.6	2.0	3.3	1.9
27	6.1	16.1	27.4	30.1	3.5	16.0	3.5	10.6	7.0	4.9	3.3	1.9
28	16.3	11.5	29.8	40.0	3.5	14.5	9.4	4.7	3.7	4.9	3.8	1.9
29	14.0	10.9	29.2	45.6	3.5	12.2	10.3	4.7	5.2	4.0	3.8	2.1
30	17.5		4.1	44.2	3.5	9.0	11.0	4.7	5.2	3.9	3.8	2.1
31	22.7		14.8		3.5		10.7	2.5		3.9		2.1
<b>Sum</b>	390.7	513.1	770.7	1,049.2	445.8	522.2	350.7	289.6	532.2	404.9	232.0	149.6

Month	Average Rainfall Inches**		Extremes Second-Feet				Average Second-Feet	Total Acre-Feet	Period 1957-1980		
	1957-1980	1980	High		Low	Acre-Feet			Average	Maximum	Minimum
			Day	Day							
Jan.	0.96	0.11	14	24.4	6	2.5	12.6	775	689	1,482	159
Feb.	1.03	.79	1	34.4	18	4.0	17.7	1,018	823	1,782	223
Mar.	.52	.04	22	36.8	30	4.1	24.9	1,529	1,083	1,845	158
Apr.	1.34	.05	23	48.5	1	15.5	35.0	2,081	1,126	2,199	357
May	2.27	2.43	1	47.8	24	3.2	14.4	884	1,035	2,624	211
June	2.48	0	10	30.0	1	3.5	17.4	1,036	1,022	2,610	209
July	1.44	.48	16	21.7	27	3.5	11.3	696	730	1,620	278
Aug.	2.27	2.81	5	20.2	31	2.5	9.3	574	690	1,252	278
Sept.	5.05	1.78	19	34.3	28	3.7	17.7	1,056	535	1,230	178
Oct.	2.14	1.57	17	33.0	26	2.0	13.1	803	725	1,549	131
Nov.	1.15	2.26	1	26.2	16	2.9	7.7	460	524	1,170	211
Dec.	.79	.44	6	11.4	121	1.9	4.8	297	573	1,580	145
<b>Yearly</b>	21.44	12.76		48.5		1.9	15.4	11,209	9,555	14,754	4,989
	Millimeters		Cubic Meters per Second			Thousands of Cubic Meters					
	545	324		1.37		0.05	0.44	13,826	11,786	18,199	6,154

\*\* United States side - average of several stations in the reach    Ø Mean daily    † And other days

## RIO GRANDE AT RIO GRANDE CITY, TEXAS NEAR CAMARGO, TAMAULIPAS

**DESCRIPTION:** Cableway, bubbler gage, gravity well, water-stage recorders (graphic and digital), and digital transmitter located on the left bank at Fort Ringgold, latitude 26° 22' 00", longitude 98° 48' 10", and river mile 235.0 (378.1 km); about 1 mile (1.6 km) downstream from Rio Grande City, Texas, and 3.7 river miles (6.0 km) downstream from Rio San Juan. The zero of the gage is 100.00 feet (30.48 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 25 discharge measurements during the year, and a continuous record of gage heights. Computations by shifting control methods. Records available: January 1955 through 1980. Records prior to 1976 were published under the title "Rio Grande at Fort Ringgold, Rio Grande City, Texas." Records composed of the addition of discharges of the Rio Grande at Roma, Texas and the Rio San Juan at Santa Rosalia, Tamaulipas are available for May, June, and October 1914; September 1916; September and October 1917; October 1918; September and October 1919; August and September 1920; June 1922; September 1923; and 1924 through 1931. Records are also available for the station "Rio Grande near Rio Grande City," 3.0 miles (4.8 km) downstream, for 1932 through 1954.

**REMARKS:** Reservoirs, diversions, and drainage returns modify the river flow at this station. Except for tributary inflows and intervening diversions below Falcon Dam, flow at this station is controlled largely by releases from Falcon Reservoir, 39.9 river miles (64.1 km) upstream. The transmitter relays gage height data via radio to the Mercedes Office of the Commission, where it is recorded automatically, and to the Anzaldua Dam control room for visual readout.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 220,000 second-feet (6,230 m<sup>3</sup>/sec) on September 22 and 23, 1967 with a gage height of 61.40 feet (18.71 m). Min. no flow occurred several days in June and July 1953.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max.	207,000 (5,860)	Sept. 23, 1967	Min.	14.6 (0.41)	April 13, 1957
Monthly:	Max.	49,600 (1,400)	Oct. 1958	Min.	235 (6.66)	March 1957
Yearly:	Max.	9,140 (259)	1958	Min.	1,750 (49.6)	1970

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	912	5,730	3,280	2,610	11,700	3,460	4,770	6,180	1,740	805	501	526
2	912	5,560	2,850	2,640	11,700	3,490	4,980	7,130	1,710	840	862	501
3	876	5,450	1,980	2,590	11,600	4,100	4,770	7,880	1,700	639	936	501
4	1,070	5,380	1,600 *	2,080	11,700	5,720	4,240	7,800	1,390	523	964	526
5	1,250	4,640	1,220	2,130	11,700 *	6,180	3,880	6,670	1,030	788	795	516 *
6	1,430	4,460	1,230	2,680	11,000	6,220 *	4,480	6,820	1,220	1,440	643 *	526
7	1,440	4,320	1,250	2,740	9,640	8,120	5,440	5,830	1,160	1,960	526	547
8	1,870	4,030 *	1,530	2,970	9,320	6,960	4,240	5,230	1,160	2,710	2,130	526
9	2,510	3,760	1,910	3,570	8,480	6,360	4,130	2,340	1,240	3,430	2,260	480
10	2,670 *	4,090	1,950	3,970	8,690	6,040	4,800 *	876	1,400	3,600	1,910	480
11	2,740	3,900	2,130	4,230	8,440	7,060	4,870	915	1,590	3,670	1,920	480
12	3,400	3,580	2,320	6,390	8,440	7,560	4,730	717	1,800	3,740	2,210	501
13	3,480	2,530	2,460	5,700	8,190	5,330	5,160	6,670	2,660	3,780	2,210	501
14	3,460	1,080	2,490	5,660	8,900	5,190	4,410	3,030	2,870	4,910	1,840	501
15	4,020	388	2,500	5,840	8,970 *	5,190	4,030	696	2,600	5,470	1,290	501
16	4,670	593	2,640	6,800	7,770	5,120	3,640	240	3,050	5,260	1,430	1,890
17	5,480	765	2,570	8,470 *	8,690	5,090	4,170	153	3,230	5,620	1,410	1,870
18	4,980	1,010	2,820 *	8,190 *	8,400	4,730	4,380	118	3,020	5,330	1,510	1,680
19	6,370	952	2,990	8,850	8,550	4,700	4,450	289	3,250	5,540	1,570	1,430
20	6,750	952	2,950	9,820	4,340	5,190	5,050	809	3,510	5,190	1,380 *	1,370
21	6,890	622	2,400	10,200	4,240	5,190	5,230	946	3,640	2,510	1,600	1,380
22	7,010	594	2,660	11,000	4,590	5,510	5,090	946	3,430	1,320	1,080	1,490
23	6,430	576	2,900	11,100	2,840	5,190	6,640	494	3,920	487	664	1,280
24	6,960 *	650	3,520	11,600	2,280	5,010	4,200 *	646	4,870	643	480	1,150
25	7,690	952	3,980	11,700	2,220	4,870	3,920	703	5,160	865	272	964
26	7,700	1,020	4,110	11,600	2,210	4,840 *	4,660	706	4,100	420	251	936
27	7,930	770	3,470	11,600	2,240	4,910	5,010	360	2,280	353	480	795
28	8,080	490	3,320	11,500	3,120	4,730	4,870	329	1,840	275	516	692
29	7,930	458	3,140	11,500	2,390	4,800	5,510	1,780	1,080	275	523	547
30	6,950		2,770	11,500	3,020	4,730	6,110	1,800	1,270	293	530	501
31	6,250		2,670		3,480		7,310	1,750		293		526
Sum	140,110	69,302	79,610	211,230	218,850	161,590	149,170	80,853	72,920	72,979	34,693	26,114

Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Period #1954-1980 Acre-Feet			
	High	Low	High	Low	Day	Day			Average	Maximum	Minimum	
	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day		
Jan.	30.56	25.82	28	8,420	3	660	4,520	277,904	223,177	416,906	33,043	
Feb.	30.24	25.25	1	8,020	17	239	2,390	137,459	179,540	376,607	25,500	
Mar.	29.59	25.50	26	6,580	6	390	2,570	157,904	147,623	378,000	14,400	
Apr.	32.19	25.74	25	11,800	4	585	7,040	418,969	261,465	510,426	75,100	
May	32.12	26.15	5	11,800	29	1,050	7,060	433,917	339,625	650,936	36,702	
June	30.35	26.38	7	8,330	1	1,350	5,370	320,444	296,031	658,255	98,620	
July	31.76	26.48	23	11,200	4	1,510	4,800	295,872	180,277	573,798	22,300	
Aug.	30.87	24.97	13	9,640	118	98.2	2,610	160,368	251,499	1,502,678	25,000	
Sept.	29.79	25.62	25	7,060	1.6	494	2,430	144,644	366,785	2,712,754	42,423	
Oct.	29.72	25.16	18	6,920	29	208	2,360	144,770	387,781	3,047,000	30,000	
Nov.	28.05	24.77	8	3,710	26	195	1,160	68,848	160,910	1,442,000	29,274	
Dec.	27.72	25.16	16	3,170	9	399	844	51,820	136,596	540,000	36,100	
Yearly	32.19	24.77		11,800		98.2	3,600	2,612,919	2,931,309	6,619,700	1,269,259	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
	9.81	7.55		334		2.78	102	3,223,036	3,615,770	8,165,400	1,565,631	

\*\* Period 1955-1980

\* Discharge measurement made on this day

! And other days

# 1954 values are Rio Grande City less arroyo inflow

**CONTRIBUTIONS TO THE RIO GRANDE FROM  
THE LOWER RIO SAN JUAN IRRIGATION DISTRICT  
RIO GRANDE CITY TO ANZALDUAS DAM**

**DESCRIPTION:** The Lower Rio San Juan Irrigation District in Mexico lies along the Rio Grande between Cd. Miguel Aleman and Rio Bravo, Tamaulipas and is irrigated with water impounded by Marte R. Gomez Dam situated on the Rio San Juan 12.4 river miles (20 km) upstream from the confluence with the Rio Grande. The Rio San Juan enters the Rio Grande at river mile 238.7 (384.1 km). Drain water from this irrigation district enters the Rio Grande between Falcon Dam and the Rio Grande City Gaging Station through the Rio San Juan channel, Rancherías Drain, and Los Fresnos Drain; and between this station and Anzalduas Dam through Puertecitos, Los Indios, Huizache, and Morillo Drains. Only the portion of drain water from this irrigation district reaching the Rio Grande via drains located downstream from Rio Grande City Gaging Station is shown below. The portion of water reaching the Rio Grande via channels located upstream from the Rio Grande City Gaging Station is shown on page 63 in this bulletin.

**RECORDS:** Drain water reaching the Rio Grande through Morillo Drain was determined by hourly staff gage readings and the weir discharge table, and through Puertecitos and Los Indios Drains by prorating between frequent current meter measurements. In 1980, 48, 48, and 3 meter measurements were made at Puertecitos, Los Indios, and Morillo Drains, respectively. All storm water measured at these drains was deducted and is not included in the tabulation below. In 1980, 49% of the drain water from this irrigation district reaching the Rio Grande between the Rio Grande City Gaging Station and Anzalduas Dam was contributed by Morillo Drain. Records available: 1953 through 1980.

**REMARKS:** In 1980 there were 165,481 irrigable acres (66,968 ha) in the Lower Rio San Juan Irrigation District. Since July 9, 1969 some water has been diverted from Morillo Drain directly to the gulf via the Morillo Drain Diversion Canal to reduce the salinity of Rio Grande waters. In 1980, 55,601 acre-feet (68,583,000 m<sup>3</sup>) were diverted.

**Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15.2	157	51.6	21.2	177	86.9	26.5	11.7	13.1	17.7	14.1	14.1
2	14.8	158	39.9	20.5	163	82.6	25.4	11.7	13.1	17.7	13.8	13.4
3	15.2	154	38.8	19.8	165	77.3	23.7	11.3	13.4	17.3	13.1	13.4
4	15.2	146	39.9	19.4	181	78.8	22.2	11.3	14.8	17.3	12.7	13.4
5	15.5	147	37.4	18.7	185	86.2	20.5	11.7	15.9	16.6	12.4	13.8
6	15.9	141	34.6	18.4	178	96.1	18.4	23.7	17.3	16.6	11.7	13.8
7	16.2	165	32.1	17.7	169	96.1	16.6	25.8	17.3	16.2	10.9	13.8
8	16.2	167	31.1	17.3	167	105	24.4	11.7	19.8	16.2	10.6	13.8
9	16.6	150	30.4	16.6	167	145	13.4	56.2	20.8	16.2	10.2	14.1
10	16.6	145	29.3	17.7	174	146	13.4	74.9	22.2	16.6	9.9	14.1
11	16.2	128	28.6	18.7	179	120	13.4	74.9	22.2	16.6	9.2	14.1
12	16.2	126	27.5	23.3	175	109	13.4	74.9	21.9	17.3	8.8	13.8
13	16.2	136	27.2	35.0	173	119	13.1	75.2	21.9	17.3	9.2	13.8
14	16.2	117	27.2	40.6	177	125	13.1	75.2	21.9	17.7	9.5	13.8
15	15.9	102	26.8	42.0	196	96.8	13.1	47.0	21.9	17.7	9.9	13.8
16	15.9	90.4	26.1	43.4	191	85.8	13.1	47.0	21.5	17.3	10.2	13.4
17	25.1	77.0	25.8	55.8	190	72.7	12.7	47.0	21.5	16.6	10.6	13.4
18	36.0	80.5	25.8	60.4	188	60.7	12.4	40.3	21.2	16.2	10.9	13.1
19	41.0	89.0	25.4	65.0	186	57.9	12.0	11.3	20.5	15.2	11.3	12.4
20	47.7	86.2	25.4	71.7	184	46.6	11.7	11.3	22.2	14.8	11.7	12.0
21	68.5	85.1	25.4	93.9	182	40.3	11.3	11.3	27.5	14.1	11.7	11.3
22	81.6	74.9	25.4	104	180	36.7	10.9	11.7	29.3	13.8	11.7	10.9
23	91.1	73.8	25.4	114	178	35.3	10.6	11.7	19.4	13.8	12.0	10.2
24	91.5	72.4	25.4	124	176	33.9	10.6	12.0	18.4	14.1	12.4	9.9
25	94.6	58.6	25.4	126	145	32.5	10.9	12.0	18.4	14.1	12.4	9.9
26	99.2	55.4	25.4	125	122	31.4	10.9	12.4	18.0	14.1	12.0	9.5
27	115	56.2	24.7	127	112	30.7	10.9	12.4	18.0	14.1	12.4	9.5
28	141	60.0	24.0	260	108	29.7	10.9	12.7	18.0	14.1	12.7	9.5
29	134	58.3	23.3	155	109	28.3	11.3	12.7	18.0	14.5	12.7	9.5
30	143		22.6	171	88.6	27.2	11.3	13.1	17.7	14.5	12.7	9.2
31	164		21.9		80.2		11.3	12.7		14.5		9.2
<b>Sum</b>	1,627.3	3,156.8	899.8	2,043.1	5,045.8	2,219.5	453.4	888.4	588.2	490.8	343.4	379.9
<b>Current Year 1980</b>									<b>Period 1954-1980</b>			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			31	164	2	14.8	52.3	3,227	2,048	4,745	466	
Feb.			8	167	26	55.4	109	6,261	3,157	7,059	509	
Mar.			1	51.6	31	21.9	29.0	1,784	2,335	5,291	582	
Apr.			28	260	9	16.6	68.2	4,054	3,199	6,111	899	
May			15	196	31	80.2	163	10,007	7,533	30,179	1,557	
June			10	146	30	27.2	74.2	4,403	9,433	85,952	2,027	
July			1	26.5	123	10.6	14.5	899	5,131	48,782	899	
Aug.			113	75.2	1	11.3	28.6	1,761	2,620	13,292	661	
Sept.			22	29.3	1	13.1	19.8	1,167	2,509	11,273	665	
Oct.			!	17.7	122	13.8	15.9	974	3,023	9,831	623	
Nov.			1	14.1	12	8.8	11.3	681	2,246	10,461	520	
Dec.			!	14.1	130	9.2	12.4	754	2,837	34,043	512	
<b>Yearly</b>				260		8.8	49.4	35,972	46,071	179,482	13,462	
	<b>Meters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>					
				7.37		0.25	1.40	44,371	56,828	221,389	16,608	

∅ Mean daily

! And other days

## DIVERSIONS FROM THE RIO GRANDE

### UNITED STATES SIDE, RIO GRANDE CITY TO ANZALDUAS DAM

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 181,568 irrigable acres (73,479 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging station at Rio Grande City and Anzalduas Dam. Such irrigable area was 24.5% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 286,993 acre-feet (354,006,000 m<sup>3</sup>), or 22.6% of the total water diverted from the Rio Grande below Falcon Dam. About 83% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

#### EXTREME FLOWS FROM RECORDS:

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 1,220 (34.6)	June 21, 1960	Min. 0	Occasionally
Monthly:	Max. 1,010 (28.6)	June 1960	Min. 10.3 (0.29)	March 1957
Yearly:	Max. 417 (11.8)	1961	Min. 188 (5.32)	1966

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	180	338	283	614	1,020	59.5	984	601	61.6	160	56.6	111
2	368	134	297	626	1,090	102	1,030	134	283	173	69.1	136
3	250	103	671	706	721	121	894	319	290	246	150	99.4
4	293	364	624	565	647	319	778	760	269	169	242	54.2
5	268	338	617	334	1,020	269	656	789	262	165	249	65.7
6	247	360	601	245	974	301	484	806	100	307	294	55.8
7	308	336	504	726	880	226	982	652	90.8	332	263	18.7
8	286	199	344	709	959	223	977	186	298	371	210	74.8
9	318	228	282	752	960	384	963	0	337	384	167	175
10	327	238	723	782	687	502	979	0	353	379	392	132
11	313	533	699	731	468	491	818	0	369	223	324	142
12	190	360	763	569	879	553	603	0	343	223	351	158
13	160	182	816	443	826	536	507	0	172	555	282	96.8
14	418	122	697	838	932	344	863	0	101	549	355	96.8
15	359	85.4	415	794	828	333	883	0	337	556	212	70.3
16	414	86.7	404	877	673	747	929	4.5	362	476	92.1	78.8
17	404	82.6	796	897	462	744	917	4.5	380	413	390	65.5
18	351	206	816	791	446	752	707	58.2	417	238	381	122
19	205	221	823	545	196	795	517	15.9	395	150	367	96.9
20	204	297	846	502	87.4	632	392	131	229	79.9	301	47.7
21	503	226	850	952	81.6	527	791	134	142	35.6	155	9.9
22	437	260	567	953	37.9	503	806	108	421	53.5	9.1	135
23	456	209	415	922	40.5	818	799	67.6	476	55.6	3.0	207
24	495	144	838	908	5.2	777	741	25.0	490	72.7	79.9	128
25	476	416	862	910	40.5	934	559	162	420	44.7	62.5	0
26	255	448	848	676	40.5	934	430	147	324	43.4	34.4	5.7
27	226	518	814	519	75.9	833	365	146	156	109	2.6	12.8
28	538	513	732	895	61.6	674	724	117	108	138	126	5.8
29	543	426	487	943	127	519	794	120	232	133	3.7	204
30	513		387	974	181	1,030	772	55.4	188	99.3	3.7	223
31	461		680		27.8		761	52.6		129		186
<b>Sum</b>	<b>10,766</b>	<b>7,973.7</b>	<b>19,501</b>	<b>21,698</b>	<b>15,474.9</b>	<b>15,982.5</b>	<b>23,405</b>	<b>5,779.7</b>	<b>8,406.4</b>	<b>7,062.7</b>	<b>5,627.7</b>	<b>3,014.6</b>
<b>Current Year 1980</b>												
<b>Month</b>	Average Rainfall Inches**	∅ Extreme Second-Feet						Average Second- Feet	Total Acre-Feet	Period 1957-1980		
		High		Low		Acre-Feet						
		Day	Day	Day	Day	Day	Day	Average	Maximum	Minimum		
Jan.	1.28	0.08	29	543	13	160	347	21,354	12,129	28,747	2,010	
Feb.	1.03	.90	11	533	17	82.6	275	15,816	12,603	38,599	1,640	
Mar.	.58	.06	25	862	9		629	38,680	20,979	41,200	637	
Apr.	1.49	.03	30	974	6	245	723	43,037	25,132	43,037	5,760	
May	2.25	5.06	2	1,090	24	5.2	499	30,694	23,920	48,400	3,177	
June	2.58	T	30	1,030	1	59.5	533	31,701	24,842	59,900	5,011	
July	1.44	.04	2	1,030	27	365	755	46,423	22,495	46,423	6,753	
Aug.	2.32	8.09	6	806	9	0	186	11,464	21,357	36,280	6,866	
Sept.	4.05	2.27	24	490	1	61.6	280	16,674	13,914	35,000	4,136	
Oct.	2.60	4.23	15	556	21	35.6	228	14,009	15,857	37,755	2,830	
Nov.	1.00	2.25	10	392	27	2.6	188	11,162	13,752	27,516	2,930	
Dec.	.94	.45	30	223	25	0	97.2	5,979	11,318	21,233	2,506	
<b>Yearly</b>	<b>21.56</b>	<b>23.46</b>		<b>1,090</b>		<b>0</b>	<b>395</b>	<b>286,993</b>	<b>218,298</b>	<b>302,180</b>	<b>136,460</b>	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	548	596		30.9		0	11.2	354,006	269,271	372,739	168,323	

∅ Mean daily      \*\* United States side - average of several stations in the reach

### DIVERSIONS FROM THE RIO GRANDE ANZALDUAS CANAL NEAR REYNOSA, TAMULIPAS

**DESCRIPTION:** Cableway, gravity well, and water-stage recorder located on the left bank at latitude 26°07'50", longitude 98°20'10", 0.5 canal mile (0.8 km) from the canal intake, and about 5 miles (8 km) northwest of Reynosa, Tamaulipas. The canal intake is immediately upstream from Anzalduas Dam at river mile 170.3 (274.1 km), 102.2 river miles (164.5 miles) downstream from Falcon Dam. The zero of the gage is 86.32 feet (26.31 m) above mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 107 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1980.

**REMARKS:** Diversions by this canal are for irrigation and domestic use in Mexico and for conveying water for storage in Culebron, Villa Cardenas, and Palito Blanco Reservoirs about 23 canal miles (37.0 km) downstream from this station. During 1980, 478,991 acres (193,841 ha) were irrigated with water delivered through this canal. More than one crop per year was grown on parts of this land. Flow at this canal station is affected by backwater from the operation of canal gates 4.5 miles (7.2 km), 11.3 miles (18.2 km), and 22.5 miles (36.2 km) below this station. During 1980, there was no water returned to the Rio Grande through Poniente Drain.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 10,950 second-feet (310 m<sup>3</sup>/sec) on June 2, 1957 with a gage height of 16.01 feet (4.88 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)			
Daily:	Max. 9,350 (265)	May 29, 1957	Min. 0
Monthly:	Max. 6,250 (177)	May 1978	Min. 0
Yearly:	Max. 1,980 (56.1)	1959	Min. 150 (4.26)
			Frequently Several months 1952

#### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.4	5,330	1.4	770	8,020	3,110	325	3,960 *	374	242 *	1.4	1.4
2	1.4	4,630	1.4	766	8,050 *	3,530	530	4,310	731 *	1.4	1.4	1.4
3	1.4	4,060	1.4	756	7,980	3,570	526 *	5,050	735	1.4	1.4	1.4
4	184	3,600 *	1.4	766	7,980	3,530	533 *	5,650 *	738 *	166	1.4	1.4
5	374	3,710	1.4	756	7,560	3,570 *	530	5,650	537	293	1.4	210
6	406	3,210 *	1.4	759	6,570 *	3,740	530	5,690 *	427	327 *	215	420
7	406 *	3,210	1.4	1,010	6,570	3,850	600 *	5,330	427	579	194 *	420
8	569	3,180 *	1.4	1,040	6,000 *	3,880	600	3,880 *	424 *	957 *	1.4	210 *
9	1,020	3,180	1.4	1,040	5,510 *	4,130 *	710	1.4	417	1,260	1.4	1.4
10	1,380	3,180	177	1,270	4,980	4,200 *	812 *	1.4	420	2,230 *	194	1.4
11	1,700 *	3,180	353	1,620 *	5,010	3,600 *	851	1.4	420 *	2,440	194	1.4
12	1,700	2,570	353	1,620	5,010 *	2,900	893	1.4	901 *	3,210	1.4	1.4
13	1,940	1,980 *	177	2,120	4,980	2,650 *	1,100	1.4	904	3,110 *	194	1.4
14	2,170 *	1,320 *	1.4	2,210	4,980 *	2,050	1,110 *	1.4	1,170	3,080	336 *	1.4
15	2,180	622 *	1.4	2,520	5,120	1,200	1,090	1.4	1,190 *	3,190 *	353	1.4
16	2,730 *	353	1.4	2,920 *	5,260	978 *	1,100	1.4	1,170	3,510 *	392	1.4
17	3,530	350	177	3,290	5,650	1,110 *	1,110 *	1.4	1,420	4,130 *	392 *	1.4
18	4,200 *	385 *	332 *	4,100	5,650	731 *	1,260	1.4	1,420 *	4,630	388	1.4
19	4,590	392	332	4,590	4,850	526	1,410	1.4	1,420	4,700	385	258
20	4,590	175	364	5,190	3,880 *	530	1,410	141	1,840	3,670 *	388	516
21	5,090 *	1.4	350	5,470 *	3,670	533	1,800	214	1,840	1,620 *	1.4	516
22	5,470	1.4	350	6,320 *	2,910 *	353 *	2,340 *	1.4	2,200 *	805 *	1.4	258 *
23	5,510 *	1.4	346	6,890 *	2,000 *	357	2,330 *	1.4	2,240	851	1.4	1.4
24	5,260	1.4	381 *	7,240 *	1,940	351	2,170 *	1.4	2,250 *	590 *	1.4	1.4
25	5,300 *	1.4	381	7,630 *	1,760	357	2,320	1.4	2,550	381	1.4	1.4
26	5,510	1.4	724 *	7,800	1,570 *	357 *	2,470	210	2,800 *	381	1.4	1.4
27	5,830	1.4	724	7,840	1,710	353	2,650	509 *	1,950	191 *	1.4	1.4
28	6,110 *	1.4	727	7,910 *	1,700 *	1.4	2,930	308	809	1.4	1.4	1.4
29	6,180	1.4	717	7,880	2,020 *	1.4	2,930	1.4	551 *	1.4	1.4	1.4
30	6,180 *	770	7,880 *	2,300	325 *	3,180 *	3,570 *	1.4	448	1.4	1.4	1.4
31	5,830	770 *	2,650					1.4		1.4	1.4	1.4
<b>Sum</b>	<b>95,943.2</b>	<b>48,629.6</b>	<b>8,521.8</b>	<b>111,973</b>	<b>143,440</b>	<b>56,373.8</b>	<b>45,720</b>	<b>40,927.2</b>	<b>34,723</b>	<b>46,551.4</b>	<b>3,650.2</b>	<b>2,840.2</b>

Month	Current Year 1980						Period 1954-1980					
	Average Rainfall Inches**		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	1954-1980	1980	Day	High	Day	Low	Acre-Feet	Average	Maximum	Minimum		
Jan.	1.26	0.31	129	6,180	1	1.4	3,090	190,279	100,453	259,799	1,520	
Feb.	1.34	1.61	1	5,330	121	1.4	1,680	96,467	98,735	251,519	1,086	
Mar.	.63	.39	130	770	1	1.4	275	16,902	43,500	147,900	1,128	
Apr.	1.89	.04	28	7,910	1	3	756	3,740	222,100	124,007	303,212	23,381
May	2.28	2.72	2	8,050	26	1,570	4,630	284,531	196,585	384,058	29,169	
June	2.95	.28	10	4,200	128	1.4	1,880	111,823	108,951	270,700	14,221	
July	1.81	.31	31	3,570	1	325	1,480	90,695	45,418	162,400	5,730	
Aug.	2.95	8.46	6	5,690	1	9	1,320	81,172	83,934	236,942	6,709	
Sept.	4.96	2.40	26	2,800	1	374	1,160	68,868	65,160	165,800	2,177	
Oct.	2.91	2.64	19	4,700	1	2	1,500	92,317	58,618	209,590	0	
Nov.	1.38	3.11	116	392	1	1.4	122	7,245	12,688	83,690	0	
Dec.	1.14	1.93	120	516	1	1.4	91.5	5,632	24,341	166,700	651	
<b>Yearly</b>	<b>25.50</b>	<b>24.20</b>		<b>8,050</b>		<b>1.4</b>	<b>1,750</b>	<b>1,268,031</b>	<b>962,390</b>	<b>1,434,920</b>	<b>551,946</b>	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	648	615		228		0.04	49.5	1,564,098	1,187,098	1,770,162	680,817	

\* Discharge measurement made on this day      \*\* Average of several stations      Ø Mean daily  
! And other days

## RIO GRANDE BELOW ANZALDUAS DAM NEAR REYNOSA, TAMAULIPAS AND MISSION, TEXAS

**DESCRIPTION:** Cableway, gravity well, water-stage recorder, and selsyn-type transmitter, located on the right bank at latitude 26°07'50", longitude 98°19'55", and river mile 169.8 (273.3 km); 0.5 river mile (0.8 km) downstream from Anzalduas Dam, about 4.5 miles (7 km) northwest of Reynosa, Tamaulipas, and 10.3 river miles (16.6 km) upstream from the international highway bridge between Hidalgo, Texas and Reynosa, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 103 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1952 through 1980.

**REMARKS:** Except during local storms, flow at this station is controlled largely by releases from Falcon Reservoir and by diversions into Anzalduas Canal. Excessive upstream flood flows are partly diverted into the United States floodway system inlet at Anzalduas Dam before reaching this station. Prior to January 1, 1968 the zero of the gage was 82.61 feet (25.18 m) above mean sea level, U. S. C. & G. S. datum. The transmitter relays gage height data to the Anzalduas Dam control room.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 131,000 second-feet (3,700 m<sup>3</sup>/sec) on September 24, 1967 with a gage height of 30.51 feet (9.30 m). Min. periods of no flow have occurred on several occasions in 1953, 1954, 1956, and 1957.

		Average Flow in Second-Feet (Cubic Meters per Second)					
Daily:	Max.	121,000 (3,440)	Sept. 25, 1967	Min.	0	Occasionally	
Monthly:	Max.	37,830 (1,070)	Oct. 1958	Min.	5.5 (0.16)	March 1957	
Yearly:	Max.	6,410 (182)	1958	Min.	158 (4.49)	1957	

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	512	1,410	975	1,380 *	3,520	929	4,240 *	1,620	795	911	381	406 *
2	512 *	1,350	1,560	1,400	3,510 *	840 *	4,310	1,940	911	897	491	388
3	516	1,310	2,160 *	1,280	3,570	1,210	4,310	2,490	925 *	844 *	611 *	420
4	512	1,430	1,740	1,070	3,920	1,720	4,060 *	2,030	893	653	625	424
5	512	1,590	1,390	925	4,130	1,890 *	3,920	1,800 *	756	699	996	424 *
6	607	1,300	742 *	1,110	5,090 *	2,450	3,780	1,540	600	865 *	975 *	406
7	706	1,200 *	756	1,500 *	4,060	3,070	3,570	1,480 *	622	770	448	424
8	685 *	1,150	777	1,730	3,530 *	4,630	3,340	1,490	692	731	367	406
9	752	1,030	1,080	1,740	3,430	3,670	3,140	5,470	646 *	816 *	2,080	371 *
10	830	1,010	1,310 *	1,770 *	3,350	3,780 *	3,000	4,450	604	1,030	1,980	267
11	1,060	1,080 *	1,400	1,840	3,810	3,920	2,980 *	5,930	636	1,220	1,630 *	199 *
12	1,210	1,150	1,500	1,920	3,570 *	4,100 *	2,910	3,600 *	745 *	1,220	1,350	293
13	1,210	992	1,580 *	2,490	3,370	4,200	2,860	4,410	946	1,200	1,250 *	349
14	1,200	788 *	1,600	3,140	3,330	4,270	2,900 *	6,340 *	1,290	1,190 *	1,180	396
15	1,070 *	456 *	1,700	2,990 *	3,190 *	4,410	2,900 *	3,480	1,510	1,180	1,010	424 *
16	943	459	1,800	3,070	3,310	4,520 *	2,630	1,200	1,610	1,290 *	1,030	1,310
17	971	396	1,850 *	3,150	2,860	4,480	2,330	650	1,690 *	1,380	1,180	2,000
18	1,060	480	1,930	3,170	2,760	4,480	2,250 *	526 *	1,690	1,500	1,070 *	1,050
19	1,120	562 *	1,900	3,340	4,840	4,520 *	1,980	540	1,700 *	1,640	848	989 *
20	1,440	565	1,810 *	3,570	5,620	4,520 *	2,030	572 *	1,700	2,300	851	989 *
21	1,600	562	1,640	3,640 *	2,860 *	4,590	2,280	530	1,720	3,170 *	855	968
22	1,560 *	565 *	1,660	3,530	1,900	4,700	2,300 *	579	1,720	1,540	706	968
23	1,470	565	1,980	3,740 *	2,270 *	4,770 *	3,530	1,110	1,650 *	562	629	989 *
24	1,480	565	1,910 *	3,600 *	1,380	4,730 *	4,060	766	1,610	381 *	607	417
25	1,510	523	2,200	3,480 *	918	4,590 *	2,330 *	816	1,630 *	339	512	388
26	1,600	523	2,140	3,670	1,050 *	4,410	2,100	784 *	1,650	357	420	406 *
27	2,040	735	2,090 *	4,100	943 *	4,410	2,010	784 *	1,920	381	420 *	516
28	1,610	982 *	1,800	4,030 *	1,320	4,270	1,940	862 *	1,510	424	374	614
29	1,510 *	957	1,500	3,640 *	1,030	4,340	1,760 *	1,420	1,180	424	343	632 *
30	1,560	1,460	1,460	3,570	745 *	4,270	1,680	1,620	1,020 *	413 *	348	614
31	1,500	1,550	1,550		890		1,680	1,260		392		632
<b>Sum</b>		25,685	49,490	79,585	90,076	112,689	89,110	62,179	36,571	30,719	25,567	19,079
	34,868											

Month	Current Year 1980						Period 1954-1980				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum
Jan.	82.81	80.38	27	2,180	1	512	1,130	69,191	105,420	325,550	1,090
Feb.	83.86	80.12	12	3,140	115	332	886	50,923	76,590	276,539	830
Mar.	83.14	80.71	23	2,390	6	671	1,600	98,175	83,250	243,477	339
Apr.	86.94	80.97	23	6,430	4	840	2,650	157,840	110,332	319,470	3,160
May	86.78	80.18	20	6,780	22	459	2,910	178,679	135,179	418,591	35,360
June	85.63	80.64	8	5,190	2	735	3,740	223,570	178,663	680,021	7,850
July	86.78	81.79	23	6,530	130	1,640	2,870	176,718	128,515	557,022	2,000
Aug.	87.73	79.69	9	7,660	18	194	2,010	123,585	146,084	1,207,862	943
Sept.	83.27	80.38	27	2,670	1	600	1,220	72,581	256,572	1,862,856	3,920
Oct.	84.09	79.92	120	3,850	125	339	992	60,953	309,161	2,326,000	1,730
Nov.	83.01	79.10	10	2,650	7	106	851	50,696	145,261	1,438,000	1,430
Dec.	82.41	79.07	116	2,220	13	98.9	614	37,821	108,275	540,100	1,500
<b>Yearly</b>	87.73	79.07		7,660		98.9	1,790	1,300,519	1,783,302	4,640,968	114,749
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>					
	26.74	24.10		217		2.80	50.7	1,604,174	2,199,680	5,724,004	141,538

\* Discharge measurement made on this day ! And other days

## RIO GRANDE FLOODWAY DISCHARGES LOWER RIO GRANDE VALLEY

### On the United States Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the United States floodway system with the inlet located at Anzalduas Dam near Mission, Texas.

Floodwater entering the system is measured first at the Banker Floodway Station at Anzalduas Dam near Mission and again 25.2 miles (40.6 km) downstream at the Main Floodway Station on Farm Road No. 88 bridge south of Weslaco. At a point 3 miles (4.8 km) southwest of Mercedes the floodway divides, one channel going north-eastward through the Arroyo Colorado Floodway to the Gulf of Mexico, and the other going to the gulf via the North Floodway, traveling first northward and then eastward to the gulf. At the point of diversion, a divisor dike, which runs longitudinally in the Main Floodway, divides and controls the flows into the Arroyo Colorado Floodway and the North Floodway. The flow of the Arroyo Colorado is measured at El Fuste Siphon south of Mercedes and farther downstream at the bridge on U. S. Highway No. 83 south of Harlingen. The North Floodway flow is measured at the bridge on old U. S. Highway No. 83 west of Mercedes and farther downstream at the bridge on U. S. Highway No. 77 near Sebastian.

In 1980, no flood flow was diverted through this floodway system.

### On the Mexican Side

Part of the excess water from floods entering the Lower Rio Grande Valley is diverted from the river through the Mexican floodway system, with the inlet located 37.1 miles (59.7 km) downstream from Anzalduas Dam and, when necessary, through Anzalduas Canal located at Anzalduas Dam.

Floodwater entering the system through the Retamal Inlet flows into Culebron and Villa Cardenas Lakes through the Retamal Floodway, while flood flows entering the canal at Anzalduas Dam reach these lakes via the Culebron and Retamal Canals from where it flows in a southeastwardly direction via Floodway No. 1 into the Gulf of Mexico.

The Retamal Floodway replaces the previously used floodway system, which consisted of Retamal Canal, San Rafael Floodway, and Floodway No. 2.

In 1980, no flood flow was diverted through Retamal Floodway or Anzalduas Canal.

## DIVERSIONS FROM THE RIO GRANDE

### UNITED STATES SIDE, ANZALDUAS DAM TO PROGRESO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 127,768 irrigable acres (51,706 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between Anzalduas Dam and the Progreso International Bridge. Such irrigable area was 17.2% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 253,130 acre-feet (312,236,000 m<sup>3</sup>), or 20.0% of the total water diverted from the Rio Grande below Falcon Dam. About 93% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

#### EXTREME FLOWS FROM RECORDS:

		Average Flow in Second-Foot (Cubic Meters per Second)					
Daily:	Max.	1,120 (31.7)	June 16 & 17,	1965	Min.	0	Occasionally
Monthly:	Max.	749 (21.2)	June	1969	Min.	13.3 (0.38)	May 1972
Yearly:	Max.	335 (9.49)		1978	Min.	167 (4.73)	1970

### Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	54.8	358	215	531	722	74.3	883	468	275	227	0	88.0
2	203	171	64.8	484	697	112	861	258	271	237	0	130
3	230	166	282	396	661	305	806	222	184	144	170	165
4	274	317	338	392	687	416	816	554	146	69.3	246	125
5	188	324	388	322	761	408	824	529	202	62.9	235	65.6
6	134	283	409	166	750	424	819	577	89.7	218	266	41.3
7	316	302	461	402	785	443	731	447	54.1	330	203	0
8	352	302	388	526	750	459	724	232	164	363	126	17.6
9	340	194	398	455	715	646	769	10.2	175	372	44.8	93.1
10	270	121	575	467	704	752	797	0	238	387	173	97.2
11	283	277	639	514	654	767	797	0	162	343	239	20.9
12	280	306	690	488	662	765	796	0	213	261	337	47.7
13	175	136	668	343	671	907	774	67.5	69.6	372	339	0
14	226	49.1	674	482	686	773	723	28.7	68.7	413	233	0
15	303	49.3	604	656	559	652	605	27.0	294	444	132	93.6
16	303	.5	404	688	685	826	649	8.2	338	428	49.5	140
17	300	.5	520	600	642	890	657	0	146	421	194	186
18	281	181	634	705	455	885	623	55.6	152	457	327	64.5
19	256	136	653	777	343	943	561	63.8	247	397	282	72.7
20	127	126	641	656	84.9	947	444	75.9	288	182	255	20.2
21	266	76.0	639	792	14.2	931	520	127	172	188	254	0
22	326	70.1	599	780	111	782	565	259	349	241	94.8	140
23	284	19.5	408	784	85.6	882	585	54.0	404	23.2	0	219
24	330	22.0	542	784	18.6	929	576	37.2	417	16.2	65.7	168
25	279	161	628	696	0	934	549	271	371	0	22.5	0
26	298	241	610	790	3.3	940	485	229	287	0	77.0	2.7
27	123	241	542	697	105	921	417	277	90.8	18.2	0	18.8
28	427	232	514	791	63.8	871	467	299	81.2	96.5	0	2.7
29	406	235	326	746	59.4	907	496	302	116	146	0	210
30	387	256	741	177	878	532	121	189	149	0	222	222
31	284	583		49.1		556	85.1		154		220	
<b>Sum</b>		5,097.0	17,651	13,360.9	21,369.3	20,407	5,685.2	6,254.1	7,160.3	4,365.3	2,671.6	
	8,305.8	15,292.8										
<b>Current Year 1980</b>												
<b>Month</b>	Average Rainfall Inches**		∅ Extreme Second-Foot				Average Second- Foot	Total Acre-Foot	Period 1957-1980			
			High		Low				Acre-Foot			
	1957-1980	1980	Day	Day	Day	Day			Average	Maximum	Minimum	
Jan.	1.43	0.13	28	427	1	54.8	268	16,474	11,882	34,959	723	
Feb.	1.21	1.19	1	358	116	.5	176	10,110	9,826	28,535	1,140	
Mar.	.66	.18	12	690	2	64.8	493	30,333	17,025	36,100	1,050	
Apr.	1.57	.03	21	792	6	166	588	35,010	19,312	39,277	3,630	
May	2.46	4.00	7	785	25	0	431	26,501	22,055	43,150	817	
June	2.78	.02	20	947	1	74.3	712	42,385	27,542	44,541	5,336	
July	1.64	.28	1	883	27	417	658	40,477	23,006	41,100	6,597	
Aug.	2.64	10.43	6	577	10	0	183	11,276	15,888	27,542	7,452	
Sept.	4.47	2.56	24	417	7	54.1	208	12,405	11,506	28,000	3,214	
Oct.	2.89	3.10	18	457	125	0	231	14,202	14,010	29,215	2,059	
Nov.	1.26	2.16	13	339	1	0	146	8,658	10,626	22,818	1,015	
Dec.	1.12	.59	30	222	1	7	0	86.2	5,299	9,674	18,097	
<b>Yearly</b>	24.13	24.67		947		0	349	253,130	192,352	253,130	121,008	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	613	627		26.8		0	9.88	312,236	237,266	312,236	149,263	

∅ Mean daily

\*\* United States side - average of several stations in the reach

! And other days

## DIVERSIONS FROM THE RIO GRANDE

### UNITED STATES SIDE, PROGRESO TO SAN BENITO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 321,223 irrigable acres (129,996 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging stations at Progreso and San Benito. Such irrigable area was 43.3% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 586,544 acre-feet (723,502,000 m<sup>3</sup>), or 46.3% of the total water diverted from the Rio Grande below Falcon Dam. About 98% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Foot (Cubic Meters per Second)				
Daily:	Max.	2,750 (77.9)	June 15, 1965	Min.	0	Occasionally
Monthly:	Max.	2,080 (58.9)	June 1960	Min.	53.5 (1.52)	March 1957
Yearly:	Max.	808 (22.9)	1980	Min.	367 (10.4)	1968

### Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	238	1,010	56.5	960	1,980	425	2,200	874	132	572	58.4	55.9
2	328	705	30.2	680	2,020	584	2,280	906	273	597	58.6	63.5
3	340	610	243	524	1,980	765	2,350	952	541	583	174	59.5
4	123	562	312	520	1,970	681	2,290	1,060	627	555	264	54.2
5	117	350	344	511	1,980	741	2,240	1,100	645	465	266	131
6	31.2	537	338	348	1,920	872	1,910	1,140	521	358	272	138
7	277	612	343	576	2,070	1,020	1,690	776	424	391	211	126
8	363	602	340	920	2,080	1,110	1,590	410	426	471	100	166
9	433	706	397	1,020	1,900	1,850	1,560	105	380	464	128	210
10	406	643	582	859	1,920	2,060	1,620	0	434	478	196	77.1
11	428	473	646	799	1,860	1,980	1,630	0	427	448	223	39.6
12	436	384	756	885	1,920	1,960	1,560	85.8	438	440	476	39.1
13	459	520	791	861	1,830	1,960	1,420	61.2	475	447	687	54.3
14	485	592	750	1,480	1,860	2,230	1,490	46.4	500	439	675	40.0
15	609	402	726	1,820	1,960	2,210	1,390	70.2	805	434	686	38.3
16	696	85.7	668	1,900	2,010	2,180	1,460	22.0	914	515	696	87.7
17	710	40.3	1,030	1,900	1,940	2,280	1,270	45.3	920	653	646	198
18	645	32.8	1,090	2,000	1,930	2,310	1,260	71.7	953	829	518	172
19	576	217	974	2,070	1,060	2,320	1,290	124	950	821	544	78.9
20	618	276	907	2,000	790	2,290	1,120	331	910	908	433	192
21	942	333	990	2,020	660	2,310	1,090	297	922	682	309	200
22	1,110	79.2	839	1,960	265	2,430	1,250	287	797	390	206	266
23	1,180	87.2	715	1,870	215	2,480	1,140	281	798	329	167	330
24	1,170	31.1	1,000	1,860	261	2,500	1,040	281	822	252	205	375
25	1,110	230	1,110	1,880	200	2,450	1,170	311	821	103	260	214
26	1,110	332	1,220	1,890	194	2,410	1,200	254	805	93.3	265	322
27	1,160	393	1,310	1,920	202	2,300	1,090	260	689	88.9	0	401
28	1,200	280	1,340	1,940	372	2,350	963	288	545	61.7	133	405
29	1,120	177	1,140	1,990	521	2,340	858	303	432	55.5	136	346
30	1,010		720	2,050	609	2,260	827	278	517	63.5	41.7	290
31	1,010		933		564		811	183		58.0		263
<b>Sum</b>		11,302.3		42,013		55,658		11,203.6		18,843	13,044.9	5,433.1
	20,440.2		22,640.7		41,043		45,059				9,034.7	

Month	Current Year 1980						Period 1957-1980				
	Average Rainfall Inches**		Extreme Second-Foot			Average Second-Foot	Total Acre-Foot	Acre-Foot			
	1957-1980	1980	Day	High	Low			Average	Maximum	Minimum	
Jan.	1.56	0.29	28	1,200	6	31.2	659	40,543	37,042	97,130	4,872
Feb.	1.50	1.38	1	1,010	24	31.1	390	22,418	20,426	49,859	4,307
Mar.	.72	.29	28	1,340	2	30.2	730	44,907	26,959	54,200	3,280
Apr.	1.67	.05	19	2,070	6	34.8	1,400	83,332	44,474	98,523	12,900
May	2.68	2.03	8	2,080	26	194	1,320	81,408	52,736	110,440	9,277
June	3.26	.14	24	2,500	1	425	1,860	110,396	69,578	123,000	14,674
July	1.92	.93	3	2,350	31	811	1,450	89,373	41,898	89,373	11,307
Aug.	3.11	7.43	6	1,140	110	0	361	22,222	28,914	64,223	12,736
Sept.	5.27	2.14	18	953	1	132	628	37,375	22,446	59,400	4,308
Oct.	3.18	2.31	20	908	29	55.5	421	25,874	23,753	58,164	5,146
Nov.	1.63	3.03	16	696	27	0	301	17,920	18,923	44,359	4,853
Dec.	1.32	.71	28	405	15	38.3	175	10,776	20,448	37,500	6,663
<b>Yearly</b>	27.82	20.73		2,500		0	808	586,544	407,597	586,544	266,680
	Millimeters		Cubic Meters per Second			Thousands of Cubic Meters					
	707	527		70.8		0	22.9	723,502	502,771	723,502	328,950

Ø Mean daily      \*\* United States side - average of several stations in the reach      † And other days

## RIO GRANDE NEAR SAN BENITO, TEXAS AND RAMIREZ, TAMAULIPAS

**DESCRIPTION:** Cableway, concrete control weir, bubbler gage, water-stage recorders (graphic and digital), and digital transmitter, located on the left bank at latitude 26°01'50", longitude 97°43'40", and river mile 96.8 (155.8 km), 3.9 river miles (6.3 km) downstream from San Benito pumping plant and about 9.5 miles (15.3 km) southwest of San Benito, Texas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 24 discharge measurements during the year and a continuous record of gage heights. Computations for high flows by shifting control methods. Low and medium flow computations based on a stable control weir rating curve defined by meter measurements. Records available: November 26, 1952 through August 25, 1953, and December 1953 through 1980.

**REMARKS:** Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 178.0 river miles (286.4 km) upstream. Excessive upstream flood flows are partly diverted through the United States and Mexican floodway systems before reaching this station. The transmitter relays gage height data via radio to the Texas Department of Water Resources office in Weslaco. The concrete control weir was constructed in December 1965, and the gage was moved to its present location just above the weir on January 4, 1967.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 25,000 second-feet (708 m<sup>3</sup>/sec) on September 29, 1967 with a gage height of 61.05 feet (18.61 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)\*\*

Daily:	Max. 24,800 (702)	Sept. 29, 1967	Min. 0	Frequently
Monthly:	Max. 14,300 (405)	Oct. 1971	Min. 39.5 (1.12)	December 1956
Yearly:	Max. 3,780 (107)	1976	Min. 200 (5.66)	1956

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	347	121	558	280	562	158	625	186	1,200	480	388	417
2	239	253	672	130	452	374	544	117	675	275	364	388
3	181	438	831	283	466	156	579	223	300	156	424	353
4	179	471 *	1,250	349 *	579	104	703	749	133 *	160	298	304
5	239	551	1,180	339	886	104	540	420	176	179	223	237 *
6	277	673	772	324	1,000	213	562	186	177	261	190	273
7	327 *	570	487	188	1,540	452	982	129	209	264	417	320
8	183	428	212	146	1,050	1,000	1,030	448	227	206	491	406
9	121	266	114	108	784 *	1,620	791	1,390	274	124 *	315	319
10	89.3	235	* 88.9	87.6	576	795	576 *	4,270	182	79.1	840	303
11	77.3	290 *	75.1	154	692	509	406	4,590	129	68.5	1,360	351
12	79.8	435	69.5	176	922	629	423	5,090	107	110	1,060	302
13	221	482	66.8	286	777	629	459	4,700	97.1	399	396	286
14	452 *	388	72.7	396 *	692	547	576	4,700	109	399	300	350
15	401	352	106	385	590	629	537	5,330 *	267	344	367	420 *
16	269	473	286	223	512	848	607	4,520	268	266	285	420
17	170	364	417	193	484	848	618	2,550	255	236	317	463
18	102	392	302	271	350	710 *	385	1,520	434	130	317	939
19	117	414	268	186	886	735	276	996	509	156	166	1,110
20	179	252	308 *	291	2,710	710	247	572	547	410	202	816
21	236	211	242	473 *	3,350	667	247	473	473	879	350	678
22	222	298 *	208	554	2,800	643	406	385	590 *	2,150	494	653
23	156	436	255	572	2,140	752	505	381	604	1,710	554	523
24	102 *	512	413	805	1,720	664	1,070	509	494	777	533	392
25	91.4	505	239	713	1,540	625	2,000	689	431	579	438	431
26	88.3	263	276	636	1,020	604	823	505	480	480	367	237
27	104	144	227	643	876	583	516	413	625	459	516	156
28	386 *	* 89.6	211	932	713	505	406	310	1,070	477	424	124
29	336	150	144	936	406	523	459	216	1,160 *	477	441	225
30	161		335	576	664	530	364	353	685	420	459	307
31	130		433		286		276	985		367		215
<b>Sum</b>		10,456.6		11,635.6		17,866		47,905		13,477.6		12,718
	6,263.1		11,119.0		32,025		18,538		12,887.1		13,256	

Month	Current Year 1980						Period 1954-1980					
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total Acre-Feet	Acre-Feet				
	High	Low	Day	High	Day			Low	Average	Maximum	Minimum	
Jan.	35.34	34.29	28	542	11	68.6	202	12,423	58,122	319,002	2,920	
Feb.	35.70	34.36	6	784	28	80.8	361	20,740	50,544	363,000	3,380	
Mar.	37.14	34.24	5	1,390	13	55.5	359	22,054	41,499	360,000	2,560	
Apr.	35.96	34.38	29	982	10	87.6	388	23,079	47,448	251,919	11,500	
May	42.29	34.51	21	3,430	31	161	1,030	63,517	60,489	349,091	16,873	
June	38.19	34.28	9	1,920	4	86.5	597	35,436	71,384	525,330	16,100	
July	38.78	34.74	25	2,420	119	230	597	36,770	75,476	447,886	4,690	
Aug.	45.70	34.45	15	5,440	7	105	1,550	95,022	93,449	827,107	3,100	
Sept.	36.61	34.38	1	1,270	13	86.8	431	25,580	155,996	638,757	7,710	
Oct.	39.44	34.32	22	2,350	11	59.7	434	26,732	196,287	880,859	3,840	
Nov.	37.17	34.58	11	1,480	6	130	442	26,293	89,809	662,000	5,640	
Dec.	36.61	34.51	19	1,250	28	98.2	410	25,224	80,596	479,000	2,430	
<b>Yearly</b>	45.70	34.24		5,440		55.5	569	412,870	1,021,099	2,743,424	145,520	
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>						
	13.93	10.44		154		1.57	16.1	509,275	1,259,526	3,384,014	179,499	

\*\* Period 1954-1980

\* Discharge measurement made on this day

! And other days

## DIVERSIONS FROM THE RIO GRANDE UNITED STATES SIDE, SAN BENITO TO BROWNSVILLE

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 101,041 irrigable acres (40,890 ha) and several towns and rural homes were allotted Rio Grande water in the river reach between the gaging stations near San Benito and Brownsville. Such irrigable area was 13.6% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 126,665 acre-feet (156,241,000 m<sup>3</sup>), or 10.0% of the total water diverted from the Rio Grande below Falcon Dam. About 90% of the water diverted in this river reach was determined by the International Boundary and Water Commission through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the rest of these diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. More than one crop per year is often grown on parts of this land.

**EXTREME FLOWS FROM RECORDS:**

Average Flow in Second-Feet (Cubic Meters per Second)				
Daily:	Max. 782 (22.1)	June 14, 1963	Min. 0	Occasionally
Monthly:	Max. 542 (15.3)	June 1965	Min. 18.5 (0.52)	February 1966
Yearly:	Max. 223 (6.32)	1965	Min. 102 (2.89)	1968

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36.9	74.4	38.8	171	418	118	399	265	30.7	185	46.0	20.2
2	32.4	78.5	36.3	152	442	215	416	120	56.5	168	12.9	55.1
3	29.8	75.5	32.7	144	462	389	432	90.8	50.6	166	57.1	27.1
4	34.4	157	36.7	91.0	432	264	441	92.9	43.6	77.7	32.7	46.0
5	41.1	296	84.1	34.8	422	175	452	141	32.2	19.8	53.8	37.4
6	31.0	216	58.6	49.6	378	151	445	171	32.1	126	46.4	35.7
7	41.6	137	44.9	166	443	218	364	90.5	30.8	164	150	16.9
8	35.5	158	45.4	250	411	465	360	54.0	156	276	331	54.3
9	38.3	89.9	36.2	148	399	596	303	0	267	150	328	24.0
10	52.2	37.2	49.2	101	378	500	328	0	226	113	218	25.1
11	50.1	86.5	36.7	118	365	509	319	5.5	188	35.6	83.6	19.7
12	54.4	134	43.3	92.0	436	510	316	15.5	102	30.4	71.5	25.3
13	40.3	57.1	78.3	54.3	347	553	170	15.7	58.6	163	70.6	29.0
14	243	41.8	66.2	193	241	530	180	22.1	32.2	346	19.8	28.5
15	283	30.8	48.5	357	333	492	286	19.0	204	394	16.8	36.9
16	240	30.7	36.8	365	344	509	310	24.4	319	203	36.5	44.1
17	49.3	37.9	216	231	497	231	309	19.2	270	207	45.2	41.7
18	56.7	37.8	301	174	247	517	256	29.7	321	108	43.7	39.0
19	54.1	38.7	241	234	160	535	157	33.5	414	74.8	37.7	36.4
20	55.3	32.8	145	171	239	490	150	17.5	458	119	137	43.8
21	64.7	33.3	155	303	349	478	288	24.1	450	151	88.0	30.6
22	53.0	50.8	71.0	508	312	438	237	30.5	464	157	17.9	33.1
23	106	24.8	38.9	438	250	421	274	40.7	444	195	11.2	41.0
24	97.4	22.4	165	445	109	430	322	41.1	464	192	191	28.3
25	137	29.9	275	453	98.0	413	374	43.8	364	41.4	343	27.4
26	112	40.5	148	559	211	465	109	47.8	92.0	28.8	205	27.5
27	63.1	37.5	184	556	278	471	114	45.7	83.5	39.9	43.6	38.1
28	66.6	44.1	216	516	270	468	331	44.0	90.7	23.7	51.3	27.8
29	216	48.7	40.5	533	311	393	427	35.9	83.6	25.5	60.4	45.6
30	214		35.6	551	327	408	392	29.2	86.3	24.5	55.1	26.9
31	107		115		231	321	335	33.5		14.4		53.5
Sum	2,736.2	2,179.6	3,119.7	8,158.7	9,904.0	12,618	9,596	1,643.6	5,914.4	4,019.5	2,904.8	1,066.0
Current Year 1980								Period 1957-1980				
Month	Average Rainfall Inches**		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	1957-1980	1980	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.	1.72	0.86	15	283	3	29.8	88.3	5,427	10,543	24,568	1,290	
Feb.	1.73	1.44	5	296	24	22.4	75.2	4,323	7,036	20,626	1,028	
Mar.	.60	.48	18	301	3	32.7	101	6,188	7,028	15,200	705	
Apr.	1.89	.01	26	559	5	34.8	272	16,183	11,434	27,753	2,180	
May	2.55	2.16	3	462	25	98.0	319	19,644	14,998	28,027	2,561	
June	3.28	.11	9	596	1	118	421	25,027	17,838	32,279	6,690	
July	1.89	.69	5	452	26	109	310	19,033	11,481	23,145	3,687	
Aug.	3.23	6.96	1	265	9	0	53.0	3,260	8,092	14,556	3,260	
Sept.	5.64	1.86	122	464	1	30.7	197	11,731	5,820	12,600	876	
Oct.	3.18	2.02	15	394	31	14.4	130	7,973	5,803	11,300	1,591	
Nov.	1.58	3.29	25	343	23	11.2	96.8	5,762	4,699	9,021	1,796	
Dec.	1.53	1.88	2	55.1	7	16.9	34.4	2,114	5,669	11,200	2,014	
Yearly	28.82	21.76		596		0	174	126,665	110,441	161,503	73,788	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	732	553		15.9		0	4.93	156,241	136,229	199,214	91,017	

\*\* United States side - average of several stations in the reach    † Mean daily    ‡ And other days

## RIO GRANDE NEAR BROWNSVILLE, TEXAS AND MATAMOROS, TAMAULIPAS

**DESCRIPTION:** Cableway, bubbler gage, and water-stage recorders (graphic and digital) located on the left bank at latitude 25°52'35", longitude 97°27'20", and river mile 48.7 (78.3 km), 0.2 river mile (0.3 km) downstream from El Jardin pumping plant, and 7.0 river miles (11.2 km) downstream from the international highway bridge (Gateway) between Brownsville, Texas and Matamoros, Tamaulipas. The zero of the gage is at mean sea level, U. S. C. & G. S. datum.

**RECORDS:** Based on 25 discharge measurements during the year and a continuous record of gage heights. Computations by shifting control methods. Records available: 1934 through 1980.

**REMARKS:** Except for diversions, tributary inflows, and drainage returns below Falcon Dam, flow at this station after August 25, 1953 was controlled largely by releases from Falcon Reservoir, 226.1 miles (363.9 km) upstream. Excessive upstream flood flows are partly diverted into the United States and Mexican floodway systems before reaching this station.

**EXTREME FLOWS FROM RECORDS:** Momentary: Max. 31,700 second-feet (898 m<sup>3</sup>/sec) on October 8, 1945 with a gage height of 31.48 feet (9.60 m). Min. no flow occurs frequently.

Average Flow in Second-Feet (Cubic Meters per Second)**				
Daily:	Max. 16,200 (459)	Oct. 19, & 20, 1971	Min. 0	Frequently
Monthly:	Max. 14,400 (408)	Oct. 1971	Min. 3.5 (0.10)	August 1957
Yearly:	Max. 3,640 (103)	1976	Min. 42.1 (1.19)	1956

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	266	89.1	101	246	128	225	176	66.7	784	650	360	396
2	283	84.8	333	202	67.5	139	192	53.7	982	434	349	403
3	252	92.4	516	118 *	37.1	82.3	150	56.9	657	283	346 *	378
4	187	237 *	741	101	20.1	42.4	125	75.2	385 *	200	388	320
5	173	209	1,100	232	9.5	31.1	165	448	238	201	307	290 *
6	200	239	971	287	236	29.3	190	456	194	179	243	263
7	244 *	418	714 *	237	512	32.5	243 *	260	186	141	206	246
8	296	410	464	99.6	85.1 *	35.7	519	290	188	120	168	281
9	222	310	260	49.4	579	308	590	770	130	* 89.3	179	348
10	156	190	146	33.9	374	731	452	2,170	89.0	69.2	139	352
11	119	200 *	114	33.2	231	274	302	3,640 *	66.0	65.0	516	303
12	99.9	160	91.8	58.3	270	86.2	170	4,200	56.9	70.6	1,080	335
13	86.4	200	51.7	74.2	438	57.2	145	4,270	68.5	63.6	925	310
14	* 83.9	392	67.9	86.5	526	89.3	267	4,030	82.6	57.2	505	287
15	118	332	71.5	59.0	456	59.3	261	4,060	72.4	65.3	332	318
16	124	301	75.0	31.4	259	44.5	203	4,340	35.0	59.3	276	381 *
17	119	352	116	17.0	274	169	243	3,330	14.8	56.2	257	388
18	156	304	111	7.8	219	202 *	217	1,800 *	* 4.2	63.9	207	417
19	124	302	80.8	6.0	213	165	178	1,140	16.6	90.4	210	844
20	112	332	101 *	9.5	770	139	132	812	36.4	110	166 *	975
21	120	245	174	* 8.5	2,220	159	99.6	562	65.0	188	116	763
22	166 *	193 *	179	12.0	2,670	179	53.7	438	77.3	731	180	636
23	186	222	181	20.8	2,240	195	86.5	388	97.1	1,700	357	593
24	124	348	188	57.2	1,740	228	187	327	174	1,170	392	505
25	76.1	418	168	205	1,510	250	756	388	178	805	231	388
26	74.8	434	116	191	1,250	205	1,150	643	285	600	168	349
27	71.1	283	104	113	752	183	696	456	403	494	244	295
28	* 54.3	181 *	97.5	107	576	173	427	367	600	466	330	196
29	62.6	115	84.3	297	417	155	148	296	1,010 *	431	364	165
30	138	112	300	213	193	80.9	236	1,000	420	381	374	156
31	104			246		92.2	280					217
Sum	4,598.1	7,593.3	7,793.5	3,300.3	20,304.2	4,861.8	8,696.9	40,649.5	8,175.8	10,454.0	9,915	12,098

Month	Current Year 1980							Period 1954-1980				
	Extreme Gage Feet		Extreme Second-Feet			Average Second-Feet	Total	Acre-Feet				
	High	Low	Day	High	Low	Day	Acre-Feet	Average	Maximum	Minimum		
Jan.	5.62	3.80	8	305	29	42.0	148	9,120	48,246	330,268	283	
Feb.	6.40	4.18	26	467	2	84.8	262	15,061	45,306	362,000	1,060	
Mar.	8.88	3.85	5	1,140	13	40.5	251	15,458	35,806	361,000	2,050	
Apr.	5.84	3.12	129	347	118	2.8	110	6,544	34,911	219,590	8,570	
May	13.62	3.18	22	2,820	5	5.3	657	40,283	44,686	340,106	4,140	
June	7.84	3.25	10	862	6	29.3	162	9,643	51,943	486,551	2,430	
July	9.06	3.71	26	1,250	22	36.4	280	17,241	65,635	437,546	1,120	
Aug.	17.59	3.90	16	4,410	2	53.7	1,310	80,632	83,720	812,033	218	
Sept.	8.43	3.35	2	1,040	18	4.2	273	16,216	140,873	635,722	950	
Oct.	10.96	3.64	23	1,860	17	53.3	337	20,746	184,021	887,207	756	
Nov.	8.60	4.00	12	1,110	21	105	330	19,669	84,864	528,000	1,290	
Dec.	8.23	4.13	20	1,050	30	149	392	23,996	78,206	480,000	524	
Yearly	17.59	3.12		4,410		2.8	378	274,609	897,767	2,645,434	30,596	
	Meters		Cubic Meters per Second			Thousands of Cubic Meters						
	5.36	0.95		125		0.08	10.7	338,730	1,107,396	3,263,143	37,740	

\*\* Period 1954-1980

\* Discharge measurement made on this day

! And other days

## DIVERSIONS FROM THE RIO GRANDE UNITED STATES SIDE, BROWNSVILLE TO THE GULF OF MEXICO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

During 1980, 4,800 irrigable acres (1,943 ha) were allotted Rio Grande water in the river reach between the gaging station near Brownsville and the mouth of the Rio Grande. Such irrigable area was 0.7% of the total irrigable acres (ha) below Falcon Dam allotted Rio Grande water.

The total diversion during 1980 in this river reach was 2,439.5 acre-feet (3,009,000 m<sup>3</sup>), or 0.2% of the total water diverted from the Rio Grande below Falcon Dam. All records of diversions in this river reach, which were determined by means of flow meters, were furnished by the Rio Grande Watermaster. More than one crop per year is often grown on parts of this land.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Feet (Cubic Meters per Second)					
Daily:	Max. 40.4 (1.14)	June 17, 1965	Min. 0				
Monthly:	Max. 23.4 (0.66)	June 1965	Min. 0	Frequently			
Yearly:	Max. 7.0 (0.20)	1965	Min. 0.7 (0.02)	Occasionally 1976			

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	9.0	0	1.2	9.8	0	13.8	0	0	0	0	0
2	0	9.0	0	1.2	9.8	0	13.8	0	0	0	0	0
3	0	9.0	0	1.2	11.7	3.5	6.3	0	0	0	3.5	4.6
4	0	0	0	2.5	11.7	6.6	6.3	0	0	0	3.5	4.6
5	0	0	0	2.5	20.0	15.4	6.3	0	0	0	3.5	4.6
6	0	0	0	2.5	20.0	23.4	6.3	0	0	0	3.5	0
7	0	0	0	2.5	20.8	23.8	14.6	0	0	0	0	0
8	0	0	0	2.5	11.3	18.7	7.0	0	0	0	0	0
9	0	0	0	0	12.3	21.8	7.1	0	0	0	0	0
10	0	0	0	3.1	12.4	23.5	3.9	0	0	0	0	0
11	0	0	0	3.1	12.4	26.0	3.9	0	0	0	0	0
12	0	0	0	3.1	12.4	37.8	3.1	0	0	0	0	0
13	0	0	0	3.1	3.0	33.3	0	0	0	2.5	0	0
14	0	0	0	3.1	3.0	32.2	0	0	0	2.5	0	0
15	0	0	0	5.0	6.0	20.2	0	0	0	4.4	0	0
16	1.8	0	0	5.0	6.0	26.5	0	0	0	5.4	0	0
17	1.8	0	0	5.0	6.0	28.7	0	0	0	4.5	0	0
18	1.8	0	3.3	5.0	6.0	29.3	3.8	0	0	2.5	0	0
19	1.8	0	3.3	5.0	6.0	25.8	3.8	0	0	0	0	0
20	1.8	0	3.3	5.0	0	19.8	3.8	0	0	0	0	0
21	8.2	0	3.3	5.0	0	15.4	3.8	2.4	1.8	0	0	0
22	8.2	0	3.3	5.2	0	13.7	0	2.4	1.8	0	0	0
23	8.2	0	3.3	3.4	0	27.8	0	2.4	0	0	0	0
24	9.0	0	3.3	3.4	0	14.4	0	2.4	0	0	0	0
25	9.0	0	3.3	3.4	0	14.1	2.2	2.4	0	0	0	0
26	9.1	0	0	3.4	0	15.5	2.2	2.4	0	0	0	.8
27	6.6	2.5	0	5.6	0	14.3	2.2	0	0	0	0	0
28	9.9	2.5	0	6.0	0	12.0	2.2	0	0	0	0	0
29	8.9	2.5	0	6.0	0	9.5	0	0	0	0	0	0
30	8.9	0	0	9.8	0	13.8	0	0	0	0	0	0
31	8.9	0	0	0	0	0	0	0	0	0	0	0
<b>Sum</b>	<b>103.9</b>	<b>34.5</b>	<b>26.4</b>	<b>112.8</b>	<b>200.6</b>	<b>566.8</b>	<b>116.4</b>	<b>14.4</b>	<b>3.6</b>	<b>21.8</b>	<b>14.0</b>	<b>14.6</b>
<b>Current Year 1980</b>								<b>Period 1957-1980</b>				
<b>Month</b>	<b>Average Rainfall Inches**</b>		<b>Extreme Second-Feet</b>				<b>Average Second-Feet</b>	<b>Total Acre-Feet</b>	<b>Acre-Feet</b>			
	1957-1980	1980	<b>High</b>		<b>Low</b>	<b>Average</b>			<b>Maximum</b>	<b>Minimum</b>		
			<b>Day</b>	<b>Day</b>								
Jan.	1.72	0.93	28	9.9	1 1	0	3.4	206	378	1,275	0	
Feb.	1.82	1.40	1 1	9.0	1 4	0	1.2	68.4	205	668	0	
Mar.	.58	.47	118	3.3	1 1	0	.9	52.4	133	634	0	
Apr.	1.99	T	30	9.8	9	0	3.8	224	220	953	0	
May	2.43	2.03	7	20.8	120	0	6.5	398	360	1,356	0	
June	3.03	.22	12	37.8	1 1	0	18.9	1,124	464	1,393	9.7	
July	1.77	.49	7	14.6	113	0	3.8	231	192	778	0	
Aug.	3.14	7.46	121	2.4	1 1	0	.5	28.6	115	317	13.7	
Sept.	5.70	1.59	121	1.8	1 1	0	.1	7.1	50.5	190	0	
Oct.	3.10	2.10	16	5.4	1 1	0	.7	43.2	61.9	218	0	
Nov.	1.61	3.59	1 3	3.5	1 1	0	.5	27.8	64.8	252	0	
Dec.	1.62	3.02	1 3	4.6	1 1	0	.5	29.0	75.1	335	0	
<b>Yearly</b>	<b>28.51</b>	<b>23.30</b>		<b>37.8</b>		<b>0</b>	<b>3.36</b>	<b>2,439.5</b>	<b>2,319.3</b>	<b>5,036.3</b>	<b>543.2</b>	
	<b>Millimeters</b>		<b>Cubic Meters per Second</b>				<b>Thousands of Cubic Meters</b>					
	724	592		1.07		0	0.10	3,009	2,861	6,212	670	

\*\* United States side - average of several stations in the reach      Ø Mean daily      ! And other days

## DIVERSIONS FROM THE RIO GRANDE UNITED STATES SIDE, FALCON DAM TO THE GULF OF MEXICO

Beginning June 1971, the Texas Water Rights Commission, now the Texas Department of Water Resources, assumed control of the United States portion of the water in Falcon Reservoir and in the Rio Grande below Falcon Dam, the disposition of such waters being made by its Rio Grande Watermaster. Previous to that, since June 1956, such waters had been under the jurisdiction of the 93rd District Court of Texas administered by its Special Water Master.

In 1980, 741,393 irrigable acres (300,034 ha), several towns, and many rural homes were allotted Rio Grande water between Falcon Dam and the Gulf of Mexico. The total diversion from the river was 1,266,999 acre-feet (1,562,843,000 m<sup>3</sup>). About 92% of the water diverted was determined through records of discharge obtained by means of flow meters, by open channel rating stations, and by deflection meters developed by the Commission. The records for the balance of the diversions were furnished by the Rio Grande Watermaster and were determined from records of discharge obtained by means of flow meters. Drainage from more than 90% of this area does not return to the Rio Grande, but some of it is reused within the area. More than one crop per year is often grown on parts of this land.

Diversion data pertaining to "Diversions from the Rio Grande—United States Side below Rio Grande City" for the period 1922 through 1957 may be found in previous issues of these Water Bulletins. The area irrigated below Rio Grande City is about 99% of the total acreage irrigated on the United States side below Falcon Dam.

A breakdown by river reaches of the total diversion below Falcon Dam shown in the tabulation below may be found in appropriate downstream order in preceding pages of this Water Bulletin. Because the mean daily discharges are rounded, the total acre-feet shown in the summary below may not equal the sum of the acre-feet of the individual reaches.

**EXTREME FLOWS FROM RECORDS:**

		Average Flow in Second-Feet (Cubic Meters per Second)		
Daily:	Max. 5,380 (152)	June 20 & 21, 1960	Min. 3.5 (0.10)	Oct. 31, 1976
Monthly:	Max. 4,350 (123)	June 1960	Min. 102 (2.89)	March 1957
Yearly:	Max. 1,750 (49.6)	1980	Min. 880 (24.9)	1970

### Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	524	1,820	604	2,290	4,200	680	4,490	2,220	506	1,150	165	281
2	948	1,130	437	1,960	4,310	1,020	4,610	1,610	892	1,180	145	390
3	855	981	1,240	1,790	3,870	1,600	4,500	1,590	1,080	1,150	581	366
4	732	1,430	1,340	1,590	3,770	1,700	4,340	2,490	1,100	888	814	294
5	619	1,330	1,460	1,220	4,230	1,630	4,190	2,580	1,160	723	831	312
6	446	1,420	1,430	830	4,070	1,790	3,670	2,710	766	1,030	902	282
7	952	1,420	1,380	1,910	4,220	1,950	3,790	1,980	610	1,230	844	167
8	1,050	1,290	1,140	2,450	4,230	2,290	3,670	893	1,070	1,500	776	319
9	1,140	1,240	1,130	2,410	4,010	3,530	3,610	118	1,180	1,390	673	506
10	1,070	1,050	1,950	2,250	3,710	3,870	3,740	2.8	1,270	1,380	986	339
11	1,090	1,390	2,050	2,200	3,370	3,790	3,580	8.3	1,170	1,070	877	230
12	974	1,200	2,280	2,070	3,930	3,850	3,290	104	1,120	972	1,240	278
13	846	910	2,380	1,720	3,690	4,020	2,880	147	798	1,560	1,380	189
14	1,400	816	2,220	3,030	3,740	3,930	3,270	100	713	1,780	1,290	169
15	1,570	581	1,830	3,670	3,700	3,720	3,180	119	1,660	1,860	1,050	244
16	1,670	217	1,540	3,870	3,740	4,310	3,370	67.2	1,950	1,650	877	355
17	1,480	168	2,600	3,680	3,330	4,470	3,170	74.3	1,730	1,730	1,280	495
18	1,350	462	2,870	3,720	3,100	4,510	2,870	226	1,870	1,660	1,270	401
19	1,110	620	2,720	3,670	1,770	4,630	2,540	251	2,040	1,460	1,240	290
20	1,020	743	2,570	3,350	1,210	4,390	2,120	568	1,920	1,300	1,130	308
21	1,790	688	2,670	4,120	1,110	4,280	2,700	597	1,710	1,060	809	242
22	1,940	479	2,120	4,250	732	4,180	2,870	700	2,060	845	331	577
23	2,040	362	1,600	4,070	597	4,650	2,810	460	2,140	607	184	800
24	2,110	233	2,580	4,050	397	4,670	2,690	395	2,210	537	545	701
25	2,020	859	2,900	3,990	342	4,760	2,660	806	1,990	194	691	243
26	1,800	1,080	2,850	3,960	452	4,780	2,230	691	1,520	168	585	361
27	1,580	1,210	2,880	3,730	664	4,560	1,990	739	1,030	261	49.5	473
28	2,260	1,080	2,830	4,190	771	4,390	2,500	753	829	325	314	443
29	2,310	900	2,020	4,260	1,020	4,180	2,590	766	869	364	204	808
30	2,150	1,406	4,370	1,300	4,600	2,530	4,888	488	986	340	104	764
31	1,890		2,330		875		2,470	357		359		725
Sum	42,736	27,109	61,351	90,670	80,460	106,730	98,920	24,610.6	39,949	31,723	22,167.5	12,352

Current Year 1980							Period 1957-1980					
Month	Average Rainfall Inches**		Extreme Second-Feet				Average Second- Feet	Total Acre-Feet	Acre-Feet			
	1957-1980	1980	Day	High		Day			Low	Average	Maximum	Minimum
Jan.	1.39	0.25	29	2,310	6	446	1,380	84,766	72,658	182,403	9,717	
Feb.	1.28	1.11	1	1,820	17	168	935	53,770	50,917	126,230	11,785	
Mar.	.61	.19	25	2,900	2	437	1,980	121,688	73,218	149,000	6,280	
Apr.	1.58	.03	30	4,370	6	830	3,020	179,841	101,689	209,970	25,100	
May	2.40	3.47	2	4,310	25	342	2,600	159,590	115,131	228,833	16,071	
June	2.86	.06	26	4,780	1	680	3,560	211,696	141,328	259,000	31,931	
July	1.62	.43	2	4,610	27	1,990	3,190	196,205	99,819	196,205	31,502	
Aug.	2.67	7.08	6	2,710	10	2.8	794	48,814	75,053	143,286	36,208	
Sept.	4.76	2.20	24	2,210	1	506	1,330	79,238	54,245	136,000	12,709	
Oct.	2.82	3.07	15	1,860	26	168	1,020	62,922	60,223	124,598	12,991	
Nov.	1.28	2.61	13	1,380	27	49.5	739	43,969	48,582	97,969	12,674	
Dec.	1.14	.80	29	808	7	167	398	24,500	47,763	84,500	14,034	
Yearly	24.41	21.30		4,780		2.8	1,750	1,266,999	940,626	1,266,999	636,835	
	Millimeters		Cubic Meters per Second				Thousands of Cubic Meters					
	620	541		135		0.08	49.6	1,562,843	1,160,262	1,562,843	785,536	

\*\* United States side - average of several stations in the reach

Ø Mean daily

## OUTFALLS FROM SEWERS INTO THE RIO GRANDE

### In Acre-Feet

#### EL PASO SEWAGE OUTFALL

Treated sewage effluent enters the Rio Grande through the outfall of the Haskell Street Wastewater Treatment Plant located 7.1 river miles downstream from the American Dam. The outfall from this plant consists of flows measured by a Sparling propeller outfall meter and estimates of amounts which bypass the meter. The effluent from the Socorro Treatment Plant, located 17.6 miles below the American Dam, after treatment in oxidation ponds is discharged to the Riverside Canal to be used for irrigation. This effluent is also measured by a Sparling propeller outfall meter, does not enter the Rio Grande, and is not included in the table below. Both plants are operated by the El Paso Water Utilities of the Public Service Board of the City of El Paso, Texas, and the records are furnished by that agency.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1980	2,221	2,091	2,271	2,074	2,289	2,404	2,556	2,335	2,342	2,076	1,963	2,031	26,653
* Average	1,911	1,818	1,931	1,963	2,073	2,027	2,188	2,152	2,075	2,013	1,896	1,917	23,964

#### EAGLE PASS SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 495.8 and about 600 feet upstream from the Eagle Pass-Piedras Negras International Railroad Bridge. The records are based on weekly current meter measurements and estimates by personnel of the International Boundary and Water Commission.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1980	155	133	219	154	204	187	190	204	193	202	198	190	2,229
* Average	107	96.6	116	99.9	114	123	126	138	127	132	130	123	1,432.5

#### LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 360.0 and immediately upstream from the Nuevo Laredo Gaging Station. The record is furnished by Laredo Waterworks System.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1980	760	696	691	770	874	842	922	938	919	885	806	784	9,887
* Average	614	543	619	622	690	649	674	664	649	622	638	632	7,616

#### NUEVO LAREDO SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 358.7 and 357.7, 2.2 and 3.2 miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas. The records are computed by the International Boundary and Water Commission based on current meter measurements, the weir discharge table, and a continuous record of gage heights.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1980	1,029	913	902	603	923	774	842	832	582	919	843	948	10,110
# Average	986	875	876	793	958	839	859	840	865	1,013	998	1,052	10,954

#### BROWNSVILLE SEWAGE OUTFALL

This sewage outfall enters the Rio Grande at river mile 52.2, 3.5 river miles downstream from the Gateway Bridge between Brownsville, Texas and Matamoros, Tamaulipas and 3.5 river miles upstream from the Brownsville Gaging Station. Records are furnished by the City of Brownsville.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly
1980	815	775	804	784	891	895	906	852	905	879	660	711	9,877
* Average	701	647	679	659	702	700	727	717	723	742	672	687	8,356

\* Period averages are for past 10 years

# Period 1976-1980

## MUNICIPAL AND INDUSTRIAL WATER USES

## In Acre-Feet

Tabulated below are monthly and yearly amounts of water pumped from the Rio Grande directly into municipal distribution systems of cities along the border, except for the city of Del Rio, whose total supply is derived from San Felipe Springs; and the city of El Paso, whose supply is derived mainly from deep wells. The amount shown below for the city of El Paso is Rio Grande water pumped from the Franklin Canal at the El Paso Water Plant for municipal use. Included in this amount are 121 acre-feet of water pumped from wells near Canutillo, Texas into the Rio Grande to be conveyed 17 miles downstream to the point of diversion at the El Paso Water Plant. Ciudad Acuna, Coahuila, whose municipal diversion from the Rio Grande started in 1971, may at times use an alternate source from Arroyo Las Vacas, which was its previous source of supply. Such use would be reflected in the tabulations below.

All Rio Grande water used by U. S. municipalities below Falcon Dam is also included in the figures shown under "Diversions from the Rio Grande - United States Side..." (by river reaches and total below Falcon Dam) on pages 65, 68, 72, 73, 75, 77, and 78 herein. Population data for all cities are estimates based on the 1980 official census except for Falcon Village (estimated by the International Boundary and Water Commission); Del Mar and San Ignacio, which are based on utilities connections; and Rio Grande City, which was estimated based on the 1980 Texas Almanac.

## In the United States

Month	EL PASO (Pop. 432,585)				DEL RIO <sup>Ø</sup> (Pop. 34,973)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	169	16.9	169	0	546.5	427.8	546.5	343.5
Feb.	361	36.1	361	0	611.4	455.6	611.4	350.8
Mar.	1,256	312.0	1,256	0	916.8	657.3	916.8	498.9
Apr.	2,282	1,053.3	2,282	0	1,099.7	653.8	1,099.7	493.3
May	3,274	2,346.9	3,360	0	757.2	642.8	838.6	466.3
June	3,506	3,011.0	4,084	1,596	1,358.3	829.1	1,358.3	561.2
July	3,213	2,777.0	3,728	1,962	1,618.2	948.6	1,618.2	472.3
Aug.	3,137	2,878.4	3,850	1,748	1,162.0	884.2	1,236.9	500.8
Sept.	1,778	1,774.2	2,709	863	1,119.1	706.4	1,119.1	484.4
Oct.	417	217.0	540	0	799.8	573.7	842.6	394.3
Nov.	334	52.4	334	0	599.9	432.9	599.9	363.9
Dec.	329	62.1	329	0	510.0	421.0	510.0	360.3
Yearly	20,056	14,537.3	20,056	7,229	11,098.9	7,633.2	11,098.9	6,490.0

Month	EAGLE PASS (Pop. 21,407)				DEL MAR (Pop. 4,112)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	285.0	243.6	305.1	190.7	56.5	32.6	56.5	20.2
Feb.	293.4	235.7	331.9	188.2	59.8	35.6	59.8	20.1
Mar.	354.4	294.6	394.9	217.0	79.7	50.1	79.7	27.6
Apr.	367.1	295.3	407.7	200.4	93.1	54.5	93.1	37.4
May	318.5	320.3	400.1	270.5	88.6	59.3	88.6	27.6
June	419.5	361.2	433.0	282.6	140.4	67.7	140.4	30.0
July	529.7	421.0	582.1	281.9	161.2	67.5	161.2	32.1
Aug.	431.1	404.7	564.3	260.6	102.6	61.2	102.6	33.2
Sept.	451.7	335.6	544.5	228.3	94.5	51.5	94.5	32.5
Oct.	422.0	314.0	506.9	191.4	71.0	45.5	88.6	15.6
Nov.	315.2	252.7	345.1	187.8	61.1	39.8	62.9	19.9
Dec.	267.3	240.0	279.4	172.0	47.7	34.2	48.4	18.0
Yearly	4,454.9	3,718.7	4,611.0	3,060.3	1,056.2	599.5	1,056.2	395.8

Month	LAREDO (Pop. 91,449)				LAREDO POWER STATION			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	1,428.0	1,097.4	1,428.0	866.6	60.5	68.8	134.1	40.1
Feb.	1,421.4	1,061.6	1,421.4	831.8	67.8	71.4	122.7	35.1
Mar.	1,899.8	1,353.1	1,899.8	1,087.5	74.9	84.0	181.3	47.3
Apr.	2,016.6	1,431.2	2,016.6	1,015.9	117.6	85.1	143.4	53.9
May	1,856.7	1,568.4	1,860.7	1,058.8	137.3	104.6	159.0	72.2
June	2,378.8	1,709.9	2,378.8	1,289.3	170.4	108.3	170.4	69.6
July	2,693.6	1,892.7	2,693.6	1,434.1	166.0	120.5	177.8	73.7
Aug.	2,108.1	1,778.1	2,294.7	1,339.0	155.6	118.8	173.8	73.8
Sept.	2,045.1	1,485.6	2,045.1	1,162.4	127.2	95.2	147.5	50.0
Oct.	1,750.6	1,407.3	2,048.5	898.8	90.6	88.9	215.7	45.0
Nov.	1,560.6	1,209.6	1,657.1	927.2	39.1	71.6	125.6	35.0
Dec.	1,436.3	1,136.4	1,651.1	877.0	32.4	66.7	120.9	32.4
Yearly	22,595.6	17,131.3	22,595.6	14,515.1	1,239.4	1,083.9	1,686.2	771.9

<sup>Ø</sup> Includes Laughlin Air Force Base

## MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In the United States

Month	SAN YGNACIO (Pop. 877)				NEW ZAPATA (Pop. 5,751)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	4.8	3.3	4.8	2.2	54.9	39.5	54.9	28.8
Feb.	4.1	3.5	4.4	1.9	52.0	41.4	53.4	27.6
Mar.	4.7	4.3	5.2	3.2	73.3	53.1	77.1	32.1
Apr.	6.6	5.0	6.6	3.0	83.6	55.4	83.6	36.4
May	7.8	5.2	7.8	2.6	86.6	58.6	86.6	32.5
June	9.5	5.5	9.5	2.9	105.2	61.7	105.2	34.1
July	8.9	5.5	8.9	3.2	112.5	67.5	112.5	39.4
Aug.	6.7	5.7	8.5	3.2	85.3	65.0	89.5	31.5
Sept.	8.6	4.7	8.6	2.6	103.6	51.1	103.6	29.5
Oct.	6.4	4.1	6.7	1.8	77.9	48.2	77.9	20.0
Nov.	4.7	3.6	5.3	2.2	64.7	44.1	67.8	28.0
Dec.	3.6	3.3	4.1	2.2	53.2	39.9	53.3	23.6
Yearly	76.4	53.7	76.4	35.3	952.8	625.5	952.8	394.4

Month	FALCON VILLAGE (Pop. 150)				ROMA * (Pop. 3,504)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	8.7	8.8	9.9	7.6	29.1	41.4	61.6	29.1
Feb.	8.3	8.5	9.9	7.2	48.3	47.4	107.0	25.1
Mar.	11.3	10.7	12.9	8.4	71.1	50.4	72.9	38.1
Apr.	13.8	11.2	13.8	8.9	73.9	54.5	77.6	37.2
May	12.3	10.9	12.3	8.4	73.0	57.7	79.0	42.1
June	17.6	11.2	17.6	6.6	89.8	60.7	89.8	41.5
July	18.0	12.9	18.0	9.2	97.4	61.4	97.4	41.7
Aug.	12.9	12.0	14.5	9.7	84.6	59.6	85.9	38.0
Sept.	13.0	9.6	13.0	7.0	87.6	52.8	87.6	35.2
Oct.	11.6	9.5	11.6	6.2	73.9	48.3	73.9	22.3
Nov.	9.7	8.6	10.1	6.6	67.1	49.6	86.4	29.0
Dec.	9.7	9.3	11.6	7.6	58.4	44.5	66.1	25.1
Yearly	146.9	123.2	146.9	110.8	854.2	628.3	930.2	437.9

Month	RIO GRANDE CITY (Pop. 6,500)				BROWNSVILLE (Pop. 84,997)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	149.5	105.6	149.5	72.2	1,251.1	1,051.2	1,355.8	847.5
Feb.	133.1	97.6	133.1	61.9	1,144.2	1,015.8	1,144.2	850.5
Mar.	177.4	118.5	177.4	72.5	1,308.3	1,220.2	1,484.7	964.4
Apr.	180.1	122.5	180.1	73.3	1,467.2	1,227.3	1,467.2	983.6
May	154.2	125.7	177.6	70.2	1,565.8	1,322.9	1,708.5	972.0
June	223.7	140.2	223.7	60.2	1,907.0	1,366.7	1,907.0	984.5
July	235.0	159.1	235.0	100.0	2,221.3	1,503.8	2,221.3	993.6
Aug.	189.0	146.0	205.7	48.4	1,914.4	1,468.7	1,914.4	977.4
Sept.	221.6	132.6	221.6	93.8	1,706.5	1,250.8	1,706.5	912.9
Oct.	162.4	128.0	178.8	83.9	1,617.4	1,279.9	1,664.5	904.2
Nov.	153.3	118.1	181.4	80.7	1,464.1	1,170.2	1,464.1	902.7
Dec.	141.7	112.8	157.9	80.0	1,368.4	1,128.3	1,411.4	855.7
Yearly	2,121.0	1,506.7	2,121.0	1,039.4	18,935.7	15,005.8	18,935.7	11,509.2

\* Includes Los Saenz and Escobares, Texas

## MUNICIPAL AND INDUSTRIAL WATER USES

In Acre-Feet

In Mexico

Month	CD. ACUNA, COAHUILA (Pop. 37,902)				PIEDRAS NEGRAS, COAHUILA (Pop. 107,298)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	201.2	104.8	220.0	0	457.1	350.2	457.1	273.0
Feb.	205.0	122.9	218.2	38.0	406.0	302.1	406.0	215.2
Mar.	220.4	151.0	226.3	76.8	491.0	355.5	491.0	260.6
Apr.	216.8	144.5	216.8	67.9	444.1	346.1	444.1	258.3
May	225.0	148.6	225.0	77.6	472.2	380.7	472.2	283.2
June	217.1	156.4	238.3	83.7	459.7	386.1	459.7	275.2
July	223.1	173.7	278.0	80.1	452.5	410.1	523.9	304.0
Aug.	223.8	190.0	279.0	83.7	427.6	403.4	462.8	281.2
Sept.	215.1	165.5	270.0	81.9	418.3	375.6	454.2	287.3
Oct.	223.9	155.9	225.4	68.3	395.1	369.3	448.9	263.2
Nov.	214.3	132.3	219.1	55.7	351.3	330.5	421.3	264.2
Dec.	223.8	120.5	223.8	0	382.8	336.7	429.8	290.9
Yearly	2,609.5	1,766.1	2,662.4	828.8	5,157.7	4,346.3	5,157.7	3,287.1

Month	NUEVO LAREDO, TAMPS. (Pop. 230,000)				NUEVA CD. GUERRERO, TAMPS. (Pop. 3,275)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	2,146.3	1,685.7	2,146.3	1,461.7	46.8	33.5	48.7	24.5
Feb.	1,937.3	1,564.1	1,937.3	1,387.0	42.9	33.2	50.2	22.0
Mar.	2,248.0	1,811.2	2,278.8	1,530.2	51.5	37.4	54.3	26.0
Apr.	2,141.0	1,808.7	2,141.0	1,627.4	51.5	37.3	61.0	23.3
May	2,349.6	2,017.8	2,680.9	1,574.1	54.6	38.1	60.3	23.3
June	2,348.5	2,049.2	2,472.7	1,623.9	52.2	38.5	60.1	25.6
July	2,434.7	2,198.9	2,750.6	1,821.9	54.3	39.9	59.0	25.1
Aug.	2,308.7	2,227.9	2,797.8	1,776.8	50.4	39.1	53.2	19.3
Sept.	2,100.8	2,044.7	2,566.4	1,654.4	42.6	33.8	49.2	15.7
Oct.	2,055.2	2,054.2	2,591.6	1,611.4	54.8	37.8	54.8	20.5
Nov.	2,138.9	1,937.8	2,506.2	1,530.2	56.7	35.9	56.7	20.9
Dec.	2,156.2	1,821.1	2,156.2	1,484.5	58.5	33.6	58.5	20.5
Yearly	26,365.2	23,291.3	28,668.7	19,578.7	616.8	438.1	616.8	282.8

Month	CD. MIER, TAMPS. (Pop. 5,692)				CD. MIGUEL ALEMAN, TAMPS. (Pop. 13,520)			
	1980	Period 1971-1980			1980	Period 1971-1980		
		Average	Maximum	Minimum		Average	Maximum	Minimum
Jan.	45.0	36.4	69.1	11.8	52.9	40.6	55.7	25.3
Feb.	11.2	28.3	50.0	10.5	50.2	40.4	55.0	25.9
Mar.	76.5	40.6	76.5	9.9	58.0	46.6	58.0	32.4
Apr.	43.0	34.0	50.2	9.1	43.4	46.6	62.8	32.3
May	52.9	37.3	52.9	9.1	61.8	49.8	63.9	36.6
June	42.7	40.9	57.5	27.2	64.0	52.7	66.7	37.4
July	48.2	43.7	73.6	28.6	63.6	55.5	65.6	40.6
Aug.	44.4	40.6	59.4	13.1	62.6	57.7	68.1	38.8
Sept.	41.4	35.2	51.6	15.2	58.5	50.2	59.9	35.9
Oct.	54.7	42.1	101.3	14.5	54.4	49.7	61.4	35.8
Nov.	40.5	39.5	72.2	13.3	50.8	48.0	62.0	36.3
Dec.	47.9	39.4	60.6	12.6	49.1	43.8	56.9	27.8
Yearly	548.4	458.0	660.1	191.3	669.3	581.6	721.9	420.6

**STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN**

**In Thousands of Acre-Feet**

Data are presented below for all storage reservoirs in the Rio Grande Basin in the United States and Mexico that exceed 15,000 acre-feet in capacity, except San Esteban Reservoir on Alamito Creek which according to the Texas Water Development Board originally had a capacity of 18,800 acre-feet. There are no monthly storage data available for this reservoir. Also presented on pages 86 and 87 are data for International Amistad and Falcon Reservoirs on the Rio Grande. The monthly figures represent the water in storage on the last day of each month, in thousands of acre-feet. The capacities indicated are at spillway level. Storage figures greater than the capacity indicate that the water surface was above spillway level.

The reservoirs and the agencies providing the data are: Rio Grande, Continental, Santa Maria, Terrace, Mountain Home, and Platoro from the State of Colorado, Division of Water Resources; Sanchez from the Sanchez Ditch and Reservoir Company; Abiquiu, Cochiti, and Santa Rosa from the United States Corps of Engineers; Costilla, Bluewater, Lake Sumner, McMillan, and Avalon from the United States Geological Survey; Storrie from the State Engineer Office of New Mexico; Heron, El Vado, Elephant Butte, and Caballo from the United States Bureau of Reclamation; Red Bluff from the Red Bluff Water Power Control District; Lake Casa Blanca from the Webb County Office; Willacy from the Willacy County Water Control and Improvement District No. 1; La Boquiulla, La Colina, and Rosetilla from the Federal Power Commission of Mexico; Francisco I. Madero, Chihuahua, Luis L. Leon, Centenario, San Miguel, Venustiano Carranza, Laguna de Salinillas, La Boca, Marte R. Gomez, Culebron, Villa Cardenas, and Palito Blanco from the Ministry of Agriculture and Hydraulic Resources of Mexico; Amistad Reservoir (International) and Falcon Reservoir (International) from the International Boundary and Water Commission.

**In the United States**

Month	RIO GRANDE (Capacity 51.1)		CONTINENTAL (Capacity 22.7)		SANTA MARIA (Capacity 45.1)		TERRACE (Capacity 17.2)		MOUNTAIN HOME (Capacity 18.6)	
	1980	# Average 1927-1980	1980	# Average 1928-1980	1980	# Average 1928-1980	1980	# Average 1925-1980	1980	# Average 1924-1980
Jan.	40.2	14.0	6.4	4.7	12.1	6.7	7.1	3.7	5.7	3.5
Feb.	40.7	15.1	6.9	5.1	12.3	7.1	7.5	4.0	5.9	3.8
Mar.	41.2	16.4	7.4	5.5	12.5	7.8	8.4	4.4	6.2	4.2
Apr.	42.5	16.8	8.1	6.1	12.8	9.0	8.0	5.3	6.6	4.7
May	28.1	20.9	13.9	7.8	13.3	12.2	7.0	6.9	8.7	6.3
June	42.1	22.3	15.1	8.1	21.5	13.9	5.7	8.2	11.5	6.6
July	17.0	13.4	5.9	5.4	9.9	9.5	1.4	5.6	8.0	4.9
Aug.	16.1	7.6	6.1	3.7	9.9	5.4	.2	3.5	3.4	3.0
Sept.	15.6	7.8	6.1	3.6	9.9	5.1	0	3.0	3.0	2.6
Oct.	16.4	8.7	6.3	3.5	10.0	5.3	0	3.1	3.0	2.6
Nov.	18.8	11.2	6.8	3.9	10.2	5.8	0	3.1	3.1	2.9
Dec.	20.4	12.8	7.4	4.4	10.5	6.3	0	3.4	3.5	3.2
Avg.	28.3	13.9	8.0	5.2	12.1	7.8	3.8	4.5	5.7	4.0
Max.	42.5	52.1	15.1	26.7	21.5	42.1	8.4	17.7	11.5	16.4
Min.	15.6	0	5.9	0	9.9	0	0	0	3.0	0

Month	SANCHEZ (Capacity 103.2)		PLATORO (Capacity 60.0)		COSTILLA (Capacity 15.7)		HERON (Capacity 401.3)		EL VADO (Capacity 196.5)	
	1980	# Average 1927-1980	1980	Average 1952-1980	1980	# Average 1922-1980	1980	Average 1971-1980	1980	Average 1935-1980
Jan.	22.7	10.7	0	8.1	8.6	4.2	244.9	123.7	123.6	38.9
Feb.	22.1	10.9	0	8.1	9.0	4.6	244.2	124.1	123.8	36.8
Mar.	21.8	11.4	0	8.4	9.4	5.2	240.2	124.4	123.4	37.4
Apr.	22.0	12.8	0	9.1	10.0	6.3	256.8	128.8	123.4	72.8
May	26.8	16.2	14.2	10.7	11.9	8.2	300.1	157.2	123.4	113.6
June	32.0	15.9	42.0	17.2	12.9	7.6	356.0	185.2	122.7	105.6
July	23.7	11.7	36.4	15.8	8.4	5.0	355.9	192.3	121.8	87.5
Aug.	18.5	9.3	19.7	14.6	5.2	3.3	347.3	191.5	110.9	66.9
Sept.	17.9	9.5	19.7	14.7	4.3	2.9	346.2	189.6	95.3	55.0
Oct.	17.1	9.9	19.7	14.6	4.8	3.2	343.4	189.8	85.5	50.6
Nov.	17.6	10.2	19.6	9.9	5.2	3.6	342.3	189.4	85.6	41.2
Dec.	17.6	10.6	19.7	9.9	5.5	3.9	317.7	156.4	107.9	40.1
Avg.	21.6	11.6	15.9	11.8	7.9	4.8	307.9	162.7	112.3	62.2
Max.	32.0	62.4	42.0	54.0	12.9	15.1	356.0	356.0	123.8	203.5
Min.	17.1	0	0	0	4.3	0	240.2	0.6	85.5	0

# Some months missing

## STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

### In Thousands of Acre-Feet

#### In the United States

Month	ABIQUIU (Capacity 1,212.0)		COCHITI (Capacity 496.6)		BLUEWATER (Capacity 43.5)		ELEPHANT BUTTE (Capacity 2,109.4)		CABALLO (Capacity 344.0)	
	1980	Average 1965-1980	1980	# Average 1973-1980	1980	# Average 1927-1980	1980	Average 1915-1980	1980	# Average 1938-1980
Jan.	46.3	8.9	46.4	36.5	16.3	6.6	935.8	725.0	115.9	93.9
Feb.	46.2	8.8	46.4	36.3	19.7	7.3	932.3	729.4	148.1	116.8
Mar.	43.1	9.3	46.4	36.5	27.6	10.8	969.1	708.1	60.6	98.9
Apr.	63.0	15.5	54.2	37.7	39.2	14.3	937.8	700.9	92.5	95.8
May	169.6	52.3	64.7	46.5	38.2	12.8	1,118.7	791.7	116.2	98.5
June	165.7	46.8	47.0	58.0	35.0	10.6	1,277.4	821.1	95.4	83.1
July	136.3	35.5	46.4	41.0	32.9	9.2	1,244.0	767.1	48.7	65.8
Aug.	134.5	35.0	46.2	41.4	30.8	8.2	1,164.0	712.1	40.8	38.9
Sept.	133.4	35.5	46.1	41.3	29.8	7.8	1,174.1	688.6	17.2	27.9
Oct.	132.3	33.9	46.4	42.5	28.7	7.4	1,158.2	688.4	20.2	41.6
Nov.	81.7	21.0	46.4	37.9	28.0	7.2	1,207.7	706.5	24.6	55.3
Dec.	40.3	14.0	47.1	39.2	27.5	7.1	1,222.2	727.0	83.2	72.9
Avg.	99.4	26.4	48.6	41.2	29.5	9.1	1,111.8	730.5	72.0	74.1
Max.	169.6	194.0	64.7	175.2	39.2	47.1	01,291.6	0 2,302.8	0148.1	0 346.6
Min.	40.3	0	46.1	3.6	16.3	0	0 920.7	0 3.3	0 15.3	0 0.1

Month	STORRIE (Capacity 23.3)		SANTA ROSA (Capacity 499.0)		LAKE SUMNER (Capacity 101.6)		McMILLAN & AVALON (Capacity 38.0)		RED BLUFF (Capacity 310.0)	
	1980	# Average 1939-1980	1980		1980	# Average 1937-1980	1980	# Average 1908-1980	1980	# Average 1936-1980
Jan.	10.2	7.1	0		85.8	65.0	18.6	25.7	82.1	94.5
Feb.	10.0	7.1	0		90.3	69.0	20.8	25.9	85.0	96.1
Mar.	9.5	7.9	0		89.9	57.8	12.4	25.7	85.4	93.3
Apr.	10.9	8.2	2.5		55.5	50.5	18.8	17.2	74.7	81.0
May	10.0	8.6	16.9		54.6	53.1	13.9	19.1	71.1	83.1
June	8.9	7.2	27.3		32.6	47.1	4.2	18.6	62.1	83.7
July	7.6	7.3	0		2.4	45.0	23.9	17.9	45.5	74.7
Aug.	7.9	8.0	0		8.9	48.5	13.6	16.6	34.8	70.1
Sept.	7.5	7.4	2.5		12.2	50.8	28.3	17.8	67.1	74.7
Oct.	7.3	7.1	2.5		12.3	53.4	22.8	19.6	68.3	83.7
Nov.	7.1	7.1	2.9		17.7	55.9	26.7	21.3	82.1	86.7
Dec.	6.7	6.7	3.0		22.9	60.5	28.2	24.2	84.9	90.8
Avg.	8.6	7.5	4.8		40.4	54.7	19.4	20.8	70.3	84.4
Max.	10.9	26.3	27.3		90.3	156.3	28.3	85.5	85.4	327.5
Min.	6.7	0	0		2.4	0.4	4.2	0	34.8	10.0

Month	LAKE CASA BLANCA (Capacity 19.1)		WILLACY (Capacity 25.0)		TOTAL IN U. S. RESERVOIRS (Capacity 6,152.9)		
	1980	Average 1962-1980	1980	#Average 1939-1980	1980	Estimated Average	
Jan.	11.5	13.2	17.3	15.3		1,857.5	1,309.9
Feb.	11.4	12.9	17.0	14.7		1,899.6	1,343.9
Mar.	11.0	12.6	17.3	14.0		1,842.8	1,300.0
Apr.	10.2	12.6	16.5	14.0		1,866.0	1,321.9
May	9.3	13.4	19.1	14.7		2,249.7	1,570.7
June	8.5	13.7	14.6	14.8		2,440.2	1,622.6
July	8.4	13.2	16.3	14.7		2,200.8	1,442.5
Aug.	14.3	13.5	16.2	13.6		2,049.3	1,314.7
Sept.	14.0	14.9	16.2	15.0		2,066.4	1,278.0
Oct.	13.9	14.3	14.5	15.3		2,033.8	1,301.2
Nov.	12.9	14.0	15.6	15.1		2,062.6	1,312.1
Dec.	12.7	13.7	14.2	14.8		2,103.1	1,324.9
Avg.	11.5	13.5	16.2	14.7		2,056.0	1,370.2
Max.	14.3	28.2	19.1	22.6		2,440.2	
Min.	8.4	3.5	14.2	0		1,842.8	

# Some months missing

0 Daily extremes

! Totals of period averages in all reservoirs

**STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN**

In Thousands of Acre-Feet

**In Mexico**

Month	LA BOQUILLA (Capacity 2,417.5)		LA COLINA (Capacity 19.5)		ROSETILLA (Capacity 15.4)		FRANCISCO I. MADERO (Capacity 282.2)		CHIHUAHUA (Capacity 25.9)	
	1980	# Average 1914-1980	1980	Average 1940-1980	1980	Average 1940-1980	1980	# Average 1948-1980	1980	Average 1961-1980
Jan.	2,162.6	1,457.3	19.9	17.9	13.9	12.6	245.8	225.4	14.5	8.4
Feb.	2,094.1	1,422.3	19.9	18.4	13.9	12.5	223.9	222.1	13.8	8.1
Mar.	2,011.9	1,369.2	19.9	18.5	13.9	11.9	178.0	208.2	13.1	7.6
Apr.	1,918.3	1,296.3	20.1	18.9	13.9	11.6	121.7	174.1	12.2	7.2
May	1,793.9	1,230.9	20.0	18.6	13.9	11.7	83.6	145.1	11.0	6.6
June	1,690.9	1,150.0	20.1	18.7	13.9	12.0	54.0	126.7	9.9	6.1
July	1,578.3	1,186.2	20.1	18.7	13.9	11.9	28.4	140.2	8.9	6.3
Aug.	1,625.9	1,352.5	19.9	18.4	13.9	12.8	51.4	172.2	9.8	7.6
Sept.	2,092.0	1,530.5	19.8	18.2	13.9	13.1	278.8	220.3	13.2	10.1
Oct.	2,266.0	1,539.7	19.8	18.0	13.8	13.0	281.1	227.9	12.6	9.9
Nov.	2,267.2	1,505.2	19.7	16.2	13.9	12.4	281.1	228.2	11.8	9.6
Dec.	2,280.2	1,489.8	19.8	18.1	13.9	12.9	280.6	229.1	11.3	9.1
Avg.	1,981.8	1,377.5	19.9	18.2	13.9	12.4	175.7	193.3	11.8	8.0
Max.	2,280.2	2,544.7	20.1	22.5	13.9	19.4	281.1	366.6	14.5	26.5
Min.	1,578.3	16.9	19.7	11.6	13.8	0	28.4	1.4	8.9	0.2

Month	LUIS L. LEON (Capacity 689.1)		CENTENARIO and SAN MIGUEL (Capacity 19.9)		VENUSTIANO CARRANZA (Capacity 1,122.8)		LAGUNA DE SALINILLAS (Capacity 15.4)		LA BOCA (Capacity 33.2)	
	1980	Average 1968-1980	1980	Average 1934-1980	1980	Average 1930-1980	1980	Average 1931-1980	1980	Average 1963-1980
Jan.	381.0	403.9	8.5	13.2	843.0	459.7	6.5	7.3	32.9	28.1
Feb.	388.2	403.4	9.2	13.0	813.7	438.7	6.7	9.2	31.5	28.1
Mar.	368.9	378.0	7.1	9.9	745.8	415.0	6.6	7.2	29.3	27.5
Apr.	339.2	343.8	4.2	8.5	710.9	402.9	5.3	8.6	27.3	26.4
May	280.8	318.1	7.1	9.1	678.1	385.0	6.7	8.7	25.6	26.0
June	295.3	317.5	4.9	7.6	594.3	366.2	6.3	7.8	23.6	25.8
July	275.6	330.4	1.5	7.2	539.1	378.4	4.2	7.3	21.6	26.0
Aug.	349.6	342.4	11.3	8.0	672.2	385.6	4.9	7.5	23.6	26.9
Sept.	371.7	420.9	17.8	10.1	774.2	439.3	4.9	8.4	24.9	28.7
Oct.	447.2	432.4	19.5	12.4	943.2	476.1	3.4	7.8	31.5	29.5
Nov.	467.5	437.4	19.5	12.6	1,043.9	484.7	5.8	7.1	33.0	29.3
Dec.	485.0	445.6	19.2	13.0	1,098.9	483.3	11.6	6.9	33.2	29.2
Avg.	370.8	381.2	10.8	10.4	788.1	426.2	6.1	7.8	28.2	27.6
Max.	Ø 485.0	Ø 753.1	19.5	20.7	Ø 1,098.9	Ø 1,167.8	Ø 12.5	15.8	33.2	35.7
Min.	Ø 273.9	Ø 3.8	1.5	0	Ø 520.6	* 1.0	Ø 3.2	0	21.6	0

Month	MARTE R. GOMEZ (Capacity 898.3)		CULEBRON and VILLA CARDENAS (Capacity 90.0)		PALITO BLANCO (Capacity 124.0)		TOTAL IN MEXICAN RESERVOIRS (Capacity 5,753.2)	
	1980	# Average 1943-1980	1980	# Average 1939-1980	1980	Average 1942-1980	1980	Estimated Average
Jan.	638.5	625.5	0	31.1	0	32.6	4,367.1	3,323.0
Feb.	593.0	579.6	0	28.7	0	28.3	4,207.9	3,212.4
Mar.	570.2	549.7	0	26.8	0	28.1	3,964.7	3,057.6
Apr.	442.7	508.9	0	28.2	0	25.9	3,615.8	2,861.3
May	355.7	466.7	0	30.0	0	26.1	3,276.4	2,682.6
June	279.6	460.1	0	31.6	0	28.3	2,992.8	2,558.4
July	251.8	449.5	0	27.8	0	27.3	2,743.4	2,617.2
Aug.	249.7	495.2	0	29.7	0	24.9	3,032.2	2,883.7
Sept.	181.8	620.4	0	36.5	0	35.4	3,793.0	3,391.9
Oct.	245.4	659.6	0	38.0	0	39.4	4,283.5	3,503.7
Nov.	275.4	662.3	0	32.1	0	37.8	4,438.8	3,474.9
Dec.	291.8	660.2	0	35.4	0	36.4	4,545.5	3,469.0
Avg.	364.6	561.5	0	31.3	0	30.9	3,771.8	3,086.3
Max.	Ø 709.8	Ø 1,465.4	0	116.8	0	140.1	4,545.5	
Min.	Ø 181.8	** 17.8	0	0	0	0	2,743.4	

# Some months missing      Ø Daily extremes  
! Total of period averages in all reservoirs

\* Minimum since full reservoir in 1932  
\*\* Minimum since full reservoir in 1947

## STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN

### International Amistad Reservoir

Amistad Dam is the second of the major international storage dams constructed on the Rio Grande as authorized by the Water Treaty of 1944 between the United States and Mexico. It is located at mile 573.9, 12.9 river miles upstream from Del Rio, Texas and Cd. Acuna, Coahuila.

Maximum storage for period of record: 4,859,900 acre-feet on September 22, 1974 with an elevation of 1,135.66 feet above mean sea level, U. S. C. & G. S. datum.

### Storage Capacities

(1961 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
898.0	Original River Bed at Dam Axis	0	0	8,029	Dead
930.0	Lowest Outlet (United States Penstocks)	8,029	712	3,497,410	Silt & Conservation
1,117.0	Top of Conservation Storage *	3,505,439	64,860	1,744,222	Ordinary Flood
1,140.4	Top of Spillway Gates	5,249,661	84,358	407,116	Super Flood
1,145.1	Maximum Water Surface	5,656,777	88,984		

### Storage in Thousands of Acre-Feet at 24:00 Hours 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3,424.9	3,355.2	3,285.4	3,157.4	3,146.5	3,072.6	2,877.2	2,552.6	2,884.7	3,123.7	3,162.4	3,135.6
2	3,423.8	3,353.1	3,283.3	3,155.5	3,146.5	3,067.7	2,862.2	2,549.0	2,881.0	3,135.6	3,160.4	3,133.6
3	3,419.6	3,350.0	3,283.3	3,155.5	3,155.5	3,061.9	2,846.4	2,543.0	2,879.1	3,142.5	3,160.4	3,132.6
4	3,417.6	3,347.9	3,283.3	3,153.5	3,164.4	3,057.0	2,831.5	2,540.4	2,879.1	3,150.5	3,159.4	3,131.7
5	3,414.4	3,344.9	3,280.3	3,153.5	3,165.4	3,052.1	2,816.7	2,537.0	2,879.1	3,155.5	3,159.4	3,130.7
6	3,414.4	3,340.7	3,278.2	3,153.5	3,165.4	3,046.3	2,801.9	2,532.6	2,878.2	3,160.4	3,158.4	3,128.7
7	3,410.2	3,339.7	3,277.2	3,152.5	3,168.4	3,040.5	2,787.2	2,529.2	2,877.2	3,164.4	3,157.4	3,130.7
8	3,408.2	3,337.6	3,276.2	3,153.5	3,169.4	3,037.6	2,771.6	2,527.5	2,877.2	3,167.4	3,157.4	3,131.7
9	3,405.0	3,335.6	3,275.2	3,152.5	3,169.4	3,031.7	2,757.9	2,524.9	2,878.2	3,169.4	3,157.4	3,130.7
10	3,405.0	3,332.5	3,274.2	3,152.5	3,169.4	3,025.9	2,743.3	2,526.6	2,881.0	3,171.4	3,156.5	3,128.7
11	3,402.9	3,329.4	3,271.1	3,152.5	3,168.4	3,022.1	2,728.8	2,655.2	2,893.2	3,174.4	3,155.5	3,127.7
12	3,399.8	3,326.3	3,269.1	3,153.5	3,163.4	3,016.3	2,713.4	2,612.1	2,909.2	3,175.4	3,153.5	3,125.7
13	3,398.8	3,324.3	3,265.0	3,149.5	3,156.5	3,012.4	2,697.2	2,619.5	2,915.8	3,177.4	3,152.5	3,126.7
14	3,396.7	3,322.2	3,259.9	3,148.5	3,148.5	3,004.7	2,682.9	2,626.9	2,921.5	3,178.4	3,151.5	3,126.7
15	3,395.6	3,320.2	3,256.9	3,147.5	3,145.5	2,998.9	2,668.6	2,634.3	2,926.3	3,181.4	3,149.5	3,125.7
16	3,393.6	3,318.1	3,254.9	3,147.5	3,139.6	2,990.2	2,654.3	2,644.5	2,930.1	3,181.4	3,148.5	3,124.7
17	3,391.5	3,315.0	3,249.8	3,145.5	3,135.6	2,984.5	2,640.1	2,639.4	2,932.0	3,181.4	3,147.5	3,123.7
18	3,389.4	3,313.0	3,243.7	3,147.5	3,132.6	2,978.7	2,626.8	2,617.6	2,933.9	3,180.4	3,146.5	3,123.7
19	3,388.4	3,310.9	3,240.7	3,146.5	3,126.7	2,972.0	2,622.4	2,614.4	2,933.9	3,180.4	3,145.5	3,121.8
20	3,387.3	3,308.9	3,236.6	3,146.5	3,122.8	2,966.3	2,614.5	2,615.1	2,933.9	3,178.4	3,144.5	3,118.8
21	3,386.3	3,306.8	3,230.6	3,145.5	3,118.8	2,959.6	2,608.3	2,601.9	2,933.9	3,177.4	3,143.5	3,114.9
22	3,383.2	3,304.8	3,225.5	3,145.5	3,113.9	2,951.9	2,603.9	2,606.6	2,932.0	3,175.4	3,142.5	3,113.9
23	3,380.0	3,302.7	3,220.5	3,146.5	3,109.9	2,944.3	2,596.9	2,600.4	2,931.0	3,176.4	3,141.6	3,112.9
24	3,376.9	3,299.7	3,214.5	3,148.5	3,106.0	2,937.7	2,590.8	2,603.2	2,931.0	3,174.4	3,137.6	3,112.9
25	3,373.8	3,296.6	3,206.4	3,148.5	3,102.1	2,930.1	2,582.9	2,604.1	2,934.1	3,171.4	3,141.6	3,111.9
26	3,372.8	3,292.5	3,197.4	3,146.5	3,099.1	2,924.4	2,576.0	2,604.1	3,013.4	3,171.4	3,138.6	3,109.9
27	3,368.6	3,290.5	3,193.4	3,146.5	3,094.2	2,916.8	2,569.0	2,603.2	3,029.8	3,170.4	3,137.6	3,109.9
28	3,366.6	3,289.4	3,184.4	3,146.5	3,090.3	2,909.2	2,564.6	2,603.2	3,063.3	3,169.4	3,135.6	3,108.9
29	3,364.5	3,287.4	3,177.4	3,145.5	3,086.3	2,901.7	2,562.9	2,600.4	3,070.7	3,165.4	3,135.6	3,108.9
30	3,362.4		3,169.4	3,146.5	3,082.4	2,891.3	2,559.4	2,600.4	3,042.2	3,163.4	3,134.6	3,108.9
31	3,358.3		3,157.4		3,076.5		2,554.2	2,606.6		3,162.4		3,108.0

Month	1980							Period 1969-1980		
	MOMENTARY MAXIMUM		MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage			
	Elevation	Storage	Day	Elevation	Storage		Day	Average	Maximum	Minimum
Jan.	1,115.78	3,427.0	1	1,114.70	3,358.3	31	3,392.9	3,001.7	4,030.4	722.6
Feb.	1,114.70	3,358.3	1	1,113.57	3,287.4	29	3,320.5	2,988.2	4,014.7	787.7
Mar.	1,113.57	3,287.4	1	1,111.45	3,157.4	31	3,242.6	2,950.0	4,016.4	861.7
Apr.	1,111.45	3,157.4	1	1,111.25	3,145.5	121	3,149.8	2,941.9	3,981.0	962.8
May	1,111.65	3,169.4	1	1,110.11	3,076.5	31	3,133.5	2,891.9	3,829.5	1,038.6
June	1,110.11	3,076.5	1	1,106.94	2,891.3	30	2,990.2	2,844.4	3,807.8	914.4
July	1,106.94	2,891.3	1	1,100.82	2,554.2	31	2,681.1	2,812.7	3,847.3	949.6
Aug.	1,106.99	2,894.1	125	1,100.26	2,524.9	9	2,755.9	2,925.3	3,941.3	963.9
Sept.	1,110.40	3,094.2	30	1,106.69	2,877.2	1	2,933.4	3,003.1	4,117.2	1,034.0
Oct.	1,111.84	3,181.4	115	1,110.40	3,094.2	1	3,168.0	3,154.8	4,471.2	1,207.2
Nov.	1,111.53	3,162.4	1	1,111.07	3,134.6	30	3,149.1	3,178.2	4,241.4	1,263.2
Dec.	1,111.09	3,135.6	1	1,110.63	3,108.0	31	3,122.0	3,186.4	4,029.7	1,290.4
Yearly	1,115.78	3,427.0		1,100.26	2,524.9		3,085.6	2,989.9	3,950.8	1,047.6

\* When necessary, the Commission may set temporary conservation levels

! And other days

**STORED WATER IN LARGE RESERVOIRS OF THE RIO GRANDE BASIN**

**International Falcon Reservoir**

Falcon Dam is the lowermost of the major international storage dams authorized for construction on the Rio Grande by the Water Treaty of 1944 between the United States and Mexico and was the first dam constructed. It is located 86.1 river miles downstream from the old international highway bridge between Laredo, Texas and Nuevo Laredo, Tamaulipas and 274.8 river miles upstream from the Gulf of Mexico.

Maximum storage for period of record: 3,490,600 acre-feet on October 19, 1958 with an elevation of 308.11 feet above mean sea level, U. S. C. & G. S. datum.

**Storage Capacities**

(1971-1972 Survey)

Elevation	Description	At Indicated Elevation		Between Indicated Elevations	
		Reservoir Capacity Acre-Feet	Reservoir Area Acres	Storage Volume Acre-Feet	Type of Storage
175.0	Original River Bed at Dam Axis	0	0		
203.3	Lowest Outlet (Mexican Penstock)	67	89	67	Dead
301.2	Top of Conservation Storage *	2,667,588	86,843	2,667,521	Silt & Conservation
306.7	Top of Spillway Gates	3,177,093	98,512	509,505	Ordinary Flood
314.2	Maximum Water Surface	3,978,416	115,406	801,323	Super Flood

**Storage in Thousands of Acre-Feet at 24:00 Hours 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,522.9	2,366.7	2,371.5	2,366.0	1,952.4	1,846.9	1,661.6	1,653.4	1,983.4	1,965.0	1,965.8	2,059.0
2	2,525.4	2,361.2	2,371.5	2,370.7	1,930.1	1,845.6	1,655.3	1,639.1	1,985.5	1,977.0	1,969.3	2,064.8
3	2,528.8	2,355.7	2,369.9	2,376.3	1,907.2	1,842.9	1,656.6	1,624.2	1,986.9	1,980.5	1,970.7	2,069.8
4	2,531.3	2,350.1	2,368.3	2,377.1	1,886.5	1,838.8	1,659.1	1,610.0	1,988.3	1,984.8	1,972.1	2,074.9
5	2,532.1	2,347.0	2,366.7	2,373.9	1,864.0	1,832.0	1,661.6	1,596.5	1,989.0	1,987.6	1,974.2	2,079.2
6	2,533.0	2,343.8	2,366.0	2,369.9	1,844.2	1,823.2	1,663.5	1,585.0	1,989.0	1,989.0	1,976.3	2,083.6
7	2,535.5	2,339.9	2,364.4	2,364.4	1,828.6	1,813.8	1,666.0	1,576.5	1,989.0	1,987.6	1,977.7	2,088.6
8	2,533.8	2,336.7	2,363.6	2,358.0	1,815.2	1,805.1	1,668.5	1,575.3	1,987.6	1,986.2	1,977.7	2,094.5
9	2,533.0	2,332.8	2,362.8	2,350.1	1,799.1	1,797.7	1,671.7	1,578.9	1,987.6	1,981.9	1,978.4	2,098.8
10	2,532.1	2,329.7	2,361.2	2,342.2	1,781.8	1,790.4	1,674.8	1,582.0	1,987.6	1,978.4	1,978.4	2,102.5
11	2,529.6	2,328.1	2,359.6	2,331.2	1,765.2	1,781.8	1,676.7	1,610.6	1,985.5	1,976.3	1,978.4	2,106.9
12	2,527.1	2,328.9	2,357.2	2,320.3	1,750.8	1,775.1	1,678.6	1,677.4	1,981.9	1,972.1	1,979.1	2,111.2
13	2,524.6	2,332.8	2,354.9	2,309.3	1,735.1	1,769.2	1,680.5	1,799.1	1,979.1	1,966.5	1,978.8	2,115.6
14	2,521.3	2,337.5	2,354.1	2,297.7	1,722.2	1,763.3	1,683.1	1,885.9	1,977.0	1,958.7	1,984.1	2,120.8
15	2,516.3	2,341.5	2,353.3	2,284.5	1,717.0	1,757.3	1,686.2	1,917.6	1,973.5	1,952.4	1,987.6	2,123.7
16	2,510.5	2,343.8	2,352.5	2,270.6	1,718.9	1,749.5	1,689.4	1,931.5	1,967.9	1,946.1	1,992.6	2,125.2
17	2,504.7	2,347.0	2,350.9	2,254.5	1,717.6	1,744.2	1,692.6	1,941.3	1,963.6	1,940.5	1,992.6	2,125.2
18	2,498.0	2,349.3	2,350.1	2,237.0	1,712.5	1,739.0	1,697.1	1,949.6	1,959.4	1,936.4	1,991.1	2,127.4
19	2,488.9	2,352.5	2,349.3	2,218.8	1,717.6	1,733.2	1,700.9	1,955.2	1,955.2	1,928.0	1,991.8	2,132.5
20	2,479.1	2,355.7	2,349.3	2,199.3	1,724.8	1,727.3	1,704.1	1,960.8	1,948.9	1,928.0	1,990.0	2,135.4
21	2,470.0	2,358.8	2,348.5	2,178.3	1,725.4	1,720.9	1,707.3	1,965.0	1,944.0	1,929.4	2,005.3	2,135.4
22	2,461.0	2,362.0	2,347.8	2,157.6	1,742.9	1,713.8	1,709.9	1,970.0	1,937.8	1,932.2	2,012.4	2,137.6
23	2,452.0	2,365.2	2,346.2	2,135.4	1,750.1	1,706.7	1,712.5	1,974.9	1,930.8	1,937.8	2,018.8	2,140.6
24	2,442.3	2,367.5	2,343.8	2,113.4	1,754.7	1,701.6	1,707.3	1,979.1	1,924.5	1,940.5	2,024.5	2,143.5
25	2,431.7	2,369.1	2,342.2	2,091.6	1,758.7	1,697.1	1,704.1	1,981.2	1,920.4	1,941.2	2,030.3	2,146.5
26	2,420.4	2,371.5	2,342.2	2,066.2	1,766.6	1,692.0	1,702.2	1,984.8	1,925.9	1,942.6	2,036.7	2,149.4
27	2,409.1	2,374.7	2,346.2	2,042.4	1,770.5	1,686.2	1,695.2	1,987.6	1,927.3	1,951.7	2,041.0	2,153.9
28	2,398.7	2,377.1	2,350.1	2,019.5	1,817.2	1,680.5	1,689.4	1,986.9	1,928.7	1,958.0	2,044.6	2,158.3
29	2,389.1	2,373.1	2,353.3	1,996.8	1,842.9	1,674.8	1,682.4	1,986.2	1,935.0	1,959.4	2,048.9	2,162.7
30	2,380.3		2,357.2	1,973.5	1,845.6	1,668.5	1,673.6	1,984.8	1,955.2	1,960.8	2,053.2	2,167.2
31	2,373.1		2,361.2		1,846.9		1,664.7	1,984.1	1,952.4	1,962.9		2,170.9

Month	1980							Period 1954-1980		
	MOMENTARY MAXIMUM			MOMENTARY MINIMUM			Average Storage	Mean Monthly Storage		
	Elevation	Storage	Day	Elevation	Storage	Day		Average	Maximum	Minimum
Jan.	299.65	2,535.5	7	297.66	2,373.1	31	2,485.0	2,205.7	3,070.8	218.7
Feb.	297.71	2,377.1	28	297.09	2,328.1	11	2,351.7	2,096.0	3,009.6	156.2
Mar.	297.66	2,373.1	1	297.27	2,342.2	125	2,356.0	2,066.8	2,990.8	226.7
Apr.	297.71	2,377.1	4	292.30	1,973.5	30	2,238.2	1,965.3	2,954.6	325.6
May	292.30	1,973.5	1	288.44	1,712.5	18	1,790.7	1,835.2	2,869.9	490.1
June	290.47	1,846.9	!	287.75	1,668.5	30	1,757.3	1,756.0	2,789.1	273.7
July	288.44	1,712.5	23	287.54	1,655.3	2	1,683.1	1,851.8	2,685.9	209.9
Aug.	292.50	1,987.6	27	286.24	1,575.3	8	1,820.5	1,840.3	2,771.4	208.0
Sept.	292.52	1,989.0	!	291.54	1,920.4	25	1,963.2	1,945.0	2,871.1	256.2
Oct.	292.52	1,989.0	6	291.65	1,928.0	119	1,959.4	2,191.5	3,250.2	308.3
Nov.	293.42	2,053.2	30	292.15	1,962.9	1	1,997.6	2,262.8	3,124.5	390.9
Dec.	295.03	2,170.9	31	293.42	2,053.2	1	2,119.5	2,292.3	3,129.7	343.4
Yearly	299.65	2,535.5		286.24	1,575.3		2,042.4	2,025.8	2,764.2	544.3

\* When necessary, the Commission may set temporary conservation levels

! And other days

## QUALITY OF WATER - 1980

## Rio Grande at El Paso, Texas

LOCATION: At gaging station on Courchesne Bridge at river mile 1,255.7 (2,020.8 km); 5.5 river miles (8.9 km) upstream from Paso del Norte Bridge between El Paso, Texas and Cd. Juarez, Chihuahua.

RECORDS: Chemical analyses, February 1930 through 1980; biochemical analyses, September 1943 through 1972 and February 1976 through 1980; specific conductance 1930 through 1932 and 1937 through 1980; suspended silt, 1947 through 1976.

REMARKS: Sampling by International Boundary and Water Commission; chemical analyses by U.S. Geological Survey, biochemical analyses by Waste Water Treatment Plant Laboratory; specific conductance and silt determinations by International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by U. S. Geological Survey.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 15	0900	58.5	2,560	8.0	8.0	500	230	140	37
Feb. 12	1130	86.6	2,120	7.9	9.0	450	190	130	30
Mar. 19	0840	541	941	7.9	11.5	220	59	68	13
Apr. 18	0855	627	982	7.9	15.0	260	84	78	15
May 21	0925	682	867	7.9	23.0	230	56	70	13
June 19	1010	865	875	7.7	22.0	230	56	70	13
July 16	1300	774	961	8.1	27.0	250	64	75	14
Aug. 15	0926	1,180	890	7.7	24.0	250	75	75	14
Sep. 16	1257	529	1,320	7.8	25.5	310	100	94	19
Oct. 15	0820	160	2,140	8.4	17.0	480	220	140	31
Nov. 18	0740	129	2,260	8.1	15.0	500	230	150	31
Dec. 18	0915	124	2,380	8.2	7.0	510	220	150	33

Samples taken at American Dam

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 15	380	7.4	12	330	0	620	330	33	1,710
Feb. 12	290	6.0	11	310	0	460	240	26	340
Mar. 19	100	2.9	6.2	200	0	170	81	18	554
Apr. 18	110	3.0	7.3	210	0	190	88	20	612
May 21	96	2.8	7.4	210	0	160	66	19	535
June 19	92	2.7	7.0	210	0	160	66	19	531
July 16	110	3.1	7.6	220	0	190	77	21	603
Aug. 15	96	2.7	7.5	210	0	200	78	21	594
Sep. 16	160	3.9	9.5	260	0	280	120	23	854
Oct. 15	280	5.6	11	320	0	500	250	27	1,400
Nov. 18	320	6.2	15	330	0	520	270	29	1,500
Dec. 18	350	6.7	11	350	0	530	290	28	1,570

Samples taken at American Dam

1980	Temper- ature	Oxygen, Dissolved (DO)	pH	Coli- form, Fecal	Oxygen Demand, Bio- Chemical (BOD)	1980	Temper- ature	Oxygen Dissolved (DO)	pH	Coli- form, Fecal	Oxygen Demand, Bio- Chemical (BOD)
Date	Deg C	mg/L	Units	Colonies /100 mL	mg/L	Date	Deg C	mg/L	Units	Colonies /100 mL	mg/L
Jan. 1	7.2	9.2	8.1	160	3	July 1		8.2	8.2		180
8	10.0	9.6	8.1	200	5	8		8.2	8.2		
15	11.1	8.8	7.3	260	4	15		6.6	7.1	750	2
22	10.0	8.8	7.9	400	12	22	22.8		8.2	460	6
29	10.6	8.6	7.9		8	29		7.0	8.3	2,000	9
Feb. 5	10.0	9.0	8.1	680	4	Aug. 12		5.0	8.3	530	12
12	5.6	10.0	7.9	360	7	19		5.4	8.1	1,260	14
19	10.6	9.2	8.0	440	4	26	23.9	6.9	8.3	740	2
26	9.4	9.0	8.2	727	11	Sept. 2	22.2	5.2	8.3	740	25
Mar. 4	10.0	8.6	7.6	4,327	4	9					
11	10.0		7.8	9,434		16	10	8.0	8.1	580	3
18	12.2	9.6	7.9	1,330		23	18.9	8.7	8.2	950	99
25	7.8	8.8	8.1	820	3	30	21.1	10.0	8.2	2,800	11
Apr. 4	12.2	8.0	8.2	100	5.5	Oct. 7	17.8		8.0	700	
8	13.9	8.1	8.2	220	4.2	14					
15	13.9	8.0	8.1	480	5.7	21	12.8		8.2	1,020	
22	17.8	7.6	8.2	345	3.6	28	10.0	8.4	8.2		3
29	20	7.4	7.7	170	2.8	Nov. 4	13.9	8.8	8.2	740	4
May 6	19.4	2.8	8.2	155		13	13.9	10.4	8.1	920	4
13	21.1	7.8	8.1	185	3	18	6.1	11.2	7.0	290	
20	20	6.8	8.1	270	2	25	8.9	9.6	8.1	440	3
27	20	7.0	8.0	250	4	Dec. 2	11.1	9.9		180	
June 3	22.8	7.0	8.3	120	3	16	7.8	9.8		280	2
10	21.1	6.5	8.3	250	3	22	6.1	10.0		100	2
17			8.0	120		30	7.8	10.2		370	
24		6.8	8.3	700	3						

**QUALITY OF WATER - 1980**

**Rio Grande at El Paso, Texas**

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		1,380		768	908		787	914		1,990		2,310
2	2,400			817	1,010	786	800			1,990		2,200
3	2,400		790	876		921	878	849		1,900	2,240	
4	2,420	1,490	782	917		810			1,200		2,090	2,270
5		1,500	801		789	918			1,210		2,240	2,320
6		1,510	812			932		852	1,220	2,010		
7	2,460		937		930	1,020	811	899	1,220		2,120	
8	2,430	1,610		1,030			911	935		1,910		
9	2,340			1,110	1,050	829	908	905		2,110		
10	2,440		792	815		818	911	921		2,120		
11	2,500	1,860	766	812		827	911	895	1,210			
12		2,100	772		907	838		950	1,220		2,230	
13		2,080	797		870	812		843	1,320		2,140	
14	2,490	2,290	878	780	939		925	797	1,530		2,180	
15		2,300		834	922		928	880		2,130		2,250
16			874	841	943	853	874	1,380	1,540	2,140		2,270
17	2,410		909	903		866	874	1,460	1,540	2,140	2,180	
18	2,560		926	931		877	870		1,570		2,150	2,380
19		2,150	891		875	817	872		1,640		2,170	2,400
20		2,210			861	815		1,460		2,100	2,100	
21	2,260	2,270	894	960	900			1,460			2,000	2,390
22	1,190	2,220		941	921			1,470	1,840	2,050		2,360
23	1,010			1,030	894	815	891	1,300	1,900	2,150	2,230	2,450
24	999		907	1,030		812	984	1,160	1,910	2,170	2,210	
25		1,900	899	1,020		842	872		1,890			
26		1,470	901			880	872		1,790		2,210	
27		1,380	924		885	848	871	1,160		2,120		
28	1,310	1,440	870	935	890			1,170		2,070	2,230	
29	1,320	1,000		935	890				1,780	2,200		2,400
30	1,320			934	858	794	871	1,200	1,900	2,140		2,470
31	1,400		788				877	1,210		2,060		2,460

Samples taken at American Dam

**Rio Grande at Riverside Canal Heading near El Paso, Texas  
and Cd. Juarez, Chihuahua**

LOCATION: At river mile 1,237.3 (1,991.2 km), 9.5 miles (15.3 km) downstream from the Haskell R. Street Waste Water Treatment Plant and 16.7 river miles (26.8 km) downstream from the American Dam at El Paso, Texas.

RECORDS: Biochemical analyses, February 1976 through 1980. Samples also collected quarterly by the Texas Department of Water Resources one mile upstream at Yaleta-Zaragoza Bridge, 1937 through 1972 and May 1975 through 1980.

REMARKS: Sampling by International Boundary and Water Commission. Analyses by the Waste Water Treatment Plant Laboratory in El Paso.

1980	Temperature	Oxygen, Dissolved (DO)	pH	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD)	1980	Temperature	Oxygen Dissolved (DO)	pH	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD)
Date	Deg C	mg/L	Units	Colonies /100 mL	mg/L	Date	Deg C	mg/L	Units	Colonies /100 mL	mg/L
Jan. 3	8.9	5.8	7.9	290,500	26	July 1	24	7.6	7.6		40
8	10.0	5.4	8.0	0	23	8	26.5	5.4	8.2		3
15	11.7	5.8	7.5	1,950	29	15	27.5	6.8	6.4	160	34
22	11.1	6.2	7.8	6,000	19	22			8.2	155,000	
29	12.8	6.8	7.9		16	29	26	5.2	8.2	4,600	25
Feb. 5	11.1	6.2	7.8	1,410	12	Aug. 12	24	4.6	8.3	140,000	14
12	8.9	7.8	7.6	95	27	19		4.4	8.0	20,000	44
19	12.8	4.4	7.6	850	25	26	26.1	6.7	8.0	80,000	6
26	11.1	5.9	7.5	20,000	29	Sept. 2	23.9	5.4	7.9	10,400	18
Mar. 4	13.3	7.4	7.5	100	21	9					
11	11.1		7.8	4,550	6	16	10.0	7.4	7.9	2,000	6
18	12.2	7.0	7.9	4,950		23	21.1	8.4	7.7	254,000	16
25	12.2	7.4	8.0	0	12	30	23.9	10.0	8.0	3,200	10
Apr. 4	14.4	6.0	8.0	2,600	11	Oct. 7	20		7.6	2,300	
8	17.2	6.2	8.0	240	11	14					
15	17.8	7.0	7.9	2,000	8.6	21	13.9	9.0	7.6	6,200	5
22	20.0	5.0	7.9	500	10	28	11.1		7.6		6
29	21.1	4.8	7.7	400	7.2	Nov. 4	15	8.7	7.7	265	
May 6	21.1	1.2	7.9	9,400		13	15	10.0	7.1	70	7
13	17.8	5.6	8.0	700	9	Nov. 18	7.2	9.6	6.8	130	
20	24.4	5.0	7.9	620	8	25	8.9	9.8	7.6	20	5
27	22.2	4.5	7.8	900	10	Dec. 2	12.2	17.4	7.5	40	6
June 3	23.9	5.4	8.1	3,800	5	16	10	9.8	7.5	195	7
10	21.1	5.2	8.1	1,270	10	22	8.9	10.0	7.6	0	2
17	27.8	5.4	8.0	400	10	30	10	10.4	8.0	50	7
24		5.2	8.1	1,470	6						



## QUALITY OF WATER - 1980

## Rio Grande above Rio Conchos near Presidio, Texas and Ojinaga, Chihuahua

LOCATION: Gaging station at river mile 966.4 (1,555.3 km); 5.1 river miles (10.5 km) upstream from the Rio Conchos.

RECORDS: Chemical analyses, February 1933 through 1980; specific conductance, 1931; 1935 through 1980.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; determinations for specific conductance by International Boundary and Water Commission. Results of biochemical analyses by Texas Department of Water Resources, November 1977 through 1980, available on request.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Foot	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 15	1010	22.4	4,350	7.6	10.5	750	570	200	61
Feb. 22	1125	15.5	4,570	7.5	13.0	820	640	220	66
Mar. 10	1545	10.6	5,110	7.8	16.5	960	770	260	76
Apr. 15	0930	30.7	1,380	7.9	14.0	280	120	87	16
May 20	1345	14.5	1,270	7.7	26.0	270	120	81	17
June 19	1545	3.9	1,780	7.4	34.0	340	190	100	22
July 17	1040	13.8	1,330	7.7	25.5	270	130	82	17
Aug. 25	0755	7.4	1,680	7.5	27.0	370	210	120	17
Sep. 16	1015	7.8	1,190	7.7	25.0	240	78	81	10
Oct. 20	1220	106	2,640	7.8	15.5	510	340	160	28
Nov. 19	1045	55.4	4,270	7.8	7.0	750	530	210	54
Dec. 15	1145	76.3	4,240	8.1	10.0	720	490	200	54

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 15	670	11	13	220	0	840	860	8.1	2,760
Feb. 22	680	10	15	220	0	890	900	12	2,890
Mar. 10	760	11	14	240	0	920	1,100	13	3,260
Apr. 15	170	4.4	7.7	200	0	410	83	28	900
May 20	170	4.5	7.8	190	0	370	64	31	834
June 19	250	5.9	9.6	180	0	460	180	29	1,140
July 17	170	4.5	8.5	180	0	390	81	26	863
Aug. 25	210	4.8	9.2	200	0	430	170	18	1,070
Sep. 16	150	4.2	8.1	180	0	280	120	17	748
Oct. 20	350	6.7	11	210	0	510	450	11	1,620
Nov. 19	640	10	18	270	0	760	800	11	2,630
Dec. 15	640	10	12	280	0	730	800	6.1	2,580

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	March	April	June	August	September	November
3 5,060	4 4,940	28 1,340	17 1,690	8 1,620	22 1,250	10 4,500
7 4,450	10 5,020	May	23 1,730	12 819	29 1,170	18 4,180
15 4,320	18 3,020	2 1,420	30 1,860	14 764	October	24 4,310
22 4,370	26 3,150	5 1,430	July	15 762	2 1,290	December
28 4,680	31 1,450	20 1,240	7 1,430	18 775	6 1,330	2 4,560
February	April	28 1,280	15 1,340	25 1,690	15 2,500	8 4,420
4 4,700	2 1,670	June	21 1,370	September	20 2,630	16 4,260
11 4,520	8 1,350	3 1,360	28 1,390	3 2,340	27 3,570	19 4,420
19 4,670	15 1,360	9 1,410	August	8 1,330	November	22 4,390
25 5,090	22 1,370		4 1,140	16 1,200	4 4,540	29 4,330

## QUALITY OF WATER - 1980

## Rio Conchos near Ojinaga, Chihuahua

LOCATION: At gaging station, 1.5 river miles (2.5 km) from the confluence with the Rio Grande, which is located at river mile 961.4 (1,547.2 km).

RECORDS: Chemical analyses, February 1935 through 1980; suspended silt, 1956 through 1979, specific conductance 1935 through 1980.

REMARKS: Sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission; chemical analyses by the U. S. Geological Survey.

1980 Date	Time Standard	Streamflow, Momentary Second-Feet	Specific Conductance Micromhos	pH Units	Temper- ature Deg C	Hardness, Total (as CaCO <sub>3</sub> ) mg/L	Hardness, Noncarbonate (as CaCO <sub>3</sub> ) mg/L	Calcium ion (Ca), Dissolved mg/L	Magnesium ion (Mg), Dissolved mg/L
Jan. 15	0900	283	1,440	7.9	12.0	350	170	110	18
Feb. 22	1115	275	1,480	7.9	16.5	350	180	110	19
Mar. 10	1500	717	1,620	8.0	18.0	360	180	110	20
Apr. 15	0900	675	1,290	7.9	14.5	290	120	91	16
May 20	1440	1,280	1,240	7.8	24.0	280	110	84	16
June 19	1530	88.3	1,840	7.5	32.0	420	240	130	23
July 17	0745	371	1,320	8.1	27.0	280	130	84	17
Aug. 22	1505	1,120	1,340	7.8	28.0	620	540	230	11
Sep. 16	1250	1,880	1,250	7.9	27.0	250	110	76	15
Oct. 21	1430	579	1,410	8.1	18.5	350	190	110	18
Nov. 19	1105	526	1,360	8.2	9.0	340	150	110	17
Dec. 15	1400	305	1,630	8.1	14.5	350	170	110	18

1980 Date	Sodium ion (Na), Dissolved mg/L	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved mg/L	Bicar- bonate ion (HCO <sub>3</sub> ) mg/L	Car- bonate ion (CO <sub>3</sub> ) mg/L	Sulfate ion (SO <sub>4</sub> ), Dissolved mg/L	Chloride ion (Cl), Dissolved mg/L	Silica (SiO <sub>2</sub> ), Dissolved mg/L	Solids Dissolved (Calculated) mg/L
Jan. 15	180	4.2	6.8	220	0	390	120	27	960
Feb. 22	180	4.2	8.5	210	0	410	120	27	978
Mar. 10	210	4.8	7.7	210	0	410	160	30	1,050
Apr. 15	160	4.1	7.3	210	0	370	71	31	850
May 20	160	4.2	7.4	200	0	350	61	33	810
June 19	230	4.9	8.9	220	0	500	170	29	1,200
July 17	170	4.4	8.3	180	0	390	80	28	865
Aug. 22	61	1.1	6.9	100	0	590	41	15	1,000
Sep. 16	160	4.4	8.2	170	0	390	56	34	803
Oct. 21	170	4.0	6.8	200	0	420	100	28	949
Nov. 19	160	3.8	8.2	230	0	350	110	29	898
Dec. 15	210	4.9	6.0	220	0	360	200	25	1,040

## QUALITY OF WATER - 1980

## Rio Conchos near Ojinaga, Chihuahua

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	May	July	September	October
17 1,430	25 1,430	3 1,280	26 1,230	3 1,350	2 1,410	9 1,140
21 1,380	28 1,320	7 1,250	29 1,310	7 1,340	4 1,330	13 1,310
24 1,420	March	11 1,200	June	10 1,340	5 1,300	16 1,370
28 1,320	3 1,330	14 1,270	3 1,380	14 1,310	8 1,240	21 1,380
31 1,410	6 1,350	28 1,280	5 1,420	18 1,320	11 1,230	25 1,390
February	10 1,150	May	9 1,180	31 1,430	12 1,220	29 1,390
6 1,310	13 1,150	1 1,230	12 1,620	August	15 1,250	December
7 1,310	17 1,150	5 1,230	16 1,650	4 1,550	18 1,320	11 1,480
11 1,380	20 1,270	8 1,220	19 1,810	7 1,540	22 1,490	15 1,460
14 1,330	24 1,270	12 1,220	23 1,840	12 1,170	October	18 1,340
18 1,400	27 1,150	15 1,170	26 1,780	13 1,050	3 1,120	22 1,320
21 1,330	31 1,260	19 1,210	30 1,910	15 1,210	6 1,080	25 1,250
		22 1,260		29 1,580		29 1,300

## Rio Grande below Rio Conchos near Presidio, Texas and Ojinaga, Chihuahua

LOCATION: Gaging station at river mile 949.8 (1,258.5 km); 0.4 river mile (0.6 km) downstream from Alamito Creek and 11.6 river miles (18.7 km) downstream from the Rio Conchos.

RECORDS: Specific conductance, 1956 through 1980.

REMARKS: Sampling and determinations for specific conductance by the International Boundary and Water Commission. Results of biochemical analyses by Texas Department of Water Resources, November 1977 through 1980, available on request.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	March	May	June	August	September	November
3 1,610	4 1,710	2 1,370	23 2,250	12 1,160	22 1,570	4 1,740
7 1,660	10 1,340	5 1,230	30 2,660	12 1,160	25 739	10 1,710
15 1,680	12 1,220	13 1,250	July	13 966	28 727	18 1,780
22 1,690	18 1,330	20 1,250	2 2,100	14 599	30 880	24 1,810
28 1,670	31 1,250	28 1,280	7 1,480	15 983	October	December
February	April	June	16 1,400	18 935	2 1,110	2 2,040
4 1,760	2 1,330	3 1,580	21 1,530	September	6 1,150	9 2,310
11 1,660	8 1,320	9 1,060	28 1,530	3 1,530	15 1,490	16 1,830
19 1,710	15 1,260	11 1,820	August	8 1,260	20 1,620	18 1,780
25 1,680	22 1,320	17 2,030	4 1,570	12 1,250	28 1,690	22 1,710
	28 1,330		11 1,720	16 1,250		29 1,750

## QUALITY OF WATER - 1980

## Rio Grande at Foster Ranch near Langtry, Texas and Rancho Santa Rosa, Coahuila

LOCATION: Gaging station at river mile 657.5 (1,058.2 km), about 12.3 miles (19.8 km) west of Langtry, Texas.

RECORDS: Chemical analyses, March 1969 through 1970 and October 1974 through 1980; biochemical, October 1974 through 1980; suspended silt 1969 through 1980; specific conductance, 1969 through 1980.

REMARKS: Sampling and analyses by U. S. Geological Survey; sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1980	Time	Stream-flow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg)	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Jan. 9	1145	652	1,320	7.1	12.0	320	140	94	21	140	3.4	3.2
Feb. 6	1245	572	1,280	7.1	14.0	320	190	91	22	140	3.4	5.7
Mar. 12	1150	569	1,240	7.4	20.0	330	160	91	24	150	3.6	6.1
Apr. 9	1310	840	1,210	7.6	20.0	290	120	82	20	140	3.6	6.6
May 7	1045	1,110	1,270	7.8	24.0	280	140	81	20	150	3.9	6.9
June 11	1330	1,950	1,140	7.8	28.0	310	190	89	21	150	3.7	7.7
July 23	1100	533	1,260	7.5	29.0	330	200	91	24	160	3.9	7.4
Aug.												
Sep. 10	1400	2,990	1,010	7.5	28.0	250	160	86	9.5	99	2.7	6.3
Oct. 8	1215	2,810	1,078	7.2	24.0	270	120	87	12	130	3.5	6.7
Nov. 5	1305	971	1,320	7.4	21.0	330	180	99	20	150	3.6	7.8
Dec. 3	1340	883	1,270	7.8	14.0	330	230	96	21	160	3.9	7.7

1980	Bicarbonate ion (HCO <sub>3</sub> )	Carbonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Oxygen, Dissolved (DO)	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD) 5 day	Turbidity	Solids, Dissolved (Calculated)	Solids, Dissolved (Residue @ 180 Deg C)	Suspended Sediment
Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Cols./100 mL	mg/L	NTU	mg/L	mg/L	mg/L
Jan. 9	220	0	300	120	21	10.2	20	2.4	6.6	813	821	46
Feb. 6	160	0	320	110	22	11.5	17	1.2	9.3	795	740	90
Mar. 12	200	0	330	110	23	9.5	24	1.0	11	837	829	86
Apr. 9	200	0	330	74	27	11.4	47	1.3	40	784	790	112
May 7	200	0	330	77	27	9.6	640	1.7	120	781	802	251
June 11	170	0	360	87	31	8.4	500	2.7	300	823	839	1,010
July 23	180	0	390	110	25	10.6	440	1.8	96	889	913	243
Aug.												
Sep. 10	120	0	290	63	19	7.8	8,400		630	644	674	5,010
Oct. 8			280	50	26	8.3	8,000	3.5	5.3	691	660	
Nov. 5			330	120	25	8.5	8,400	1.6	47	844	855	
Dec. 3			330	130	24	8.4	140	2.9	46	833	877	

## SUSPENDED SILT - 1980

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons/Ac.Ft.	Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	51,797,000	1,570	31	0.003040			1.1	5.7	34.9	0.61
Feb.	44,582,000	2,250	29	.005080			1.6	3.9	17.8	.57
Mar.	62,372,000	5,710	28	.009160			3.9	9.9	49.2	.72
Apr.	68,769,000	3,950	29	.005760			2.7	10.3	26.9	.22
May	111,932,000	52,200	27	.04654	0.3460	0.02500	36.0	142	792	.60
June	54,367,000	31,200	29	.05740	.8305	.008500	21.5	324	1,570	21.5
July	32,442,000	3,090	30	.009520			2.1	445	875	2.1
Aug.	317,566,000	1,423,000	29	.4482	2.5638	.01840	980	638	1,320	21.8
Sept.	298,565,000	2,427,000	30	.8129	1.9191	.02540	1,670	807	1,670	13.4
Oct.	214,639,000	730,000	31	.3403	2.3727	.01470	503	365	1,590	1.1
Nov.	75,986,000	5,810	25	.007540			4.0	163	1,760	.76
Dec.	71,588,000	2,290	30	.003200			1.6	8.2	19.6	.62
Year	1,404,605,000	4,688,090	348	0.3338	2.5638		3,227.5	2,922.0	7,763.5	954.9

## QUALITY OF WATER - 1980

## Rio Grande at Foster Ranch near Langtry, Texas and Rancho Santa Rosa, Coahuila

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,270	1,180	1,160	1,170		1,140	964	1,080	818	735	1,260	1,340
2	1,280	1,220	1,200	1,180		1,140	858	1,070	863	733		1,340
3	1,300	1,210	1,230	1,140		1,110	935	1,070	954	819		1,340
4	1,320	1,200	1,220	1,140	495	1,110	948	1,080	1,030	871		1,330
5	1,310	1,210	1,210	1,140		1,110	934	1,100	1,190	1,010	1,320	1,330
6	1,280	1,180		1,160	1,130	1,110	948	1,090	1,360	1,070	1,330	1,340
7	1,290	1,200	1,210	1,170	1,170	1,080		1,090	1,110	1,080	1,320	1,330
8	1,280	1,200	1,240	1,170	1,150	1,110	819	1,000	1,020	1,070	1,320	1,320
9	1,270	1,220	1,250	1,170	1,250	1,100	886	1,010	1,410	1,080	1,310	1,330
10	1,290	1,220	1,240	1,160	1,300	1,090	914	1,200	1,160	1,070	1,320	1,310
11	1,270	1,210	1,240	1,170	1,240	1,260	907		1,010	1,080	1,310	1,320
12	1,250	1,210	1,250	1,170	1,180	1,000	920	337	767	1,100	1,300	1,340
13	1,290	1,190	1,240	1,180	1,140	1,250	926	430	691	1,100	1,310	1,330
14	1,250	1,200	1,270	1,160	1,140		920	433	926	1,080	1,310	1,320
15	1,230	1,190	1,230	1,180	1,130	746	927	1,180	802	957	1,320	1,330
16	1,220	1,200	1,400	1,140	1,140	826	989	842	1,110	1,070	1,300	1,320
17	1,250	1,180		1,160	1,140	854	1,070	751	1,160	1,070	1,310	1,310
18	1,250	1,190	1,440	1,170	1,140	761	1,100	789	1,160	1,070	1,330	1,300
19	1,240	1,200		1,160	1,150	752	1,220	743	1,160	1,080	1,300	1,280
20	1,280	1,190	1,230	1,170	1,170	815	1,310	978	1,160	1,120	1,340	1,290
21	1,260	1,180	1,210	1,160	1,160	909	1,380	859	1,150	1,130	1,320	1,280
22	1,280	1,220	1,210	1,160	1,160	834	1,420	886	1,140	1,170	1,340	1,320
23	1,260	1,200	1,190	1,190	1,150	880	1,290	736	1,130	1,190	1,350	1,350
24	1,230	1,230	1,180		1,080	1,060	1,210	1,040	1,120	1,210	1,350	1,450
25	1,220	1,230	1,170	1,140	1,120	1,090	1,210	839	1,100	1,260	1,350	
26	1,240	1,240	1,180	1,140	1,150	1,000	1,180	848	819	1,300	1,340	1,580
27	1,250	1,220	1,150	1,160	1,160	1,020	1,160		945	1,310		1,640
28	1,230	1,200	1,120	1,160	1,150	1,090	1,140	857	541	1,310	1,330	1,520
29	1,250	1,210	1,180	1,170	1,150	1,130	1,130	804	753	1,310		1,500
30	1,220		1,190	1,170	1,150	1,040	1,120	778	714	1,300	1,330	1,450
31	1,210		1,190		1,130		1,090	783		1,260		1,410

## QUALITY OF WATER - 1980

## Pecos River near Langtry, Texas

LOCATION: At gaging station, 15.0 river miles (24.1 km) from the confluence with the Rio Grande, which is located at river mile 616.0 (991.4 km).

RECORDS: Chemical analyses, 1967 through 1980; biochemical analyses, October 1974 through 1980; suspended silt, November 1954 through 1976; specific conductance, 1969 through 1980.

REMARKS: Sampling and analyses by U. S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1980	Time	Stream-flow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg)	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Jan. 9	0940	182	3,640	7.3	11.0	720	540	160	79	500	8.1	3.7
Feb. 6	0950	179	3,760	7.4	12.0	750	640	170	79	500	7.9	8.1
Mar. 12	1010	173	3,980	7.4	20.0	800	660	180	84	570	8.8	9.4
Apr. 9	1005	144	4,130	7.8	21.0	820	690	180	89	550	8.4	9.5
May 7	0815	153	4,200	7.7	25.0	700	590	160	73	500	8.0	9.1
June 11	0940	117	3,020	7.8	28.0	620	510	140	66	460	8.0	8.6
July 23	0830	99.9	2,700	7.4	28.0	520	420	110	59	390	7.5	7.5
Aug. 13	0900	579	665	8.2	25.0	170	81	52	10	64	2.1	4.7
Sep. 10	0925	144	2,580	7.7		480	370	110	50	330	6.6	8.1
Oct. 8	0945	403	2,680	7.3	23.0	550	390	130	54	360	6.7	8.0
Nov. 5	0950	237	2,890	8.4	19.0	590	440	140	58	370	6.6	9.3
Dec. 3	0940	237	4,360	7.7	13.5	940	830	220	94	670	9.5	15

1980	Bicarbonate ion (HCO <sub>3</sub> )	Carbonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Oxygen, Dissolved (DO)	Coliform, Fecal	Oxygen Demand, Biochemical (BOD) 5 day	Turbidity	Solids, Dissolved (Calculated)	Solids, Dissolved (Residue @ 180 Deg C)	Suspended Sediment	
Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Cols./100 mL	mg/L	NTU	mg/L	mg/L	mg/L	
Jan. 9	220	0	450	790	14	10.1	13	2.1	0.50	2,110	2,160	6	
Feb. 6	140	0	500	890	15	11.0	15	.8	.90	2,240	2,320	17	
Mar. 12	170	0	570	990	11	10.4	15	.5	1.6	2,500	2,560	14	
Apr. 9	150	0	560	1,000	12	11.0	24	1.2	1.2	2,480	2,530	14	
May 7	150	0	470	840		10.8	26	1.8	2.4		2,220	15	
June 11	140	0	400	770	11	10.3	28	2.0	.80	1,920	2,020	9	
July 23	130	0	360	660	8.1	10.0	24	1.6	1.0	1,650	1,780	16	
Aug. 13	110	0	70	110	8.3	8.2	110	2.4	21	382	401	41	
Sep. 10	150	0	290	540	12	7.8	23			3.0	1,410	1,490	20
Oct. 8			310	630	15	8.2	33	2.0	.40	1,610	1,660		
Nov. 5			330	630	14	8.3	35	2.7	1.5	1,650	1,730		
Dec. 3			620	1,200	11	8.2	13	2.5	.60	2,900	2,940		

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	June	July	September	November
7 3,450	19 3,860	7 4,100	2 1,490	21 2,910	8 2,520	17 3,630
14 3,480	25 4,030	14 4,070	9 3,280	28 2,740	15 2,550	24 4,140
21 3,560	March	21 4,010	16 3,230	August	22 2,860	December
28 3,560	3 4,110	28 3,900	23 3,190	4 2,780	29 1,520	1 4,570
February	10 4,120	May	30 3,240	18 1,890	October	15 5,160
4 3,640	17 4,120	5 3,770	July	25 2,300	6 2,620	22 5,350
11 3,770	24 4,180	12 3,750	7 3,070	September	14 2,720	29 5,570
	31 4,070	27 3,630	14 2,980	2 2,570	20 3,130	

## QUALITY OF WATER - 1980

## Devils River at Pafford Crossing near Comstock, Texas

LOCATION: At gaging station 25.5 river miles (41.0 km) from the confluence with the Rio Grande, which is located at river mile 574.6 (924.7 km).

RECORDS: Specific conductance, 1968 through 1980.

REMARKS: Sampling and determinations for specific conductance by the U. S. Geological Survey. Sampling prior to 1978 by the International Boundary and Water Commission. Chemical and biochemical analyses, 1978 through 1980 available from U. S. Geological Survey.

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	399	380	372	366	365	338	330	333	353	370	397	395
2	366	362	355	364	354	331	317	330	359	384	423	392
3	374	387	368	362	346	333	327	332	363	393	413	391
4	377	370	378	365	345	332	331	330	352	397	396	393
5	379	361	357	350	340	331	336	331	340	397	387	394
6	382	396	366	360	337	331	333	329	335	393	437	391
7	380	370	374	369	334	334	331	334	331	391	426	386
8	384	380	388	373	343	336	328	337	328	389	436	382
9	385	374	364	368	357	338	326	339	342	387	432	384
10	388	366	384	367	350	333	346	341	340	385	433	387
11	390	353	387	373	342	337	340	342	336	404	439	389
12	393	367	386	360	331	343	337	364	337	383	455	390
13	397	372	375	363	347	347	335	367	344	427	445	391
14	399	380	380	366	343	343	333	365	334	416	441	392
15	394	383	360	378	339	339	331	366	340	380	468	391
16	396	347	368	379	337	336	336	363	349	379	432	389
17	397	364	377	369	358	338	338	360	351	378	452	390
18	393	381	356	360	355	342	340	358	355	376	459	389
19	388	397	372	377	350	337	339	346	347	383	443	389
20	386	394	378	370	348	334	341	343	343	388	434	393
21	391	389	380	362	347	335	343	340	346	387	467	396
22	389	386	377	360	344	334	334	342	347	389	458	397
23	395	390	370	365	353	333	351	341	348	387	451	399
24	401	392	372	366	352	340	343	340	350	385	462	398
25	394	380	377	353	353	350	344	339	183	387	448	397
26	400	375	374	357	352	357	345	342	250	390	436	397
27	398	371	373	360	352	349	348	344	265	394	453	397
28	396	389	376	362	356	341	350	346	289	413	435	394
29	399	390	379	359	347	343	352	348	335	390	398	390
30	405		377	373	348	342	366	349	358	396	396	389
31	400		372		346		345	351		398		390

## QUALITY OF WATER - 1980

## Rio Grande below Amistad Dam near Cd. Acuna, Coahuila and Del Rio, Texas

LOCATION: Gaging station at river mile 571.8 (920.3 km), 2.2 river miles (3.4 km) downstream from Amistad Dam.  
 RECORDS: Chemical analyses, July 1968 through 1980; suspended silt, 1969 through 1976; specific conductance, 1968 through 1980.

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission, analyses by the U. S. Geological Survey. Sampling and determinations for specific conductance by the International Boundary and Water Commission.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 16	0820	2,320	1,010	8.0	12.0	270	140	77	18
Feb. 20	0815	2,370	1,020	7.9	10.5	280	150	79	19
Mar. 19	0825	3,200	1,020	8.1	12.0	260	130	76	18
Apr. 16	0823	1,240	1,030	8.0	15.5	260	130	76	18
May 27	1119	3,990	1,040	8.2	23.0	270	140	77	19
June 18	0720	4,060	1,050	7.6	25.0	270	150	76	20
July 16	0725	7,840	1,080	8.2	26.0	270	150	76	20
Aug. 20	0720	2,030	1,050	8.0	27.0	260	150	73	19
Sep. 17	0720	2,070	996	7.8	25.5	250	130	69	18
Oct. 15	0740	2,070	986	8.1	24.0	250	140	71	18
Nov. 19	0830	1,990	982	8.2	16.0	240	120	70	17
Dec. 19	0820	1,990	984	7.9		250	130	72	17

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 16	110	2.9	5.1	150	0	240	110	17	651
Feb. 20	100	2.6	5.8	150	0	230	110	16	634
Mar. 19	110	2.9	5.1	160	0	220	100	16	624
Apr. 16	110	2.9	5.4	160	0	230	100	17	635
May 27	110	2.9	5.3	160	0	220	110	17	637
June 18	120	3.2	5.3	150	0	230	110	17	652
July 16	120	3.2	5.8	150	0	240	120	17	673
Aug. 20	120	3.2	5.9	140	0	240	120	17	664
Sep. 17	110	3.1	5.4	140	0	220	110	17	618
Oct. 15	110	3.0	5.2	140	0	230	110	17	630
Nov. 19	100	2.8	6.3	150	0	220	100	17	602
Dec. 19	100	2.8	4.6	150	0	230	100	17	613

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	June	July	September	November
2 1,020	22 999	11 1,040	2 1,050	25 1,070	17 996	10 986
4 1,010	25 1,000	14 1,010	4 1,060	28 1,070	19 993	12 984
7 993	27 1,010	16 1,020	6 1,050	30 1,070	22 991	14 977
9 1,010	29 1,000	18 1,010	9 1,020	August	24 994	17 980
11 988	March	21 1,030	11 1,060	1 1,080	29 993	19 982
14 1,010	1 1,010	23 1,040	13 1,060	3 1,070	October	21 984
16 996	3 1,010	25 1,010	16 1,060	5 1,070	1 992	24 987
18 1,000	5 1,010	28 1,030	18 1,060	8 1,070	3 992	26 983
21 1,000	7 1,010	30 1,030	20 1,060	11 1,060	6 989	28 982
23 987	12 994	May	23 1,060	15 1,060	8 988	December
25 998	14 997	2 1,030	25 1,060	18 1,040	10 995	1 983
28 1,000	17 989	5 979	27 1,060	20 1,040	15 986	3 983
30 1,010	19 980	7 1,040	30 1,070	22 1,040	17 986	5 985
February	21 980	9 1,030	July	25 1,020	21 985	8 985
1 981	25 1,010	12 1,030	2 1,070	27 1,000	22 986	10 982
4 1,010	26 1,020	14 1,040	7 1,070	29 1,010	24 991	12 981
6 1,000	28 1,010	16 992	9 1,070	September	27 991	15 982
8 991	31 1,010	19 1,030	11 1,070	2 981	29 989	17 985
11 1,000	April	21 1,050	14 1,070	4 992	31 989	19 987
13 1,000	2 1,020	23 1,040	16 1,070	8 998	November	22 983
15 1,010	4 1,000	27 1,060	18 1,060	10 989	3 988	24 991
19 1,010	7 1,020	29 1,060	21 1,070	12 996	5 989	26 998
20 983	9 1,010		23 1,060	15 998	7 990	31 991

## QUALITY OF WATER - 1980

## Rio Grande near Jimenez, Coahuila and Quemado, Texas

LOCATION: Near gaging station at Maverick Canal Headgates. The canal intake is at river mile 543.6 (874.9 km), 13.3 river miles (21.5 km) above the gaging station.

RECORDS: Specific conductance, 1954 through 1980

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,020	997	1,030	1,010	1,010	1,040	1,100	1,050	983	986	987	985
2	1,000	987	983	1,010	996	1,040	1,070	1,050	959	982	992	979
3	1,010	991	973	996	980	1,040	1,070	1,060	970	982	999	977
4	1,010	1,000	978	973	954	1,040	1,070	1,060	978	982	988	978
5	1,000	1,010	995	980	956	1,040	1,070	1,060	984	976	994	978
6	998	1,000	1,010	989	968	1,040	1,070	1,060	984	978	986	974
7	1,010	995	1,000	1,010	980	1,000	1,050	1,050	991	977	987	972
8	1,010	1,010	1,010	990	980	1,050	1,070	1,050	973	974	985	971
9	996	1,010	1,010	978	920	1,010	1,080	1,060	991	978	982	971
10	1,000	1,000	1,030	968	979	1,040	1,070	1,070	987	982	975	967
11	1,000	999	1,010	982	1,020	1,040	1,070	1,030	977	977	978	970
12	1,010	1,000	1,000	996	1,010	1,050	1,070	389	987	979	977	970
13	1,010	1,000	998	980	1,030	1,050	1,070	856	984	978	983	966
14	1,000	1,000	988	981	1,020	1,030	1,040	1,020	982	979	983	969
15	1,000	1,010	995	985	1,030	1,040	1,070	1,040	982	976	987	963
16	1,000	1,000	1,020	979	1,030	1,050	1,070	1,040	982	976	951	965
17	993	993	1,030	988	1,000	1,040	1,080	1,040	986	979	973	970
18	985	997	1,000	989	1,010	1,050	1,060	1,050	985	977	977	971
19	990	1,000	1,020	984	1,030	1,050	1,070	1,040	984	975	983	969
20	1,010	1,010	1,020	987	1,010	1,050	1,070	1,040	981	974	979	971
21	1,000	1,000	1,020	993	1,020	1,050	1,070	1,030	981	973	982	968
22	995	1,000	1,020	1,010	1,030	1,050	1,060	1,030	980	971	975	967
23	993	997	1,020	1,010	1,030	1,050	1,050	1,030	985	972	985	969
24	993	1,000	1,030	1,000	1,030	1,050	1,050	990	990	976	987	
25	997	1,010	1,030	1,000	1,030	1,070	1,060	1,020	1,000	977	977	
26	996	1,010	1,020	998	1,030	1,040	1,070	1,020	978	972	978	
27	997	990	1,030	994	714	1,050	1,060	1,020	980	973	985	979
28	989	1,010	1,020	998	1,030	1,050	1,060	1,010	983	976	984	981
29	996	996	1,030	993	1,030	1,050	1,070	1,010	981	983	981	980
30	995	1,020	998	998	1,040	1,060	1,050	1,000	983	981	980	979
31	996	1,020			1,030		1,050	989		986		979

## Rio Grande near El Indio, Texas and Villa Guerrero, Coahuila

LOCATION: Gaging station at river mile 460.4 (741.0 km), 35.9 river miles (57.8 km) downstream from the international highway bridge between Eagle Pass, Texas and Piedras Negras, Coahuila.

RECORDS: Specific conductance, 1954 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	June	August	October	December
2 1,020	27 1,030	9 1,020	4 1,080	15 702	8 786	3 885
16 1,020	March	23 1,100	18 1,090	27 916	22 833	17 882
30 1,010	11 1,070	May	July	September	November	31 914
February	26 1,060	7 1,120	2 1,090	10 959	5 871	
13 1,030		21 1,070	16 1,090	25 982	19 829	
			30 1,100			

## QUALITY OF WATER - 1980

## Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, Texas

LOCATION: Samples for biochemical analyses, specific conductance, and suspended silt collected at the Laredo Water Plant, river mile 364.0 (585.8 km); for chemical and biochemical analyses at International Bridge II, river mile 360.6 (580.3 km).

RECORDS: Chemical analyses, 1955 through 1976; chemical and biochemical analyses, 1973 through 1980; biochemical analyses, September 1968 through 1980; suspended silt, 1953 through 1980; specific conductance, 1948-1949 and 1955 through 1980.

REMARKS: Samples for chemical and biochemical analyses collected and analyzed by the U. S. Geological Survey; sampling and determinations for suspended silt and specific conductance by the International Boundary and Water Commission and the Texas Department of Water Resources. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey.

1980	Time	Stream-flow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium (Mg)	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Jan. 23	1637	2,660	933	8.3	14.0	260	120	77	17	96	2.6	4.6
Feb. 21	1438	2,560	1,010	8.3	17.5	300	170	85	21	110	2.8	5.1
Mar. 27	1003	5,230	1,030	8.2	18.0	290	160	83	20	110	2.8	5.0
Apr. 21	1700	911	1,110	8.3	23.5	290	170	83	20	120	3.1	5.2
May 27	0810	5,900	1,010	8.2	27.5	260	130	76	18	110	2.9	5.0
June 25	0700	3,220	1,100	8.2	29.0	260	150	72	20	120	3.2	5.2
July 24	0842	3,490	1,100	8.3	29.0	260	150	74	19	120	3.2	5.5
Aug. 19	0853	3,990	829	8.2	28.0	260	120	80	14	73	2.0	4.7
Sep. 15	1544	2,080	932	8.0	29.5	250	130	71	17	92	2.5	4.5
Oct. 21	0707	2,890	802	8.1	22.0	230	100	69	14	73	2.1	4.0
Nov. 18	0930	3,640	801	8.3	11.5	230	110	68	15	86	2.5	4.7
Dec. 16	0830	2,990	838	8.2	15.0	260	120	77	16	82	2.2	3.5

1980	Bicarbonate ion (HCO <sub>3</sub> )	Carbonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Oxygen, Dissolved (DO)	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD) 5 day	Turbidity	Solids, Dissolved (Calculated)	Solids, Dissolved (Residue @ 180 Deg C)	Suspended Sediment
Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Cols./100 ml	mg/L	NTU	mg/L	mg/L	mg/L
Jan. 23	170	0	210	93	15	10.1	860	0.5	22	600	629	54
Feb. 21	160	0	230	100	15	10.1	740	.9	19	646	638	33
Mar. 27	160	0	240	110	15	8.4	480	1.3	40	665	664	131
Apr. 21	150	0	260	120	14	8.5		1.8	21	697	720	34
May 27	160	0	220	100	16	7.0	2,300	1.9	160	626	647	316
June 25	140	0	230	120	17	4.1	400	2.8	27	655	688	78
July 24	150	0	250	120	17	6.6	260	2.2	26	673	691	75
Aug. 19	170	0	160	80	10	7.2	1,200	.4	55	514	435	139
Sep. 15	150	0	200	100	14	7.5	1,600	1.4	47	573	593	69
Oct. 21	160	74	14	14	14	4.7	4,000	2.1	27	490	490	
Nov. 18	160	72	13	13	13	10.4	800	1.0	36	523	522	
Dec. 16	180	84	14	14	14	9.6	580	2.1	17	545	533	

1980	Time	Stream-flow, Momentary	Specific Conductance	pH	Temperature	Oxygen, Dissolved (DO)	Coliform, Fecal	Oxygen Demand, Bio-Chemical (BOD) 5 Day	Alkalinity Total (as CaCO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Solids, Dissolved (Residue @ 180 Deg C)	Suspended Sediment
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	Cols./mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 21	0910	2,660	995	8.3	15.5	10.6	20	2.5	134	221	102	640	25
Feb. 19	0915	2,600	1,040	7.0	13.0	10.0	5	2.0	130	234	98	630	22
Mar. 26	0815	3,740	1,060	8.1	18.5	8.4	25	1.0	132	238	109	42	42
Apr. 15	0905	1,060	1,140	7.6	17.0	10.4	10	1.0	136	254	116	720	19
May													
June 10	0720	3,600	1,160	8.2	28.0	7.2		3.0	126	253	112		58
July 15	0810	6,890	1,100	7.7	27.5	13.2	120	1.5	124	246	116	680	114
Aug. 26	0810	2,970	851	8.6	29.0	7.6	25	2.0	120	176	84	560	47
Sep. 17	0630	2,140	1,120	8.0	27.3	7.0			122	211	96		38
Oct. 21	0825	2,890	790	9.3	22.0	8.9	20						
Nov. 12	0925	2,490	850	8.3	21.5	9.1	5	1.0	128	179	82	500	25
Dec. 3	0740	3,000	900	8.2	13.1	9.6	20						

QUALITY OF WATER - 1980

Rio Grande at Nuevo Laredo, Tamaulipas and Laredo, Texas

SUSPENDED SILT - 1980

Month	Tons		Number of Samples	Gravimetric Percentages			Acre-Feet at 1,452 Tons/Ac.Ft.	Period of Record		
	Water	Silt		Average	Maximum Sample	Minimum Sample		Average	Maximum	Minimum
Jan.	217,924,000	9,410	31	0.004320			6.5	4.5	11.0	0.93
Feb.	201,055,000	7,320	29	.003640			5.0	13.7	109	.88
Mar.	236,830,000	15,700	31	.006640			10.8	12.6	62.7	1.8
Apr.	122,927,000	3,690	30	.003000			2.5	34.0	251	1.2
May	376,150,000	97,000	31	.02580	0.1385	0.002900	66.8	55.8	165	22.5
June	277,670,000	8,770	30	.003160			6.0	77.5	688	.56
July	445,672,000	24,800	31	.005560			17.1	77.1	418	1.3
Aug.	481,351,000	161,000	31	.03344	0.07910	.01030	111	67.2	313	2.3
Sept.	204,388,000	13,200	30	.006440			9.1	90.2	700	9.0
Oct.	271,129,000	12,400	31	.004560			8.5	64.2	286	1.7
Nov.	231,270,000	3,330	30	.001440			2.3	8.0	27.3	1.6
Dec.	244,684,000	22,000	31	.009000			15.2	5.8	15.2	.83
Year	3,311,050,000	378,620	366	0.01144	0.1385		260.8	510.6	1,626.9	124.0

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,060	1,040	1,050	1,050	1,150	1,010	1,090	1,100	941	503	850	886
2	1,020	1,010	1,050	1,040	1,140	1,050	1,090	1,110	947	557	845	874
3	998	1,010	1,060	1,040	1,160	1,090	1,100	1,110	947	610	852	880
4	1,030	1,010	1,070	1,030	1,140	1,070	1,090	1,120	945	625	853	881
5	1,030	1,010	1,070	1,050	1,140	1,080	1,100	1,140	947	662	849	873
6	1,030	1,010	1,050	1,050	1,150	1,090	1,090	1,150	950	679	847	864
7	1,020	1,000	1,080	1,050	1,130	1,080	1,150	1,150	929	709	850	877
8	1,020	992	1,090	1,080	1,090	1,080	1,110	1,140	918	717	852	870
9	1,020	1,000	1,080	1,110	1,130	1,050	1,100	1,150	944	752	850	874
10	1,020	1,010	1,080	1,120	1,160	1,080	1,100	1,050	926	762	841	875
11	1,020	1,020	1,070	1,130	1,140	1,040	1,100	710	946	766	844	876
12	1,020	1,020	1,070	1,130	1,090	1,030	1,100	466	941	788	846	875
13	1,020	1,020	1,070	1,140	1,020	1,080	1,090	338	946	794	848	867
14	1,020	1,010	1,030	1,150	1,100	1,050	1,100	432	943	793	855	858
15	1,020	1,010	864	1,130	1,060	1,050	1,090	462	966	794	849	868
16	1,020	1,030	1,060	1,120	620	1,070	1,100	542	961	781	854	865
17	1,020	1,030	1,050	1,140	947	1,070	1,080	661	961	805	859	858
18	1,030	1,020	1,050	1,130	802	1,080	1,100	758	963	803	861	867
19	1,020	1,030	1,020	1,130	843	1,070	1,090	817	957	798	884	900
20	1,020	1,030	1,040	1,130	755	1,080	1,090	861	959	805	879	884
21	1,020	1,030	1,060	1,130	740	1,080	1,090	883	959	804	851	873
22	1,020	1,020	1,080	1,130	944	1,080	1,080	903	959	808	853	876
23	1,020	1,020	1,060	1,120	1,020	1,080	1,090	897	960	807	856	878
24	1,010	1,020	1,050	1,110	1,050	1,080	1,090	884	970	812	859	878
25	1,010	1,010	1,060	1,170	1,050	1,080	1,080	847	971	826	884	880
26	1,020	1,020	1,050	1,120	1,050	1,080	1,100	859	951	818	880	874
27	1,020	1,020	1,050	1,130	1,020	1,080	1,080	878	921	820	863	877
28	1,020	1,020	1,070	1,120	531	1,080	1,080	892	961	826	870	857
29	1,010	1,030	1,070	1,130	588	1,080	1,080	919	973	840	882	876
30	1,000		1,060	1,140	652	1,090	1,090	920	745	829	877	886
31	1,000		1,070		836		1,090	925		850		888

## QUALITY OF WATER - 1980

## Rio Salado near Las Tortillas, Tamaulipas

LOCATION: At gaging station 24.8 river miles (39.9 km) from the confluence with the Rio Grande, which is located at river mile 299.5 (482.0 km).

RECORDS: Chemical analyses, 1935 through 1980.

REMARKS: Sampling by the International Boundary and Water Commission and analyses by the U. S. Geological Survey.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 4	1020	64.6	3,680	8.0	13.0	1,300	1,100	290	130
Feb. 6	1100	64.6	3,980	7.8	15.0	1,400	1,200	300	160
Mar. 4	1030	31.1	4,530	7.8	14.0	1,500	1,300	340	160
Apr. 1	1050	56.5	3,970	7.8	22.0	1,300	1,200	330	120
May 2	1030	48.0	4,270	7.7		1,500	1,400	350	150
June 3	1045	121	1,660	7.5	28.0	510	400	130	44
July 2	1045	41.7	4,120	8.0	30.0	1,400	1,200	310	140
Aug. 20	1300	410	1,740	7.7	29.5	560	330	150	45
Sep. 3	1200	97.1	3,610	7.9	29.0	1,200	1,100	290	120
Oct. 15	1210	97.1	3,830	8.0	28.0	1,300	1,200	310	130
Nov. 6	1200	97.1	3,790	8.1	21.0	1,300	1,200	310	130
Dec. 2	1120	101	3,570	8.1	17.0	1,200	1,100	310	110

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 4	410	5.0	4.1	180	0	1,400	340	24	2,690
Feb. 6	440	5.1	5.3	210	0	1,600	360	24	2,990
Mar. 4	510	5.7	4.7	210	0	1,800	460	28	3,410
Apr. 1	420	5.0	5.2	190	0	1,500	360	29	2,860
May 2	500	5.6	4.8	170	0	1,800	400	25	3,310
June 3	170	3.3	5.3	130	0	510	150	17	1,090
July 2	520	6.2	6.6	140	0	1,600	440	18	3,100
Aug. 20	170	3.1	5.8	210	0	480	190	26	1,160
Sep. 3	410	5.1	4.8	190	0	1,300	440	23	2,680
Oct. 15	400	4.8	4.6	180	0	1,500	400	21	2,860
Nov. 6	430	5.2	5.7	200	0	1,500	380	22	2,870
Dec. 2	400	5.0	3.5	210	0	1,300	350		

## QUALITY OF WATER - 1980

## Rio Grande below Falcon Dam near Falcon, Texas and Nueva Cd. Guerrero, Tamaulipas

LOCATION: Chemical sampling at the Falcon Village Water Plant, river mile 274.8 (442.3 km) and biochemical sampling at the Chapeno gaging station 2.5 river miles (4.1 km) below Falcon Dam; latitude 26° 31' 45", longitude 99° 09' 30".

RECORDS: Chemical analyses, July 1955 through 1980; biochemical analyses, July 1975 through 1980; suspended silt, July 1955 through 1976; specific conductance 1955 through 1980.

REMARKS: Sampling for chemical analyses by the International Boundary and Water Commission, analyses by the U. S. Geological Survey; sampling and determinations for specific conductance by the International Boundary and Water Commission; biochemical analyses, collected and analyzed by the International Boundary and Water Commission and the Texas Department of Water Resources.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Foot	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 14	0900	1,990	1,020	7.8	14.5	260	150	71	20
Feb. 19	0915	1,030	1,050	8.0	14.5	260	150	71	21
Mar. 24	1100	3,330	1,070	7.7	15.5	270	160	74	21
Apr. 14	1005	3,420	1,080	7.9	18.0	270	150	75	20
May 19	0930	6,290	1,090	8.1	24.5	290	170	78	22
June 16	1030	3,420	1,080	7.5	26.5	270	150	73	21
July 14	0815	2,970	1,090	7.8	28.0	270	160	73	21
Aug. 18	1000	141	1,110	7.6	26.5	280	170	130	22
Sep. 23	1530	5,020	1,060	7.6	26.0	260	160	69	21
Oct. 16	0825	4,520	1,030	7.8	25.0	260	160	70	20
Nov. 17	0930	2,100	1,020	8.1	18.5	260	170	71	21
Dec. 15	1000	73.1	1,020	7.9	15.0	260	160	71	20

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 14	110	3.0	5.1	130	0	240	110	11	631
Feb. 19	110	2.9	5.9	140	0	240	110	11	638
Mar. 24	110	2.9	5.1	140	0	240	110	11	640
Apr. 14	110	2.9	5.4	140	0	250	110	11	650
May 19	120	3.1	5.4	140	0	240	120	12	666
June 16	110	2.9	5.2	140	0	250	110	12	650
July 14	120	3.2	5.9	130	0	250	120	13	667
Aug. 18	130	3.4	6.4	130	0	260	130	14	700
Sep. 23	120	3.2	6.0	120	0	250	130	13	668
Oct. 16	110	3.0	5.6	120	0	270	110	12	656
Nov. 17	110	2.9	6.9	120	0	270	100		
Dec. 15	110	3.0	4.9	160	0	250	110	11	637

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Tempera- ture	Oxygen, Dissolved (DO)	Coliform, Fecal
Date	Standard	Second-Foot	Micromhos	Units	Deg C	mg/L	Cols./ 100 mL
Jan. 31	1100	6,250	1,120	8.0	13.8	9.4	12
Feb. 28	1115	508	1,080	8.2	18.5	10.8	10
Mar. 25	1140	3,730	1,050	8.0	18.4	8.5	2
Apr. 28	1500	11,900	1,110	8.2	22.3	8.5	2
May							
June 9	1150	6,640	1,160	8.3	28.2	7.4	32
July 30	1430	6,430	1,180	7.8	30.0	6.0	52
Aug. 7	0725	3,720	1,200	8.3	27.6	7.1	18
Sep. 16	1220	2,790	1,200	8.1	29.4	8.3	129
Oct. 29	1125	194	1,150	8.1	16.7	9.6	59
Nov. 19	1440	1,160	1,040	8.1	19.3	10.0	0
Dec.							

## QUALITY OF WATER - 1980

## Rio Grande below Falcon Dam near Falcon, Texas and Nueva Cd. Guerrero, Tamaulipas

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	June	July	September	November
2 1,030	22 1,050	14 1,070	6 1,100	28 1,090	19 1,060	10 959
4 1,030	25 1,050	16 1,070	9 1,100	30 1,090	22 1,060	12 974
7 1,020	27 1,050	18 1,070	11 1,090	August	24 1,050	14 995
9 1,030	29 1,050	21 1,070	13 1,100	1 1,090	26 1,040	17 1,020
11 1,030	March	25 1,080	16 1,090	4 1,090	29 1,050	19 1,020
14 1,030	3 1,050	28 1,080	18 1,100	6 1,090	October	21 1,010
16 1,030	5 1,050	30 1,080	20 1,100	8 1,100	1 1,050	24 1,020
18 1,030	7 1,050	May	23 1,100	11 1,090	3 1,050	26 1,020
21 1,030	10 1,050	2 1,080	25 1,090	13 1,100	6 1,050	28 1,020
23 1,030	12 1,050	5 1,080	27 1,080	15 1,100	8 1,050	December
25 1,040	14 1,050	7 1,080	30 1,110	18 1,100	10 1,040	1 1,020
28 1,040	17 1,050	9 1,080	July	20 1,100	14 1,040	3 1,020
30 1,040	19 1,050	12 1,080	2 1,090	22 1,100	15 1,030	5 1,020
February	21 1,050	14 1,090	3 1,080	25 1,090	17 1,040	8 999
1 1,040	24 1,060	16 1,090	4 1,080	27 1,100	20 1,030	10 1,020
4 1,040	26 1,060	19 1,090	7 1,070	29 1,090	22 1,030	12 1,010
6 1,040	28 1,060	21 1,090	9 1,080	September	24 1,030	15 1,010
8 1,050	31 1,060	23 1,090	11 1,080	2 1,090	27 1,030	17 1,010
11 1,050	April	27 1,090	14 1,090	3 1,080	29 1,030	19 1,010
13 1,050	2 1,050	28 1,090	16 1,080	5 1,080	31 1,030	22 1,010
15 1,050	4 1,060	30 1,090	18 1,080	8 1,110	November	24 1,010
19 1,050	7 1,060	June	21 1,080	10 1,070	3 1,030	26 1,010
20 1,050	9 1,070	2 1,100	23 1,090	12 1,080	5 1,030	29 1,010
	11 1,060	4 1,100	25 1,090	15 1,060	7 1,030	31 1,010
				17 1,070		

## Rancherias Drain near Camargo, Tamaulipas

LOCATION: At a point about 1,950 feet (600 m) from the confluence with the Rio Grande, which is located at river mile 241.6 (388.8 km). This drain carries wastewater from the Lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1948 and 1960 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 26 DEG C - 1980

January	March	April	June	August	October	November
2 5,790	5 6,040	30 4,620	18 6,340	6 5,750	1 5,400	19 6,590
9 5,680	12 5,820	May	25 6,360	20 6,020	8 6,110	December
16 6,430	19 5,120	7 5,200	July	27 6,150	15 6,230	3 6,560
23 2,040	26 6,300	14 3,620	2 6,120	September	22 6,290	17 6,390
29 3,050	April	28 6,570	9 6,400	3 6,090	30 5,850	24 6,590
February	2 6,470	June	16 6,330	10 6,020	November	31 6,170
6 3,790	9 4,710	3 6,730	23 6,250	17 3,770	5 6,370	
20 4,920	16 4,080	11 4,560	30 6,120	24 5,740	12 6,460	
27 6,130	23 3,110					

## QUALITY OF WATER - 1980

## Rio San Juan at Camargo, Tamaulipas

LOCATION: At gaging station, 3.1 river miles (5 km) from the confluence with the Rio Grande, which is located at river mile 238.7 (384.1 km).

RECORDS: Specific conductance, 1960 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	March	April	June	July	September	November
2 2,080	5 2,080	23 1,960	11 1,610	30 1,970	17 2,230	12 2,000
9 2,120	12 2,040	30 1,820	18 1,770	August	24 2,010	19 2,030
16 2,140	19 2,090	May	25 1,720	6 1,850	October	December
29 1,940	26 2,270	7 1,840	July	20 1,890	1 1,990	3 2,120
February	April	14 1,750	2 1,770	27 1,860	8 2,110	17 2,160
6 2,060	2 2,250	28 830	9 1,740	September	15 2,140	24 2,320
20 2,250	9 2,220	June	16 1,950	3 2,160	22 2,990	31 2,240
27 2,220	16 2,210	3 1,480	23 703	10 2,120	30 3,000	

## Rio Grande at Rio Grande City, Texas near Camargo, Tamaulipas

LOCATION: Gaging station at river mile 235.0 (378.1 km), 3.7 river miles (6.0 km) downstream from Rio San Juan.

RECORDS: Chemical analyses, 1959 through 1980; specific conductance, 1958 through 1980; suspended silt, 1959 through 1977.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; specific conductance determinations by the International Boundary and Water Commission.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temper- ature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 14	1610	2,850	1,040	8.2	16.5	270	150	72	21
Feb. 19	1555	1,160	1,240	7.8	17.0	290	170	79	23
Mar. 17	1445	3,070	1,090	7.7	18.0	270	160	75	21
Apr. 14	1515	4,120	1,110	7.7	18.0	280	170	80	20
May 19	1500	9,180	1,090	7.4	25.0	280	160	77	21
June 20	0905	7,030	1,100	7.4	26.5	270	160	74	21
July 24	1230	4,590	1,100	7.7	28.5	260	150	70	21
Aug. 18	1500	114	1,350	7.4	29.0	290	160	90	17
Sep. 8	1545	1,790	1,120	7.5	29.0	280	160	76	22
Oct. 14	1530	4,030	1,040	7.7	26.5	250	150	67	20
Nov. 17	1610	1,790	1,050	7.9	16.0	270	170	72	21
Dec. 15	1245	438	1,320	7.9	16.5	340	230	87	29

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO <sub>3</sub> )	Car- bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 14	110	2.9	5.3	140	0	240	120	10	647
Feb. 19	140	3.6	6.2	150	0	280	150	9.7	762
Mar. 17	120	3.2	5.2	140	0	240	120	11	661
Apr. 14	120	3.1	5.5	140	0	250	120	11	676
May 19	110	2.9	6.4	150	0	240	110	12	650
June 20	120	3.2	5.5	140	0	250	120	12	672
July 24	120	3.2	6.0	130	0	260	120	12	673
Aug. 18	170	4.3	7.0	160	0	190	250	11	814
Sep. 8	120	3.1	6.1	130	0	260	130	12	695
Oct. 14	120	3.3	6.5	120	0	260	120	12	664
Nov. 17	120	3.2	7.0	120	0	250	120	12	662
Dec. 15	150	3.6	4.9	130	0	280	180	10	807

## QUALITY OF WATER - 1980

## Rio Grande at Rio Grande City, Texas near Camargo, Tamaulipas

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January	February	April	June	July	September	November
2 1,200	25 1,320	16 1,100	6 1,120	30 1,090	19 1,070	10 1,040
4 1,140	28 1,320	19 1,080	9 1,130		21 1,090	12 1,040
7 1,100	29 1,320	21 1,080	11 1,120	August 1 1,110	24 1,070	14 1,150
9 1,140	March	23 1,090	13 1,150	4 1,100	25 1,060	17 1,080
11 1,130	3 1,100	25 1,090	16 1,140	6 1,100	26 1,050	19 1,070
14 1,090	5 1,100	28 1,100	18 1,120	8 1,100	29 1,370	20 1,330
16 1,040	7 1,140	30 1,090	19 1,110	11 1,350		24 1,310
18 1,040	10 1,090	May	22 1,130	13 319	1 1,240	26 1,640
21 1,060	12 1,110	2 1,100	26 1,120	15 546	3 1,180	27 1,440
23 1,030	14 1,150	5 1,100	29 1,100	18 1,200	6 1,110	December
26 1,040	17 1,080	7 1,090	30 1,090	20 926	10 1,050	1 1,430
28 1,050	19 1,090	10 1,090	July	22 1,190	13 1,050	3 1,340
29 1,050	22 1,080	13 1,080	2 1,090	25 1,240	16 1,060	5 1,330
February	24 1,100	14 1,100	4 1,120	27 1,260	17 1,030	8 1,310
1 1,060	26 1,090	16 1,100	7 1,090	29 1,150	20 1,040	10 1,330
4 1,060	28 1,090	19 1,100	8 1,110	September	22 1,290	12 1,310
6 1,080	31 1,090	21 1,120	12 1,090	2 1,130	24 1,420	15 1,320
8 1,070	April	23 1,120	14 1,120	3 1,110	27 970	17 1,050
11 1,090	2 1,110	25 1,130	16 1,110	5 1,160	29 1,270	19 1,040
13 1,110	5 1,110	28 901	18 1,110	8 1,190	31 1,370	22 1,060
15 1,090	7 1,120	31 1,110	21 1,090	10 1,150	November	24 1,140
18 1,400	9 1,070	June	24 1,090	12 1,180	3 1,300	26 1,280
20 1,210	11 1,110	2 1,120	25 1,100	15 1,090	5 1,350	28 1,240
22 1,290	14 1,090	4 1,110	28 1,100	17 1,080	7 1,220	30 1,270

## Puertecitos Drain and Los Indios Drain near Cd. Diaz Ordaz, Tamaulipas

LOCATION: For Puertecitos Drain, at a point about 8,500 feet (2,600 m) from the confluence with the Rio Grande, which is located at river mile 219.3 (352.9 km); and, for Los Indios Drain, at a point about 2,150 feet (650 m) from its confluence with Puertecitos Drain. These two drains join at a point about 4,250 feet (1,300 m) from the confluence with the Rio Grande. These drains carry wastewater from the Lower Rio San Juan Irrigation District in Mexico.

RECORDS: Specific conductance, 1960 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Date	Puertecitos Drain	Los Indios Drain	Date	Puertecitos Drain	Los Indios Drain	Date	Puertecitos Drain	Los Indios Drain	Date	Puertecitos Drain	Los Indios Drain
Jan. 2	3,430	2,650	Apr. 2	3,950	2,680	July 2	3,640	2,570	Oct. 1	3,330	2,560
9	3,420	2,600	9	3,880	2,630	9	3,610	2,550	8	3,280	2,660
16	3,320	2,610	16	3,490	2,570	16	3,650	2,530	15	3,140	2,770
23	3,060	2,260	23	3,090	2,390	23	3,550	2,570	22	3,200	2,540
30	3,210	2,630	30	3,130	2,530	30	3,580	2,550	30	3,140	2,580
Feb. 6	3,160	2,620	May 7	3,410	2,710	Aug. 6	3,290	2,330	Nov. 12	3,270	2,660
20	3,570	2,750	14		2,430	20	3,240	2,440	19	3,210	2,640
27	3,350	2,710	28	3,490	2,510	27	3,160	2,450	Dec. 3	3,160	2,510
Mar. 5	3,490	2,740	June 3	3,870	2,390	Sep. 3	3,030	2,520	17	3,110	2,480
12	3,810	2,500	11	3,100		10	3,070	2,390	24	3,110	2,590
19	3,920	2,690	18	3,230	2,500	17	2,930	2,700	31	3,100	2,460
26	4,020	2,790	25	3,710	2,530	24	3,100	2,330			

QUALITY OF WATER - 1980

Rio Grande at Los Ebanos, Texas near Cd. Diaz Ordaz, Tamaulipas

LOCATION: Gaging station at river mile 204.3 (328.8 km), 34.0 river miles (54.7 km) upstream from Anzalduas Dam.  
 RECORDS: Chemical analyses, June 1977 through 1980. Specific conductance, 1956 through 1980.

REMARKS: Sampling by the International Boundary and Water Commission, chemical analyses by the U. S. Geological Survey, determinations for specific conductance by the International Boundary and Water Commission.

1980 Date	Time Standard	Streamflow, Momentary	Specific Conductance	pH Units	Temper- ature Deg C	Hardness, Total (as CaCO3)	Hardness, Noncarbonate (as CaCO3)	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
		Second-Foot	Micromhos			mg/L	mg/L	mg/L	mg/L
Jan. 14	1650	3,500	1,060	8.1	16.5	270	160	75	21
Feb. 19	1640	1,070	1,590	7.7	18.5	360	210	97	29
Mar. 17	1600	2,000	1,170	7.7	19.0	290	170	78	22
Apr. 14	1615	6,050	1,120	7.5	18.0	280	170	77	22
May 19	1600	8,600	1,110	7.8	25.0	280	160	77	22
June 20	1010	4,120	1,160	7.5	27.0	290	170	81	21
July 24	1315	5,450	1,020	7.5	28.0	240	130	68	16
Aug. 18	1630	118	1,480	7.5	29.0	380	220	110	25
Sep. 8	1718	670	1,330	7.6	28.5	300	190	80	25
Oct. 14	1625	4,020	1,090	7.7	26.5	260	160	71	21
Nov. 17	1655	1,000	1,260	8.0	14.5	310	190	84	24
Dec. 15	1330	500	1,810	7.7	18.5	440	280	120	34

1980 Date	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio(SAR)	Potassium ion (K), Dissolved	Bicar- bonate ion (HCO3)	Car- bonate ion (CO3)	Sulfate ion (SO4), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO2), Dissolved	Solids Dissolved (Calculated)
	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 14	120	3.2	5.2	140	0	250	120	11	671
Feb. 19	190	4.3	6.8	180	0	340	220	12	984
Mar. 17	130	3.4	5.4	140	0	260	140	11	715
Apr. 14	120	3.1	5.9	140	0	250	120	12	676
May 19	120	3.1	5.7	150	0	250	120	12	681
June 20	130	3.3	5.5	140	0	260	130	12	709
July 24	110	3.1	5.5	130	0	220	120	12	616
Aug. 18	170	3.8	7.5	190	0	250	250	14	920
Sep. 8	160	4.0	6.6	140	0	300	180	14	835
Oct. 14	120	3.2	6.6	120	0	260	130	13	683
Nov. 17	150	3.7	7.1	150	0	280	170	12	799
Dec. 15	220	4.6	5.4	200	0	370	270	12	1,130

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,360	1,060	1,700	1,210	1,100	1,220	1,170	1,120	1,210	1,250	1,910	1,900
2	1,350	1,070	1,150	1,200	1,090	1,210	1,170	1,120	1,220	1,260	1,930	1,960
3	1,340	1,080	1,220	1,190	1,100	1,200	1,160	1,110	1,230	1,510	1,800	2,020
4	1,330	1,080	1,180	1,200	1,100	1,200	1,150	1,110	1,230	1,540	1,600	1,870
5	1,290	1,120	1,280	1,200	1,100	1,140	1,160	1,110	1,280	1,510	1,480	1,860
6	1,310	1,160	1,400	1,220	1,100	1,130	1,160	1,130	1,310	1,550	1,430	1,830
7	1,280	1,120	1,380	1,190	1,110	1,130	1,140	1,110	1,320	1,350	1,490	1,830
8	1,260	1,120	1,400	1,180	1,110	1,120	1,120	1,140	1,310	1,220	1,770	1,830
9	1,140	1,130	1,390	1,160	1,110	1,130	1,170	1,170	1,310	1,090	1,260	1,810
10	1,100	1,140	1,220	1,150	1,110	1,140	1,160	1,150	1,300	1,070	1,070	1,810
11	1,090	1,140	1,200	1,150	1,120	1,140	1,140	1,450	1,290	1,070	1,120	1,830
12	1,080	1,130	1,210	1,150	1,110	1,130	1,140	1,580	1,270	1,070	1,130	1,810
13	1,050	1,160	1,190	1,110	1,120	1,170	1,140	1,610	1,230	1,060	1,100	1,820
14	1,060	1,190	1,190	1,110	1,130	1,130	1,130	339	1,140	1,060	1,120	1,820
15	1,070		1,190	1,110	1,120	1,170	1,140	354	1,140	1,060	1,120	1,820
16	1,070	1,390	1,190	1,110	1,120	1,160	1,160	718	1,130	1,050	1,180	1,780
17	1,050	1,520	1,190	1,100	1,110	1,170	1,170	1,080	1,130	1,050	1,160	1,350
18	1,040	1,750	1,180	1,110	1,120	1,220	1,150	1,380	1,110	1,040	1,180	1,110
19	1,050	1,640	1,170	1,110	1,110	1,220	1,140	1,660	1,130	1,040	1,160	1,120
20	1,040	1,510	1,180	1,110	1,030	1,230	1,140	1,940	1,120	1,040	1,160	1,130
21	1,040	1,590	1,170	1,110	1,260	1,160	1,130	1,730	1,110	1,040	1,190	1,160
22	1,050	1,580	1,210	1,110	1,240	1,140	1,150	1,240	1,120	1,070	1,150	1,160
23	1,060	1,680	1,210	1,110	1,190	1,160	1,170	1,540	1,100	1,260	1,210	1,150
24	1,060	1,720	1,160	1,110	1,210	1,160	1,150	1,520	1,100	1,270	1,410	1,170
25	1,050	1,710	1,160	1,110	1,260	1,200	1,150	1,500	1,080	1,450	1,510	1,220
26	1,050	1,600	1,130	1,110	1,250	1,210	1,150	1,540	1,080	1,470	1,750	1,300
27	1,050	1,450	1,140	1,120	1,270	1,180	1,130	1,550	1,070	1,510	2,220	1,440
28	1,050	1,550	1,160	1,110	1,250	1,190	1,120	1,560	1,100	1,670	2,140	1,340
29	1,050	1,660	1,170	1,110	1,100	1,160	1,120	1,750	1,380	1,750	2,050	1,390
30	1,050		1,170	1,110	1,260	1,190	1,120	1,400	1,420	1,760	2,170	1,540
31	1,050		1,190		1,200		1,120	1,230		1,650		1,640

## QUALITY OF WATER - 1980

## Rio Grande at Penitas, Texas and Reynosa Diaz, Tamaulipas

LOCATION: At the H.C.W.C. & I. District No. 1 (Edinburg) pumping plant, river mile 186.6 (300.4 km), 16.3 river miles (26.2 km) upstream from Anzalduas Dam.

RECORDS: Specific conductance, 1963 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

January		February		April		June		July		September		November	
2	1,490	25	1,550	16	1,130	4	1,650	28	1,150	17	1,160	7	1,640
4	1,490	27	1,700	18	1,120	6	1,160	30	1,140	19	1,150	10	1,660
7	1,360	29	1,740	21	1,110	9	1,130			22	1,130	12	1,170
9	1,270			23	1,110	11	1,150		August	24	1,150	14	1,160
11	1,170	3	1,680	25	1,110	13	1,140	4	1,120	26	1,130	17	1,200
14	1,100	5	1,200	28	1,120	16	1,230	6	1,120	29	1,150	19	1,260
16	1,110	7	1,310	30	1,120	18	1,150	8	1,120			21	1,250
18	1,080	10	1,550			20	1,160	11	960		October	24	1,330
21	1,110	12	1,350	2	1,100	23	1,180	13	723	3	1,610	26	1,280
23	1,080	14	1,240	5	1,100	25	1,190	15	1,710	6	1,490	28	1,330
25	1,090	17	1,220	7	1,100	27	1,180	18	1,670	8	1,760		December
28	1,060	19	1,220	9	1,100	30	1,140	20	1,320	10	1,190	1	1,690
30	1,080	21	1,200	12	1,120			22	1,470	13	1,090	3	2,120
		24	1,220	14	1,120	2	1,170	25	2,010	15	1,000	5	2,170
		26	1,190	16	1,120	4	1,160	27	1,580	17	1,060	8	2,260
		28	1,130	19	1,120	7	1,170	29	1,680	20	1,060	10	2,100
		31	1,150	21	1,510	9	1,130			22	1,030	12	2,140
				23	1,120	11	1,180		September	24	1,120	15	2,080
				26	1,480	14	1,140	3	1,700	27	1,630	17	2,080
				28	1,360	16	1,130	5	1,540	29	1,400	22	1,250
				30	1,580	18	1,190	8	1,790	31	1,510	24	1,220
						21	1,140	10	1,450		November	26	1,260
					June	23	1,120	12	1,470	3	1,740	29	1,410
						25	1,030	15	1,190	5	1,830	31	1,400

## Morillo Drain near Anzalduas Dam

LOCATION: At the Morillo Drain Project pumping plant located about 0.4 river mile (0.6 km) from the confluence with the Rio Grande or at the gaging station on the bypass channel 0.4 mile (0.6 km) from the pumping plant. Morillo Drain enters the Rio Grande at river mile 179.1 (288.3 km), 8.8 river miles (14.2 km) upstream from Anzalduas Dam. This drain carries wastewater from the Lower Rio San Juan Irrigation District in Mexico and surface runoff during periods of heavy precipitation.

RECORDS: Chemical analyses, 1962 through 1980; specific conductance, 1956 through 1980.

REMARKS: Sampling by the International Boundary and Water Commission and chemical analyses by the U. S. Geological Survey. Determinations for specific conductance by the International Boundary and Water Commission.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Foot	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 15	1420	88.3	5,960	8.1	20.5	900	690	220	86
Feb. 19	1100	143	7,410	7.8	17.0	1,100	830	260	100
Mar. 18		72.4	8,390	7.7	14.5	1,200	920	270	120
Apr. 14	0900		5,350	7.7	15.0	850	650	210	79
May 19	1400	448	4,380	7.4	24.5	720	560	190	60
June 16	1145	149	6,210	7.6	29.0	910	690	220	87
July 24	1530	846	1,950	7.5	29.5	260	140	79	15
Aug. 14	0800	63.6	3,160	7.3	27.0	540	380	150	40
Sep. 10		59.3	7,760	7.7	26.0	1,100	900	270	110
Oct. 16	0725	67.8	8,740	7.9	24.5	1,300	1,100	310	130
Nov. 14	0845	57.9	9,240	8.0	20.5	1,400	1,100	310	140
Dec. 8	1110	53.7	9,600	7.8	23.0	1,400	1,200	320	150

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved	Bicarbonate ion (HCO <sub>3</sub> )	Car-bonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 15	990	14	7.6	260	0	1,000	1,300	32	3,760
Feb. 19	1,200	16	10	280	0	1,200	1,600	32	4,540
Mar. 18	1,500	19	9.4	300	0	1,600	1,900	37	5,580
Apr. 14	840	13	7.7	240	0	1,000	1,000	28	3,280
May 19	680	11	8.9	200	0	740	850	22	2,650
June 16	1,100	16	8.2	260	0	1,200	1,300	24	4,070
July 24	290	7.8	7.8	140	0	270	370	18	1,120
Aug. 14	450	8.4	11	200	0	540	630	15	1,950
Sep. 10	1,400	18	10	280	0	1,400	1,900	34	5,260
Oct. 16	1,600	19	10	290	0	1,700	2,000	41	5,900
Nov. 14	1,600	19	14	320	0	1,700	2,100	39	6,060
Dec. 8	1,700	20	8.2	290	0	1,700	2,300	37	6,360

**QUALITY OF WATER - 1980**  
**Morillo Drain near Anzalduas Dam**

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Date	Bypass Canal	Pumping Plant	Date	Bypass Canal	Pumping Plant	Date	Bypass Canal	Pumping Plant	Date	Bypass Canal	Pumping Plant
Jan. 3	7,610		Apr. 7	6,620		July 7	8,070		Sep. 26		6,690
7	7,220		10	6,610		10	7,960		29	6,650	6,810
10	6,220		14	5,340	5,360	14	7,900		30		7,470
15	6,000	5,960	14		5,350	17	8,270		Oct. 2		7,950
17	6,050	5,990	17	6,120	5,960	22		4,250	6		8,310
21	5,740	5,660	21	5,300	5,530	23	8,480		9		8,380
24	5,810	5,730	24	5,310	5,360	24	1,480	1,950	13		8,760
28	5,440	5,170	28	2,170	2,770	24		2,270	16		8,900
31	5,940	6,000	May 1	5,510	5,340	28	7,530	7,550	20		4,200
Feb. 4	6,370	5,820	5	5,120	4,980	31	8,460	8,410	23		8,220
7	5,770	5,710	8	5,360	5,410	Aug. 4	6,870		27		7,860
11	6,330	6,470	12	5,540	5,520	7	6,860	6,850	30		8,250
14	6,820	6,850	15	5,590	5,500	8		7,060	Nov. 3		9,070
18	7,250	7,260	19		4,380	11		813	6		9,170
19		7,410	22	5,940	5,770	14		3,160	10		9,280
21	7,280	7,190	26	7,530	7,590	14		3,600	13		9,230
25	7,550	7,560	29	7,760	7,770	15		6,800	14		9,240
27	7,750		June 2	7,010	7,120	18		9,260	17		9,170
28		7,800	5	6,550	6,240	19		9,420	20		9,240
Mar. 3	8,150	8,090	9	5,220	5,220	21	8,550		24		8,990
6	8,250	8,250	12	5,660	5,910	25	9,070		27		9,210
10	8,500		16		6,210	28	9,700		Dec. 4		9,390
13	8,720		16	6,200	6,150	Sep. 4	8,880		8		9,500
17	8,520		18	5,820	7,900	8	8,060		15		9,310
18		8,390	19	7,180	7,220	10		7,760	18		9,530
20	8,520		23	7,800	7,820	11	8,000		22		9,090
24	8,330		26	7,820		15	6,520		26		9,080
27	8,370		30	8,160		18	5,640		29		9,010
31	8,690		July 3	8,150		22	6,140	6,240	31		9,140
Apr. 3	7,490					25	6,600				

**Rio Grande below Anzalduas Dam, Texas near Reynosa, Tamaulipas and Mission, Texas**

LOCATION: At Anzalduas Dam, 0.5 river mile (0.8 km) above the gaging station, located at river mile 169.8 (273.3 km).

RECORDS: Chemical analyses, March 1959 through 1980; specific conductance, 1948 and 1956 through 1980; suspended silt, May 1956 through 1977.

REMARKS: Sampling by the International Boundary and Water Commission; chemical analyses by the U.S. Geological Survey; determinations for specific conductance by the International Boundary and Water Commission.

1980	Time	Streamflow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO3)	Hardness, Noncarbonate (as CaCO3)	Calcium ion (Ca), Dissolved	Magnesium ion (Mg), Dissolved
Date	Standard	Second-Feet	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L
Jan. 19	1400	1,070	1,100	8.1	18.5	280	160	77	21
Feb. 19	1130	562	1,520	7.9	17.0	340	220	91	28
Mar. 18		1,930	1,240	7.7	20.0	310	190	85	24
Apr. 14	0920	3,140	1,150	7.7	16.0	280	160	77	21
May 19	1400	4,840	1,320	7.6	25.0	310	190	86	24
June 16	1230	4,520	1,220	7.5	29.0	290	180	79	23
July 24	1600	4,060	1,080	7.5	29.0	240	140	66	18
Aug. 14	0830	1,290	1,650	7.4	29.0	360	220	96	28
Sep. 10		604	1,400	7.7	30.0	330	200	88	26
Oct. 16	0740	1,290	1,100	7.6	25.0	270	160	72	21
Nov. 14	0830	1,180	1,240	7.9	24.0	290	170	78	23
Dec. 8	1140	406	2,440	8.0	21.0	590	400	160	47

1980	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved	Bicarbonate ion (HCO3)	Car-bonate ion (CO3)	Sulfate ion (SO4), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO2), Dissolved	Solids Dissolved (Calculated)
Date	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan. 15	120	3.1	8.4	140	0	260	130	11	696
Feb. 19	180	4.2	6.6	150	0	330	210	12	932
Mar. 18	140	3.5	5.5	150	0	270	150	10	758
Apr. 14	120	3.1	5.2	140	0	250	130	12	684
May 19	160	3.9	5.5	150	0	310	160	13	832
June 16	140	3.6	5.5	140	0	270	150	13	750
July 24	130	3.7	6.5	120	0	240	140	13	673
Aug. 14	210	4.9	7.1	170	0	330	240	15	1,010
Sep. 10	170	4.1	6.9	150	0	310	210	14	899
Oct. 16	130	3.5	6.0	120	0	270	130	13	703
Nov. 14	140	3.6	7.3	150	0	290	140	12	812
Dec. 8	310	5.5	5.9	230	0	440	460	17	1,550

## QUALITY OF WATER - 1980

## Rio Grande below Anzalduas Dam near Reynosa, Tamaulipas and Mission, Texas

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,450	1,160	2,070	1,160	1,170	1,350	1,140	1,130	1,920	1,230	1,450	1,350
2	1,480	1,160	2,240	1,170	1,170	1,360	1,140	1,110	1,600	1,250	1,490	1,390
3	1,460	1,200	1,760	1,200	1,170	1,280	1,150	1,120	1,410	1,300	1,580	1,410
4	1,500	1,210	1,790	1,220	1,170	1,300	1,150	1,110	1,310	1,390	1,700	1,480
5	1,510	1,220	1,400	1,220	1,170	1,300	1,150	1,150	1,310	1,410	1,770	1,590
6	1,510	1,210	1,230	1,220	1,180	1,220	1,180	1,120	1,310	1,560	1,990	1,850
7	1,490	1,250	1,290	1,230	1,190	1,210	1,190	1,160	1,340	1,460	1,990	2,110
8	1,480	1,250	1,280	1,280	1,210	1,210	1,170	1,130	1,350	1,630	2,140	2,380
9	1,470	1,270	1,330	1,260	1,210	1,200	1,150	1,130	1,360	1,680	1,940	2,370
10	1,360	1,250	1,400	1,230	1,220	1,220	1,150	1,330	1,400	1,340	1,880	2,330
11	1,280	1,260	1,520	1,210	1,210	1,230	1,170	758	1,450	1,150	1,570	2,280
12	1,180	1,260	1,440	1,200	1,210	1,230	1,170	649	1,470	1,100	1,300	2,300
13	1,120	1,270	1,360	1,220	1,210	1,210	1,140	889	1,490	1,100	1,240	2,320
14	1,120	1,340	1,330	1,140	1,230	1,220	1,150	1,620	1,410	1,110	1,270	2,270
15	1,090	1,360	1,330	1,140	1,230	1,240	1,160	762	1,250	1,120	1,230	2,280
16	1,120	1,350	1,280	1,140	1,230	1,230	1,130	599	1,310	1,080	1,180	2,320
17	1,060	1,310	1,250	1,150	1,230	1,230	1,130	595	1,210	1,060	1,150	2,250
18	1,060	1,480	1,250	1,150	1,220	1,220	1,160	640	1,210	1,050	1,180	2,160
19	1,080	1,510	1,250	1,140	1,190	1,210	1,190	697	1,190	1,050	1,270	1,970
20	1,070	1,490	1,250	1,150	1,260	1,220	1,180	704	1,170	1,120	1,300	1,480
21	1,100	1,530	1,230	1,160	1,270	1,210	1,170	930	1,170	1,090	1,330	1,240
22	1,100	1,610	1,200	1,160	1,250	1,180	1,140	981	1,170	1,080	1,310	1,190
23	1,110	1,730	1,240	1,160	1,390	1,170	1,130	993	1,160	1,080	1,320	1,240
24	1,140	1,840	1,260	1,170	1,420	1,170	1,080	1,110	1,190	1,100	1,300	1,250
25	1,120	1,850	1,270	1,170	1,450	1,160	1,300	1,440	1,150	1,090	1,290	1,280
26	1,120	1,930	1,210	1,170	1,470	1,190	1,100	1,970	1,150	1,130	1,310	1,290
27	1,120	1,960	1,180	1,160	1,440	1,190	1,170	1,820	1,130	1,150	1,310	1,310
28	1,130	1,900	1,150	1,190	1,560	1,200	1,190	1,650	1,220	1,160	1,320	1,320
29	1,130	1,990	1,130	1,170	1,520	1,210	1,160	1,700	1,230	1,180	1,370	1,280
30	1,140		1,170	1,170	1,520	1,170	1,170	1,810	1,210	1,240	1,370	1,270
31	1,150		1,170		1,650		1,150	1,870		1,300		1,270

## QUALITY OF WATER - 1980

Rio Grande at Mercedes Irrigation District Pumps  
Near Mercedes, Texas and Rio Rico, Tamaulipas

LOCATION: At river mile 117.8 (189.5 km), 52.6 river miles (84.6 km) downstream from Anzalduas Dam.

RECORDS: Specific conductance, 1945 through 1980.

REMARKS: Sampling and determinations by the International Boundary and Water Commission.

## SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,680	1,200	1,940	1,200	1,160	1,630	1,170	1,240	1,850	1,210	1,270	1,600
2	1,560	1,200	1,940	1,200	1,160	1,590	1,160	1,240	1,900	1,230	1,310	1,610
3	1,570	1,220	2,010	1,260	1,170	1,640	1,160	1,220	1,990	1,240	1,370	1,660
4	1,600	1,220	2,220	1,240	1,160	1,450	1,160	1,150	1,900	1,260	1,660	1,650
5	1,660	1,270	1,890	1,240	1,160	1,490	1,170	1,150	1,810	1,260	1,770	1,650
6	1,660	1,270	1,820	1,270	1,160	1,400	1,170	1,160	1,500	1,460	1,750	1,640
7	1,660	1,280	1,620	1,330	1,170	1,380	1,170	1,160	1,460	1,530	1,910	1,640
8	1,770	1,280	1,380	1,290	1,180	1,270	1,180	1,170	1,460	1,630	1,960	1,720
9	1,710	1,290	1,370	1,270	1,180	1,270	1,220	1,120	1,510	1,620	1,950	1,780
10	1,690	1,360	1,480	1,290	1,200	1,230	1,180	1,090	1,500	1,740	2,000	1,970
11	1,700	1,380	1,420	1,320	1,210	1,250	1,180	1,100	1,530	1,660	2,090	2,270
12	1,670	1,400	1,420	1,290	1,220	1,240	1,190	1,110	1,560	1,850	1,940	2,440
13	1,500	1,350	1,480	1,290	1,210	1,260	1,230	1,150	1,590	1,410	1,860	2,510
14	1,320	1,350	1,580	1,240	1,210	1,240	1,260	975	1,620	1,290	1,480	2,180
15	1,200	1,380	1,470	1,200	1,200	1,240	1,210	945	1,590	1,260	1,440	2,470
16	1,190	1,380	1,380	1,160	1,210	1,270	1,180	1,060	1,530	1,290	1,400	2,440
17	1,210	1,400	1,400	1,150	1,230	1,300	1,200	1,060	1,440	1,300	1,400	2,320
18	1,190	1,410	1,350	1,170	1,220	1,270	1,190	982	1,320	1,270	1,380	2,370
19	1,210	1,540	1,320	1,180	1,230	1,270	1,220	982	1,240	1,190	1,330	2,310
20	1,190	1,560	1,280	1,170	1,220	1,250	1,230	982	1,240	1,160	1,320	2,340
21	1,170	1,590	1,270	1,160	1,240	1,240	1,260	1,050	1,270	1,110	1,380	2,240
22	1,150	1,600	1,270	1,160	1,240	1,240	1,240	1,110	1,250	1,140	1,380	2,060
23	1,140	1,570	1,290	1,170	1,240	1,230	1,220	1,080	1,250	1,160	1,400	1,550
24	1,150	1,590	1,280	1,170	1,290	1,200	1,200	1,110	1,230	1,160	1,440	1,390
25	1,170	1,630	1,260	1,170	1,290	1,180	1,200	1,200	1,220	1,140	1,510	1,390
26	1,160	1,740	1,290	1,190	1,290	1,170	1,090	1,170	1,230	1,210	1,540	1,450
27	1,170	1,830	1,290	1,190	1,320	1,170	1,340	1,260	1,240	1,250	1,590	1,540
28	1,170	1,920	1,230	1,170	1,560	1,180	1,160	1,520	1,210	1,300	1,590	1,610
29	1,150	1,920	1,190	1,170	1,550	1,190	1,230	1,750	1,190	1,270	1,590	1,610
30	1,170	1,220	1,170	1,170	1,590	1,180	1,260	2,070	1,190	1,250	1,590	1,570
31	1,190	1,200	1,200	1,200	1,560	1,200	1,250	2,040	1,200	1,230	1,530	1,530

## QUALITY OF WATER - 1980

## Rio Grande near Brownsville, Texas and Matamoros, Tamaulipas

LOCATION: Gaging station at river mile 48.7 (78.3 km), 0.2 river mile (0.3 km) downstream from El Jardin pumping plant and 7.0 river miles (11.2 km) downstream from the international highway bridge between Brownsville, Texas and Matamoros, Tamaulipas.

RECORDS: Chemical and biochemical analyses, October 1967 through January 1968 and October 1974 through 1980; biochemical, December 1976 through 1980; specific conductance, 1955 through 1980; suspended silt, 1955 through 1977.

REMARKS: Sampling and analyses by the U. S. Geological Survey. Additional water quality parameters, including heavy metals, nutrients, pesticides, and biological indices, determined and published by the U. S. Geological Survey. Sampling and determinations for specific conductance prior to 1978 by the International Boundary and Water Commission.

1980	Time	Stream-flow, Momentary	Specific Conductance	pH	Temperature	Hardness, Total (as CaCO <sub>3</sub> )	Hardness, Noncarbonate (as CaCO <sub>3</sub> )	Calcium ion (Ca), Dissolved	Magnesium ion (Mg)	Sodium ion (Na), Dissolved	Sodium Adsorption Ratio (SAR)	Potassium ion (K), Dissolved
Date	Std.	Sec.-Ft.	Micromhos	Units	Deg C	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Jan. 24	1527	102	1,490	8.1	16.0	390	210	110	29	150	3.3	5.7
Feb. 20	1245	345	1,360	8.5	17.5	370	230	100	28	150	3.4	5.4
Mar. 25	1224	170	1,480	8.2	22.0	400	250	110	31	150	3.3	6.1
Apr. 23	0930	19.4	1,780	8.0	22.0	500	280	140	37	190	3.7	6.7
May 28	1205	576	1,440	8.3	30.5	310	190	86	24	180	4.4	6.2
June 24	1000	233	1,300	8.3	30.0	300	220	78	25	150	3.8	5.6
July 22	1105	56.9	1,300	8.3	31.0	320	200	87	25	150	3.6	5.8
Aug. 20	0957	840	1,000	8.1	29.0	230	120	64	17	120	3.4	6.6
Sep. 17	1120	14.8	1,890	7.9	30.0	480	290	130	38	220	4.4	7.6
Oct. 22	1510	922	1,360	8.1	21.0	350	200	96	27	150	3.5	6.9
Nov. 19	1328	210	1,790	8.1	14.5	420	300	110	36	250	5.3	8.8
Dec. 16	0850	388	1,730	8.2	18.0	410	280	110	34	210	4.5	5.9

1980	Bicarbonate ion (HCO <sub>3</sub> )	Carbonate ion (CO <sub>3</sub> )	Sulfate ion (SO <sub>4</sub> ), Dissolved	Chloride ion (Cl), Dissolved	Silica (SiO <sub>2</sub> ), Dissolved	Oxygen, Dissolved (DO)	Coliform, Fecal	Oxygen Demand, Biochemical (BOD) 5 day	Turbidity	Solids, Dissolved (Calculated)	Solids, Dissolved (Residue @ 180 Deg C)	Suspended Sediment
Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Cols./100 mL	mg/L	NTU	mg/L	mg/L	mg/L
Jan. 24	220	0	290	190	11	9.6	120	2.9	32	895	955	76
Feb. 20	160	4	290	180	12	10.8	4,400	3.2	25	850	870	58
Mar. 25	180	0	320	200	13	8.2	73	2.9	42	919	950	58
Apr. 23	270	0	360	250	19	8.4	110	2.9	32	1,140	1,140	92
May 28	160	0	300	210	13		600	1.6	68	894	903	127
June 24	150	0	310	160	14	4.9	270	1.9	8.6	791	840	48
July 22	160	0	300	160	15	7.4	160	1.9	17	816	832	35
Aug. 20	130	0	180	150	7.0		230	.6	140	612	584	221
Sep. 17	240	0	370	310	21	7.6	200	2.7	33	1,210	1,240	116
Oct. 22			300	180	14	8.6		2.8	80	865	853	
Nov. 19			350	320	14	10.7	49	2.9	48	1,160	1,170	
Dec. 17			340	290	11	9.7	350	4.5	34	1,080	997	

## QUALITY OF WATER - 1980

## Rio Grande near Brownsville, Texas and Matamoros, Tamaulipas

SPECIFIC CONDUCTANCE OF WATER SAMPLES IN MICROMHOS/CM @ 25 DEG C - 1980

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,950	1,370	1,420	1,360	1,170	1,530	1,240	1,490	1,220	1,200	1,310	1,520
2	1,920	1,360	1,500	1,340	1,200	1,550	1,270	1,370	1,330	1,200	1,400	1,550
3	1,730	1,350	1,550	1,360	1,220	1,580	1,270	1,320	1,980	1,180	1,460	1,560
4	1,750	1,350	1,600	1,430	1,240	1,630	1,290	1,360	1,710	1,220	1,490	1,520
5	1,720	1,370	1,700	1,400	1,380	1,650	1,270	1,440	1,800	1,270	1,510	1,560
6	1,720	1,420	1,650	1,290	1,310	1,680	1,290	1,420	1,760	1,310	1,520	1,640
7	1,730	1,420	1,600	1,320	1,190	1,680	1,260	1,420	1,760	1,310	1,540	1,600
8	1,680	1,430	1,550	1,280	1,180	1,750	1,220	1,320	1,780	1,340	1,550	1,600
9	1,670	1,430	1,530	1,340	1,180	1,810	1,230	1,200	1,760	1,390	1,560	1,620
10	1,670	1,440	1,510	1,380	1,190	1,410	1,220	1,150	1,820	1,440	1,620	1,640
11	1,690	1,450	1,530	1,410	1,200	1,300	1,210	1,120	1,800	1,480	1,630	1,670
12	1,660	1,440	1,520	1,480	1,200	1,280	1,250	1,080	1,830	1,530	1,860	1,670
13	1,680	1,420	1,510	1,460	1,200	1,320	1,270	1,220	1,830	1,640	1,950	1,630
14	1,690	1,350	1,500	1,520	1,210	1,350	1,320	1,090	1,860	1,680	2,170	1,680
15	1,670	1,360	1,510	1,430	1,220	1,360	1,310	790	1,810	1,660	2,050	1,670
16	1,680	1,380	1,500	1,480	1,240	1,380	1,290	892	1,780	1,680	1,950	1,670
17	1,630	1,370	1,480	1,480	1,250	1,390	1,340	1,580	1,850	1,620	1,920	1,790
18	1,720	1,370	1,490	1,570	1,260	1,310	1,290	1,660	1,960	1,580	1,970	2,070
19	1,810	1,380	1,500	1,500	1,250	1,270	1,310	1,380	2,020	1,640	1,900	2,310
20	1,750	1,370	1,480	1,620	1,240	1,270	1,300	1,010	1,930	1,590	1,900	2,370
21	1,700	1,360	1,460	1,640	1,240	1,320	1,320	859	1,840	1,840	1,880	2,360
22	1,690	1,370	1,470	1,700	1,280	1,340	1,310	848	1,700	1,350	1,700	2,330
23	1,620	1,360	1,470	1,590	1,290	1,320	1,340	867	1,640	1,060	1,600	2,320
24	1,450	1,340	1,480	1,490	1,300	1,320	1,360	930	1,680	1,150	1,520	2,310
25	1,500	1,300	1,470	1,270	1,310	1,290	1,360	959	1,400	1,130	1,400	2,280
26	1,430	1,300	1,430	1,190	1,350	1,300	1,260	1,000	1,320	1,120	1,330	2,220
27	1,490	1,360	1,490	1,180	1,400	1,300	1,210	1,060	1,260	1,110	1,360	2,180
28	1,400	1,370	1,500	1,180	1,440	1,290	1,180	1,100	1,290	1,120	1,420	2,100
29	1,410	1,400	1,510	1,170	1,500	1,280	1,180	1,140	1,240	1,170	1,430	2,060
30	1,390		1,460	1,190	1,510	1,240	1,210	1,230	1,250	1,200	1,510	1,910
31	1,400		1,440		1,520		1,340	1,280		1,270		1,750

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES**  
In Inches

Tabulated below, in approximate downstream order, are monthly records of United States rainfall stations with averages for their periods of record. With the exception of Las Cruces, New Mexico, all stations are located in Texas. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 137 through 139 in this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the United States Section of the Commission. Daily records for years prior to 1953 may also be found in corresponding water bulletins.

Detailed listings of the months and years for which records are available through 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 26, and Supplement 40A.

Month	Las Cruces, New Mexico		American Dam		Clint Station		Acala Station		Fort Hancock Bridge	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.77	0.68	0.55	0.41	0.38	0.31	0.28	0.30	0.42	0.37
Feb.	.86	.42	.71	.39	.32	.28	0	.20	.34	.30
Mar.	.23	.23	.34	.31	.16	.21		.24	.17	.24
Apr.	.80	.32	.62	.20	.06	.14		.18	.30	.25
May	.80	.62	.22	.24	.12	.30		.34	.23	.48
June	0	.65	.02	.55	0	.50		.60	1.10	.82
July	.77	1.12	.66	1.50	0	1.03		1.13	.20	1.30
Aug.	1.16	2.72	1.10	1.34	.48	1.12		1.23	2.81	1.64
Sept.	2.04	1.63	1.80	1.14	2.10	.87		.88	4.81	1.42
Oct.	.57	.90	.86	.73	.73	.65		.84	.17	.97
Nov.	.36	.76	.60	.28	.51	.23		.25	.86	.36
Dec.	.05	.54	.06	.37	.05	.35		.32	.13	.40
Yearly	8.41	10.59	7.54	7.46	4.91	5.99		6.51	11.54	8.55

Month	Guayuco Arroyo		Fort Quitman		Neely Ranch		96 Ranch Headquarters		La Macolla Farm	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.16	0.28	0.18	0.36	0.13	0.32	0.20	0.53	0	0.26
Feb.	.16	.19	.08	.23	.07	.19	.20	.53	0	.36
Mar.	0	.21	.02	.21	.03	.17	0	.27	0	0
Apr.	0	.19	0	.22	.03	.16	.10	.08	0	.14
May	0	.44	0	.39	.08	.36	.20	1.19	.21	1.80
June	.05	.55	0	.76	T	.76	1.10	1.82	0	1.16
July	0	1.39	1.20	1.48	.96	1.72	1.50	4.99	0	1.62
Aug.	.42	1.67	.22	1.60	2.61	1.78	2.70	3.09	3.99	3.42
Sept.	1.44	1.20	.57	1.05	5.82	1.64	3.30	5.50	2.78	2.60
Oct.	.30	.98	.22	.81	.26	1.00	.90	1.11	1.18	.87
Nov.	.24	.22	.21	.28	.45	.26	.40	.59	0	.50
Dec.	.04	.34	.12	.35	.21	.40	.50	.58	0	.12
Yearly	2.81	7.66	2.82	7.74	10.65	8.76	11.10	20.28	8.16	11.85

Month	Bill Shannon Ranch		Shafter		Presidio (IB&WC Gage)		Quebec Ranch		Kerr Mitchell Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.10	0.42	0.08	0.09	0.07	0.24	0	0.42	0.15	0.44
Feb.	0	.37	0	.33	.05	.20	0	.32	.15	.35
Mar.	0	.32	0	.32	.05	.16	0	.28	0	.19
Apr.	0	.15	.07	.28	.05	.21	0	.24	0	.42
May	0	.72	.05	.85	T	.48	1.20	.81	.52	1.05
June	.10	1.55	.88	2.58	.62	1.22	.80	1.61	1.10	1.83
July	.80	2.29	.05	3.71	.16	1.51	.90	2.61	0	2.04
Aug.	5.00	2.59	4.39	3.58	5.24	1.34	.90	2.47	2.52	2.33
Sept.	4.10	2.65	5.63	3.97	3.81	1.53	6.45	2.55	4.77	2.16
Oct.	2.45	1.16	.89	1.19	.73	.67	1.10	.95	1.85	1.26
Nov.	1.00	.46	.45	.42	.64	.30	0	.31	.60	.37
Dec.	.25	.39	.30	.24	.31	.25	.70	.34	.30	.36
Yearly	13.80	13.07	12.79	17.56	11.73	8.11	12.05	12.91	11.96	12.80

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES**

**In Inches**

Month	H. T. Fletcher Ranch		Plata		La Mota Ranch		Redford		Lajitas	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.10	0.69	0.20	0.19	0	0.64	0.10	0.27	0.05	0.07
Feb.	0	.33	0	.11	0	.09	.05	.20	0	.22
Mar.	0	.35	0	0	0	.23	T	.21	0	.22
Apr.	0	.45	0	.16	.09	.34	.10	.24	0	.41
May	.25	1.03	0	.16	0	1.01	T	.46	.05	.77
June	1.05	1.74	0	1.42	.50	1.64	1.45	1.04	0	1.37
July	0	2.96	0	.50	0	1.39	2.25	1.46	0	1.11
Aug.	4.75	3.25	2.98	2.88	3.55	1.92	3.80	1.37	0	1.29
Sept.	9.50	2.63	6.26	3.23	7.46	2.33	6.10	1.90	4.04	2.41
Oct.	2.80	1.46	.67	1.45	.51	.31	.40	.82	.17	.69
Nov.	1.00	.45	.60	.61	.75	.44	.50	.35	.77	.32
Dec.	.60	.41	0	0	.62	.36	.10	.23	.10	.27
Yearly	20.05	15.75	10.71	10.71	13.48	10.70	14.85	8.55	5.18	9.15

Month	Study Butte		Terlingua Creek Station		Castolon		Johnson Ranch		J. F. Woodward Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.14	0.13	0.10	0.20	0.10	0.20	T	0.29	0.40	0.42
Feb.	.05	.14	T	.20	.08	.30	T	.22	0	.37
Mar.	0	.05	0	.15	0	.27	0	.18	0	.24
Apr.	.11	.24	0	.30	.08	.35	0	.37	T	.50
May	0	1.33	0	.70	.11	.94	T	1.00	.58	1.01
June	.56	1.18	.10	1.03	1.96	1.39	.10	1.10	1.02	1.88
July	.13	1.70	.10	1.17	.85	1.96	T	1.17	.05	2.41
Aug.	3.57	2.28	2.85	1.23	3.30	1.89	2.55	.88	3.49	2.90
Sept.	1.74	1.66	3.30	1.35	3.22	2.12	4.95	1.39	8.64	2.59
Oct.	.65	.44	.35	.65	.79	.79	.65	.63	.88	1.03
Nov.	.69	.28	.70	.21	.75	.27	.60	.21	.13	.53
Dec.	.56	.28	.40	.27	.52	.27	0	.29	1.15	.36
Yearly	8.20	9.71	7.90	7.46	11.76	10.75	8.85	7.73	16.34	14.24

Month	Yarborough Ranch		Elephant Mountain Ranch		Buttrill Ranch		A. M. Potter Ranch		Harold Wynne Ranch Headquarters	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.40	0.22	0	0.42	0.25	0.44	0.27	0.33	0	0.17
Feb.	0	.42	0	.31	0	.19	0	.48	0	.18
Mar.	.04	.23	0	.15	0	.16	0	.18	0	.17
Apr.	0	.29	0	.45	0	.52	0	.25	0	.53
May	.57	.90	1.35	.83	1.90	1.13	.28	.98	.60	1.02
June	1.61	1.73	1.30	1.46	1.10	1.39	0	1.12	.60	1.08
July	0	2.53	0	1.73	0	1.52	0	1.48	.30	1.70
Aug.	2.97	2.97	4.17	1.86	1.52	1.59	2.79	1.63	7.30	3.33
Sept.	6.14	3.23	6.83	2.04	3.81	2.08	3.10	1.94	2.70	2.27
Oct.	.84	1.17	1.03	1.01	.85	.91	1.03	.59	.50	.85
Nov.	1.21	.60	.25	.31	0	.29	1.30	.41	.50	.37
Dec.	.77	.53	1.30	.53	1.50	.32	1.32	.44	.80	.57
Yearly	14.55	14.82	16.23	11.10	10.93	10.54	10.09	9.83	13.30	12.24

Month	Persimmon Gap Ranger Station		Heath Crossing		Dove Mountain Ranch		Slaughter Ranch		Steve Stumberg Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.13	0.46	1.00	0.28	0.16	0.39	0	0.38	0	0.45
Feb.	.05	.48	.06	.39	0	.37	0	.44	0	.39
Mar.	.06	.31	0	.27	0	.20	0	.38	0	.39
Apr.	.14	.45	1.30	.51	0	.43	0	.65	0	.67
May	.52	.96	.55	.95	2.00	1.16	4.07	1.64		1.39
June	1.03	1.17	.73	1.11	.40	1.11	0	1.20		1.66
July	0	1.43	0	1.31	0	1.74	0	.98		2.04
Aug.	2.45	1.02	2.73	1.67	1.85	1.25		2.49	4.76	2.01
Sept.	1.72	1.41	1.27	2.42	2.24	1.66		2.84	5.54	2.39
Oct.	1.28	1.13	1.90	.90	.16	1.23		1.54		1.50
Nov.	1.10	.41	.81	.70	.90	.34		1.02	.38	.61
Dec.	.57	.32	.49	.34	1.00	.40		.48	2.50	.52
Yearly	9.05	9.55	10.84	10.85	8.71	10.28		14.04		14.02

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	McGonagill Ranch Headquarters		White V- Ranch		Lewis James Ranch		Dryden		Ross Foster Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.26	0.40	0.48	0.38	0.29	0.66	0.49	0.01	0.36
Feb.	0	.45	0	.60	.20	.55	.38	.51	.20	.45
Mar.	0	.41	0	.34	0	.33	.03	.42	.30	.26
Apr.	0	.46	0	1.28	.09	.87	0	.90	T	.75
May	3.20	1.32	1.46	1.46	2.58	1.52	1.84	1.66	.65	1.15
June	1.50	1.95	2.65	1.58	.49	1.17	.22	1.12	.45	1.24
July	0	2.27	0	1.25	0	1.46	.07	1.11	0	.68
Aug.	5.20	1.94	8.40	1.71	7.51	2.25	5.28	1.42	4.84	1.42
Sept.	6.20	2.68	5.05	2.94	3.33	3.40	2.44	2.12	2.10	1.85
Oct.	1.30	1.10	.50	1.58	.25	1.31	.21	1.29	T	.95
Nov.	0	.35	1.96	.75	.37	.82	1.27	.44	1.26	.43
Dec.	1.00	.16	1.37	.39	.29	.35	.21	.43	.20	.32
Yearly	18.40	13.35	21.79	14.36	15.49	14.32	12.61	11.91	10.01	9.86

Month	Billings Ranch		W. A. Arledge Ranch		Owens Ranch		Latham Ranch		Prosser Ranch No. 3	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.		0.24	0.21	0.61	0.20	0.34	1.00	0.37	0.68	0.37
Feb.		.50	.43	.54	.50	.65	0	.87	.58	.77
Mar.	0.70	.68	.48	.47	1.50	.90	0	.61	.78	.58
Apr.	0	1.40	0	1.27	1.50	1.78	0	1.50	.06	1.30
May	4.87	2.64	1.45	1.82	2.16	1.98	3.10	2.84	2.17	2.06
June	.80	.68	0	1.56	2.50	2.01	1.00	2.32	0	1.26
July	.55	1.83	0	1.27	0	1.22	0	2.97	.58	1.68
Aug.	6.50	2.98	6.94	1.46	3.00	1.81	5.50	3.27	3.64	2.31
Sept.	5.15	4.29	3.25	2.08	5.60	2.75	11.00	4.08	3.10	3.74
Oct.	.10	.68	T	1.55	.30	2.11	0	1.79	0	1.71
Nov.	1.28	1.06	1.27	.48	2.20	1.39	2.00	.92	1.07	.68
Dec.	1.00	1.06	.51	.49	.30	.50	0	.53	.58	.39
Yearly		18.04	14.54	13.60	19.76	17.44	23.60	22.07	13.24	16.85

Month	Ranchita (Continental)		Rio Grande near Dryden		Pecos River near Langtry Station		Dead Mans Canyon near Comstock		Prosser Ranch No. 1	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.60	0.35	0.39	0.22	0.55	0.29	0.70	0.35	0.70	0.31
Feb.	.60	.78	0	.06	.20	.66	.45	.67	.50	.66
Mar.	.50	.64	.12	.12	1.00	.51	.70	.63	.80	.48
Apr.		1.14	.05	.58	T	.85	0	1.10	.18	1.34
May		1.83	.93	1.06	.22	1.08	.70	1.93	2.42	2.12
June	.40	2.06	.23	.71	.20	1.80	0	2.14	.35	1.45
July	.10	1.77	0	.83	1.20	1.60	1.05	2.64	4.30	2.33
Aug.	4.00	2.79	7.11	2.21	1.55	1.80	4.30	2.16	4.00	2.27
Sept.	3.00	3.01	3.05	1.75	2.05	2.63	2.45	2.87	2.40	3.22
Oct.	.10	1.92	.27	.34	.10	1.15	.77	1.79	.20	1.62
Nov.	1.30	.70	1.30	.97	1.15	.76	2.13	.82	1.10	.69
Dec.	1.10	.52	.20	.28	.20	.34	.40	.43	.50	.36
Yearly		17.51	13.65	9.13	8.42	13.47	13.65	17.53	13.45	16.85

Month	Continental Ranch		Martin King Ranch		Brotherton Ranch		Walker Ranch		Zuberbueller Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.60	0.50	0.69	0.48	0.52	0.61	1.07	0.31	0.46	0.30
Feb.	.80	.90	.51	.72	.47	.84	.39	.65	.38	.74
Mar.	.80	.64	.12	.34	0	.55	.19	.51	.02	.40
Apr.		1.37	.06	.90	.09	.94	.06	1.05	0	.94
May		2.56	.71	1.51	.51	1.50	.62	2.06	.54	1.66
June	.70	1.93	.08	1.65	0	1.82	0	1.94	0	1.78
July	.80	2.75	.30	1.55	1.46	1.63	0	1.94	1.98	3.09
Aug.	3.60	2.59	5.91	1.65	5.21	2.07	4.46	1.52	5.43	1.58
Sept.	3.40	4.07	2.30	2.65	1.85	2.71	3.50	3.88	2.32	2.00
Oct.	.15	2.22	.57	2.06	.85	1.79	.50	1.87	.50	1.03
Nov.	1.50	.70	1.28	.57	1.29	.56	1.12	.74	1.57	.84
Dec.	1.30	.51	.22	.44	.52	.36	.10	.37	.45	.60
Yearly		20.74	12.75	14.52	12.77	15.38	12.01	16.84	13.65	14.96

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES  
In Inches**

Month	P. W. Kelly Ranch		Comstock		Cow Creek near Comstock		Amistad Reservoir near Comstock		Feely	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.35	0.45	0.17	0.56	0.25	0.30	0	0.21	0.49	0.39
Feb.	0	.72	.32	.79	0	.51	0	.34	.01	.70
Mar.	0	.81	.13	.60	0	.39	0	.49	0	.44
Apr.	.11	1.16	0	1.38	0	1.10	0	1.25	0	1.32
May	.88	2.01	.03	1.82	.90	1.08	2.15	1.19	2.25	1.76
June	.39	2.15	.02	2.06	0	1.51	.04	1.35	0	1.81
July	.73	2.33	1.28	1.37	.50	1.68	.44	1.43	1.00	1.50
Aug.	3.66	2.16	4.82	1.90	4.48	2.24	6.86	2.08	4.25	2.13
Sept.	4.50	3.20	2.64	2.41	2.42	2.36	1.87	1.90	.75	2.27
Oct.	.52	1.67	.65	1.82	.15	1.66	.03	1.82	.15	2.04
Nov.	1.20	.82	1.29	.60	1.20	.61	2.00	.43	1.25	.59
Dec.	.63	.33	.47	.64	.25	.31	.25	.24	.30	.36
Yearly	12.97	17.81	11.82	15.95	10.15	13.75	13.64	12.73	10.45	15.31

Month	Line Store		W. E. Sawyer Ranch		Whitehead Brothers Ranch		Prosser Ranch No. 2		Devils River at Cauthorn Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.24	0.51	0.05	0.37	0.65	0.48	0.48	0.35	0.72	0.39
Feb.	.48	.91	.07	.93	.45	.70	.48	.81	.64	.66
Mar.	.44	.64	.43	.85	.10	.75	.82	.64	.54	.39
Apr.	.25	1.81	.30	1.90	.26	1.62	.14	1.36	.13	.95
May	3.07	2.26	3.86	2.40	1.24	2.42	2.62	2.25	.59	1.72
June	2.50	1.82	1.87	2.00	0	1.60	1.31	1.52	.50	.77
July	0	2.27	0	2.37	.18	2.04	.10	2.02		.43
Aug.	3.73	2.59	1.45	3.03	1.80	2.46	4.17	2.65		.57
Sept.	6.33	4.03	8.68	3.67	2.60	3.14	3.00	3.68		1.29
Oct.	1.01	1.81	.25	1.99	.10	2.57	0	1.75		.92
Nov.	1.64	.91	1.70	.81	1.40	.93	1.16	.70		.35
Dec.	0	.41	1.00	.55	.50	.43	.19	.34		.42
Yearly	19.69	19.97	19.66	20.87	9.28	19.14	14.47	18.07		8.86

Month	Bakers Crossing		Erekson Ranch		Vinegarone		Eugene Miller Ranch		Dolan Springs	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.		0.68	0.40	0.77	0.19	0.45	0.51	0.36	0.20	0.45
Feb.		.95	.80	1.26	.97	.79	.43	.48	.20	.75
Mar.		.71	0	.91	0	.83	.30	.69	0	.82
Apr.	0.10	1.25	0	2.11	.10	1.68	.18	1.51	.42	1.71
May	0	2.54	1.77	2.57	.94	2.48	6.03	3.29	2.26	2.20
June	.66	2.00	2.95	2.90	0	1.81	.17	2.15	0	1.98
July	.48	1.74	.69	2.35	1.00	2.40	T	4.06	.35	2.14
Aug.	1.65	2.15	.85	2.30	1.34	2.90	3.20	2.20	2.00	3.01
Sept.	6.11	3.68	2.82	2.99	2.30	2.90	12.49	4.18	15.20	4.06
Oct.	.07	1.77	.68	2.42	1.00	2.57	.20	1.58	.60	2.27
Nov.	1.24	.59	1.22	.93	1.46	.95	1.11	1.11	1.20	.77
Dec.		.63	1.42	.55	.53	.47	.60	.40	.50	.43
Yearly		18.69	13.60	22.06	9.83	20.23	25.22	22.01	22.93	20.59

Month	H. K. Fawcett Ranch		Ed Crane Ranch		H. T. Miers Ranch Headquarters		H. T. Miers Ranch No. 2		A. A. Baker Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.25	0.65	0.62	0.76	0.30	0.59	0.44	0.46	0.18	0.38
Feb.	.50	.75	.45	1.10	0	1.02	.66	.85	.30	.71
Mar.	.08	.75	.15	.60	T	.74	.33	.90	.16	.56
Apr.	.14	1.75	.12	1.71	.16	1.92	.20	1.68	.11	1.31
May	1.48	2.32	1.33	2.54	1.59	2.69	2.99	2.47	.67	1.66
June	.35	1.53	.20	1.97	0	2.68	0	1.90	.07	1.77
July	1.42	1.78	1.16	1.94	.85	1.80	1.17	1.54	.24	1.65
Aug.	1.76	2.41	3.36	1.16	1.90	2.14	2.63	2.69	3.97	2.12
Sept.	4.76	3.33	2.64	2.76	.75	2.66	.05	2.91	2.94	3.17
Oct.	.66	2.22	.42	1.89	.20	2.73	0	1.98	.60	1.78
Nov.	1.53	.73	1.34	.80	1.40	.84	1.45	.84	1.13	.64
Dec.	.53	.47	.59	.64	.70	.58	.30	.61	.42	.40
Yearly	13.46	18.69	12.38	17.87	7.85	20.39	10.22	18.83	10.79	16.15

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Harlow Ranch		Gillis Ranch		Goldwire Ranch		Pafford Crossing		Big Satan Creek Station	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.40	0.29	0.36	0.50	0.40	0.52	0.30	0.48	0.40	0.48
Feb.	.30	.49	.38	.90	0	.66	.20	.75	0	.58
Mar.	.30	.36	.04	.75	.05	.72	.05	.53	0	.99
Apr.	0	1.25	.11	1.66	.26	1.80	.13	1.39	.26	1.85
May	.95	1.74	.88	1.96	1.99	2.48	.57	1.89	2.29	2.28
June	.05	2.30	0	1.62	T	1.92	0	2.06	0	1.62
July	.25	1.56	.85	1.78	1.35	2.02	.80	1.86	1.45	2.44
Aug.	4.05	2.07	2.65	1.78	2.95	3.65	1.95	2.12	2.30	3.27
Sept.	2.95	2.91	1.68	3.09	1.40	2.64	2.50	3.13	.95	2.52
Oct.	.35	1.93	.31	2.28	.33	2.21	.09	2.11	0	2.38
Nov.	1.25	.61	1.29	.83	1.50	.89	1.55	.73	1.40	.88
Dec.	.30	.34	.35	.62	.60	.49	.40	.49	.20	.60
Yearly	11.15	15.85	8.90	17.77	10.83	20.80	8.54	17.54	9.25	19.89

Month	Cliff Lowry Ranch No. 1		Lowry Ranch No. 2		Tuffy Whitehead Ranch		Stewart Ranch		Rough Canyon near Del Rio	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.55	0.40	0.40	0.34	0.30	0.31	0.78	0.41	0.70	0.33
Feb.	.20	1.01	.24	.84	.25	.73	.20	.86	.25	.85
Mar.	.25	.76	.10	.78	.09	.59	.21	.61	.15	.69
Apr.	.19	1.85	.14	1.79	.09	1.43	.16	1.74	.23	1.48
May	1.19	2.58	.89	1.98	1.24	1.54	1.09	1.75	.97	1.59
June	.17	2.15	.13	1.93	.02	1.77	.08	2.26	0	2.14
July	1.74	1.98	.94	2.08	.64	1.50	.37	1.88	.30	2.37
Aug.	2.85	2.51	1.75	2.67	4.38	1.84	2.05	1.97	1.60	2.91
Sept.	.29	3.11	.89	2.40	1.65	2.83	.55	2.56	1.10	2.37
Oct.	.12	2.20	.11	1.95	.20	1.78	.15	2.09	.05	2.42
Nov.	1.50	.91	1.27	.86	1.36	.66	1.28	.78	1.55	.94
Dec.	.67	.53	.43	.55	.27	.42	.55	.53	.20	.53
Yearly	9.72	19.99	7.29	18.17	10.49	15.40	7.47	17.44	7.10	18.62

Month	Devils Lake		Sellers Ranch		Evans Creek near Comstock		J. G. Brite Ranch		Hutto Ranch No. 1	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.45	0.61	0.20	0.35	0.39	0.22	0.35	0.33	0.29	0.47
Feb.	.25	.83	.20	.70	.19	.70	.30	.87	.32	.88
Mar.	.12	.61	0	.53	.05	.66	.17	.70	.16	.65
Apr.	.15	1.63	0	1.35	0	1.23	.12	1.57	.14	2.10
May	.46	1.77	1.35	1.49	1.73	1.13	1.29	1.91	1.82	1.91
June	.10	2.28	T	2.30	T	2.05	.09	2.04	.05	1.97
July	.54	1.34	.10	1.37	.39	2.16	.34	1.66	.15	2.26
Aug.	1.85	1.86	1.45	1.97	5.19	3.15	1.71	2.30	2.18	2.32
Sept.	1.98	2.37	1.80	2.49	.92	2.96	2.19	3.22	1.00	2.69
Oct.	.06	1.91	0	1.94	.29	2.02	.23	2.09	.05	2.13
Nov.	1.30	.71	1.20	.71	1.63	.95	1.60	.84	1.87	.87
Dec.	.44	.70	.30	.47	.39	.39	.43	.50	.83	.55
Yearly	7.70	16.62	6.60	15.67	11.17	17.62	8.82	18.03	8.86	18.80

Month	Hutto Ranch No. 2		Middle Fork San Pedro		North Fork San Pedro		Long Ranch		Buoy No. 11	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.55	0.48	0.30	0.40	0.50	0.38	0.49	0.40	0.10	0.31
Feb.	.22	.98	.30	.85	.25	.73	.26	.75	.20	.45
Mar.	.29	.64	.20	.70	.20	.72	.36	.75	.10	.56
Apr.	.17	2.15	.18	1.99	.12	1.92	.15	1.69	0	1.45
May	2.29	1.70	2.17	2.26	1.48	2.02	3.05	1.96	3.79	1.63
June	0	2.11	.10	1.91	.30	2.04	.12	2.01	0	1.93
July	.10	2.21	.15	3.04	1.25	3.03	.40	2.66	.44	2.06
Aug.	2.30	2.32	2.70	2.72	2.00	2.64	1.99	1.79	6.86	2.53
Sept.	1.79	3.37	1.20	1.57	.90	1.93	1.24	2.02	1.77	2.46
Oct.	.04	1.93	.10	2.71	.50	2.49	.07	2.04	.03	1.65
Nov.	1.84	.99	1.95	1.08	1.70	1.05	1.72	.86	.87	.61
Dec.	.64	.49	.60	.63	.60	.59	.56	.53	0	.37
Yearly	10.23	19.37	9.95	19.86	9.80	19.54	10.41	17.46	14.16	16.01

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES  
In Inches**

Month	Amistad Dam		Laughlin Air Force Base			Gillis Headquarters Ranch		Lewis Ranch		Maverick County Canal Headgate	
	1980	Average	1979	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.79	0.44	0.28	0.17	0.47	1.13	0.56	0.10	0.54	0.15	0.54
Feb.	.32	.82	1.04	.20	.89	.30	.98	.50	1.09	.09	.93
Mar.	.17	.72	2.58	.10	.50	.20	.81	0	.74	.10	.58
Apr.	.13	1.82	1.33	.35	2.01	.35	2.23	.30	2.24	.78	1.56
May	3.63	1.99	.93	3.21	2.05	1.14	2.27	1.05	2.45	2.89	2.12
June	.16	1.99	5.11	.11	2.63	T	2.39	0	2.24	.36	2.20
July	.14	1.98	.07	.18	2.62	.17	2.74	.45	1.68	.40	1.78
Aug.	5.03	2.43	.33	1.01	1.94	3.02	3.23	2.60	2.56	3.23	1.62
Sept.	1.13	3.72	.02	.39	2.46	.42	2.00	.85	3.08	.77	2.69
Oct.	.23	1.90	T	.08	2.55	.14	2.61	0	2.62	.09	2.07
Nov.	1.95	.83	.50	1.71	1.05	1.66	1.21	2.15	1.14		.96
Dec.	.61	.55	.36	.44	.55	1.27	.79	1.30	.70		.56
Yearly	14.29	19.19	12.55	7.95	19.72	9.80	21.82	9.30	21.08		17.61

Month	Wardlaw Standart Ranch		Pinto Creek Station		Las Moras Creek		Wipff Ranch		Lateral No. 2 Spill	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.20	0.20	0.25	0.52	0.26	0.68	0.25	0.63	0.25	0.57
Feb.	.28	.75	0	.73	.40	.99	.10	.76	.10	.67
Mar.	.15	1.77	.40	.53	.70	.63	.70	.62	.50	.67
Apr.	.30	1.31	.30	1.36	.52	1.37	.40	1.60	.80	1.72
May	3.29	2.18	5.00	2.06	5.50	2.30	7.80	2.51	7.40	2.80
June	0	2.22	.20	2.36	.14	2.54	0	2.24	0	2.29
July	1.51	.76	.10	1.51	.80	1.38	T	1.63	.20	1.93
Aug.	2.70	.92	3.20	1.75	2.13	2.04	2.85	1.93	3.30	2.16
Sept.	1.00	1.20	1.15	2.84	.40	3.34	.60	2.87	.20	3.02
Oct.	T	1.17	T	1.96	.40	2.45	.20	2.15	0	2.12
Nov.	2.52	3.33	2.55	1.27	3.23	1.09	3.80	1.23	2.85	1.11
Dec.	.54	.34	.65	.56	.80	.64	.30	.56	.40	.50
Yearly	12.49	16.15	13.80	17.45	15.28	19.45	17.00	18.73	16.00	19.56

Month	Normandy		Lateral No. 12 Headgate		Lateral 15 Spill		Maverick Power Plant		Cooper Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.36	0.70	0.25	0.54	0.25	0.55	0.16	0.65	0.25	0.47
Feb.	.09	.71	.10	.57	.15	.61	.06	.74	.30	.66
Mar.	.63	.74	.45	.59	.40	.52	.21	.76	.35	.67
Apr.	.70	1.89	.80	1.67	.90	1.44	.63	1.81	.50	1.58
May	5.06	2.96	4.40	2.86	3.80	2.62	4.81	2.80	3.25	2.57
June	.11	2.13	0	2.06	0	2.00	.09	2.35	0	2.48
July	.22	2.07	T	1.62	T	1.98	.09	1.68	.30	1.96
Aug.	4.03	2.26	3.60	1.91	3.80	1.84	3.51	2.03	3.90	2.10
Sept.	.66	3.00	.50	2.83	1.00	2.44	.43	2.74	2.00	3.39
Oct.	.54	2.39	0	2.50	T	2.46	.14	2.44	.30	2.35
Nov.	2.76	1.08	2.70	.90	3.00	.84	3.08	.85	3.90	.96
Dec.	.55	.66	.60	.52	.30	.52	.53	.58	.60	.55
Yearly	15.71	20.59	13.40	18.57	13.60	17.82	13.74	19.43	15.65	19.74

Month	Coal Mine		Elm Creek Station		Chittim Ranch		Eagle Pass		Canon Diablo	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.17	0.53	0.25	0.47	0.20	0.51	0.19	0.61	0.20	0.48
Feb.	.05	.70	.10	.61	.10	.74	.10	.80	.15	.66
Mar.	.30	.72	.40	.55	.35	.58	.15	.78	.15	.62
Apr.	.43	1.69	.85	1.72	.75	1.92	.34	1.76	.35	1.95
May	3.55	2.87	5.70	3.17	4.55	3.25	4.70	3.79	5.75	3.94
June	0	1.84	0	2.33	0	2.21	T	2.87	0	2.70
July	0	2.18	.05	1.95	.10	2.01	T	2.02	.30	1.54
Aug.	4.50	1.89	2.05	2.21	4.30	2.34	4.10	3.07	4.40	2.59
Sept.	1.05	3.22	.60	2.82	1.60	2.93	.69	3.31	.80	3.46
Oct.	0	2.43	.30	2.42	T	2.54	.13	2.32	.10	2.12
Nov.	3.32	.85	2.80	.78	3.70	.78	4.00	.97	4.15	.94
Dec.	.30	.43	.30	.53	0	.55	.33	.70	.40	.55
Yearly	13.67	19.35	13.40	19.56	15.65	20.36	14.73	23.00	16.75	21.55

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN THE UNITED STATES**  
In Inches

Month	Rosita Creek Siphon		Weyrich Farm		Trees Farm		Rosita Creek Station		Farias Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.20	0.44	0.20	0.46	0.06	0.47	0.20	0.41	0.18	0.59
Feb.	.15	.70	.10	.68	.05	.72	.15	.64	.08	.93
Mar.	.20	.56	.20	.46	.04	.43	.25	.48	.17	.50
Apr.	.45	1.68	.25	1.65	.15	1.83	.25	1.94	.15	1.94
May	4.50	2.88	4.00	3.17	5.11	3.03	7.70	2.72	8.97	3.25
June	0	2.15	0	1.82	0	1.90	0	2.14	0	2.01
July	.30	1.86	0	1.25	0	1.79	T	1.44	.70	2.23
Aug.	4.70	2.01	2.90	1.98	4.22	1.87	4.30	1.89	4.55	2.20
Sept.	.80	2.84	.40	2.79	.80	2.80	1.10	2.92	1.60	3.79
Oct.	.20	2.19	0	1.71	.70	2.90	.10	2.61	.10	2.85
Nov.	4.20	.89	3.50	.81	4.24	.89	3.90	.88	3.15	.91
Dec.	.60	.62	0	.56	.06	.57	.50	.56	.45	.72
Yearly	16.30	18.82	11.55	17.34	15.43	19.20	18.45	18.63	20.10	21.92

Month	Indio Ranch		El Indio		Van Dalsem Farm		Wuensch Farm		Keisling Farm	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.26	0.57	0.31	0.69	0.30	0.48	0.26	0.61	0.22	0.52
Feb.	.15	.78	.07	.88	.25	.81	.24	.90	.18	.82
Mar.	.20	.52	.58	.53	.45	.48	.31	.57	.38	.63
Apr.	.19	2.01	.18	1.78	.40	1.89	.28	1.68	.30	1.73
May	11.10	2.92	9.40	3.40	8.65	3.22	7.10	2.97	7.17	2.91
June	0	2.36	0	2.05	0	1.58	0	2.23	0	2.52
July	0	1.98	T	1.31	T	1.60	.05	1.34	.40	1.51
Aug.	4.45	1.82	5.24	2.03	5.50	1.67	4.70	1.81	4.94	1.86
Sept.	.87	3.53	1.17	3.13	.90	3.41	1.19	3.12	1.33	3.02
Oct.	.13	2.56	0	2.26	.10	2.45	.09	2.18	.07	2.35
Nov.	3.45	.90	3.75	.79	3.20	.79	2.97	.77	3.05	.73
Dec.	.45	.64	.75	.63	.41	.61	.54	.59	.45	.75
Yearly	21.25	20.59	21.45	19.48	20.16	18.99	17.73	18.77	18.49	19.35

Month	Cuervo Creek Station		Laredo Water Plant		Fort McIntosh (Laredo)		Corralitos Ranch		Huisache Ranch	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.18	0.56	0.24	0.74	0.41	0.73	0.40	0.58	0.50	0.70
Feb.	.12	.69	.88	.78	1.04	.86	.80	.74	1.00	.90
Mar.	.30	.41	.01	.57	.05	.69	T	.45	T	.51
Apr.	.36	1.56	.02	1.16	.17	1.33	0	1.12	0	1.28
May	6.70	2.46	2.84	2.39	4.60	2.69	2.60	1.91	1.30	2.10
June	0	2.20	0	2.23	0	2.28	0	2.29	0	2.45
July	.30	1.33	0	1.22	T	1.44	0	1.16	0	1.23
Aug.	4.75	1.70	2.87	1.93	4.27	1.98	2.30	1.97	2.50	1.60
Sept.	1.50	3.12	1.48	3.10	2.41	2.97	.35	3.49	.40	4.39
Oct.	.10	2.22	.10	1.74	.98	1.77	.35	1.70	.20	1.98
Nov.	4.00	.76	3.42	.91	3.32	1.15	2.20	.90	1.10	.88
Dec.	.50	.54	.35	.84	.66	.86	.10	.59	T	.74
Yearly	18.81	17.55	12.21	17.61	17.91	18.75	9.10	16.90	7.00	18.76

Month	Zapata Water Plant		Arroyo Tigre Chiquito		Falcon Dam		Roma (International Bridge)		Garciasville	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.72	0.04	0.67	0.11	0.78		0.81	0.14	0.85
Feb.	.93	.81	.83	.85	.71	.84		.99	.88	.84
Mar.	0	.47	0	.29	.03	.60		.64	.10	.40
Apr.	0	1.46	0	1.01	0	1.09	0	1.36	0	1.06
May	4.24	2.57	2.10	2.18	1.42	2.23	2.00	1.67	2.16	2.06
June	0	2.26	0	2.06	0	2.67	0	2.03	0	2.31
July	0	1.26	.07	1.15	1.36	1.21		1.29	0	1.31
Aug.	2.96	1.87	1.16	2.10	2.92	2.45	1.10	1.95	2.33	1.95
Sept.	.84	4.84		4.66	.92	4.63	1.10	4.57	2.36	3.81
Oct.	.85	1.74	.25	1.84	.78	2.10		1.96	1.95	1.96
Nov.	1.50	.95	2.16	1.09	2.34	1.16		.77	2.34	.97
Dec.	0	.74	T	.56	.30	.70		.44	.61	.72
Yearly	11.32	19.69	6.61	18.46	10.89	20.46		18.48	12.87	18.24

T Trace

## RAINFALL ON THE RIO GRANDE WATERSHED IN THE UNITED STATES

In Inches

Month	Los Ebanos		La Joya		HCWCID #6 Goodwin Pump No. 4B		HCWCID #6 Goodwin Pump No. 3		HCWCID #6 Goodwin Pump No. 5	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.18	1.00	0.17	0.95	0.10	1.22	0	1.24	0	1.22
Feb.	1.00	.81	.93	.90	.70	.99	1.30	.98	0	.95
Mar.	0	.39	0	.39	.20	.45	.12	.59	0	.57
Apr.	.26	1.51	0	1.05	0	1.21	0	1.47	0	1.30
May	2.84	1.87	4.35	2.26	6.30	2.08	7.44	2.35	7.23	2.55
June	0	2.12	0	2.35	0	2.42	0	2.44	0	2.47
July	.15	1.24	.05	1.18	0	1.16	0	1.50	0	1.21
Aug.	4.65	2.15	.67	1.64	7.28	1.68	8.24	2.05	7.28	2.64
Sept.	2.05	3.50	3.65	3.37	1.29	3.30	1.74	3.40	1.29	4.19
Oct.	1.77	2.05	3.67	1.89	5.15	2.65	5.74	2.93	5.15	2.69
Nov.	2.27	.60	2.15	.89	1.35	.95	2.65	.94	1.35	.95
Dec.	.62	.75	.55	.93	0	.86	.96	.98	0	.90
Yearly	15.79	17.99	16.19	17.80	22.37	18.97	28.19	20.87	22.30	21.64

Month	HCWCID #6 Goodwin Pump No. 3A		HCWCID #6 Goodwin Pump No. 4		Penitas (Edinburg Pumping Plant)		New Mission Pumping Plant		O. C. Dale Farm	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	1.21	0	1.56	0	1.26	0	0.94	0.11	1.67
Feb.	.32	.93	1.25	.95	1.10	.90	1.10	.78	1.46	1.19
Mar.	0	.54	0	.49	0	.45	0	.63	.13	.76
Apr.	0	1.75	0	1.50	0	1.19	0	1.41	0	1.86
May	6.67	2.18	5.85	2.29	4.50	2.20	5.21	2.39		2.05
June	0	2.55	0	2.66	0	2.95	0	2.50		3.16
July	0	1.49	0	1.58	0	1.45	0	1.46		1.64
Aug.	10.50	2.40	7.28	2.19	9.15	2.48	9.50	2.23		2.32
Sept.	2.70	3.41	2.10	3.71	2.15	3.66	2.36	3.16		4.12
Oct.	6.13	3.05	6.07	3.05	2.95	2.81	4.62	2.48		3.13
Nov.	3.00	.98	3.32	1.00	2.30	.98	2.60	.70		1.20
Dec.	0	.88	.80	1.07	0	.98	1.05	.81		1.18
Yearly	29.32	21.37	26.67	22.05	22.15	21.31	26.44	19.49		24.28

Month	HCWCID #15 (Edinburg Office)		Edinburg Filtration Plant		La Feria Pumping Plant		La Feria Materials Yard		CCWCID #19 (Adams Gardens)	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.20	1.34	0.16	1.49	0	1.58	0	1.39	0.22	1.26
Feb.	.94	1.00	1.03	1.10	1.40	1.52	1.60	1.36	1.56	1.24
Mar.	0	.57	.20	.67	.25	.74	0	.68	.28	.70
Apr.	T	1.79	.02	1.72	0	2.14	0	1.61	.02	1.56
May	7.87	2.31	4.36	2.16	0	2.84	0	2.68	2.36	2.41
June	0	2.45	.03	2.70	0	3.39	0	3.72	.26	2.75
July	.06	1.43	.23	1.29	2.00	2.32	2.50	1.91	.74	1.56
Aug.	17.65	2.69	14.54	2.55	7.25	3.96	8.00	3.73	9.36	3.24
Sept.	3.23	4.61	2.90	3.91	2.00	6.74	2.40	5.29	1.84	4.24
Oct.	4.33	2.67	3.38	2.65	1.40	4.06	4.20	3.40	2.16	3.01
Nov.	1.84	1.05	1.72	1.12	4.60	1.96	4.50	1.59	2.45	1.54
Dec.	.47	.97	.40	1.04	.60	1.52	1.10	1.71	.67	1.15
Yearly	36.59	22.88	28.97	22.40	19.50	32.77	24.30	29.07	21.92	24.66

Month	San Benito Pump		Whipple Farm		* CCWCID #11 (Bayview Dist. Off.)				
	1980	Average	1980	Average	1980	Average			
Jan.	0.15	1.36	1.37	1.88	0.92	1.43			
Feb.	1.24	.99	2.00	1.81	.65	1.69			
Mar.	.40	.77	.65	.62	.84	.64			
Apr.	.04	1.40	0	2.18	0	2.00			
May	2.20	2.47	2.10	2.84	2.11	2.48			
June	0	2.54	0	3.46	0	2.41			
July	0	1.71	1.05	2.38	0	1.81			
Aug.	6.40	2.43	5.02	3.34	5.40	2.84			
Sept.	2.00	4.49	2.85	6.09	1.45	5.61			
Oct.	2.86	2.68	2.07	3.23	2.08	2.37			
Nov.	4.08	1.15	3.50	1.63	2.85	1.49			
Dec.	.20	1.31	1.65	1.67	1.36	1.43			
Yearly	19.57	23.30	22.26	31.13	17.66	26.20			

T Trace

\* Average of 18 gages

## RAINFALL ON THE RIO GRANDE WATERSHED IN MEXICO In Inches

Tabulated below, in approximate downstream order, are monthly records of Mexican rainfall stations with averages for their periods of record. For location, elevation, period of record, type of gage in use, watershed subdivision in which the station is located, and the observer, see alphabetical listing of these stations shown on pages 140 through 143 in this bulletin. These rainfall records have not been published elsewhere. Records of daily rainfall amounts, where available, are on file in the office of the Mexican Section of the Commission.

Detailed listings of the months and years for which records are available through 1970 may be found under "Index to Precipitation Records" in Water Bulletins 10, 14, 22, 26, and Supplement 40A.

Month	Juarez, Chihuahua		El Sauzal D. B., Chihuahua		Garita Km. 28, Chihuahua		Samalayuca, Chihuahua		San Agustin, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.59	0.42	0.47	0.49	0.43	0.58	0.43	0.43	0.24	0.37
Feb.	.59	.45	.43	.41	1.65	.47	.75	.52	.16	.34
Mar.	.28	.35	.04	.12	.39	.28	.51	.36	.08	.22
Apr.	.28	.29	.04	.12	.87	.14	.20	.14	0	.11
May	.12	.34	.16	.34	.16	.25	.47	.20	0	.32
June	T	.62	0	.37	0	.70	0	.74	0	.64
July	.04	1.55	0	1.17	.91	1.82	.16	1.99	.08	1.49
Aug.	1.77	1.49	1.26	1.25	2.20	1.77	.94	1.82	1.81	1.23
Sept.	3.23	1.50	4.92	1.87	5.98	1.94	5.08	2.11	3.94	1.55
Oct.	1.10	1.00	.55	1.00	1.18	.94	.59	.67	.71	.78
Nov.	.39	.48	.35	.19	.55	.56	.63	.37	.35	.30
Dec.	.04	.51	T	.34	.59	.59	.20	.42	.04	.45
Yearly	8.43	9.00	8.22	7.67	14.91	10.04	9.96	9.77	7.41	7.80

Month	Guadalupe, Chihuahua		Praxedis G. Guerrero, Chihuahua		Porvenir, Chihuahua		Vado de Cedillos, Chihuahua		Los Barriles, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.55	0.38	0.28	0.30	0.28	0.34	0.16	0.36	0.28	0.34
Feb.	.28	.37	.39	.26	.24	.36	.28	.33	.08	.22
Mar.	.12	.32	.04	.21	T	.22	0	.21	0	.20
Apr.	.31	.16	.28	.08	.24	.13	.16	.18	.08	.10
May	0	.35	.12	.27	.24	.43	.04	.41	0	.34
June	.04	.72	.20	.58	.24	.83	.83	1.03	0	.97
July	0	1.79	.83	1.84	0	1.70	0	1.66	.16	1.82
Aug.	1.30	1.43	2.20	1.28	1.81	1.72	2.83	1.85	.87	1.97
Sept.	5.12	1.65	5.04	1.62	4.80	1.91	5.67	2.03	1.42	1.55
Oct.	.51	.95	.47	.85	.35	.91	.24	.99	.20	1.02
Nov.	.12	.34	.39	.36	.47	.45	.63	.43	.04	.46
Dec.	T	.31	0	.35	.08	.46	.08	.51	0	.30
Yearly	8.35	8.77	10.24	8.00	8.75	9.46	10.92	9.99	3.13	9.29

Month	Escuela de Agricultura Escobar, Chihuahua		Banderas, Chihuahua		El Cuarenta, Chihuahua		El Cuervo, Chihuahua		Carichic, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.35		0	0.13	0.08	0.37	T	0.19	0.04	0.45
Feb.	.43		0	.26	.08	.35	.16	.27	.12	.47
Mar.	.28		0	.17	0	.23	.04	.10	.35	.20
Apr.	.94		0	.10	0	.10	T	.11	.04	.16
May	0		0	.22	.04	.30	.12	.41	T	.39
June	0		0	.74	.16	.70	.08	1.32	.63	1.57
July	1.42		0	1.17	1.30	2.08	.94	2.40	4.45	5.97
Aug.	1.93		.31	1.76	3.39	2.66	5.35	2.88	4.65	4.89
Sept.	3.66		3.66	1.95	5.08	2.06	6.30	2.87	12.20	3.83
Oct.	.98		0	.91	.31	1.00	.12	.92	.12	1.06
Nov.	.83		0	.30	.59	.51	.87	.32	.91	.55
Dec.	.04		0	.23	.12	.46	0	.16	1.30	.70
Yearly	10.86		3.97	7.94	11.15	10.82	13.98	11.95	24.81	20.24

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	San Juanito, Chihuahua		Siquirichio, Chihuahua		El Vergel, Chihuahua		Balleza, Chihuahua		El Sitio, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	1.26	1.84	0	1.28	T	1.28	T	0.34	0	0.21
Feb.	2.20	1.28	.75	.64	.28	.78	T	.34	0	.33
Mar.	.47	.41	1.10	.58	.59	.51	T	.13	0	.12
Apr.	.04	1.05	.08	.24	T	.43	.12	.20	0	.15
May	.24	.66	T	.52	0	.76	0	.24	0	.39
June	.79	1.67	1.02	1.65	1.02	2.96	1.10	1.56	1.26	1.61
July	5.75	10.39	1.26	5.95	6.02	6.83	6.14	4.72	1.18	4.38
Aug.	6.46	7.16	6.54	5.58	10.39	6.89	5.28	4.91	5.67	4.87
Sept.	10.79	4.53	6.30	3.31	7.44	4.97	5.31	3.49	7.95	3.76
Oct.	.59	2.66	2.05	1.50	3.46	1.86	1.65	.82	1.50	.85
Nov.	1.50	1.16	1.34	.50	.51	.66	.35	.47	.55	.39
Dec.	2.44	1.62	3.70	1.32	1.06	1.29	.71	.46	0	.32
Yearly	32.53	34.43	24.14	23.07	30.77	29.22	20.66	17.68	18.11	17.38

Month	La Boquilla, Chihuahua		San Antonio, Durango		Estacion Rosario, Durango		Villa Coronado, Chihuahua		Ojo Caliente, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.28	0	0.29	0	0.21	0.04	0.25	0	0.18
Feb.	0	.18	.16	.16	0	.28	.20	.30	0	.22
Mar.	0	.15	0	.09	0	.13	.04	.20	0	.15
Apr.	0	.21	0	.27	0	.26	0	.35	0	.16
May	0	.55	0	.59	0	.79	.59	.67	0	.50
June	.31	1.40	.20	1.97	0	2.34	.71	2.70	.24	1.63
July	.63	2.95	2.48	4.65	1.73	4.43	2.48	4.00	1.42	3.36
Aug.	4.09	2.97	5.04	4.22	3.31	5.17		5.23	4.37	2.86
Sept.	10.28	3.07	11.50	4.47	4.72	5.19		4.40	10.59	2.93
Oct.	.94	.89	2.44	1.16	2.05	1.11	1.30	1.06	1.26	1.10
Nov.	.59	.33	.43	.27	.55	.39		.42	.98	.21
Dec.	0	.35	0	.24	0	.37	0	.39	.04	.25
Yearly	16.84	13.33	22.25	18.38	12.36	20.67		19.97	18.90	13.55

Month	Escalon, Chihuahua		Jimenez, Chihuahua		Parral, Chihuahua		Camargo, Chihuahua		Victoria, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.29	0	0.19	T	0.19	T	0.31	0	0.24
Feb.	.35	.20	0	.15	.04	.21	T	.28	0	.56
Mar.	.04	.11	.04	.10	T	.09	.04	.12	.08	.15
Apr.	T	.28	0	.13	T	.19	T	.16	T	.21
May	.08	.69	.63	.48	0	.46	.08	.59	T	.79
June	.71	1.75	.51	1.23	.51	1.68	.08	1.55	.35	1.92
July	.47	2.55	.79	3.37	1.73	4.26	1.42	3.23	.55	3.27
Aug.	5.35	3.01	2.76	2.47	5.35	4.44	4.41	2.97	4.17	3.42
Sept.	4.57	2.71	4.17	2.43	11.06	4.48	10.39	3.27	16.54	3.78
Oct.	.63	1.13	.63	1.18	1.38	1.15	1.26	1.00	1.18	.65
Nov.	.87	.28	.47	.25	.35	.48	1.02	.38	.87	.29
Dec.	T	.32	0	.23	0	.37	.12	.33	.28	.30
Yearly	13.15	13.32	10.00	12.21	20.42	18.00	18.82	14.19	24.02	15.58

Month	Tacubaya, Chihuahua		Nonoava, Chihuahua		El Maguey, Chihuahua		San Lorenzo, Chihuahua		Villaalba, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.18	0.08	0.21	T	0.21	0.08	0.13	0	0.29
Feb.	0	.47	.04	.37	0	.31	.08	.17	0	.14
Mar.	0	.12	0	.18	0	.12	0	.04	0	.05
Apr.	0	.13	0	.12	0	.14	0	.05	.04	.16
May	0	.92	0	.41	0	.38	0	.45	0	.37
June	1.18	1.54	.83	1.82	.98	1.52	.20	1.50	.35	1.23
July	.55	3.88	1.57	5.21	2.99	3.64	5.24	4.35	1.06	3.56
Aug.	3.35	2.52	5.63	3.66	4.21	4.10	4.96	4.47	4.09	3.02
Sept.	16.54	3.89	2.56	2.75	5.83	3.71	7.91	4.81	8.66	2.98
Oct.	1.69	.73	.08	.98	1.26	.83	.35	.94	1.42	.96
Nov.	.87	.30	.63	.41	.24	.25	1.38	.45	.98	.28
Dec.	.24	.48	.47	.37	.20	.28	.16	.37	0	.35
Yearly	24.42	15.16	11.89	16.49	15.71	15.49	20.36	17.73	16.60	13.39

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Las Virgenes, Chihuahua		Km. 135, Chihuahua		Delicias, Chihuahua		Lazaro Cardenas, Chihuahua		Meoqui, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.24	0	0.07	0	0.30	T	0.19	0.08	0.14
Feb.	.04	.12	0	.20	0	.16	T	.25	.04	.20
Mar.	.04	.05	0	.07	.04	.11	.08	.10	.04	.08
Apr.	T	.19	0	.21	.12	.26	T	.22	.16	.34
May	0	.33	.08	.52	0	.34	.20	.48	T	.48
June	.63	1.15	.39	1.18	.94	1.14	.79	1.22	2.13	1.28
July	.83	2.58	.39	2.48	.71	2.48	1.10	2.91	.51	2.69
Aug.	4.72	2.71	2.60	2.70	3.43	2.50	3.94	2.76	7.09	2.90
Sept.	7.64	2.52	6.97	3.44	7.48	2.34	5.83	2.91	7.52	2.63
Oct.	.79	.82	.79	.93	1.18	.82	.87	.87	.63	1.00
Nov.	.87	.23	1.50	.30	1.02	.26	1.50	.35	1.14	.23
Dec.	.04	.32	0	.28	.04	.35	T	.19	.12	.33
Yearly	15.60	11.26	12.72	12.38	14.96	11.06	14.31	12.45	19.46	12.30

Month	Las Burras, Chihuahua		Ciudad Guerrero, Chihuahua		Bachiniva, Chihuahua		La Trasquila, Chihuahua		Cuahtemoc, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.21	0.04	0.58	0	0.42	0.08	0.27	0	0.28
Feb.	.04	.18	.39	.42	.31	.19	.20	.30	.12	.15
Mar.	.04	.11	.31	.21	.16	.29	0	.09	.04	.11
Apr.	T	.16	T	.19	0	.11	.04	.12	T	.18
May	.31	.44	T	.32	0	.25	0	.32	0	.36
June	.83	1.08	.43	1.51	.83	1.41	0	1.26	.55	1.46
July	1.46	2.86	4.25	4.82	.87	5.37	1.22	3.65	2.83	4.68
Aug.	5.39	2.63	4.57	5.18	6.14	4.58	1.81	2.76	6.14	4.21
Sept.	6.61	2.54	6.30	3.17	8.07	2.80	4.80	3.34	7.09	2.86
Oct.	.35	.77	.63	1.17	.47	1.13	.79	.78	.16	1.13
Nov.	1.50	.24	.39	.49	.31	.33	.47	.32	.31	.30
Dec.		.34	1.34	.70	.87	.43	.12	.28	.71	.38
Yearly		11.56	18.65	18.76	18.03	17.31	9.53	13.49	17.95	16.10

Month	Colonia Anahuac, Chihuahua		Presa Chihuahua, Chihuahua		Majalca, Chihuahua		Posta Zootecnica, Chihuahua		Villa Aldama, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.26	0	0.17	0	0.29	T	0.20	T	0.15
Feb.	.08	.27	.08	.21	.43	.34	.12	.22	.08	.18
Mar.	0	.12	.08	.13	.16	.23	0	.13	0	.14
Apr.	T	.22	0	.17	0	.28	.04	.24	.04	.15
May	0	.54	.04	.85	0	.76	T	.63	.12	.43
June	.67	1.55	.24	2.26	.51	2.43	.28	1.42	.71	1.59
July	2.52	4.73	1.50	4.35	3.07	6.21	.63	3.43	.24	2.92
Aug.	4.21	4.70	5.47	4.47	5.79	6.02	4.72	3.88	4.25	2.95
Sept.	6.18	3.89	6.38	3.67	16.69	5.03	5.83	3.12	4.09	3.48
Oct.	.24	1.06	.83	.94	1.26	1.03	.59	1.03	.55	.72
Nov.	.79	.34	1.22	.36	.98	.42	.71	.35	.71	.33
Dec.	.28	.24	.08	.31	.39	.36	.08	.32	T	.32
Yearly	14.97	17.92	15.92	17.89	29.28	23.40	13.00	14.97	10.79	13.36

Month	Presa Luis L. Leon, Chihuahua		Maclovio Herrera (Falomir), Chihuahua		Parrita, Chihuahua		Maijoma, Chihuahua		Coyame, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.06	0.08	0.28	0	0.14	0.12	0.35	0	0.15
Feb.	.04	.12	0	.19	0	.24	.31	.34	0	.32
Mar.	0	.12	0	.12	0	.07	T	.16	0	.13
Apr.	T	.19	0	.28	0	.35	.04	.21	0	.25
May	.08	.41	.16	.56	0	.39	.31	.79	.31	.56
June	.55	1.17	.67	1.14	.55	1.69	.63	1.58	.55	1.50
July	.31	2.27	.04	2.73	.67	2.50	.43	2.98	.04	2.41
Aug.	7.48	3.05	6.57	2.74	3.74	3.18	2.76	3.26	5.12	2.33
Sept.	4.80	2.77	6.46	3.30	4.17	3.31	8.35	2.93	4.02	3.03
Oct.	.20	.64	.12	.70	.67	1.02	1.10	.99	1.81	.87
Nov.	1.18	.29	1.30	.35	1.06	.32	1.06	.36	.94	.44
Dec.	.08	.28	.08	.56	0	.19	.71	.39	.20	.17
Yearly	14.80	11.37	15.48	12.99	10.86	13.40	15.82	14.34	12.99	12.16

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Gallego, Chihuahua		El Sueco, Chihuahua		Ojinaga (IB&WC), Chihuahua		Ojinaga (M.S. of Mexico), Chihuahua		Manuel Benavides, Chihuahua	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.29	0.08	0.38	0.08	0.30	0.12	0.28	0.08	0.12
Feb.	.24	.37	.31	.40	T	.24	T	.23	.04	.25
Mar.	0	.16	0	.21	T	.17	.04	.20	.04	.25
Apr.	.08	.17	0	.17	T	.23	T	.25	T	.27
May	0	.30	T	.30	0	.44	0	.59	.20	1.08
June	.12	.98	.12	.85	1.10	1.32	.04	1.15	.24	1.33
July	1.89	3.22	1.46	3.15	.04	1.72	0	1.62	.43	2.24
Aug.	4.09	3.16	5.51	3.47	5.55	1.77	3.43	1.63	3.82	2.41
Sept.	7.99	3.07	8.15	3.32	4.33	1.80	3.58	1.66	8.27	3.07
Oct.	.51	1.27	.24	1.12	.75	.99	.87	1.00	.51	.83
Nov.	.55	.32	.51	.44	1.50	.43	.55	.37	.75	.28
Dec.	.08	.25	.08	.31	.24	.32	.24	.40	.24	.31
Yearly	15.63	13.56	16.46	14.12	13.59	9.73	8.87	9.38	14.62	12.44

Month	Ejido Eutimias, Coahuila		Ejido La Rosita, Coahuila		San Fernando, Coahuila		Santa Rosa, Coahuila		Hacienda San Miguel, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	T	0.18	0	0.18	0.24	0.27	0	0.67	0.55	0.34
Feb.	0	.11	0	.06	0	.57	0	.81	0	.62
Mar.	.24	.11	0	.17	.16	.39	0	.54	.47	.62
Apr.	0	.46	0	.50	0	1.00	0	.95	0	1.70
May	.79	1.03	0	.44	1.61	1.35	1.30	1.29	5.20	2.62
June	.16	1.10	0	.78	0	1.14	1.30	1.79	.39	1.95
July	.04	2.00	0	1.14	0	1.31	.51	1.53	.20	1.78
Aug.	2.68	.81	.51	.91	7.87	2.09	8.19	1.99	5.75	1.75
Sept.	1.93	1.43	1.57	.78	5.16	3.03	2.20	2.45	1.02	3.13
Oct.	.39	.45	0	.65	.39	1.71	1.30	2.20	.20	1.54
Nov.	1.57	.39	.71	.29	2.76	.72	2.99	.85	1.61	.67
Dec.	T	.47	0	.84	.59	.41	0	.39	.87	.40
Yearly	7.80	8.54	6.74	6.74	18.78	13.99	17.79	15.46	16.26	17.12

Month	Rancho La Chuparrosa, Coahuila		Presa Centenario, Coahuila		Amistad Res. near Tlaloc, Coahuila		La Amistad, Coahuila		Represa Amistad, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.06	0.14	0.08	0.48	0.65	0.40	0.83	0.36	0.47	0.27
Feb.	.22	.42	0	.78	.20	.58	.24	.66	.08	.58
Mar.	0	.49	.31	.59	.15	.73	0	.73	0	.64
Apr.	0	.99	.28	1.47	.15	1.39	.12	1.33	.08	1.13
May	.87	1.21	5.67	2.02	4.20	1.77	2.48	1.69	3.27	1.32
June	.04	1.47	.08	2.16	.15	2.24	.16	2.86	.16	1.32
July	.06	2.05	1.26	1.62	.40	2.70	.55	.81	.67	2.24
Aug.	8.74	2.60	7.05	2.81	7.50	2.94	T	.64	4.69	2.20
Sept.	.57	2.39	1.54	3.79	1.30	3.09	1.65	1.86	1.26	2.69
Oct.	.02	1.84	0	2.50	.50	1.97	.55	1.37	0	2.17
Nov.	1.02	.52	2.32	1.09	1.85	.74	1.97	1.67	1.65	.84
Dec.	.26	.26	.63	.52	.50	.44	.47	.38	.39	.35
Yearly	11.86	14.38	19.22	19.83	17.55	18.99	9.02	14.36	12.72	15.75

Month	Ciudad Acuna, Coahuila		Presa Cabeceras, Coahuila		Presa San Miguel, Coahuila		Palestina, Coahuila		San Carlos, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.28	0.52	0	0.48	0	0.44	0	0.84	0.12	0.46
Feb.	.16	.86	0	.66	0	.72	0	.94	.08	.77
Mar.	.20	.71	.24	.65	0	.66	.24	.72	.12	.44
Apr.	.67	1.69	0	1.53	0	1.18	.63	1.77	.47	1.66
May	3.70	2.30	2.68	2.65	2.52	2.49	4.29	2.42	2.68	2.05
June	.12	2.21	.31	2.33	.24	2.50	.20	2.29	0	2.23
July	.59	1.74	0	2.91	0	1.80	.87	2.02	.20	1.99
Aug.	2.32	1.91	7.48	3.33	12.05	3.17	12.76	2.44	12.52	2.55
Sept.	1.30	3.05	1.81	4.51	.91	3.67	1.77	3.16	.75	3.13
Oct.	.12	2.40	0	2.75	0	2.16	0	2.20	0	1.85
Nov.	2.28	.76	1.81	1.29	2.80	1.21	2.68	.89	2.99	1.20
Dec.	.87	.56	.55	.49	.63	.46	.51	.73	.28	.46
Yearly	12.61	18.71	14.88	23.58	19.15	20.46	23.95	20.42	20.21	18.79

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Emiliano Zapata, Coahuila		Jimenez, Coahuila		El Remolino, Coahuila		Piedras Negras, Coahuila		Guerrero, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.28	0.66	0.51	0.67	0	0.37	0.16	0.68	0	0.49
Feb.	0	.51	.24	.87	0	.54	.12	.92	0	.65
Mar.	.24	.80	.47	.73	0	.36	.12	.64	.43	.45
Apr.	0	1.68	.59	1.68	0	1.30	.31	1.94	.31	1.51
May	3.35	3.99	5.24	2.56	0	2.15	5.63	3.50	5.51	2.82
June	.24	2.92	.31	2.55	0	3.46	T	2.48	0	2.48
July	0	3.32	1.42	1.71	0	2.57	0	2.11	0	1.72
Aug.	12.05	3.02	3.58	1.82	5.91	2.02	4.41	2.63	6.02	2.29
Sept.	.67	1.56	.39	2.94	1.65	3.94	1.85	3.18	2.09	3.68
Oct.	0	1.61	.12	2.50	0	2.74	.43	2.81	0	2.66
Nov.	3.31	2.48	3.11	1.16	1.34	.57	4.13	.90	4.29	.74
Dec.	.71	.81	.79	.64	0	.37	.28	.63	.51	.56
Yearly	20.85	23.36	16.77	19.83	8.90	20.39	17.44	22.42	19.16	20.05

Month	Rancho San Diego, Coahuila		Villa Hidalgo, Coahuila		Colombia (IB&WC), Nuevo Leon		Rancho Vidrios, Tamaulipas		Nv. Laredo (M. S. of Mexico), Tamps.	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.23	0.39	0.71	0.39	0.38	0.35	0.74	0.16	0.77
Feb.	0	.47	.63	.89	1.38	.65	.79	.84		.89
Mar.	0	.32	.28	.62	0	.74	0	.47	.39	.61
Apr.	0	1.00	.67	1.64	.98	1.83	.39	1.54	.12	1.24
May	1.38	2.44	2.68	2.75	4.33	2.92	3.94	2.99		2.48
June	0	1.66	0	2.16	0	2.05	0	2.11	0	2.26
July	4.53	1.32	.16	1.12	1.18	1.50	0	1.48	0	1.31
Aug.	0	1.21	9.45	2.37	7.68	3.19	5.51	2.37	3.39	1.71
Sept.	.39	2.91	2.13	3.52	3.74	4.14	3.15	3.55	1.85	2.99
Oct.	0	1.27	.47	2.02	.20	1.82	.39	2.36	1.18	1.62
Nov.	1.18	.67	2.20	.98	2.95	1.10	3.35	1.20	3.07	.99
Dec.	0	.45	1.02	.73	.98	.75	.59	.89	1.06	.86
Yearly	7.48	13.95	20.08	19.51	23.81	21.07	18.46	20.54		17.73

Month	Nv. Laredo (IB&WC), Tamaulipas		Nuevo Laredo (Sur), Tamaulipas		Nuevo Laredo Km. 26 SSW, Tamaulipas		Rancho Las Espuelas, Tamaulipas		San Ignacio, Tamaulipas	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.31	0.64	0.20	0.43	0.08	0.68	0	0.67	0.31	0.57
Feb.	.98	.90	1.10	.46	.79	.96	1.30	.95	1.61	.90
Mar.	.04	.44	T	.36	0	.41	0	.81	0	.37
Apr.	.20	1.32	.39	1.65	.24	1.78	0	1.52	0	1.40
May	5.08	2.83	2.76	3.33	3.23	2.59	4.29	3.59	3.15	2.57
June	0	2.67	0	2.11	0	2.28	0	2.30	0	2.24
July	T	1.35	T	2.69	.39	1.82	1.61	3.14	.79	1.34
Aug.	4.53	2.48	5.51	2.14	4.25	2.45	4.80	2.17	3.94	2.65
Sept.	1.73	3.38	2.83	2.69	1.50	3.44	2.32	4.54	.83	3.71
Oct.	1.10	1.96	.87	2.30	.67	2.03	.71	2.35	.51	2.48
Nov.	2.99	1.03	3.15	1.10	3.54	1.21	3.58	1.23	4.33	1.21
Dec.	.55	.74	.87	.54	.59	.66	.59	.94	.51	.71
Yearly	17.51	19.74	17.68	19.80	15.28	20.31	19.20	24.21	15.98	20.15

Month	Muzquiz, Coahuila		Sabinas, Coahuila		Ejido, 1º de Mayo, Coahuila		Juarez, Coahuila			Cuatro Ciénegas, Coahuila	
	1980	Average	1980	Average	1980	Average	1979	1980	Average	1980	Average
Jan.	0.55	0.74	0	0.54	0		0.43	0.51	0.55	0	0.30
Feb.	.16	.57	.24	.67			.63	.55	.53	.67	.36
Mar.	.08	.79	.08	.38	0		1.50	0	.42	.12	.12
Apr.	.28	1.01	.39	1.19	0		3.11	1.54	1.28	.08	.31
May	3.23	3.71	3.70	2.47	1.50		5.51	3.50	2.11	.35	.78
June	0	3.29	0	2.14			1.61	0	1.61	0	.71
July	0	2.74	.91	1.43			.35	0	1.00		.82
Aug.	13.39	2.69	.98	2.09			.43		1.30	2.13	1.16
Sept.	7.76	4.93	1.42	3.45	0		1.34		3.18	.20	1.49
Oct.	.28	2.16	.08	1.75	.51		0	0	1.66	.16	.76
Nov.		1.09	2.87	.65	1.18		0	2.95	.68	.98	.41
Dec.		.86	.28	.51	0		.98	1.73	.49	0	.44
Yearly		24.58	10.95	17.27			15.89		14.81		7.66

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Ocampo, Coahuila		Progreso, Coahuila		Presa Carranza, Coahuila		Laguna de Salinillas, Nuevo Leon		Candela, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.34	0.08	0.45	0.20	0.68	0.24	0.60		0.28
Feb.		.27	.63	.52	.67	.64	.87	.62	1.42	.53
Mar.		.19	.04	.36	T	.48	0	.54	0	.12
Apr.	0	.66	.28	1.08	.43	1.18	.43	1.06	0	.87
May	.98	1.17	3.11	2.21	1.69	2.05	3.58	2.18		.97
June		1.34	0	1.62	0	1.76	0	1.95		1.74
July	1.02	1.77	0	1.06	.98	1.07	1.02	1.07	.47	2.57
Aug.	1.65	1.57	2.95	1.96	4.37	2.01	5.04	2.43	5.12	2.02
Sept.	1.02	2.24	2.56	3.06	1.81	3.01	1.46	3.38	2.28	3.35
Oct.	.63	.99	.83	1.76	.91	1.67	.47	1.91	.59	1.17
Nov.	2.09	.51	1.22	.60	1.73	.60	1.77	.74	2.13	.71
Dec.	.08	.44	.51	.50	.24	.62	.31	.57	0	.47
Yearly		11.49	12.21	15.18	13.03	15.77	15.19	17.05		14.80

Month	Lampazos, Nuevo Leon		San Nicolas, Nuevo Leon				Anahuac, Nuevo Leon		Rio Salado, Carr. 85, N. L.	
	1980	Average	1978	1979	1980	Average	1980	Average	1980	Average
Jan.	0.28	0.57		0.63	0.71	0.67	0.16	0.67	0.16	0.46
Feb.	.91	.81		.59	.98	.78	.87	.62	.67	.75
Mar.	0	.48		1.77	.20	.98	T	.49	T	.38
Apr.	0	.98		2.64			.12	1.15	T	1.08
May	2.01	2.19		1.14			2.36	2.20	6.85	2.38
June	0	2.76		4.41	0	.14	.39	1.91	0	2.81
July	.04	1.99		.28	0	.14	.08	1.40	0	2.43
Aug.	6.65	1.94		1.14	7.13	4.14	5.31	2.39	11.81	1.96
Sept.	1.85	5.38	7.20	2.24	1.26	3.57	1.73	3.32	1.65	4.54
Oct.	.98	1.84	1.85	0		.92	.98	1.65	1.10	1.79
Nov.	2.76	.79	.43	.32		.38	2.91	.70	2.20	.82
Dec.	.28	.57	.75	.79	.83	.79	.31	.71	0	.61
Yearly	15.76	20.30		15.95			15.22	17.21	24.44	20.01

Month	Espinazo, Nuevo Leon		Bustamante, Nuevo Leon		Ojo de Agua (Sabinas), N. L.		Sabinas Hidalgo, Nuevo Leon		Garza Ayala, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08		0	0.52	0.24		0.20	0.44		0.20
Feb.	.83		0	.76	.79		0	.77		.47
Mar.	T		0	.44	0		0	.68		.54
Apr.	.87		0	.94	0		0	1.11		1.31
May	.83		1.97	1.37	1.34		1.42	2.18		1.00
June	.87		0	3.03	.20		0	3.91	2.24	1.90
July	.79		.20	2.10	1.77		1.34	2.85	0	5.85
Aug.	1.54		6.50	3.42	4.88		5.47	2.43	4.25	2.46
Sept.	.43		2.76	6.14	4.80		4.29	7.01	1.65	4.96
Oct.	1.50		.94	2.19	1.18		1.14	2.68	.75	3.47
Nov.	1.14		2.28	.96	1.46		1.38	1.07	1.22	2.65
Dec.	.16		.16	.56	.16		.20	.59	.12	.33
Yearly	9.04		14.81	22.43	16.82		15.44	25.72		25.14

Month	Vallecillo, Nuevo Leon		Las Tortillas, Tamaulipas		Rancho Bonanza, Tamaulipas		Rancho San Rafael, Bustamante, Tamps.		Rio Salado Riberena, Tamaulipas	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.51	0.31	0.55	0	0.63	0.31	0.67	0.08	0.50
Feb.	.04	.76	.67	.96	.79	.92	.67	1.09	.59	.85
Mar.	.16	.47	0	.50	0	.74	0	.51	0	.47
Apr.	.08	1.60	0	1.28	0	.64	0	1.10	0	1.14
May	8.70	2.00	6.10	3.01	3.19	2.85	3.86	2.57	3.54	2.49
June	0	3.11	0	3.17	0	2.38	0	3.14	0	2.38
July	.31	1.83	0	1.32	0	2.95	0	1.90	0	1.57
Aug.	2.64	1.90	3.74	2.23	2.32	2.14	3.27	3.02	2.36	2.55
Sept.	1.42	4.42	1.97	4.20	2.91	3.84	1.26	4.52	2.76	5.02
Oct.	.59	2.12	.47	1.72	.71	1.92	.55	2.98	.59	1.96
Nov.	1.54	.97	2.56	1.25	2.80	1.01	2.72	1.35	2.36	1.18
Dec.	.75	.68	.59	.79	.39	.95	.47	.66	.39	.83
Yearly	16.23	20.37	16.41	20.98	13.11	20.97	13.11	23.51	12.67	20.94

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
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In Inches**

Month	Aniego 166, Tamaulipas		La Bandera, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		La Escondida, Nuevo Leon			Hacienda El Alamo, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1979	1980	Average	1980	Average
Jan.	0.12	0.70	0.16	0.67	0.12	0.85		0.32		0.75	0.81
Feb.	.71	.90	.53	.78	.63	.84	0.12	T	0.06	.55	.80
Mar.	0	.48	0	.61	.08	.51	.35	.04	.20	.12	.35
Apr.	0	1.01	0	1.30	T	1.14		0		.08	1.02
May	3.86	2.98	3.03	2.85	1.65	2.07	.28	1.18	.73	2.60	1.92
June	0	3.00	0	3.48	0	2.68	3.78	1.63	2.20	0	3.67
July	2.68	1.55	.83	1.92	.43	1.29	.20	1.14	.67	.51	2.55
Aug.	3.03	2.36	2.48	2.29	2.36	2.14	.39	11.93	6.16	13.58	3.77
Sept.	2.05	5.68	1.22	5.38	1.89	4.35	1.46	4.21	2.84	2.60	5.46
Oct.	2.48	1.99	2.13	1.91	1.30	2.06	0	1.65	.82	1.50	2.65
Nov.	2.28	1.14	2.52	1.09	2.20	1.05	.16	1.06	.61	2.40	1.14
Dec.	.39	.73	.39	.80	.39	.67	4.41	1.94	2.68	.47	.80
Yearly	17.60	22.52	13.39	23.08	11.05	19.65		23.10		25.16	24.94

Month	Agualeguas, Nuevo Leon			General Trevino, Nuevo Leon		Paras, Nuevo Leon		San Javier, Nuevo Leon		Cd. Mier, Km. 8 SW, Tamaulipas	
	1979	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.24	0.55	0.40	0.31	0.80	1.22	0.43	0.31	0.71	0.20	0.70
Feb.	.32	.47	.40	.51	.50	.67	.46	.67	.92	.75	.98
Mar.	.28			.04	.15	0	.58	0	.60	0	.61
Apr.	1.61	0	.80	0	.62	T	.70	0	1.52	0	1.24
May	.20	2.95	1.58	4.69	3.01	1.97	1.48	3.39	3.38	3.11	2.79
June		.51		.12	1.48	.35	2.66	0	3.51	0	3.15
July		.12		.16	.69	0	1.49	.67	2.20	.75	1.85
Aug.	5.04			4.21	2.54	5.08	2.26	1.85	2.90	2.28	2.67
Sept.		1.65		1.26	6.32	3.03	3.92	1.77	5.95	1.26	5.30
Oct.		2.91		.51	1.46	.63	2.38	2.05	2.26	2.20	2.45
Nov.		1.69		1.85	1.32	1.97	.83	1.89	1.13	2.20	1.11
Dec.		.63		.75	1.20	.83	.54	.31	.81	.39	.81
Yearly				14.41	20.09	15.75	17.73	12.91	25.89	13.14	23.66

Month	Cd. Mier, Tamaulipas		Miguel Aleman, Tamaulipas		Parras, Coahuila		San Juan de Vaqueria, Coahuila		General Cepeda, Coahuila	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.90	0.04	0.78	0.31	0.45			0.08	0.45
Feb.	.63	1.07	.98	.92	1.02	.38			.75	.47
Mar.	0	.59	0	.33	T	.32			0	.27
Apr.	0	1.26	.08	1.59	.67	.29	.24		.20	.39
May	3.23	2.52	1.69	1.92	.04	1.03	.20		.04	.81
June	0	2.38	0	2.29	.04	1.79	.51		.16	2.12
July	0	1.22	0	1.92	.75	2.59	2.76		1.50	3.20
Aug.	1.93	2.45	.75	2.05	1.85	3.03	1.61		.94	3.06
Sept.	1.46	4.93	1.77	5.99	2.09	2.88	2.20		1.97	2.79
Oct.	2.32	2.13	2.09	1.70	2.72	1.24			1.54	1.23
Nov.	1.97	1.16	2.52	1.00	1.06	.60	.35		.55	.50
Dec.	.39	.78	.20	.69	.08	.77	0		.04	.56
Yearly	12.01	21.39	10.12	21.18	10.63	15.37			7.77	15.85

Month	Hipolito, Coahuila		Saltillo, Coahuila		Ramos Arizpe, Coahuila		Huachichil, Coahuila		Carbonera, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08		0.20	0.56	0.08	0.45			0.63	0.73
Feb.	.51		.71	.55	.67	.37			.63	.64
Mar.	0		T	.40	0	.28			0	.57
Apr.	.08		.35	.78	.35	.46	.51		.16	.87
May	.32		.75	1.17	.47	.84	1.26		.55	1.94
June	0		T	2.17	.04	1.07	.35		.39	2.33
July	1.02		.98	2.57	.63	1.36	2.40		2.76	2.88
Aug.			1.73	2.50	.79	1.33	1.69		2.09	3.12
Sept.	.51		1.30	2.69	.59	1.74	2.17		.31	2.71
Oct.	1.14		2.09	1.24	1.69	.74			3.35	1.65
Nov.	.59			.81	.67	.48	1.73		1.61	.93
Dec.			.16	.65	0	.52			.67	1.06
Yearly				16.09	5.98	9.64			13.15	19.43

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
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Month	Ioamole, Nuevo Leon		Mina, Nuevo Leon		La Popa, Nuevo Leon		La Arena, Nuevo Leon		Cienega de Flores, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.12	0.23	T	0.40	0	0.38	0.35	0.65	0.12	1.24
Feb.	.79	.28	.63	.40	.51	.74	.35	.83	.31	.97
Mar.	0	.13	0	.13	0	.22	T	.58	0	1.04
Apr.	0	.26	0	.54	.08	.46	0	.94	T	1.47
May	.59	.73	.98	.58	.98	.94	4.06	2.17	1.97	2.57
June	.04	1.00	0	1.54		1.67	0	3.42	0	3.34
July	.43	.59	0	1.11	2.32	1.30	.71	3.52	.39	2.32
Aug.	.79	.98	4.49	1.62	2.80	1.93	3.74	3.98	8.78	4.52
Sept.	.63	2.15	1.85	3.20	.39	3.26	4.13	5.58	4.92	6.01
Oct.	2.28	.91	1.30	1.06	1.22	.75	1.57	2.83	1.02	2.64
Nov.	4.76	.76	.71	.77		.70	1.30	.99	1.54	1.25
Dec.	.43	.50	.24	.50		.77		.48		1.17
Yearly	10.86	8.52	10.20	11.85		13.12		25.97		28.54

Month	Hacienda Mamulique, Nuevo Leon		La Pomona, Nuevo Leon		San Diego, Nuevo Leon		Cola de Caballo, Nuevo Leon		Una de Gato, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.39	0.45	0.08					0.57	0.12	0.20
Feb.	.47	.23	.47			0.26		.69	.94	.49
Mar.	0	.22	.24	0.16		.49		.79	.04	.38
Apr.	0	.61	T	.90		1.77	1.85	2.19	0	2.19
May	1.02	.85	4.61	2.88			2.83	2.74	2.72	1.36
June	.16	2.79	T	2.62		.92	.28	3.07	.16	1.42
July	.79	3.99	1.46	1.48			1.10	2.30	1.18	1.44
Aug.	6.14	3.19	2.72	2.94	8.62	4.21	9.17	6.31	4.76	4.17
Sept.	1.46	5.43	2.64	4.16	13.39	8.82	7.68	15.65	4.69	3.15
Oct.	.91	1.18	2.44	1.24	5.12	2.91	7.32	6.98	1.57	.78
Nov.	1.34	1.45	1.97	1.42	2.48	.85			1.14	.63
Dec.	.79	.90	.59	.30	1.93	1.55	.79	.57	.63	1.66
Yearly	13.47	21.29	17.22						17.95	16.00

Month	Ejido Marin, Nuevo Leon		La Huasteca, Nuevo Leon		Vaqueria, Nuevo Leon		Topo Chico, Nuevo Leon		Tepehuaje, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.28		0	0.18	0.16		0.08	0.38	0.55	
Feb.			.43	.31	.55		.28	.53	.24	
Mar.	0	0.42	0	0				.45	.08	
Apr.	T	.04	0	.32	1.69	1.32	.20	.94	.08	
May	2.83	1.69	.51	.83	6.57	3.28	2.95	1.38	5.98	
June	0	1.73	.94	2.29	0	1.44	.59	2.40	.04	2.80
July	.79	1.48	1.89	.88	1.54		.47	1.50	.51	1.98
Aug.	4.57	3.76	1.14	1.80	5.09	2.92	7.64	3.23	3.43	2.38
Sept.	4.72	3.62	2.13	4.79	3.50	2.80	3.35	4.76	3.82	5.26
Oct.	1.85	.92	2.05	3.98	3.98	2.05	4.45	2.67	3.03	1.52
Nov.	1.50	1.12	.87	.29	2.36	1.22	1.54	.78	1.61	1.02
Dec.	.35	1.56	0	.96	.55	2.08	0	.47		
Yearly			9.96					19.49		

Month	Gomez Farias, Coahuila		Higueras, Nuevo Leon		Los Ramones, Nuevo Leon		Cerro Prieto, Nuevo Leon		Los Herrera, (La Tableta), N. L.	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.39		0.28	0.65	0.16	0.64	0.24	0.34	0.08	0.55
Feb.	1.14		.28	.56	.35	.73	.20	.61	.47	.63
Mar.	0		0	.63	T	.59	0	.44	.04	.61
Apr.	.55		0	1.22	T	1.48	1.34	1.04	T	1.24
May	.16		6.54	2.02	3.82	2.59	6.81	4.36	3.15	2.68
June	.55	1.91	.24	2.68	.20	3.25	.08	3.59	0	2.64
July	1.46	1.58	2.40	2.26	.94	1.92		2.42	2.44	1.87
Aug.	1.61	1.42	10.04	3.41	3.82	3.50	3.62	3.15	1.89	2.70
Sept.	.94	1.30	4.84	4.87	2.68	5.65	.94	5.23	2.09	5.04
Oct.	2.83	1.48	2.72	1.85	2.72	2.81	3.43	2.84	2.40	2.36
Nov.	.79	.42	1.89	.83	1.42	.75	1.73	.65	1.38	.69
Dec.	.43	1.73	.51	.69	.47	.53	.94	.73	.35	.51
Yearly	10.85		29.74	21.67	16.58	24.44	25.40	14.29	21.52	

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Madero (Los Aldámas), Nuevo Leon		El Brasil, Nuevo Leon			Rinconada, Nuevo Leon		Santa Catarina, Nuevo Leon		Monterrey, Nuevo Leon	
	1980	Average	1979	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	T	0.80		T		0.20	0.28	0	0.62	0.24	0.59
Feb.	.51	.81		.43		.79	.28	.35	.42	.31	.68
Mar.	0	.72		0		0	.19	0	.30	T	.70
Apr.		.76				.04	.39	0	.59	.16	1.10
May	2.72	3.02		3.43		.12	.51	2.13	.92	3.11	1.57
June	T	4.11		0		.16	1.12	.43	2.01	.67	2.82
July	T	2.28	0.91	.94	0.92	.31	.57	2.76	1.22	1.34	2.43
Aug.	4.37	4.74	.87	3.86	2.36	2.01	1.22	1.65	2.75	8.39	3.30
Sept.	4.33	6.04	2.48	2.40	2.44	.28	1.88		4.30	4.61	6.04
Oct.	1.77	2.04	0	1.54	.77	1.34	.85		1.69	4.13	3.20
Nov.		.57	0	2.09	1.04	1.14	.40		.56	1.02	1.21
Dec.		.75	2.80	0	1.40		.35	0	.52	.31	.69
Yearly		26.64					8.04		15.90	24.29	24.33

Month	Apodaca, Nuevo Leon		Pajonal, Nuevo Leon		Cadereyta, Nuevo Leon		La Cruz, Nuevo Leon		Tunel San Francisco, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.31	0.53	0	0.50	0.51	0.71	0.98	0.71		0.89
Feb.	.31	.77	1.06	.60	.12	.89	.91	.51	.63	1.16
Mar.	.16	.60	0	.23	.04	1.11	.39	.30	.08	1.45
Apr.	0	.98	.47	.81	.08	1.94	1.54	.86	.63	2.04
May	3.58	1.93	1.46	1.79	2.72	2.43	2.40	1.56	4.41	3.09
June	.16	2.94	1.97	2.51	.04	3.56	4.29	2.56	.59	6.73
July		2.34	5.87	2.51	.75	2.56		3.13		4.19
Aug.	3.82	3.44	5.63	3.96	1.34	3.51	5.47	3.97	7.48	7.43
Sept.	2.72	5.91	4.92	4.94	2.48	5.35		6.46	.67	11.36
Oct.	2.05	2.23	5.39	2.11	3.23	3.27		2.21	8.15	6.05
Nov.	1.38	.94	1.73	.54	1.18	1.20	.39	.82	2.05	1.94
Dec.	.47	.68	0	.63	.79	.76	0	.35	.75	.91
Yearly		23.29	28.50	21.13	13.28	27.29		23.44		47.24

Month	Las Comitas, Nuevo Leon		Presa La Boca, Nuevo Leon		Las Enramadas, Nuevo Leon		Adjuntas, Nuevo Leon		Villa Allende, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0	0.31	0.35	0.86	0.20	0.83		0.45	1.02	0.95
Feb.	.20	.37	.55	.97	.31	.69		.54	1.06	1.25
Mar.	0	.24	.24	1.10	0	.71		.42	0	1.27
Apr.	.43	.69	1.26	1.69	0	1.81	1.18	1.34	2.24	2.50
May	.51	1.00		2.62	6.46	2.88	1.77	2.87	5.59	3.60
June	.31	2.45	.94	5.64	0	3.32	3.31	7.84	2.01	5.25
July		1.82	2.01	3.78	.91	2.32		5.73		3.63
Aug.	3.19	3.34	10.04	6.44	2.68	3.73	5.24	5.55	2.64	5.65
Sept.	2.83	4.73	7.52	9.61	1.30	6.54	4.21	12.38	4.96	9.08
Oct.	3.86	1.85	7.28	5.03	2.32	2.66		4.73	4.37	5.39
Nov.	.35	.52	1.30	1.39	1.77	.80	.28	.87	1.73	1.67
Dec.	0	.41	.51	.90	.12	.75	.98	.46	.87	1.01
Yearly		17.73		40.03	16.07	27.04		43.18		41.25

Month	San Juan, Nuevo Leon		Laguna de Sanchez, Nuevo Leon		Cerritos, Nuevo Leon		Casillas, Nuevo Leon		Cienega del Toro, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.87	0.52	0.04	0.62	0.35	0.51	0.08	0.48	0.43	0.85
Feb.	.43	.90	1.26	.62	.47	.89	0	.66	.94	.57
Mar.	.08	.68	0	.42	.08	.49	0	.57	0	.76
Apr.	.16	1.94	.28	1.20	.59	.96		.96	.79	1.38
May	6.06	2.55	.20	1.83	4.09	3.38		1.91	1.61	2.47
June	.16	3.16	2.68	3.48	.35	7.01		3.29	0	2.23
July	1.22	2.26	3.11	2.60	5.51	6.31		2.51	.83	2.99
Aug.	3.54	3.59	5.08	4.45	10.47	6.07		2.99	4.76	3.01
Sept.	2.76	5.60	6.69	6.53		12.19	6.57	4.69	1.89	3.55
Oct.	4.61	3.20	3.58	2.69	5.71	4.22	5.00	2.47	5.12	2.17
Nov.	1.89	1.02	1.42	.67		.63	1.85	.73	2.01	.93
Dec.	1.26	.64	0	.56	.39	.53	.39	.52	.55	.83
Yearly	23.04	26.06	24.34	25.67		43.19		21.78	18.93	21.74

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Mimbres, Nuevo Leon		Rusio, Nuevo Leon		Rayones, Nuevo Leon		Potosi, Nuevo Leon		Galeana, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	1.06	1.25	0.63	0.67	0.28	0.32	0.59	0.84	0.35	0.21
Feb.	.87	1.24	.43	.61	.28	.40	.63	.67		.52
Mar.	0	1.10	0	.48	T	.31	0	.36	0	.33
Apr.	1.34	1.54	.47	1.11	.59	1.02	.87	1.26	.75	1.14
May	2.24	2.31	.91	1.76	1.77	1.76		1.56	2.24	1.57
June	.39	2.84	.08	1.86	1.02	2.07		1.28	.79	1.75
July	2.40	2.94	0	1.11	2.80	1.18		1.36	2.99	1.73
Aug.	3.35	3.49	.59	1.42	2.83	2.80	.20	1.49	2.17	2.47
Sept.	2.32	3.96	.43	1.74	4.02	3.39	0	1.60	2.20	3.07
Oct.	5.98	2.08	2.91	1.22	3.46	1.56	2.76	1.40	3.50	1.35
Nov.	1.77	1.25	1.10	.70		.45	1.26	1.30	1.10	.32
Dec.	.87	1.14	.51	.87	.24	.39	.71	1.61	.71	.66
Yearly	22.59	25.14	8.06	13.55		15.65		14.73		15.12

Month	Iturbide, Nuevo Leon		Cabezones, Nuevo Leon		Linares, Nuevo Leon		Montemorelos, Nuevo Leon		El Realito, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.55	0.53	0.39	0.74	0.35	0.87	0.71	0.76	0.08	0.52
Feb.	.63	.65	.35	.85	.24	.84	.28	.96	.08	.49
Mar.	.16	.58	.12	1.13	.12	1.04	.04	1.14	.08	.57
Apr.	.87	1.20	.79	2.35	.47	2.23	.31	2.17	1.42	1.13
May	1.57	1.94	3.58	3.65	3.94	3.64	5.16	3.24	2.99	2.22
June	1.30	3.47	1.02	4.37	.20	3.80	1.26	4.05	0	2.58
July	3.19	2.66	.28	3.21	.71	2.68	.51	2.23	.71	2.70
Aug.	5.28	4.18	5.39	5.44	1.77	3.76	1.57	4.29	4.72	3.88
Sept.	5.98	5.96	5.28	8.98	3.23	6.52	4.76	6.39	3.03	6.68
Oct.	3.03	2.47	3.66	3.62	3.23	3.47	5.12	3.96	3.11	2.07
Nov.	.94	.56	1.50	1.04	1.57	1.15	1.42	1.58	1.38	.59
Dec.	.31	.60	.28	.85	.63	1.05	.55	.90	.24	.62
Yearly	23.81	24.80	22.64	36.23	16.46	31.05	21.69	31.67	17.84	24.05

Month	San Rafael, Nuevo Leon		El Cuchillo, Nuevo Leon		Gral. Bravo, Nuevo Leon		Cerralvo, Nuevo Leon		El Cuervito, Nuevo Leon	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.31	0.74	0.28	0.61	0.31	0.74	0.20	0.64	0.16	
Feb.	.79	.89	.39	.54	.43	.54	.28	.60	.91	
Mar.	0	.58	T	.47	.04	.54	.12	.51		
Apr.	.24	.86	0	1.25	0	1.41	T	1.75		
May	1.02	1.70	2.95	2.28	3.62	2.87	3.94	3.02	2.76	
June	1.57	2.25	0	2.54	.39	2.65	2.60	3.21		
July	.91	2.47	.47	1.93	3.35	2.25	2.44	1.84		
Aug.	.91	2.46	2.28	2.82	3.35	2.67	3.70	3.44		
Sept.	1.10	2.28	2.13	4.60	.87	4.47	2.52	5.30	.28	
Oct.	5.75	1.75	5.83	2.03	4.17	2.06	.94	2.64	3.43	
Nov.	1.42	.92	1.89	.58	2.68	.87	1.69	.74	2.36	
Dec.	.55	.88	.24	.51	.24	.74	.75	.50	.47	
Yearly	14.57	17.78	16.46	20.16	19.45	21.81	19.18	24.19		

Month	Comales, Tamaulipas		Camargo, Tamaulipas		Valadecios, Tamaulipas		Bajo Rio San Juan, Tamps., No. 2-29		Cd. Diaz Ordaz, Tamaulipas	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	0.83	0.16	0.93	0.08	1.10	0.08	1.23	0.20	0.93
Feb.	.67	.72	.71	.87	.98	.86	1.10	.86	1.14	.87
Mar.	.08	.61	.08	.50	.12	.48	0	.38	.08	.48
Apr.	.04	1.54	.12	1.57	.08	1.49	0	1.44	.08	1.45
May	2.83	2.00	3.39	2.19	2.95	2.56	3.15	3.15	3.39	2.32
June	0	2.09	0	2.23	0	2.93	0	2.69	0	2.28
July	2.83	1.38	.04	1.40	.16	1.59	.12	1.46	0	1.27
Aug.	2.48	2.66	2.40	2.17	2.48	2.54	4.41	2.89	5.79	2.28
Sept.	.12	4.24	1.65	4.83	1.10	4.89	1.34	4.43	2.83	3.98
Oct.	1.97	2.28	1.77	1.93	2.32	2.34	2.44	2.48	2.48	2.54
Nov.	2.13	.75	2.05	1.07	2.28	1.16	2.24	.96	2.68	1.00
Dec.	.31	.74	.51	.70	.31	.84	.39	.94	.79	.88
Yearly	13.54	19.84	12.88	20.39	12.86	22.78	15.27	22.91	19.46	20.28

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO**  
In Inches

Month	Reynosa Km. 22 SW, Tamaulipas		Bajo Rio San Juan, Tamps., No. 2-38		Bajo Rio San Juan, Tamps., No. 2-33		Arguelles, Tamaulipas		Presa Anzalduas, Tamaulipas	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.39	1.12	0.04	1.21	0.08	1.24	0.39	1.15	0.12	0.81
Feb.	1.18	.75	.87	.80	.79	.84	.79	1.03	.98	.53
Mar.	0	.55	0	.41	.04	.42	.20	.47	.04	.48
Apr.	0	1.58	.67	1.36	.04	1.70	0	1.56	0	1.54
May	3.94	2.58	1.77	3.09	3.43	3.31	3.94	2.52	4.53	2.35
June	0	2.69	0	3.08	0	2.79	0	2.38	0	2.28
July	.79	1.99	.71	1.87	.55	1.93	0	1.57	.04	1.48
Aug.	7.87	2.75	9.13	3.85	8.74	3.40	8.66	2.35	9.69	2.64
Sept.	2.17	4.28	1.77	4.18	1.77	4.60	2.95	4.02	1.81	3.79
Oct.	2.76	2.05	1.34	1.85	2.17	2.35	2.76	1.76	4.45	2.32
Nov.	2.95	1.17	2.13	1.16	2.32	1.06	2.56	1.11	2.17	.69
Dec.	.79	1.13	.47	.96	.51	1.07	.79	1.07	.35	.67
Yearly	23.04	22.64	18.90	23.82	20.44	24.71	23.04	20.99	24.18	19.58

Month	Reynosa, Tamaulipas		Bajo Rio San Juan, Tamps., No. 3-55		Bajo Rio San Juan, Tamps., No. 3-58		Bajo Rio San Juan, Tamps., No. 3-60		Bajo Rio San Juan, Tamps., No. 3-47	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	1.06	0.08	1.63	0.16	1.41	0.08	1.29	0.08	1.72
Feb.	1.42	.87	1.38	1.23	1.34	1.08	1.22	1.11	.71	1.07
Mar.	.12	.66	.12	.58	.04	.56	.12	.55	.08	.50
Apr.	0	1.27	0	2.15	.24	1.72	0	1.68	0	1.76
May	5.00	2.22	1.26	2.21	2.28	2.23	2.13	2.12	.79	2.86
June	0	2.20	0	3.40	0	3.01	0	3.41	0	3.48
July	.28	1.44	0	2.95	0	3.02	0	2.24	.67	2.64
Aug.	12.48	2.02	6.14	3.14	4.37	3.02	3.78	2.78	4.65	3.00
Sept.	3.62	3.74	3.54	4.74	3.07	5.13	3.31	4.78	1.06	4.87
Oct.	4.25	2.27	2.32	3.02	3.94	2.83	3.70	2.91	1.22	2.47
Nov.	2.60	.94	3.43	.97	3.39	1.12	3.31	1.14	1.18	1.02
Dec.	.47	.82	1.10	.96	.71	.93	.59	.87	.75	1.12
Yearly	30.32	19.51	19.37	26.98	19.54	26.06	18.24	24.88	11.19	26.51

Month	Bajo Rio San Juan, Tamps., No. 3-63		Rio Bravo, Tamaulipas		Retamal, Tamaulipas		Bajo Rio Bravo, Tamps., No. 3-15		Bajo Rio Bravo, Tamps., No. 4-16	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	T	1.43	0.16	1.25	0.08	0.93	0.39	1.60	0.16	1.29
Feb.	1.38	1.23	1.22	1.15	1.38	.92	1.69	1.40	1.18	1.11
Mar.	.08	.57	0	.61	.79	.65	.08	.75	.08	.65
Apr.	.24	1.46	.04	1.70	0	1.50	.08	2.32	.16	2.12
May	2.28	2.24	1.73	2.23	2.24	2.30	1.34	2.44	2.60	2.47
June	0	3.73	0	2.83	0	2.70	0	4.05	0	4.27
July	0	2.36	.43	2.24	.79	1.57	0	2.82	.20	2.27
Aug.	3.98	3.09	6.26	2.92	5.35	2.78	5.67	3.60	4.33	3.98
Sept.	2.99	5.20	2.80	5.07	1.93	3.54	3.11	4.65	3.03	5.18
Oct.	3.98	2.44	1.38	2.73	2.01	2.58	2.91	2.81	3.23	2.51
Nov.	3.03	.94	3.35	1.23	1.97	1.22	3.50	1.39	3.35	1.57
Dec.	1.14	.84	.71	.91	.71	1.00	1.18	1.35	.87	1.02
Yearly	19.10	25.53	18.08	24.87	17.25	21.69	19.95	29.18	19.19	28.44

Month	Bajo Rio Bravo, Tamps., No. 3-14		Bajo Rio Bravo, Tamps., No. 3-17		Bajo Rio Bravo, Tamps., No. 4-8		Bajo Rio Bravo, Tamps., No. 2-6		Bajo Rio Bravo, Tamps., No. 4-10	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.08	1.29	0.20	1.49	0.24	1.46	0.39	1.93	0.20	1.32
Feb.	1.46	.97	1.61	1.22	1.73	1.25	1.50	1.34	1.50	1.60
Mar.	.04	.47	.08	.61	.35	.81	.20	.78	.28	1.01
Apr.	0	1.58	0	1.58	0	2.48	0	1.84	0	2.27
May	1.81	2.51	2.13	2.42	2.60	3.08	1.89	2.61	1.89	2.35
June	.08	3.03	0	3.17	0	3.08	0	3.00	0	3.11
July	.16	2.45	0	2.64	0	3.04	0	2.72	0	2.70
Aug.	5.63	2.96	5.87	3.70	5.28	4.42	5.39	3.68	4.92	3.54
Sept.	1.61	4.10	2.09	4.93	4.06	5.69	4.33	4.93	4.06	5.69
Oct.	2.36	2.48	3.31	2.58	3.31	2.82	2.48	2.65	2.87	2.32
Nov.	2.68	1.01	3.31	1.35	2.76	1.59	4.53	1.54	3.07	1.36
Dec.	.63	1.05	.91	1.17	.83	1.16	1.18	1.17	1.46	.96
Yearly	16.54	23.90	19.51	26.86	21.16	30.78	21.89	28.19	20.25	28.23

T Trace

**RAINFALL ON THE RIO GRANDE WATERSHED  
IN MEXICO  
In Inches**

Month	Valle Hermoso, Tamaulipas		Control, Tamaulipas		Bajo Rio Bravo, Tamps., No. 2-5		Bajo Rio Bravo, Tamps., No. 2-11		Bajo Rio Bravo, Tamps., No. 1-2	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.20	1.09	0.39	1.25	0.12	1.73	0	1.43	0.12	1.54
Feb.	1.61	1.20	1.77	1.06	1.46	1.32	1.85	1.17	1.54	1.77
Mar.	.47	.67	.35	.59	.39	1.02	.35	.60	.31	.44
Apr.	0	2.04	.20	1.68	.16	1.73	.12	2.78	.16	1.57
May	2.01	2.48	2.13	2.75	2.20	2.59	1.18	2.55	1.18	2.84
June	.47	3.29	.31	2.98	0	3.21	2.20	4.26	.20	3.63
July	.39	2.06	.20	1.73	.39	2.19	0	2.58	0	1.88
Aug.	5.83	2.73	8.90	3.35	5.31	3.69	6.42	4.02	7.20	4.06
Sept.	2.76	5.37	1.85	5.04	1.46	4.89	1.89	5.55	1.65	5.10
Oct.	2.17	2.58	2.72	2.74	2.91	2.68	2.72	2.85	2.13	2.90
Nov.	2.44	1.46	3.15	1.27	2.60	1.42	2.83	1.33	2.87	1.38
Dec.	1.22	1.00	1.54	1.00	1.34	1.29	1.30	1.36	1.65	1.12
Yearly	19.57	25.97	23.51	25.44	18.34	27.76	20.86	30.48	19.01	28.23

Month	Bajo Rio Bravo, Tamps., No. 2-7		Bajo Rio Bravo, Tamps., No. 1-4		Bajo Rio Bravo, Tamps., No. 1-18		Bajo Rio Bravo, Tamps., No. 1-3		Bajo Rio Bravo, Tamps., No. 1-13	
	1980	Average	1980	Average	1980	Average	1980	Average	1980	Average
Jan.	0.12	1.35	0.16	1.68	0.94	1.53	0.63	1.49	0	1.35
Feb.	1.69	1.22	1.50	1.19	1.73	1.33	1.77	1.22	1.34	1.15
Mar.	.55	.66	.28	.66	.24	.41	.39	.46	.24	.51
Apr.	0	2.87	0	2.12	0	1.96	0	2.02	0	1.84
May	.67	2.50	2.44	2.43	1.89	2.19	1.93	2.29	.59	1.60
June	1.14	3.64	.43	3.35	0	3.24	.39	3.19	1.14	3.43
July	.39	2.32	.28	1.84	1.69	2.10	0	1.89	.08	1.85
Aug.	5.98	4.31	5.63	3.50	5.87	3.53	7.17	3.06	5.63	3.56
Sept.	2.60	5.28	3.43	5.17	1.54	4.78	6.46	5.25	1.10	5.33
Oct.	2.64	2.55	2.48	2.65	2.32	3.32	2.13	2.86	1.18	2.48
Nov.	3.03	1.53	2.17	1.25	2.95	1.42	2.68	1.53	1.81	1.10
Dec.	.12	1.08	.94	1.26	2.28	1.34	1.42	1.27	2.13	1.13
Yearly	18.93	29.31	19.74	27.10	21.45	27.15	24.97	26.53	15.24	25.33

Month	Bajo Rio Bravo, Tamps., No. 1-12		Matamoros, Tamaulipas						
	1980	Average	1980	Average					
Jan.	0.87	1.77	0.83	1.77					
Feb.	1.57	1.38	1.81	1.77					
Mar.	.43	.49	.28	.50					
Apr.	.08	1.96	T	2.23					
May	1.54	2.57	2.20	2.37					
June	1.46	3.29	.63	3.80					
July	1.61	2.26	T	2.16					
Aug.	7.56	3.33	9.69	4.30					
Sept.	1.65	5.45	1.85	6.25					
Oct.	2.36	3.58	1.97	3.72					
Nov.	2.87	1.39	5.43	1.55					
Dec.	1.30	1.37	5.79	1.88					
Yearly	23.30	28.84	30.48	32.30					

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**AVERAGE RAINFALL ON SUBDIVISIONS OF THE RIO GRANDE WATERSHED**  
**With Averages for the 110 Years 1871 - 1980, Inclusive**  
**In Inches**

The precipitation records of all stations on or adjacent to the watershed subdivisions listed below have been used, with proper weighting for area, in calculating the average rainfalls shown here. The drainage area for each subdivision is shown in parentheses. The hundreds of individual records are delineated in the various "Indexes to Precipitation Records" shown in Water Bulletins Nos. 10, 14, 22, 26, and Supplement 40A.

Month	El Paso to Fort Quitman (2,677 Square Miles)		Fort Quitman to Above Rio Conchos (3,056 Square Miles)		* Above Rio Conchos to Johnson Ranch (3,782 Square Miles)		Johnson Ranch to Foster Ranch (12,982 Square Miles)	
	1980	Period Average	1980	Period Average	1980	Period Average	1980	Period Average
Jan.	0.32	0.44	0.15	0.39	0.09	.34	0.18	0.47
Feb.	.44	.37	.10	.27	.10	.28	.06	.37
Mar.	.13	.32	.01	.24	.01	.20	.06	.40
Apr.	.25	.26	.04	.33	.04	.39	.03	.78
May	.13	.41	.33	.61	.14	.77	.91	1.49
June	.24	.79	.36	1.18	.76	1.13	.62	1.69
July	.35	2.27	.93	2.95	.67	1.88	.08	1.87
Aug.	1.75	1.89	3.22	2.42	3.59	1.91	4.11	2.22
Sept.	4.13	1.46	4.83	2.01	6.61	1.63	3.30	1.19
Oct.	.52	.91	1.08	1.02	.73	.85	.76	1.20
Nov.	.47	.43	.55	.41	.79	.34	.93	.59
Dec.	.13	.57	.29	.52	.36	.40	.60	.54
Yearly	8.86	10.12	11.89	12.35	13.89	10.12	11.64	13.72

Month	Pecos River below Sheffield (3,390 Square Miles)		# Foster Ranch to Amistad Dam (2,799 Square Miles)		Devils River (4,305 Square Miles)		+ Amistad Dam to Eagle Pass (1,625 Square Miles)	
	1980	Period Average	1980	Period Average	1980	Period Average	1980	Period Average
Jan.	0.47	0.68	0.35	0.50	0.47	0.67	0.31	0.73
Feb.	.21	.86	.11	.63	.41	.72	.19	.90
Mar.	.37	.76	.28	.76	.33	1.05	.31	.99
Apr.	.30	1.83	.02	1.33	.22	1.77	.49	1.70
May	2.79	1.82	2.51	1.97	2.60	2.58	3.69	2.91
June	.93	2.43	.29	2.18	.91	2.63	.09	2.48
July	.19	1.86	.22	1.27	.30	1.81	.36	1.89
Aug.	3.85	2.01	6.33	1.69	2.00	2.14	3.71	1.98
Sept.	5.93	2.53	2.61	2.38	5.13	3.00	.99	3.06
Oct.	.22	1.82	.32	1.45	.40	2.17	.11	2.05
Nov.	1.60	.93	1.91	.77	1.57	1.50	2.67	1.05
Dec.	.89	.72	.55	.62	.75	.97	.79	.85
Yearly	17.75	18.25	15.50	15.55	15.09	21.01	13.71	20.59

Month	! Eagle Pass to Laredo (3,795 Square Miles)		** Laredo to Falcon Dam (3,369 Square Miles)		# Falcon Dam to Rio Grande City (468 Square Miles)		United States Side below Rio Grande City (986 Square Miles)	
	1980	Period Average	1980	Period Average	1980	Period Average	1980	Period Average
Jan.	0.22	0.71	0.20	0.74	0.07	0.88	0.27	1.26
Feb.	.45	.79	.89	.79	.82	.82	1.16	1.08
Mar.	.33	.91	.01	.78	.02	.92	.20	1.01
Apr.	.94	1.60	.09	1.40	.03	1.18	.03	1.40
May	3.25	3.12	3.52	3.16	2.33	2.40	3.65	2.77
June	1.27	2.45	0	2.00	0	2.10	.07	2.54
July	1.07	1.48	.22	2.07	.26	1.89	.40	1.78
Aug.	5.30	2.31	3.47	1.89	1.89	2.14	7.78	2.40
Sept.	1.47	3.03	1.45	3.12	1.23	3.59	2.25	4.40
Oct.	.19	1.87	.71	1.64	1.04	1.93	3.24	2.56
Nov.	2.19	.96	2.67	1.53	2.20	.80	2.65	1.37
Dec.	.55	.96	.33	.83	.18	.67	.84	1.25
Yearly	17.23	20.19	13.56	19.95	10.07	19.32	22.54	23.82

\* Excluding Rio Conchos, Alamito, and Terlingua Creeks      # Excluding Pecos and Devils Rivers  
+ Excluding Arroyo Las Vacas, San Felipe Creek, Pinto Creek, Rio San Diego, and Rio San Rodrigo  
! Excluding Rio Escondido      \*\* Excluding Rio Salado above old Cd. Guerrero  
## Excluding Rio Alamo and Rio San Juan



LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

The precipitation records of stations listed below began on the date shown and extend through 1980. For detailed information regarding sources of data, specific periods of record, and other pertinent matters relative to these and additional rainfall stations on the Rio Grande watershed, see "Index to Precipitation Records" in Water Bulletins Nos. 10, 14, 22, 26, and Supplement 40A. With the exception of Las Cruces, New Mexico, all United States precipitation stations listed below are in Texas, while those in Mexico are in the indicated state as shown.

In the United States

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Acala Station	R	31° 23'	105° 59'	3,550	# 1938	El Paso - Fort Quitman	I. B. & W. C.
American Dam	S	31° 47'	106° 32'	3,730	# 1938	El Paso - Fort Quitman	I. B. & W. C.
Amistad Dam	R	29° 28'	101° 02'	1,150	July 1962	Foster Ranch - Amistad Dam	I. B. & W. C.
Amistad Reservoir near Comstock	C	29° 33'	101° 13'	1,130	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Arledge, W. A. Ranch	S	29° 58'	101° 38'	1,950	#June 1933	Foster Ranch - Amistad Dam	W. A. Arledge
Arroyo Tigre Chiquito	C	26° 41'	99° 07'	314	#Apr. 1954	Laredo - Falcon Dam	I. B. & W. C.
Baker, A. A. Ranch	R	29° 44'	101° 09'	1,720	July 1962	Devils River	I. B. & W. C.
Bakers Crossing	S	29° 58'	101° 09'	1,520	#Apr. 1955	Devils River	James Baker
Big Satan Creek Station	C	29° 40'	100° 58'	1,150	Nov. 1968	Devils River	I. B. & W. C.
Billings Ranch	S	30° 02'	101° 38'	1,970	#Mar. 1969	Foster Ranch - Amistad Dam	Newman Billings
Brite, J. G. Ranch	R	29° 33'	101° 01'	1,150	#Sep. 1962	Devils River	I. B. & W. C.
Brotherton Ranch	V	29° 42'	101° 19'	1,400	1961	Foster Ranch - Amistad Dam	Perry Calk
Buoy No. 11	C	29° 31'	101° 10'	#	#Dec. 1969	Foster Ranch - Amistad Dam	I. B. & W. C.
Buttrill Ranch	S	30° 00'	103° 16'	3,500	Mar. 1952	Johnson Ranch - Foster Ranch	Tom B. Leary
Canon Diablo	C	28° 39'	100° 27'	700	# 1964	Eagle Pass - Laredo	I. B. & W. C.
Castolon	S	29° 08'	103° 31'	2,100	#Mar. 1953	Above Rio Conchos - Johnson Ranch	National Park Service
CCWID #11 (Bayview Dist. Off.) Avg. 18 Gages	S	26° 08'	97° 21'	25	# 1952	Lower Rio Grande Valley	CCWID #11
CCWID #19 (Adams Gardens)	S	26° 10'	97° 47'	50	1952	Lower Rio Grande Valley	CCWID #19
Chittim Ranch	C	28° 44'	100° 28'	810	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Clint Station	R	31° 32'	106° 14'	3,630	# 1939	El Paso - Fort Quitman	I. B. & W. C.
Coal Mine	R	28° 48'	100° 28'	770	#Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Comstock	R	29° 41'	101° 10'	1,530	May 1939	Foster Ranch - Amistad Dam	I. B. & W. C.
Continental Ranch	S	29° 51'	101° 18'	1,560	Mar. 1965	Pecos River Below Sheffield	Julio Crowder
Cooper Ranch	C	28° 50'	100° 27'	800	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Corrallitos Ranch	C	27° 07'	99° 25'	346	1953	Laredo - Falcon Dam	I. B. & W. C.
Cow Creek near Comstock	C	29° 37'	101° 12'	1,310	Apr. 1965	Amistad Dam	I. B. & W. C.
Crane, Ed Ranch	S	29° 51'	101° 05'	1,630	# 1955	Devils River	Ed Crane
Cuervo Creek Station	C	28° 21'	100° 19'	620	1954	Eagle Pass - Laredo	I. B. & W. C.
Dale, O. C. Farm	S	26° 15'	98° 16'	130	1952	Lower Rio Grande Valley	O. C. Dale
Dead Mans Canyon near Comstock	C	29° 47'	101° 19'	1,320	Sep. 1967	Sheffield	I. B. & W. C.
Devils Lake	R	29° 35'	100° 59'	1,158	#May 1939	Devils River	I. B. & W. C.
Devils River at Cauthorn Ranch	S	30° 05'	101° 07'	1,656	#Apr. 1976	Devils River	I. B. & W. C.
Dolan Springs	C	29° 58'	100° 59'	1,360	Feb. 1966	Devils River	I. B. & W. C.
Dove Mountain Ranch	S	29° 48'	102° 54'	2,880	#Mar. 1952	Johnson Ranch - Foster Ranch	Sam Cavness
Dryden	S	30° 03'	102° 07'	2,130	# 1931	Johnson Ranch - Foster Ranch	Lewis Cash
Eagle Pass	S	28° 42'	100° 30'	815	1964	Eagle Pass - Laredo	I. B. & W. C.
Edinburg Filtration Plant	S	26° 18'	98° 10'	100	1952	Lower Rio Grande Valley	City of Edinburg
Elephant Mountain Ranch	S	30° 01'	103° 34'	4,150	# 1952	Johnson Ranch - Foster Ranch	R. Schoenfeldt
El Indio	S	28° 31'	100° 19'	725	# 1941	Eagle Pass - Laredo	Glen Stidham
Elm Creek Station	C	28° 46'	100° 30'	720	1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Erekson Ranch	S	29° 56'	100° 34'	2,330	# 1955	Devils River	Bob Erekson
Evans Creek near Comstock	C	29° 32'	101° 06'	1,180	July 1969	Devils River	I. B. & W. C.
Falcon Dam	S	26° 33'	99° 08'	323	Apr. 1950	Laredo - Falcon Dam	I. B. & W. C.
Farias Ranch	R	28° 36'	100° 20'	720	#Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Fawcett, H. K. Ranch	C	29° 52'	100° 54'	1,550	# 1941	Devils River	I. B. & W. C.
Feely	C	29° 34'	101° 07'	1,250	#Apr. 1965	Foster Ranch - Amistad Dam	I. B. & W. C.
Fletcher, H. T. Ranch	S	30° 12'	104° 16'	5,100	# 1939	Alanito Creek	Hayes Mitchell, Jr.
Fort Hancock Bridge	S	31° 16'	105° 51'	3,500	#Apr. 1940	El Paso - Fort Quitman	I. B. & W. C.
Fort McIntosh (Laredo)	V	27° 30'	99° 31'	410	# 1850	Eagle Pass - Laredo	I. B. & W. C.

S Standard R Recording C Cumulative V Visual ## Reservoir surface  
# Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In the United States

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Fort Quitman	R	31° 06'	105° 36'	3,430	# 1937	Fort Quitman - Above Rio Conchos	I. B. & W. C.
Foster, Ross Ranch	C	29° 47'	101° 45'	1,230	May 1961	Johnson Ranch - Foster Ranch	I. B. & W. C.
Garciasville	R	26° 20'	98° 41'	200	#Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Gillis Headquarters Ranch	S	29° 37'	100° 47'	1,410	1968	Amistad Dam - Eagle Pass	Jake Schiller
Gillis Ranch	S	29° 41'	101° 03'	1,440	# 1965	Devils River	Walter Gillis
Goldwire Ranch	C	29° 44'	100° 57'	1,685	Nov. 1968	Devils River	Jake Schiller
Guayuco Arroyo	R	31° 10'	105° 40'	3,600	#May 1940	El Paso - Fort Quitman	I. B. & W. C.
Harlow Ranch	C	29° 50'	101° 11'	1,695	Mar. 1969	Devils River	I. B. & W. C.
HCWCID #6 Goodwin Pump No. 3	S	26° 16'	98° 24'	175	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 3A	S	26° 14'	98° 22'	130	# 1954	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 4	S	26° 16'	98° 21'	185	1958	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 4B	S	26° 18'	98° 23'	210	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #6 Goodwin Pump No. 5	S	26° 22'	98° 21'	225	# 1953	Lower Rio Grande Valley	HCWCID #6
HCWCID #15 (Edinburg Office)	S	26° 23'	98° 09'	85	1952	Lower Rio Grande Valley	HCWCID #15
Heath Crossing	S	29° 27'	102° 50'	1,775	#July 1966	Johnson Ranch - Foster Ranch	Dow Chemical
Huisache Ranch	C	26° 57'	99° 21'	383	Aug. 1953	Laredo - Falcon Dam	I. B. & W. C.
Hutto Ranch No. 1	R	29° 30'	100° 50'	1,240	1964	Devils River	I. B. & W. C.
Hutto Ranch No. 2	R	29° 29'	100° 54'	1,210	1964	Devils River	I. B. & W. C.
Indio Ranch	S	28° 31'	100° 22'	700	1959	Eagle Pass - Laredo	Earnest Seales
James, Lewis Ranch	S	30° 11'	102° 07'	2,275	1966	Johnson Ranch - Foster Ranch	Lewis James
Johnson Ranch	C	29° 01'	103° 23'	2,050	#July 1933	Johnson Ranch - Foster Ranch	I. B. & W. C.
Keisling Farm	S	28° 23'	100° 17'	740	Dec. 1958	Eagle Pass - Laredo	Robert Smith
Kelly, P. W. Ranch	S	29° 46'	101° 12'	1,750	# 1965	Foster Ranch - Amistad Dam	Bobby Kelly
King, Martin Ranch	R	29° 44'	101° 22'	1,460	Nov. 1954	Foster Ranch - Amistad Dam	I. B. & W. C.
La Feria Materials Yard	V	26° 10'	97° 50'	60	# 1960	Lower Rio Grande Valley	CCWCID #3
La Feria Pumping Plant	S	26° 03'	97° 50'	60	# 1952	Lower Rio Grande Valley	CCWCID #3
Lajitas	S	29° 16'	103° 48'	2,320	#June 1967	Above Rio Conchos - Johnson Ranch	Ben Simmons
La Joya	C	26° 15'	98° 29'	150	# 1957	Lower Rio Grande Valley	I. B. & W. C.
La Macolla Farm	S	30° 00'	104° 41'	2,750	Apr. 1977	Fort Quitman - Above Rio Conchos	Tom Pelton
La Mota Ranch	S	29° 33'	103° 59'	3,854	# 1943	Alamito Creek	John Rice
Laredo Water Plant	S	27° 33'	99° 31'	410	# 1930	Eagle Pass - Laredo	Laredo Water Plant
Las Cruces, New Mexico	S	32° 19'	106° 47'	3,893	1975	Caballo Dam - El Paso	I. B. & W. C.
Las Moras Creek	S	29° 00'	100° 38'	800	1958	Amistad Dam - Eagle Pass	Lou McGee
Lateral No. 2 Spill	C	28° 56'	100° 38'	760	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral No. 12 Headgate	C	28° 54'	100° 34'	800	1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Lateral 15 Spill	C	28° 51'	100° 34'	740	# 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Latham Ranch	S	30° 13'	101° 22'	2,120	# 1965	Pecos River below Sheffield	John and Bob Latham
Laughlin Air Force Base	S	29° 21'	100° 47'	1,080	Dec. 1958	Amistad Dam - Eagle Pass	U. S. A. F. Billie C.
Lewis, Billie C., Jr. Ranch	S	29° 33'	100° 40'	1,400	# 1964	Amistad Dam - Eagle Pass	Lewis, Jr.
Line Store	S	30° 40'	100° 57'	2,400	#Oct. 1962	Devils River	Claud Ward
Long Ranch	R	29° 28'	100° 57'	1,140	Oct. 1971	Devils River	I. B. & W. C.
Los Ebanos	C	26° 14'	98° 34'	150	#Apr. 1957	Lower Rio Grande Valley	I. B. & W. C.
Lowry, Cliff Ranch	R	29° 39'	100° 52'	1,490	June 1962	Devils River	I. B. & W. C.
Lowry Ranch No. 2	R	29° 37'	100° 56'	1,160	May 1965	Devils River	I. B. & W. C.
Maverick County Canal Headgate	S	29° 10'	100° 46'	870	#Mar. 1948	Amistad Dam - Eagle Pass	MCWCID #1
Maverick Power Plant	S	28° 50'	100° 33'	800	June 1952	Amistad Dam - Eagle Pass	C. P. & L. Co.
McGonagill Ranch - Headquarters	V	30° 20'	102° 58'	4,150	Apr. 1952	Johnson Ranch - Foster Ranch	W. L. Broth
Middle Fork San Pedro	C	29° 30'	100° 53'	1,170	#June 1969	Devils River	I. B. & W. C.
Miers, H. T. Ranch - Headquarters	C	29° 44'	100° 51'	1,760	# 1957	Devils River	I. B. & W. C.
Miers, H. T. Ranch No. 2	R	29° 44'	100° 53'	1,600	Apr. 1964	Devils River	I. B. & W. C.
Miller, Eugene Ranch	S	30° 26'	101° 10'	2,150	July 1975	Devils River	Eugene Miller
Mitchell, Kerr Ranch	S	30° 13'	104° 00'	4,450	# 1941	Alamito Creek	Mrs. K. Mitchell
Neely Ranch	S	30° 59'	105° 32'	3,350	#Aug. 1941	Fort Quitman - Above Rio Conchos	Mrs. Tom Neely
New Mission Pumping Plant	S	26° 11'	98° 24'	175	#Aug. 1961	Lower Rio Grande Valley	HCWCID #14
96 Ranch Headquarters	V	30° 40'	104° 50'	3,870	1972	Fort Quitman - Above Rio Conchos	Walter Paschal
Normandy	S	28° 55'	100° 36'	780	Dec. 1958	Amistad Dam - Eagle Pass	Famin G. Lowe
North Fork San Pedro	C	29° 31'	100° 53'	1,144	June 1969	Devils River	I. B. & W. C.

R Recording

C Cumulative

S Standard

V Visual

# Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In the United States

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Owens Ranch	S	30° 45'	101° 40'	2,170	#July 1963	Pecos River below Sheffield	Jeff Owens
Pafford Crossing	C	29° 41'	101° 00'	1,180	Feb. 1960	Devils River	I. B. & W. C.
Pecos River near Langtry Station	C	29° 48'	101° 27'	1,260	July 1967	Pecos River below Sheffield	I. B. & W. C.
Penitas (Edinburg Pumping Plant)	S	26° 14'	98° 27'	100	July 1957	Lower Rio Grande Valley	B. Leadbetter
Persimmon Gap Ranger Station	S	29° 40'	103° 10'	2,900	# 1948	Johnson Ranch - Foster Ranch	Mrs. Glen Harris
Pinto Creek Station	C	29° 09'	100° 43'	870	#Dec. 1958	Amistad Dam - Eagle Pass	I. B. & W. C.
Plata	S	29° 52'	104° 02'	3,750	#July 1977	Alamito Creek	Jim Turner
Potter, A. M. Ranch	S	29° 46'	103° 25'	3,440	# 1952	Johnson Ranch - Foster Ranch	A. M. Potter
Presidio (IB&W Gage)	S	29° 34'	104° 23'	2,550	#Oct. 1949	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Prosser Ranch No. 1	C	29° 54'	101° 14'	1,710	Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Prosser Ranch No. 2	C	29° 59'	101° 16'	1,850	#Mar. 1965	Devils River	I. B. & W. C.
Prosser Ranch No. 3	C	30° 02'	101° 16'	2,020	#Mar. 1965	Pecos River below Sheffield	I. B. & W. C.
Quebec Ranch	V	30° 31'	104° 25'	4,600	# 1949	Adjacent to Alamito Creek	Pablo Vasquez
Ranchita (Continental)	S	29° 50'	101° 20'	1,540	# 1969	Pecos River below Sheffield	Julio Crowder
Redford	C	29° 29'	104° 13'	2,500	July 1954	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Rio Grande near Dryden	S	29° 49'	102° 09'	1,350	May 1976	Johnson Ranch - Foster Ranch	I. B. & W. C.
Roma (International Bridge)	S	26° 24'	99° 01'	230	# 1941	Falcon Dam - Rio Grande City	Starr County Bridge Co.
Rosita Creek Siphon	C	28° 41'	100° 24'	760	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Rosita Creek Station	C	28° 36'	100° 24'	700	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Rough Canyon nr. Del Rio	C	29° 35'	100° 56'	1,147	June 1969	Devils River	I. B. & W. C.
San Benito Pump	S	26° 03'	97° 45'	50	Oct. 1933	Lower Rio Grande Valley	I. B. & W. C.
Sawyer, W. E. Ranch	S	30° 28'	100° 47'	2,100	#July 1966	Devils River	Geo. Powell
Sellers Ranch	C	29° 34'	101° 02'	1,190	#Feb. 1960	Devils River	I. B. & W. C.
Shafter	V	29° 49'	104° 19'	3,800	#July 1968	Above Rio Conchos - Johnson Ranch	Raymond Wylie
Shannon, Bill Ranch	C	29° 57'	104° 40'	2,680	#July 1956	Fort Quitman - Above Rio Conchos	Bill Shannon
Slaughter Ranch	V	29° 57'	102° 41'	2,560	# 1965	Johnson Ranch - Foster Ranch	Mike Wood
Stewart Ranch	R	29° 35'	100° 52'	1,330	#Feb. 1960	Devils River	I. B. & W. C.
Study Butte	S	29° 19'	103° 32'	2,550	July 1977	Terlingua Creek	Shirley Willard
Stumberg, Steve Ranch	R	30° 11'	102° 53'	4,300	# 1943	Johnson Ranch - Foster Ranch	I. B. & W. C.
Terlingua Creek Station	C	29° 12'	103° 36'	2,215	Mar. 1952	Above Rio Conchos - Johnson Ranch	I. B. & W. C.
Trees Farm	R	28° 38'	100° 25'	720	#Mar. 1959	Eagle Pass - Laredo	I. B. & W. C.
Van Dalsem Farm	C	28° 27'	100° 19'	700	# 1959	Eagle Pass - Laredo	I. B. & W. C.
Vinegarone	C	29° 57'	100° 46'	1,780	May 1966	Devils River	I. B. & W. C.
Walker Ranch	C	29° 50'	101° 14'	1,530	July 1969	Devils River	I. B. & W. C.
Wardlaw Standart Ranch	S	29° 19'	100° 38'	1,070	Apr. 1977	Pinto Creek	Hadly Wardlaw
Weyrich Farm	C	28° 40'	100° 24'	760	Sep. 1962	Eagle Pass - Laredo	I. B. & W. C.
Whipple Farm	S	26° 04'	97° 29'	25	# 1952	Lower Rio Grande Valley	Harry Whipple
Whitehead Bros. Ranch	C	30° 02'	100° 52'	1,900	May 1966	Devils River	I. B. & W. C.
Whitehead, Tuffy Ranch	R	29° 38'	101° 07'	1,420	July 1962	Devils River	I. B. & W. C.
White V- Ranch	S	30° 18'	102° 09'	2,650	#Apr. 1952	Johnson Ranch - Foster Ranch	Mrs. Tucker White
Wipff Ranch	C	29° 00'	100° 35'	840	Mar. 1959	Amistad Dam - Eagle Pass	I. B. & W. C.
Woodward, J. F. Ranch	S	30° 08'	103° 36'	4,750	1954	Johnson Ranch - Foster Ranch	J. F. Woodward
Wuensche Farm	S	28° 24'	100° 19'	670	# 1952	Eagle Pass - Laredo	I. B. & W. C.
Wynne, Harold Ranch Headquarters	S	29° 29'	103° 23'	3,610	# 1974	Johnson Ranch - Foster Ranch	Harold Wynne
Yarborough Ranch	S	30° 06'	103° 36'	4,550	# 1966	Johnson Ranch - Foster Ranch	H. D. Smith
Zapata Water Plant	S	26° 54'	99° 16'	380	#May 1953	Laredo - Falcon Dam	Zapata Water Plant
Zuberbueler Ranch	S	29° 41'	101° 14'	1,460	Feb. 1975	Foster Ranch - Amistad Dam	J.U. Zuberbueler

S Standard                      R Recording                      C Cumulative                      V Visual  
# Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In Mexico

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Adjuntas, Nuevo Leon	S	25° 18'	100° 08'	1	# 1958	Rio San Juan	S. A. R. H.
Agualeguas, Nuevo Leon	S	26° 18'	99° 33'	1	# 1979	Rio Alamo	S. A. R. H.
Amistad Reservoir near Tlaloc, Coahuila	C	29° 26'	101° 07'	1,250	1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Anahuac, Nuevo Leon	S	27° 15'	100° 08'	656	#June 1933	Rio Salado	S. A. R. H.
Aniego 166, Tamaulipas	C	26° 46'	99° 15'	310	1964	Laredo - Falcon Dam	I. B. & W. C.
Apodaca, Nuevo Leon	S	25° 46'	100° 11'	1,330	#Feb. 1964	Rio San Juan	S. A. R. H.
Arguelles, Tamaulipas	C	26° 11'	98° 28'	1	1962	Lower Rio Grande Valley	I. B. & W. C.
Bachiniva, Chihuahua	S	28° 46'	107° 15'	6,250	# 1952	Adjacent to Rio Conchos	Meteor. Service of Mexico
Bajo Rio Bravo, Tamps.							
No. 1-2	S	25° 56'	97° 46'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-3	S	25° 50'	97° 42'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-4	S	25° 51'	97° 45'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-12	S	25° 56'	97° 38'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-13	S	25° 44'	97° 40'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 1-18	S	25° 49'	97° 42'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-5	S	25° 48'	97° 49'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-6	S	25° 44'	97° 53'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-7	S	25° 39'	97° 42'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-8	S	25° 40'	97° 55'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-10	S	25° 36'	97° 52'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-11	S	25° 35'	97° 46'	1	# 1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-14	S	25° 56'	97° 59'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-15	S	25° 46'	98° 01'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-17	S	25° 49'	97° 58'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 4-16	S	25° 35'	98° 00'	1	1964	Lower Rio Grande Valley	S. A. R. H.
Bajo Rio San Juan, Tamps.							
No. 2-29	S	26° 10'	98° 38'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-33	S	26° 10'	98° 28'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 2-38	S	26° 06'	98° 34'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-47	S	25° 58'	98° 07'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-55	S	25° 52'	98° 12'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-58	S	25° 50'	98° 11'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-60	S	25° 46'	98° 10'	1	1964	Lower Rio Grande Valley	S. A. R. H.
No. 3-63	S	25° 41'	98° 06'	1	1964	Lower Rio Grande Valley	S. A. R. H.
Balleza, Chihuahua	S	26° 57'	106° 21'	5,870	# 1903	Rio Conchos	Meteor. Service of Mexico
Banderas, Chihuahua	S	31° 01'	105° 35'	1	# 1963	Fort Quitman - Above Rio Conchos	S. A. R. H.
Bustamante, Nuevo Leon	S	26° 32'	100° 31'	1,450	# 1958	Rio Salado	S. A. R. H.
Cabezones, Nuevo Leon	S	24° 59'	99° 45'	1	# 1962	Adjacent to Rio San Juan	S. A. R. H.
Cadereyta, Nuevo Leon	S	25° 35'	100° 00'	1,180	#Sept. 1904	Rio San Juan	S. A. R. H.
Camargo, Chihuahua	S	27° 42'	105° 10'	3,950	#Oct. 1956	Rio Conchos	S. A. R. H.
Camargo, Tamaulipas	S	26° 19'	98° 50'	230	# 1953	Falcon Dam - Rio Grande City	S. A. R. H.
Candela, Coahuila	S	26° 50'	100° 40'	1	# 1970	Rio Salado	S. A. R. H.
Carbonera, Nuevo Leon	S	24° 49'	100° 47'	1	# 1958	Rio San Juan	S. A. R. H.
Carichic, Chihuahua	S	27° 55'	107° 04'	1	#May 1961	Rio Conchos	Meteor. Service of Chihuahua
Casillas, Nuevo Leon	S	25° 12'	100° 12'	4,060	# 1958	Rio San Juan	S. A. R. H.
Cd. Acuna, Coahuila	S	29° 20'	100° 57'	900	1951	Amistad Dam - Eagle Pass	I. B. & W. C.
Cd. Diaz Ordaz, Tamaulipas	S	26° 14'	98° 36'	130	# 1953	Lower Rio Grande Valley	S. A. R. H.
Cd. Guerrero, Chihuahua	S	28° 33'	107° 29'	6,560	#May 1903	Adjacent to Rio Conchos	Meteor. Service of Mexico
Cd. Mier, Tamaulipas	S	26° 26'	99° 09'	260	Oct. 1955	Falcon Dam - Rio Grande City	I. B. & W. C.
Cd. Mier Km. 8, SW, Tamaulipas	C	26° 23'	99° 14'	1	1962	Rio Alamo	I. B. & W. C.
Cerralvo, Nuevo Leon	R	26° 05'	99° 37'	1,130	#Nov. 1938	Rio San Juan	S. A. R. H.
Cerritos, Nuevo Leon	S	25° 31'	100° 12'	1	# 1958	Rio San Juan	S. A. R. H.
Cerro Prieto, Nuevo Leon	S	25° 56'	99° 23'	890	#May 1958	Rio San Juan	S. A. R. H.
Cienega de Flores, Nuevo Leon	R	25° 57'	100° 10'	1,770	#Apr. 1938	Rio San Juan	S. A. R. H.
Cienega del Toro, Nuevo Leon	S	25° 05'	100° 20'	7,010	# 1958	Rio San Juan	S. A. R. H.
Cola de Caballo, Nuevo Leon	S	25° 41'	100° 25'	1	1978	Rio San Juan	S. A. R. H.
Colombia, Nuevo Leon	C	27° 42'	99° 46'	1	# 1964	Eagle Pass-Laredo	I. B. & W. C.
Colonia Anahuac, Chihuahua	S	28° 29'	106° 44'	6,550	1961	Rio Conchos	Chih. S.A.
Comales, Tamaulipas	R	26° 11'	98° 55'	260	#Mar. 1938	Rio San Juan	S. A. R. H.
Control, Tamaulipas	S	25° 58'	97° 49'	59	#June 1942	Lower Rio Grande Valley	S. A. R. H.
Coyame, Chihuahua	S	29° 28'	105° 06'	1	#Nov. 1961	Rio Conchos	Meteor. Service of Chihuahua
Cuatro Cienegas, Coahuila	S	26° 59'	102° 04'	2,430	#June 1923	Rio Salado	S. A. R. H.
Cuauhtemoc, Chihuahua	S	28° 24'	106° 52'	7,250	#June 1923	Adjacent to Rio Conchos	Meteor. Service of Mexico
Delicias, Chihuahua	S	28° 11'	105° 28'	3,710	#Aug. 1933	Rio Conchos	S. A. R. H.
Ejido Eutimias, Coahuila	S	28° 20'	102° 45'	3,440	#Apr. 1972	Johnson Ranch - Foster Ranch	S. A. R. H.

S Standard

C Cumulative

R Recording

I Not available

# Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In Mexico

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Ejido La Rosita, Coahuila	S	28° 27'	103° 18'	1	# 1974	Johnson Ranch - Foster Ranch	S. A. R. H.
Ejido Marin, Nuevo Leon	S	25° 50'	100° 00'	1	Mar. 1979	Rio San Juan	S. A. R. H.
Ejido 1° de Mayo, Coahuila	S	27° 13'	101° 13'	1	# 1980	Rio Salado	S. A. R. H.
El Brasil, Nuevo Leon	S	25° 53'	98° 59'	1	# 1979	Rio San Juan	S. A. R. H.
El Cuarenta, Chihuahua	S	30° 33'	105° 50'	1	# 1961	Adjacent to Ft. Quitman	Meteor. Service of Chihuahua
El Cuchillo, Nuevo Leon	S	25° 43'	99° 16'	590	#June 1938	Above Rio Conchos	S. A. R. H.
El Cuervito, Nuevo Leon	S	25° 54'	98° 40'	1	# 1980	Rio San Juan	S. A. R. H.
El Cuervo, Chihuahua	S	30° 15'	105° 08'	3,840	# 1961	Adjacent to Ft. Quitman	Meteor. Service of Chihuahua
El Maguey, Chihuahua	S	27° 37'	106° 09'	4,380	#July 1955	Above Rio Conchos	Meteor. Service of Chihuahua
El Realito, Nuevo Leon	S	25° 18'	99° 21'	1	# 1970	Rio San Juan	S. A. R. H.
El Remolino, Coahuila	S	28° 45'	101° 05'	1,310	June 1958	Rio San Rodrigo	I. B. & W. C.
El Sauzal D.B., Chih.	S	31° 35'	106° 18'	3,650	July 1970	El Paso - Ft. Quitman	S. A. R. H.
El Sitio, Chihuahua	S	27° 34'	106° 16'	1	July 1955	Rio Conchos	Meteor. Service of Chihuahua
El Sueco, Chihuahua	S	29° 54'	106° 24'	5,090	# 1958	Adjacent to Rio Conchos	Meteor. Service of Chihuahua
El Vergel, Chihuahua	S	26° 22'	106° 30'	7,350	# 1957	Rio Conchos	Meteor. Service of Mexico
Emiliano Zapata, Coahuila	S	29° 01'	100° 49'	1	#Mar. 1976	Eagle Pass - Laredo	S. A. R. H.
Escalon, Chihuahua	S	26° 45'	104° 20'	4,160	# 1957	Adjacent to Rio Conchos	S. A. R. H.
Escuela de Agricultura Escobar, Chihuahua	S	31° 42'	106° 27'	3,690	1980	El Paso - Ft. Quitman	S. A. R. H.
Espinazo, Nuevo Leon	S	26° 15'	101° 05'	1	1980	Rio Salado	S. A. R. H.
Estacion Rosario, Durango	S	26° 30'	105° 38'	1	July 1962	Rio Conchos	S. A. R. H.
Galeana, Nuevo Leon	S	24° 50'	100° 04'	5,430	# 1958	Adjacent to Rio San Juan	Meteor. Service of Mexico
Gallego, Chihuahua	S	29° 50'	106° 23'	5,100	1958	Adjacent to Rio Conchos	Meteor. Service of Chihuahua
Garita Km. 28, Chihuahua	S	31° 33'	106° 28'	3,990	May 1958	El Paso - Ft. Quitman	I. B. & W. C.
Garza Ayala, Nuevo Leon	S	26° 29'	100° 03'	1	# 1968	Rio Salado	S. A. R. H.
General Trevino, Nv. Leon	S	26° 13'	99° 29'	1	#Oct. 1976	Rio Alamo	S. A. R. H.
Gral. Bravo, Nuevo Leon	S	25° 33'	99° 11'	590	#Sept. 1906	Rio San Juan	S. A. R. H.
Gral. Cepeda, Coahuila	S	25° 23'	101° 29'	4,920	#Aug. 1926	Rio San Juan	S. A. R. H.
Gomez Farias, Coahuila	S	24° 58'	101° 53'	1	June 1979	Rio San Juan	S. A. R. H.
Guadalupe, Chihuahua	S	31° 23'	106° 06'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
Guerrero, Coahuila	S	28° 19'	99° 23'	690	#June 1958	Eagle Pass - Laredo	I. B. & W. C.
Hacienda El Alamo, N. Leon	S	26° 29'	99° 46'	1	# 1968	Rio Alamo	I. B. & W. C.
Hacienda Mamulique, N. Leon	S	26° 07'	100° 14'	1	#Sept. 1973	Rio San Juan	S. A. R. H.
Hacienda San Miguel, Coahuila	S	29° 13'	101° 30'	1	# 1966	Amistad Dam	I. B. & W. C.
Higuera, Nuevo Leon	S	25° 58'	100° 01'	1,640	#Sept. 1901	Rio San Juan	Meteor. Service of Mexico
Hipolito, Coahuila	S	25° 42'	101° 24'	1	# 1980	Rio San Juan	S. A. R. H.
Huachichil, Coahuila	S	25° 12'	100° 50'	1	# 1980	Rio San Juan	S. A. R. H.
Icamole, Nuevo Leon	S	25° 55'	100° 43'	4,900	# 1958	Rio San Juan	S. A. R. H.
Iturbide, Nuevo Leon	S	24° 44'	99° 54'	1	1941	Adjacent to Rio San Juan	S. A. R. H.
Jimenez, Chihuahua	S	27° 08'	104° 55'	4,490	# 1951	Rio Conchos	S. A. R. H.
Jimenez, Coahuila	S	29° 04'	100° 40'	810	# 1951	Amistad Dam - Eagle Pass	I. B. & W. C.
Juarez, Chihuahua	S	31° 44'	106° 28'	3,740	# 1903	El Paso - Ft. Quitman	I. B. & W. C.
Juarez, Coahuila	S	27° 37'	104° 44'	1,000	# 1943	Rio Salado	S. A. R. H.
Km. 135, Chihuahua	S	28° 22'	105° 37'	3,940	# 1962	Rio Conchos	S. A. R. H.
La Amistad, Coahuila	S	29° 27'	101° 05'	1	Feb. 1977	Amistad Dam - Eagle Pass	I. B. & W. C.
La Arena, Nuevo Leon	S	25° 46'	100° 01'	1	# 1968	Rio San Juan	S. A. R. H.
La Bandera, Tamaulipas	C	26° 42'	99° 22'	1	1962	Laredo - Falcon Dam	I. B. & W. C.
La Boquilla, Chihuahua	S	27° 32'	105° 25'	4,330	# 1910	Rio Conchos	Elec. Industry of Mexico
La Cruz, Nuevo Leon	S	25° 28'	100° 26'	1	# 1958	Rio San Juan	S. A. R. H.
La Escondida, Nuevo Leon	S	26° 16'	99° 46'	1	# 1979	Rio San Juan	S. A. R. H.
La Huasteca, Nuevo Leon	S	25° 30'	100° 30'	1	# 1978	Rio San Juan	S. A. R. H.
La Pomona, Nuevo Leon	S	24° 59'	99° 12'	1	Mar. 1979	Rio San Juan	S. A. R. H.
La Popa, Nuevo Leon	S	26° 10'	100° 50'	3,230	# 1958	Rio San Juan	S. A. R. H.
La Trasluz, Chihuahua	S	29° 08'	107° 08'	1	# 1962	Adjacent to Rio Conchos	S. A. R. H.
Laguna de Salinillas, Nuevo Leon	S	27° 26'	100° 23'	750	# 1940	Rio Salado	S. A. R. H.
Laguna de Sanchez, Nuevo Leon	R	25° 22'	100° 17'	6,500	Apr. 1941	Rio San Juan	S. A. R. H.
Lampazos, Nuevo Leon	S	27° 02'	100° 30'	1,120	# 1958	Rio Salado	S. A. R. H.
Las Barras, Chihuahua	S	28° 31'	105° 26'	3,590	July 1949	Rio Conchos	S. A. R. H.
Las Comitas, Nuevo Leon	S	25° 30'	100° 24'	1,670	# 1940	Rio San Juan	S. A. R. H.
Las Enramadas, Nuevo Leon	S	25° 30'	99° 31'	730	#Sept. 1926	Rio San Juan	S. A. R. H.
Las Tortillas, Tamaulipas	C	26° 50'	99° 34'	360	#May 1961	Rio Salado	I. B. & W. C.
Las Virgenes, Chihuahua	S	28° 10'	105° 38'	4,070	# 1943	Rio Conchos	S. A. R. H.
Lazaro Cardenas, Chih.	S	28° 23'	105° 37'	3,940	# 1961	Rio Conchos	Meteor. Service of Chihuahua
Linares, Nuevo Leon	R	24° 52'	99° 34'	1,180	# 1900	Adjacent to Rio San Juan	S. A. R. H.
Los Barriles, Chihuahua	S	30° 55'	105° 45'	4,860	July 1958	El Paso - Ft. Quitman	I. B. & W. C.

S Standard C Cumulative R Recording ! Not available  
# Some months or years missing

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In Mexico

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Los Herrera (La Tableta), Nuevo Leon	R	25° 54'	99° 24'	820	#Sept. 1939	Rio San Juan	S. A. R. H.
Los Ramones, Nuevo Leon	R	25° 42'	99° 38'	260	#Sept. 1939	Rio San Juan	S. A. R. H.
Maclovio Herrera (Falomir), Chihuahua	S	29° 04'	105° 09'	3,220	# 1924	Rio Conchos	Meteor. Service of Mexico
Madero (Los Aldama), Nuevo Leon	S	26° 02'	99° 12'	!	#May 1970	Rio San Juan	S. A. R. H.
Maijoma, Chihuahua	S	28° 55'	104° 21'	4,270	Aug. 1955	Rio Conchos	Meteor. Service of Chihuahua
Majalca, Chihuahua	S	28° 53'	106° 21'	6,860	June 1963	Rio Conchos	Meteor. Service of Mexico
Manuel Benavides, Chihuahua	S	29° 06'	103° 54'	!	#Oct. 1961	Above Rio Conchos - Johnson Ranch	Meteor. Service of Chihuahua
Matamoros, Tamaulipas	S	25° 52'	97° 30'	33	# 1958	Lower Rio Grande Valley	Meteor. Service of Mexico
Mecoqui, Chihuahua	S	28° 15'	105° 29'	3,790	1961	Rio Conchos	Meteor. Service of Chihuahua
Miguel Aleman, Tamaulipas	S	26° 24'	99° 02'	180	1964	Falcon Dam - Rio Grande City	S. A. R. H.
Mimbres, Nuevo Leon	S	24° 58'	100° 16'	!	# 1958	Rio San Juan	S. A. R. H.
Mira, Nuevo Leon	S	26° 00'	100° 32'	!	# 1958	Rio San Juan	S. A. R. H.
Montemorelos, Nuevo Leon	S	25° 12'	99° 50'	1,420	#Aug. 1904	Rio San Juan	S. A. R. H.
Monterrey, Nuevo Leon	S	25° 40'	100° 18'	1,740	# 1896	Rio San Juan	S. A. R. H.
Muzquiz, Coahuila	S	27° 53'	101° 31'	1,650	# 1923	Rio Salado	S. A. R. H.
Nonoava, Chihuahua	S	27° 29'	106° 44'	!	# 1963	Rio Conchos	Meteor. Service of Chihuahua
Nueva Cd. Guerrero, Tamaulipas	S	26° 34'	99° 14'	350	#May 1954	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	1950	Eagle Pass - Laredo	I. B. & W. C.
Nuevo Laredo, Tamaulipas	S	27° 30'	99° 30'	430	# 1909	Eagle Pass - Laredo	Meteor. Service of Mexico
Nuevo Laredo Km. 26, SSW, Tamaulipas	C	27° 17'	99° 37'	!	#Apr. 1961	Laredo - Falcon Dam	I. B. & W. C.
Nuevo Laredo (Sur), Tamaulipas	S	27° 26'	99° 32'	413	#May 1975	Laredo - Falcon Dam	I. B. & W. C.
Ocampo, Coahuila	S	27° 19'	102° 24'	3,770	#May 1960	Adjacent to Rio Salado	S. A. R. H.
Ojinaga, Chihuahua	S	29° 34'	104° 25'	2,590	#Apr. 1954	Rio Conchos	I. B. & W. C.
Ojinaga, Chihuahua	S	29° 34'	104° 25'	2,620	#Nov. 1906	Rio Conchos	Meteor. Service of Mexico
Ojo Caliente, Chihuahua	S	27° 41'	105° 12'	4,010	1942	Rio Conchos	S. A. R. H.
Ojo de Agua (Sabinas), Nuevo Leon	S	26° 30'	100° 11'	!	1958	Rio Salado	S. A. R. H.
Pajonal, Nuevo Leon	S	25° 29'	100° 23'	5,020	1958	Rio San Juan	S. A. R. H.
Palestina, Coahuila	S	29° 09'	100° 59'	1,080	# 1931	Rio San Diego	S. A. R. H.
Paras, Nuevo Leon	S	26° 30'	99° 31'	541	# 1958	Rio Alamo	S. A. R. H.
Parral, Chihuahua	S	26° 56'	105° 39'	5,740	# 1903	Rio Conchos	Meteor. Service of Mexico
Parras, Coahuila	S	25° 27'	102° 10'	5,510	1958	Adjacent to Rio San Juan	S. A. R. H.
Parrita, Chihuahua	S	29° 25'	100° 29'	!	# 1958	Adjacent to Rio Conchos	S. A. R. H.
Piedras Negras, Coahuila	S	28° 43'	100° 31'	820	# 1951	Amistad Dam - Eagle Pass	Meteor. Service of Mexico
Porvenir, Chihuahua	S	31° 14'	105° 52'	3,530	1958	El Paso - Ft. Quitman	I. B. & W. C.
Posta Zootecnica, Chihuahua	S	28° 41'	106° 04'	4,740	# 1957	Rio Conchos	Meteor. Service of Mexico
Potosi, Nuevo Leon	S	24° 51'	100° 19'	6,260	# 1958	Adjacent to Rio San Juan	S. A. R. H.
Praxedis G. Guerrero, Chihuahua	S	31° 22'	106° 00'	3,560	# 1958	El Paso - Ft. Quitman	I. B. & W. C.
Presa Anzalduas, Tamps.	V	26° 08'	98° 20'	105	Apr. 1960	Lower Rio Grande Valley	I. B. & W. C.
Presa Cabeceras, Coahuila	S	29° 02'	101° 05'	!	# 1964	Amistad Dam - Eagle Pass	S. A. R. H.
Presa Carranza, Coahuila	S	27° 31'	100° 37'	790	#June 1927	Rio Salado	S. A. R. H.
Presa Centenario, Coah.	S	29° 13'	100° 57'	!	# 1964	Arroyo Las Vacas	S. A. R. H.
Presa Chihuahua, Chih.	S	28° 34'	106° 10'	5,230	Oct. 1961	Rio Conchos	S. A. R. H.
Presa La Boca, Nuevo Leon	S	25° 25'	100° 09'	1,460	# 1923	Rio San Juan	S. A. R. H.
Presa Luis L. Leon, Chih.	S	28° 57'	105° 17'	!	Oct. 1964	Rio Conchos	S. A. R. H.
Presa San Miguel, Coah.	S	29° 02'	100° 57'	1,000	# 1964	Rio San Diego	S. A. R. H.
Progreso, Coahuila	S	27° 25'	101° 00'	1,210	#Feb. 1943	Rio Salado	S. A. R. H.
Ramos Arizpe, Coahuila	S	25° 32'	100° 57'	4,590	#Apr. 1907	Rio San Juan	Meteor. Service of Mexico
Rancho Bonanza, Tamps.	S	26° 50'	99° 26'	!	1973	Laredo - Falcon Dam	Delfino Garcia P.
Rancho La Chuparrosa, Coahuila	R	29° 30'	101° 15'	1,150	# 1970	Foster Ranch - Amistad Dam	I. B. & W. C.
Rancho Las Espuelas, Tamaulipas	S	27° 07'	99° 27'	!	Nov. 1971	Laredo - Falcon Dam	Delfino Garcia P.
Rancho Vidrios, Tamps.	C	27° 35'	99° 37'	450	#Sept. 1956	Eagle Pass - Laredo	I. B. & W. C.
Rancho San Diego, Coah.	S	28° 03'	100° 35'	!	May 1959	Eagle Pass - Laredo	I. B. & W. C.
Rancho San Rafael Bustamante, Tamps.	C	26° 54'	99° 30'	!	Nov. 1967	Rio Salado	I. B. & W. C.
Rayones, Nuevo Leon	S	25° 01'	100° 05'	1,970	#Oct. 1926	Rio San Juan	S. A. R. H.
Represa Amistad, Coahuila	R	29° 26'	101° 02'	918	#June 1969	Amistad Dam - Eagle Pass	I. B. & W. C.

S Standard C Cumulative

R Recording

! Not available

# Some months or years missing

V Visual

## LOCATION OF RAINFALL STATIONS ON THE RIO GRANDE WATERSHED

## In Mexico

NAME OF STATION	TYPE GAGE	LATI-TUDE	LONGI-TUDE	ELEV. (FT.)	RECORD BEGAN	WATERSHED SUBDIVISION	OBSERVER
Retamal, Tamaulipas	S	26° 02'	98° 03'	82	#Oct. 1949	Lower Rio Grande Valley	I. B. & W. C.
Reynosa, Tamaulipas	R	26° 06'	98° 19'	130	# 1941	Lower Rio Grande Valley	S. A. R. H.
Reynosa Km. 22, SW, Tamaulipas	C	26° 00'	98° 30'	1	# 1962	Lower Rio Grande Valley	I. B. & W. C.
Rinconada, Nuevo Leon	S	25° 41'	100° 42'	4,790	#Apr. 1944	Rio San Juan	S. A. R. H.
Rio Bravo, Tamaulipas	S	25° 59'	98° 06'	85	#Sept. 1950	Lower Rio Grande Valley	S. A. R. H.
Rio Salado Carr. 85, Nuevo Leon	S	26° 53'	99° 49'	390	#May 1958	Rio Salado	I. B. & W. C.
Rio Salado Riberena, Tamaulipas	S	26° 48'	99° 25'	330	July 1964	Laredo - Falcon Dam	I. B. & W. C.
Rusio, Nuevo Leon	S	24° 42'	100° 26'	6,570	#June 1956	Adjacent to Rio San Juan	S. A. R. H.
Sabinas, Coahuila	S	27° 51'	101° 07'	1,120	#May 1922	Rio Salado	S. A. R. H.
Sabinas Hidalgo, Nv. Leon	S	26° 30'	100° 10'	1,030	May 1958	Rio Salado	I. B. & W. C.
Saltillo, Coahuila	S	25° 26'	101° 00'	5,280	# 1886	Rio San Juan	S. A. R. H.
Samalayuca, Chihuahua	S	31° 21'	106° 28'	4,180	1958	El Paso - Ft. Quitman	Meteor. Service of Mexico
San Agustin, Chihuahua	S	31° 31'	106° 15'	3,650	1958	El Paso - Ft. Quitman	I. B. & W. C.
San Antonio, Durango	S	26° 25'	105° 21'	5,430	# 1943	Rio Conchos	S. A. R. H.
San Carlos, Coahuila	S	29° 01'	100° 54'	980	# 1961	Rio San Diego	F. Jakubesch
San Diego, Nuevo Leon	S	25° 14'	99° 15'	1	#Feb. 1978	Rio San Juan	S. A. R. H.
San Fernando, Coahuila	S	29° 25'	101° 43'	1	Aug. 1961	Foster Ranch - Amistad Dam	I. B. & W. C.
San Ignacio, Tamaulipas	C	27° 04'	99° 28'	1	# 1964	Laredo - Falcon Dam	I. B. & W. C.
San Javier, Nuevo Leon	C	26° 16'	99° 25'	1	1962	Rio Alamo	I. B. & W. C.
San Juan, Nuevo Leon	S	25° 33'	99° 50'	880	#Nov. 1943	Rio San Juan	S. A. R. H.
San Juan de Vaqueria, Coahuila	S	25° 15'	101° 13'	1	# 1980	Rio San Juan	S. A. R. H.
San Juanito, Chihuahua	S	27° 58'	107° 36'	1	# 1959	Adjacent to Rio Conchos	Meteor. Service of Mexico
San Lorenzo, Chihuahua	S	28° 10'	106° 29'	3,770	# 1961	Rio Conchos	S. A. R. H.
San Nicolas, Nuevo Leon	S	27° 26'	100° 02'	1	# 1978	Rio San Juan	S. A. R. H.
San Rafael, Nuevo Leon	S	25° 02'	100° 33'	1	# 1959	Adjacent to Rio San Juan	S. A. R. H.
Santa Catarina, Nv. Leon	R	25° 40'	100° 29'	2,230	#Oct. 1937	Rio San Juan	S. A. R. H.
Santa Rosa, Coahuila	V	29° 38'	101° 28'	1	# 1958	Foster Ranch - Amistad Dam	Ind. Co-operator
Siquirichic, Chihuahua	S	27° 09'	107° 12'	7,610	#July 1956	Adjacent to Rio Conchos	Meteor. Service of Mexico
Tacubaya, Chihuahua	S	28° 08'	104° 23'	5,150	#July 1962	Adjacent to Rio Conchos	Meteor. Service of Mexico
Tepehuaje, Nuevo Leon	S	25° 32'	100° 15'	1	#June 1979	Rio San Juan	S. A. R. H.
Topo Chico, Nuevo Leon	R	25° 44'	100° 20'	1,640	#Aug. 1939	Rio San Juan	S. A. R. H.
Tunel San Francisco, Nuevo Leon	S	25° 25'	100° 10'	1	# 1958	Rio San Juan	S. A. R. H.
Una de Gato, Nuevo Leon	S	25° 58'	99° 41'	1	1979	Rio San Juan	S. A. R. H.
Vado de Cedillos, Chih.	S	31° 13'	105° 48'	3,500	Apr. 1958	El Paso - Ft. Quitman	I. B. & W. C.
Valadezes, Tamaulipas	S	26° 14'	98° 40'	1	1964	Lower Rio Grande Valley	S. A. R. H.
Vallecillo, Nuevo Leon	S	26° 40'	99° 59'	900	#June 1958	Rio Salado	S. A. R. H.
Valle Hermoso, Tamaulipas	S	25° 41'	97° 48'	52	#June 1949	Lower Rio Grande Valley	S. A. R. H.
Vaqueria, Nuevo Leon	S	25° 08'	99° 04'	1	#Mar. 1979	Rio San Juan	S. A. R. H.
Victoria, Chihuahua	S	27° 58'	104° 33'	4,810	June 1963	Adjacent to Rio Conchos	Meteor. Service of Mexico
Villa Aldama, Chihuahua	S	28° 50'	105° 55'	4,140	1961	Rio Conchos	Meteor. Service of Mexico
Villa Allende, Nuevo Leon	S	25° 17'	100° 01'	2,210	#Nov. 1938	Rio San Juan	S. A. R. H.
Villa Coronado, Chihuahua	S	26° 44'	105° 08'	4,790	#Aug. 1964	Rio Conchos	S. A. R. H.
Villa Hidalgo, Coahuila	S	27° 47'	99° 52'	660	1951	Eagle Pass - Laredo	I. B. & W. C.
Villalba, Chihuahua	S	27° 59'	105° 47'	3,940	Oct. 1940	Rio Conchos	S. A. R. H.

R Recording      C Cumulative      S Standard      V Visual      ! Not available  
# Some months or years missing

**EVAPORATION IN THE RIO GRANDE BASIN  
IN THE UNITED STATES**  
In Inches

Tabulated below are records of evaporation observed at eight stations in Texas operated by the United States Section of the Commission from Presidio to Brownsville. At all stations, the exposure to wind was uniform and relatively unimpeded. The sites were kept cleared of all high brush and trees within 150 feet, and all brush, tall weeds, and other obstructions within 100 feet of the fenced enclosures. Within the enclosures all vegetation has been eradicated or kept trimmed to within 3 inches of the ground surface. For specific location of these stations, refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed," pages 137 through 139 in this bulletin.

Records were obtained by means of:

1. Standard National Weather Service pan. A circular pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, is set on a wooden platform with the rim of the pan 16 inches above the ground. The water level is maintained between 2 and 3 inches below the rim of the pan and is measured with a micrometer gage. This type of pan was in operation at Amistad Dam and Falcon Dam.

2. A circular pan, 2 feet in diameter and 36 inches deep, made of 22-gage galvanized iron, is set in the ground with the rim of the pan 3 inches above the ground surface and the top covered with a circular screen of No. 4 (1/4" mesh) galvanized hardware cloth. The water level is maintained between 2.5 and 3.5 inches below the rim of the pan. This type of pan was in operation at Falcon Dam. This same type of pan, equipped with an automatic feed tank that maintains the water at a level 3 inches below the rim of the pan, was in operation at Martin King Ranch and Eagle Pass.

3. An evaporimeter, developed by the United States Section of the Commission and calibrated against a 2-foot pan described above, was in operation at Presidio, Johnson Ranch, and at a site 7 miles east of Brownsville.

Month	Presidio		Johnson Ranch		Martin King Ranch		Long Ranch	
	1980	Average 1950-1980	1980	Average 1950-1980	1980	#Average 1956-1980	1980	Average October 1971-1980
Jan.	4.67	3.79	2.89	3.23	3.45	3.03	2.31	2.22
Feb.	6.68	5.11	4.28	4.71	3.75	3.61	2.91	2.83
Mar.	7.24	8.06	7.91	8.08	6.96	6.14	5.50	4.67
Apr.	10.24	9.92	9.09	10.22	9.48	7.41	7.92	5.51
May	10.03	11.58	10.83	11.64	8.20	8.15	6.39	5.47
June	12.38	12.64	12.36	12.03	11.65	10.07	9.50	7.55
July	13.06	11.84	12.75	11.87	14.18	11.04	12.89	8.38
Aug.	9.73	10.92	9.69	10.85	12.21	10.49	9.28	7.50
Sept.	6.06	9.11	5.48	8.66	7.80	7.49	6.76	6.08
Oct.	5.13	7.30	4.30	6.85	5.42	5.46	5.06	3.86
Nov.	3.43	4.84	1.94	4.32	3.56	3.81	2.91	2.89
Dec.	2.66	3.58	2.13	3.21	2.29	3.08	1.87	2.13
Total	91.31	98.69	83.65	95.67	88.95	79.78	73.30	59.09

Month	Amistad Dam		Eagle Pass		Falcon Dam				Brownsville	
	1980	Average March 1963-1980	1980	#Average 1964-1980	2-Foot Pan		4-Foot Pan		1980	#Average 1958-1980
					1980	#Average 1950-1980	1980	#Average 1956-1980		
Jan.	3.47	3.86	3.53	3.20	3.19	3.48	3.61	3.97	3.29	2.65
Feb.	5.14	4.88	4.58	3.61	3.44	4.33	4.46	5.30	3.96	3.41
Mar.	8.81	8.46	6.62	5.69	5.82	6.58	7.88	8.39	6.43	4.60
Apr.	12.33	10.14	10.18	6.92	8.68	7.87	10.58	10.37	7.25	5.48
May	10.66	10.70	8.15	7.19	8.11	9.19	10.86	11.86	8.42	5.43
June	14.85	13.21	12.26	9.81	13.98	10.88	17.01	13.56	11.06	6.16
July	17.75	15.00	15.26	11.10	13.78	12.54	17.67	15.43	12.18	6.78
Aug.	12.56	13.32	12.51	9.87	10.04	11.25	12.39	14.03	13.75	6.47
Sept.	10.15	9.72	9.20	7.34	9.37	7.90	11.40	9.80	10.76	5.12
Oct.	8.22	7.30	8.18	6.10	6.93	6.39	7.69	7.40	7.49	4.35
Nov.	4.46	4.74	5.47	3.94	4.03	4.77	4.93	5.29	4.66	3.42
Dec.	2.79	3.73	2.12	3.39	2.63	3.64	2.97	3.91	3.82	2.83
Total	111.19	105.06	98.06	78.16	90.00	88.82	111.45	109.31	93.07	56.70

# Some months missing

## EVAPORATION IN THE RIO GRANDE BASIN IN MEXICO In Inches

Tabulated below are records of evaporation observed at ten stations operated and maintained by the Mexican Section of the Commission. Nine stations are along the Rio Grande from Cd. Acuna, Coahuila to Retamal, Tamaulipas, and one is located on the Rio Conchos near Ojinaga, Chihuahua. At all stations, except Ojinaga, the sites were kept cleared of all high brush and trees within 150 feet, and of all brush and tall weeds within 100 feet of the fenced enclosures. There are several large trees at the Ojinaga station. The corrugated iron gage well, 42 inches in diameter, and one A-frame of the cableway of the Rio Conchos stream gaging station are in the north end of the enclosure. Inside the enclosures, all vegetation has been eradicated or kept trimmed to within 3 inches of the ground surface. Except for a water barrel and a thermometer shelter in the northeast and northwest corners of the enclosures, the exposure to wind was uniform and relatively unimpeded. For specific location of these stations refer to data opposite same station name shown in "Location of Rainfall Stations on the Rio Grande Watershed," pages 140 through 143 in this bulletin.

The type of pan used at all these stations was a standard National Weather Service-type pan, 4 feet in diameter and 10 inches deep, made of 22-gage galvanized iron, set on a wooden platform with the rim of the pan 16 inches above the ground. The water level was maintained between 2 and 3 inches below the rim of the pan and was measured with a micrometer gage.

Data for other evaporation stations in the Rio Grande basin in Mexico, which were operated by various Mexican agencies, are available in Water Bulletin No. 50 published by the Mexican Section of the Commission.

Month	Cd. Juarez, Chihuahua											# Average 1969-1980
	1969	1970	1971	1972	1973	1974	1975	1976	1977	1979	1980	
Jan.		4.33	4.21	4.17	2.72	2.64	3.11	2.91	2.52	2.36	3.23	3.22
Feb.	5.04	4.02	5.94	5.39	3.07		4.25	5.59	5.20	4.17	4.17	4.68
Mar.	7.40	7.48	10.91	8.94	7.48	7.56	7.91	9.53	7.68	7.87	7.24	8.18
Apr.	11.57	11.14	10.63	10.67	10.55		9.29	9.41	9.09	10.31	9.02	10.17
May	11.73	11.97	13.58	9.92	12.32	12.48	9.53	10.47	11.61	10.67	10.28	11.32
June	14.06	12.48	13.78	10.63	13.19	12.95	12.20	12.28	12.56	11.50	12.44	12.55
July	10.87	10.67	11.42	11.10	10.16	10.67	9.92	9.53	11.18	11.50	11.97	10.82
Aug.	11.54	9.76	9.96	9.25	9.72	8.46	9.72	10.39	11.77	9.49	9.21	9.93
Sept.	8.54	7.64	8.39	6.26	10.04		7.24	6.54	10.91	8.27	6.54	8.04
Oct.	7.68	6.69	6.18	6.18	6.97	5.24	6.65	5.51	5.71	7.32	5.51	6.33
Nov.	3.86	5.51	4.17	3.98	4.72	3.35	5.04	2.72	4.65	4.49	3.39	4.17
Dec.	2.99	4.13	2.56	3.78	4.61	3.74	3.70	2.01	4.65	2.60	2.91	3.43
Total		95.82	101.73	90.27	95.55		88.56	86.89	97.53	90.55	85.91	92.84

Month	Ojinaga, Chihuahua		Cd. Acuna, Coahuila		La Amistad, Coahuila		Jimenez, Coahuila	
	1980	#Avg. Apr. 1954-1980	1980	# Average 1951-1980	1980	#Avg. Feb. 1977-1980	1980	# Average 1951-1980
Jan.	3.39	3.70	2.87	3.42	3.31	3.24	4.02	3.61
Feb.	5.79	5.10	4.76	4.62	5.35	4.94	6.10	4.62
Mar.	8.78	8.66	8.23	7.85	8.82	8.34	9.96	7.29
Apr.	12.20	11.16	10.83	8.87	12.36	10.18	8.62	7.87
May	14.33	13.28	9.13	9.72	8.78	9.64	8.90	8.81
June	16.18	13.82	12.95	11.69	15.79	13.04	13.90	10.88
July	17.83	13.10	15.08	13.18	18.35	15.72	16.34	12.17
Aug.	10.63	11.20	11.14	11.87		14.08	11.42	10.95
Sept.	6.38	8.79	8.66	8.58	10.83	10.36	9.61	7.92
Oct.	4.25	7.06	6.30	6.13	8.39	8.20	7.87	5.70
Nov.	2.72	4.39	2.95	3.87	4.33	4.84	4.25	3.74
Dec.	2.68	3.37	2.01	3.11	2.87	3.96	3.15	3.19
Total	105.16	103.63	94.91	92.91		106.54	104.14	86.85

Month	Hidalgo, Coahuila		Nuevo Laredo, Tamaulipas		Nueva Cd. Guerrero, Tamaulipas		Cd. Mier, Tamaulipas		Retamal, Tamaulipas	
	1980	# Average 1951-1980	1980	Avg. Aug. 1964-1980	1980	#Avg. June 1954-1980	1980	#Avg. Oct. 1955-1980	1980	# Average 1951-1980
Jan.	3.35	3.86	5.51	4.09	2.87	3.41	3.66	3.64	2.80	4.05
Feb.	4.29	5.15	6.14	5.24	2.24	4.32	4.53	4.87	3.27	4.64
Mar.	7.13	7.85	9.76	8.50	7.17	7.20	8.35	7.92	6.10	6.58
Apr.	10.16	9.74	13.74	10.32	9.49	8.91	10.08	9.62	7.76	7.89
May	11.06	11.62	13.39	11.38	8.82	10.29	9.29	10.89	7.72	8.45
June	15.16	13.35	20.94	13.54	14.37	11.62	15.91	12.45	9.65	9.07
July	15.79	14.97	22.56	14.75	14.96	13.21	15.67	14.19	11.02	9.97
Aug.	12.60	13.57	16.34	13.37	11.42	12.10	12.40	12.96	9.49	9.63
Sept.	9.76	9.75	12.95	10.04	10.04	8.76	11.42	9.54	8.54	7.33
Oct.	5.90	7.30	9.65	7.74	6.54	6.54	7.91	7.35	5.24	6.01
Nov.	3.27	4.68	5.98	5.19	3.94	4.57	4.02	4.84	3.23	4.36
Dec.	2.24	3.62	3.74	4.00	2.60	3.39	2.99	3.69	2.87	3.83
Total	100.71	105.46	140.70	108.16	94.46	94.32	106.23	101.96	77.69	81.81

# Some months missing

## TEMPERATURE, HUMIDITY, AND WIND

The maximum and minimum temperatures shown for the stations in Mexico are from daily maximum and minimum thermometer observations. The mean monthly temperatures are averages of these daily maximum and minimum temperatures.

The mean monthly temperatures and relative humidities shown for stations in the United States were integrated from continuous records of hygrothermographs, housed in louvered shelters, with the sensing elements of the instruments 16 inches above the ground and 9 feet southwest of either a 2 or 4-foot diameter evaporation pan. The maximum and minimum temperatures shown below are the extreme temperatures for the month as recorded on the charts except for Falcon Dam and Amistad Dam, where the readings are based on daily maximum and minimum thermometer observations.

Monthly mean wind velocities are based on the total miles of wind movement indicated by a standard 3-cup anemometer installed and operated according to specifications for a Class A National Weather Service evaporation station.

### Temperature - Degrees Fahrenheit In the United States

Month	Amistad Dam, Texas				Eagle Pass, Texas				Falcon Dam, Texas			
	Mean 1980	Average March 1963-1980	1980		Mean 1980	#Average #July 1964-1980	1980		Mean 1980	Average #July 1950-1980	1980	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	53.3	49.8	83	33	55.9	51.2	84	34	59.9	55.6	83	35
Feb.	54.4	53.3	90	21	58.1	55.3	97	28	63.4	59.9	94	34
Mar.	62.3	62.6	92	24	65.2	64.4	92	25	71.2	67.2	96	31
Apr.	70.1	71.2	97	42	73.3	72.9	98	42	76.6	75.1	99	40
May	78.3	71.0	101	48	80.8	77.7	102	65	84.0	80.0	103	66
June	86.6	82.2	110	70	89.3	83.2	110	74	81.7	83.8	109	72
July	88.8	84.8	108	73	92.6	86.1	108	76	82.2	85.7	108	71
Aug.	83.5	83.5	103	65	87.4	84.9	103	73	79.5	85.3	105	68
Sept.	81.4	78.5	100	67	84.8	79.3	100	70	78.6	80.9	102	69
Oct.	70.0	69.5	92	40	72.3	70.1	94	33	67.5	73.2	99	44
Nov.	56.7	59.5	92	30	58.8	60.4	95	32	53.2	63.5	95	35
Dec.	53.2	51.9	76	30	54.1	54.0	80	31	49.4	57.3	84	35
Yearly	69.9	68.2	110	21	72.7	70.0	110	25	70.6	72.3	109	31

### In Mexico

Month	Ojinaga, Chihuahua				La Amistad, Coahuila				Cd. Acuna, Coahuila			
	Mean 1980	#Average April 1954-1980	1980		Mean 1980	#Average 1977-1980	1980		Mean 1980	#Average April 1951-1980	1980	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	51.8	49.3	79	19	46.4	44.0	77	21	50.0	49.1	86	25
Feb.	55.4	54.2	86	25	46.4	50.4	70	27	53.6	54.4	95	19
Mar.	60.8	61.6	91	28	53.6	61.2	75	25	60.8	63.1	93	18
Apr.	66.2	70.9	93	25	62.6	68.4	82	41	69.8	71.8	100	30
May	78.8	79.4	106	50	75.2	76.1	102	59	78.8	78.3	106	57
June	91.4	85.4	113	70	89.6	83.3	113	72	87.8	84.4	113	66
July	91.4	85.9	109	70	91.4	87.4	109	73	89.6	87.2	111	68
Aug.	84.2	84.1	109	68		85.4			84.2	86.4	106	63
Sept.	78.8	79.4	104	61	84.2	81.5	106	64	82.4	81.2	104	59
Oct.	60.8	70.1	93	30	71.6	70.7	97	41	68.0	71.1	99	25
Nov.	53.6	57.9	91	27	59.6	60.4	95	30	55.4	58.6	97	23
Dec.	51.8	50.6	81	25	51.8	51.8	79	23	51.8	51.2	79	23
Yearly	68.8	69.1	113	19		68.4		21	69.4	69.7	113	18

Month	Jimenez, Coahuila				El Remolino, Coahuila				Piedras Negras, Coahuila			
	Mean 1980	#Average March 1951-1980	1980		Mean 1980	Average June 1958-1980	1980		Mean 1980	#Average April 1951-1980	1980	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	55.4	52.6	86	32	60.8	57.0	95	27	53.6	50.9	86	30
Feb.	55.4	56.4	95	23	59.0	60.1	91	25	57.2	55.7	95	27
Mar.	60.8	63.2	93	21	68.0	66.2	97	34	66.2	63.2	91	25
Apr.	71.6	71.3	97	39	73.4	74.4	102	39	73.4	72.0	100	39
May	80.6	77.3	102	61	75.2	78.9	106	48	80.6	77.7	104	63
June	87.8	83.3	109	68	84.2	83.9	109	59	89.6	83.9	111	72
July	91.4	85.7	109	68	84.2	85.8	109	61	91.4	86.5	109	72
Aug.	86.0	85.1	104	68	82.4	85.2	108	55	86.0	85.7	106	72
Sept.	68.0	80.2	99	66	80.6	81.8	108	59	84.2	80.0	102	64
Oct.	68.0	71.4	97	34	77.0	74.0	102	50	71.6	70.5	95	30
Nov.	59.0	60.7	91	30	73.4	67.8	100	45	59.0	59.3	95	30
Dec.	51.8	53.9	79	30	62.6	60.7	100	34	55.4	52.8	82	30
Yearly	69.6	70.1	109	21	73.4	73.0	109	25	72.4	69.8	111	25

# Some months missing

**TEMPERATURE, HUMIDITY, AND WIND**  
**Temperature - Degrees Fahrenheit**  
**In Mexico**

Month	Guerrero, Coahuila				Villa Hidalgo, Coahuila				Nuevo Laredo, Tamps., C.I.L.A.			
	Mean 1980	#Average 1958-1980	1980		Mean 1980	#Average 1951-1980	1980		Mean 1980	Average August 1964-1980	1980	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	59.0	51.7	90	32	51.8	52.8	81	25	60.8	55.0	91	39
Feb.	60.8	56.0	99	32	55.4	57.3	95	25	62.6	59.6	106	30
Mar.	69.8	66.3	95	32	64.4	65.6	93	27	69.8	69.4	99	30
Apr.	77.0	74.4	104	46	71.6	75.0	102	32	77.0	77.4	106	45
May	84.2	79.9	102	70	80.6	79.8	102	48	86.0	82.2	106	66
June	91.4	84.8	111	77	87.8	85.2	109	72	93.2	86.2	113	77
July	91.4	86.6	106	77	87.8	86.8	106	70	91.4	88.1	113	77
Aug.	86.0	86.3	108	75	84.2	86.8	102	66	89.6	87.8	108	73
Sept.	89.6	81.8	104	68	82.4	82.2	100	66	89.6	83.9	109	73
Oct.	75.2	71.8	97	36	69.8	73.4	93	32	77.0	75.8	100	43
Nov.	62.6	62.0	97	32	57.2	61.1	95	34	64.4	65.9	100	37
Dec.	57.2	55.0	86	32	53.6	55.7	79	32	60.8	59.6	86	39
Yearly	75.4	71.4	111	32	70.6	71.8	109	25	76.8	74.2	113	30

Month	Nuevo Laredo, Tamps. M.S. of M.				Sabinas Hidalgo, Nuevo Leon				Nueva Cd. Guerrero, Tamaulipas			
	Mean 1980	#Average 1945-1980	1980		Mean 1980	Average October 1961-1980	1980		Mean 1980	Average 1958-1980	1980	
			Max.	Min.			Max.	Min.			Max.	Min.
Jan.	55.4	55.6	82	36	59.0	56.3	73	39	59.0	55.2	84	36
Feb.	60.8	60.8	93	28	55.4	59.9	100	36	59.0	59.1	93	32
Mar.	68.0	67.8	93	28	69.8	67.8	95	28	69.8	67.2	95	32
Apr.	75.2	75.5	102	43	73.4	75.2	100	48	75.2	75.9	97	43
May		80.9			80.6	80.2	104	61	80.6	80.7	100	66
June	91.4	84.9	111	70	91.4	84.4	111	70	87.8	84.8	106	73
July	93.2	87.8	109	77	91.4	85.2	111	72	89.6	86.2	106	72
Aug.	87.8	87.3	106	72	84.2	84.9	102	68	86.0	86.1	104	72
Sept.	86.0	81.5	102	73	86.0	80.0	102	72	86.0	82.0	100	70
Oct.	73.4	73.0	93	41	77.0	73.9	93	48	75.2	74.6	95	45
Nov.	59.0	64.0	86	36	62.6	64.6	99	34	60.8	65.2	95	34
Dec.	55.4	50.9	79	34	59.0	59.0	81	34	57.2	57.7	84	36
Yearly		72.5	111	28	74.2	72.6	111	28	73.8	72.9	106	32

Month	Cd. Mier, Tamaulipas				Retamal, Tamaulipas							
	Mean 1980	#Average October 1955-1980	1980		Mean 1980	#Average 1951-1980	1980					
			Max.	Min.			Max.	Min.				
Jan.	59.0	55.1	84	39	60.8	59.9	82	36				
Feb.	60.8	59.3	95	36	59.0	62.5	86	32				
Mar.	69.8	67.5	95	36	68.0	69.3	90	28				
Apr.	75.2	75.7	102	43	71.6	76.2	95	39				
May	82.4	80.5	100	63	80.6	79.8	93	55				
June	91.4	84.8	108	75		83.4						
July	91.4	86.6	106	75		85.0						
Aug.	86.0	86.3	102	70	86.0	85.8	102	70				
Sept.	84.2	82.0	100	73	86.0	82.8	104	55				
Oct.	75.2	74.4	95	46	75.2	76.6	99	43				
Nov.	62.6	64.8	90	37	64.4	67.7	90	37				
Dec.	59.0	58.0	84	36	62.6	61.7	86	39				
Yearly	74.8	72.9	108	36		74.2		28				

# Some months missing

## TEMPERATURE, HUMIDITY AND WIND

Mean Wind Speed - Miles per Hour  
In the United States

Month	Martin King Ranch, Texas		Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1980	Average 1957-1980	1980	#Average March 1963-1980	1980	#Average December 1963-1980	1980	#Average July 1950-1980
Jan.	3.7	3.9	3.0	3.3	3.8	2.6	3.1	3.8
Feb.	4.6	4.6	3.5	3.7	4.5	3.1	3.0	4.3
Mar.	6.0	6.1	4.2	4.5	5.5	3.6	3.3	4.8
Apr.	6.0	6.2	4.2	4.6	5.4	3.8	4.0	5.4
May	6.6	6.7	3.6	4.5	5.6	3.7	4.4	5.5
June	8.4	7.1	4.5	4.8	6.2	3.6	6.0	5.8
July	7.2	6.7	4.0	4.5	5.9	3.7	5.0	6.0
Aug.	7.1	5.9	4.0	4.0	5.7	3.3	4.7	5.1
Sept.	5.2	5.0	3.4	3.5	4.7	2.7	3.7	3.9
Oct.	3.9	4.6	2.9	3.4	3.7	2.4	3.3	3.4
Nov.	3.6	4.0	2.8	3.1	3.3	2.2	3.1	3.7
Dec.	3.3	3.5	2.8	3.1	3.5	2.2	2.7	3.4
Yearly	5.5	5.4	3.6	3.9	4.8	3.1	3.9	4.6

Mean Relative Humidity - Percent  
In the United States

Month	Amistad Dam, Texas		Eagle Pass, Texas		Falcon Dam, Texas	
	1980	Average March 1963-1980	1980	#Average 1964-1980	1980	Average #July 1950-1980
Jan.	70.1	61.8	87.3	65.4	78.7	66.6
Feb.	57.2	59.6	54.1	60.8	73.6	63.7
Mar.	45.4	53.8	43.7	57.1	66.2	61.7
Apr.	41.6	58.0	41.7	60.7	63.4	62.1
May	66.1	64.7	59.2	66.9	76.1	64.9
June	58.1	62.4	50.4	64.3	67.9	63.7
July	51.7	59.6	46.9	61.0	65.9	60.6
Aug.	68.4	61.4	58.8	63.3	71.4	61.7
Sept.	71.9	67.0	60.1	69.4	71.9	66.6
Oct.	61.7	66.5	51.6	68.3	71.9	66.4
Nov.	72.4	65.3	62.1	68.1	77.0	66.5
Dec.	78.3	63.1	65.4	66.3	82.3	65.9
Yearly	61.9	61.9	56.8	64.3	72.2	64.2

## In Mexico

Month	Nueva Cd. Guerrero, Tamaulipas	
	1980	Average August 1961-1980
Jan.	76	78
Feb.	69	76
Mar.	58	70
Apr.	50	70
May	64	75
June	52	74
July	57	72
Aug.	61	72
Sept.	62	78
Oct.	62	76
Nov.	68	76
Dec.	72	78
Yearly	63	75

# Some months missing

## DRAINAGE BASIN AND IRRIGATED AREAS

## Along the Rio Grande and Tributaries - 1980

The total area within the outer rim of the Rio Grande basin is about 335,500 square miles but it contains large areas, especially along its southwestern boundary, that contribute no surface runoff to the Rio Grande. Such noncontributing areas constitute about 47 percent of the total area, leaving 176,333 square miles of productive watershed, which is the only one included in the list below.

The irrigated areas shown below are listed in accordance with the location of their diversion points and are all within the Rio Grande basin, except in the Lower Rio Grande Valley where large portions of irrigated lands in both countries lie outside the basin boundary line.

On the United States side, only the areas irrigated in 1980 are shown, except that in the reaches below Falcon Dam, the figures shown represent acreages which were subject to irrigation in 1980 but for which data on the portion actually irrigated is not known. On the Mexican side, part of the data may have been gathered previous to 1980. The irrigated area data tabulated are the best data that could be obtained.

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Above Elephant Butte Dam	25,923	0	25,923			
Elephant Butte Dam to Caballo Dam	1,295	0	1,295	0	0	0
Above Caballo Dam	27,218	0	27,218	0	0	0
Caballo Dam to American Dam	2,053	0	2,053	81,803	0	81,803
Above American Dam	29,271	0	29,271	81,803	0	81,803
American Dam to Acala Station	672	544	1,216	50,275	14,340	64,615
Above Acala Gaging Station	29,943	544	30,487	132,078	14,340	146,418
Acala Station to Fort Quitman Station	663	794	1,457	13,333	0	13,333
Above Fort Quitman Gaging Station	30,606	1,338	31,944	145,411	14,340	159,751
Fort Quitman Station to Above Presidio Station	1,646	1,410	3,056	a) 801	a) 299	1,100
Above Presidio Station above Rio Conchos	32,252	2,748	35,000	146,212	14,639	160,851
Rio Conchos above Boquilla Dam	0	8,131	8,131	0	b) 6,054	6,054
Rio Conchos above Luis L. Leon Dam	0	22,992	22,992	0	0	0
Rio Conchos - Total	0	26,404	26,404	0	339,757	339,757
Alamito Creek above Gaging Station	1,504	0	1,504	0	0	0
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - excluding above tributaries	340	91	431	2,974	692	3,666
Presidio Station above Rio Conchos to Presidio Station below Rio Conchos - Total	1,844	26,495	28,339	2,974	340,449	343,423
Above Presidio Station below Rio Conchos	34,096	29,243	63,339	149,186	355,088	504,274
Terlingua Creek above Gaging Station	1,070	0	1,070	c) 400	0	400
Presidio Station below Rio Conchos to Johnson Ranch Station - excluding Terlingua Creek	1,093	2,258	3,351	762	2,787	3,549
Presidio Station below Rio Conchos to Johnson Ranch Station - Total	2,163	2,258	4,421	1,162	2,787	3,949
Above Johnson Ranch Gaging Station	36,259	31,501	67,760	150,348	357,875	508,223
Johnson Ranch Station to Foster Ranch Station	6,412	6,570	12,982	d) 655	0	655
Above Foster Ranch Gaging Station	42,671	38,071	80,742	151,003	357,875	508,878
Foster Ranch Station to Langtry Station	182	505	687	0	0	0
Above Langtry Gaging Station (Discontinued)	42,853	38,576	81,429	151,003	357,875	508,878
Pecos River above Girvin	29,562	0	29,562	0	0	0
Pecos River, Girvin to Station near Langtry	5,617	0	5,617	0	0	0
Pecos River above Station at Mouth (Discontinued)	35,308	0	35,308	0	0	0
Devils River above Pafford Crossing Station	3,961	0	3,961	0	0	0
Devils River above Station near Mouth (Discontd.)	4,305	0	4,305	0	0	0
Langtry Station to Amistad Dam - excluding above tributaries	217	1,875	2,092	0	0	0
Langtry Station to Amistad Dam - Total	39,830	1,875	41,705	0	0	0
Above Amistad Dam	82,683	40,451	123,134	151,003	357,875	508,878
Amistad Dam to Below Amistad Dam Gaging Station	5	4	9	0	0	0
Above the Below Amistad Dam Gaging Station	82,688	40,455	123,143	151,003	357,875	508,878
Below Amistad Dam Station to Del Rio Station	60	100	160	238	0	238
Above Del Rio Gaging Station	82,748	40,555	123,303	151,241	357,875	509,116
Arroyo Las Vacas above Gaging Station	0	350	350	0	237	237
San Felipe Creek above Gaging Station	46	0	46	2,178	0	2,178
Pinto Creek above Gaging Station	249	0	249	0	0	0
Rio San Diego above Gaging Station	0	853	853	0	19,736	19,736
Rio San Diego - Total	0	859	859	0	21,095	21,095

**DRAINAGE BASIN AND IRRIGATED AREAS**  
**Along the Rio Grande and Tributaries - 1980**

DESIGNATION OF AREAS AND GAGING STATIONS	Drainage Basin Square Miles			Irrigated Areas - Acres		
	United States	Mexico	Total	United States	Mexico	Total
Del Rio Station to Jimenez Station - excluding above tributaries	669	110	779	e) 38,548	3,008	41,556
Del Rio Station to Jimenez Station - Total	964	1,319	2,283	40,726	24,340	65,066
Above the Jimenez Gaging Station	83,712	41,874	125,586	191,967	382,215	574,182
Rio San Rodrigo above Gaging Station	0	1,049	1,049	0	5,673	5,673
Rio San Rodrigo - Total	0	1,049	1,049	0	5,673	5,673
Jimenez Station to Maverick Power Plant - excluding Rio San Rodrigo	287	114	401	1,510	0	1,510
Jimenez Station to Maverick Power Plant - Total	287	1,163	1,450	1,510	5,673	7,183
Above Maverick Power Plant	83,999	43,037	127,036	193,477	387,888	581,365
Maverick Power Plant to Piedras Negras Station	244	32	276	160	183	343
Above Piedras Negras Gaging Station	84,243	43,069	127,312	193,637	388,071	581,708
Rio Escondido above Gaging Station	0	1,459	1,459	0	10,455	10,455
Rio Escondido - Total	0	1,471	1,471	0	10,455	10,455
Piedras Negras Station to El Indio Station - excluding Rio Escondido	237	206	443	320	442	762
Piedras Negras Station to El Indio Station - Total	237	1,677	1,914	320	10,897	11,217
Above El Indio Gaging Station	84,480	44,746	129,226	193,957	398,968	592,925
El Indio Station to Villa Hidalgo Station	629	1,683	2,312	800	613	1,413
Above Villa Hidalgo Gaging Station	85,109	46,429	131,538	194,757	399,581	594,338
Villa Hidalgo Station to Nuevo Laredo Station	607	433	1,040	4,355	3,052	7,407
Above Nuevo Laredo Gaging Station	85,716	46,862	132,578	199,112	402,633	601,745
Rio Salado above Venustiano Carranza Dam	0	15,831	15,831	0	61,282	61,282
Rio Salado above Las Tortillas Gaging Station	0	23,155	23,155	0	129,382	129,382
Rio Salado above River Road Crossing	0	23,323	23,323	0	129,382	129,382
Nuevo Laredo Station to Falcon Dam - excluding Rio Salado	2,042	1,327	3,369	f) 8,734	7,618	16,352
Nuevo Laredo Station to Falcon Dam - Total	2,042	24,560	26,602	8,734	137,000	145,734
Amistad Dam to Falcon Dam - excluding above tributaries	4,780	4,009	8,789	54,665	14,916	69,581
Above Falcon Dam	87,758	71,512	159,270	207,846	539,633	747,479
Rio Alamo above Gaging Station	0	1,675	1,675	0	7,660	7,660
Rio San Juan above Marte Gomez Dam	0	12,745	12,745	0	102,549	102,549
Rio San Juan - Marte Gomez Dam to Camargo Gaging Station	0	195	195	0	165,481	165,481
Rio San Juan - Total	0	12,949	12,949	0	268,030	268,030
Falcon Dam to Rio Grande City Station - excluding above tributaries	222	246	468	4,993	2,508	7,501
Falcon Dam to Rio Grande City Station - Total	222	14,870	15,092	4,993	278,198	283,191
Above Rio Grande City Gaging Station	87,980	86,382	174,362	212,839	817,831	1,030,670
Rio Grande City Station to Anzalduas Dam	952	798	1,750	181,568	497,356	678,924
Above Anzalduas Dam	88,932	87,180	176,112	394,407	1,315,187	1,709,594
Anzalduas Dam to Progreso Station	13	163	176	127,768	5,204	132,972
Above Progreso Gaging Station	88,945	87,343	176,288	522,175	1,320,391	1,842,566
Progreso Station to San Benito Station	7	9	16	321,223	4,759	325,982
Above San Benito Gaging Station	88,952	87,352	176,304	843,398	1,325,150	2,168,548
San Benito Station to Brownsville Station	14	15	29	101,041	2,483	103,524
Falcon Dam to Brownsville Station - excluding Rio Alamo and Rio San Juan	1,208	1,231	2,439	736,593	512,310	1,248,903
Above Brownsville Gaging Station	88,966	87,367	176,333	944,439	1,327,633	2,272,072
Brownsville Station to Gulf of Mexico				4,800	0	4,800
Falcon Dam to Gulf of Mexico - excluding Rio Alamo and Rio San Juan				741,393	512,310	1,253,703
Amistad Dam to Gulf of Mexico - excluding above tributaries				796,058	527,226	1,323,284
Above Gulf of Mexico				949,239	1,327,633	2,276,872

a) Total area irrigated from the Rio Grande at least once during the year; additional irrigations from this source dependent on availability of river water in this reach

b) Includes area above Madero Reservoir

c) Includes 350 acres irrigated by spreader dams

d) Includes 500 acres irrigated by spreader dams

e) Includes 37,948 acres irrigated from the Maverick Canal below Mile 13 gaging station

f) Includes 110 acres irrigated from small reservoirs

## SUPPLEMENTARY DATA—INTERNATIONAL AMISTAD RESERVOIR

### Deduced Inflows

Considering that a knowledge of the mean daily inflows reaching the International Amistad Reservoir would serve a useful purpose, such data have been deduced for 1980 showing the flows as closely as they can be approximated. These data are based on the daily operation of the International Amistad Reservoir, taking into account: a) record of gage heights at the dam; b) releases; c) filtrations; d) elevation-area-capacity tables based on 1961 survey; and e) rate of evaporation measured at the dam.

Flow contributions from different sources, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and bank storage and return incident to changes in reservoir level, all tend to cause variations in the deduced determinations; and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Foster Ranch, Pecos River near Langtry, and Devils River at Pafford Crossing.

In spite of the deficiencies noted above and others that may occur, the data shown below represent a reasonable approximation of the flows entering the International Amistad Reservoir.

**Mean Daily Discharge in Second-Foot 1980 — Annual and Period Summary**

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,600	1,350	1,200	2,700	1,900	2,330	1,220	1,370	1,810	16,000	1,850	1,930
2	1,590	1,410	1,150	2,520	2,010	2,350	1,270	1,300	1,280	9,850	1,650	1,860
3	1,480	1,450	1,250	2,260	3,760	2,330	1,250	995	1,420	7,880	1,720	1,860
4	1,500	1,520	1,470	1,970	3,740	2,270	1,140	855	2,580	7,200	1,680	2,010
5	1,470	1,420	1,370	2,280	4,460	2,310	1,230	872	2,380	6,520	1,960	1,740
6	1,590	1,420	1,330	1,710	3,120	2,410	1,450	1,130	2,140	5,140	2,010	1,790
7	1,490	1,480	1,540	1,940	2,680	2,180	1,110	1,010	2,270	4,630	1,990	1,980
8	1,540	1,480	1,750	1,920	2,600	2,480	1,060	1,420	3,290	4,120	2,000	2,120
9	1,480	1,480	1,910	2,020	2,660	2,430	1,410	1,560	3,140	3,740	2,080	2,010
10	1,630	1,540	1,930	2,020	2,520	2,550	1,460	2,480	4,620	3,820	2,020	1,960
11	1,620	1,550	1,820	2,020	2,600	3,240	1,700	37,400	9,700	3,750	2,020	1,850
12	1,520	1,490	2,030	2,160	2,780	2,220	1,510	67,600	8,870	3,670	1,850	1,870
13	1,670	1,560	2,120	1,720	2,770	1,860	1,270	36,200	6,170	3,350	1,860	1,930
14	1,660	1,570	1,950	1,730	2,810	1,640	1,270	21,600	7,080	2,880	1,870	1,940
15	1,760	1,620	1,990	1,630	3,410	1,740	1,410	11,300	4,690	3,030	1,710	1,920
16	1,650	1,730	2,120	1,600	2,940	1,340	1,720	8,970	4,140	2,770	1,710	1,980
17	1,750	1,620	1,910	1,600	2,940	1,300	1,750	8,720	4,000	2,810	1,720	1,850
18	1,750	1,620	1,720	1,980	2,550	1,660	1,510	7,840	3,490	2,670	1,760	1,800
19	1,850	1,600	1,720	1,970	2,620	1,990	1,930	5,870	3,100	2,630	1,830	1,720
20	1,830	1,650	1,830	2,060	2,640	1,960	1,800	5,430	2,780	2,160	1,860	1,750
21	1,860	1,670	1,950	1,930	2,470	1,790	2,130	4,340	2,370	2,130	1,850	1,610
22	1,840	1,710	1,890	1,760	2,640	1,770	2,110	5,220	2,180	1,950	1,910	1,710
23	1,730	1,720	1,770	1,880	2,610	1,190	2,230	4,900	2,140	2,120	1,900	1,620
24	1,680	1,670	1,850	2,160	2,590	1,230	2,200	4,220	2,200	1,960	1,680	1,660
25	1,570	1,620	2,010	2,120	2,660	1,340	1,520	3,420	32,200	1,840	1,990	1,690
26	1,620	1,520	1,920	2,010	2,920	1,540	1,540	2,980	13,400	1,870	1,850	1,620
27	1,530	1,580	2,090	2,040	2,740	1,420	1,400	2,550	11,100	2,210	1,860	1,650
28	1,550	1,600	2,170	2,000	2,750	1,460	1,790	2,380	11,500	1,760	1,750	1,540
29	1,500	1,480	2,250	1,660	2,570	1,110	2,070	2,170	15,400	1,550	1,840	1,620
30	1,480	2,330	1,740	2,840	1,010	2,000	2,170	14,800	1,690	1,850	1,760	1,660
31	1,340	2,100	2,100	2,270	1,010	1,360	1,840	1,840	1,620	1,620	1,900	1,900
<b>Sum</b>	50,130	45,130	56,440	59,110	88,170	56,450	49,080	260,112	186,240	119,320	55,630	56,250

  

Month	Current Year 1980						Period 1973-1980			
	Extreme Gage Feet		Extreme Second-Foot		Average Second-Foot	Total Acre-Foot	Acre-Foot			
	High	Low	Day	Low			Average	Maximum	Minimum	
Jan.	21	1,860	31	1,340	1,620	99,431	102,388	136,708	72,708	
Feb.	16	1,730	1	1,350	1,560	89,514	105,816	172,088	73,688	
Mar.	30	2,330	2	1,150	1,820	111,947	153,964	304,417	93,840	
Apr.	1	2,700	116	1,600	1,970	117,243	157,541	231,030	86,703	
May	4	5,340	1	1,900	2,840	174,883	183,294	230,589	103,515	
June	11	3,240	30	1,010	1,880	111,967	181,936	418,612	103,948	
July	23	2,230	8	1,060	1,580	97,349	237,334	689,085	97,349	
Aug.	12	67,600	4	855	8,390	515,925	276,338	515,925	143,446	
Sept.	25	32,200	2	1,280	6,210	369,402	473,462	2,091,428	125,316	
Oct.	1	16,000	29	1,550	3,850	236,668	314,172	950,737	89,772	
Nov.	9	2,080	2	1,650	1,850	110,340	159,390	454,512	67,616	
Dec.	8	2,120	28	1,540	1,810	111,570	110,001	163,332	58,459	
<b>Yearly</b>				67,600	855	2,960	2,146,239	2,455,636	4,328,998	1,614,745
	<b>Meters</b>		<b>Cubic Meters per Second</b>			<b>Thousands of Cubic Meters</b>				
				1,914	24.2	83.8	2,647,386	3,029,027	5,339,819	1,991,788

∅ Mean daily

1 And other days

## SUPPLEMENTARY DATA—INTERNATIONAL FALCON RESERVOIR

## Deduced Inflows

Considering that a knowledge of the mean daily inflows reaching the International Falcon Reservoir would serve a useful purpose, such data have been deduced for 1980 showing the flows as closely as they can be approximated. These data are based on the daily operation of the International Falcon Reservoir, taking into account: a) record of gage heights at the dam; b) releases as measured at both hydroelectric plants and outlet works; c) elevation-area-capacity tables based on 1971-1972 surveys; and d) rate of evaporation measured at the dam and Nueva Cd. Guerrero applied to an area one foot higher than the average area of two consecutive days.

Flow contributions from different sources, irrigation diversion between Laredo and Falcon, river channel losses, reservoir evaporation, accuracy of gage-height records, displacement due to wind action on the reservoir, and bank storage and return incident to changes in reservoir level, all tend to cause variations in the deduced determinations; and the inflows shown below should not necessarily be in agreement with the combined flow of the Rio Grande at Laredo and the Rio Salado at Las Tortillas.

In spite of the deficiencies noted above and others that may occur, the data shown below represent a reasonable approximation of the flows entering the International Falcon Reservoir.

## Mean Daily Discharge in Second-Feet 1980 — Annual and Period Summary

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2,350	2,870	2,460	5,540	756	4,480	3,090	1,680	2,790	6,390	2,690	3,390
2	2,400	2,690	2,370	5,830	756	4,310	2,830	1,740	3,710	7,420	2,600	3,420
3	2,980	2,840	1,220	5,620	2,490	4,590	6,600	1,580	3,050	2,950	2,380	3,070
4	2,650	2,750	971	3,280	2,130	5,370	6,360	1,550	2,500	3,850	1,820	2,920
5	2,030	3,040	1,200	1,670	2,080	4,170	6,640	1,480	2,450	3,810	1,970	2,650
6	2,060	2,940	1,180	1,310	2,700	3,480	6,920	1,480	2,070	3,520	2,040	2,940
7	3,520	2,640	1,120	1,070	2,130	3,880	6,570	2,450	2,160	2,870	3,710	3,190
8	1,960	2,710	1,780	1,340	2,670	3,810	6,780	2,410	1,650	3,670	2,870	3,640
9	2,300	2,540	1,960	1,130	777	4,170	7,450	2,620	2,530	2,460	2,780	2,840
10	2,630	2,520	1,880	957	657	4,100	7,420	2,150	2,700	2,790	2,360	2,410
11	2,870	2,900	2,260	1,040	975	3,670	6,780	15,000	1,880	3,520	2,680	2,770
12	2,590	2,870	2,160	1,090	1,440	4,240	6,780	37,400	2,320	2,610	2,910	2,940
13	2,730	3,010	1,990	1,300	1,430	3,570	6,820	57,900	2,510	2,650	2,680	2,720
14	2,690	2,790	2,700	862	3,050	3,150	6,320	45,200	2,710	2,330	3,670	2,990
15	2,730	2,860	2,680	1,210	6,430	3,200	6,390	16,700	1,860	3,880	3,220	3,740
16	2,770	2,520	2,790	1,250	9,850	2,880	6,780	7,840	2,080	3,350	4,170	2,880
17	2,820	2,700	2,740	957	8,720	3,500	6,670	5,830	2,150	4,030	2,010	2,020
18	2,880	2,530	3,180	915	6,360	3,400	7,660	5,580	2,300	4,560	1,210	3,030
19	2,600	2,880	3,170	1,130	8,860	3,380	7,560	4,770	2,660	2,070	1,970	4,100
20	2,700	2,660	3,310	1,010	8,440	3,600	7,660	4,480	1,720	3,340	2,900	3,030
21	2,690	2,780	3,090	1,070	5,190	3,240	9,110	4,030	2,510	2,040	6,640	1,480
22	2,690	2,710	3,010	1,710	12,100	3,390	5,540	3,780	2,120	1,830	4,240	2,350
23	2,900	2,740	3,360	1,800	6,430	2,890	4,840	3,920	2,220	3,410	3,390	2,570
24	2,670	2,730	3,710	2,270	4,940	3,960	3,350	3,880	3,380	2,320	3,070	2,630
25	2,770	2,330	4,060	2,200	4,700	3,990	3,640	2,710	3,130	1,150	3,270	2,450
26	2,580	2,510	3,670	351	6,640	3,740	3,710	3,000	5,540	1,490	3,960	2,290
27	2,580	2,510	5,330	509	4,520	3,310	3,530	2,620	2,120	5,440	2,810	2,890
28	3,010	2,320	5,510	1,260	26,400	3,210	3,600	2,660	2,070	3,990	2,450	2,910
29	2,610	2,320	5,370	1,420	16,900	3,300	3,400	2,600	5,050	1,210	2,740	2,710
30	2,710		5,470	477	5,790	3,000	3,320	2,180	11,500	1,280	2,870	2,920
31	3,000		5,910		5,330		3,150	2,650		1,910		2,510
Sum	82,470	78,210	91,211	51,578	171,641	110,980	177,270	253,870	87,440	98,140	88,080	88,400
Current Year 1980									Period 1968-1980			
Month	Extreme Gage Feet		Extreme Second-Feet				Average Second-Feet	Total Acre-Feet	Acre-Feet			
	High	Low	Day	High	Day	Low			Average	Maximum	Minimum	
Jan.			7	3,520	8	1,960	2,660	163,563	121,910	245,376	50,635	
Feb.			5	3,040	128	2,320	2,700	155,116	155,244	453,053	54,934	
Mar.			128	5,510	4	971	2,940	180,927	160,605	431,073	53,064	
Apr.			2	5,830	26	351	1,720	102,261	140,687	351,929	49,911	
May			28	26,400	10	657	5,540	340,399	276,455	674,606	101,854	
June			4	5,370	16	2,880	3,710	220,139	278,748	770,709	46,609	
July			21	9,110	2	2,830	5,720	351,635	325,573	1,056,340	33,481	
Aug.			13	57,900	1	1,480	8,190	503,633	296,486	1,023,293	64,413	
Sept.			30	11,500	8	1,650	2,910	173,391	450,259	1,442,682	137,408	
Oct.			2	7,420	25	1,150	3,170	194,677	375,327	1,365,884	56,661	
Nov.			21	6,640	18	1,210	2,930	174,679	187,477	538,929	40,660	
Dec.			19	4,100	21	1,480	2,850	175,331	144,310	304,865	42,870	
Yearly				57,900		351	3,780	2,735,751	2,914,081	6,234,950	1,280,067	
	Meters		Cubic Meters per Second				Thousands of Cubic Meters					
				1,640		9.93	107	3,374,512	3,594,480	7,690,727	1,578,946	

0 Mean daily

! And other days

**CORRECTIONS TO PREVIOUS WATER BULLETINS**

<u>Water Bulletin and Page Number</u>	<u>Heading</u>	<u>Reference</u>	<u>Published As</u>	<u>Correction</u>
49-5	Foreword	Units of Measure, Conversion of 1 square kilometer to square mile	3,38610 Square Mile	0.38610 Square Mile
49-6	General Hydrologic Conditions for 1979	Second paragraph, third line	99% of average below Elephant Butte Dam	92% of average below American Dam
49-8	Rio Grande below Caballo Dam	Period Summary, average for November for December	Blank 2	2,154 2,232

# Flow of the Rio Grande and Related Data 1980



RIO GRANDE NEAR EL INDIO, TEXAS  
AND VILLA GUERRERO, COAHUILA

UNITED STATES OF AMERICA  
DEPARTMENT OF STATE

INTERNATIONAL BOUNDARY AND WATER COMMISSION  
UNITED STATES AND MEXICO

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WATER BULLETIN NUMBER 50

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COVER PHOTOGRAPH

Rio Grande near El Indio, Texas, and Villa Guerrero, Coahuila. This hydrographic station, consisting of a cableway, bubbler gage, concrete control weir and water stage recorders (graphic and digital), is located 5 miles (8.0 km) northeast of Villa Guerrero, Coahuila, and 11.5 miles (18.5 km) south of El Indio, Texas.

Flow at the time the photograph was taken was approximately 7,000 cubic feet per second (198 cubic meters per second).